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Revision 0

Central Plateau Cleanup Completion Strategy

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY | Richland Operations Office

P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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CENTRAL PLATEAU CLEANUP COMPLETION STRATEGY

EXECUTIVE SUMMARY

The U. S. Department of Energy (DOE) is committed to aggressively move forward to complete the cleanup of the Hanford Site and to shrink the size of the final footprint of the Central Plateau that will require long-term management of wastes and residual contamination. This commitment is an extension of DOE's on-going actions to protect the Columbia River and cleanup activities underway along the River Corridor. The DOE, the U.S. Environmental Protection Agency (EPA) and the State of Washington Department of Ecology (Ecology) (the Tri-Parties) have agreed that a Central Plateau cleanup strategy is needed. In response to that need, this document presents DOE's Central Plateau Cleanup Completion Strategy (the Strategy).

The Strategy lays out the approach DOE intends to use to clean up nearly 75 square miles of the Central Plateau near the center of the Hanford Site. In implementing the Strategy DOE will make cleanup decisions to achieve the following goals:

- Protect groundwater, workers, the public, and the environment from exposure to radiological and chemical contamination.
- Shrink the portion of the Central Plateau that will require continued management.
- Be compliant with all applicable and relevant regulations that guide and direct cleanup.

The objective of this document is to present DOE's strategy for completion of Central Plateau cleanup and to stimulate a dialogue with the Tribal Nations, stakeholders, and members of the public in order to help DOE further define the future direction for cleanup of the Central Plateau.

This strategy describes DOE's vision for completion of Central Plateau cleanup, the technical and regulatory path forward and the decisions needed to achieve the vision. Implementing the strategy will:

Protect groundwater, workers, the public, and the environment from radiological and chemical contamination.

Select remedies that appropriately balance criteria such as long-term effectiveness and cost effectiveness, and that consider public acceptance.

Efficiently manage cleanup resources through systematic planning and implementation.

Optimize Central Plateau readiness to utilize funding when it is freed up by the completion of River Corridor and Plutonium Finishing Plant cleanup projects by having a strong basis to request and defend that funding.

Background

The Central Plateau has been the site of processing and waste management activities since 1945. The initial framework for cleanup was established when DOE, EPA, and Ecology signed the *Hanford Federal Facilities Agreement and Consent Order* (Tri-Party Agreement) in 1989. In 1992, the Tri-Parties actively engaged stakeholders and the public on Hanford Site cleanup with the Hanford Future Site Uses Working Group. Three key recommendations of the group[1] have framed much of the direction of cleanup since that time.

[1] *The Future for Hanford: Uses and Cleanup, Final Report of the Hanford Future Site Uses Working Group*

- ***"Protect the Columbia River"*** *– Stop actual and possible future contamination of the Columbia River. Protection of the Columbia River and its uses is viewed as a high priority.*
- ***"Deal Realistically and Forcefully with Groundwater Contamination"*** *– Return groundwater to unrestricted use where possible. Restrict groundwater use where necessary, but apply treatment technologies and source removal to enable future use.*
- ***"Use the Central Plateau Wisely for Waste Management"*** *– To facilitate cleanup of the rest of the site, wastes from throughout the Hanford Site should be concentrated in the Central Plateau. Minimize the amount of land devoted to, or contaminated by, waste management activities.*

The first two recommendations have been the focus of cleanup efforts in the last 15 years for the three major components for Hanford Site cleanup – the River Corridor, Tank Waste, and Central Plateau. Specific activities have been further shaped by discussions with Tribal Nations, interactions with the public, and advice from the Hanford Advisory Board. Cleanup of waste sites and facilities in the River Corridor will essentially be complete by 2015, with substantial progress made on groundwater remediation. Closure of tanks and tank farms is being evaluated in the forthcoming *Tank Closure and Waste Management Environmental Impact Statement* (EIS).

The Central Plateau has been utilized to support cleanup of the rest of the Hanford Site as contaminated soils and debris have been brought to the Environmental Restoration Disposal Facility (ERDF) for final disposal. There has also been substantial characterization and investigation of Central Plateau soil waste sites, underlying groundwater, and deep vadose zone contamination. Interim actions to contain and remediate contaminated groundwater have also been implemented.

Why is a Central Plateau Cleanup Strategy needed now?

Remedy decisions are needed now to enable Central Plateau cleanup to transition from investigation to remediation.

Alternative evaluation, remedy selection, and implementation need to evolve from multiple, independent actions fostered by the current operable unit structure to a more comprehensive approach that:

- Reflects the magnitude of the Central Plateau,
- Acknowledges the implications of previous decisions, and
- Integrates remedies for individual sites with the remedies throughout the geographic area.

Why is a Central Plateau cleanup strategy needed?

As the River Corridor cleanup nears completion, decisions on the closure of tank farms are forthcoming, and the initial characterization of the Central Plateau waste sites is being completed, DOE has focused additional attention on how to reach cleanup decisions and implement remedies on the Central Plateau. The current structure of 23 operable units has served well for the characterization phase of the Central Plateau waste sites. However, as the cleanup effort moves into the remedial alternative evaluation, remedy selection, and remedy implementation phase, a more comprehensive approach is needed to ensure holistic decisions. The holistic approach will provide consistency, take into consideration the scale of cleanup needed on the Central Plateau, account for the geographic proximity of other waste sites, facilities or landfills and enable efficient, effective remedies to be implemented.

The current operable unit structure is based on grouping waste sites that are similar in nature and process history, but may be geographically located very far apart. Multiple independent decision units create redundancy in decision making, causing many of the same difficult issues to be revisited multiple times

by multiple decision-makers. This has led to disagreements on decision processes and, ultimately, on remedy selection, and has contributed to delays in getting Central Plateau decision documents approved.

The current approach could result in inconsistencies in the many risk evaluations and feasibility studies. Inconsistencies in approach could also extend to how evaluations are being conducted on contaminated media in tank farms relative to adjacent soil sites outside of the tank farm boundary. Approaching remedy selection in a holistic, rather than sequential manner will assure the public and taxpayers that remediation dollars are being focused on the highest priority actions.

What are the basic elements of the strategy?

DOE's strategy was influenced by many previous efforts and inputs including: discussions with EPA and Ecology, discussions with Tribal Nations, the recommendations and advice of the 1992 Future Site Uses Working Group, Hanford Advisory Board, and the Oregon Hanford Cleanup Board, as well as experience from other Hanford cleanup activities and from other DOE and non-DOE sites. In addition, in 2009, senior executives of the Tri-Parties met to discuss and develop the basic elements of the Strategy. Additional meetings were held with management and staff of the Tri-Parties to refine these elements. At the conclusion of the decision process for the Central Plateau, a master "blueprint" will be established that supports the time-phased sequence of cleanup. This blueprint will promote consistency during a multi-decade cleanup program.

Elements of DOE's strategy include:

- ***Dedicated area for waste management and containment of residual contamination***. Waste and residual contamination will remain in place on the Central Plateau because of decisions already made and continued use of Central Plateau disposal facilities for wastes generated from cleanup activities across the Hanford Site. To ensure protection of human health and the environment, federal ownership and control is required as long as the potential hazard exists.
- ***Small and contiguous final footprint***. The area identified for waste management and containment of residual contamination should be as small as practical while ensuring that the entire area requiring protection is encompassed in contiguous areas.[2] DOE believes that long-term protectiveness of remedies can best be achieved through establishing a contiguous geographic area that is the smallest practical footprint for waste management. With continuity of a final area dedicated to the management of all contamination, a single set of institutional and waste management practices can be implemented more effectively and reduce the risk of potential exposure to radiological and chemical contaminants. The remainder of the Central Plateau will be available for other uses, although it will also be retained under federal ownership and control.
- ***Land use authority and CERCLA decision making***. DOE has exercised its responsibility to determine reasonably anticipated land use as input to the CERCLA process. The Comprehensive Land-Use Plan Environmental Impact Statement (HCP-EIS) and the corresponding record of decision provide the basis for DOE's determination of future anticipated land use for CERCLA decision making. In accordance with CERCLA requirements, cleanup levels will be established commensurate with potential future uses to ensure protection of future users.
- ***Consistent/comprehensive approach to remedial decision-making***. DOE will consistently apply a set of technical principles to cleanup decisions including:

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[2] This Inner Area approach is analogous to EPA's goal "…to develop a comprehensive response to address area-wide contamination. This will help avoid response actions that create 'clean islands' amid widespread contamination." (EPA 540-R-97-013, OSWER 9355.0-69 *Soil Screening Guidance*, August 1997).

  - Develop a baseline risk assessment including consistent exposure scenarios and dose/risk standards for assessing risk to human health.
  - Establish ecological protection standards including science-based point of compliance and action levels.
  - Derive soil cleanup levels to protect ground water.
  - Establish a master list of contaminants of potential concern and characterization data requirements.
  - Define a standard set of applicable and relevant or appropriate requirements (ARARs) that represent the substantive requirements that must be satisfied by remedial alternatives.
  - Develop comprehensive decision logic for selecting remedial actions.
- ***Appropriate scale***. DOE will apply a comprehensive approach in conducting evaluations on a large scale to avoid fragmentation in evaluating and selecting remedies. This element of the Strategy is responsive to comments of stakeholders and others that decisions need to be put into a context of the overall cleanup of the Central Plateau.
- ***Protection of human health, ecological resources and groundwater***. The Strategy uses a 3-pronged approach in achieving cleanup that protects human health and the environment through the ecological, groundwater, and direct contact pathways.
  - The first prong addresses the protection of ecological resources by preventing these resources from coming into contact with waste. Cleanup levels and the depth at which they must be applied to break the exposure pathway will be established.
  - The second prong will determine the soil concentrations that are needed to be protective of groundwater. Part of the alternative assessment will include determining the practical depth of excavation, and the depth to which a barrier is effective.
  - The third prong will establish cleanup levels that must be achieved to be protective of humans through direct contact. This will include taking into consideration reasonably anticipated future land use and direct contact exposure pathways associated with that land use, as well as measures necessary for preventing other exposures from occurring. DOE believes that many of the waste sites that pose a risk to humans (through direct contact) and/or to ecological resources will be excavated to reduce the risks to acceptable levels.

As DOE implements the Central Plateau Cleanup Completion Strategy, DOE affirms that it will:

- Follow the CERCLA process, incorporate the RCRA corrective action process per EPA guidance, and apply the RCRA closure process to applicable TSD units.
- Recognize existing decisions, commitments, and guidance relative to use of the Central Plateau including designated land uses and established institutional controls.
- Maintain or improve the pace of decision making process.
- Select remedies based on sound technical cleanup principles with consideration of their cost, while ensuring Tribal Nation, stakeholder, and public involvement throughout the decision process and cleanup implementation.
- Implement remedies in a timely and efficient manner.

How are Central Plateau cleanup decisions to be organized?

Central Plateau cleanup will be organized into the following three major components:

Inner Area – defined as the final footprint area of the Hanford Site that will be dedicated to waste management and containment of residual contamination which will remain under federal ownership and control. This boundary is defined by waste disposal decisions[3] already in place and anticipated future decisions that will result in the requirement for continued waste management and containment of residual contamination. The locations of these sites were key considerations in development of DOE's initial boundary of the Inner Area as shown in the figure below.

There are 3 major cleanup components of the Central Plateau:

Inner Area: The final footprint area of the Hanford Site that will be dedicated to waste management and containment of residual contamination.

Outer Area: All areas of the Central Plateau beyond the boundary of the Inner Area.

Groundwater: Contaminant plumes underlying the Central Plateau and originating from waste sites on the Central Plateau.

The Inner Area footprint should be as small as practical. For sites at the edge of the boundary, the Tri-Parties will be attentive to the potential for possible further shrinking of the Inner Area.

Actions to implement the strategy for the Inner Area include:

- Develop and implement a consistent, comprehensive Inner Area decision process.

Central Plateau Inner Area

- Consolidate decision documents for the Inner Area into four geographic area groupings that are amenable to consistent remedy selection and effective implementation:
  - 200-PW-1/3/6 and 200-CW-5 Decision Unit
  - 200 West Inner Area Decision Unit
  - 200 East Inner Area Decision Unit
  - Balance of Inner Area Decision Unit[4].

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[3] These prior decisions include: US Ecology Low Level Radioactive Waste Disposal Facility, Naval Reactor Compartment Disposal Facility, Mixed Waste Disposal Trenches 31 and 34 within the 218-W-5 burial ground, Environmental Restoration Disposal Facility, U Plant Canyon Disposition Initiative, and Integrated Disposal Facility.

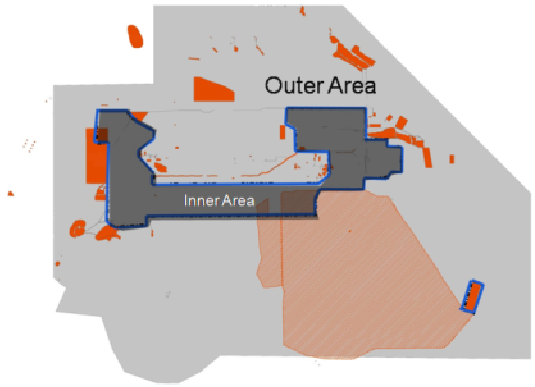
[4] Tank farm environmental media (i.e., past contaminant releases to the soil from tank farms) will be included in this decision unit. Initially, only environmental media from Waste Management Area (WMA) C will be included and will coincide with closure decisions for the WMA. Remedy selection for subsequent WMAs will be incorporated through future amendments to the decision document.

- Implement remedies using a geographic area approach organized around canyon facilities, landfills, tank farms and other discrete areas.
- Develop and apply deep vadose zone treatment technologies to address potential sources of future groundwater contamination.
- Integrate groundwater and soils remediation using a defense-in-depth approach that applies a combination of actions including: infiltration barriers, vadose zone monitoring, groundwater monitoring, and readiness to implement groundwater treatment, when necessary.
- As part of the CERCLA five-year review process, regularly evaluate new and improved cleanup technologies to assess their potential to improve cleanup effectiveness.

Benefits of the Strategy to achieve Inner Area Cleanup:

1. Applies a consistent and uniform approach in evaluating and selecting remedies.
2. Acknowledges previous decisions which commit portions of the Central Plateau to waste management.
3. Provides a comprehensive understanding of remedies by defining the range of alternatives through the CERCLA criteria.
4. Puts cleanup decisions in context of the entire Central Plateau, rather than as isolated discrete decisions.
5. Incorporates RCRA process at a more comprehensive level to ensure consistency in remedy development and selection and closure actions.
6. Reduces the number of decisions, saving time and money in reaching decisions and advancing cleanup implementation.
7. Preserves Tribal Nation and stakeholder involvement throughout the decision and implementation process.

Outer Area – defined as all areas of the Central Plateau beyond the boundary of the Inner Area. It is DOE's intent to clean up this portion of the site to a level comparable to that achieved for the River Corridor (that is, suitable for unrestricted surface use under continued federal ownership and control, consistent with the anticipated future land use of conservation/mining). Contaminated soils and debris will be removed to ERDF within the Inner Area for final disposal. Completion of cleanup of the Outer Area will shrink the footprint of active cleanup to the final approximate 10 square mile Inner Area.



Central Plateau Outer Area

Actions to implement the strategy for the Outer Area include:

- Consolidate final remedy selections into a single Outer Area decision document.
- Accelerate cleanup with interim actions.
- Remediate using cleanup levels comparable to River Corridor.

Groundwater –As acknowledged in the *Hanford Site Groundwater Strategy*, the *Hanford Integrated Groundwater and Vadose Zone Management Plan* and reaffirmed in the 200-ZP-1 Final ROD, the goal is to restore groundwater to its beneficial uses, unless

restoration is determined to be technically impracticable. This includes groundwater underlying the 200 West Area and 200 East Area. Actions to implement the strategy for the groundwater include:

- Amend the 200-ZP-1 ROD to incorporate remedy selection for groundwater underlying the remainder of 200 West Area.
- Continue investigation of contaminated groundwater underlying the 200 East Area. Amend 200-ZP-1 ROD to select the remedy or use a separate decision document, as appropriate.
- Implement treatment systems to contain contaminant plumes to protect the Columbia River and to restore groundwater to its beneficial uses, if practical.
- Evaluate further cleanup opportunities as new technologies become available.

Benefits of the Strategy

To achieve Outer Area Cleanup:

1. Expands area that is cleaned up to levels comparable to River Corridor (i.e. suitable for unrestricted surface use under continued federal ownership and control, consistent with anticipated future land use of conservation/mining).
2. Accelerate cleanup with interim actions.
3. Consolidate final remedy selections into a single Outer Area decision document.

To achieve Groundwater Cleanup:

1. Recognizes geographic continuity in groundwater remediation needs.
2. Employs a defense-in-depth approach to mitigate potential impacts of contaminants remaining in the vadose zone
3. Builds upon previous 200-ZP-1 Record of Decision to complete groundwater decisions.

How will DOE implement cleanup decisions?

To facilitate a thorough, organized, and comprehensive cleanup of the Central Plateau, decisions and actions will be implemented using a time-phased geographic approach. Cleanup will be managed using smaller subsections or geographic areas, each with a defined inventory of facilities and waste sites requiring cleanup.

The primary geographic areas are configured around important components and include waste sites and facilities that lie in relatively close physical proximity to each other. Four types of geographic areas were identified:

- **Facility areas** center around the "Key" Facilities defined in the Section 8 of the Tri-Party Agreement Action Plan or other major facilities (B Plant, T Plant, PFP, PUREX, U Plant, REDOX, and Waste Treatment Plant Areas).
- **Tank Farm** areas include the Waste Management Areas (WMAs).
  - Single-shell tank WMAs, (A/AX Farms, B/BX/BY Farms, C Farm, S/SX Farms, T Farm, TX/TY Farms, and U Farm Areas).
  - Proposed Double-shell tank WMAs (AN/AP/AW/AY/AZ Farms, and SY Farm Areas).
- **Landfill areas** include the existing landfill areas (200 West Landfill and 200 East Landfill Area, which includes 3 parts).
- **Balance of 200 West Inner Area, Balance of 200 East Inner Area, and Outer Area** encompass the remainder of the Central Plateau not included in another geographic area.

What is DOE's path forward for finalizing this strategy?

To achieve timely implementation of this strategy, DOE is seeking input from the Tribal Nations, the public, and stakeholders. DOE will consider any input and revise the strategy as appropriate. In addition, DOE, EPA and Ecology will negotiate Tri-Party Agreement change packages based on the

strategy. Following completion of those negotiations, the proposed TPA change packages will undergo public review.

DOE is committed to provide numerous opportunities for discussions with Tribal Nations and public involvement during Central Plateau decision making and implementation. In addition to documents requiring review in accordance with the Tri-Party Agreement Community Relations Plan, topic areas that will require discussions with Tribal Nations, and input from stakeholders, and the public include the overall Central Plateau strategy, the consolidation of waste site and canyon remediation schedules, integration approaches for CERCLA/RCRA actions, and regrouping of decision documents.

Implementation of this strategy will affect a wide variety of projects and regulatory decisions. Agreements on scope and schedule need to be made as soon as possible, clearing the way to apply funds to those projects best suited for their application. A defined regulatory pathway and a process that provides the Congress with the confidence that cleanup funding will continue to be well spent are keys to ensuring continued support. A Central Plateau strategy that meets these objectives provides the means to justify and sustain funding.

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Terms

AIP	Agreement-In-Principle
ARAR	applicable or relevant and appropriate requirement
ARRA	American Recovery and Reinvestment Act
BCCA	BC Control Area
CAD/ROD	Corrective Action Decision/Record of Decision
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
D&D	deactivation and decommissioning
DOE	U.S. Department of Energy
DQO	data quality objective
DST	double shell tanks
EE/CA	Engineering Evaluation/Cost Analysis
Ecology	State of Washington Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FDE	Facility Decommissioning Evaluation
FS	feasibility study
FY	fiscal year
HWMA	Hazardous Waste Management Act
IDF	Integrated Disposal Facility
MNA	Monitored Natural Attenuation
MTCA	Model Toxics Control Act
NCP	National Contingency Plan
NEPA	National Environmental Policy Act of 1969
NRDWL	Non-Radioactive Dangerous Waste Landfill
ORP	Office of River Protection
OU	Operable Unit
PFP	Plutonium Finishing Plant

PP	proposed plan
PUREX	Plutonium Uranium Extraction Facility
QA/QC	Quality assurance/quality control
R-CCP	RCRA-CERCLA Past Practice Units
RCRA	Resource Conservation and Recovery Act of 1976
RD/RA	remedial design/remedial action
REDOX	Reduction Oxidation Facility
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPP	RCRA Past Practice
RTD	Remove, treat, and dispose
SST	single-shell tank
STOMP	Subsurface Transport Over Multiple Phases
SWL	Solid Waste Landfill
TBD	to be determined
TPA	Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement)
TSD	treatment, storage, and disposal
WAC	Washington Administrative Code
WMA	Waste Management Area
WTP	Waste Treatment and Immobilization Plant

1 INTRODUCTION

The U. S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) and the State of Washington Department of Ecology (Ecology) signed *Agreement in Principle, Negotiation of Hanford Federal Facility Agreement and Consent Order Revisions to Address CERCLA/RCRA Integration, Integration of Facility Disposition with Remediation of Geographically Associated Waste Sites, Central Plateau Cleanup Completion Strategies and Dispute Resolution Provisions* in February 2009. In the Agreement-In-Principle (AIP), the Tri-Parties agreed to attempt to reach agreement on the development of a Central Plateau Cleanup Completion Strategy to address processes for evaluating, selecting, and implementing remedies for the Central Plateau. The strategy was also to address the following elements:

- Utilization of a parallel Resource Conservation and Recovery Act (RCRA)/Hazardous Waste Management Act (HWMA) Corrective Action/Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Record of Decision (ROD) documents.
- Coordination of decisions for canyon facilities with remediation of waste sites that are in close geographic proximity.
- A strategy for the deep vadose zone in the Central Plateau.
- Responsibility for development of RODs.

DOE recognized the need for a comprehensive strategy for the Central Plateau and committed to develop a cleanup completion strategy that addressed those subject areas. At DOE's request, three meetings of the senior executives of the Tri-Parties – the Manager of DOE-Richland Operations Office, the Manager of DOE-Office of River Protection (ORP), the Director of Environmental Cleanup for EPA Region 10, and the Director of Ecology – were convened in February, April, and July 2009 to review and discuss key points of DOE's strategy.

This document reflects DOE's understanding of the agreements reached by the senior executives, which were used to refine the strategy. The details of DOE's strategy and its implementation were also shaped by numerous meetings and workshops among management and staff of the Tri-Parties since the AIP was signed.

1.1 Purpose of this document

The draft *Hanford Site Cleanup Completion Framework* (DOE/RL-2009-10) describes the overall approach for cleanup of the Central Plateau in coordination with the River Corridor and Tank Waste components of Hanford cleanup. As noted in the Completion Framework: "The principal elements of the Central Plateau cleanup completion strategy are: (1) contain and eventually remediate contaminated groundwater; (2) *develop and implement a geographic area cleanup strategy (similar to the strategy developed for the River Corridor) that guides remedy selection from a plateau-wide perspective*; (3) develop and implement viable treatment methods for deep vadose contamination to provide long term protection of the groundwater; and (4) conduct essential waste management operations in coordination with cleanup actions." *[Emphasis added]*

The purpose of this document is to further develop and provide details regarding principal element #2, the geographic area cleanup strategy. In addition, this document addresses the key subject areas described in the AIP. DOE's strategy focuses on completion of cleanup work for which the Richland Operations Office has responsibility, including waste site operable units, excess facilities, and groundwater remediation, with key logic ties to tank farms closure and cleanup. This document describes DOE's plans for decision-making and implementation of Central Plateau cleanup and describes anticipated changes

that would be required to the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement or TPA) to implement the strategy.

The objective of this document is to present DOE's strategy for completion of Central Plateau cleanup and to stimulate a dialogue with the Tribal Nations, stakeholders, and members of the public to help DOE further define the future direction for cleanup of the Central Plateau.

1.2 Why a Central Plateau strategy is needed

The initial framework for cleanup was established when DOE, EPA, and Ecology signed the *Hanford Federal Facilities Agreement and Consent Order* (Tri-Party Agreement) in 1989. In 1992, the Tri-Parties engaged stakeholders and the public in Hanford Site cleanup with the Hanford Future Site Uses Working Group. Three key recommendations of the group[5] have framed much of the direction of cleanup since that time.

- ***"Protect the Columbia River"*** *– Stop actual and possible future contamination of the Columbia River. Protection of the Columbia River and its uses is viewed as a high priority.*
- ***"Deal Realistically and Forcefully with Groundwater Contamination"*** *– Return groundwater to unrestricted use where possible. Restrict groundwater use where necessary, but apply treatment technologies and source removal to enable future use.*
- ***"Use the Central Plateau Wisely for Waste Management"*** *– To facilitate cleanup of the rest of the site, wastes from throughout the Hanford site should be concentrated in the Central Plateau. Minimize the amount of land devoted to, or contaminated by, waste management activities.*

The first two recommendations have been the focus of cleanup efforts in the last 15 years for the three major components for Hanford Site cleanup – the River Corridor, Tank Waste, and Central Plateau. Specific activities have been further shaped by discussions with Tribal Nations, interactions with the public, and advice from the Hanford Advisory Board. Each of these three management areas is, in itself, a complex and challenging undertaking involving multiple projects and contractors and requiring many years and billions of dollars to complete.

For the River Corridor, wastes were consolidated on the Central Plateau either for storage, as is the case for nuclear fuel previously stored in the K Basins, or for disposal, as is the case for contaminated soils and debris brought from waste sites and facilities in the 100 and 300 Areas. Extensive interim actions have been conducted to remediate groundwater that flows to the Columbia River. A schedule for completion of the River Corridor has been negotiated by the Tri-Parties as documented in Tri-Party Agreement Change Number M-016-08-07, *New and Accelerated Groundwater and Columbia River Protection Hanford Federal Facility Agreement and Consent Order Milestones*, dated August 11, 2009.

Cleanup activities on the Central Plateau in the last 15 years have been focused on management of single-shell and double-shell tank wastes, stabilization of nuclear materials, and groundwater treatment. Closure of tanks and tank farms will be evaluated in the forthcoming *Tank Closure and Waste Management Environmental Impact Statement* (EIS). The single-shell tank closure process is described in Appendix I of the Tri-Party Agreement. Radioactive contamination of environmental media beneath the tanks will be addressed using CERCLA. There has also been substantial characterization and investigation of Central Plateau soil waste sites, including underlying groundwater and deep vadose zone contamination.

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[5] *The Future for Hanford: Uses and Cleanup, Final Report of the Hanford Future Site Uses Working Group, December 1992.*

The current structure of 23 operable units has provided a sound basis for characterization and for the remedial investigation phase for the Central Plateau waste sites. However, as the effort moves into the remedy selection and implementation phase, a more comprehensive structure to the CERCLA decision process is needed to ensure consistency and consideration of scale in decision-making. Making individual decisions in the operable unit structure that currently exists requires multiple work teams at all agencies. Given different work teams, it is not always possible to use consistent processes, values, parameters, endpoint objectives and other inputs to decision-making. Redundancy in decision making has caused many of the same difficult issues to be revisited multiple times as each decision document progresses. This has led to disagreements on decision processes and, ultimately, on remedy selection, that has contributed to delays in getting Central Plateau decision documents approved. The DOE strategy approaches remedy selection in a holistic rather than sequential manner, to assure stakeholders and taxpayers that remedies are consistent and defensible, and that remediation dollars are focused on the highest priority actions.

As acknowledged in the February 2009 AIP and the draft Completion Framework document, a strategy for Central Plateau cleanup is the next step in finalizing the framework for completing Hanford's cleanup mission and transitioning to post-cleanup activities. The Central Plateau cleanup completion strategy provides the vision and path forward for decision-making and cleanup implementation, and represents DOE's strategy for optimizing use of this area of the site to support the overall Hanford cleanup. DOE's strategy emphasizes a progressive process for establishing the cleanup approach to the Central Plateau that is responsive to EPA guidance on CERCLA and RCRA corrective action, is consistent with previous planning efforts, responds to Tribal Nation and stakeholder expectations for a comprehensive cleanup approach, incorporates experience from other major cleanup sites, and provides for the development of a comprehensive picture of cost and schedule for Central Plateau cleanup to provide a basis for sustained future funding.

1.3 Basic elements of DOE's strategy

DOE's strategy was influenced by many previous efforts and inputs including: discussions with Tribal Nations, the recommendations and advice of the Future Site Uses Working Group, Hanford Advisory Board, and the Oregon Hanford Cleanup Board, as well as experience from other Hanford cleanup activities and from other DOE and non-DOE sites.

DOE's strategy includes two main parts: (1) the overarching elements of the strategy, which were agreed to by the senior executives, and (2) the detailed elements of the technical cleanup principles and the structure of the decision units that will be used to implement the elements of the strategy. The elements of DOE's strategy are:

- Because of past activities and decisions, waste and residual contamination will inevitably remain in place on the Central Plateau. To ensure protection of human health and the environment, federal ownership and control is required as long as the potential hazard exists.
- This area identified for waste management and containment of residual contamination should be as small as practical while ensuring that the entire area requiring protection is encompassed in contiguous areas. DOE has elected to call this the "Inner Area"[6].

[6] The Inner Area approach is analogous to EPA's goal "…to develop a comprehensive response to address area-wide contamination. This will help avoid response actions that create 'clean islands' amid widespread contamination." (EPA 540-R-97-013, OSWER 9355.0-69 *Soil Screening Guidance*, August 1997).

- The remainder of the Central Plateau (the "Outer Area") will be available for other uses, although it will also be retained under federal ownership and control.
- In accordance with CERCLA requirements, cleanup levels will be established commensurate with the potential future use to ensure protection of potential future users and ecological receptors.
  - Cleanup levels for waste sites within the Inner Area will be established recognizing permanent federal ownership and control.
  - Cleanup levels for waste sites within the Outer Area will be established to enable unrestricted surface uses comparable with the River Corridor and consistent with the anticipated future land use of conservation/mining.
- Cleanup levels for groundwater will be established to restore its beneficial use, unless restoration is shown to be technically impracticable. As the sole government entity holding land use planning authority for the Hanford Site, DOE has exercised its responsibility to determine reasonably anticipated land use as input to the CERCLA process. The Comprehensive Land-Use Plan Environmental Impact Statement (HCP-EIS) and the corresponding record of decision provides the main basis for DOE's determination of future anticipated land use for CERCLA. Key elements of the HCP-EIS relating to the Central Plateau are:
  - DOE has designated the land use for a 20 square mile area of the Central Plateau as Industrial Exclusive. Industrial-Exclusive (IE) is an area suitable and desirable for treatment, storage, and disposal of hazardous, dangerous, radioactive, nonradioactive wastes and related activities.
  - DOE intends to use a portion of this IE area solely for waste management and containment of residual contamination (Inner Area). Other portions of the IE area will be suitable for DOE and other federally sponsored industrial uses.
  - DOE has designated the land use for those Central Plateau areas outside of the IE area as Conservation-Mining. This is defined as an area reserved for the management and protection of archeological, cultural, ecological, and natural resources. Limited and managed mining (materials for governmental purposes) could occur within appropriate areas. Limited public access would be consistent with resource conservation.
- Technical cleanup principles and decision logic will be established to guide comprehensive and consistent selection of remedies.
- Cleanup decisions will be made using the CERCLA process structured to streamline the decisions for the Inner Area and Outer Area and for the groundwater, while enabling appropriate involvement of Tribal Nations, stakeholders, and the public, and facilitating timely implementation of selected remedies. Facility decommissioning and/or cleanup activities will be coordinated with other cleanup decisions where appropriate.

As DOE implements the Central Plateau Cleanup Completion Strategy, DOE affirms that it will:

- Follow the CERCLA process, incorporate the RCRA corrective action process per EPA guidance, and apply the RCRA closure process to applicable TSD units.
- Recognize existing decisions, commitments, and guidance relative to use of the Central Plateau including designated land uses and established institutional controls.
- Maintain or improve the pace of decision making process.
- Select remedies based on sound technical cleanup principles with consideration of their cost while ensuring Tribal Nation, stakeholder, and public involvement throughout the decision process and cleanup implementation.
- Implement remedies in a timely and efficient manner.

1.4 Discussions and agreements among the Tri-Parties

During meetings with the senior executives of the Tri-Parties, DOE presented their initial concepts and ideas for a Central Plateau cleanup completion strategy. More than two dozen meetings and workshops were held with management and staff of the Tri-Parties to discuss overall approaches as well as specific details. There were many areas where agreement was reached and others where differences remain. Based on these discussions, DOE believes that the senior executives of the Tri-Parties came to a mutual understanding on the following points:

- Central Plateau cleanup will be organized into the following three major components:
  - **Inner Area** – Defined as the final footprint area of the Hanford Site that will be dedicated to waste management and containment of residual contamination and will remain under federal ownership and control. The boundary will be defined by waste disposal decisions already in place and anticipated future decisions that will result in the requirement for continued waste management and containment of residual contamination. The Inner Area footprint should be as small as practical. For sites at the edge of the boundary, the agencies will be attentive to the potential for possible further shrinkage of the Inner Area.
  - **Outer Area** – Defined as areas of the Central Plateau beyond the boundary of the Inner Area. The Tri-Parties will proceed with cleanup of the Central Plateau Outer Area based on criteria comparable to the River Corridor cleanup.
  - **Groundwater** –As acknowledged in the *Hanford Site Groundwater Strategy*, the *Hanford Integrated Groundwater and Vadose Zone Management Plan* and reaffirmed in the 200-ZP-1 Final ROD, the goal is to accomplish cleanup and restore groundwater to its beneficial uses. This includes groundwater underlying the 200 West Area (operable units [OU] 200-ZP-1 and 200-UP-1) and 200 East Area (OUs 200-BP-5 and 200-PO-5).

- A consistent/comprehensive approach to remedial decision-making is appropriate for the Inner Area. The elements of this approach include:
  - Key technical cleanup principles will be applied consistently to Inner Area cleanup decisions. The Tri-Parties have reached high-level agreement on the need for processes for resolving baseline risk assessment and exposure scenarios, dose/risk standards, approach for ecological risk, approach for soil cleanup levels to protect ground water, contaminants of potential concern and cleanup requirements. The development of the details of the principles and their application will be worked out as part of 200 West Inner Area decision unit, the first comprehensive proposed plan in the Inner Area.
  - Exposure scenarios for the Inner Area would be defined and analyzed consistent with the exclusive use of the Inner Area for waste management and containment of residual contamination.
  - The goal is to restore groundwater to its beneficial uses, unless restoration is determined to be technically impracticable.

- The Tri-Parties are committed to continue with a strong Tribal Nation discussion and consultation, public and stakeholder involvement program throughout the implementation of the cleanup of the Central Plateau.
- The decision document architecture can reduce the number of decision documents, promote more efficient implementation of remedies and a reduction in overall cleanup costs, while ensuring consistency in decision making across the CERCLA remedial action and RCRA/HWMA corrective action.
  - The decision unit structure for the Inner Area presented in this document represents DOE's path forward following discussions among the Tri-Parties.

- The full application of the Central Plateau cleanup completion strategy including the comprehensive analysis of alternatives for the entire Inner Area will be presented in an Inner Area feasibility study.
- In certain circumstances a combined Corrective Action Decision (RCRA)/Record of Decision (CERCLA) (CAD/ROD) will be developed and used for Inner Area decisions.
- Outer Area sites will be addressed in a consolidated feasibility study (FS) and proposed plan (PP) for selection of the final remedy using a CERCLA ROD. Interim actions are being conducted prior to final remedy selection to accelerate cleanup of the Outer Area.
- The 200-UP-1 groundwater OU decision will be documented using an amendment to the 200-ZP-1 groundwater ROD. After additional characterization, the agencies will make a decision on the 200-BP-5 and 200-PO-1 operable units. These sites may either be consolidated into the 200-ZP-1 ROD or into a separate CERCLA ROD.

1.5 Organization of the document

Section 2 provides background information on the Central Plateau, including a description of decisions already made that influenced the development of the strategy.

Section 3 is the heart of the document and provides a detailed description of the elements of DOE's strategy, along with the decision architecture.

Section 4 describes activities that affect all parts of the strategy, such as the coordination of CERCLA and RCRA decisions, deep vadose zone issues, DOE's proposed defense-in-depth approach, the interface with tank farm cleanup activities, tribal nation and stakeholder involvement, and DOE's approach to risk assessment.

Section 5 describes the anticipated changes to the Tri-Party Agreement that will be required to implement the strategy. Section 6 discusses the relationship of the strategy and future funding. Section 7 offers conclusions and a path forward.

2 BACKGROUND

2.1 Description of Central Plateau

The Central Plateau includes approximately 75 square miles in the central portion of the Hanford Site as shown in Figure 2-1. This region contains the 200 East and 200 West Areas that have been used primarily for nuclear fuel processing and waste management and disposal activities. The Central Plateau encompasses the 200 Area National Priorities List site, with a large inventory of processing and support facilities, tank systems, liquid and solid waste disposal and storage facilities, utility systems, and contaminated groundwater.

During fuel reprocessing activities, over 450 billion gallons of liquid waste and effluent, some containing radionuclides and other hazardous substances, were released to the ground, resulting in contaminated soil and groundwater. There are more than 1000 contaminated soil waste sites, pipelines, burial grounds, and unplanned releases on the Central Plateau, as well as more than 900 surplus facilities. The combined area of contaminated groundwater plumes originating from the Central Plateau is approximately 60 square miles. Cleanup of waste sites and groundwater will involve a combination of containment, removal, and in-place treatment.

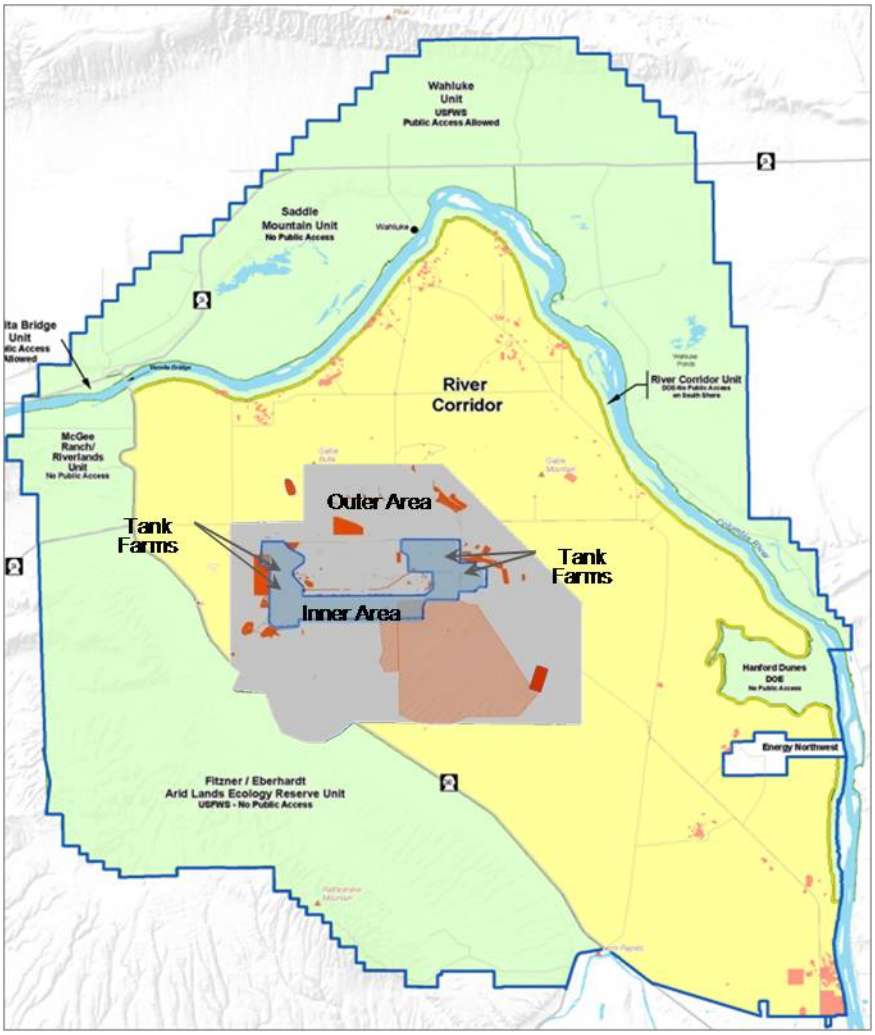


Figure 2-1. Principal Components of the Hanford Site

Active waste management facilities are operating to support the ongoing cleanup including liquid effluent treatment, solid waste packaging and handling, solid waste disposal, used nuclear fuel storage, analytical laboratories, and eventually the Waste Treatment and Immobilization Plant (WTP) for treatment of radioactive tank waste.

Facilities for disposal of wastes contaminated with radionuclides and other hazardous substances will remain on the Central Plateau after the cleanup mission is complete. Existing facilities, such as the Environmental Restoration Disposal Facility (ERDF), used for disposal of wastes from cleanup activities

across Hanford, and the Integrated Disposal Facility (IDF), to be used for disposal of radioactive and hazardous wastes from tank retrieval and closure and from WTP operations, will require federal ownership and control of a portion of the Central Plateau for the foreseeable future.

2.2 Existing disposal facilities/remediation decisions

Six sites on the Central Plateau have been designated for continued waste management and containment of residual contamination as part of the Hanford Site's defense production or cleanup missions. The sites were authorized as early as 1965 through a series of Nuclear Regulatory Commission licensing, NEPA or CERCLA decisions, and RCRA permitting actions. The locations of these sites were key considerations in development of DOE's initial boundary of the Inner Area as shown in Figure 2-2.

- **US Ecology Low Level Radioactive Waste Disposal Facility** was opened on the Central Plateau in 1965. It is licensed by the Nuclear Regulatory Commission and permitted by the State of Washington for disposal of commercially generated low level radioactive waste. The State of Washington leases 1000 acres of the Site from DOE and sub-leases 100 acres to US Ecology to operate the disposal facility. This facility will be turned over to DOE for caretaking after disposal operations have ceased and a closure barrier has been installed.
- **Naval Reactor Compartment Disposal Facility** was developed for the Department of the Navy in 1986 for disposal of defueled reactor compartments from retired navy vessels.
- **Mixed Waste Disposal Trenches 31 and 34** within the 218-W-5 burial ground support the Hanford cleanup mission and are currently in operation. They have been permitted through the Hanford RCRA Facility Permit since 1992 for disposal of dangerous wastes that are contaminated with radioactive materials (mixed low-level wastes.)
- **Environmental Restoration Disposal Facility** was developed in 1993 for disposal of wastes generated from Hanford cleanup actions. The facility was sited to consolidate remediation wastes from the River Corridor on the Central Plateau to enable a broader range of potential future uses in the River Corridor area. ERDF is a multi-cell landfill that is designed consistent with RCRA landfill performance standards (e.g. liner/leachate collection system and cover).
- **U Plant Canyon FS/PP** resulted in a CERLA Record of Decision in 2005 for remediation of the U Plant Canyon. The canyon building will be partially demolished with residual contamination inside, followed by placement of an engineered surface barrier over the entire structure.
- **Integrated Disposal Facility** is a RCRA permitted disposal facility for mixed radioactive and dangerous wastes. The facility was included in the Hanford RCRA Facility permit in 2006 and will operate in support of tank waste retrieval and treatment activities.

2.3 Central Plateau Cleanup Actions to Date

Inner Area – Inventory removal and deactivation of facilities were initiated as part of the transition from the defense production mission to Hanford's current environmental management mission. Stabilization and removal of plutonium-bearing materials was completed at Plutonium Finishing Plant (PFP) in 2008. Deactivation and demolition of the PFP structures is currently underway. DOE began implementing its removal action authority for above grade structures in 2004 with the removal of the 233S Plutonium Concentration Facility. Deactivation and demolition work continues on PFP, U Plant, and other above-grade structures throughout the Central Plateau.

A final record of decision was issued for the 221-U Facility in October 2005 as part of the Canyon Disposition Initiative. The selected remedy calls for encasing equipment and piping in a grout matrix inside the canyon cells, demolishing the upper portion of the canyon structure and covering the

demolished structure with an evapotranspiration barrier. Remediation of the U Plant canyon was initiated in fiscal year (FY) 2009.

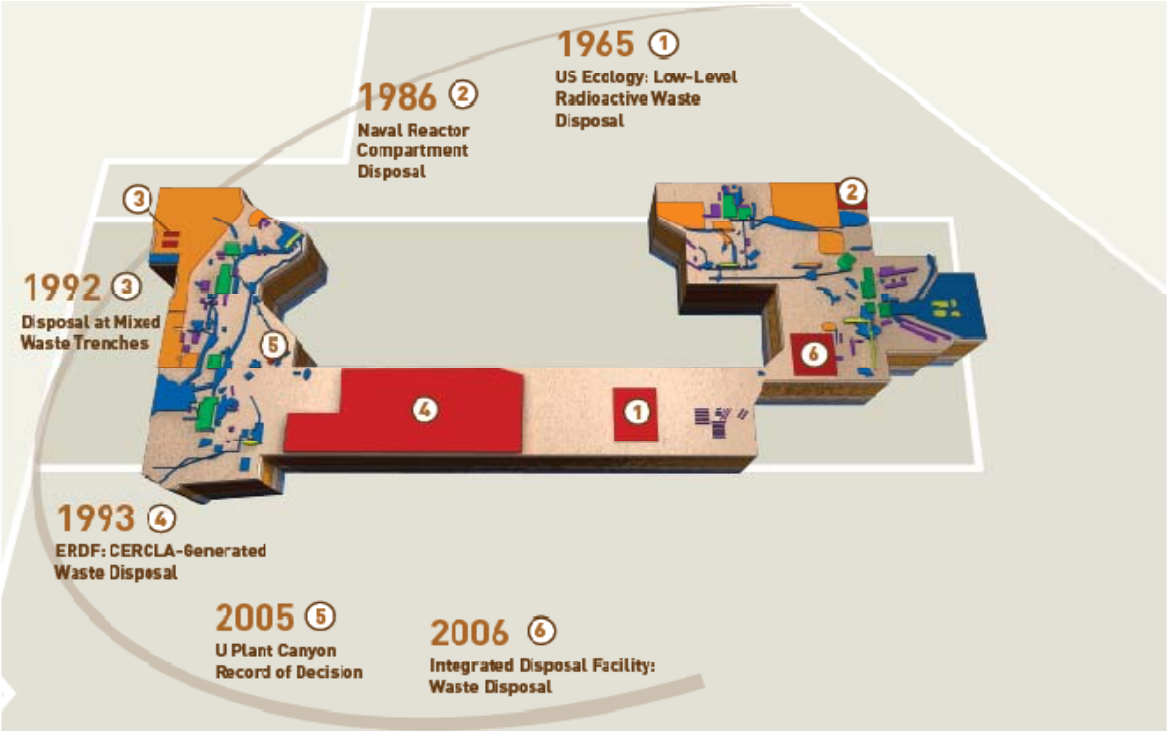


Figure 2-2. Existing decisions that leave waste in place on the Central Plateau

Remedial investigation and remedial alternative analysis for Central Plateau soil waste sites were initially conducted on geographic area-based operable units, with the initial remedial investigation (RI) report and FS submitted in 1993 for the 200-BP-1 operable unit north of the BY Tank Farm. Work priorities were shifted to the River Corridor in 1995 as documented in Tri-Party Agreement Change Request M-15-94-09.

Figure 2-3. Waste sites in the 200 Areas

Additional scope and milestone changes were negotiated as documented in Tri-Party Agreement change requests M-15-08-07 and M-16-08-07 in August 2009. The negotiations resulted from the Tri-Parties' desire to accelerate groundwater remediation and establish a path forward for closure of the River Corridor areas, and because of fiscal year (FY) 2009 funding issues. The changes reset the completion date for milestone M-15-00C to a date to be determined and replaced milestones for submittal of waste

site operable unit feasibility studies with a milestone for identifying new submittal dates by December 31, 2009.

Delays in completing the remedial investigation/feasibility study (RI/FS) process have been experienced in part because of the Tri-Parties' difficulties in reaching resolution on remedy selection and cleanup levels. The February 2009 AIP and DOE's comprehensive Central Plateau cleanup completion strategy will provide a consistent framework for remedial alternative evaluation, decision-making, and implementation, improve the pace of cleanup, and resolve overarching issues that have been impeding progress on the Central Plateau to date.

Outer Area – Cleanup of waste sites in the Outer Area has started under interim removal actions identified in Appendix A. Deactivation, decontamination, decommissioning, and demolition of facilities has also started with the 212 N, P, and R buildings during the summer of 2009.

Groundwater – Interim pump and treat actions have been conducted in the 200-ZP-1 and 200-UP-1 groundwater operable units to remove carbon tetrachloride and uranium from contaminated groundwater in the 200 West Area. A final record of decision for remediation of the carbon tetrachloride plume (200-ZP-1) was issued in September 2008. Design of an expanded pump and treat facility is currently underway. Solvent vapor extraction has been utilized to remove carbon tetrachloride from the vadose zone and reduce the volume available to enter the groundwater. Investigation activities, including treatability tests, are ongoing for the 200-BP-5 and 200-PO-1 groundwater operable units in the 200 East Area.

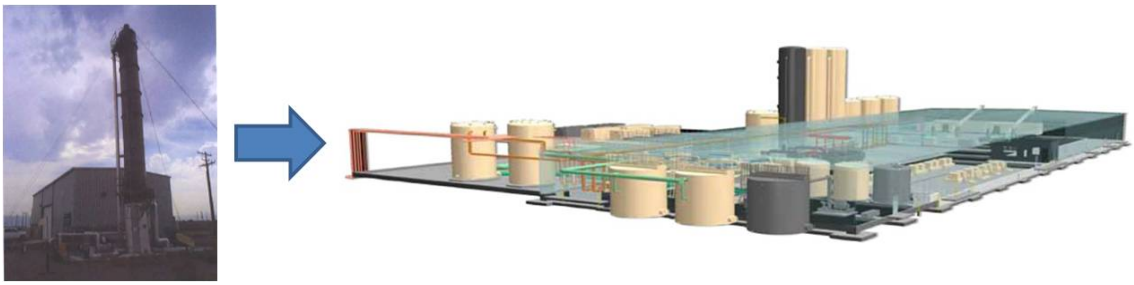


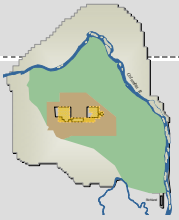
Figure 2-4. Original 200-ZP-1 treatment facility & expanded pump and treat facility

3 CENTRAL PLATEAU CLEANUP COMPLETION STRATEGY

The Central Plateau cleanup completion strategy covers three major cleanup components: (1) the Inner Area – approximately 10 square miles at the core of the Central Plateau where the bulk of the chemical processing and waste management activities occurred (2) the Outer Area – an area approximately 65 square miles that includes much of the relatively open area on the Central Plateau with limited processing activity; and (3) groundwater underlying the area, including contaminated groundwater plumes originating from the Central Plateau.

DOE has developed the Central Plateau cleanup completion strategy considering the CERCLA remedial action and RCRA/HWMA corrective action requirements that must be satisfied, the magnitude of the cleanup actions that will be taken, the state of knowledge of the nature and extent of contamination, existing and anticipated future land uses on the Central Plateau, as well as advice and feedback from Tribal Nations, the Hanford Advisory Board, and stakeholders. The overall goal of DOE's strategy is to select remedies that will be protective of human health and the environment that comply with applicable requirements, that appropriately balance criteria such as long-term effectiveness and cost, and that consider public acceptance.

Table 3-1. Central Plateau Cleanup Completion Strategy Highlights



Inner Area Section 3.1	• Hanford's final cleanup footprint – the area required for waste management and containment of residual contamination. • Develop consistent and comprehensive Inner Area decisions utilizing agreed-upon technical cleanup principles. • Consolidate decision documents for the Inner Area into geographic area groupings that are amenable to consistent remedy selection and effective implementation. • Implement cleanup decisions using a geographic area approach. • Develop, test, and deploy deep vadose zone treatment technologies to address potential sources of future groundwater contamination. • Integrate groundwater and soils remediation using a defense-in-depth approach to monitoring and treatment. • Regularly evaluate new and improved cleanup technologies to assess their potential to improve cleanup effectiveness and to allow for greater footprint reduction.
Outer Area Section 3.2	• Remove, treat, and dispose using cleanup levels comparable to River Corridor, with some exceptions. • Accelerate cleanup with interim actions. • Consolidate final remedy selections into a single Outer Area ROD. • Deactivate and demolish excess facilities under CERCLA or DOE authority.
Groundwater Section 3.3	• Protect the Columbia River. • Implement treatment systems to contain contaminant plumes in the Central Plateau. • Restore groundwater to beneficial use, unless restoration is determined to be technically impracticable. • Amend 200-ZP-1 ROD to incorporate remedy selection for 200-UP-1. • Continue investigation in 200-BP-5 and 200-PO-1. Develop a consolidated feasibility study and Record of Decision for 200 East Area groundwater remediation.

The current organizational structure (more than 1,000 waste sites grouped into 23 waste site OUs and 4 groundwater OUs) has been effective for characterization purposes. But as the Hanford Central Plateau cleanup moves into the implementation phase, it is appropriate to organize operable unit cleanup decisions to promote consistency in remedy evaluation, selection, and implementation.

The Central Plateau strategy and decision process will ensure that selected remedial actions will meet the requirements of CERCLA and the applicable portions of RCRA/HWMA by being protective of human health and the environment, and addressing applicable, or relevant and appropriate requirements identified through the decision process. In addition, the strategy takes into consideration discussions with Tribal Nations, and advice and feedback from the Hanford Advisory Board, the Oregon Hanford Cleanup Board, other stakeholders and the public.

Major cleanup components on the Central Plateau:

Inner Area: *The final footprint area of the Hanford Site that will be dedicated to waste management and containment of residual contamination and will remain under federal ownership and control.*

Outer Area: *All areas of the Central Plateau beyond the boundary of the Inner Area.*

Groundwater: *Contaminant plumes underlying the Central Plateau and originating from waste sites on the Central Plateau.*

Details about the Central Plateau cleanup completion strategy for each of the major cleanup components, and the decision and remediation process are described in subsequent sections.

3.1 Inner Area

Because of past decisions establishing permanent waste management activities in the Central Plateau Inner Area, the senior executives of the Tri-Parties have acknowledged that there will be some portion of the Hanford Site that will be required for continuing waste management and containment of residual contamination. Reducing the area where this occurs to the smallest practical size is consistent with CERCLA and RCRA policy, DOE management goals, sound fiscal practices, and stakeholder input.

Figure 3-1 highlights the initial boundary for the Inner Area, as developed by DOE, which encompasses the smallest practical final footprint of the Central Plateau waste management and containment area. In defining this boundary, DOE considered:

- Waste disposal decisions already in place, such as ERDF, the Integrated Disposal Facility, the Naval Reactor Compartment Disposal trench, Trench 31 and 34 Mixed Waste Landfills, the U Plant canyon, and the US Ecology Washington Low-Level Radioactive Waste facility.
- Areas where post-closure and cleanup actions would likely result in engineered surface barriers even if some waste removal was performed, such as the remaining canyons, tank farms, portions of the Waste Treatment Plant, and existing low-level waste burial grounds.
- Areas where deep vadose zone contamination exists below the effective range of surface remedies which will likely require long-term surface controls.

As cleanup decisions are made and cleanup implementation progresses, the boundary of the Inner Area will be refined as appropriate to reflect the final management/containment area.

Figure 3-1. Initial boundary for Central Plateau Inner Area

3.1.1 Strategy for Inner Area remediation

The Inner Area is defined as the final footprint of the Hanford Site that will remain following completion of cleanup. DOE's strategy for remediation of the Inner Area is to:

- Ensure that the configuration of the waste disposal facilities and residual contamination remaining after cleanup is protective of groundwater, human health, and the environment.
- Use a CERCLA decision process for excess facilities, waste sites, burial grounds, and tank farm environmental media contaminated by radionuclides. Apply RCRA and RCRA/HWMA corrective action requirements where applicable.
- Use sound technical cleanup principles as the basis for remedy selection to ensure that CERCLA criteria are applied consistently across the entire Inner Area.
- Use a comprehensive approach to evaluation of remedial alternatives (1) to improve DOE's ability to evaluate each site in the context of the entire Inner Area cleanup, (2) to provide the best assurance that the full scope of potential risks and impacts are taken into account by decision-makers when selecting remedies for specific sites and (3) to appropriately balance other criteria such as long-term effectiveness and cost, and consider public acceptance across the entire Inner Area.
- Implement decisions using a geographical approach to enable the most efficient and cost-effective cleanup.
- Minimize the final footprint to the smallest contiguous size practical.
- Integrate groundwater and soils remediation using a defense-in-depth approach that applies a combination of actions including: infiltration barriers, vadose zone monitoring, groundwater monitoring, and readiness to implement groundwater treatment, when necessary.
- As part of the CERCLA five-year review process, monitor the Inner Area to ensure cleanup remedies remain protective and enable early action in the event of emerging contaminant plumes that could potentially impact groundwater. Establish institutional controls that will complement engineered controls selected in decision documents. Continued federal ownership combined with institutional controls will ensure long-term protection of human health and the environment.

3.1.2 Inner Area Decision Design

The structure of DOE's strategy for the Inner Area decision process stems from the need to make final remedial decisions using a holistic view – decisions across the entire Inner Area should be consistent with each other and with the ultimate end use of the area for waste management and containment of residual contamination. Key to the success of the holistic process is the consistent application of a set of technical

cleanup principles that form the foundation for the development and evaluation of potential remedial alternatives.

Shortly after the AIP was signed, the Tri-Parties jointly developed the list of technical cleanup principles that should be used as potential remedies are being developed and evaluated. Management and staff of the Tri-Parties have held numerous discussions on specific aspects of the principles. In some areas, the Tri-Parties have reached agreement on the concept and details. In other areas, the Tri-Parties have agreed on the concept, but further discussions are needed to reach agreement on the details that will impact their use. The technical cleanup principles are described in section 3.1.2.2.

The Tri-Parties have also had continuing discussions on the method by which the remedial alternatives are developed and evaluated. DOE's approach for application of the technical cleanup principles, the remedial alternatives to be evaluated, and the supporting documentation to be developed is described in sections 3.1.2.3 and 3.1.2.4. The role and use of characterization data as part of the evaluation of potential remedies and throughout cleanup implementation is described in section 3.1.2.5. DOE's strategy for grouping cleanup decisions into discrete decision units for the purposes of remedy evaluation and selection is described in section 3.1.2.6.

3.1.2.1 Scope of the Inner Area Decision Process

The scope of the Inner Area decision process includes:

- Waste sites and facilities on the Central Plateau within the initial Inner Area boundary.
- Deep vadose zone portions of waste sites.
- Environmental media contaminated by past releases from TSDs, including single-shell tanks.
- Solid waste burial grounds, pipelines and associated subsurface structures.
- Canyon facilities requiring a cleanup decision (PUREX, REDOX, B Plant, and T Plant).
- Contaminated below-grade portions of structures that are not removed as part of the facility demolition process and that present a release or threat of release of hazardous substances to the environment.

Decisions for above grade structures other than canyon facilities will be addressed by the Facility Decommissioning Evaluation process currently being developed as part of the ongoing Tri-Party Agreement Facility Disposition negotiations (Section 3.1.4.1). Closure of single-shell and double-shell tanks and tank system components are addressed by the Tri-Party Agreement Appendix I and M-45 milestones. Groundwater underlying the Inner Area will be addressed as described in Section 3.3.

3.1.2.2 Key Technical Cleanup Principles for Inner Area Decisions

As part of setting the appropriate decision framework, DOE, EPA and Ecology, identified eight technical cleanup principles that will be applied consistently across the Inner Area. These eight technical cleanup principles are the elements that must be considered to develop a threshold case alternative for analysis – one that meets the CERCLA threshold criteria (protectiveness and compliance with applicable and relevant or appropriate requirements [ARARs]) for a remedial alternative to be considered for selection. The eight principles, which were developed during a series of workshops among the Tri-Parties, are described below. Additional discussion will occur among the Tri-Parties as feasibility studies are developed to finalize detailed parameters of the technical principles. The application of the parameters will be formalized through the decision document approval process to ensure public review and comment.

- **Define the exposure scenarios used to evaluate impacts to human receptors** – The Tri-Parties agreed that a baseline risk assessment would be developed and used to establish the need for action throughout the Inner Area because a threat exists to human health. Assessment of risks during the remedy evaluation process identifies remedial alternatives that meet threshold criteria and assist with applying the CERCLA balancing and modifying criteria. Relevant exposure scenarios related to the Inner Area are evaluated for both current and reasonably anticipated future land uses. Figure 3-2 illustrates the relationship of land use and exposure scenarios for the Inner Area in contrast with the Outer Area. During the workshops, the Tri-Parties have agreed that the risk evaluations will address a broad range of exposure scenarios that include:
  - Baseline risk (representing the "no action" case) – Unrestricted rural resident.
  - Threshold remedy selection (reasonably anticipated future land use) – Industrial worker whose duties involve maintaining institutional controls and adult and youth trespasser.
  - Comparative analysis and information (risk management scenarios for applying balancing criteria) – Construction worker, well driller, and Tribal scenarios from the Yakama Nation and the Confederated Tribes of the Umatilla Indian Reservation.

  Protectiveness of the threshold reference case alternative in the Inner Area would be assessed based upon the human exposures associated with the reasonably foreseeable land use. The FS will evaluate how the implementation of cleanup actions, including cleanup levels in environmental media, will protect human health and the environment. The risk information in the feasibility studies will be structured to ensure that the substantive portions of the Model Toxics Control Act [MTCA, Washington Administrative Code (WAC) 173-340] are addressed when it is included as an ARAR. See Section 4.7 for additional information on DOE's approach to risk assessment.

Key Technical Cleanup Principles for Inner Area Decisions

- *Define the exposure scenarios used to evaluate impacts to human receptors*
- *Set ecological protection parameters*
- *Set dose and risk standards*
- *Establish a master list of contaminants of potential concern (COPCs), and characterization data requirements*
- *Define soil cleanup levels protective of groundwater*
- *Build the foundation for the Inner Area Institutional Control Plan*
- *Agree to the ARARs, including those portions that apply*
- *Develop decision logic for developing a threshold case alternative*

- **Set ecological protection parameters** – Relevant ecological exposure pathways related to the Inner Area will be evaluated in the baseline risk assessment. Protectiveness of the threshold reference case alternative would be based upon remediation that breaks ecological exposure pathways. The Tri-Parties have agreed that they will establish a conditional point of compliance (depth) and action levels for the Inner Area based on relevant scientific studies. Soil cleanup levels protective of soil biota, plants, and wildlife will be based upon relevant studies and ecological indicator concentrations in WAC 173-340-7490, Table 749-3, or procedures noted as acceptable in that table or elsewhere in MTCA or CERCLA. For radionuclides, the Tri-Parties agree to use DOE's graded approach (DOE-STD-1153-2002) and apply biota concentration guides corresponding to 0.1 rad/day for animals and 1 rad/day for plants.
- **Set dose and risk standards** – Reasonable maximum exposure is the primary criterion used for evaluating potential risk to human health from radionuclides. However, other measures can be used to describe risk more fully. The Tri-Parties have agreed that evaluation of human health

protectiveness (direct human exposure) will consider the following dose/risk standards to represent unacceptable risk:

- Excess lifetime cancer risk from radionuclides greater than the CERCLA risk range of $1x10^{-4}$ to $1x10^{-6}$.
- Cumulative excess lifetime cancer risk from non-radiological carcinogens greater than 1×10^{-5}.
- Hazard index value for non-carcinogenic hazardous substances greater than 1.
- Exposures to DOE site workers during cleanup operations (about 50 years) in excess of DOE dose standards.

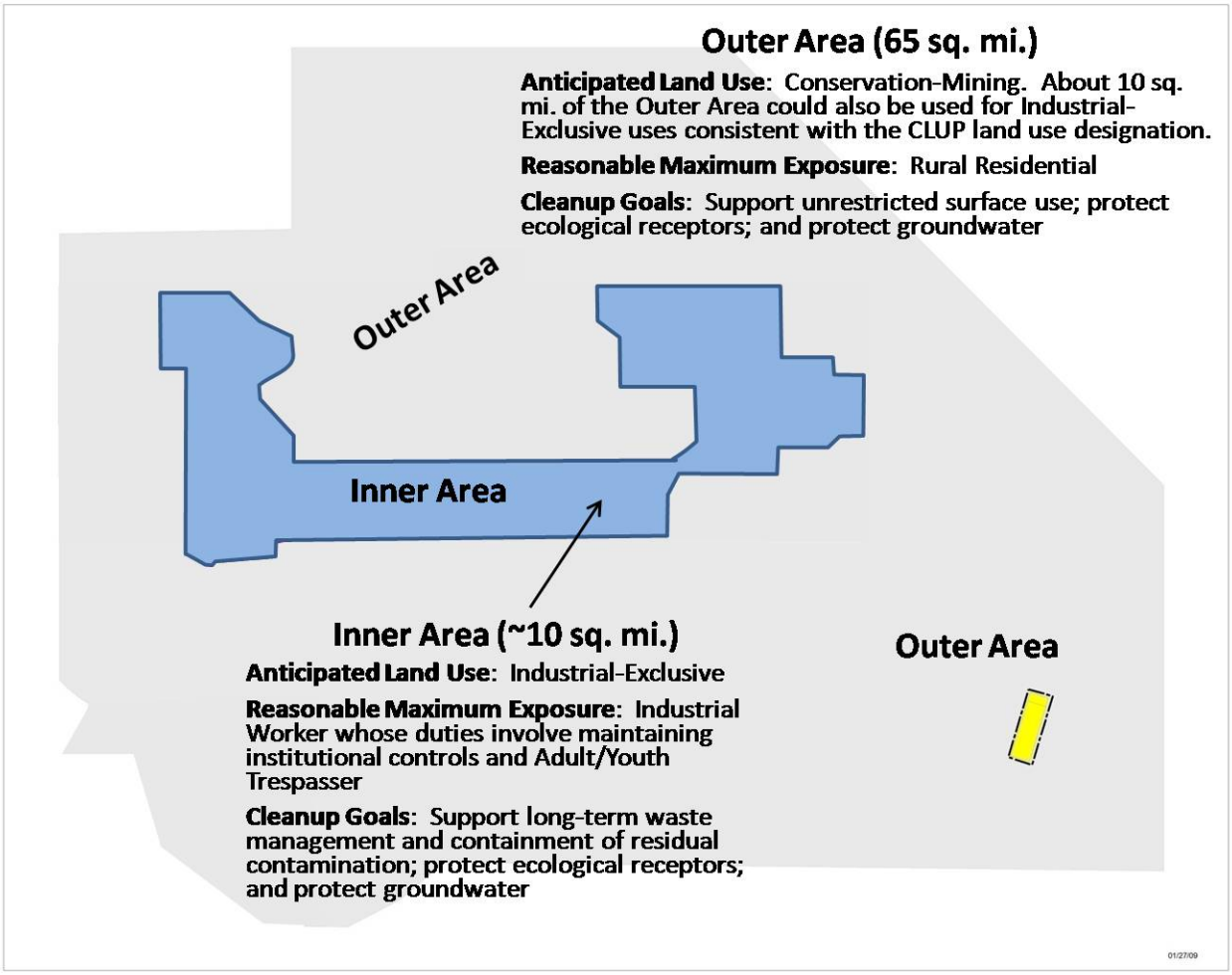


Figure 3-2. Exposure scenarios and land use

- **Establish a master list of contaminants of potential concern (COPCs), and characterization data requirements** – Characterization of the waste sites and soil contamination on the Central Plateau has been ongoing for more than twenty years. The Tri-Parties have agreed upon the supplemental characterization required for remedial decisions. While additional data are being sought for burial grounds and pipelines, sufficient contaminant concentration data has been collected or will be collected in the immediate future to adequately characterize the nature and extent of contamination and allow the Tri-Parties to develop an Inner Area-wide list of COPCs which will be further refined on an area or site-specific basis during remedy selection. Additional characterization will be required as projects move into remedy design, remedy implementation, and remedy completion.

- **Define soil cleanup levels protective of groundwater** – Through the workshops, the Tri-Parties agreed to establish soil cleanup levels for protection of groundwater starting with consideration of screening levels, and then using a graded approach that relies on a range of methods from simple equations to complex computer codes (e.g. two dimensional [2D] Subsurface Transport Over Multiple Phases [STOMP] models) depending on site complexity and the site conceptual model. For selected sites (e.g., deep sites or sites with unique chemistry), supplemental modeling such as 2D/3D STOMP will be used. The modeling will employ a 1,000 year analysis period with calculation of peak concentrations beyond 1,000 years for informational purposes. The Tri-Parties agreed to continue discussions to address model sensitivity and uncertainty and to ensure an efficient approach to data collection and modeling, so that (for example) DOE does not spend more on modeling/evaluation than it would cost to remove/treat/dispose (RTD) a site.
- **Build the foundation for the Inner Area Institutional Control Plan** – The Tri-Parties recognize that a portion of the Central Plateau will be used for waste management and containment of residual contamination. In the Inner Area, there are currently six locations where decisions have been made to leave waste in place (Section 2.2). Several other areas will likely be designated as waste management and containment areas in the future because residual waste will remain in place even if some removal occurs. The existing and future waste management and containment sites set the logical boundary for a contiguous area for practical management with institutional controls. An institutional control approach will be developed for the Inner Area in support of alternative development and evaluation.
- **Agree to the ARARs, including those portions that apply** – A standard set of ARARs will be defined that represent the substantive requirements that must be satisfied by remedial alternatives. The Tri-Parties have agreed to define the ARARs, including areas where portions of a regulation must be met as part of the Inner Area decision process.
- **Develop decision logic for developing a threshold case alternative** – The technical cleanup principles identified above can be represented by decision logic that can be applied to waste sites in the Inner Area to ensure consistent application of regulatory requirements and performance standards. The Tri-Parties have agreed that the decision logic will be applied across the entire Inner Area to construct the base (threshold) case as part of the comprehensive evaluation of potential remedies. The decision logic use a 3-pronged approach in achieving cleanup that protects human health and the environment through the ecological, groundwater, and direct contact pathways.
  - The first prong addresses the protection of ecological receptors by preventing contact with waste. Cleanup levels and the depth at which they must be applied to break the exposure pathway will be established.
  - The second prong will determine the soil concentrations that are needed to be protective of groundwater. Part of the alternative assessment will include determining the practical depth of excavation, and the depth to which a barrier is effective.
  - The third prong will establish cleanup levels that must be achieved to be protective of humans through direct contact. This will include taking into consideration reasonably anticipated future land use and direct contact exposure pathways associated with that land use, as well as measures necessary for preventing other exposures from occurring.

  Each waste site will be evaluated using this 3-pronged approach and the most restrictive cleanup level will drive remedy selection. DOE believes that many of the waste sites that pose a risk to humans through direct contact and/or ecological resources in most instances can be excavated. Exceptions to this would be where a site is in reasonable proximity to a planned engineered barrier or where the contaminants represent a short term risk and monitored natural attenuation will resolve the risk. DOE's strategy employs a bias to RTD waste sites in the Inner Area where it is necessary to protect human health and ecological receptors.

The 3-pronged approach will also be applied to pipelines, diversion boxes, and other shallow hardware. The location of pipelines and their associated components will influence how they are remediated or closed. Waste transfer pipelines are located either: entirely inside a tank farm fence line (closure decisions will be consistent with each tank farm closure), entirely outside a tank farm fence line or transect the tank farm fence line. Pipelines and associated components that exist in geographic areas that are not remediated as part of a barrier decision will be remediated by applying a comprehensive decision logic developed specifically for pipelines. The decision logic, which will be developed with EPA and Ecology, will define the factors such as process knowledge of the pipelines, the depth of the point of compliance, and depth of pipeline that are applicable to selecting remedies. This approach will ensure a consistent remedy is applied to the pipelines and associated components across the Inner Area.

Remedies to protect groundwater in the Inner Area will be selected based on a variety of criteria. If effectiveness of surface remedies (e.g. barrier or RTD) is not assured for groundwater protection, then there would be an assessment of deep vadose zone remedies, if available. In those instances where contamination exists at such deep depths in the vadose zone that there is currently no effective remedy, DOE will use a defense-in depth approach to monitor and assess the movement of the contamination and deal with it upon arrival into the groundwater through established groundwater remediation systems. DOE will also continue to assess emerging and new technologies to protect groundwater. Discussion will continue among the Tri-Parties on the composition of the decision logic and the standard performance depths of remedial approaches, including the practical limit of standard excavation, the depth of barrier effectiveness, and how decision logic is applied to complex sites.

3.1.2.3 Holistic application of technical cleanup principles to Inner Area conditions and potential remedies

DOE will apply the technical cleanup principles, including the decision logic, to the entire Inner Area to support remedy evaluation and remedy selection for specific sites. This analysis will provide the framework to consider the final footprint of the Inner Area as a whole and provide the best assurance that the full scope of potential risks and impacts are taken into account by decision-makers when selecting remedies for specific sites. This analysis will be documented in a separate report as described in Section 3.1.2.4 and referenced in documents that analyze or select remedies for Inner Area waste sites or buildings.

Tribal Nation representatives and Hanford stakeholders have stated their expectation that DOE perform a comprehensive assessment to evaluate the collective impacts of proposed remedies and actions. The primary concern is to ensure that, while an action for each individual site when considered alone is protective, the combined impacts of multiple actions must also be protective.

The comprehensive evaluation will enable decision-makers to engage in a thoughtful consideration of resource use for the Inner Area by delineating where the areas of highest concern are and identifying opportunities for maximizing the environmental benefits of remedy implementation. DOE's evaluation will account for the institutional controls appropriate for the Inner Area as a whole to avoid the potential distortion of the evaluation that could occur if institutional controls were to be set on a site-by-site basis.

The key to the comprehensive evaluation is the development of the remedial alternatives to be considered for the Inner Area. CERCLA guidance requires that the remedy evaluation present a range of alternatives that include treatment as a principal element, containment with little or no treatment, and no-action. Consistent with that guidance, the remedy evaluation will include the entire scope of the Inner Area and will consider the following remedial alternatives:

Alternatives that will be considered

- *"No Action" alternative*
- *Maximum containment alternative*
- *Base case "threshold" alternative*
- *Balanced alternatives that consider a combination of remedies*
- *Maximum RTD alternative*

- A "No Action" alternative as required under CERCLA.
- An alternative that complies with CERCLA guidance for consideration of a range of alternatives which bound the full range of remedies by maximizing containment, minimizing RTD, and relying on the application of barriers and institutional controls to isolate and contain contaminants.
- A base case "threshold" alternative which is constructed using the decision logic described in the technical cleanup principles. This alternative meets the CERCLA threshold criteria of overall protection of human health and the environment and compliance with ARARs.
- One or more "balanced" alternatives that consider a combination of containment, treatment, and removal which apply the CERCLA balancing and modifying criteria based on input received from regulators, discussion with Tribal Nations, stakeholders, and the public.

A final alternative that complies with CERCLA guidance for consideration of a range of alternatives by maximizing the application of RTD in the Inner Area using a combination of onsite and offsite disposal facilities with the intent of minimizing the number of institutional controls.Any remedy alternative that is not at least as protective as the threshold case alternative will be excluded from further consideration. This approach will enable the Tri-Parties to:

- Apply a consistent set of technical cleanup principles to produce remedial alternatives that will protect human health, ecological receptors, and groundwater, and that will satisfy ARARs, consistent with CERCLA's threshold criteria.

- Apply CERCLA balancing criteria consistently across the entire Inner Area to establish final decisions that appropriately balance regulatory agency expectations, stakeholder preferences, long-term and short-term effectiveness, reduction of hazards, implementability, and costs.

Additionally, the comprehensive analysis will provide a clearer picture of the cost and duration for the full range of possible remedies. This will enable decision-makers to make informed judgments on tradeoffs while ensuring that the remedy selected for specific sites will be protective of human health and the environment, will satisfy ARARs, and that funding for remediation is utilized for the highest priority actions.

3.1.2.4 Technical basis documentation

In support of the Inner Area analysis, DOE will prepare five documents which collectively form the foundation for the development and evaluation of the base case threshold alternative and the range of alternatives for the Inner Area. The documents, considered secondary documents in accordance with Tri-Party Agreement Section 9, are:

- **Inner Area Technical Basis Document** – provides the technical foundation for DOE's Inner Area strategy that will (1) establish the set of exposure scenarios that will apply in the Inner Area, based on DOE's commitment that the Inner Area will remain in federal ownership and control for waste management and containment of residual contamination; (2) establish the contaminants of potential concern for the Inner Area; (3) identify the cleanup levels for the Inner Area; and (4) compile and analyze soil characterization and site data for the Inner Area.

- **Baseline Risk Assessment** – developed utilizing information from the Inner Area Technical Basis Document. This document evaluates the potential for risk, implementing the exposure scenarios defined in the Inner Area Technical Basis Document. This risk assessment will document the need for action in the Inner Area based on (1) unrestricted future access to the site (e.g. loss of institutional control) and (2) the reasonably anticipated land use of waste management and containment of residual contamination.

- **Inner Area Feasibility Study Framework Technical Basis Document** – the heart of the Inner Area evaluation. It establishes the ARARs that must be met by viable remedies, develops the remedial action objectives, and verifies the basis for the conceptual site model. It documents the development of the Inner Area base case threshold and range of alternatives and presents a comparative analysis of the alternatives. The base case threshold alternative as well as the bounding alternatives for the Inner Area are compliant with the CERCLA threshold criteria and are protective of human health, ecological resources and groundwater. This analysis provides the foundation against which the feasibility studies for the final three Inner Area decision units will formulate a balancing case alternative(s) and Proposed Plan by applying the CERCLA balancing criteria.

- **Canyon Decision Technical Basis Document** – provides the foundation for the application of exposure scenarios and cleanup levels in canyon facilities. This document will be used in conjunction with the other foundation documents for decision documents that include canyon facilities.

- **Tank Farm Environmental Media Technical Basis Document** – provides the foundation for application of exposure scenarios and cleanup levels in environmental media. This document will be used in conjunction with the other foundation documents for decision documents that include tank farm environmental media.

3.1.2.5 Characterization and Investigation in the Inner Area

DOE is committed to completing the approved supplemental characterization activities as part of the Central Plateau cleanup completion strategy. The strategy also recognizes that there are four principal opportunities within the CERCLA process to obtain characterization data:

- **Decision Stage** – collection of characterization data during the RI phase, to determine the need for action, support remedy selection activities, and perform the baseline risk assessments.

- **Remedial Design Stage** – collection of additional field data as necessary to support remedial design determinations (e.g. to design barriers, or further delineate the planned limits of soil excavation). Design data obtained during this stage may also be used to support remedy design for appropriate geographic area-specific COCs.

- **Remedy Implementation Stage** – additional remedy verification data is obtained during field execution as part of the overall observational approach to remedy performance. Real-time analysis, field screening, and other close-support laboratory techniques will be used to track the progress of the remedies and verify actual conditions encountered.

- **Remedy Completion Stage** – remedy completion data is obtained during this stage to close out individual geographic areas, as individual site remedial actions are completed.

DOE believes that there is sufficient existing characterization information obtained over the past 20 years to 1) support the development of the Inner Area technical cleanup principles; 2) identify the decision logic for developing the threshold case alternative for the Inner Area waste sites and subsurface structures; and 3) formulate and evaluate the range of alternatives across the Inner Area to support the comprehensive CERCLA threshold, balancing, and modifying criteria evaluations.

The remedial investigation process for Central Plateau waste sites relies on information obtained from two primary sources (1) process knowledge and (2) sampling and analysis of waste sites. Process knowledge is a form of characterization that is based on historical records, process flowsheets, radiochemical and geochemical behavior, waste discharge data, and any other non-sample related data that may be available about a waste site or waste stream. In many ways, it is one of the most complete forms of data available about radioactive materials and other hazardous substances – both constituents and volumes – that may be present in a waste site.

In addition to process knowledge, sampling and other forms of characterization, such as geophysical logging, have been performed on Central Plateau waste sites since the 1950s. A detailed characterization program, specifically aimed at identifying the nature and extent of contamination from Central Plateau waste sites was initiated in the 1990s, resulting in thousands of groundwater and soil samples and laboratory analyses. A systematic evaluation was conducted, using a data quality objectives (DQO) process, in 2005-2006 by the Tri-Parties to determine the specific additional characterization needed to make remedy decisions for Central Plateau waste sites.

To support the assessment of supplemental data needs, the Tri-Parties grouped waste sites into seven conceptual model groups (Model Groups 1 through 7) that are based on exposure pathways. These pathways are a function of the type and location of contaminants within, beneath, and around the waste sites. For example, shallow sites have different pathways for exposure than do sites with deeper contamination. The model groups provided an effective method for determining types and locations of supplemental data needed to support decision making. The results are documented in DOE/RL-2007-02, *Supplemental Remedial Investigation/ Feasibility Study Work Plan for the 200 Areas Central Plateau Operable Units*. The supplemental characterization, as agreed to in DOE/RL-2007-2 and 200-UW-1 discussions, will be completed to support remedy selection and implementation.

The model groups lay the groundwork for the decision logic that DOE plans to use to develop the base case (threshold) alternative that is protective of human health and the environment by ensuring that the exposure pathways of concern in each model group are addressed. Balancing criteria can also be applied at the model group level to develop additional alternatives for consideration. Data collected during remedy implementation will verify that the exposure pathways are appropriately addressed by the selected remedy.

Two operable units not included in the model group analysis were 200-IS-1 (pipelines, diversions boxes, tanks, etc.) and 200-SW-2 (radioactive waste burial grounds and landfills) although the decision logic does address these OUs. Decision logic related to pipelines and other 200-IS-1 sites will focus on the depth of contaminants based on the depth of the original pipeline.

DOE anticipates that the most likely remedy for burial grounds within 200 West and East Areas will be containment (capping using an engineered surface barrier with continued monitoring). Focused removal of some wastes will be considered during remedial alternative development for the feasibility studies.. CERCLA policy and guidance recognizes that heterogeneous landfills are complex and that containment

can be a protective and cost-effective remedy. DOE will work with Ecology and EPA to submit a revised Remedial Investigation Work Plan to focus characterization on what is needed to ensure cap performance.

DOE will continue to investigate past releases from SSTs. Characterization efforts will be implemented in accordance with the plans established in *RCRA Facility Investigation/Corrective Measures Study Work Plan for Waste Management Area C*, (RPP-PLAN-39114), *Phase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas* (RPP-PLAN-37243, Rev. 0, September 2008), and interim barrier design activities.

Consistent with CERCLA, the four stages of characterization (decision-making, remedy design, remedy implementation, and remedy completion) provide meaningful opportunities over the life of the remedial actions to verify field conditions encountered against the cleanup requirements specified in Inner Area cleanup decisions. These opportunities continually aid in confirming and refining design-based remedial action depths, areal extents, and volumes for the waste sites in each of the geographic based decision units.

3.1.2.6 Inner Area decision unit architecture

DOE's approach for Inner Area decision units was developed after extensive discussions among the Tri-Parties about the technical cleanup principles and potential options for decision unit architecture. The decision-unit structure considers DOE's holistic view of Central Plateau decision-making while recognizing that some decision documents have progressed to the point where it is prudent to proceed with a decision as currently structured.

As a result of the discussions, DOE intends to geographically group decisions for the existing operable units into four Inner Area decision units that also address decisions for the remaining canyon facilities. The four decision units are described below.

200-PW-1/3/6 and 200-CW-5 Decision Unit

The 200-PW-1/3/6 and 200-CW-5 Decision Unit will combine the existing 200-PW-1/3/6 OU group with the 200-CW-5 OU. EPA has specifically requested that these operable units be addressed separately from the remaining portions of the Inner Area. These sites have been evaluated in existing draft feasibility studies. The Tri-Parties are reviewing the analyses in the draft feasibility studies and are discussing the appropriate remedy to recommend in the combined proposed plan. As part of the agreement among the Tri-Parties, this decision unit is being retained separate from the implementation of the new Inner Area cleanup completion strategy, and will employ exposure scenarios for decision-making that were defined in 2006. The existing feasibility studies will be finalized and issued as separate documents.

A consolidated proposed plan will be developed for public comment that will introduce the Central Plateau cleanup approach that will be applied in subsequent Inner Area remedy evaluations and decisions. The final remedy decision for these operable units will also recognize that there are key balancing factors to be considered in making remedy decisions for waste sites contaminated with plutonium. The intent is to adopt a holistic view to making such decisions across the Inner Area. The proposed plan and the record of decision will describe the overall Central Plateau strategy.

200 West Inner Area Decision Unit

The 200 West Inner Area Decision Unit will consolidate the remaining Inner Area sites in the 200 West Area except for environmental media underlying tank farm waste management areas (WMAs) and several waste sites with deep vadose zone contamination that are adjacent to the WMA environmental media

sites. The 200 West Inner Area decision unit will be the first Inner Area decision unit that will make use of a comprehensive application of the technical cleanup principles for the Inner Area as a whole to support remedy evaluation and remedy selection for specific sites. This analysis will provide the framework to consider the final footprint of the Inner Area as a whole and provide the best assurance that the full scope of risks and impacts are taken into account by decision-makers when selecting remedies for specific sites. The 200 West Inner Area FS/PP will include Inner Area sites from multiple OUs, including the 200 West Area portions of the low-level waste burial grounds (200-SW-2), the 200 West Area pipelines (200-IS-1), waste sites around the U Plant canyon (200-UW-1), other 200 West Area cribs, ponds, and ditches, and the REDOX and T Plant canyons.

The feasibility study will describe the decision parameters, the decision logic, cleanup standards, the comprehensive inner area evaluation process, and the policy decisions that need to be made based on the comprehensive evaluation. The technical basis documents described in Section 3.1.2.4 provide the link between the Central Plateau cleanup strategy and the FS/PP. The proposed plan will summarize the technical cleanup principles and decision logic and will also include a preferred alternative for the sites within the 200 West Inner Area. The FS/PP/ROD will also include methodology for evaluating and selecting remedies for sites which may be found during remediation.

RCRA closure plans will be developed as needed for closure of TSD units within the 200 West Inner Area to coordinate with decision unit activities.

200 East Inner Area Decision Unit

The 200 East Inner Area Decision Unit will consolidate the remaining Inner Area sites in the 200 East Area except for environmental media underlying tank farm WMAs and several waste sites with deep vadose zone contamination that are adjacent to the WMA environmental media sites. The 200 East Inner Area Decision Unit will also make use of a comprehensive application of the technical cleanup principles for the Inner Area developed for the 200 West Inner Area decision unit. The 200 East Inner Area FS/PP will include Inner Area sites from multiple OUs, including the 200 East Area portions of the low-level waste burial grounds, the 200 East Area pipelines, other 200 East Inner Area cribs, ponds, and ditches, and the PUREX and B Plant canyons.

The analysis for this decision unit will follow the same pattern as the 200 West Inner Area decision unit and will utilize the same technical basis documents and comprehensive evaluation of the alternatives to clearly demonstrate how selected remedies for each fit within the framework of impacts from the entire Inner Area. Like the 200 West Inner Area Decision Unit, the FS/PP/ROD will include methodology for evaluating and selecting remedies for sites which may be found during remediation.

RCRA closure plans will be developed as needed for closure of TSD units within the 200 East Inner Area to coordinate with decision unit activities.

Balance of Inner Area Decision Unit

The Balance of Inner Area Decision Unit includes contaminated environmental media underlying the tank farm WMAs and sites with deep vadose zone contamination not addressed in other decision units. The analysis for the Balance of Inner Area decision unit will follow the same pattern as the 200 West Inner Area decision unit and will utilize the same technical basis documents and comprehensive evaluation of the alternatives to clearly demonstrate how selected remedies for each fit within the framework of impacts from the entire Inner Area. Initially, only environmental media from Waste Management Area (WMA) C will be included and will coincide with closure decisions for the WMA. Remedy selection for subsequent WMAs will be incorporated through future amendments to the decision document.

Key assumptions

Several important assumptions will be carried throughout the Inner Area decision unit documentation as noted below.

- DOE anticipates that the final remedy for the four remaining canyons will be similar to the remedy selected for U Plant canyon in the 2005 record of decision (partial demolition with in-place disposal beneath an engineered surface barrier). As a result waste sites surrounding the canyons that are expected to be impacted by the potential barrier will be addressed as part of the same remedy. Work will be coordinated with other facility decommissioning as appropriate.
- DOE anticipates that the remedy for low-level burial grounds within 200 West and East Areas will be containment using an engineered surface barrier and continued monitoring, similar to closure requirements for TSD landfills.
- DOE intends to apply the Inner Area technical cleanup principles to remedy selection for environmental media contaminated by past releases from single-shell tank farms. The single-shell tank system, i.e., tanks and associated hardware, will be closed to meet RCRA TSD closure requirements and is not addressed within this Decision Unit. Remedy selection for the tank farm environmental media will meet RCRA corrective action requirements (to support RCRA closure of the WMA) and CERCLA requirements to ensure that hazardous and radioactive constituents are addressed.

Specific actions required to complete the Inner Area decision units are described in Appendix A.

3.1.3 Transition to the New Approach

DOE is proceeding with implementation of the cleanup of the Hanford Site, which includes near-term cleanup activities in the Central Plateau and River Corridor. The Central Plateau cleanup includes work supported by the site baseline budget and work accelerated by supplemental funding through the American Recovery and Reinvestment Act. Significant progress in the cleanup of the Central Plateau will be realized near-term (FY 2009-2011) through:

- De-inventory of special nuclear materials from the PFP.
- Elimination of the protected area at PFP.
- Removal and decontamination of process equipment and process glove boxes at PFP.
- Construction of an Interim Storage Area for consolidation of slightly irradiated fuels.
- Cleanup of a number of facilities and waste sites within the ~65 square mile Outer Area.
- Completion of the decision process for groundwater plumes in the Central Plateau.
- Design and construction of the 200 West groundwater treatment system.
- Demolition of numerous U Plant ancillary facilities and Central Plateau industrial facilities.
- Retrieval of suspect contact-handled transuranic wastes from storage and either preparation for shipment to WIPP or disposal on site.
- Elimination of the backlog of mixed low-level wastes.

3.1.4 Implementing Cleanup Decisions

At the conclusion of the decision process for the Central Plateau, a master “blueprint” for cleanup will have been established that supports the time-phased sequence of remedial actions and other cleanup. This enduring blueprint will promote consistency in subsequent cleanup actions and will serve as a roadmap to guide DOE, the implementing contractors, and the regulatory agencies during cleanup.

To facilitate a thorough, organized, and comprehensive cleanup of the Central Plateau, Inner Area decisions and actions will be implemented using a time-phased geographic approach. Cleanup of the Inner Area will be managed using smaller subsections or geographic areas within the decision units, each with a defined inventory of facilities and sites requiring cleanup. Geographic areas were developed considering location of major facilities, resource usage, logistics of mobilization, and overall size of the unit. A new Appendix J to the Tri-Party Agreement Action Plan is being proposed to describe what comprises the geographic areas.

The geographic areas are configured around important components and provide for coordination of cleanup of waste sites and facilities that lie in relatively close physical proximity to each other (Figure 3-3). Four types of geographic areas were identified:

- **Facility areas** center around the "Key" Facilities defined in the Section 8 of the Tri-Party Agreement Action Plan or other major facilities (B Plant, T Plant, PUREX, U Plant, REDOX, PFP, and WTP Areas).
- **Tank Farm** areas include the Waste Management Areas (WMAs).
  - Single-shell tank WMAs, (A/AX Farms, B/BX/BY Farms, C Farm, S/SX Farms, T Farm, TX/TY Farms, and U Farm Areas).
  - Proposed Double-shell tank WMAs (AN/AP/AW/AY/AZ Farms and SY Farm Areas).
- **Landfill areas** include the existing landfill areas requiring remediation (200 West Landfill and 200 East Landfill Area, which includes 3 parts).
- **Balance of 200 West Inner Area** and **Balance of 200 East Inner Area** which encompass the remainder of the Inner area not included in another geographic area.

A remedial design/remedial action (RD/RA) work plan will be developed for the 200 West Inner Area following the completion of the 200 West Inner Area CAD/ROD. This RD/RA work plan will provide the overarching cleanup goals, the sequence for completion of the geographic areas, and include proposed changes to the Tri-Party Agreement for completion of cleanup. More focused work plans and design documents will be developed for each geographic area. The geographic area work plans and design documents will provide greater detail for completion of the individual elements within the geographic areas in accordance with the overarching goals and requirements. An overarching 200 East Inner Area RD/RA work plan will be prepared following completion of the final 200 East Inner Area CAD/ROD.

Recognizing that this approach means that remedial actions will be implemented over an extended period of time, the RD/RA work plan will include provisions for implementing the defense-in-depth principles at the outset of remedial actions. The work plan will also provide a strategy for addressing priority environmental threats in an expedited manner that may fall outside of work areas scheduled by the geographic area approach.

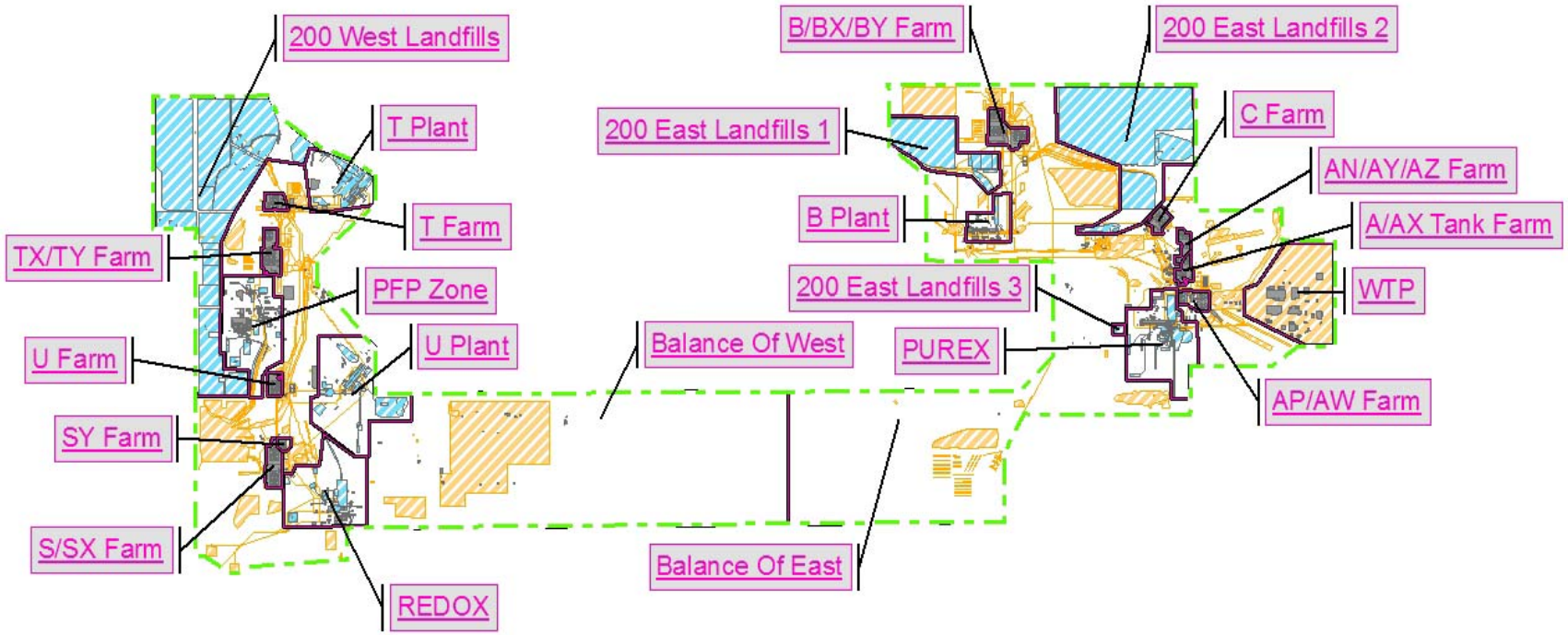


Figure 3-3. Inner Area geographic implementation areas

3.1.4.1 Facility Disposition

Structures will be evaluated individually to determine the regulatory path for remediation or removal. A Facility Decommissioning Evaluation (FDE) will be conducted in accordance with the process being developed as part of ongoing Tri-Party Agreement negotiations on Facility Disposition. The proposed detailed evaluation applies a graded approach to facility decommissioning. Structures will be categorized or binned as a Type 1, Type 2, Type 3, or Type 4 Decommissioning Model.

- **Type 1** structures are the "Key" Facilities defined in Section 8 of the Tri-Party Agreement Action Plan and others as agreed upon by the Tri-Parties. Final decommissioning of these facilities will follow a CERCLA remedial action process and be addressed by the overall Inner Area decision process.
- **Type 2** structures have had a documented release of hazardous substances to the environment in the past or pose a threat of release of hazardous substances to the environment. Decommissioning this type of structure is expected to follow a CERCLA removal action process with final area cleanup coordinated with the remedial action for the applicable geographic area.
- **Type 3** structures contain hazardous substances, but do not pose a threat of release to the environment prior to or during decommissioning and are dispositioned using standard DOE decommissioning practices.
- **Type 4** structures are industrial facilities that do not contain hazardous substances. These are dispositioned using standard DOE decommissioning practices.

Documentation from the Facility Decommissioning Evaluation (FDE) for Type 1, 2, and 3 structures will be provided to the regulatory agencies as negotiated for review and concurrence. The FDE process is proposed to be incorporated into the Tri-Party Agreement as part of a revision to Section 8 of the Action Plan, *Facility Decommissioning Process*.

Most above-grade structures are expected to be demolished and debris disposed of in an appropriate disposal location. The 200 West Inner Area and 200 East Inner Area decision unit documents will assume that non-canyon facilities will be demolished in accordance with the proposed FDE process. As part of a removal action, DOE will evaluate the foundation to determine if any further investigation of environmental media beneath the foundation is warranted and if any additional contamination remains that requires further evaluation.

If hazardous substances are found that require further evaluation, additional cleanup could be conducted immediately if addressed in the removal action to allow closeout of the cleanup action for that structure. In some cases, however, it may be appropriate to defer to investigation/cleanup activities for the geographic area. This may occur if the presence of the stabilized slab or surface provides protection to human health and the environment from a waste site not yet remediated or when cost is considered or when it is logistically feasible to complete the removal as part of a future response action planned in the vicinity and there is no adverse effect if the removal is deferred. For those instances, the site will be updated or entered into the Waste Information Data System (WIDS) database as a new waste site. These waste sites will then be addressed by the 200 West Inner Area or 200 East Inner Area decision units using the "discovery" site methodology to be developed as part of the decision.

In conjunction with the facility evaluation, waste sites and other nearby or related elements will be evaluated to determine if their remediation should be conducted at the same time as a facility removal or remedial action. This is specifically applicable to the canyon buildings, where the final remedy is expected to include an engineered surface barrier. Decision units that include canyons will consider whether the surface barrier anticipated for the canyon buildings will be a protective remedy for waste sites

within the footprint of the anticipated barrier or within the geographic area to enable remediation activities to utilize opportunities to consolidate wastes under an approved barrier remedy. Remediation of those waste sites will be implemented on the same schedule as the canyon facility response action.

3.1.4.2 Major Work Plans and Supporting Documents Accompanying the Inner Area Remedy Implementation Phase

The following major deliverables will document how ROD requirements are being implemented and how compliance with ARARs is demonstrated during the Inner Area implementation phase:

- 200 West Inner Area and 200 East Inner Area RD/RA Work Plans
- Individual Geographic Area Work Plans
- Remedial design support documents/approaches that meet CERCLA requirements and may address other cleanup actions as appropriate. Examples of the types of documents are listed below.
  - Excavation and demolition plans and protocols.
  - Plan for demonstrating achievement of waste acceptance criteria.
  - Closure verification and certification protocols, plans, and requirements.
  - Process for identifying Area-Specific Contaminants of Potential Concern.
  - Analytical support levels and data quality objectives (DQOs) for continuing data collection.
  - Remedy implementation monitoring requirements (project specific and area-wide monitoring).
  - Material staging, segregation, and final destination protocols.
  - Environmental control and support plans (keeping certified areas clean and access controlled; storm water run-on/run-off control; airborne particulates control, etc.)
  - Natural resource restoration plans.
  - Quality assurance/quality control (QA/QC) and project oversight plans.
  - Inner Area Legacy Management and Institutional Control Plan.
  - Defense-in-depth implementation strategy.

Geographic area-specific support documents may also be required in some areas. Some of these documents will be considered primary documents consistent with Tri-Party Agreement Action Plan Section 9 and will require regulatory agency review and approval. Others will be provided to regulatory agencies for information purposes. These plans will support satisfactory implementation of ROD or CAD/ROD requirements and ARARs throughout the cleanup process.

3.1.4.3 Data Collection during the Remedy Implementation Phase

In addition to the pre-decisional characterization data collected during the remedial investigations to support Inner Area remedy decision-making (see Section 3.1.2.5), DOE envisions three additional data collection opportunities to support remedy implementation:

- Collection of design data as necessary to support remedial action implementation (e.g. to determine the extent of a barrier or further delineate the planned limits of soil excavation for design purposes).

- Remedy verification data obtained during field execution, as part of the overall observational approach to remedy performance. Real-time analysis, field screening, and other close-support laboratory techniques will be used as appropriate to track progress of the remediation and verify actual conditions encountered.

- Formal remedy certification data obtained to close out individual geographic areas, as remedial actions are completed.

3.1.4.4 Geographic Area Completion

The response action completion reports prepared for each Inner Area geographic area will document the completion of the remedial actions. It is anticipated that the completion reports will be organized by the geographic areas described in the proposed Tri-Party Agreement Action Plan Appendix J.

Following the implementation of site cleanup actions, there will be disposal facilities and other areas that will necessitate long-term management activities. Natural resource restoration, institutional control, and long-term stewardship activities will be required for portions of the Hanford Site to ensure protection of human health and the environment.

The CERCLA five-year review process will provide a continuing mechanism for ensuring that remedial actions including institutional controls have been successfully implemented and are protective. In addition, RCRA post-closure care requirements will need to be met.

DOE anticipates seeking deletion or partial deletion of the Central Plateau in accordance with CERCLA closeout procedures for NPL Sites (EPA 2000) when Central Plateau groundwater meets drinking water standards for key contaminants, cleanup remedies are implemented, and institutional controls are in place. A final close-out report will be developed that describes how Central Plateau cleanup was accomplished and will provide overall technical justification for the response action completion report.

3.2 Outer Area

The Outer Area covers approximately 65 square miles and contains more than 100 waste sites and structures scattered throughout largely undisturbed sagebrush steppe habitat (Figure 3-4). Most of the waste sites in the Outer Area are small near-surface sites that will be removed for treatment as needed for onsite disposal or sampled to confirm that no additional action is required, except for implementation of appropriate institutional controls. The largest components of the Outer Area remediation are the ponds where cooling water and chemical sewer effluents were discharged and the BC Control Area where surface contamination was spread because of animal intrusion into a waste site.

Figure 3-4. Central Plateau Outer Area

3.2.1 Strategy for Outer Area Remediation

The Outer Area of the Central Plateau will be remediated to unrestricted surface levels comparable to the adjacent River Corridor to support the future anticipated land use of conservation/mining. Most of this area is reserved for the management and protection of archeological, cultural, ecological, and natural resources and related uses which require protection of human health and ecological pathways. Limited and managed mining (e.g., quarrying for sand, gravel, basalt, and topsoil for governmental purposes only) could also occur. Approximately 10 square miles of the Outer Area is within the Industrial-Exclusive land use area as designated by the HCP-EIS ROD and would be available for uses consistent with that designation.

Remediation up to a depth of 15 feet is planned, to be consistent with the River Corridor and to enable authorized surface uses. Institutional controls will be required in limited areas as there may be restrictions on sub-surface use in portions of the Outer Area. Cleanup of the Outer Area is biased to removal for treatment as needed and disposal in ERDF or other approved disposal locations. Monitoring and continued institutional control will likely be required at the large ponds in the Outer Area to allow radioactive contaminants to decay to levels suitable for unrestricted surface use, consistent with anticipated future land use of conservation/mining. A small area in the southeastern portion of the Outer Area containing two inactive landfills will be closed under Washington State landfill closure regulations (that is, placement of a cap and continued monitoring/institutional control). These lands will remain under continued federal ownership and control, although federal agencies in addition to DOE may be involved in management of the Outer Area.

3.2.2 Outer Area Decision Design

Final cleanup decisions for the Outer Area waste sites will be developed through a single CERCLA RI/FS, Proposed Plan, and ROD. The decision process will incorporate multiple interim action decisions and make decisions for sites not covered under an interim action.

The Outer Area RI/FS will evaluate groundwater risks, human health and ecological risks, and remedial action objectives will be developed, consistent with unrestricted surface use similar to the River Corridor to ensure that the Outer Area cleanup decisions will support the anticipated future land use. No impacts to groundwater are anticipated from Outer Area waste sites. The final ROD will be developed with a bias for RTD for the Outer Area sites, with the accompanying disposal of the excavated materials within the Inner Area (i.e., ERDF).

DOE will ensure that there is a sound technical basis for key pieces of the decision process. The Outer Area Baseline Risk Assessment will address exposure scenarios, conceptual site models, contaminants of potential concern (COPCs), and support development of cleanup levels. The remedy selection process will consider proposed ARARs, remedial action objectives, and decision logic for identifying protective remedial alternatives. As part of the decision process, DOE will confirm that interim actions completed and in process are protective of human health and the environment or, if necessary, identify additional actions required, select remedies for sites not covered by a previous interim action, and finalize institutional controls appropriate for Outer Area sites.

The Outer Area ROD is anticipated to specify contingent remedies for sites that may be discovered during cleanup and for sites that may not ready for a final decision at the time the Outer Area decision process is underway or that will require other decision documentation. Remedy decisions for these sites will be incorporated into the Outer Area ROD using an Explanation of Significant Difference to document the remedy selection if appropriate.

- **West Lake** – Because of West Lake's unique nature as a surface expression of groundwater in contaminated soil, additional characterization may be required before a remedy decision can be made. If necessary, the Outer Area ROD will be revised to incorporate a remedy decision on West Lake should information for remedy selection be determined to be insufficient when the ROD is issued.
- **Inactive cross-site transfer lines** – Because of proximity with the active cross-site transfer lines used for transfer of tank wastes between 200 West and 200 East Areas, the decision for the inactive lines will be deferred until a decision is made for the active lines. The active lines will be addressed by decisions made for the existing double-shell tank systems and components. Decisions for these lines will be consistent with Outer Area remediation goals. The Outer Area ROD will be revised to incorporate the final remedy decision for the inactive lines when it can be made.

- **B Pond and S-10 Pond/Ditch –** These inactive RCRA Treatment, Storage and Disposal (TSD) units will be addressed in the Outer Area decision documents in concert with appropriate RCRA closure documentation. The remedy selected in the Outer Area ROD will satisfy both CERCLA cleanup and will meet RCRA closure requirements. Closure of the TSD units will be documented in a modification to the Hanford Facility RCRA Permit.
- **Non-Radioactive Dangerous Waste Landfill (NRDWL) and the Solid Waste Landfill (SWL) –** Closure plans for the inactive landfills will be prepared in accordance with Washington Administrative Code Dangerous waste regulations (NRDWL) or landfill closure requirements (SWL). Decisions for these sites do not need to be incorporated into the Outer Area ROD.
- **Septic systems –** Closure of septic systems in the Outer Area will be documented in accordance with Washington State Department of Health requirements. Decisions for these sites do not need to be incorporated into the Outer Area ROD.

Interim action decisions for Outer Area sites that have already been made or that are in progress are described in Appendix A. Adjustments to operable unit assignments will be made to coordinate with the decision unit assignment. Specific actions required to complete the Outer Area Decision Unit are also described in Appendix A.

3.2.3 Implementing Outer Area Cleanup Decisions

Cleanup of the Outer Area is being accelerated using American Recovery and Reinvestment Act (ARRA) funding, including some of the interim actions identified in Appendix A. The majority of the interim actions in the Outer Area involve (1) removal of small near-surface waste sites, treatment where needed and disposal in an approved disposal facility or (2) confirmatory sampling to confirm that cleanup standards are not exceeded and, as a result, no further cleanup action is required. Interim actions are utilized to enable cleanup to proceed in advance of final decisions. Individual removal action work plans and sampling and analysis plans are being prepared and implemented.

Final remedial actions will be implemented using a Remedial Design/Remedial Action (RD/RA) Work Plan for Outer Area sites. Verification sampling will be incorporated into the work plan where necessary to verify that cleanup standards have been met.

Remediation of the Outer Area, in conjunction with the River Corridor, supports a substantial active cleanup footprint reduction of the Hanford Site. The majority of waste sites in the Outer Area will be remediated by 2015, although some waste sites may require longer to complete.

Remediation of the active and inactive cross-site transfer lines will be coordinated and will likely share technologies and resources for cleanup. Cleanup of these lines is not expected to occur until the operations of the active lines are complete.

Areas requiring institutional controls for protection of human health and the environment following remediation will be limited to NRDWL/SWL, ponds, and to a small number of sites where natural attenuation of hazardous substances is determined to be the final remedy. Land use controls and access restrictions will be in place throughout the Outer Area consistent with federal ownership of the site.

3.3 Groundwater

The groundwater beneath the Central Plateau is divided into four operable units for investigation and remediation: 200-ZP-1 and 200-UP-1 operable units address groundwater contamination from waste disposal practices in the 200 West Area; 200-BP-5 and 200-PO-1 address similar contamination in the 200 East Area. A final ROD was issued for the 200-ZP-1 operable unit in September 2008. Currently the

contaminant plumes that are present in groundwater encompass approximately 60 square miles and extend beyond the boundaries of the Central Plateau (Figure 3-5).

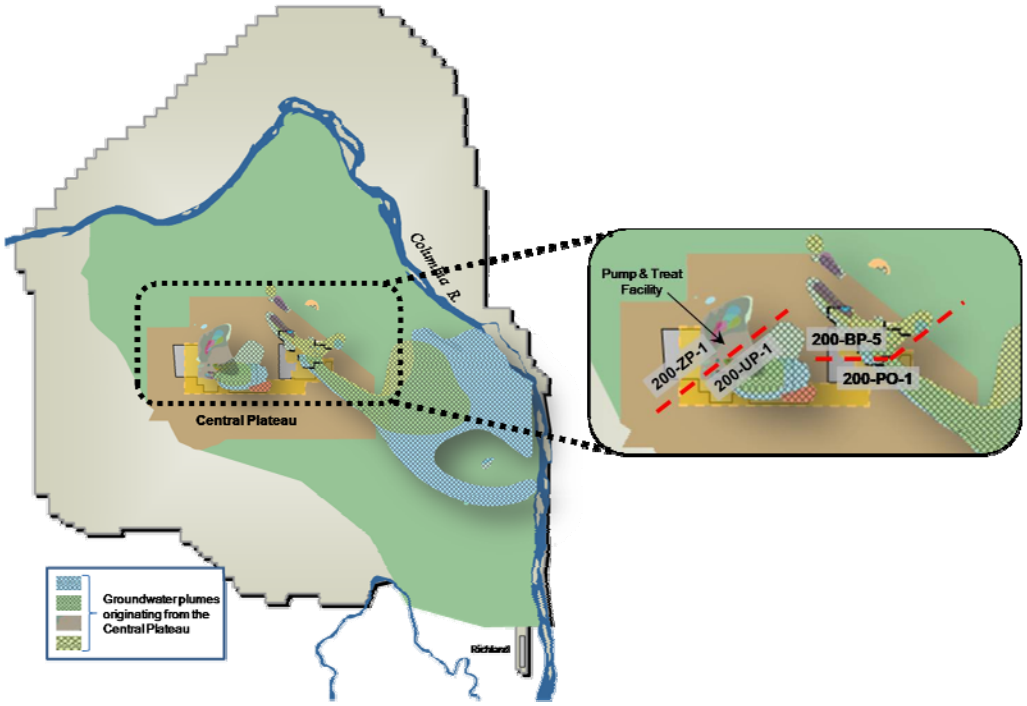


Figure 3-5. Groundwater plumes originating from the Central Plateau

3.3.1 Strategy for Groundwater Remediation

DOE's strategy for groundwater is contained in *Hanford Site Groundwater Strategy: Protection, Monitoring, and Remediation*, further outlined in the *Hanford Integrated Groundwater and Vadose Zone Management Plan*, and reaffirmed in the 200-ZP-1 Final ROD. DOE plans to implement remedial actions for contaminated groundwater plumes that underlie and emanate from the Central Plateau to contain key contaminants and to restore groundwater and return it to its beneficial uses, unless restoration is determined to be technically impracticable. The contaminants of most concern on the Central Plateau are technetium-99, uranium, and carbon tetrachloride. DOE is committed to continue to take actions to contain the plumes, prevent further contaminant migration, prevent exposure to contaminated groundwater, and evaluate further risk reduction opportunities as new technologies become available. DOE is also committed to integrating the groundwater and soil contamination cleanup efforts to, at a minimum, provide early warning of areas where new contamination may enter the groundwater system and allow for early response to these plumes in the groundwater to achieve the remediation goals (see Section 4.3, Defense-In-Depth).

3.3.2 Groundwater Decision Design

The existing 200-ZP-1 ROD has set the stage for the RI/FS methodology and the majority of the remediation elements that will be addressed in the remaining Central Plateau groundwater operable unit decisions. Additional requirements and clarifications can be addressed through amendments to the ROD (e.g. defining the Central Plateau containment boundary, including contaminants of concern not addressed

in the 200-ZP-1 Final ROD and integrating soil and groundwater cleanup actions including "defense-in-depth" actions).

At the current time, the 200-UP-1 final remedy decisions are planned to be addressed through an amendment to the 200-ZP-1 ROD. The two OUs will comprise a 200 West Area Groundwater Decision Unit. Remedial investigation activities have been completed for 200-UP-1. A remedial investigation/feasibility study report will be prepared to support public comment on a proposed plan.

The 200 East Area groundwater operable units (200-BP-5 and 200-PO-1) are on different schedules for completing remedial investigation. Separate remedial investigation reports are being prepared for each operable unit. A combined feasibility study will be developed to support public comment on the proposed plan and a remedy decision for 200 East Area groundwater remediation. More information on the groundwater decision units is included in Appendix A.

3.3.3 Implementing Groundwater Cleanup Decisions

Both 200-ZP-1 and 200-UP-1 operable units have interim pump-and-treat systems in place to address the contaminants of highest concern in 200 West Area groundwater (e.g. carbon tetrachloride, uranium, technetium-99). There are no interim systems addressing 200 East Area groundwater. The 200-ZP-1 Final ROD has required a significant expansion to the pump-and-treat capability as a principal element of the cleanup decision. The expanded pump and treat system is being designed with treatment capability and sufficient capacity to address the 200-UP-1 contaminants as the plumes are largely contiguous with the 200-ZP-1 contamination.

For the 200-PO-1 Operable Unit, the likely response will be to monitor the existing iodine, tritium, and nitrate plumes to ensure that they decay or attenuate to restore groundwater to its beneficial use within a reasonable timeframe. Isolated contaminant plumes will be contained within the Central Plateau to mitigate the spread of contamination and help achieve restoration goals. For the 200-BP-5 operable unit, treatment options for the uranium and technetium-99 plumes will be investigated to contain these plumes within the Central Plateau. Achieving groundwater restoration goals whenever practicable will be a key element of the anticipated cleanup decisions.

3.4 Timeframe and Outcome for Strategy Implementation

DOE has identified timeframes for submitting the Inner Area and Outer Area decision unit documentation in Appendix A. These dates will be the starting point for proposed milestones in Tri-Party Agreement change packages to be negotiated with EPA and Ecology. Formalization of these dates and scheduling of activities beyond this level of detail will occur when the strategy is approved and milestone negotiations are complete.

It is DOE's intention to restore the natural surface features of the Central Plateau, including the Inner Area. A comparison of the current Central Plateau and DOE's projection of the area as it will appear during the post-cleanup long-term stewardship phase is shown in Figure 3-6.

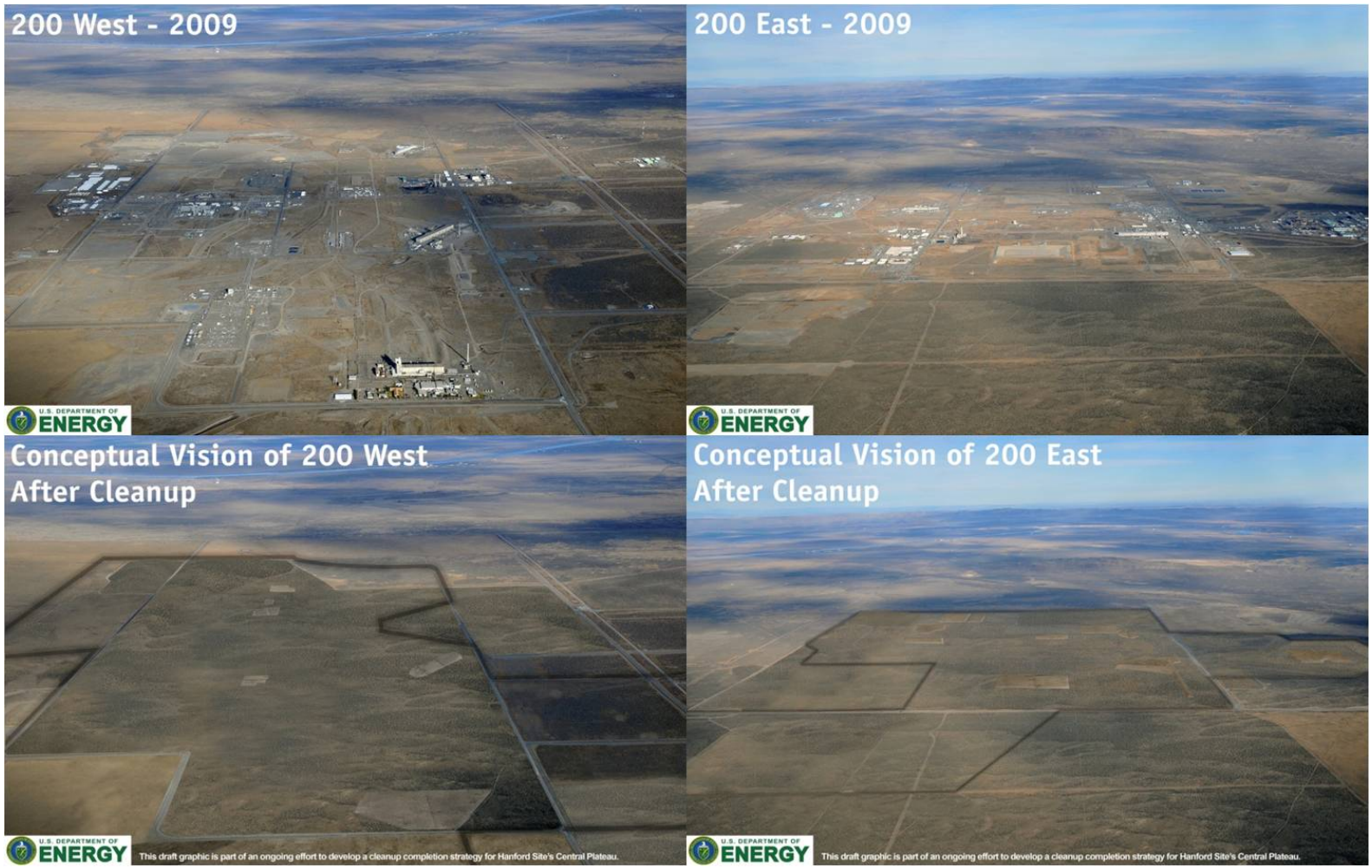


Figure 3-6. Conceptual Vision of the Central Plateau

4 CROSS-CUTTING ACTIVITIES

4.1 RCRA and CERCLA

RCRA traditionally applies primarily to active waste management facilities whereas CERCLA was established by Congress to address inactive or abandoned sites. Where delegated by EPA, states implement RCRA through their State hazardous waste programs. In Washington State, the Department of Ecology implements the Hazardous Waste Management Act (Revised Code of Washington 70.105) through its Dangerous Waste Regulations (WAC 173-303). RCRA requires that facilities with RCRA permits, like the Hanford Site, implement a program to clean up releases of hazardous waste anywhere on the operator's property through a "corrective action" program. In addition, CERCLA §120 and Executive Order 12580 empower the Department of Energy to conduct "remedial action" cleanups of hazardous substances released on its facilities, under EPA oversight. In May of 1989, DOE, EPA and the State of Washington entered into the Hanford Federal Facility Agreement and Consent Order (HFFACO), also called the Tri-Party Agreement (TPA), which establishes a process to reconcile the two separate authorities governing Hanford cleanup.

The Tri-Party Agreement Action Plan outlines two separate but equivalent approaches for satisfying technical, legal, and regulatory requirements of both authorities that work around the differing scope of each statute. In accordance with the Tri-Party Agreement and the existing Hanford RCRA Permit, the Tri-Parties have agreed that either the RCRA/HWMA corrective action or CERCLA past practice process can be used to satisfy the analysis requirements of both programs; however, their decision documents are not equivalent. Specifically, RCRA/HWMA corrective action authority at Hanford does not extend to the cleanup of radionuclides addressed by the Atomic Energy Act (AEA), while CERCLA cleanup jurisdiction includes AEA radionuclides in its list of "hazardous substances".

This agreement is further implemented through the Hanford Facility RCRA Permit, Condition II.Y.2, which accepts remedial action under CERCLA as fulfilling the RCRA/HWMA corrective action requirements. For example, when investigations have been completed under one program, there should be no need to review or repeat them under another program. Similarly, a cleanup remedy that is acceptable under one program should meet the standards of the other. The Tri-Party Agreement outlines parallel steps under either authority to get from initial investigation to cleanup implementation. While the steps are parallel, they are not always identical.

As discussed in EPA's September 1996 memorandum, "Coordination between RCRA Corrective Action and Closure and CERCLA Site Activities", several approaches for coordination between programs at facilities subject to both RCRA and CERCLA are currently in use. The Tri-Parties have agreed that, as part of the Central Plateau Cleanup Completion Strategy, there will be parallel decisions for certain RCRA/HWMA corrective actions and CERCLA remedial actions that are embodied in integrated RCRA/HWMA Corrective Action Decision/CERCLA Record of Decision (CAD/ROD) documents.

The implementation of the CAD/ROD process would include the following steps:

- The Tri-Party Agreement Action Plan will be amended to describe and accommodate the CAD/ROD approach to past practice cleanup including the re-categorization of certain RPP (RCRA Past Practice) units as R-CPP (RCRA-CERCLA Past Practice) units.
- The Hanford Facility RCRA Permit will be amended to make a one-time "blanket" incorporation by reference of all RPP corrective actions (and re-categorize them as R-CPP) to eliminate the need for permit modifications after each cleanup decision. The re-categorization will also be entered in the Tri-Party Agreement Action Plan.

- The Tri-Party Agreement will be amended to specify that RCRA/HWMA corrective action decisions for RPPs in the IA Central Plateau will be made through issuance of CAD/ROD documents in lieu of a HWMA permit amendment.
- In lieu of the RCRA Facility Investigation/Corrective Measures Study (RFI/CMS), the Tri-Parties will produce a CERCLA Remedial Investigation/Feasibility Study (RI/FS) document analyzing RCRA/HWMA corrective action substantive requirements and certain additional WAC 173-340 criteria. The related CAD/ROD will affirm that this RI/FS satisfactorily addresses the RCRA/HWMA requirements.
- DOE will prepare for each R-CPP a Draft CAD/Proposed Plan document for Ecology review as a Tri-Party Agreement Primary Document with an enforceable deadline. The document will fulfill both CERCLA remedial action and RCRA/HWMA corrective action requirements, including certain WAC 173-340 criteria. The CAD/ROD will undergo public review as a RCRA/HWMA corrective action decision and a CERCLA decision in accordance with the *Hanford Site Tri-Party Agreement Public Involvement Community Relations Plan*.
- The CAD/ROD document will be issued concurrently, by Ecology under its RCRA/HWMA corrective action authority and by EPA under its CERCLA Section 120 authority to select remedial actions. The decision will therefore have all the legal attributes of a RCRA/HWMA Corrective Action and a CERCLA ROD.
- The CAD/ROD will be developed and implemented through the normal Tri-Party Agreement processes and will be included in the Hanford Site Administrative Record.

4.2 Deep Vadose Zone

There are some Central Plateau waste sites where mobile contamination has been driven deep into the soil column or vadose zone. Key contaminants of concern include technetium-99, uranium, and carbon tetrachloride. These mobile contaminants are present deep into the vadose zone where surface remedies have no influence. There is direct characterization and monitoring evidence that some of these contaminants are impacting groundwater today. Of equal concern are the locations where contamination has not yet reached the groundwater but will at some point in the future. These sites are being identified through ongoing characterization and monitoring activities.

4.3 Defense-in-Depth

Inclusion of an integrated monitoring system that is designed to provide early warning of significant contaminant movement or impact to groundwater is a necessary element of the controls identified in source and groundwater records of decision. This is the “defense-in-depth” concept.

A comprehensive, integrated defense-in-depth approach could include monitoring of the applied remedy (such as monitoring systems installed as part of barriers to detect elevated soil moisture beneath select areas of the remedy), monitoring the vadose zone beneath the remaining contamination, and monitoring groundwater. The requirement for these monitoring systems will be included in the specific RODs and addressed in remedial design documents. Remedy decisions, in particular the groundwater RODs, will also specify the conditions under which contingent remedial measures would be implemented to address emerging contaminant plumes.

An important additional activity that is related to the defense-in-depth monitoring approach is DOE’s commitment to initiate a series of treatability tests to identify and evaluate potential approaches to deep

vadose zone contamination. The strategy for reaching remedy decisions for deep vadose zone contaminants in the Central Plateau depends on the outcome of treatability testing. If viable technologies are developed here or elsewhere, then remedies could be selected and implemented across broad regions of the Central Plateau in a manner analogous to groundwater remedy selection. These technologies will most probably not be identified before the final RODs are developed and would have to be included through ROD modification at a future date.

4.4 Interface with Tank Farms

Completion of cleanup of the Central Plateau includes tank farm closure decisions and actions. The Single-Shell Tank (SST) system contains 149 SSTs and associated components (ancillary equipment, transfer lines, and miscellaneous small tank structures). These tanks are organized into seven Waste Management Areas (WMAs) for closure purposes. The Hanford Double Shell Tanks (DSTs) consists of 28 tanks and associated equipment organized into six tank farms. In addition there are approximately 60 miscellaneous underground storage tanks and other ancillary equipment associated with tank farm activities; some of this ancillary equipment is located outside of the boundaries of the tank farm WMAs.

This section describes DOE's approach for coordinating tank farm closure decisions with other Central Plateau cleanup decisions. Appendix I (Section 3.2) of the Tri-Party Agreement Action Plan recognizes the need to "integrate SST system closure actions with Central Plateau remedial action" and "soil contamination outside of WMAs will require close integration with decision making at adjacent sites." The following are the elements of this approach:

- Closure of the SST system
- Remedy selection for environmental media contaminated by past releases from tank farm operations (both radiological and non-radiological constituents)
- Remedy selection for tank system components that reside outside of WMA boundaries
- Role of the WMA performance assessment process in supporting remedy selection decisions for tank farm environmental media.

4.4.1 SST System Closure

The Tri-Party Agreement Action Plan Milestone M-045-00 states that closure of all units located within the boundary of each tank farm is to occur in accordance with WAC 173-303-610. Final closure of the hazardous waste portion of tank systems (i.e., the tanks and ancillary equipment) falls under the RCRA TSD closure program. Under the Tri-Party Agreement, these tank systems are RCRA hazardous waste management units that will be eventually closed under State Dangerous Waste regulations (WAC 173-303). RCRA authority, however, does not extend to radionuclides. To achieve decisions for radionuclides contained in the tank systems themselves, DOE will apply DOE Order 435.1, *Radioactive Waste Management.*

4.4.2 Remedy Selection for Tank Farm Environmental Media

Hazardous waste releases from the tank system that has contaminated media are currently addressed under the RCRA corrective action program. Cleanup actions for the non-radionuclide component of releases above action levels will be specified in the Hanford Facility RCRA Permit. However, because RCRA does not provide authority for cleanup of radionuclides in contaminated media, DOE will apply the authority under the CERCLA process. For the Inner Area, CERCLA decisions will be made that encompass geographic decision units inclusive of CERCLA cleanup and RCRA corrective action sites. This approach will ensure that remedies are consistently evaluated and selected for the Inner Area.

Cleanup decisions, under this approach, will include selection of the cleanup remedy in both a CERCLA ROD for the associated Inner Area decision unit and in the RCRA Site-Wide Permit. The objective of this approach is to prepare documentation that incorporates both CERCLA requirements and RCRA requirements for evaluation, selection, and implementation of cleanup actions with the intent of minimizing administrative workload and duplication of paperwork. RCRA closure and corrective action requirements for hazardous constituents will be met through this approach. This approach will ensure that appropriate authorities have been applied that substantiates the remedy selection process.

It is expected that the CERCLA proposed plan for the Balance of the Inner Area will be scheduled to coincide with the RCRA closure decision (permit modification) for WMA C (approximately 2016 for the closure decision). DOE anticipates that a parallel public review of the proposed plan for the environmental media and the WMA C closure permit conditions will be conducted to meet both statutory requirements. Closure decisions for other WMAs will be completed at a later date. DOE anticipates that the environmental media remedy selection for subsequent WMAs will occur through an amendment to the Balance of Inner Area decision and a modification of the Hanford Facility RCRA Permit.

Because some of the tank farm environmental media includes deep vadose zone contamination for which there may not be currently available remediation technologies, DOE will continue treatability testing (see Section 4.2) and will continue to seek effective treatment methods. As technologies for vadose zone remediation are identified and demonstrated, they could be included in this decision. Remedial technologies that address deep contaminants at both past practice sites and the vadose zone underlying WMAs could be added as interim action ROD amendments prior to WMA closure decisions.

4.4.3 Remediation and Closure of SST System Components Outside of WMAs

In addition to the SSTs themselves, the SST system includes many components and ancillary equipment items (e.g., transfer lines, diversion boxes, catch tanks, etc.). SST components within the WMAs will be closed in concert with the SSTs (i.e., through RCRA TSD closure requirements and DOE 435.1 requirements for radionuclides). Many of these components are located outside the boundaries of the WMAs and thus remedy selection must be closely coordinated with the Central Plateau completion strategy. Most of the SST system components residing outside of WMA boundaries are currently assigned to the 200-IS-1 operable unit and may be included in the forthcoming SST Closure Permit, but the remediation selection and implementation will be achieved via the 200 West Inner Area ROD or the 200 East Inner Area ROD. This approach will ensure consistency per paragraphs 17 and 19 of the current Hanford Federal Facility Agreement and Consent Order. The completion strategy for these components is:

- The SSTs and SST components within a WMA will be closed in association with its WMA closure and therefore closure actions will be defined through a closure plan application and permit modification.
- SST components outside of the WMAs will have a CERCLA remedy selected in conjunction with the decision unit in which it resides. Modifications to the Hanford facility RCRA Permit will also be required in parallel for SST components. The selected remedy will be implemented in conjunction with its associated geographic zone.

4.4.4 Role of WMA Performance Assessment

DOE is conducting a performance assessment to support WMA C closure as specified in Tri-Party Agreement, Appendix I, Section 2.5. The intent of this performance assessment is to support both RCRA and DOE 435.1 closure decisions. Because this performance assessment will also encompass the environmental media and past releases from the tank farms in order to make informed decisions for

closure of the WMA tank systems, DOE anticipates using the performance assessment to supplement and inform the CERCLA remedy selection process. It is expected that the assessment and remedy selection processes used for WMA C will be repeated for the remaining WMAs as their performance assessments and closure decisions are developed.

4.5 Communication

DOE began developing the Central Plateau Cleanup Completion Strategy in early 2009, in coordination with the State of Washington Department of Ecology (Ecology) and the U. S. Environmental Protection Agency (EPA). During the early stages of Strategy development, DOE held discussions with the Tribal Nations and diverse audiences; including the State of Oregon, the Hanford Advisory Board, the Hanford Communities. These discussions focused on the Strategy's main elements (e.g., Outer Area, Inner Area, Groundwater, and potential decision document architecture). The Strategy incorporates input from these discussions as well as previous input from the Tribal Nations, Future Site Uses Working Group, Hanford Advisory Board, and Oregon Hanford Cleanup Board.

DOE recognizes that the Strategy will continue to mature - based upon input from Ecology and EPA and dialogue with Tribal Nations, stakeholders and the public. DOE is committed to provide opportunities for stakeholders to remain informed and to provide input prior to and during Central Plateau decision-making and implementation. To help achieve this commitment, consistent with the Tri-Party Agreement Community Relations Plan, DOE will provide meaningful information, foster two-way dialogue, and ensure that diverse values are considered in decision-making.

Communication activities will encompass overarching concepts as well as specific decision documents. Major elements identified in the February 2009, Agreement In Principle; such as the overall Central Plateau strategy, the consolidation of waste site and canyon remediation schedules, integration approaches for CERCLA/RCRA actions, the strategy for the Central Plateau deep vadose zone and regrouping of decision documents; are examples of topic areas that will require ongoing discussion.

Implementation of the Central Plateau Strategy would require changes to the Tri-Party Agreement that would be subject to public comment. DOE will follow guidance in the Tri-Party Agreement Community Relations Plan to support formal public comment periods. Typical activities include providing early notice of upcoming comment periods, fact sheets, local newspaper advertisements, document availability in the Administrative Record and Public Information Repositories, and internet postings. Comments received will be evaluated and documented through a Response to Comment or Responsiveness Summary. A preliminary list of potential documents supporting the Strategy that would be available for public review includes:

- Combined Proposed Plan for the 200-PW-1/3/6 and 200-CW-5 operable unit remedies.
- Outer Area Proposed Plan.
- Proposed Plans for the 200-UP-1, 200-BP-5 and 200-PO-1 groundwater operable unit remedies.
- Proposed Plans for 200 West Inner Area, 200 East Inner Area, and Balance of Inner Area decision units.
- 200 West Inner Area and 200 East Inner Area Remedial Design/Remedial Action Work Plans.
- Geographic area-specific plans, as appropriate.
- RCRA Permit modifications.

4.5.1 Tribal Nations

DOE's American Indian & Alaska Native Tribal Government Policy sets forth the principles to ensure an effective implementation of a government to government relationship with American Indian and Alaska Native tribal governments. This Policy is based on the United States Constitution, treaties, Supreme Court decisions, Executive Orders, statutes, existing federal policies, tribal laws, and the dynamic political relationship between Indian Nations and the federal government. The most important doctrine derived from this relationship is the trust responsibility of the United States to protect tribal sovereignty and self-determination, tribal lands, assets, resources, and treaty and other federally recognized and reserved rights. This Policy provides direction to all Departmental officials, staff, and contractors regarding fulfillment of trust obligations and other responsibilities arising from DOE actions which may potentially impact American Indian and Alaska Native traditional, cultural and religious values and practices; natural resources; treaty and other federally recognized and reserved rights.

The DOE recognizes Tribal Nations as sovereign entities with primary authority and responsibility for the protection of the health, safety and welfare of their citizens. DOE will recognize the right of each Tribal Nation to set its own priorities and goals in developing, protecting, and managing its natural and cultural resources. This recognition includes separate and distinct authorities that are independent of state governments.

Consultation with tribal nations will occur as requested by tribes for the Central Plateau Cleanup Completion Strategy through pre-set bi-weekly calls and monthly meetings.

4.5.2 Stakeholders and the Public

A wide range of organizations and individuals comprise the Hanford stakeholder community, including the Oregon Office of Energy, local city and county governments, the Hanford Communities, the Hanford Advisory Board, and many others. Potential public informational exchanges and involvement activities that will occur in support of the public comment process for the Tri-Party Agreement changes are:

- Monthly briefings to the Hanford Advisory Board's River and Plateau Committee and briefings to the Hanford Advisory Board.
- Briefings to the Oregon Office of Energy and the Oregon Hanford Cleanup Board.
- Briefings to local and regional groups, such as the Hanford Communities.

In addition, the Tri-Parties are expected to provide regular briefings to staff and management of the Tri-Party Agreement agencies - including DOE Headquarters - and congressional staff on the contents and status of the Strategy.

4.6 Record of Decision Development

Executive Order 12580 and the National Contingency Plan (NCP) assign the responsibility for development of records of decision to the Department of Energy for DOE sites. The Tri-Party Agreement Action Plan (Section 7.3.8) assigns the responsibility for preparing records of decision to the lead regulatory agency.

The Tri-Parties have agreed to revise the Tri-Party Agreement to state that DOE will prepare the RODs and provide them to the regulatory agencies (EPA and Ecology) for review and negotiated concurrence in accordance with 40 CFR 300.430(f)(4)(iii). Ecology will determine State Acceptance in accordance with CERCLA Section 120 (f). EPA has approval authority of RODs in accordance with CERCLA Section 120(e)(4)(A).

4.7 Planned Central Plateau Risk Assessments

The Central Plateau Strategy and decision documents will be supported by a set of risk assessment activities. These activities include:

- Reissuing the Central Plateau Ecological Risk Assessment Report, configuring this report as a data package that will be used as one of the resources for preparing ecological risk assessments for the Outer and Inner Areas of the Central Plateau.
- Conducting a baseline risk assessment to assess human health and ecological risks, in support of Outer Area CERCLA decisions documents.[7]
- Conducting a baseline risk assessment to assess human health and ecological risks, in support of Inner Area CERCLA decision documents.
- Providing ongoing presentations and communications of site risks that incorporate the results from the Outer and Inner Area risk assessments and risk assessment results from the River Corridor (such as the River Corridor Baseline Risk Assessment) and the Tank Farms (e.g. Performance Assessments).

4.7.1 Central Plateau Ecological Risk Assessment

The Central Plateau Ecological Risk Assessment report (DOE/RL-2007-50) will be revised and reissued as a data compilation and status report. Portions of the data presented in this report will be incorporated into updated analyses of ecological risks in the baseline risk assessments conducted in support of the Outer and Inner Area RI/FSs. Key areas to be addressed in the revision of the report include: 1) a more detailed presentation of sampling and analytical data showing how the data link to the various investigation phases; 2) a more transparent presentation of the methods used in the report, especially the use of multi-increment sampling and reference areas; 3) a more detailed description of the process for identifying waste sites where ecological exposure pathways were analyzed; 4) a more detailed description of the selection process for contaminants of potential ecological concern; 5) a discussion of the potential for exposure from biointrusion; and 6) a more detailed discussion of the uncertainties associated with various sampling and analytical methods, including identification of potential data needs to address those uncertainties.

The scope and objectives of the Ecological Risk Assessment report will be refocused to provide the strengthened presentation of data, methods, and associated uncertainties in those data and methods. Ecological risk conclusions will not be presented in the revised report, but will be incorporated into the risk assessments supporting the Outer and Inner Area decision documents described below. The revised report will be reissued as a secondary document (*Central Plateau Ecological Risk Assessment Data Package)* in accordance with Tri-Party Agreement Section 9.

4.7.2 Inner Area Risk Assessment Activities

The risk assessment for the Inner Area will provide an analysis of baseline human health risks, ecological risks, and potential impacts to groundwater from contaminants. This analysis will provide the basis for action at sites, and will provide the basis for calculating preliminary remediation goals (PRGs) for use in evaluating remedial alternatives. The risk assessment will include a range of human exposure scenarios that are consistent with the anticipated land uses in the Inner Area as well as an unrestricted use scenario to meet baseline risk evaluation requirements. Activities for the Inner Area baseline risk assessment will be coordinated with the Waste Management Area C Performance Assessment. Key ecological risk

[7] CERCLA decision documents could include Remedial Investigation/Feasibility Study reports, Proposed Plans and Records of Decision.

questions for the Inner Area include identification of waste sites where exposure pathways currently exist, identification of waste sites where exposure pathways might be present in the future, and identification of possible depths of biointrusion.

4.7.3 Outer Area Risk Assessment Activities

A baseline human health and ecological risk assessment will support Outer Area decision documents. The scope of this risk assessment will include three principal areas in the Outer Area: waste sites that have undergone removal actions, the large pond sites, and non-operational areas. The methods for assessing human health risk, ecological risks and groundwater protection used for this risk assessment will be comparable with the risk assessment approaches used for the River Corridor and for the Inner Area of the Central Plateau.

The baseline risk assessment for the Outer Area will be conducted in a manner that is consistent with DOE's strategy for the Central Plateau Outer Area. Post-remediation risks will be evaluated at the waste sites that have undergone removal actions. This will help determine if further cleanup is needed to achieve remedial action objectives. This risk assessment also will help determine the basis for action for the large pond sites and will be used to calculate PRGs for evaluating remedial alternatives.

4.7.4 Integrated Presentation and Communication of Hanford Site Risks

An integrated site-wide depiction of risks will be important in presenting and communicating the results from these risk assessments and the risk reduction over time as remedial actions are completed. This integrated presentation of site-wide risks will incorporate results from the risk assessments prepared for groundwater operable units, the risk assessments prepared for the Outer and Inner Area RI/FSs, the River Corridor Baseline Risk Assessment, including the Columbia River Component, and Performance Assessments prepared for tank farm WMAs. The ability to communicate site risks on a geographic basis, taking into consideration waste sites, facilities, buildings and the non-operational areas, represents a way of providing an integrated presentation of both Central Plateau and Hanford Site risks. This integrated presentation and communication of site risks will be an ongoing activity that will capture information and results from risk assessments and other data analyses as they are completed. In addition to these risk assessments, the information and characterizing conditions in non-operational areas also will be incorporated into this integrated presentation. This integrated risk presentation will provide a geographic depiction of Hanford Site risks to human health and the environment and will improve communication of those risks to decision makers and the public.

4.8 Natural Resource Damage Assessment

In enacting CERCLA, Congress intended to ensure the timely cleanup of contaminated sites and to place the cleanup costs on those responsible for the contamination. In addition to remediation of past releases, CERCLA also requires that injuries to natural resources resulting from certain past releases be identified in a process – known as Natural Resource Damage Assessment. Federal, state, and tribal Natural Resource Trustees are authorized to act on behalf of the public as trustees for site natural resources. This document focuses primarily on CERCLA's cleanup requirements; however, consultation with Natural Resource Trustees is an important element of selection and implementation of remedial actions.

The CERCLA-designated Natural Resource Trustees at Hanford include DOE, U.S. Department of Interior (DOI), U.S. Department of Commerce (through the National Oceanic and Atmospheric Administration); the states of Washington and Oregon; and the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe. The Trustees' role is to determine injuries to and loss of natural resources caused by CERCLA-regulated releases and to determine the extent of restoration necessary to mitigate for identified injuries and loss of natural resources. Recognizing the

potential benefit of an approach to National Resource Damage Assessment that integrates Trustee viewpoints, the Trustees formed the Hanford Natural Resource Trustee Council (NRTC) in 1993 with DOE-RL as the coordinator.

In April of 2007, DOE and the other federal trustees determined it was appropriate to begin Natural Resource Injury Assessment planning activities. The objective of this effort is to produce a collaborative injury assessment plan that will be used in identifying potentially injured natural resources resulting from releases of hazardous substances from the Hanford Site which could benefit from early restoration. The plan will likely describe a holistic, site-wide approach for injury assessment and restoration. The effort will ultimately define those efforts desired for natural resource restoration of the Hanford Site.

The first phase of the effort, which includes the approach to the conceptual model and scope of work necessary to complete the injury assessment plan, was delivered in FY 2009 and the second phase, which includes issuing the plan, is expected to be completed in FY 2010. The NRTC has requested funding in FY 2010 that would support collaborative injury assessment activities. The time frame to complete injury assessment activities cannot be determined precisely and depends on the results of the injury assessment plan and available funding in the upcoming years. It is DOE's intent, to the extent possible, to use information from the injury assessment activities to help guide investigations and selection of remedial actions.

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5 ANTICIPATED TRI-PARTY AGREEMENT CHANGES

Implementation of the Central Plateau Cleanup Completion Strategy requires modification to the Tri-Party Agreement to reflect changes in operable unit assignments, milestones and deliverables.

Operable unit designations identified in the Tri-Party Agreement Action Plan Appendix C will be adjusted to align operable units with decision units and geographic implementation areas. To simplify the scope of the decision units, the existing 200 Areas OUs are being restructured to ensure that sites within individual operable units are included in the scope of only one decision unit. Waste sites geographically located in the Outer Area are assigned to a new OU, 200-OA-1. For waste sites geographically located in the Inner Area, the existing OU structure is being retained, but some waste sites are re-assigned to divide the OUs between the 200 West Inner Area and the 200 East Inner Area. In several cases, it was necessary to create new operable units. Sites adjacent to the tank farm WMAs that require remedy selection in coordination with the environmental media underlying the WMA are assigned to a new OU, 200-BI-1. The proposed alignment is illustrated in the upper part of Table 5-1. Other changes are discussed in the following sections.

5.1 Inner Area

Anticipated Tri-Party Agreement change packages will address potential milestones to be negotiated for decision documentation in the M-15 milestone series. Submittal of the proposed change packages satisfies interim milestone M-015-40E, that requires DOE to submit a change package for new interim milestones that set forth a schedule to complete the RI/FS process for 200-SC-1, 200-PW-2, 200-PW-4, 200-TW-1, 200-BP-5 operable units and to submit a change package for the M-015-00 and M-15-00C milestones. Key changes anticipated include:

- Dates will be added to M-15-00 major milestone to complete RI/FS process and M-15-00C milestone to complete RI/FS process for 200 Area OUs.
- New M-15 series interim milestones will be added for submitting Draft A Feasibility Studies for the 200 West Inner Area, 200 East Inner Area, and Balance of Inner Area decision units.
- Interim milestones for feasibility studies/proposed plans will be deleted for operable units that will be incorporated into the Inner Area decision unit feasibility studies (M-15-44B, M-15-51, and M-15-83).
- Scope of the M-16-00 major milestone will be revised to exclude waste sites consolidated with the canyons from the scope of the M-16-00 milestone. Remediation of the consolidated canyon/waste site groups will be addressed as part of a new M-85 milestone series.
- A new M-85 milestone series will be added for cleanup of canyon facilities. Specific new milestones for disposition of the U Plant canyon are also included. As Central Plateau remediation planning matures, the Tri-Parties may elect to use the newly established M-85 milestone series in the future for the remaining canyons or other facilities and for geographic area cleanup.
- A new Appendix J will be added to identify the geographic cleanup areas, including the consolidated canyon/waste site groupings. The proposed Appendix J will identify the preliminary listing of waste sites within each geographic area. Facilities to be cleaned up using CERCLA as defined by the FDE process will also be identified in the appropriate geographic area listing. The listings contained within the proposed Appendix J will be finalized when Remedial Action Work Plans that develop geographic-area specific commitments are approved. The lower portion of Table 5-1 provides a roadmap of the relationship between the proposed OU assignments and the geographic implementation areas.

- The existing Section 8, *Facility Decommissioning Processes* is being revised to incorporate the FDE process negotiated among the Tri-Parties. The existing Section 7 will also be revised to support the FDE process.

5.2 Outer Area

Proposed Tri-Party Agreement changes include:

- Revising existing milestone M-015-38B to change the scope from submittal of the 200-CW-1 OU to submittal of the Outer Area Draft A FS.
- The new proposed Appendix J will include a listing of the Outer Area waste sites and facilities being dispositioned using CERCLA processes.

5.3 Groundwater

Tri-Party Agreement changes required to support 200-UP-1 are included in change package M-15-08-07, approved by the Tri-Parties in August 2009.

An additional Tri-Party Agreement change will be required to consolidate two separate M-15 series interim milestones (M-15-21A and M-15-73) for submittal of 200-PO-1 and 200-BP-5 Feasibility Studies and Proposed Plans into one milestone (M-15-21A) for the combined documents.

5.4 Other

Tri-Party Agreement change packages will address changes in the Legal Agreement and Action Plan needed to implement the CAD/ROD approach, including changes for dispute resolution, as necessary.

A Tri-Party Agreement change package will include a revision of Action Plan Section 7 to assign responsibility for the preparation of records of decision to DOE and to establish a schedule for review and approval of the RODs following public comment on a proposed plan.

Table 5-1. Transition of Operable Units through Implementation of the Central Plateau Cleanup Completion Strategy

	Existing OU groups		Proposed OU assignments for Feasibility Studies[1,2]				
			PW-1/3/6 and CW-5	**West Area Sites**	**East Area Sites**	**Sites Near WMAs**	**Outer Area Sites**
Transition from Process-Based OUs to Geographic OUs (Occurs now)	200-PW-1/3/6		200-PW-1/3/6				
	200-CW-5		200-CW-5				
	200-PW-2/4	Waste sites to be reassigned to new and existing Operable Units to establish fully geographic Operable Units		200-PW-4	200-PW-2[3]	***200-BI-1***[4]	---
	200-SW-1/2[5]			200-SW-2	***200-SW-3***[4]	---	---
	200-LW-1/2			200-LW-1	200-LW-2	***200-BI-1***[4]	---
	200-MW-1			200-LW-1	200-MW-1	---	---
	200-SC-1			200-SC-1	***200-SC-2***[4]	***200-BI-1***[4]	---
	200-TW-1/2/200-PW-5[3]			200-TW-1	200-TW-2	***200-BI-1***[4]	---
	200-BC-1			---	200-BC-1	---	---
	200-CS-1			---	200-CS-1	---	***200-OA-1***[4]
	200-UW-1			200-UW-1	---	---	
	200-MG-1/2			200-MG-2	200-MG-1	***200-BI-1***[4]	
	200-IS-1			200-IS-1	***200-IS-2***[4]	---	
	200-CW-1			200-CW-1	---	---	
	200-CW-3			---	---	---	
	200-UR-1			200-UR-1	200-MG-1	***200-BI-1***[4]	
	100-IU-2/6			---	---	---	
Decision Units and Documents	Feasibility Studies		200-PW-1/3/6 and separate 200-CW-5	**200 West Inner Area**	**200 East Inner Area**	**Balance of Inner Area**	**Outer Area**
	Proposed Plans		**200-PW-1/3/6 combined with 200-CW-5**				
	Decisions						
Geographic Areas for Implementation (Remedial Design and Remedial Action)	**Outer Area**						X
	200 East Inner Area						
	B Plant Area				X		
	PUREX Area		X (200-PW-3 sites only)		X		
	WTP Area				X		
	200 East Landfill Area				X		
	Balance of 200 East Inner Area				X		
	A/AX Farms Area					X	
	AN/AP/AW/AY/AZ Farms Area					X	
	B/BX/BY Farms Area					X	
	C Farm Area					X	
	200 West Inner Area						
	T Plant Area			X			
	U Plant Area			X			
	REDOX Area			X			
	PFP Area		X (200-PW-1/6 & 200-CW-5 sites only)	X			
	200 West Landfill Area			X			
	Balance of 200 West Inner Area			X			
	S/SX Farms Area					X	
	SY Farm Area					X	
	T Farm Area					X	
	TX/TY Farms Area					X	
	U Farm Area					X	

Notes:

1. OUs are re-aligned so that each OU is covered in only one decision unit. Waste sites are re-assigned as necessary. For example – waste sites in the 200-PW-2/4 OU group will be assigned to 200-PW-4 if located in 200 West Area and to 200-PW-2 if located in 200 East Area. Several sites adjacent to tank farm WMAs will be assigned to new OU, 200-BI-1. Specific waste site assignments will be addressed in a proposed Tri-Party Agreement change package modifying Appendix C of the Action Plan.
2. Consolidated Remedial Investigation reports will be developed to support the 200 West Inner Area, the 200 East Inner Area, Balance of Inner Area, and Outer Area Feasibility Studies.
3. 200-PW-5 is eliminated. Sites in 200 West are assigned to 200-TW-1. Three sites in 200 East are assigned to the new operable unit 200-BI-1. The remaining site in East Area (216-B-62) is assigned to 200-PW-2.
4. New operable units that are created to ensure geographic integrity of decisions (e.g., 200-BI-1).
5. 200-SW-1 includes the Non-radioactive Dangerous Waste Landfill and the Solid waste Landfill. Both will be closed in accordance with WAC landfill closure regulations and are not included in the Central Plateau decision units listed above.

6 RELATIONSHIP OF COMPLETION STRATEGY AND FUNDING

Funding of Hanford cleanup plays a crucial role in making progress and the ultimate cleanup of the Hanford Site. With the implementation of the American Recovery and Reinvestment Act (ARRA), the DOE has demonstrated its commitment to the cleanup of the site. Using these funds and base appropriations, significant funding has been applied to Hanford cleanup activities that would not have been otherwise funded in FY 2009 through 2011. While the ARRA funding has a defined life, significant progress is envisioned that would not have been made otherwise, and maintaining the momentum from this additional funding is an objective of the DOE and the regulatory agencies. The impact of increased funding above those funds required to maintain facilities in a safe and compliant condition, using the ARRA funding as an example, demonstrates the incremental affect funding has on the cleanup progress. ARRA funding allocated to DOE-RL will be used for visible and measureable progress, as the costs for maintaining the safe and compliant posture of the facilities and waste sites are funded through base appropriations; ARRA funding is being applied to cleanup activities that will reduce risk, reduce the site footprint of active cleanup, and reduce longer term liabilities from sites, wastes, and facilities that are dispositioned.

The budget planning process for 2012 is ongoing. Of particular interest is the effect on the Hanford cleanup with planned completion of River Corridor cleanup by about FY 2015, the planned demolition of the PFP by about the end of 2013, and the completion of ARRA-funded work. With completion of the River Corridor cleanup and PFP, additional funding may be available for cleanup of the Central Plateau and the 100 K Area that can be used to remediate groundwater, deactivate and decommission facilities, remediate waste sites, and retrieve and disposition wastes. Several factors will influence the ability to potentially obtain this funding upon completion of River Corridor Cleanup.

- Demonstrating measurable progress with the funding available on projects that are currently underway.
- Achieving near term Tri-Party Agreement milestones.
- Obtaining regulatory decisions to proceed with projects that are anticipated to be ready to start after 2012.
- Having a site-wide completion strategy that defines the approach, goals, and criteria to reach an achievable end state.

Implementation of this strategy will affect a wide variety of projects and regulatory decisions. Agreements on scope and schedule need to be made as soon as possible, clearing the way to apply funds to those projects best suited for their application. A defined regulatory pathway and a process that provides the Congress with the confidence that cleanup funding will continue to be well spent are keys to ensuring continued support. A Central Plateau strategy that meets these objectives provides the means to justify and sustain funding.

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7 CONCLUSION AND PATH FORWARD

This document provides for the first time a comprehensive vision and strategy for completing cleanup of the Central Plateau portion of the Hanford Site. This vision and strategy is essential to guide future decisions for waste sites and facilities on the Central Plateau. Key to this strategy is the Inner Area, approximately 10 square miles that will become the final contiguous footprint of the Hanford Site. The Inner Area will be dedicated to waste management and containment of residual contamination and will require continued federal presence and oversight. Portions of this Inner Area have previously been dedicated to permanent waste disposal through prior decisions. In addition, the Inner Area has been utilized to support cleanup of the rest of the Hanford Site as contaminated soils and debris have been brought to ERDF for disposal – thus enabling the extensive cleanup of the balance of the site.

This completion strategy also defines the Outer Area (approximately 65 sq. mi.) of the Central Plateau. It is DOE's intent to clean up this portion of the site to a level comparable to that achieved for the River Corridor. Contaminated soils and debris will be removed to ERDF within the Inner Area for final disposal. Completion of cleanup of the Outer Area will shrink the footprint of active cleanup to the final 10 sq. mi. Inner Area.

This strategy also sets in place the approach to achieve final decisions for Central Plateau groundwater operable units. DOE's goal is to restore groundwater to its beneficial uses unless determined to be technically impracticable. Currently, a record of decision is in place for the 200-ZP-1 operable unit in the northern half of the 200 West Area. This strategy calls for an amendment to that ROD to encompass remedy selection for the 200-UP-1 operable unit in the southern half of the 200 West Area. Remediation of the contaminated groundwater in 200 West Area is the focus of a large treatment system currently undergoing design and construction. A second groundwater ROD will be prepared to encompass the two groundwater operable units in the 200 East Area, 200-BP-5 and 200-PO-1.

For the Inner Area, the strategy reaches remedy decisions through four CERCLA records of decision:

- 200-PW-1/3/6 and 200-CW-5 Decision Unit
- 200 West Inner Area Decision Unit
- 200 East Area Decision Unit
- Balance of Inner Area Decision Unit

DOE intends to obtain remedy decisions that are protective of the surface uses, consistent with the reasonably anticipated use of the Inner Area for long-term waste management and containment of residual contamination. In addition, remedies will be protective of groundwater and ecological receptors. DOE's strategy will also streamline implementation of remedies through a geographic zone closure approach. Once remedy decisions have been made for waste sites and facilities within a zone, a zone-based RD/RA work plan will guide efficient use of cleanup resources to complete the remediation.

Implementation of this strategy is essential so that remediation efforts on the Central Plateau can ramp up as cleanup efforts in the River Corridor are completed, providing a stable funding profile for the site as a whole. To achieve timely implementation of this strategy, DOE is seeking input from the Tribal Nations, the public, and stakeholders. DOE will consider any input and revise the strategy as appropriate. In addition, DOE, EPA and Ecology will negotiate Tri-Party Agreement change packages based on the strategy in accordance with Tri-Party Agreement milestone M-15-40E that calls for development of milestones for completing M-15 work for the Central Plateau by December 2009. Following completion of those negotiations, the proposed TPA change packages will undergo public review.

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Appendix A

Scope of Central Plateau Decision Units

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This appendix defines the scope and path forward for each of the decision units in sufficient detail to enable planning and document development to proceed. The appendix contains the following:

- Table A-1, Central Plateau Decision Units – summary of decision unit scope and description with critical assumptions identified.
- Specific actions DOE will take to develop the decision unit documentation and reach final remedy decisions. Includes Table A-2 identifying the interim actions being taken in the Outer Area.

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Table A-1. Central Plateau Decision Units

Title	Scope	Geographic Description	Decision Document type	Lead regulatory agency	Notes	Tentative Schedule
Inner Area						
200-PW-1/3/6 and 200-CW-5	• Includes waste sites in the 200-PW-1/3/6 and 200-CW-5 operable units.	Includes waste sites in the 200 West Area near PFP and the 200 East Area near PUREX	CERCLA ROD	EPA	• Remedy selection in discussion between EPA and DOE. If agreement on remedy selection not reached in a timely manner, the Tri-Parties may forward the issue to dispute resolution or consolidate with the 200 West Inner Area decision unit. • Existing draft feasibility studies for the 200-PW-1/3/6 OU group and the 200-CW-5 OU will be finalized to support development of a consolidated proposed plan. The Proposed Plan and ROD will include a description of the context of this action within the overall Central Plateau strategy. • The Tri-Parties agreed to retain this decision unit separate from implementation of the new Inner Area cleanup completion strategy. Analysis will employ exposure scenarios for decision-making that were defined in 2006. • Other Central Plateau decisions will employ the new strategy and accompanying exposure scenarios, which recognize that the Inner Area will be permanently dedicated to waste management and containment the reasonably anticipated future use. • The Remedial Design/Remedial Action Work Plan for this scope will be included in the 200 West Inner Area work plan to be issued after the 200 West Inner Area ROD.	Proposed Plan developed by 2010
200 West Inner Area	• Includes Inner Area sites, including 200-UW-1, and 200 West Area portions of multiple operable units, (200-IS-1, 200-SW-2, 200-PW-2/4, 200-MG-1/2, 200-MW-1). • Includes REDOX and T Plant canyons. • Some sites that have deep vadose zone contamination and are near the tank farm WMAs will be included in the Balance of Inner Area decision unit.	Includes waste sites located in the 200 West Area.	CAD/ROD	Joint EPA and Ecology	• This remedial decision will document elements of the new Inner Area cleanup completion strategy, including exposure scenarios, cleanup levels, and institutional controls that are applied across the Inner Area. • As part of the development of this Proposed Plan, the Inner Area threshold alternative will be defined, which will serve as the basis from which balancing and modifying criteria can be applied to develop the final remedy. • Proposed Plan and ROD will include a mechanism for plug-in of discovery sites including waste sites remaining after structures are removed consistent with the proposed Facility Decommissioning Evaluation process. • DOE anticipates that the most likely remedy for burial grounds within 200 West and East Areas will be containment (capping using an engineered surface barrier with continued monitoring). Focused removal of some wastes may occur prior to placement of the cap if appropriate as a result of risk assessment outcomes (to meet CERCLA threshold criteria) or if CERCLA modifying criteria justify such an action. CERCLA policy and guidance recognizes that heterogeneous landfills are complex and that containment can be a protective and cost-effective remedy. DOE will work with Ecology and EPA to submit a revised Remedial Investigation Work Plan to focus characterization on what is needed to ensure cap performance. • Characterization previously agreed to for 200-UW-1 will be completed as part of the 200 West inner Area decision unit.	Proposed Plan developed by 2012

Table A-1. Central Plateau Decision Units

Title	Scope	Geographic Description	Decision Document type	Lead regulatory agency	Notes	Tentative Schedule
200 East Inner Area	• Includes Inner Area sites from multiple operable units, including 200 East Inner Area portions of 200-BC-1, 200-IS-1, 200-LW-1/2, 200-MG-1/2 , 200-SC-1 , and 200-MW-1. • Includes the PUREX and B Plant canyon facilities and the associated waste sites and facilities. • Some sites that have deep vadose zone contamination and are near the tank farm WMAs will be included in the Balance of Inner Area decision unit.	Includes waste sites located in the 200 East Area.	CAD/ROD	Joint EPA and Ecology	• Like 200 West Area Decision Unit, decisions for the 200 East Inner Area decision unit will be made by full implementation of the new Inner Area cleanup completion strategy and accompanying exposure scenarios, including waste sites remaining after structures are removed consistent with the proposed Facility Decommissioning Evaluation process. • Proposed Plan and ROD will include a mechanism for plug-in of discovery sites. • DOE anticipates that the most likely remedy for burial grounds within 200 West and East Areas will be containment (capping using an engineered surface barrier with continued monitoring). Focused removal of some wastes may occur prior to placement of the cap if appropriate as a result of risk assessment outcomes (to meet CERCLA threshold criteria) or if CERCLA modifying criteria justify such an action. CERCLA policy and guidance recognizes that heterogeneous landfills are complex and that containment can be a protective and cost-effective remedy. DOE will work with Ecology and EPA to submit a revised Remedial Investigation Work Plan to focus characterization on what is needed to ensure cap performance.	Proposed Plan developed in 2014.
Balance of Inner Area	• Includes sites from 200-TW-1/2 and 200-PW-5 operable units, many which have deep vadose zone contamination. • Includes contaminated environmental media underlying remaining tank farm waste management areas pending completion of ongoing milestone negotiations. • Includes sites with deep vadose zone contamination not captured in other decision units (no specific sites identified).	Includes sites around the tank farm WMAs in both 200 East and 200 West Area.	CAD/ROD	Joint EPA and Ecology	• As the decision unit for the balance of the Inner Area, this final CAD-ROD will make the final remedy decisions for sites not addressed in earlier decision documents, again consistent with the new Inner Area Strategy and accompanying exposure scenarios. • The Balance of Inner Area decision unit will include remedy selection for environmental media at WMA-C, WMA A-AX, WMA B-BX-BY, WMA S-SX, WMA T, WMA TX-TY, and WMA U. The first proposed plan and ROD in this decision unit will address the environmental media beneath WMA-C first. Additional proposed plans will be developed as needed and the ROD revised to incorporate environmental media for other WMAs.	Proposed Plan developed in 2017
Outer Area						
Central Plateau Outer Area	• Includes sites from multiple operable units located in the Outer Area, including 200-CW-1 (Outer Area Ponds), 200-CW-3, 200-UR-1 (West Lake and BC Control Area), and 200-MG-1. • Includes 216-B-3 Pond, 216-S-10P and 216-S-10D RCRA units, and 216-S-16	Outer Area covers approximately 65 square miles along the outside of the Central Plateau.	CERCLA ROD	EPA	• The final ROD will recognize DOE's commitment to RTD remedy elements for the Outer Area sites, with the accompanying disposal of the excavated materials within the Inner Area (i.e., ERDF). • Cleanup standards for the Outer Area will support unrestricted surface use, consistent with the adjacent River Corridor and the designated land use of conservation/mining. • Most characterization is complete. Observational approach will be used for RTD.	Proposed Plan developed by 2011
Groundwater Decision Units						
200 West Area Groundwater	• Includes 200-UP-1 groundwater operable unit	Groundwater underlying the 200 West Area and contaminant plumes from 200 West Area sources	Amendment to existing 200-ZP-1 ROD to incorporate remedy for 200-UP-1	EPA	• DOE expects to revise the 200-ZP-1 ROD using an Explanation of Significant Differences.	Proposed Plan developed by 2010
200 East Area Groundwater	• Includes 200-BP-5 and 200-PO-1 groundwater operable units.	Groundwater underlying the 200 East Area and contaminant plumes from 200 east Area sources	CERCLA ROD	Ecology	• Characterization will continue as currently scheduled. Separate RI reports to be developed. • FS will consolidate alternative evaluation for both OUs. • May be incorporated as a revision to the 200-ZP-1 ROD.	Proposed Plan developed by 2012

Decision unit actions

The following specific actions are required to develop the decision unit documentation and reach final remedy decisions.

200-PW-1/3/6 and 200-CW-5 Decision Unit

- DOE will finalize the current draft of the 200-PW-1/3/6 feasibility study and issue Revision 0 in 2010 in preparation for public comment on the proposed plan.
- DOE will revise the current draft of the 200-CW-5 feasibility study to incorporate an additional RTD alternative and issue Revision 0 in 2010 in preparation for public comment on the proposed plan.
- DOE and EPA will continue to discuss the alternatives and try to reach agreement on proposed remedies for the sites. DOE will develop a Proposed Plan for the sites based on the agreed upon proposed remedy. The Proposed Plan will include a description of the overall Central Plateau strategy and how the remedies proposed for the sites fit within the overall strategy. If DOE and EPA cannot reach agreement on the proposed remedies, then DOE will develop the proposed remedy based on the evaluation of potential remedies against the threshold and balancing criteria.
- DOE and EPA will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.
- DOE and EPA will consider the comments received during the public comment period and prepare a Record of Decision for the 200-PW-1/3/6/200-CW-5 sites.
- DOE will incorporate the selected remedy into the Remedial Design/Remedial Action Work Plan for the 200 West Inner Area when it is issued.

200 West Inner Area Decision Unit

Completion of 200 West Inner Area Decision Unit will require the following actions:

- DOE will prepare technical foundation documents (Inner Area Technical Basis Document, Baseline Risk Assessment, Inner Area Feasibility Study Framework Technical Basis Document, and Canyon Decision Technical Baseline Document) which collectively form the logical and consistent foundation for the development and evaluation of the base case threshold alternative and the range of alternatives for the Inner Area.

- DOE will prepare a RI Report that will evaluate the existing data specific to the waste sites within the scope of the 200 West Inner Area Decision Unit by 2012. The report will assess the data available through calendar year 2009 for the burial grounds (200-SW-2) in the context of anticipated selection of the capping remedy. The nature and extent of contamination and conceptual site models for the 200 West Area and for individual waste sites will be described.

- DOE will work with EPA and Ecology to revise the existing 200-SW-2 RI/FS Work Plan in accordance with the anticipated remedy.

- DOE will prepare a feasibility study and proposed plan for 200 West Inner Area Decision Unit by 2012 using overall Inner Area and site-specific data and the foundation documents for supporting analysis. The feasibility study will describe the decision principles, the decision logic, cleanup standards, the comprehensive inner area evaluation process, and the policy decisions that need to be made based on the comprehensive evaluation. The feasibility study will identify how RCRA/HWMA corrective action requirements will be satisfied by implementation of the remedies. The proposed plan

will summarize the technical cleanup principles and decision logic and will also include a reference case (preferred alternative) for the sites for which a specific remedy decision will be made.

- DOE, EPA, and Ecology will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.
- DOE, EPA, and Ecology will consider the comments received during the public comment period and prepare a finalCAD/ROD for the 200 West Inner Area Decision Unit. The CAD/ROD will document the final decision logic, cleanup standards, the use of the comprehensive evaluation as the framework for future decisions for the remaining parts of the Inner Area, the Inner Area master COCs, the Inner Area master ARARs, and specific remedy decisions on the sites as appropriate.
- DOE will prepare a Remedial Design/Remedial Action Work Plan and other implementing plans as described in Section 3.1.4 and develop specific geographic area work plans as needed to implement cleanup decisions.

200 East Inner Area Decision Unit

Completion of 200 East Inner Area Decision Unit will require the following actions:

- DOE will update the foundation documents if necessary to incorporate data or analyses that may be specific to the scope of the decision unit.
- DOE will prepare a RI Report that will evaluate the data specific to the waste sites within the scope of 200 East Inner Area Decision Unit by 2014. The nature and extent of contamination and conceptual site models for the Inner Area and for individual waste sites will be described.
- DOE will prepare a feasibility study and proposed plan for 200 East Inner Area Decision Unit by 2014 using overall Inner Area and site-specific data and the foundation documents for supporting analysis. The feasibility study will describe the decision principles, the decision logic, cleanup standards, the comprehensive Inner Area evaluation process, and the policy decisions that need to be made based on the comprehensive evaluation. The feasibility study will identify how RCRA/HWMA corrective action requirements will be satisfied by implementation of the remedies. The proposed plan will summarize the principles and decision logic and will also include a reference case (preferred alternative) for the sites for which a specific remedy decision will be made.
- DOE, EPA, and Ecology will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.
- DOE, EPA, and Ecology will consider the comments received during the public comment period and prepare a final CAD/ROD for the 200 East Inner Area sites.
- DOE will utilize the Remedial Design/Remedial Action Work Plan and other implementing plans as described in Section 3.1.4 and develop specific geographic area work plans as needed to implement cleanup decisions.

Balance of Inner Area Decision Unit

Completion of Balance of Inner Area Decision Unit will require the following actions:

- DOE will update the foundation documents if necessary to incorporate data or analyses that may be specific to the deep vadose zone sites.

- DOE will prepare a Remedial Investigation Report that will evaluate the data available for the WMA-C based on characterization reports to support a closure decision. The nature and extent of contamination and conceptual site models for the deep vadose zone and for individual waste sites will be described. The report will assess the data available for the remaining tank farms based on characterization reports to be developed. This RI Report will be supplemented by the Phase 1 RCRA Facility Investigation Report for Single-Shell Tank Farms (*RCRA Facility Investigation Report for Hanford Single-Shell Tank Waste Management Areas*, DOE/ORP-2008-01, Rev. 0, January 2008). Characterization of tank farm past releases is continuing in accordance with *RCRA Facility Investigation/Corrective Measures Study Work Plan for Waste Management Area C*, (RPP-PLAN-39114) and P*hase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas* (RPP-PLAN-37243, Rev. 0, September 2008) and results from these investigations will be included in the RI Report for the Balance of Inner Area Decision Unit.

- DOE will prepare a feasibility study and proposed plan for Balance of Inner Area Decision Unit by 2017 using overall Inner Area and site-specific data and the foundation documents for supporting analysis. The feasibility study will focus on environmental media underlying the WMA-C. The feasibility study will describe the decision principles, the decision logic, cleanup standards, the comprehensive inner area evaluation process, and the policy decisions that need to be made based on the comprehensive evaluation. The feasibility study will identify how RCRA/HWMA corrective action requirements will be satisfied by implementation of the remedies. The proposed plan will summarize the principles and decision logic and will also include a reference case (preferred alternative) for the sites for which a specific remedy decision will be made. Note that remedy selection for tank farm environmental media will require completion of the Tank Closure and Waste Management Environmental Impact Statement and issuance of a Record of Decision. DOE, EPA, and Ecology will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.

- DOE, EPA, and Ecology will consider the comments received during the public comment period and prepare a final CAD/ROD for the Balance of Inner Area sites.

- DOE will utilize the Remedial Design/Remedial Action Work Plan and other implementing plans as described in Section 3.1.4 and develop specific geographic area work plans as needed to implement cleanup decisions.

- As data is available, the feasibility study will be evaluated and revised if necessary to address environmental media underlying other WMAs. Additional PPs as needed will be developed to support revisions to the decision documents to cover other WMAs.

Outer Area Decision Unit

Cleanup in the Outer Area is being expedited using a series of interim actions described in Table A-2.

Table A-2. Interim Actions in the Outer Area of the Central Plateau

Site	Interim Action Documentation	Status of Interim Action
200-MG-1	DOE/RL-2008-44, Engineering Evaluation/Cost Analysis (EE/CA) for the 200-MG-1 Operable Unit Waste Sites	EE/CA issued in June 2009. Action Memorandum for 11 200-MG-1 sites approved. Second Action Memorandum for remaining 200-MG-1 sites has been drafted.
BC Control Area (BCCA)	DOE/RL-2007-51, Engineering Evaluation/Cost Analysis for the Northern Part of the BC Control Area (UPR-200-E-83) DOE/RL-2008-21, Action Memorandum for the Non-Time Critical Removal Action for the Northern Part of the BC Control Area (UPR-200-E-83) DOE/RL-2008-22, Removal Action Work Plan for the Northern Part of the BC Control Area (UPR-200-E-83) Located Within the 200-UR-1 Operable Unit	Field work for BCCA North ongoing in fall 2009. Initial characterization and hot-spot remediation for borrow area complete.
212-N/P/R	DOE/RL-2008-07, 212-N, -P, and –R Facilities Engineering Evaluation/Cost Analysis DOE/RL-2008-80, Action Memorandum for the Non Time Critical Removal Action for the 212N, -P, and -R Facilities DOE/RL-2009-11, 212-N, -P and -R Facilities Removal Action Work Plan	Demolition of 212-N, P, & R initiated in August 2009.
200 North Area sites	EPA, Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington, DOE/RL-2006-69, Remedial Design/Remedial Action Work Plan for Select 200 North Area Waste Sites (216-N-2, -3, -5, and -7) in the 200-CW-3 Operable Unit DOE/RL-2007-55, Remedial Design/Remedial Action Work Plan for 200 North Area Waste Sites Located in the 200-CW-3 Operable Unit	Interim actions under DOE/RL-2006-69 completed in 2008. Confirmatory sampling and analysis on remediating wastes sites underway in fall 2009.

Completion of the Outer Area Decision Unit will require the following actions:

- DOE will continue to prepare appropriate removal action decision and implementing documents as described in Table A-2.
- DOE will prepare a combined remedial investigation/feasibility study for the Outer Area by 2011.
- DOE will prepare an Outer Area Proposed Plan that documents the final remedies for Outer Area waste sites by 2011.
- DOE and EPA will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.

- DOE and EPA will consider the comments received during the public comment period and prepare a Record of Decision for the Outer Area.
- DOE will implement final remedial actions using a Remedial Design/Remedial Action Work Plan for Outer Area sites.

200 West Area Groundwater

Completion of 200 West Area Groundwater Decision Unit will require the following actions:

- DOE will complete data evaluation, modeling, and alternatives analysis and prepare a combined Remedial Investigation/ Feasibility Study by September 2010.
- DOE will prepare a Proposed Plan describing the preferred alternative by September 2010.
- DOE, EPA, and Ecology will seek public comment on the proposed remedy in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.
- DOE, EPA, and Ecology will consider the comments received during the public comment period and amend the 200-ZP-1 Final Groundwater ROD to select the 200-UP-1 final remedy.

200 East Area Groundwater

Completion of 200 East Area Groundwater Decision Unit will require the following actions:

- DOE will prepare two separate remedial investigation reports for 200-BP-5 and 200-PO-1 in 2010 to document the characterization work that has been completed.
- DOE will prepare a single Feasibility Study and Proposed Plan by December 2012.
- DOE, EPA, and Ecology will seek public comment on the proposed remedies in accordance with the processes prescribed in the Tri-Party Agreement Community Relations Plan.
- DOE, EPA, and Ecology will consider the comments received during the public comment period and prepare a Record of Decision for the combined 200-BP-5/200-PO-1 operable units. If the remedies are sufficiently similar, the 200-ZP-1 Final Groundwater ROD may be revised instead.