



# **Environmental Assessment for the Accelerated Tank Closure Demonstration Project**

---

Prepared by:  
U.S. Department of Energy  
Office of River Protection  
Richland, Washington



## CONTENTS

1.0	PURPOSE AND NEED FOR AGENCY ACTION .....	1
1.1	BACKGROUND .....	1
1.1.1	Cleanup Strategy .....	2
1.1.2	Previous Evaluations of Tank Retrieval and Closure Activities .....	2
1.2	TANK SELECTION .....	3
1.3	BASIS FOR CONDUCTING THE ATCD PROJECT .....	3
1.4	TANK CLOSURE EIS .....	5
2.0	DESCRIPTION OF THE PROPOSED ACTION .....	7
2.1	MOBILIZATION AND STAGING OF EQUIPMENT .....	7
2.2	SITE PREPARATION .....	7
2.3	TANK PREPARATION .....	7
2.4	TANK WASTE RETRIEVAL .....	7
2.5	RESIDUAL WASTE STABILIZATION .....	9
2.6	TANK AIR FILTRATION SYSTEM .....	10
2.7	DECONTAMINATION AND DISPOSAL OF EQUIPMENT .....	10
2.8	STAGING AREA CLEANUP AND DEMOBILIZATION .....	10
2.9	TANK ISOLATION .....	10
2.10	POSTCLOSURE SURVEILLANCE AND MONITORING .....	10
2.11	RESEARCH, DEVELOPMENT, DEMONSTRATION, AND TESTING UNDER NEPA .....	11
3.0	ALTERNATIVES TO THE PROPOSED ACTION .....	13
3.1	NO ACTION ALTERNATIVE .....	13
3.2	ALTERNATIVES TO THE PROPOSED ACTION .....	13
4.0	AFFECTED ENVIRONMENT .....	15
4.1	GEOLOGY AND SOILS .....	15
4.2	SURFACE WATER RESOURCES .....	15
4.3	GROUNDWATER RESOURCES .....	15
4.4	AIR RESOURCES .....	16
4.5	BIOLOGICAL RESOURCES .....	16
4.5.1	Threatened and Endangered Species .....	16
4.6	LAND USE .....	17
4.7	TRANSPORTATION .....	18
4.8	SOCIOECONOMICS .....	18
4.8.1	Utilities .....	18
4.8.2	Environmental Justice .....	19
4.9	HUMAN HEALTH AND SAFETY .....	19
4.9.1	Occupational Accident Risk .....	19
4.9.2	Routine Radiological Exposure Risk .....	19

4.10	CULTURAL RESOURCES .....	20
4.11	VISUAL RESOURCES AND NOISE .....	20
5.0	ENVIRONMENTAL IMPACTS.....	23
5.1	GEOLOGY AND SOILS .....	23
5.2	SURFACE WATER .....	23
5.3	GROUNDWATER .....	23
5.4	AIR.....	23
5.5	BIOLOGICAL RESOURCES .....	24
5.6	LAND USE.....	24
5.7	TRANSPORTATION.....	24
5.8	SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE .....	24
	5.8.1 Utilities.....	25
5.9	HUMAN HEALTH AND SAFETY.....	25
	5.9.1 Occupational Accident Risk .....	25
	5.9.2 Radiological Accident Risk .....	26
	5.9.3 Routine Radiological Exposure Risk .....	26
5.10	CULTURAL RESOURCES .....	28
5.11	VISUAL RESOURCES AND NOISE .....	28
5.12	CUMULATIVE IMPACTS.....	29
6.0	PERMITS AND REGULATORY REQUIREMENTS .....	31
7.0	TRIBAL GOVERNMENTS AND AGENCIES CONSULTED.....	33
8.0	REFERENCES .....	35
APPENDIX A COMMENTS AND RESPONSES ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE ACCELERATED TANK DEMONSTRATION PROJECT.....		A-1
APPENDIX B BLANKET BIOLOGICAL REVIEW FOR THE TANK FARM FACILITIES.....		B-1
APPENDIX C EXECUTIVE SUMMARY TANK ALTERNATIVE CLOSURE DEMONSTRATION PROJECT, ALTERNATIVE GENERATION & ANALYSIS.....		C-1

**FIGURE**

Figure 2-1.	Location Map of WMA C and Surrounding Facility.....	8
-------------	---	---

**TABLES**

Table 4-1.	Federal- or Washington State-Listed Threatened (T), Endangered (E), Candidate (C) and Species of Concern (SC) Occurring on the Hanford Site.....	17
------------	--	----

Table 5-1.	Worker Risk From Occupational Accidents .....	26
Table 5-2.	Preliminary Hazard Analysis .....	27
Table 5-3.	LCF Risk From Routine Radiological Exposure .....	28
Table 6-1.	Regulations and Requirements .....	32

This page intentionally left blank.

## LIST OF TERMS

AEA	<i>Atomic Energy Act of 1954</i>
ATCD	Accelerated Tank Closure Demonstration
C-106	tank 241-C-106
C tank farm	241-C tank farm
C3T	Cleanup, Constraints, and Challenges Team
CAA	Clean Air Act
CEQ	Council On Environmental Quality
CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
DST	double-shell tank
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
HFFACO	<i>Hanford Federal Facility Agreement and Consent Order</i> (also known as the Tri-Party Agreement)
LCF	latent cancer fatality
MEI	maximum exposed individual
NEPA	<i>National Environmental Policy Act of 1969</i>
ORP	Office of River Protection
PNNL	Pacific Northwest National Laboratory
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
ROD	Record of Decision
SST	single-shell tank
TSD	treatment, storage and disposal
TWRS	Tank Waste Remediation System
WAC	<i>Washington Administrative Code</i>
WMA	waste management area

This page intentionally left blank.



## 1.0 PURPOSE AND NEED FOR AGENCY ACTION

The U.S. Department of Energy's (DOE) Office of River Protection (ORP) needs to collect engineering and technical information on 1) the physical response and behavior of a Phase I grout fill in an actual tank, 2) field deployment of grout production equipment and 3) the conduct of component closure activities for single-shell tank (SST) 241-C-106 (C-106). Activities associated with this Accelerated Tank Closure Demonstration (ATCD) project include placement of grout in C-106 following retrieval, and associated component closure activities. The activities will provide information that will be used in determining future closure actions for the remaining SSTs and tank farms at the Hanford Site. This information may also support preparation of the Environmental Impact Statement (EIS) for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, Washington (Tank Closure EIS). Information will be obtained from the various activities associated with the component closure activities for C-106 located in the 241-C tank farm (C tank farm) under the *Resource Conservation and Recovery Act of 1976* (RCRA) and the Hanford Federal Facility Agreement and Consent Order (HFFACO) (Ecology et al. 1989). The impacts of retrieving waste from C-106 are bounded by the analysis in the Tank Waste Remediation System (TWRS) EIS (DOE/EIS-0189), hereinafter referred to as the TWRS EIS. DOE has conducted and continues to conduct retrieval activities at C-106 in preparation for the ATCD Project.

For major federal actions significantly affecting the quality of the human environment, the *National Environmental Policy Act of 1969* (NEPA) requires that federal agencies evaluate the environmental effects of their proposed and alternative actions before making decisions to take action. The President's Council on Environmental Quality (CEQ) has developed regulations for implementing NEPA. These regulations are found in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508. They require the preparation of an Environmental Assessment (EA) that includes an evaluation of alternative means of addressing the problem and a discussion of the potential environmental impacts of a proposed federal action. An EA provides analysis to determine whether an EIS or a finding of no significant impact should be prepared.

### 1.1 BACKGROUND

In 1997, DOE issued the Record of Decision (ROD) for the TWRS EIS (62 FR 8693), hereinafter referred to as the TWRS ROD. In the TWRS ROD, DOE selected the Phased Implementation alternative as the preferred alternative for the management and disposal of mixed, radioactive, and hazardous tank waste stored at Hanford.

The TWRS EIS and the Site-Wide RCRA Permit (WA7890008967) identified three closure alternatives for the tank farms: clean closure, modified clean closure, and landfill closure. The TWRS EIS did not analyze alternatives for closure nor did the TWRS ROD make closure decisions. Closure as a landfill was chosen as the representative closure method to provide a single and consistent method for comparison of the TWRS EIS waste treatment and disposal alternatives. A description of landfill tank closure is presented in the TWRS EIS, Appendix B, Section 5.0, and supporting data are found in the Closure Technical Data Package for the Tank Waste Remediation System Environmental Impact Statement (WHC-SD-WM-EV-107).

The TWRS ROD concluded that insufficient information existed to make a decision on the approach for final closure of the SST farms. In the TWRS ROD, DOE committed to preparing appropriate additional NEPA documentation before making decisions on final closure of the tank farms. The Tank Closure EIS will address the final closure of the tanks, associated equipment, and soils.

The Washington State Department of Ecology (Ecology) regulates the SSTs as treatment, storage, and disposal (TSD) units. The entire SST system will be closed in accordance with provisions of “Dangerous Waste Regulations,” Washington Administrative Code (WAC) 173-303, the HFFACO, and the Site-Wide RCRA permit, as modified. Under DOE Order 435.1, DOE approval also is required for classifying residual waste remaining in C-106 after retrieval and for approval of disposal of the residual waste as low-level waste as part of a tank farm closure action.

### **1.1.1 Cleanup Strategy**

DOE has developed a cleanup strategy that is designed to reduce risk while protecting the health and safety of workers, the public, and the environment (DOE/RL-2002-47). The strategy draws upon recommendations in the Environmental Management Top-to-Bottom Review (DOE 2002) and ideas developed in the Hanford Cleanup, Constraints, and Challenges Team (C3T) process. The goal of the strategy is to integrate the planning and program goals and objectives of the environmental cleanup mission with the objectives and commitments of the HFFACO, and contractor requirements.

A C3T team was established to develop an initiative to accelerate tank waste retrieval, treatment, and closure of the tank farms with the objective of more rapidly reducing long-term health and environmental risks. The C3T process for accelerated tank closure has contributed to the development of the ATCD Project. The ATCD Project will help identify the technical and regulatory framework under which tank closures are conducted. DOE and Ecology recognize that this initial demonstration does not constitute final closure.

The ATCD Project will accomplish component closure actions for C-106 located in C tank farm in the 200 East Area of the Hanford Site. The ATCD will address the first phase of closure of the tank only, and not the surrounding soils or ancillary equipment. Waste will be retrieved from the tank in accordance with the HFFACO Milestone M-45-00, which may be found at [www.hanford.gov/tpa/tpahome.htm](http://www.hanford.gov/tpa/tpahome.htm). The retrieved waste will be stored in double-shell tanks (DSTs) at the Hanford Site for future treatment and disposal. Any residual waste remaining in the tank will be stabilized. The tank will be monitored post closure.

### **1.1.2 Previous Evaluations of Tank Retrieval and Closure Activities**

An analysis of alternatives for the management and disposal of mixed, radioactive, and hazardous tank waste currently stored at Hanford was conducted in the TWRS EIS (DOE/EIS-0189). That analysis included the evaluation of impacts associated with tank waste retrieval and the treatment and disposal of retrieved tank waste. Several retrieval technologies were identified that could be used including hydraulic sluicing (past practice sluicing), a robotic arm using sluicing liquids (including alkali and acid solutions instead of water [DOE/EIS-0189, Appendix

B, Section B.9.2]), mechanical retrieval, robotic crawler, and pneumatic retrieval. From among these technologies, DOE selected hydraulic sluicing and robotic arm-based retrieval for detailed analysis in the TWRS EIS. However, as indicated in the TWRS EIS, the other retrieval technologies could “be used to retrieve tank waste during any of the ex situ alternatives.” The *Supplement Analysis for the Tank Waste Remediation System* (DOE/EIS-0189-SA3) determined that program changes including the use of alternative retrieval technologies (e.g., a crawler based system) for retrieving waste did not require further analysis. The impacts of tank waste retrieval options are not evaluated in this EA because the retrieval actions are bounded by the TWRS EIS and are not part of the ATCD Project. Tank fill alternatives for the ATCD Project were evaluated in *Tank Alternative Closure Demonstration Project Alternative Generation and Analysis* (RPP-12194). A summary of this report can be found in Appendix C. A preliminary engineering study on closure of C-106 also was conducted to develop cost estimates for tank closure actions (RPP-12331).

## 1.2 TANK SELECTION

DOE completed preliminary screening of potential closure demonstration tanks in December 2001. The tanks considered included some currently scheduled for retrieval technology demonstrations (C-104, S-112, and S-102), C-106 (partially retrieved by hydraulic sluicing), or other tanks in AX, B, C, S, T, or U farms with low residual waste volumes. Low-volume tanks were considered candidates because of the limited space in DSTs in which retrieved waste would be stored until the Waste Treatment Plant begins operation.

As part of the C3T initiative, a tank selection process for the ATCD Project was undertaken in 2002. The C3T team developed a specific set of criteria for selecting candidate tanks that could be moved into an accelerated closure demonstration project. The primary tank selection criteria included: accelerated risk reduction, chance for success, ease of implementation, data availability, and implementation cost and schedule.

Based upon these criteria the C, S, and AX tank farms were identified as having tanks that could be closed under the ATCD Project. The tank selection criteria in the *Approach for the Accelerated Tank Closure Demonstration Project* (RPP-11085) identified C-106 and the C tank farm 200-series tanks as candidates for possible closure demonstrations. The objective of the ATCD Project is component closure actions for C-106 only.

## 1.3 BASIS FOR CONDUCTING THE ATCD PROJECT

DOE selected the Phased Implementation alternative in the TWRS EIS for management and treatment of mixed and radioactive tank waste in part because it afforded the ability to conduct demonstrations of various aspects of the TWRS program during Phase I. The TWRS ROD identified actions associated with the demonstration portion of the selected alternative. These actions included:

*During the demonstration phase DOE will obtain data on SST residual characteristics, retrieval technologies, tank residual removal technologies and tank closure technologies. DOE will also further investigate technologies that have the potential to reduce uncertainties including evaluating alternative tank fill material for use during closure, demonstrating the*

*effectiveness and efficiency of waste retrieval with sluicing technology and evaluating a variety of other technologies through DOE complex-wide technology development programs.*

The ATCD Project is expected to answer specific technical questions, including but not limited to, the following:

- How will the regulatory pathways for developing future Site-Wide RCRA permit modifications for tanks, tank farms, and tank systems closure be structured?
- How will the project develop, refine and display risk evaluation tools for component closure?
- What methods will be used to gather ATCD Project data in support of the development of a Tank Closure EIS?
- How may the tank waste be effectively characterized for radioactive and chemical constituents to meet regulatory/closure requirements?
- How should the Phase I tank fill grout be formulated, prepared, and placed to stabilize residual waste?

Information expected to be obtained and benefits derived from the ATCD Project would include the following:

- Collection and analysis of data needed to support decisions about closure of the remaining tanks and eventual closure of tank farms
- Reduction of the risk currently resulting from C-106 to workers, the public, and the environment
- Achievement of closure-related life-cycle cost savings
- Development and demonstration of closure criteria and component closure
- Demonstration of the tools (both technical and regulatory) for the closure process (e.g., internal tank residual measurement and characterization technologies, risk assessments, cost-benefit analyses, application of the HFFACO Appendix H process, and permitting process).

Technical and regulatory data obtained will contribute to an understanding of how to place grout in tanks, how to effectively manage the deployment of grout production equipment and identifying the resources that will be necessary for closure as well as the durations involved. During the planning and laboratory testing of grout formulations, information will also be obtained that will contribute to the evaluations in the Tank Closure EIS and to the subsequent decisions DOE will make concerning closure of tank farms and tank farm systems. This information will be developed to support the Tank Closure EIS and Record of Decision and will provide DOE critical information that is based on actual experience with the technical and regulatory issues that will affect tank farm closure.

## 1.4 TANK CLOSURE EIS

The draft EA for the ATCD Project was released in December of 2002 for public comment. In January 2003 DOE issued a Notice of Intent to prepare an Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-shell Tanks at the Hanford Site, Richland, Washington (68 FR 03318). The proposed action to be evaluated along with alternatives is to remove waste from tanks, to the extent retrieval is technically and economically feasible, treat the waste through vitrification in the planned Waste Treatment Plant and/or one of several other treatment processes such as bulk vitrification, grout, steam reforming and sulfate removal, depending on waste type and waste characteristics. DOE proposes to package the waste for off-site shipment and disposal or onsite disposal. The tanks would be filled with materials to immobilize the residual waste and prevent long-term degradation of the tanks and discourage intruder access. DOE has developed several data packages that provide a range of technical information that will be used to support the evaluations to be conducted during the preparation of the EIS.

Elements being evaluated in the EIS as part of some alternatives are the options for conducting either landfill closure or a clean closure of Hanford tanks. Landfill closure would involve placement of grout layers in the tanks following retrieval while clean closure could involve the excavation of tanks and removing them along with surrounding soil. This demonstration project is consistent with the landfill option but would also permit clean closure if that were the selected option. If clean closure were selected as the preferred option in the Tank Closure ROD then the Phase I fill would enhance worker protection by stabilizing and shielding any residual waste in the bottom of the tank. This stabilization and shielding would mitigate potential releases during the excavation of the tank. This demonstration project does not undertake any actions that would affect DOE's ability to select either closure option in the future.

This ATCD Project is an interim action during preparation of the Tank Closure EIS. Information that is being developed in the planning and laboratory testing portions of the ATCD prior to field demonstration work will be available and may be used in the evaluations conducted in the preparation of the EIS.

This page intentionally left blank.

## **2.0 DESCRIPTION OF THE PROPOSED ACTION**

The following subsections describe the basic elements of preparing for and conducting the ATCD Project. Major elements of the project are summarized in Section 1.1.1. Figure 2-1 illustrates the layout of the C tank farm and the location of tank C-106.

The ATCD Project has been developed to demonstrate regulatory and technical aspects of component closure actions in such a way that would not eliminate future closure decision options. The ATCD Project is consistent with the intent of 40 CFR 1502.4(c)(3) and 10 CFR 1021.212 concerning research, development, demonstration, and testing projects.

### **2.1 MOBILIZATION AND STAGING OF EQUIPMENT**

A staging area for the ATCD Project would be established near the northeast corner of C tank farm in a previously disturbed area. Equipment for materials storage, and delivery of engineered fill materials would be trucked to the site and set up in a designated fenced area of 4,000 m<sup>2</sup> (one acre) or less. Trailers for contractor personnel also would be provided. Fill material produced offsite would be trucked in to the C tank farm. All contractor equipment and facilities would be located in this disturbed area.

### **2.2 SITE PREPARATION**

The staging area would require limited preparation because of the relatively level topography in the 200 East Area around C tank farm. Fencing would be provided around the contractor facilities. Water and power would be provided from existing onsite sources, and temporary connections would be made to these services.

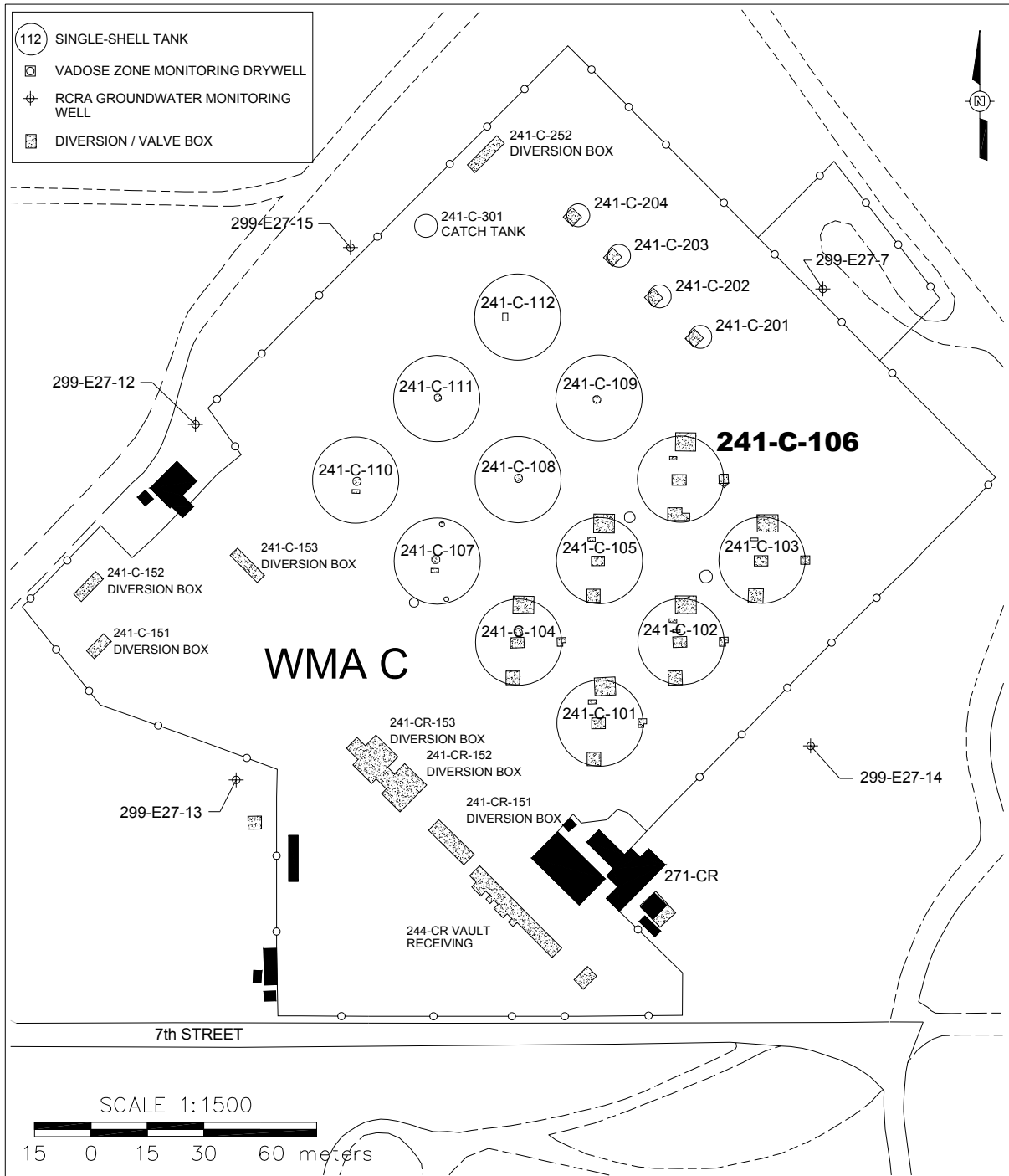
### **2.3 TANK PREPARATION**

The existing tank farm work force including health physics technicians, nuclear operators, crane and rigging personnel, and other trained personnel would provide support for the project. Tank farm work forces would be used to pull cover blocks and gain tank access through the existing risers. Some internal tank equipment placed in risers would be removed and placed in burial boxes for disposal in an approved onsite solid waste disposal facility. No new penetrations or modifications of existing penetrations into the top of the tank are required. Technologies used in tank preparation operations would involve bulk material handling, video camera support, and remote testing and monitoring (e.g., heat generation measurement).

### **2.4 TANK WASTE RETRIEVAL**

Retrieval will follow the HFFACO processes and requirements. The impacts of waste retrieval options, which could include the use of an acid wash, are not evaluated in this EA because retrieval actions were previously evaluated in the TWRS EIS and DOE/EIS-0189-SA3.

Figure 2-1. Location Map of WMA C and Surrounding Facility





## 2.5 RESIDUAL WASTE STABILIZATION

It is estimated that between 30 and 90 cm (12 to 36 in.) of high-strength grout (~126 to 380 m<sup>3</sup> or ~160 to ~500 yd<sup>3</sup>) would be placed in C-106 as part of the Phase I fill demonstration. This volume assumes that the Phase I fill volume required for waste heel stabilization is a minimum of 30.5 cm (12 in.) deep in a flat-bottomed tank. To evaluate the grout behavior around in-tank equipment during placement, additional grout will be placed in C-106. The actual volume of fill may vary depending on the height of the waste heel and the height of equipment present. Phase II tank fill would involve placement of material that would fill the majority of the void space in the tank and provide structural support to the tank. Phase III fill would be a very high strength material that would fill the remaining tank volume. Prior to the placement of any fill material in C-106, DOE has committed to review the success of the tank waste retrieval efforts with Ecology. Placement of the Phase I grout would not commence until Ecology and DOE have concurred that retrieval goals had been satisfied.

The ATCD Project can provide more applicable information that will be consistent with the alternatives being evaluated in the Tank Closure EIS if a specially formulated grout is placed as a Phase I fill material. The Tank Closure EIS will evaluate landfill and clean closure alternatives of the single-shell tank farm systems. The basic landfill closure alternative consists of adding grout in layers into retrieved tanks. Phase I grout addition will be composed of a free-flowing grout with possible addition of sequestering agents (getters) for one or more contaminants of concern (CoCs). The Phase II layer will provide structural stability and fill the majority of the tank volume. The Phase III fill will be a high compressive strength grout that could add a benefit of protection to an inadvertent intruder by providing an obvious layer that would resist drilling activities to the extent that the inadvertent driller would likely move away from the tank area.

Savannah River Technology Center (SRTC) is working on the tank fill formulation and placement that will be incorporated into a vendor specification. (WSRC-RP-2003-00341) The SRTC development program will recommend a grout formula based on variables such as compressive strength, flow, gel time, set time, bleed water, air content, hydraulic conductivity, porosity and the applicability of incorporating sequestering agents. In addition, testing of various grout/sequestering agent formulas for waste components, such as Tc-99, is planned to provide additional immobilization of wastes, if determined to be necessary in the future for other tanks. This latter testing, being conducted at Sandia National Laboratories, will be conducted in the laboratory and is not a part of the C-106 in-tank demonstration project (SNL, 2003).

Tank fill operations would be monitored with in-tank remote video cameras to ensure placement in accordance with construction requirements and specifications. A video inspection would be performed to document and assess the residual waste volume remaining in the tank for closure. Other methods (e.g., topographical mapping systems) may be used to demonstrate and/or reduce uncertainty with residual waste volume estimates.

As previously noted, the ATCD Project will provide information to evaluate component closure methods as part of preliminary engineering or final design activities. Approved methods will be stated within the closure plans that are currently being negotiated with Ecology. Adaptation of these requirements will undergo further stakeholder and public reviews as part of planned

modifications to the Hanford sitewide RCRA permit. Placement of fill material to the tank dome to stabilize the tank structure and enhance long-term performance may be done at a later date, pending the outcome of the Tank Closure EIS.

## **2.6 TANK AIR FILTRATION SYSTEM**

The ATCD Project would not generate any substantial increase in air emissions. A portable air filtration system would be used to control any toxic or radioactive air emissions from C-106 during the period it is open for waste stabilization activities as required by regulations or permits.

## **2.7 DECONTAMINATION AND DISPOSAL OF EQUIPMENT**

Contaminated equipment removed from the tank would be disposed as solid waste in an approved onsite facility. Fill equipment removed from the tank may be cleaned using water, and decontamination water would be collected and disposed using permitted wastewater treatment systems.

## **2.8 STAGING AREA CLEANUP AND DEMOBILIZATION**

Upon completing the ATCD Project, the contractor would dismantle and move equipment offsite and the site would be returned to pre-construction conditions.

## **2.9 TANK ISOLATION**

The current approach for isolating tanks from water intrusion or inadvertent waste transfer would be employed following component closure activities. This includes sealing off drain lines to tanks or tank risers and waste transfer lines entering above-tank pits. It also includes spraying a foam coating over above-tank pits to eliminate rainwater intrusion. This method of tank isolation would be maintained until final tank farm closure.

## **2.10 POSTCLOSURE SURVEILLANCE AND MONITORING**

This section describes activities DOE will undertake to provide care for C-106 between the time DOE completes component closure activities and the time DOE closes Waste Management Area (WMA) for the C tank farm (WMA C). While conducting closure actions under HFFACO schedules of compliance and permit requirements, the tank systems must continue to comply with interim status technical standards.

DOE will maintain control over WMA C for the foreseeable future. Roadways to the unit and site access will remain administratively restricted to use by authorized personnel only. Posted warning signs restrict access from the Columbia River. A chain-link fence surrounds WMA C. The 200 Areas are under 24-hour security surveillance. DOE will inspect security systems and controls on a routine basis.

The current vadose zone and groundwater monitoring programs will continue after component closure actions. Current restrictions ensuring that groundwater is not used as a drinking water source in the 200 Areas will continue after component closure actions.

Isolation of C-106 from water intrusion will be continued pending WMA C closure. Isolation techniques include sealing surface risers and tank pits with bolted or welded flanges for risers and spray foam coating for pits.

Activities following component closure actions will include inspection and maintenance of institutional controls, tank C-106 and its ancillary equipment, and the groundwater monitoring system.

## **2.11 RESEARCH, DEVELOPMENT, DEMONSTRATION, AND TESTING UNDER NEPA**

10 CFR 1021.212 (b) states, “For any proposed program described in paragraph (a) of this section, DOE shall begin its NEPA review (if otherwise required by this part) as soon as environmental effects can be meaningfully evaluated, and before DOE has reached the level of investment or commitment likely to determine subsequent development or restrict later alternatives, as discussed at 40 CFR 1502.4 (c)(3).”

DOE, in conducting the ATCD Project, does not undertake an action that determines subsequent development or restricts alternatives for tank closure. DOE retains the capability to conduct either a landfill closure or clean closure of C-106.

This page intentionally left blank.

### **3.0 ALTERNATIVES TO THE PROPOSED ACTION**

This section describes alternatives to the proposed action including the No Action alternative.

#### **3.1 NO ACTION ALTERNATIVE**

Under the No Action alternative, DOE would not conduct tank closure demonstrations. The existing tank farm operation and management procedures would be maintained. This alternative would be consistent with continuing to implement the Phased Implementation alternative as selected in the TWRS EIS ROD (62 FR 8693).

#### **3.2 ALTERNATIVES TO THE PROPOSED ACTION**

NEPA requires the consideration of reasonable alternatives. An alternative also must meet the purpose and need of the demonstration. The ATCD Project is part of a continuing program that involves research, development, and testing of the closure of tanks. The conduct of demonstration projects by DOE was set forth in the TWRS EIS ROD with the objective of obtaining additional information that would contribute to future decisions on the closure of tank farms. C-106 has been the subject of previous demonstrations concerning retrieval and sampling and analysis. The next step in this process for C-106 is the demonstration of component closure.

Alternatives to the proposed project include using a different tank or increasing the number of tanks that would be used in the demonstration and/or using alternative fill materials. Alternative fill materials would have to be able to meet the characteristic test requirements of a flowable high strength grout.

This page intentionally left blank.

## **4.0 AFFECTED ENVIRONMENT**

The environment of the Hanford Site has been described in several environmental reports, EISs, and EAs. The affected environment has been summarized from PNNL-6415, unless otherwise noted. The ATCD Project would be conducted in the 200 East Area of the Hanford Site.

### **4.1 GEOLOGY AND SOILS**

The Hanford Site is underlain by basalt flows. Sedimentary layers referred to as the suprabasalt sediments lie on top of the basalt flows. A relatively thin layer of silt, sand, and gravel is found on the surface across much of the site. Soil in the 200 Areas consists of sand, loamy sand, and sandy-loam soil types. The Hanford Site is in an area of low seismic activity compared to other portions of the Pacific Northwest. The production of grout for this demonstration would not require material from any onsite borrow sites.

### **4.2 SURFACE WATER RESOURCES**

There are no naturally occurring water bodies (including wetlands) or designated floodplains near C tank farm. The Hanford Site and the surrounding communities draw all or most of their water from the Columbia River, which is about 9.0 km (5.6 mi) from the ATCD Project site.

### **4.3 GROUNDWATER RESOURCES**

The Hanford Site groundwater resource includes the vadose zone and the underlying water table. There is substantial cesium-137 and cobalt-60 contamination in the vadose zone below tank C-106 (MACTEC, 2003). Other vadose zone contaminant plumes noted below the C tank farm (possible below C-106) include tritium, strontium-90, uranium, technetium-99, iodine-129, plutonium-239, and-240, arsenic, chromium, cyanide and nitrate (DOE/RL-92-19).

The Hanford Site groundwater resource includes the vadose zone and the underlying saturated water table. Unconsolidated glacial-fluvial sands and gravel of the Hanford formation make up most of the vadose zone material. The regional groundwater contaminant plume (tritium, iodine-129, technetium-99, and nitrate) has sources within the 200 East Area. Smaller groundwater plumes originating from the 200 East Area include uranium, strontium-90, antimony, cadmium, thallium and pentachlorophenol (PNNL-14187). Groundwater monitoring data from the WMA C indicated that nitrate levels are increasing but do not exceed the drinking water standard (45 milligrams per liter (mg/l), technetium-99 exceeds the drinking water standard (900 pCi/l) and levels continue to increase, and cyanide is present at low concentrations (<0.00018 mg/l) (PNNL-14187).

The sources of this vadose zone and groundwater contamination are most likely the result of surface spills and leaks in nearby subsurface pipelines. Historical leaks from C-106 cannot be ruled out as a potential source, but comparisons between 1993 and 1997 data indicate that C-106 did not leak. Tank C-106 has not been interim stabilized and is currently considered sound (MACTEC, 2003).

#### 4.4 AIR RESOURCES

The *Clean Air Act* (CAA), as amended, requires that the U.S. Environmental Protection Agency (EPA) develop a national air operating permit program, including provisions for state programs to be authorized by EPA to issue permits for major sources of regulated pollutants. In 1994, the EPA approved the Washington State Air Operating Permit Regulation, promulgated as “Operating Permit Regulation” (WAC 173-401). This program, administered by the Washington State Department of Health, includes the regulation of federal facilities to the extent provided for in Section 118 of the CAA, 42 USC § 7418, including the DOE Site-Wide air-operating permit for the Hanford Site. Air quality at the Hanford Site is generally good with an occasional exception due to blowing dust or brush fires.

#### 4.5 BIOLOGICAL RESOURCES

The Hanford Site is one of the largest shrub-steppe vegetation areas remaining in Washington State, and nearly half of the site’s 1,520-km<sup>2</sup> (586-mi<sup>2</sup>) area is designated as ecological study areas or refuges. Shrub-steppe areas are considered priority habitat by Washington State because of their relative scarcity and their importance to wildlife species. The undisturbed portions of the 200 Areas consist mostly of shrub-steppe habitat. The dominant plants on the Central Plateau are big sagebrush, rabbitbrush, cheatgrass, and Sandburg’s bluegrass. Cheatgrass provides half of the total plant cover.

Most of the waste disposal and tank farm sites are covered by non-native vegetation (e.g., crested or Siberian wheatgrass). These species stabilize surface soil, control soil moisture, or displace invasive deep-rooted species. Waste disposal and tank farm sites are kept in a vegetation-free condition with the use of herbicides (PNNL-6415). The ATCD Project would affect about 4,000 m<sup>2</sup> (1 acre) of land along the northeast corner of the C tank farm. The ATCD staging area is a graded, graveled area that does not currently support native vegetation or wildlife species.

A biological survey of the 200 East and West areas was conducted in May 2003. A letter report of the findings of this survey is presented in Appendix B.

##### 4.5.1 Threatened and Endangered Species

Threatened and endangered plants and animals identified on the Hanford Site, as listed by the federal government (“Endangered and Threatened Wildlife and Plants,” 50 CFR 17) and Washington State (Washington Natural Heritage Program 2002), are presented in Table 4-1. While these species are known to occur on the Hanford Site, they have not been reported in the vicinity of the C tank farm or on the land the ATCD Project would use for staging component closure activities.



**Table 4-1. Federal- or Washington State-Listed Threatened (T), Endangered (E), Candidate (C) and Species of Concern (SC) Occurring on the Hanford Site**

Common Name	Scientific Name	Federal <sup>(a)</sup>	State <sup>(b)</sup>
<b>Plants</b>			
Columbia milkvetch	<i>Astragalus columbianus</i>		T
Dwarf evening primrose	<i>Camissonia pygmaea</i>		T
Hoover's desert parsley	<i>Lomatium tuberosum</i>		T
Loeflingia	<i>Loeflingia squarrosa</i>		T
Persistent sepal yellowcress	<i>Rorippa columbiae</i>		T
Umtanum desert buckwheat	<i>Eriogonum codium</i>	C	E
White Bluffs bladderpod	<i>Lesquerella tuplashensis</i>	C	E
White eatonella	<i>Eatonella nivea</i>		T
<b>Fish</b>			
Spring-run chinook	<i>Oncorhynchus tshawytscha</i>	E	C
Steelhead	<i>Oncorhynchus mykiss</i>	E	C
Bull Trout	<i>Salvelinus confluentus</i>		SC
<b>Birds</b>			
American white pelican	<i>Pelecanus erythrorhychos</i>		E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T
Ferruginous hawk	<i>Buteo regalis</i>		T
Sandhill crane	<i>Grus canadensis</i>		E
Greater sage grouse	<i>Centrocercus urophasianus phaios</i>	C	T
Vaux's Swift	<i>Chaetura vauxi</i>		SC
Lewis Woodpecker	<i>Melanerpes lewis</i>		SC
Willow Flycatcher	<i>Empidonax traillii</i>		SC
Olive-sided Flycatcher	<i>Contopus cooperi</i>		SC
Common Loon	<i>Gavia immer</i>		SC
Northern Goshawk	<i>Accipiter gentilis</i>		SC
Burrowing Owl	<i>Athene cunicularia</i>		SC
Loggerhead Shrike	<i>Lanius ludovicianus</i>		SC
<b>Animals</b>			
Washington Ground Squirrel	<i>Spermophilus washington</i>		SC
Pygmy Rabbit	<i>Brachylagus idahoensis</i>		SC
Sagebrush Lizard	<i>Sceloporus graciosus</i>		SC

<sup>(a)</sup> 50 CFR 17 ([www.fws.gov](http://www.fws.gov)).<sup>(b)</sup> Washington Natural Heritage Program 2002 ([www.wa.gov/dnr/htdocs/fr/nhp/wanhp.html](http://www.wa.gov/dnr/htdocs/fr/nhp/wanhp.html))

Source: PNNL-6415, 2002

## 4.6 LAND USE

The ATCD Project would be consistent with current land use as defined by the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement* (DOE/EIS-0222F) and its associated Record of Decision (64 FR 61615). The Central Plateau (200 East and West Areas) was designated as an "industrial-exclusive" area capable of supporting waste treatment, storage, and/or disposal activities for hazardous, dangerous, radioactive, nonradioactive wastes and related activities.

Under the Farmland Protection Policy Act (7 USC 4201) the Natural Resource Conservation Service designates some areas as prime farmland. No lands in the ATCD Project area are designated as prime farmland (DOE/EIS-0222F).

#### **4.7 TRANSPORTATION**

The Tri-Cities serves as a regional transportation and distribution center with major air, land, and river connections. The majority of air passenger and freight services in the local area go through the Tri-Cities Airport located in Pasco, Washington. Both Richland and Kennewick have small airports serving general aviation. The ports of Benton, Kennewick, and Pasco use the commercial waterways of the Snake and Columbia Rivers to provide access to the deep-water ports of Portland, Oregon and Vancouver, Washington. Burlington Northern Santa Fe, Union Pacific, and Amtrak provide rail service to the Tri-Cities.

DOE maintains a paved two-lane road network within the Hanford Site that provides access to the various work centers. The primary access roads on the Site are Routes 2, 4, 10, and 11A. Primary access to the 200 Areas is by Route 4 South from Richland. Public access to the 200 Areas and interior locations of the Hanford Site has been restricted by manned gates at the Wye Barricade and the Yakima Barricade (at the intersection of State Route 240 and Route 11A).

#### **4.8 SOCIOECONOMICS**

The Hanford Site is the largest single source of employment in the Tri-Cities. During fiscal year (FY) 2000, ORP and its prime contractors (CH2M HILL Hanford Group, Inc. and Bechtel National, Inc.) and the DOE Richland Operations Office and its prime contractors (Fluor Hanford, Inc. and its principal subcontractors); Pacific Northwest National Laboratory (PNNL); Bechtel Hanford, Inc.; and the Hanford Environmental Health Foundation employed an average of 10,000 to 11,000 employees. The work force for the ATCD Project would average approximately 20 workers. This represents less than 1% of the total labor force at the Hanford Site.

##### **4.8.1 Utilities**

The ATCD Project would not require construction or development of new utility lines. Existing services have adequate capacity to meet the needs of the ATCD Project.

The following utilities are currently available at C tank farm:

- SST electrical power system – The electrical power capacity available to C tank farm will be 1,000 kVA of 3-phase power at 13.8 kV and 60 Hz.
- SST raw water – The raw water available in the C tank farm flows through a 5 cm (2 in.) line to the 241-C-73 Air and Water Service Building at 1,000 kPa (145 lb/in<sup>2</sup> gauge).
- SST service air system – The service air available to C tank farm is 0.7 m<sup>3</sup>/min (25 ft<sup>3</sup>/min) of dry compressed air with a dew point of -40 °C at 690 kPa (100-lb/in.<sup>2</sup> gauge).

#### **4.8.2 Environmental Justice**

The population within an 80-km (50-mi) radius around the Hanford Site includes 36% minority and Native American residents and 17.3% low-income residents (PNNL-6415). The 2000 low-income population was approximately 80,700 or 17% of the total population residing in the 50-mile radius of the Hanford Site. The majority of these households were located to the southwest and north of the site (Yakima and Grant counties) and in the cities of Pasco and Kennewick. (DOE/EIS-0286D2). Census data for 2000 identified members of the minority and Native American population as White Hispanic (24%), self-designated “other” races (54%), American Native (6%), two or more races (9%), Asians and Pacific Islanders (4%), and African American (3%). The ATCD Project would be conducted within the boundaries of the 200 East Area of the Hanford Site and specifically in areas in and adjacent to the tank farm systems.

#### **4.9 HUMAN HEALTH AND SAFETY**

The ATCD Project consists of short-term construction and operation activities. Operators would not come into physical contact with chemicals because they would be required to wear protective clothing. In addition, air monitoring and filtration would be used to identify and control any air emissions from C-106 during the period it is open for waste stabilization activities. All personnel working in C tank farm would receive appropriate health and safety training.

The hazards associated with these activities include potential occupational hazards resulting in physical trauma and radiological exposure resulting in latent cancer fatalities (LCFs). Initiating events that could result in hazardous health effects may include natural phenomena, human error, component failure, and spontaneous reactions. Health risks during normal conditions include anticipated exposure to radiation fields and radiological releases to the atmosphere during normal closure activities.

##### **4.9.1 Occupational Accident Risk**

Total occupational work hours at the Hanford Site for the 5-year period, 1997-2001, were about 56,230 worker-years (Solid Waste EIS). Occupational injury and illness incident rates for the Hanford Site ORP shows steady decrease from 1977 through 2000. Rates ranged from 3.0 cases per 200,000 worker hours (100 worker years) in 1997 to 1.7 cases in 2001.

##### **4.9.2 Routine Radiological Exposure Risk**

People have always been exposed to radiation from natural sources. The average resident of the United States receives an annual radiation dose from natural sources of about 300 mrem (0.3 rem). Exposure to large amounts of radiation (greater than 200,000 mrem [200 rem]) can cause serious illness or death. Although not confirmed by human studies, exposure to small doses of radiation, such as in medical x-rays, may cause a slight increase in the probability of cancer. At the Hanford Site, DOE activities have involved manmade radiation sources from nuclear processing. The DOE annual radiation dose standard for the public is 100 mrem (0.1 rem).

When estimating health effects for radiation protection purposes it can be assumed that, for low-level exposures (i.e., less than 20 rem), the risk of one latent cancer fatality is  $6 \times 10^{-4}$  per rem (DOE/EH-412/0015/0802 rev.1). For example, if 100,000 people receive a dose of 0.1 rem (100 mrem) or if 1,000,000 people receive a dose of 0.01 rem (10 mrem) six latent cancer fatalities would be expected.

ATCD Project activities require work in radiation zones. Due to the nature of radiation zone work, the workers could be exposed to and receive an occupational radiological dose from ionizing radiation. The DOE annual limit for occupational exposure is 5,000 mrem (5 rem). Hanford workers are administratively limited to an annual radiation dose of no more than 500 mrem.

#### **4.10 CULTURAL RESOURCES**

The Hanford Site as a whole contains extensive prehistoric and historic archaeological sites. However, the 200 Areas contain very few known sites. A comprehensive archaeological resources review for the fenced portions of the 200 Areas was conducted in 1987 and 1988. Two historic archaeological sites (i.e., can and glass scatters), four isolated historic artifacts, one isolated cryptocrystalline flake, and an extensive linear feature (i.e., the White Bluffs Road) were the only items discovered during the field survey (PNNL-6415). There are no known archaeological or historic archaeological resources within the ATCD Project site. Nor are impacts to archaeological or historical archaeological resources anticipated for this project. The tank farms underwent extensive excavation when the tanks were installed underground and no ground disturbing activities are planned. A staging area for the ATCD Project will be established near the northeast corner of C tank farm in a previously disturbed area. All contractor equipment and facilities will be located in a designated fenced area within this previously disturbed area.

Under Stipulation III (a)(3) of the Historic Buildings Programmatic Agreement (DOE/RL-96-77), activities involving waste storage tanks were exempt from review under Section 106 of the National Historic Preservation Act. Nevertheless, because of the significant role these tanks played in waste management throughout World War II and the Cold War period, these tanks were determined to be contributing properties within the Hanford Site Manhattan Project and Cold War Era Historic District. Consequently, representative single-shell and double-shell tank farms (i.e., 241-AW, 241-T, 241-TX, and 241-TY) were individually documented, and the history and contribution of these structures was described in Section 6 "Waste Management" of Section 2 of the History of the Plutonium Production Facilities as the Hanford Site Historic District, 1943-1990 (DOE/RL-97-1047). Any effects due to modification to the existing tank structures have been mitigated under Stipulation VI of the Historic Buildings Programmatic Agreement (DOE/RL-96-77).

#### **4.11 VISUAL RESOURCES AND NOISE**

Visually, the Hanford Site is characterized by wide-open vistas interspersed with over a dozen large industrial facilities (e.g., reactors and processing facilities). The 200 Areas contain several of these large processing facilities. Site facilities can be seen from elevated locations (e.g.,

Gable Mountain), a few public roadways (State Routes 24 and 240), and the Columbia River. Facilities in the 200 East Area can be seen only in the background from offsite locations.

The Hanford Site is an industrial complex and generates noise at levels that are consistent with the various activities conducted within the complex boundaries. Noise levels are maintained within prescribed limits.

This page intentionally left blank.

## 5.0 ENVIRONMENTAL IMPACTS

The potential environmental impacts from the proposed action are described in the following sections. DOE has made modifications to the proposed action that eliminate or mitigate potential impacts and/or concerns that were identified during the public review of the draft EA.

### 5.1 GEOLOGY AND SOILS

No borrow material will be used from Pit 30 or any other on-site borrow area. Grout would be formulated offsite for the demonstration project. Any borrow material used in the production of the grout would be obtained from an offsite commercial facility. There would be no substantial impacts to geologic or soil resources created by the ATCD Project. The project would not be subject to any unusual risks due to a seismic event on the Hanford Site.

### 5.2 SURFACE WATER

There would be no impacts to surface waters from the ATCD Project. There are no naturally occurring water bodies near the C tank farm. The ATCD Project does not involve dredging or filling activities in any surface water; therefore Section 404 of the *Clean Water Act* does not apply. The project would not require any new Section 402 discharge permits.

There would be no impacts to wetlands or designated floodplains from the ATCD Project. There are no wetlands or designated floodplains in the project area.

### 5.3 GROUNDWATER

The ATCD Project would not be expected to affect the vadose zone or the groundwater contaminant levels in a negative manner. The TWRS EIS developed a set of bounding assumptions to evaluate groundwater impacts from releases during retrieval and residuals (DOE/EIS-0189, Appendix F, Section F.4.6.1).

Retrieval for C-106 is basically completed and the planned retrieval action would utilize lower liquid volumes, have less hydraulic pressure, and the sluicing liquid would spend less time in the tank than under typical sluicing operations. The remaining activities associated with final retrieval and grout placement in the demonstration present considerable less risk of release than the resulting analysis conducted in the TWRS EIS based upon the assumptions used. Following Phase I grout placement, the residuals remaining in the tank, per M-45 requirements, would be more isolated and immobilized than they are now.

### 5.4 AIR

The ATCD Project will comply with air pollution control regulations governing non-radioactive airborne emissions, radioactive airborne emissions, and radiation protection of the public and the environment (RPP-11094). To achieve compliance, a high-efficiency air filtration system would be used during fill placement in tank C-106 to minimize the potential for toxic or radioactive air emissions. Construction traffic could generate some fugitive dust. As appropriate, fugitive dust

suppression measures (e.g., water spray or surfactants) would be used at the C-106 tank site. Therefore, no substantial adverse impacts to air quality are anticipated.

## **5.5 BIOLOGICAL RESOURCES**

The land in the ATCD Project area and the proposed staging area is heavily disturbed. The tank farms underwent extensive excavation when the tanks were installed underground. The staging area is located in a previously disturbed area where overhead and underground utility lines were constructed. The activities of the ATCD Project would be conducted in these previously disturbed areas, so there would be no significant direct or indirect effect to biological resources or their habitat as a result of the ATCD Project. The biological survey of the 200 East Area concluded that:

- No plant and animal species protected under the Endangered Species Act, candidates for such protection, or species listed by the Washington State were observed.
- No adverse impacts to species or habitats of concern are expected to occur from the maintenance, operation, or characterization activities at 200 East or West tank farms and associated support facilities.

## **5.6 LAND USE**

The Central Plateau (200 East and West Areas) are designated as an "industrial-exclusive" area capable of supporting waste treatment, storage, and/or disposal activities for hazardous, dangerous, radioactive, nonradioactive wastes and related activities. There would be no change in land use as a result of the ATCD Project. Because there are no lands designated as prime farmlands in the ATCD Project area, there would be no impacts to such lands by the ATCD Project. The ATCD Project is consistent with the current land use designation for the 200 Areas and would not affect the land use of the area.

## **5.7 TRANSPORTATION**

The workforce for the ATCD Project would average about 20 workers and the project material needs are minimal. There would not be a substantial increase in the existing Hanford Site workforce or material transportation activities; therefore, there would be no substantial impact to traffic circulation, volume, or parking access caused by the project.

## **5.8 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

The ATCD Project would be conducted within the boundaries of the 200 East Area of the Hanford Site and specifically in areas in and adjacent to the C tank farm. There would be no substantial impact to the socioeconomics of the Hanford Site or the surrounding communities created by the ATCD Project. The workforce for the ATCD Project would average about 20 workers from the current site workforce. This is less than 1% of the existing Hanford Site workforce.



There would be no high or disproportionate adverse health or socioeconomic impacts to minority or low-income populations as a result of the ATCD Project.

### **5.8.1 Utilities**

The ATCD Project would not require construction or development of new permanent utility lines. Existing services have adequate capacity to meet the needs of the ATCD Project. Temporary services from the existing utility system onsite would be used.

## **5.9 HUMAN HEALTH AND SAFETY**

Short-term human health risk analysis is to estimate the potential health impacts from both accident and normal (nonaccident) conditions resulting from various scenarios for tank 241-C-106 and the C tank farm during closure activities. The analysis identifies the potential accidents associated with construction and operation activities. The hazards associated with these activities include potential occupational hazards resulting in physical trauma and radiological exposure resulting in latent cancer fatalities (LCFs). Initiating events that could result in hazardous health effects may include natural phenomena, human error, component failure, and spontaneous reactions. Health risks during normal conditions include anticipated exposure to radiation fields and radiological releases to the atmosphere during normal closure activities.

Tank filling will present potential exposures to workers and the general public. Worker and general public exposure scenarios were developed for tank (i.e., component) closure activities. The preliminary scenario presented in this document is Phase I grouting (i.e., stabilizing grout) and represents the type of exposure that is expected based on planned tank closure activities. Various options for tank filling following waste retrieval will be evaluated.

Because the short-term human health risks will be encountered in the near future while the site is under physical and administrative control of the U.S. Department of Energy, it can be reasonably anticipated that the tank closure activities will be conducted in a manner that maintains exposure to tank wastes as low as reasonably achievable through the use of engineering controls and protective equipment. It is assumed that after final closure of the tanks, short-term human health risk will be fully mitigated and will not be considered further. This is consistent with the regulatory definition of closure of a treatment, storage, and/or disposal facility (i.e., no further active site management required).

### **5.9.1 Occupational Accident Risk**

The potential exists for accidents (e.g., cuts, falls) to occur resulting from construction and operation activities associated with component closure (i.e., tank closure). The occupational injuries, illnesses, and fatalities resulting from potential accidents are calculated based on the following assumptions:

- Tank 241-C-106 labor requirements for Phase I grouting of the tank
  - Phase I grouting of tank = 3,800 hours

- Phase I grouting of all C farm tanks = 60,800 hours.
- Hanford-specific incidence rates for occupational accidents
- Total recordable cases =  $1.93 \times 10^{-5}$  total recordable cases/hour
- Lost workday cases =  $8.04 \times 10^{-6}$  lost workday cases/hour
- Fatalities =  $1.35 \times 10^{-8}$  fatalities/hour.

The potential incidences resulting from occupational accidents are presented in Table 5-1.

**Table 5-1. Worker Risk From Occupational Accidents**

Case	Incidence	Tank	
		241-C-106	All
Phase I grouting of tank 241-C-106	TRC	7.33 E-02	NA
	LWC	3.06 E-02	NA
	Fatalities	5.13 E-05	NA
Phase I grouting of all C farm tanks	TRC	NA	1.17 E+00
	LWC	NA	4.89 E-01
	Fatalities	NA	8.21 E-04

LWC = lost workday cases.  
NA = not applicable.  
TRC = total recordable cases.

### 5.9.2 Radiological Accident Risk

Currently, no safety assessment for closure activities have been performed. Past safety assessments were used for the radiological accident risk. A spectrum of potential accidents associated with from tank 241-C-106 is reviewed in *Safety Assessment for Tank 241-C-106 Waste Retrieval Project W-320* (WHC-SD-WM-SAD-024). Several of the more bounding accidents identified in the safety assessment are summarized in Table 5-2.

### 5.9.3 Routine Radiological Exposure Risk

The involved worker population dose resulting from construction and operations is based on worker exposures to support closure of tank 241-C-106. The involved worker MEI dose is based on a current site administrative control of 0.5 rem/year. The LCF risk to the various receptor populations and MEIs are presented in Table 5-3.

**Table 5-2. Preliminary Hazard Analysis**

Accident	Consequences	Mitigative/Preventive Barriers		Severity Level	Probability
		Administrative	Engineered		
Opening a riser <sup>a</sup>	Increases exposure to worker from direct radiation and release of radiological contaminants	Surveillance by radiation protection technician  Radiological workers will wear personal protective gear while removing risers	Radiation detectors	Low	Likely
Flammable gas deflagration <sup>b</sup>	Energy from deflagration could compromise the tank dome or ventilation system resulting in release of radiological contaminants and exposure to the workers  Potential trauma to workers from deflagration	Flammable gas control	Tank ventilation system	High	Extremely unlikely
Spray leak from transfer line <sup>a</sup>	Spray leak from transfer line resulting in release of radiological contaminants and exposure to the workers	Operator surveillance	Cover block over jumper pit  Leak detection  Radiation detectors	High	Unlikely
Ventilation failure <sup>a</sup>	Ventilation failure resulting in unfiltered release of radiological contaminants and exposure to the workers	Evacuation procedures	Differential pressure alarms	High	Extremely unlikely
Natural phenomena <sup>a</sup>	Seismic event compromises waste tank or transfers lines resulting in release of radiological contaminants and exposure to the workers	Evaluation procedures	Seismic switch on transfer pump	Medium	Extremely unlikely

<sup>a</sup>Accident taken from WHC-SD-WM-SAD-024.

<sup>b</sup>Accident taken from 10245-CD-006.

**Table 5-3. LCF Risk From Routine Radiological Exposure**

Receptor	C-106	Worst Case Composite Tank	Regulatory Limit
IW MEI	2.00 E-04	2.00 E-04	2E-3
IW Pop	5.92 E-03	5.92 E-03	NA
NIW MEI	3.76 E-08	1.68 E-10	2E-3
NIW Pop	1.78 E-06	7.93 E-09	NA
GP MEI	9.00 E-12	4.05 E-14	2E-3
GP Pop	1.80 E-07	8.10 E-10	NA

GP MEI = general public maximum exposed individual.

GP Pop = general public population.

IW MEI = involved worker maximum exposed individual.

IW Pop = involved worker population.

NA= not applicable

NIW MEI = noninvolved worker maximum exposed individual.

NIW Pop = noninvolved worker population.

## 5.10 CULTURAL RESOURCES

There are no known cultural resources within the ATCD Project site. The tank farms underwent extensive excavation when the tanks were installed underground. The ATCD Project staging area is located in a previously disturbed area where overhead and underground utility lines were constructed. Since there are no ground disturbing activities planned or anticipated in connection with the ATCD Project, it is unlikely that any archaeological or historic archaeological resources would be encountered during the demonstration. However, if cultural resources were encountered during the demonstration, work would be halted and the DOE-RL Manager of the Hanford Historical and Cultural Resources Program would be notified to determine the appropriate disposition of the resource and any mitigative actions that would be required prior to continuing with the project. Structural effects to the C-106 tank have been mitigated as required under Stipulation VI of the Historic Buildings Programmatic Agreement (DOE/RL-96-77).

## 5.11 VISUAL RESOURCES AND NOISE

The ATCD Project would only temporarily modify the visual appearance near C tank farm. Once the ATCD Project is completed, the views in and around the tank farm would return to pre-project conditions.

The ATCD Project would use industrial equipment that would not constitute a substantial increase in current noise levels. Because of the size of the Hanford Site, its scattered facilities, and its largely undeveloped nature, site activities generally have no offsite noise impacts. Noise levels from the ATCD Project would be short-term, limited to the duration of the demonstration activities, and would not be permanent or long term.

## 5.12 CUMULATIVE IMPACTS

The operations and maintenance activities at the Hanford Site employ between 10,000 and 11,000 employees. The average number of workers for the ATCD Project is about 20, less than 1% of the total Hanford Site labor force. This labor force would not substantially contribute to the cumulative socioeconomic impacts to the community. There would be no high or disproportionate adverse impacts to minority or low-income populations. The activities do not represent a substantial impact on worker and public health and safety.

The traffic generated by the construction of the Waste Treatment Plant consists of employee traffic to and from the construction site, employee travel to North Richland, and shipments to the site. During the period from 2002 to 2006, the additional traffic is expected to increase trips 13 to 32% during the peak commuter periods (Perteet Engineering 2001). Traffic generated by the ATCD Project would be within the existing traffic volumes and would not contribute to the cumulative impacts to the transportation system of the site or the surrounding communities.

The impact evaluations presented in this EA have concluded that there would be no substantial direct or indirect impacts associated with the project. In the reasonably foreseeable future, decisions will be made concerning how the Hanford tank farm systems will be closed. This demonstration project is consistent with the options for tank farm closure being evaluated in the Tank Closure EIS and does not foreclose the selection or implementation of any future closure option.

Because there are no substantial adverse impacts from the proposed action, there would be no substantial contribution to Hanford Site cumulative impacts.

This page intentionally left blank.

## 6.0 PERMITS AND REGULATORY REQUIREMENTS

Federal and state laws apply to the closure of the SSTs. The regulatory framework for SST waste management includes requirements regarding planning and protection of air and water quality, human health, and the environment. Closure objectives are driven by the requirements of the *Atomic Energy Act of 1954* (AEA) and RCRA. The authorities for the regulation of mixed waste in the SSTs are derived from the AEA for the radioactive constituents and from RCRA and the “Hazardous Waste Management Act” for the hazardous constituents. The EPA has authority under the provisions of RCRA and AEA, Ecology has authority under the provisions of the “Hazardous Waste Management Act” and RCRA, and DOE has authority under the provisions of AEA. The HFFACO establishes lead agencies to minimize duplicative administrative requirements. Ecology regulates the SSTs as hazardous waste storage and treatment units under WAC 173-303; the SSTs must be closed in accordance with applicable portions of this regulation. Radioactive waste also must be managed in accordance with the AEA. These authorities may impose different requirements. Potential RCRA and AEA conflicts will be addressed through HFFACO procedures. The radioactive component of mixed waste also must be managed pursuant to the DOE regulatory authority under the AEA.

Ecology is the lead regulatory agency authorized to approve applications to modify the Hanford Facility RCRA permit and for toxic air emissions. The Washington State Department of Health is the lead agency for radioactive air emissions. If the existing Notices of Construction do not adequately cover the ATCD Project, applications for new Notices of Construction will be submitted. Accelerated SST system closure activities are dependent upon modification of the Site-Wide RCRA permit (WA7890008967) through addition of the SST system closure plan. Basic agency roles and responsibilities include DOE drafting the closure plan and Ecology reviewing it, issuing the draft closure plan with permit conditions that direct closure activities, and issuing the document for public comment. After public comment is taken into account, the permit will be modified with the final closure plan and associated permit conditions. DOE will classify residual waste remaining in C-106 after retrieval under DOE Order 435.1.

The following regulations and requirements (Table 6-1) are relevant to the management of waste in SSTs, the ATCD Project, and final closure of the tank farms.

**Table 6-1. Applicable Regulations and Requirements**

RCRA
<i>Federal Facilities Compliance Act</i>
NEPA
AEA
40 CFR 191
10 CFR 835
DOE Order 435.1
DOE Order 5400.5
<i>Clean Air Act</i>
<i>Safe Drinking Water Act</i>
<i>Clean Water Act</i>
Hazardous Waste Management Act
Hanford Federal Facility Agreement and Consent Order (HFFACO)
Water Pollution Control Act
Washington Clean Air Act



## 7.0 TRIBAL GOVERNMENTS AND AGENCIES CONSULTED

The Washington State Department of Ecology was consulted during preparation of this EA. The draft EA was sent for review to the following:

- Nez Perce Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Yakama Nation
- Confederated Tribes of the Colville Reservation
- Wanapum
- U.S. Environmental Protection Agency - Region 10
- U.S. Fish and Wildlife Service
- Washington State Department of Ecology
- Washington State Department of Health
- Washington State Department of Fish and Wildlife
- Washington State Historic Preservation Officer
- Oregon Office of Energy
- Benton and Franklin Counties
- Port of Benton
- Cities of Richland, Pasco, Kennewick, and West Richland.
- Hanford Advisory Board
- Heart of America Northwest
- Physicians for Social Responsibility.

The draft EA was made available during the comment period in the DOE Public Reading Room (Consolidated Information Center at Washington State University - Tri-Cities), the Richland Public Library, and the Hanford Internet ([www.hanford.gov/netlib/ea.asp](http://www.hanford.gov/netlib/ea.asp)). Comments were received from the Oregon Office of Energy, Washington Department of Ecology and Washington Department of Fish and Wildlife. Copies of the letters received and responses to these comments are presented in Appendix A.

This page intentionally left blank.

## 8.0 REFERENCES

- 10245-CD-06, 1998, Preliminary Hazard Identification and Evaluation for the Tank 241-C-106 Waste Heel Retrieval Demonstration, Rev. A, Los Alamos Technical Associates, Inc., Richland, Washington.
- 10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.
- 10 CFR 1021, "National Environmental Policy Act Implementing Procedures," *Code of Federal Regulations*, as amended.
- 40 CFR 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," *Code of Federal Regulations*, as amended.
- 40 CFR 1500-1508, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," *Code of Federal Regulations*, as amended.
- 50 CFR 17, "Endangered and Threatened Wildlife and Plants," *Code of Federal Regulations*, as amended.
- 62 FR 8693, 1997, "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, Washington," *Federal Register*, February 26.
- 64 FR 61615, 1999, "Record of Decision for Hanford Comprehensive Land-Use Environmental Impact Statement," *Federal Register*, November 2.
- 68 FR 03318, 2003, Notice of Intent to Prepare an Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, WA. *Federal Register*, January 3.
- Atomic Energy Act of 1954*, as amended, 42 USC 2011, et seq.
- Clean Air Act*, Public Law 88-206, 42 USC 7401 et seq., as amended.
- Clean Water Act*, 33 USC 1251 et seq., as amended.
- DOE 2002, *A Review of the Environmental Management Program*, Presented to the Assistant Secretary for Environmental Management by the Top-to-Bottom Review Team, February 4, 2002, U.S. Department of Energy, Washington, D.C.
- DOE/EH-412/0015/0802 rev.1 Department of Energy, Office of Environmental Policy and Guidance, Air, Water & Radiation Info Brief (January 2003), Estimating Radiation Risk from Total Effective Dose Equivalent (TEDE) ISCORS Technical Report No. 1.
- DOE/EIS-0189, 1996, *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement*, U.S. Department of Energy and Washington State Department of Ecology, Richland, Washington.

- DOE/EIS-0189-SA3, 2001, *Supplement Analysis for the Tank Waste Remediation System*, U.S. Department of Energy, Washington, D.C.
- DOE/EIS-0222F, 1999, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/EIS-0286D2, 2003, *Revised Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS)*, U.S. Department of Energy, Washington, D.C.
- DOE Order 435.1, 2001, *Radioactive Waste Management*, U.S. Department of Energy, Washington, D.C.
- DOE Order 5400.5, 1993, *Radiation Protection of the Public and Environment*, U.S. Department of Energy, Washington, D.C.
- DOE/RL-92-19, 1993, *200 East Groundwater Aggregate Area Management Study Report*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-96-77, 1996, *Programmatic Agreement Among the U.S. Department of Energy, Richland Operations Office, the Advisory Council on Historic Preservation, and the Washington State Historic Preservation Office for the Maintenance, Deactivation, Alteration, and Demolition of the Built Environment on the Hanford Site*, Washington, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-97-1047, 2002, *History of Plutonium Production at the Hanford Site Historic District, 1943-1990*, U. S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2002-47, 2002, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site*, Rev. D, U.S. Department of Energy, Richland, Washington.
- Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
- Farmland Protection Policy Act of 1994*, 7 USC 4201 et seq.
- Federal Facility Compliance Act of 1992*, Public Law 102-386, 42 USC 6921 et seq.
- “Hazardous Waste Management Act,” RCW 70. 105, *Revised Code of Washington*, as amended.
- MACTEC, 2003, *Hanford Tank Farms Vadose Zone C Tank Farm Reports*, MACTEC Environmental Restoration Service.
- National Environmental Policy Act of 1969*, 42 USC 4321 et seq.

- Perteet Engineering, 2001, *The Impact of the Waste Treatment Plant Project on the Hanford Communities*, Perteet Engineering, Inc., Thomas/Lane and Associated, Inc., and SCM Consultants, Inc., Richland, Washington.
- PNNL-6415, 2002, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, Rev. 14, Pacific Northwest Laboratory, Richland, Washington.
- PNNL-13788, 2002, *Hanford Site Groundwater Monitoring For Fiscal Year 2001*, Pacific Northwest National Laboratory, Richland, Washington.
- PNNL-14187, 2002, *Summary of Hanford Site Groundwater Monitoring For Fiscal Year 2002*, Pacific Northwest National Laboratory, Richland, Washington.
- Resource Conservation and Recovery Act of 1976*, Public Law 94-580, 90 Stat. 2795, 42 USC 901 et seq.
- RPP-11085, 2002, *Approach for the Accelerated Tank Closure Demonstration Project*, Draft A, CH2M HILL Hanford Group, Inc., Richland, Washington.
- RPP-11094, 2002, *Tank Closure Fill System for the Accelerated Tank Closure Demonstration Level 2 Specification*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.
- RPP-12194, 2002, *Tank Alternative Closure Demonstration Project Alternative Generation and Analysis*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington
- RPP-12331, 2002, *Accelerated Tank Closure Demonstration Basis of Design*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington
- Safe Drinking Water Act of 1974*, Public Law 93-523, 88 Stat. 1660, 42 USC 300f et seq.
- SNL. Test Plan for Development of a Hydroxyapatite Based Sorbent for Tc, U and Se for Use in the Enhanced Grout Project for Closure of the Hanford Waste Tanks. March 29, 2003.
- WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.
- WAC 173-401, "Operating Permit Regulation," *Washington Administrative Code*, as amended.
- "Washington Clean Air Act," Chapter 70.94, *Revised Code of Washington*, as amended.
- Washington Natural Heritage Program, 2002, access page located at [www.wa.gov/dnr/htdocs/fr/nhp/wanhp.html](http://www.wa.gov/dnr/htdocs/fr/nhp/wanhp.html), State of Washington, Department of Natural Resources, Olympia, Washington.
- "Water Pollution Control Act," Chapter 90.48, *Revised Code of Washington*, as amended.
- WHC-SD-WM-EV-107, 1995, *Closure Technical Data Package for the Tank Waste Remediation System Impact Statement*, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-WM-SAD-024, 1995, *Safety Assessment for Tank 241-C-106 Waste Retrieval Project W-320*, Westinghouse Hanford Company, Richland, Washington.

WSRC-RP-2003-00341. Task Technical & QA Plan. Immobilization Technology Section, Savannah River Technology Center. 3-31-03.

**APPENDIX A**

**COMMENTS AND RESPONSES ON THE DRAFT ENVIRONMENTAL ASSESSMENT  
FOR THE ACCELERATED TANK DEMONSTRATION PROJECT**

This page intentionally left blank.





# Oregon

Theodore R. Kulonowski, Governor



OREGON OFFICE  
OF ENERGY

625 Marion St. NE, Suite 1  
Salem, OR 97301-3742  
Phone: 503-378-4040  
Toll Free: 1-800-221-8035  
FAX: 503-373-7806  
www.energy.state.or.us

February 14, 2003

Mary Beth Burandt  
Document Manager  
Office of River Protection  
U.S. Department of Energy  
P.O. Box 450, Mail Stop H6-60  
Richland, WA 99352

Subject: Oregon Office of Energy Comments on the Draft Environmental Assessment for the Accelerated Tank Closure Demonstration Project.

Dear Ms Burandt:

Reduction of the risk from the high-level waste tanks at Hanford has long been one of Oregon's top Hanford priorities. The highly radioactive, toxic mixed wastes of these tanks represent both a short term and a long term serious threat to the health of the Columbia River and therefore also to the health of Oregon and Oregonians. One of the important steps in reducing the long-term risks to Oregon of these wastes is a technically sound, environmentally protective and legally compliant closure of the tanks. Therefore, we are vitally interested in this aspect of Hanford cleanup.

We have reviewed the draft environmental assessment for the accelerated tank closure demonstration project and have concluded that this document is inadequate to make a determination of no significant impact. Our reasons for this determination follow:

1. The Council on Environmental Quality requires that in determining whether or not a proposed action has a significant impact, the degree to which the proposed action may establish a precedent for future actions with significant effects should be considered. [CEQ 1508.27(b)(6)] Since this project's purpose is to establish precedents for future tank closures, which will have very significant impacts, a detailed consideration of this question must be included in this environmental assessment.
2. A potential source of significant environmental impact is the material that will be used to stabilize the residual waste in tank C-106. The environmental assessment asserts "The volume of initial fill material in C-106 that would be retrieved is not substantial in comparison to the volume of waste to be retrieved from all tanks." This single comment does not contain enough detail to support the contention of no significant impact from this material. A more detailed discussion of this possibility needs to be included in this document. For example, what materials are being considered as fill materials? What is the

RECEIVED

FEB 20 2003

February 14, 2003

Page 2

ease of retrieval of these materials if future retrieval is necessary? What will be the disposition of these materials if retrieval is necessary; are they high-level waste?

Should you have any questions, please contact Mr. Douglas Huston of my staff at (503)378-4456.

Sincerely,

Ken Niles/ Administrator  
Nuclear Safety Division

Cc: Shelley Cimon, Oregon Hanford Waste Board Chair  
Armand Minthorne, Confederated Tribes of the Umatilla Indian Reservation  
Russell Jim, Yakama Nation  
Pat Sobotta, Nez Perce Tribe  
Michael Wilson, Washington Department Of Ecology  
Nicholas Ceto, Environmental Protection Agency  
Todd Martin, Hanford Advisory Board Chair



03-TPD-063

Department of Energy  
Richland Operations office  
P. O. Box 550  
Richland, Washington 99352

**JUN 24 2003**

Ken Niles, Administrator  
Nuclear Safety Division  
State of Oregon  
Oregon Office of Energy  
625 Marion St. NE Suite 1  
Salem, OR 97301-3742

RESPONSE TO COMMENTS ON ENVIRONMENTAL ASSESSMENT DOE/EA-1462 FOR THE ACCELERATED TANK CLOSURE DEMONSTRATION PROJECT

Dear Mr. Niles:

The U.S. Department of Energy (DOE), Office of River Protection (ORP) acknowledges receipt of the comments provided by the State of Oregon, Office of Energy (OOE) on the Draft Environmental Assessment (EA) for the Accelerated Tank Closure Demonstration (ATCD) Project. ORP believes the conduct of this project will enhance our knowledge of the activities involved in the closure of single-shell tanks at the Hanford Site. The ATCD Project will contribute to the DOE commitment to protect public health and the environment.

The OOE has provided several comments on the Draft EA for the ATCD Project. These comments, with the DOE responses, are enclosed. As appropriate, DOE has noted where changes have been made in the Final EA as part of our response.

DOE appreciates your interest in this project. If you have additional questions concerning the proposed action, please contact Mr. Robert Lober at 509-373-7949. Questions on the NEPA process can be directed to me at 509-376-6667.

Sincerely,

A handwritten signature in cursive script that reads "Paul F. X. Dunigan, Jr.".

Paul F. X. Dunigan, Jr.  
NEPA Compliance Officer

TPD:RWL

Attachment

cc: Administrative Record

## **Department of Energy Response to State of Oregon, Oregon Office of Energy Comments on the ATCD Project Draft EA (DOE/EA-1462)**

The following is a listing of the specific comments made by the State of Oregon, Oregon Office of Energy and the DOE response to these comments. As appropriate, the comment responses indicate where changes in the final environmental assessment have been made.

### Comment 1:

Since this project's purpose is to establish precedent for future tank closures, which will have very significant impacts, a detailed consideration of this question must be included in the environmental assessment.

### Response:

The primary purposes of this project are:

- Field deployment of grout production and placement equipment.
- Placement and distribution of grout in tank.
- Physical response of tank residual to grout during placement.
- Worker/airborne exposure measurements/mitigation.
- Collect information on project costs and efficiencies

The Council on Environmental Quality (CEQ) and the DOE National Environmental Policy Act (NEPA) implementing orders and guidance are very specific that demonstration projects do not reach a level of investment or commitment that would likely determine subsequent development or restrict later actions. The purpose of this demonstration project is to obtain information and experience to better understand closure actions, not to establish precedent for future tank closures. The decision on future tank closures will not be made until after the Tank Closure EIS has been completed at which time DOE will issue a Record of Decision (ROD) that will identify how future tank closures will be accomplished. Furthermore, until the analysis of the Tank Closure EIS is completed, DOE cannot determine whether the impacts of final tank closure are or are not significant.

This demonstration project will not determine subsequent development or restrict later actions concerning the closure of C-106. Following retrieval, DOE and the Tri-Party Agreement (TPA) regulators will review the success of the retrieval efforts. If it is determined that sufficient waste has been removed from the tank, then DOE would proceed with the placement of the Phase I engineered fill portion of the demonstration. If it is determined that sufficient waste has not been removed to proceed with the demonstration, then DOE would not place any fill material in the tank and would suspend component closure activities for C-106 pending the completion of the Tank Closure EIS and issuance of the ROD.

The Tank Closure EIS is evaluating alternatives for closure of Waste Management Areas (WMAs) and the entire single shelled tank (SST) system. These alternatives include landfill closure, modified clean closure and clean closure. The Accelerated Tank Closure Demonstration

(ATCD) Project does not foreclose implementation of any of these alternatives. This demonstration preserves all future options for final closure of C-106 while obtaining important information and protecting human health and the environment. The impacts of implementing a final closure action will be considered in the Tank Closure EIS. If removal of tanks under the clean closure option were selected then the volume of fill material in C-106 would be excavated along with the tank and surrounding soil. The impacts of implementation of this closure action are more appropriately addressed in the Tank Closure EIS since there are no final closure decisions being made as part of this demonstration project.

Comment 2:

The environmental assessment asserts, "The volume of initial fill material in C-106 that would be retrieved is not substantial in comparison to the volume of waste to be retrieved from all tanks." This single statement does not contain enough detail to support the contention of no significant impacts from this material. A more detailed discussion of this possibility needs to be included in this document.

Response:

The ATCD Project contemplates the retrieval of tank waste up to the retrieval goal of the Tri-Party Agreement (HFFACO). Even if retrieval exceeds the HFFACO goal, there are still benefits to be gained by placement of grout in C-106. This comment has been edited from the environmental assessment because retrievable grout is no longer part of the demonstration project. The ATCD Project will demonstrate field deployment of a Phase I grout formulation fill material for subsequent tank closures. Between 160 and 500 cubic yards of grout may be placed in C-106. The total volume of C-106 is approximately 4,000 cubic yards. The amount of grout to be placed in this one tank is not a substantial amount of material.

Comment 3:

For example, what materials are being considered as fill materials?

Response:

Specially formulated grout is going to be used in the Phase I fill. It is possible that a granular absorbent could be used to stabilize any free residual liquid as part of a top dressing. The Savannah River Technology Center (SRTC) is preparing the technical specifications for the tank fill formulations and placement that will be incorporated into a vendor specification. The SRTC development program will recommend a grout formula based on variables such as compressive strength, flow, gel time, set time, bleed water, air content, hydraulic conductivity, porosity and the applicability of incorporating sequestering agents.

Comment 4:

What is the ease of retrieval of these materials if future retrieval is necessary?

Response:

The ATCD Project is no longer considering the placement of a retrievable material. The Phase I grout placed during the ATCD Project would be retrieved if DOE determines in the Tank Closure EIS that tank C-106 is to be removed. The removal of an underground tank the size of C-106 that has stored radioactive waste would be difficult. The removal of tank C-106 would

not be made more difficult with the Phase I grout in place. Benefits to placement of the Phase I grout in C-106 are that it would provide protection during tank removal by shielding workers from the residual waste in the tank. The removal of C-106 with the grout in place would not require any new technology beyond that used for tank removal only.

This demonstration project does not determine subsequent development or restrict later actions concerning the final closure of C-106. If the Tank Closure EIS selects landfill closure, this demonstration is consistent with implementation of that alternative. If the Tank Closure EIS selects clean closure, the volume of grout in the tank does not make removal of the entire tank impractical or impossible. Therefore, this demonstration preserves future options for final closure of C-106. This demonstration constitutes a component closure action to test Phase I of a landfill closure, but would not proceed to Phases II and III until after the Tank Closure ROD is issued.

Comment 5:

What will be the disposition of these materials if retrieval is necessary? Are they high-level waste?

Response:

If tank removal were selected for final closure in the Tank Closure EIS, then all material would be classified and disposed of in compliance with DOE Orders.



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

1415 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

February 20, 2003

Mr. Paul F.X. Dunigan, Jr.  
United State Department of Energy  
Office of River Protection  
P.O. Box 450  
Richland, Washington 99352

Dear Mr. Dunigan:

Re: Washington State Department of Ecology Nuclear Waste Programs' Comments on Draft Environmental Assessment for the Accelerated Tank Closure Demonstration Project, 200-East Area, Hanford Site, Richland, Washington (DOE/EA-1462)

We appreciate the opportunity to review the *Draft Environmental Assessment (EA) for the Accelerated Tank Closure Demonstration Project (ATCD)*. We have several serious concerns with the scope of the project as planned; however, we could not evaluate the environmental impacts of the project from the information provided in the draft ATCD EA. Until that information is available, we cannot support the addition of stabilizing materials, the alteration of access to Tank 241-C-106, or the disturbance of Borrow Pit 30 to provide fill.

Ecology wishes to provide the following specific comments on the draft EA:

**Tank Fill**

1. The draft EA as written does not satisfy the requirements of Title 40 *Protection of the Environment*, Section 1508.9 Environmental Assessment, item (3)(b) to provide a brief discussion of the environmental impacts of the proposed action and alternatives. Of particular concern to Ecology is the lack of substantive technical information about the environmental impacts of adding tank fill material in either loose granular or low-strength cementitious form to residual waste left after retrieval. The draft ATCD EA states that tank fill alternatives were evaluated in the *Tank Alternative Closure Demonstration Project Alternative Generation and Analysis*; however, no evaluation of any significant environmental impacts of the addition of the fill material is included in the draft ATCD Project EA.

**RECEIVED**

FEB 26 2003

**DOE-RL/RLCC**

.89

Mr. Paul F.X. Dunigan, Jr.  
February 20, 2003

2. Ecology cannot support the contention made in the draft EA that retrieval of the fill material will not have significant environmental consequences because the physical form of the residual waste may be altered. The residual liquid waste may be absorbed into the cementitious mixture, which will in turn create a new added waste volume in the tank. Ecology does not understand what environmental benefits will result from the creation of an additional waste volume. From the United States Department of Energy's (USDOE) description in the draft ATCD EA, the waste in its present form can be removed. From the description in the draft ACTD EA, it appears that the environmental impact will not be beneficial.
3. Creation of a new waste volume does not support the policy of the State of Washington Legislature "to encourage reduction in the use of hazardous substances and reduction in the generation of hazardous waste whenever economically and technically practicable" (see Revised Code of Washington 70.95C.010). Ecology does not support any action which is not consistent with that policy.
4. From the draft ATCD EA, Ecology cannot determine if any significant environmental impacts will result from the addition of sequestering agents to the fill material. The sequestering agents are said to reduce solubility and/or mobility of key contaminants. No information is provided about the chemical reactions of the sequestering agents with the waste residuals. Ecology cannot determine if any significant environmental impacts will result through addition of those agents.
5. No information was provided to document the compatibility of the proposed fill with future final tank fill material, including engineering load/compaction requirements to prevent future tank void space subsidence. Ecology could not evaluate impacts of using the proposed fill on future fill efforts.
6. Also missing from the draft ATCD EA is an analysis of other reasonable alternatives, including not filling the tank following retrieval. By design, successful retrieval of C-106 should remove most of the mobile contaminants and tank waste, making addition of waste stabilizing agents of no environmental benefit. If the retrieval is not successful (i.e., it does not meet Hanford Federal Facility Agreement and Consent Order Milestone M-45 requirements), further retrieval will likely be required.
7. Section 1.0 PURPOSE AND NEED FOR AGENCY ACTION states that the draft ATCD EA is to provide information and analysis of the ATCD activities and the potential environmental effects of the actions. Lacking a discussion of all alternatives to residual waste stabilization, the draft ATCD EA cannot be said to have met the purpose intended.

#### **Biological Review**

8. Ecology views with concern the intent of the ORP to use Pit 30 as the source of granular flow material. An earlier Environmental Assessment on borrow pits (DOE/EA-1403) noted that Piper's Daisy (*Erigeron piperianus*) had been found in some areas of the pit in the past. The draft ATCD EA does not mention that species, which is considered a sensitive species. It is not mentioned in the SEPA Checklist that accompanied the *Single-Shell Tank System Closure Plan*. Ecology does not regard the evaluation of potential impacts complete because the reviews are limited only to the area of the 241-C Tank Farm, but the proposed action will also affect Pit 30.



Mr. Paul F.X. Dunigan, Jr.  
February 20, 2003

9. Ecology does not consider Section 4.5.1 Threatened and Endangered Species to be complete because it limits the discussion of species to the 241-C Tank Farm and adjacent staging area. Use of Pit 30 expands the evaluation of biological resources; therefore, a summary of the impacts of use of Pit 30 should be included.

#### Closure Demonstration Work Scope

10. The draft ATCD EA describes tank isolation processes that will prevent inadvertent waste transfers and water intrusions. This practice appears to offer the least harm to the environment during the time when 241-C-106 awaits closure; therefore, Ecology would like a description of the incremental environmental benefit that will result from the addition of materials to the tank.
11. Section 2.3 of the draft ATCD EA suggests that new or modified penetrations in the top of the tank may be required. None of the potential impacts to the environment that could result from excavation of the area on top of the tank and opening new penetrations in the tank is included. Ecology cannot determine the risk to the environment that could result from those activities (e.g., releases to the air from excavation, alteration of the air flow through the tank that could dislodge contaminants and spread waste, degradation in the structural integrity of the tank) that might result from such preparation.
12. Section 2.5 states that tank fill operations and documentation and assessment of residual waste volume will be conducted using video cameras. Ecology expects sampling of residual waste to be conducted, with video cameras used for verification.
13. Section 2.9 states that isolation measures will be maintained in place until tank closure. Ecology cannot determine what measures will be taken to prevent intrusion after tank closure or during the closure process. Environmental impacts of removing isolation measures or not performing isolation should be addressed.

#### Groundwater

14. Ecology is concerned because the draft ATCD EA Section 4.3 describes plumes of contaminants in groundwater and then explains that the contaminants are varying concentrations in the unsaturated area (i.e., the vadose zone above the groundwater). The listed contaminants are present in the vadose zone; however, they have not been detected in groundwater under the entire 200 Area. Section 4.3 should be corrected.
15. Section 4.3 mentions technicium-99 concentrations that exceed the drinking water standard are present in groundwater concentrations below the 241-C Tank Farm. Due to the absence of information about the impacts in the draft ATCD EA, Ecology cannot tell what increased risk to the groundwater will result from the ATCD.

#### References

16. The draft ATCD EA referenced two documents that were said to have evaluated tank fill alternatives (DOE-12194 *Tank Alternative Closure Demonstration Project Alternative Generation and Analysis* and RPP-11085 *Approach for the Accelerated Tank Closure Demonstration Project*). These documents were not provided with the draft ATCD EA to Ecology and the information in them was not included in the draft ATCD EA. The pertinent information in the two documents should be summarized in the draft ATCD EA.

Mr. Paul F.X. Dunigan, Jr.  
February 20, 2003

### Impact on Cleanup Resources

17. The proposed action imposes an unnecessary adverse impact on Hanford cleanup resources because it requires a tank entry be made in addition to entries required for retrieval and final tank fill. Furthermore, if the fill action were reversed, more cleanup resources would be spent for that tank entry and related fill retrieval. Ecology is concerned that the scope and schedule of other Hanford projects will be adversely affected by these actions. Evaluation of the impacts to other Hanford cleanup efforts and the resulting impact(s) to the environment is missing from the draft ATCD EA.

Ecology has found the information presented in the ACTD EA to be incomplete; therefore, we could not complete a thorough review. We request that the USDOE consider these comments before proceeding in its determination of the environmental impact of the project.

If there are any questions or concerns on these comments, please feel free to contact me at (509) 736-3027.

Sincerely yours,



Melinda J. Brown, State Environmental Policy Act Coordinator  
Nuclear Waste Program

MB:jc

cc: Nick Ceto, USEPA  
Bob Lober, ORP  
Andy Stevens, ORP  
Jim Rasmussen, ORP  
R. Ovink, H9-01  
Todd Martin, HAB  
Stuart Harris, CTUIR  
Russell Jim, YIN  
Rick Sobotta, NPT  
Ken Niles, OOE  
Environmental Portal  
Administrative Record: Accelerated Tank Closure

Mr. Paul F.X. Dunigan, Jr.  
February 20, 2003

bcc: Brenda Becker-Khaleel, Ecology  
Joe Caggiano, Ecology  
Laura Cusack, Ecology  
Damon Delistraty, Ecology  
Suzanne Dahl, Ecology  
Jane Hedges, Ecology  
Dick Heggen, Ecology  
Jeff Lyon, Ecology  
Max Power, Ecology  
Barbara Ritchie, Ecology  
Laura Ruud, Ecology  
Ron Skinnarland, Ecology  
Joy Turner, Ecology  
Nancy Uziemblo, Ecology  
NWP Reader File  
NWP Central File: Accelerated Tank Closure



03-TPD-062

Department of Energy  
Richland Operations office  
P. O. Box 550  
Richland, Washington 99352  
JUN 24 2003

Melinda Brown  
State Environmental Policy Act Coordinator  
Nuclear Waste Program  
State of Washington, Department of Ecology  
1315 W. 4<sup>th</sup> Avenue  
Kennewick, Washington 99336-6018

RESPONSE TO COMMENTS ON ENVIRONMENTAL ASSESSMENT DOE/EA-1462 FOR THE ACCELERATED TANK CLOSURE DEMONSTRATION PROJECT

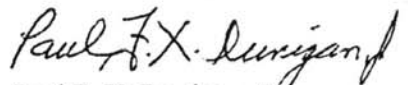
Dear Ms. Brown:

The U.S. Department of Energy (DOE), Office of River Protection (ORP) acknowledges receipt of the comments provided by the State of Washington, Department of Ecology (Ecology) on the Draft Environmental Assessment (EA) for the Accelerated Tank Closure Demonstration (ATCD) Project. ORP believes the conduct of this project will enhance our knowledge of the activities involved in the closure of single-shell tanks at the Hanford Site. The ATCD Project will contribute to the DOE commitment to protect public health and the environment.

Ecology has provided several comments on the Draft EA for the ATCD Project. These comments, with the DOE responses, are enclosed. As appropriate, DOE has noted where changes have been made in the Final EA as part of our response.

DOE appreciates your interest in this project. If you have any questions concerning the proposed action, please contact Mr. Robert Lober, Tank Farms Programs and Projects Division, (509) 373-7949. Questions on the NEPA process can be directed to me, (509)-376-6667.

Sincerely,

  
Paul F. X. Dunigan, Jr.  
NEPA Compliance Officer

TPD:RWL

Attachment

cc: Administrative Record

**State of Washington Department of Ecology Comments and Department of Energy  
Response on the ATCD Project Draft EA DOE/EA-1462**

The following is a listing of the comments made by the State of Washington, Department of Ecology and the DOE response to these comments. As appropriate, the comment responses indicate where changes in the final environmental assessment have been made.

**Comment 1:**

The draft EA does not satisfy the requirements of Title 40 Protection of the Environment, Section 1508.9 Environmental Assessment, item (3)(b) to provide a brief discussion of the environmental impacts of the proposed action and alternatives. Of particular concern to Ecology is a lack of substantive technical information about the environmental impacts of adding tank fill material in either loose granular or low strength cementation form to residual waste left after retrieval.

**Response:**

DOE does believe that the EA satisfies 40 CFR 1508.9 requirements for an Environmental Assessment. The environmental assessment does present alternatives (Section 3.0) and an appropriate level of discussion (Sections 2.0, 4.0, and 5.0) so that decision makers would be able to understand the impacts of the demonstration project.

The demonstration project will provide information on the technical and regulatory aspects of tank closure procedures and activities. The demonstration will be conducted in the tank farm and inside the tank environment. There is no other setting in which this kind of data can be collected. The potential impacts associated with removing the tank and the grout inside the tank are minor compared to the value of the information that will be obtained from the demonstration.

**Comment 2**

Ecology cannot support the contention made in the draft EA that retrieval of the fill material will not have significant environmental consequences because the physical form of the residual waste may be altered. The residual liquid waste may be absorbed into the cementitious mixture, which will in turn create a new added waste volume in the tank. Ecology does not understand what environmental benefits will result from the creation of an additional waste volume. From the USDOE description in the draft ACTD EA the waste in its present form can be removed. From the description in the draft ACTD EA, it appears that the environmental impact will not be beneficial.

**Response:**

The ATCD Project contemplates the retrieval of tank waste up to the volumetric goal of the Tri-Party Agreement (HFFACO). Following retrieval, DOE and the Tri-Party regulators will review the success of the retrieval efforts. If it is determined that sufficient waste has been removed from the tank, then DOE would proceed with the placement of the Phase I engineered fill portion of the demonstration. If it is determined that sufficient waste has not been removed to proceed with the demonstration, then DOE would not place any fill material in the tank and would suspend component closure activities for C-106 pending the completion of the Tank Closure EIS.

The text of the EA has been edited because retrievable grout is no longer part of the demonstration project. The ATCD Project will demonstrate field deployment of a high compression strength Phase I grout fill material. Between 160 and 500 cubic yards of grout may be placed in C-106. The total volume of C-106 is approximately 4,000 cubic yards. The amount of grout to be placed in this one tank is not a substantial amount of material and will not preclude the implementation of any of the tank closure alternatives under consideration in the Tank Closure EIS.

Comment 3:

Creation of a new waste volume does not support the policy of the State of Washington Legislature “to encourage reduction in the use of hazardous substance and reduction in the generation of hazardous waste whenever economically and technically practicable” Ecology does not support any action which is not consistent with this policy.

Response:

DOE believes that the ATCD Project is consistent with this policy.

Comment 4:

From the draft ATCD, Ecology cannot determine if any significant environmental impacts will result from the addition of sequestering agents to the fill material. The sequestering agents are said to reduce solubility and/or mobility of key contaminants.

Response:

The ATCD Project will collect information on 1) the technical and regulatory aspects of tank retrieval and closure activities, 2) the physical response and behavior of a Phase I grout fill in an actual tank, 3) field deployment of grout placement equipment and 4) the conduct of component closure activities of C-106. This demonstration may include the deployment of grout with sequestering agents. This would allow field-testing of this mixture to determine its compatibility with potential future grouting campaigns. Sequestering additives are being evaluated by the Savannah River Technology Center and tested in the laboratory environment to establish their usefulness and compatibility with C-106 conditions. Non-useful or incompatible sequestering agents would not be used in the ATCD Project.

Comment 5:

No information was provided to document the compatibility of the proposed fill with future final tank fill material, including engineering load/compaction requirements to prevent future tank void space subsidence. Ecology could not evaluate impacts of using the proposed fill on future fill efforts.

Response:

The fill will be a grout that is designed to be free flowing with adequate compressive strength to support future fill material loading. Section 2.5 of the EA has been modified and provides additional information on grout specifications.

**Comment 6:**

Also missing from the draft ATCD EA is an analysis of other reasonable alternatives including not filling the tank following retrieval. By design, successful retrieval of C-106 should remove most of the mobile contaminants and tank waste, making addition of waste stabilizing agents of no environmental benefit. If the retrieval is not successful (i.e., it does not meet Hanford Federal Facility Agreement and Consent Order Milestone M-45 requirements), further retrieval will likely be required.

**Response:**

The alternative of not filling the tank is addressed in the no action alternative (Section 3.1). Under the no action alternative there would be no ATCD Project.

**Comment 7:**

Section 1.0 PURPOSE AND NEED FOR AGENCY ACTION states that the draft ATCD EA is to provide information and analysis of the ATCD activities and the potential environmental effects of the actions. Lacking a discussion of all alternatives to residual waste stabilization, the draft ATCD EA cannot be said to have met the purpose intended.

**Response:**

The purpose and need statement (Section 1.0) for the ATCD Project has been modified. The purpose and need for conducting the ATCD Project is to collect information concerning the use of particular technologies that may be used in future tank closure actions.

**Comment 8:**

Ecology views with concern the intent of the ORP to use Pit 30 as the source of granular flow material. An earlier Environmental Assessment on borrow pits (DOE/EA-1403) noted that Piper's Daisy (*Erigeron piperlanus*) had been found in some areas of the pit in the past. The draft ATCD EA does not mention that species, which is considered a sensitive species. It is not mentioned in the SEPA checklist that accompanied the *Single-Shell Tank System Closure Plan*. Ecology does not regard the evaluation of potential impacts complete because the reviews are limited only to the area of the 241-C Tank Farm, but the proposed action will also affect Pit 30.

**Response:**

Grout used for this demonstration would be commercially produced offsite and trucked to the C tank farm. The ATCD Project would not utilize any Hanford Site borrow materials.

**Comment 9**

Ecology does not consider Section 4.5.1 Threatened and Endangered Species to be complete because it limits the discussion of species to the 241-C Tank Farm and adjacent staging area. Use of Pit 30 expands the evaluation of biological resources; therefore, a summary of the impacts of use of Pit 30 should be included.

**Response:**

The use of borrow material from Hanford Site borrow areas is no longer in the scope of the ATCD Project.

**Comment 10**

The draft ATCD EA describes tank isolation processes that will prevent inadvertent waste transfers and water intrusions. This practice appears to offer the least harm to the environment during the time when 241-C-106 awaits closure; therefore, Ecology would like a description of the incremental environmental benefit that will result from the addition of materials to the tank.

**Response:**

Section 1.3 of the EA has been modified to identify the benefits of this demonstration project.

**Comment 11:**

Section 2.3 of the draft ATCD EA suggests that new or modified penetrations in the top of the tank may be required. None of the potential impacts to the environment that could result from excavation of the area on top of the tank and opening new penetrations in the tank is included. Ecology cannot determine the risk to the environment that could result from those activities (e.g., releases to the air from excavation, alteration of the air flow through the tank that could dislodge contaminants and spread waste, degradation in the structural integrity of the tank) that might result from such preparation.

**Response:**

There will not be any new or modified penetration into C-106. This project would be accomplished using existing risers. Section 2.3 has been modified to remove the discussion of new or modified penetrations into the tank.

**Comment 12:**

Section 2.5 states that tank fill operations and documentation and assessment of residual waste volume will be conducted using video cameras. Ecology expects sampling of residual waste to be conducted, with video cameras used for verification.

**Response:**

Waste sampling will occur following retrieval activities, prior to grout placement.

**Comment 13:**

Section 2.9 states that isolation measures will be maintained in place until tank closure. Ecology cannot determine what measures will be taken to prevent intrusion after tank closure or during the closure process. Environmental impacts of removing isolation measures or not performing isolation should be addressed.

**Response:**

Additional text has been added to EA Section 2.9 to clarify post closure activities following the ATCD Project. The C tank farm is maintained in isolation following established security procedures. These procedures will remain in-place during and following the demonstration project. Isolation and security measures following final closure of the C tank farm will be established based upon the final closure method to be defined in the Tank Closure ROD and the DOE Long-term Stewardship Program.



## Comment 14:

Ecology is concerned because the draft ATCD EA Section 4.3 describes plumes of contaminants in groundwater and then explains that the contaminants are varying concentrations in the unsaturated area (i.e., the vadose zone above the groundwater). The listed contaminants are present in the vadose zone; however, they have not been detected in groundwater under the entire 200 Area. Section 4.3 should be corrected.

## Response:

Section 4.3 has been revised to address this comment.

## Comment 15:

Section 4.3 mentions technicium-99 concentrations that exceed the drinking water standard are present in groundwater concentrations below the 241-C Tank Farm. Due to the absence of information about the impacts in the draft ATCD EA, Ecology cannot tell what increased risk to the groundwater will result from the ATCD.

## Response:

The ATCD Project would not be expected to affect the vadose zone or the groundwater contaminant levels in a negative manner. The planned retrieval action would utilize lower liquid volumes, have less hydraulic pressure, and the sluicing liquid would spend less time in the tank than under typical sluicing operations. Following Phase I grout placement, the residuals in the tank would be more isolated and immobilized than they are now. DOE has modified the discussions in Section 4.3 and Section 5.3 to present this information.

## Comment 16:

The draft ATCD EA referenced two documents that were said to have evaluated tank fill alternatives (DOE 12194 *Tank Alternative Closure Demonstration Project Alternative Generation and Analysts* and RPP-11085 *Approach for the Accelerated Tank Closure Demonstration Project*). These documents were not provided with the draft ATCD EA to Ecology and the information in them was not included in the draft ATCD EA. The pertinent information in the two documents should be summarized in the draft ATCD EA.

## Response:

The executive summary of RPP 12194 has been added as EA Appendix C.

## Comment 17:

The proposed action imposes an unnecessary adverse impact on Hanford cleanup resources because it requires a tank entry be made in addition to entries required for retrieval and final tank fill. Furthermore, if the fill action were reversed, more cleanup resources would be spent for that tank entry and related fill retrieval. Ecology is concerned that the scope and schedule of other Hanford projects will be adversely affected by these actions. Evaluation of the impacts of other Hanford cleanup efforts and the resulting impact(s) to the environment is missing from the draft ATCD EA.

Response:

The scope of the ATCD Project has been modified and retrievable grout is no longer going to be placed in the tank. Entries for the ATCD would be limited to final waste retrieval and grout placement. Entries for removing the grout are not an option under the revised project but would be an action for consideration in the Tank Closure EIS.

DOE believes the information obtained from this demonstration justifies the potential costs noted. This demonstration is expected to be consistent with the final closure decision reached in the Tank Closure EIS. It is not expected that the ATCD Project will influence other project schedules.

FEB 13 '03 10:37AM DEPT FISHERIES



P. 2/3

State of Washington  
**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N, Olympia, WA 98501-1091 • (360) 902-2200; TDD (360) 902-2207  
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia, WA

February 13, 2003

Mr. Paul F.X. Dunigan, Jr.  
NEPA Compliance Officer  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550  
Richland, WA 99352

Dear Mr. Dunigan;

RE: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE ACCELERATED TANK CLOSURE DEMONSTRATION PROJECT (DOE/EA-1462)

The Washington Department of Fish and Wildlife (WDFW) has completed review of the EA for the Accelerated Tank Closure Demonstration Project (ATCD). The mandate of WDFW is to preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in the state waters and offshore waters. Wildlife, fish, and shellfish are the property of the state (RCW 77.04.012).

The EA indicates approximately 126 m<sup>3</sup> (165 yd<sup>3</sup>) of fill materials being considered for use in the ATCD project, and it further describes the use of an existing borrow site, Site 30, but it does not indicate how much fill from this borrow site will be needed, and how it will be expanded. The EA also discusses the possibility of an alternative borrow site being used, but it does not indicate the location. The Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (CLUP), for Pit 30, indicates, "*Expansion of the existing pit would be necessary to provide sufficient quantities of this material. Full use of the site would eradicate approximately 138 acres of shrub steppe habitat. Cultural resource and sensitive species surveys have not been conducted for Pit 30 and would be required prior to excavation. Completion of these surveys and consultation with the State of Washington and the USFWS would be required prior to initiating activity*". Biological surveys should be completed during the spring, when species most likely impacted by the project would be encountered, at all sites impacted by the ATCD project including any borrow sites. Rare plants surveys should also be included, considering the fact that Table 4-1 includes 6 species of rare plants The Nature Conservancy discovered on Central Hanford (Columbia milkvetch, dwarf evening primrose, Hoover's desert parsley, loeflingia, persistent sepal yellowcrest, Umtanum desert buckwheat).

WDFW recommends compensatory mitigation (ratio of 3:1) for shrub steppe habitat that may be impacted by this project, including the use of borrow sites. The goal of our mitigation policy is to

FEB 13 '03 10:37AM DEPT FISHERIES

P. 3/3

Mr. Paul F.X. Dunigan, Jr.

February 13, 2003

Page 2

maintain the functions and values of fish and wildlife habitat, and we strive to protect the productive capacity and opportunities reasonably expected of a site in the future. In the long-term WDFW shall seek a net gain in productive capacity of habitat through restoration, creation and enhancement.

The Federal or Washington State Listed Threatened, Endangered, and candidate species occurring on the Hanford site (Table 4-1) excluded several species. This table should also include the following:

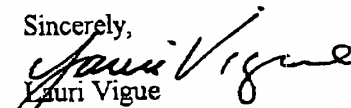
- Loggerhead shrike (SC/FSC)
- Washington Ground Squirrel (SC/FC)
- Burrowing Owl (SC/FSC)
- Pygmy Rabbit (SE/FE)
- Northern Goshawk (SC/FSC)
- Common Loon (SS)
- Sagebrush Lizard (FSC)
- Olive-sided Flycatcher (FSC)
- Willow Flycatcher (FSC)
- Bull Trout (SC/FT)
- Lewis Woodpecker (SC)
- Vaux's Swift (SC)

Also, steelhead are incorrectly listed in Table 4-1, they are protected under the mid Columbia River ESU, not upper Columbia ESU.

As indicated above, WDFW's main concern with this EA is the insufficient amount of information documented to adequately determine the impact to the environment from this proposed project. This EA excluded maps that describe the impact site; maps and illustrations of the proposed project site including the aerial photo (2000) referenced on page 11, would have been helpful to include in the appendix.

WDFW appreciates the opportunity to comment on this EA. I may be reached at (360) 902-2425 if you have questions.

Sincerely,



Lauri Vigue  
Fish and Wildlife Biologist

Cc: Ted Clausing, WDFW  
Melinda Brown, WDOE  
Larry Goldstein, WDOE



03-TPD-061

Department of Energy  
Richland Operations office  
P. O. Box 550  
Richland, Washington 99352

**JUN 25 2003**

Lauri Vigue  
Fish and Wildlife Biologist  
State of Washington, Department of Fish and Wildlife  
600 Capitol Way N. Olympia WA 98501-1091

RESPONSE TO COMMENTS ON ENVIRONMENTAL ASSESSMENT DOE/EA-1462 FOR THE ACCELERATED TANK CLOSURE DEMONSTRATION PROJECT

Dear Ms. Vigue:

The U.S. Department of Energy (DOE), Office of River Protection (ORP) acknowledges receipt of the comments provided by the State of Washington, Department of Fish and Wildlife (WDFW) on the Draft Environmental Assessment (EA) for the Accelerated Tank Closure Demonstration (ATCD) Project. ORP believes the conduct of this project will enhance our knowledge of the activities involved in the closure of single-shell tanks at the Hanford Site. The ATCD Project will contribute to the DOE commitment to protect public health and the environment.

The WDFW has provided several comments on the Draft EA for the ATCD Project. These comments, with the DOE responses, are enclosed. As appropriate, DOE has noted where changes have been made in the Final EA as part of our response.

DOE appreciates your interest in this project. If you have additional questions concerning the proposed action, please contact Mr. Robert Lober, Tank Farms Programs and Projects Division, (509) 373-7949. Questions on the NEPA process can be directed to me, (509) 376-6667.

Sincerely,

A handwritten signature in black ink that reads "Paul F. X. Dunigan, Jr." with a stylized flourish at the end.

Paul F. X. Dunigan, Jr.  
NEPA Compliance Officer

TPD:RWL

Attachment

cc: Administrative Record

**Department of Energy Response to Comments provided by the State of Washington,  
Department of Fish and Wildlife on The ATCD Project Environmental Assessment Draft  
EA DOE/EA-1462**

The following is a listing of the specific comments made by the State of Washington, Department of Fish and Wildlife and the DOE response to these comments. As appropriate, the comment responses indicate where changes in the final environmental assessment have been made.

Comment 1:

The EA indicates approximately 126 m<sup>3</sup> (165 yds<sup>3</sup>) of fill materials being considered for use in the ATCD Project and it further describes the use of an existing borrow site, Site 30, but it does not indicate how much fill from this borrow site will be needed, and how it will be expanded. The EA also discusses the possibility of an alternative borrow site being used but it does not indicate the location. The Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (CLUP), for Pit 30 indicates, "Expansion of the existing pit would be necessary to provide sufficient quantities of this material. Full use of the site would eradicate approximately 138 acres of shrub steppe habitat. Cultural resources and sensitive species surveys have not been conducted for Pit 30 and would be required prior to excavation. Completion of these surveys and consultation with the State of Washington and the USFWS would be required prior to initiating activity". Biological surveys should be completed during the spring, when species most likely impacted by the project would be encountered, at all sites impacted by the ATCD Project including any borrow sites. Rare plants surveys should also be included, considering the fact that Table 4-1 includes 6 species of rare plant The Nature Conservancy discovered on Central Hanford (Columbia milkvetch, dwarf evening primrose, Hoover's desert parsley, loeflingia, persistent sepal yellowcrest, Umtanum desert buckwheat).

Response:

The use of borrow material from Pit 30 or any other Hanford Site borrow areas is no longer in the scope of the ATCD Project.

Comment 2:

WDFW recommends compensatory mitigation (ratio of 3:1) for shrub steppe habitat that may be impacted by this project, including the use of borrow sites.

Response:

The ATCD Project would not result in any shrub steppe habitat disturbance. Therefore, there is no basis for compensatory mitigation of this habitat. Section 2.0 of the EA has been revised to clarify the proposed actions.

Comment 3:

The Federal or Washington State Listed Threatened, Endangered, and candidate species occurring on the Hanford site (Table 4-1) excluded several species. (List provided)

Response:

Comment noted and Table 4-1 has been amended.

**Comment 4:**

Steelhead are incorrectly listed in Table 4-1, they are protected under the mid Columbia River ESU, not upper Columbia ESU.

**Response:**

The Hanford Site is within the mid Columbia and upper Columbia River ESUs. For clarity, footnote “c” has been deleted from Table 4-1.

**Comment 5:**

WDFW’s main concern with this EA is the insufficient amount of information documented to adequately determine the impact to the environment from this proposed project.

**Response:**

Additional information has been included in the EA concerning recent biological surveys in the 200 East Area. This has been included in Appendix B to the EA.

**Comment 6:**

This EA excluded maps that describe the impact site; maps and illustrations of the proposed project site including the aerial photo (2000) referenced on page 11, would have been helpful to include in the appendix.

**Response:**

A map (Figure 2) has been added to the final EA to illustrate the C tank farm layout.

This page intentionally left blank.



**APPENDIX B**

**BLANKET BIOLOGICAL REVIEW FOR THE TANK FARM FACILITIES**

This page intentionally left blank.

---

## Pacific Northwest National Laboratory

Operated by Battelle for the  
U.S. Department of Energy

May 14, 2003

Mr. William T. Dixon  
CH2MHill Hanford Group, Inc.  
P. O. Box 1500, MSIN R1-51  
Richland, WA 99352

Dear Mr. Dixon:

BLANKET BIOLOGICAL REVIEW FOR THE TANK FARM FACILITIES, 200 East AND  
200 West Areas, #2003-200-037.

### Project Description:

- This blanket biological review covers all routine maintenance, operations, and characterization activities within the defined boundaries of the Tank Farms in 200 East and 200 West Areas as well as project W-523 excavations and other project work within these boundaries (see attached map for area of coverage). However this review does not apply to the demolition of buildings. This letter may be used as a reference for NEPA CX checklists and for support of excavation permits within the area of coverage.

### Survey Objectives:

- To determine the occurrence in the subject area of plant and animal species protected under the Endangered Species Act (ESA), candidates for such protection, and species listed as threatened, endangered, candidate, sensitive, or monitor by the state of Washington, and species protected under the Migratory Bird Treaty Act,
- To evaluate the potential impacts of disturbance on priority habitats and protected plant and animal species identified in the survey.

### Survey Methods:

- Pedestrian and ocular reconnaissance of the tank farm areas was conducted by C. A. Duberstein and N. A. Cadoret on 2 and 13 May, 2003.
- Priority habitats and species of concern are documented as such in the following: Washington Department of Fish and Wildlife (1993, 1994), Washington State Department of Natural Resources (1994), and for migratory birds, U.S. Fish and Wildlife Service (1985). Lists of animal and plant species considered Endangered, Threatened,

902 Battelle Boulevard • P.O. Box 999 • Richland, WA 99352

---

Mr. W. T. Dixon  
2003-200-037  
Page 2 of 6

Proposed, or Candidate by the USFWS are maintained at 50 CFR 17.11 and 50 CFR 17.12.

**Survey Results:**

- The areas included in this blanket review are highly disturbed with virtually no vegetation.

The following migratory bird activity was noted within the **200 East** project areas:

- **2237-E:** A barn swallow (*Hirundo rustica*) nest in a wooden roof corner on the east side.
- **242-A:** Three inactive cliff swallow (*Hirundo pyrrhonota*) nests on the north side.
- **242-B:** A house finch perched on a power pole on the southwest side, and a nest of an undetermined bird species behind a motor on the south side.
- **244-AR:** A Say's phoebe (*Sayornis saya*) on the north side.
- **2707-AR:** An active house finch nest above an east side entrance.
- **272-AW:** An active western kingbird (*Tyrannus verticalis*) nest on the loading dock crane on north end.
- **MO-266:** One inactive Brewer's blackbird (*Euphagus cyanocephalus*) in landscaped junipers on the west side.
- **MO-267:** One inactive Brewer's blackbird in landscaped junipers on the east side.
- **MO-439:** A western kingbird nest below a wooden roof on the east side.

The following migratory bird activity was noted within the **200 West** project areas:

- **241-SX-401:** An active barn swallow nest in a below-grade stairwell on the south side.
- **241-SX-402:** An active Say's phoebe nest in a below-grade stairwell on the south side.
- **242-S:** Two barn swallow nests above the SWP Lobby entrance on the south side and a common raven (*Corvus corax*) nest on an external platform on the south side.

Mr. W. T. Dixon  
2003-200-037  
Page 3 of 6

- **242-T:** A house finch (*Caprodacus mexicanus*) nest in a motor housing on the east side and a Say's phoebe singing from a pipe.
- **244-TX Survey Booth:** A house finch (*Caprodacus mexicanus*) nest on an inside light.
- **244-U-2904:** An inactive barn swallow nest under a southwest eave.
- **2707-SX:** An inactive barn swallow nest within the flammables bottle dock on the south side, a house finch nest under a wooden roof on the east side, and 2 more house finch nests within the corners of a Connex container adjacent the north side.
- **2724-TX:** An active house finch nest in a telephone box on the east side.
- **272-S:** An active western kingbird nest on a northeast side heat pump pipe support.
- **MO-295:** A house finch nest in a corner below the east side eave.
- **MO-296:** A house finch was flushed from under the stairs on the south side.
- Species observed that are not covered under the Migratory Bird Treaty Act include European starlings (*Sturnus vulgaris*), rock doves (*Columba livia*), and house sparrows (*Passer domesticus*).

#### Considerations and Recommendations:

- No plant and animal species protected under the ESA, candidates for such protection, or species listed by the Washington State government were observed.
- The Migratory Bird Treaty Act makes it illegal to take, capture, or kill, as applicable, any migratory bird, or any part, nest or egg of such. To assure compliance with the MBTA, we recommend that any alterations to building exteriors or other outdoor structures be performed outside of the normal breeding season (i.e. between August and March).
- Several migratory bird species had yet to arrive on the Hanford site or had not initiated nesting at the time of the field survey. Therefore some nesting activity was likely missed. Site workers should inspect all outdoor areas prior to disturbance and request support from the PNNL Ecological Compliance Assessment staff if any bird nests may be damaged by routine characterization, maintenance or operations activities.

Mr. W. T. Dixon  
2003-200-037  
Page 4 of 6

- No adverse impacts to species or habitats of concern are expected to occur from the maintenance, operation, or characterization activities at 200 East & West tank farms and associated support facilities.
- This Ecological Compliance Review is valid until 30 April 2004.

Sincerely,

*Cony Dehate for:*

Michael R. Sackschewsky  
Project Manager  
Ecological Compliance Assessment Project  
Pacific Northwest National Laboratory

bcc: KF Clouse, FHI N1-25  
PF Dunigan, RL A5-58  
DC Ward, RL A2-15  
KR Welsch, FHI N1-25  
Environmental Portal A3-01  
ECAP / File / LB

LB:mrs

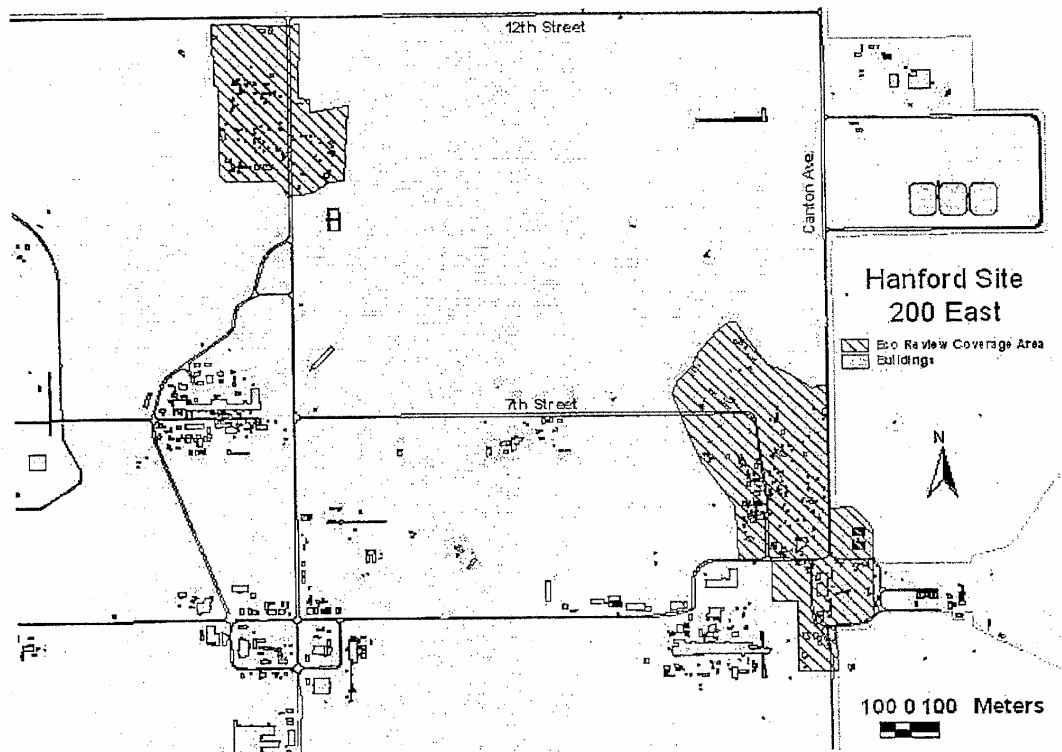
CC: Donald Carrell R1-51  
Phillip Miller R1-51  
Grady Willingham R1-51

Patrick Sobotta  
Nez Perce Tribe  
P.O. Box 365  
Lapwai, ID 83540-0365

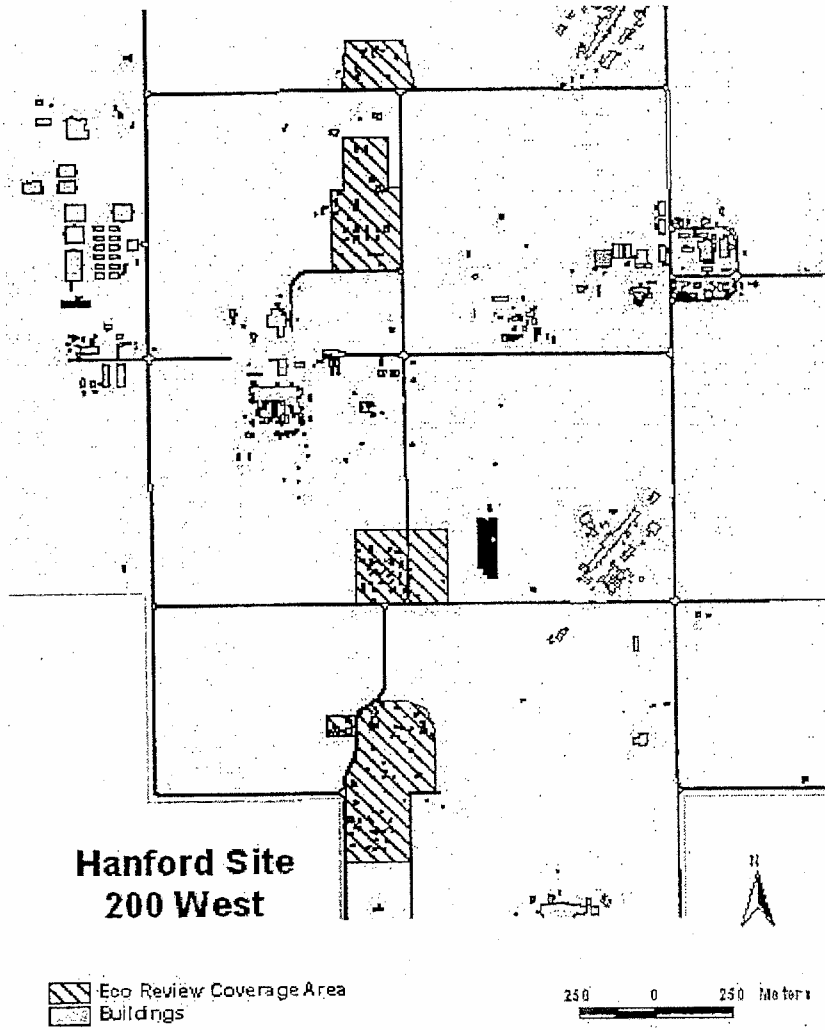
#### REFERENCES

- U. S. Fish and Wildlife Service. 1985. Revised List of Migratory Birds; Final Rule. 50 FR 13708 (April 5, 1985).
- Washington Department of Fish and Wildlife. 1993. Priority Habitats and Species. pp. 22.
- Washington Department of Fish and Wildlife. 1994. Species of Special Concern in Washington. (April 1994).
- Washington Department of Natural Resources. 1994. Endangered, Threatened & Sensitive Vascular Plants of Washington. (January 1994).

Mr. W. T. Dixon  
2003-200-037  
Page 5 of 6



Mr. W. T. Dixon  
2003-200-037  
Page 6 of 6





**APPENDIX C**

**EXECUTIVE SUMMARY TANK ALTERNATIVE CLOSURE DEMONSTRATION  
PROJECT, ALTERNATIVE GENERATION & ANALYSIS**

This page intentionally left blank.

RPP-12194 REV 0  
(September 15, 2002)**EXECUTIVE SUMMARY**

The purposes of this Alternatives Generation and Analysis (AGA) report are to evaluate the regulatory and technical alternatives for characterization, retrieval, and closure of the five tanks selected for the Accelerated Tank Closure Demonstration (ATCD) project, to assess the relationship between costs and benefits associated with waste retrieval to various possible end states, and to define the methodologies and approaches to be used for risk assessment. This report builds on information summarized in the *ATCD Data Assessment Report* (DAR) (Callison 2002), and supports finalization of preliminary engineering activities for waste retrieval and tank closure.

The ATCD approach is being implemented in a step-wise fashion to develop the technical basis for retrieval and closure of five single-shell tanks (SSTs) while working through the regulatory process and managing programmatic risk (Lee 2002).

Five tanks, all located within the C Tank Farm, were selected for demonstration of closure (the 241-C-106 tank and four 200 series tanks [241-C-201 through 241-C-204]). A complete description and background of C Tank Farm and the five selected tanks is found in the DAR. A brief summary of the tank capacities and current state as compared to the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) retrieval goal is provided below:

Summary of Tank Capacity and Current State

Tank	Capacity L (gal)	Current Estimated Volume, L (gal)			Residual Volume Retrieval Goal <sup>a</sup> L (gal)
		Liquids	Solids	Total	
241-C-106	2,010,000 (530,000)	115,000(30,000)	23,000 (6,000)	138,000 (36,000)	10,219 (2,700)
241-C-201	208,000 (55,000)	None	4,000 (1,000)	4,000 (1,000)	852 (225)
241-C-202	208,000 (55,000)	None	4,000 (1,000)	4,000 (1,000)	852 (225)
241-C-203	208,000 (55,000)	None	10,000 (3,000)	10,000 (3,000)	852 (225)
241-C-204	208,000 (55,000)	None	10,000 (3,000)	10,000 (3,000)	852 (225)

<sup>a</sup> Based on HFFACO milestone *M-45*.

**REGULATORY ALTERNATIVES**

The regulatory strategy for the ATCD Project identifies an approach for obtaining the necessary approvals from the U.S. Department of Energy (DOE), Washington State Department of Ecology (Ecology), Washington State Department of Health (WDOH), and the Environmental Protection Agency for the proposed actions. The strategy focuses on addressing decisions associated with

the key regulatory requirements controlling tank waste retrieval and closure technology demonstrations.

The recommended strategy for compliance with the regulatory requirements is summarized by the following elements:

National Environmental Policy Act (NEPA) compliance with an Environmental Assessment and State Environmental Policy Act (SEPA) checklist.

Tier Hazardous Waste Management Act (HWMA)/(RCRA) Closure Plans for RCRA Permit Modifications and DOE Order 435.1 requirements.

Redesignating residual tank waste as waste incidental to reprocessing (WIR) in accordance with DOE Order 435.1.

Long- and short-term risk is evaluated through a detailed site-specific risk assessment based on conditions and knowledge of the C Tank Farm integrated with a site-wide composite analysis for a performance assessment.

Traditional in-tank characterization requires adjustments to support the ATCD accelerated schedule. Sampling techniques and a non-traditional characterization strategy are being evaluated in the data quality objectives. The strategy includes accelerating the analytical processing of the post-retrieval samples to support regulatory approval. It is assumed that residual wastes will have the same or very similar composition as pre-retrieval wastes.

## COST-BENEFIT ANALYSIS

Selection of retrieval technologies and overall waste retrieval strategy must eventually consider factors other than retrieval technology capability. This need to consider other factors, including cost, is addressed in HFFACO Milestone M-45, Appendix H to the HFFACO, DOE Orders, and the 1996 Memorandum of Understanding agreed to by DOE and Ecology.

While we may lack the necessary understanding of the key elements impacting tank closure decisions to invoke a cost/benefit argument at this time, it is informative to conduct a preliminary evaluation of the risk reduction benefits of waste retrieval versus cost. The following principal conclusions may be drawn from this study:

- Significant risk reduction has already occurred from retrieval of 241-C-106 waste by past-practice sluicing
- Additional risk reduction by (a) pumping liquids only, (b) removing liquids and sludge to the HFFACO milestone, and (c) removing liquids and sludge to beyond the HFFACO milestone will cost significantly more, per unit of risk reduction, than the risk reduction that has already occurred.

- The cost per unit of risk reduction for progressively cleaner end states in 241-C-106 increases with increasing cost, i.e., in economic terms there is a diminishing marginal rate of return (measured by risk reduction) for increased retrieval costs.

It is important to note that this work effort and method for comparing the net benefit of a given waste retrieval action will continue to evolve as we gain maturity in the tools used to support tank closure decisions.

## RETRIEVAL ALTERNATIVES

Previous analyses have been conducted evaluating retrieval technologies for removal of sludge waste from SSTs. This AGA uses the results of those studies to determine the appropriate technologies for retrieval of the sludge from tank 241-C-106 and the 241-C-200 tanks.

The selected alternative for retrieval of the remaining waste in 241-C-106 includes the following key elements:

- Remove the necessary in-tank equipment to support the installation of retrieval system(s).
- Proceed with the pumping of liquid waste volumes from the tank. This effort is intended to remove the majority of the liquid residues and acknowledges the fact that the majority of the key risk drivers (i.e., mobile radionuclide inventory) exist within the liquid waste component. Evaluate use of the existing pipe-in-pipe waste transfer system provided under project W-320 vs. interfacing with the overground transfer line used for 241-C-103 interim stabilization.
- Using the existing infrastructure and the pumping systems deployed, design and place a modified sluicing system within the tank with the goal of retrieving the majority of the residual solid wastes within the tank.
- Evaluate the success of the modified sluicing system. If this retrieval system does not meet the HFFACO goal (less than 360 cubic feet of residuals), then proceed with additional retrieval or, if approved by Ecology, appropriate closure activities pursuant to HFFACO Appendix H.
- Maintain a parallel development and engineering activity for the Mobile Retrieval System as selected in the alternative analysis (Attachment 3). This system would be deployed in order to assure the acceleration of tank closure actions in the event modified sluicing is delayed, or waste retrieval does not achieve the HFFACO retrieval goal and an exception is not obtained.

Deployment of this multi-tiered approach will allow progress, while assuring that the tank closure schedules are not adversely affected by a single technology failure or a regulatory obstacle. CH2M HILL Hanford Group, Inc. has selected this approach as a means to ensure that the success of each retrieval technology identified above can be directly linked to an associated reduction in risk. This approach will provide a means to evaluate the effectiveness of retrieval

technology capabilities for application to future SST retrieval and illustrate a continued commitment to progress for the accelerated cleanup of the Hanford site.

A modified sluicing system has the potential to achieve compliance with the HFFACO retrieval requirements contained in milestone M-45-00. It is recommended for first line deployment since it fits within an allowable cost profile, can be implemented within the tight scheduling demands for the ATCD Project, will assist in the removal of the balance of the liquid and solid wastes, and will achieve removal of key mobile contaminants (including the expected removal of soluble components from the remaining sludge).

It should be noted that the alternative analysis (Attachment 3) was primarily focused on a technical evaluation of retrieval systems. Subsequent strategic planning sessions with ORP modified this recommended approach in an effort to meet the needs for rapid progress in the field, accelerated removal of liquids and sludges and the expectation that the concentration of key contaminants and the volume of the existing waste piles (solids) within the tank would be dramatically reduced in the first two steps of a multi-tiered approach. If additional retrieval is required to comply with the HFFACO, the MRS will be deployed. This provides an opportunity to demonstrate the MRS efficacy in a less demanding environment prior to deployment in future tank retrievals.

This multi-tiered demonstration is proposed in an effort to meet the 360 cubic feet HFFACO retrieval goal. Pending the results of this planned demonstration, and subsequent regulatory approval, it is understood that Ecology may require the deployment of the MRS to complete the removal of additional waste residues. However, the efficiencies gained from early deployment of modified technologies, any Authorization Basis modifications, updated environmental permits, tank preparation activities and deployment of trained operational staff would be made available to accelerate the momentum of the retrieval and closure activities for 241-C-106. It is important to note that, per the approach described above, a multi-tiered path for technology development efforts will be pursued to maintain operational flexibility for waste retrieval operations.

## CLOSURE ALTERNATIVES

The focus of ATCD Project is to prepare the tank for closure. Closure period for ancillary equipment, surrounding soil and final surface cap design are not evaluated in the AGA.

The DAR (Callison 2002) identified several tank fill alternatives from previous engineering studies and DOE complex experience. Those alternatives were considered in this AGA. Also included in the DAR is a discussion on the use of chemical getters. The development of getters is progressing, and the selection of the particular type to be used will be driven by constituents of concern. It is assumed that some type of getter additive will be used as a component of tank fill for residual waste stabilization. The specific selection and method of application will be determined based on studies planned in fiscal year (FY) 2003. In the mid 1990's, two principal studies were conducted that evaluated structural tank fill alternatives for closure (Skelley, 1996 and SNL, 1998 a, b). Alternatives evaluated assumed complete filling of the tank. The alternatives proposed in Skelley 1996 were essentially homogeneous systems consisting of a

single material type. The tank fill design proposed in SNL 1998a and 1998b assigned different functions to layered components of differing material types.

Fill alternatives being evaluated for the ATCD Project adopt a multi-function approach, assigning different functions to an initial waste stabilization layer, and to the remaining tank void space to be filled (i.e., structural fill zone). An objective for the waste stabilization layer, but not for structural fill, is retrievability pending final decisions on tank farm closure and the amount of waste that must be removed from tanks to support closure. Waste stabilization can include both physical and chemical stabilization with the objective of reducing the mobility of the residual contaminants in the presence of infiltrating water.

Grout fill and granular fill alternatives were evaluated for the waste stabilization layer. Grout was identified as the preferred alternative for both tank 241-C-106 and the 200-series tanks. However, it was noted that events may necessitate revisiting this decision. For example, the issue of reversibility may take on increased importance pending results of the NEPA process, and the current lawsuit challenging DOE's authority to reclassify high-level waste under DOE Order 435.1. Also, planned development of getter materials in FY 2003 may reveal significant differences in performance in a granular fill versus a grout fill. Finally, the choice of retrieval technology could shift the balance in favor of granular fill with getters, if the retrieval equipment allowed mixing of fill material with waste.

Grout, gravel, concrete, hybrid (gravel, followed by grout injection), and a multi-layer fill were evaluated for the tank structural fill. For this application, grout installed in lifts was selected as the preferred tank fill alternative.

## RISK ASSESSMENT STRATEGY

Numerous procedural and regulatory requirements drive the need to assess long-term and short-term risks for waste retrieval and tank closure. The risk assessment strategy for the ATCD Project builds on a significant body of past work including the *C Tank Farm Retrieval Performance Evaluation (RPE)* (DOE-RL 1999), *A/AX and C Tank Farm Subsurface Characterization Report (Draft)*, *Phase I RCRA Facility Investigation/Corrective Measures Study Work Plan for SST Waste Management Areas* (DOE-RL 2000), and the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 200 Area RJ/FS Master Plan*. Risk assessment for the ATCD Project will be strongly integrated with the data gathering efforts of the Vadose Zone Characterization program, Immobilized Low Activity Waste program, RCRA Groundwater Monitoring Well Drilling program, improvements in the SST Farm Best Basis Inventory (BBI 2001), and the 200 Area CERCLA Remediation program.

The recommended long-term risk assessment approach includes the following elements:

- Define performance objectives
- Define the conceptual exposure model
- Define the site physical conceptual model

- Identify and catalog the input values for fate and transport simulations
- Identify relevant closure management alternatives and decisions
- Implement the risk assessment simulations

The recommended short-term risk assessment approach involves developing worker exposure scenarios for tank closure, assessing risk for those scenarios, and either mitigating risk through engineering design or operational controls, or avoiding risk by requesting exemption from regulatory criteria (e.g., HFFACO Appendix H).

The recommended ecological assessment approach is to become integrated with the Central Plateau Ecological Assessment currently underway between Ecology and DOE.

## REFERENCES

BBI, 2001, *Best Basis Inventory*, access page located at: <http://twins.pnl.gov:8001/twins.htm>, as of May 2001.

Callison, S. W., 2002, "Accelerated Tank Closure Demonstration Data Assessment," RPP-10950, Revision 0, August 2002, CH2M HILL Hanford Group, Inc., Richland, Washington.

DOE-RL, 1999, *Retrieval Performance Evaluation Methodology for the AX Tank Farm*, DOE/RL-98-72, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2000, *Phase 1 RCRA Facility Investigation/Corrective Measure Study Work Plan for Single-Shell Tank Waste Management Areas*, DOE/RL-99-36, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

"Hazardous Waste Management Act," RCW 70.105, *Revised Code of Washington*, as amended.

Lee, T. A., 2002, "Approach for the Accelerated Tank Closure Demonstration Project," RPP-11085, Revision 0. July 2002, CH2M HILL Hanford Group, Inc., Richland, Washington.

*National Environmental Policy Act of 1969*, 42, USC 4321, et seq.

Skelly, W. A. 1996, *Engineering Study of Tank Fill Alternatives for Closure of Single-Shell Tanks*, WHC-SD-WM-ES-399, Westinghouse Hanford, Company, Richland, Washington.

SNL, 1998a, *Stabilization of In-Tank Residual Wastes and External-Tank Soil Contamination for the Hanford Tank Closure Program: Applications to the AX Tank Farm*, SAND98-1460, Sandia National Laboratories, Albuquerque, New Mexico.



SNL, 1998b, *Stabilization of In-Tank Residual Wastes and External-Tank Soil Contamination for the Hanford Tank Closure Program: Applications to the AX Tank Farm*, SAND98-2445, Sandia National Laboratories, Albuquerque, New Mexico.

“State Environmental Policy Act of 1983 (SEPA),” RCW 43.21c, *Revised Code of Washington*, as amended.

*Resource Conservation and Recovery Act of 1976*, 42, USC 6901, et seq.

This page intentionally left blank.

**FINDING OF NO SIGNIFICANT IMPACT**

ACCELERATED TANK CLOSURE  
DEMONSTRATION (ATCD) PROJECT

HANFORD SITE, RICHLAND, WASHINGTON

U.S. DEPARTMENT OF ENERGY

JUNE 2003

**AGENCY:** U.S. Department of Energy

**ACTION:** Finding of No Significant Impact

**SUMMARY:** The U.S. Department of Energy (DOE) has prepared an Environmental Assessment, DOE/EA-1462, to assess environmental impacts associated with the Accelerated Tank Closure Demonstration (ATCD) Project. Based on the analysis in the EA, and considering state agency comments, DOE has determined that the proposed action is not a major federal action significantly affecting the quality of the human environment within the meaning of the “National Environmental Policy Act of 1969” (NEPA), 42 U.S.C. 4321, et seq. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

**ADDRESSES AND FURTHER INFORMATION:** Single copies of the EA and further information about the proposed action are available from:

U.S. Department of Energy  
Office of River Protection  
R. W. Lober, NEPA Document Manager  
P.O. Box 450  
Richland, Washington 99352  
Phone: (509) 373-7949  
e-mail: Robert\_W\_Lober@rl.gov

For further information regarding the DOE NEPA process, contact:

Ms. Carol M. Borgstrom, Director  
Office of NEPA Policy and Compliance  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585  
Phone: (202) 586-4600

**PURPOSE AND NEED:** The U.S. Department of Energy needs to collect engineering and technical information on 1) the physical response and behavior of a Phase I grout fill in an actual tank, 2) field deployment of grout production equipment and 3) the conduct of component closure activities of single-shell tank (SST) 241-C-106 (C-106). This information will be used in evaluating future closure actions of the remaining SSTs and tank farms at the Hanford Site. This information may also support preparation of the Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, Washington (Tank Closure EIS).

**BACKGROUND:** In 1997, DOE issued the “Record of Decision (ROD) for the Tank Waste Remediation System (TWRS) Environmental Impact Statement (EIS),” Hanford Site, Richland,

Washington (62 FR 8693), for the management and disposal of radioactive, hazardous, and mixed waste within the TWRS program. In the TWRS ROD, DOE selected the Phased Implementation alternative as the preferred alternative.

The Phased Implementation alternative consists of Phase I, the development and demonstration phase, and Phase II, the full-scale production phase. In Phase I, which DOE has initiated, various demonstrations are to be conducted to fill data gaps and provide information on the effectiveness of retrieval technologies, characteristics of the tank wastes, effectiveness of waste separation, immobilization techniques, treatment technologies, and the processes involved in closing tanks.

The information gained from this demonstration project is essential for future decisions related to tank farm closure.

**PROPOSED ACTION:** The ATCD project will provide data on the technical and regulatory framework under which the future closure of tanks can be conducted. The ATCD project will demonstrate component closure actions in single-shell tank C-106 following waste retrieval in accordance with the TWRS EIS and the Hanford Federal Facility Agreement and Consent Order criteria. Retrieved waste will be stored in double-shell tanks at the Hanford Site for future treatment and disposal. Any waste remaining in the tanks will be stabilized. It is estimated that between 30- and 90-cm (12-to 36-in.) of high strength grout (~126- to 380- m<sup>3</sup> or ~160- to ~500- yd<sup>3</sup>) would be placed in C-106 as part of the Phase I fill demonstration. This volume assumes that the Phase I fill volume required for waste heel stabilization is a minimum of 30.5 cm (12 in.) deep in a flat-bottomed tank. To evaluate the grout behavior around in-tank equipment during placement, additional grout will be placed in C-106. The actual volume of fill may vary depending on the height of the waste heel and the height of equipment present. Prior to the placement of any fill material in C-106, DOE has committed to review the success of the tank waste retrieval efforts with the State of Washington Department of Ecology (Ecology). Placement of the Phase 1 grout would not commence until Ecology and DOE concur that retrieval goals have been satisfied.

Technical and regulatory data obtained will contribute to an understanding of how to place grout in tanks, how to effectively manage the deployment of grout production equipment and identifying the resources that will be necessary for closure as well as the durations involved. During the planning and laboratory testing of grout formulations, information will also be obtained that will contribute to the evaluations in the Tank Closure EIS and to the subsequent decisions DOE will make concerning closure of tank farms and tank farm systems. This information will be developed to support the Tank Closure EIS and Record of Decision and is expected to provide DOE critical information that is based on actual experience with the technical and regulatory issues that will affect tank farm closure.

**ALTERNATIVES CONSIDERED:**

**No Action Alternative:** Under the No Action alternative, DOE would not conduct tank closure demonstrations. The existing tank farm operation and management procedures would be maintained. This alternative would be consistent with continuing to implement the Phased Implementation alternative as selected in the TWRS Record of Decision (62 FR 8693), but no new information would be gained.

**Alternatives:** Alternatives to the proposed action include using a different tank or increasing the number of tanks that would be used in the demonstration and/or using alternative fill materials. Impacts associated with performing the demonstration in a different tank would be expected to be similar to those described for C-106. Increasing the number of tanks would create a proportional increase in the impacts described for C-106. To meet demonstration project requirements, alternative fill materials would have to be able to meet the characteristic test requirements of a flowable high-strength grout.

**ENVIRONMENTAL IMPACTS:**

**Soils:** No on-site borrow material would be utilized for the ATCD project, therefore no significant impact to geologic or soil resources is expected.

**Surface Water:** There would be no impacts to surface waters from the ATCD project.

**Floodplains and Wetlands:** There would be no impacts to wetlands or designated floodplains from the ATCD project. There are no wetlands or designated floodplains in the project area.

**Groundwater:** No significant adverse impacts to groundwater are expected as a result of the ATCD project. The stabilization of C-106 residual wastes would benefit the local groundwater resource by reducing the potential for future groundwater contamination.

**Air Quality:** The ATCD project would be conducted in compliance with state and federal air quality permit requirements. A high-efficiency air filtration system would be used during interim fill placement in tank C-106 to minimize the potential for toxic or radioactive air emissions. Fugitive dust generated by construction traffic would be controlled by dust suppression measures (e.g., water spray or surfactants). Therefore, no substantial adverse impacts to air quality are anticipated.

**Biological Habitat:** The land in the ATCD project area and the proposed staging area is heavily disturbed. The tank farms underwent extensive excavation when the tanks were installed underground. The staging area is located in a previously disturbed area where overhead and underground utility lines were constructed. The activities of the ATCD project would be conducted in these previously disturbed areas, so there would be no significant impact to biological resources or their habitat as a result of the ATCD project.

**Threatened/Endangered Species:** No impacts to endangered or threatened species, nesting sites, or habitats are expected because none have been identified in the ATCD project area.

**Land Use:** The Central Plateau (200 East and West Areas) is designated as an "industrial-exclusive" area capable of supporting waste treatment, storage, and/or disposal activities for hazardous, dangerous, radioactive, nonradioactive wastes and related activities. There would be no change in land use as a result of the ATCD project.

**Prime and Important Farmlands:** Since no lands designated as prime farmlands are in the ATCD project area, there would be no impacts to such lands.

**Socioeconomics:** The ATCD project would be conducted within the boundaries of the 200 East Area of the Hanford Site and specifically in areas in and adjacent to the C farm. The workforce for the ATCD project would average about 20 workers from the current Hanford workforce. Therefore no significant socioeconomic impacts would be expected.

**Environmental Justice:** Based on the analysis in this EA, no high or disproportionate adverse health or economic impacts to minority or low-income populations, therefore, no environmental justice impacts would be expected.

**Utilities:** The ATCD project would utilize existing utility services in the C tank farm. This project would not require construction or development of new permanent utility lines.

**Health and Safety:** Occupational accident risks and routine radiological exposures related to the ATCD project are not expected to be substantial.

**Cultural Resources:** No impacts to known cultural resources within the ATCD project site or C tank farm would be expected. If cultural resources were encountered during the demonstration, work would be halted and the Hanford Historical and Cultural Resources Program would be notified to determine the appropriate disposition of the resource and any mitigative actions that would be required prior to continuing with the project.


**Visual/Noise:** No significant impacts to views or view sheds would be expected due to the ATCD project. Noise levels from the ATCD project would be short-term, limited to the duration of the demonstration activities.

**Transportation:** Traffic generated by the ATCD project would be within the existing traffic volumes and would not contribute to the cumulative impacts to the transportation system of the site or the surrounding communities.

**Cumulative Impacts:** Because no significant adverse impacts would be expected from the proposed action, there would be no substantial contribution to Hanford Site cumulative impacts.

**DETERMINATION:** Based on the analysis in the EA, and after considering the comments received from the Oregon Office of Energy, and the State of Washington Departments of Ecology, and Fish and Wildlife, I conclude that the proposed ATCD Project does not constitute a major federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS is not required.

Issued at Richland, Washington, this 16<sup>th</sup> day of June, 2003.

  
Roy J. Schepens, Manager  
Office of River Protection