DOE/RL-2006-12
DRAFT A

Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 216-S-10 Pond and Ditch

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

United States Department of Energy
P.O. Box 550
Richland, Washington 99352

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March 2006

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L. E. Aardal 3/13/2006
Release Approval Date

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Printed in the United States of America

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TERMS

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
Ecology	Washington State Department of Ecology
GW	groundwater
HEIS	*Hanford Environmental Information System* database
MCL	maximum contaminant level
N/A	not applicable
ND	not detected
OU	operable unit
RCRA	*Resource Conservation and Recovery Act of 1976*
REDOX	Reduction-Oxidation Plant
RI	remedial investigation
SMCL	secondary maximum contaminant level
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989a)
Tri-Party Agreement Action Plan	*Hanford Federal Facility Agreement and Consent Order Action Plan* (Ecology et al. 1989b)
TSD	treatment, storage, and disposal (unit)
U	undetected

METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	Millimeters	millimeters	0.039	inches
inches	2.54	Centimeters	centimeters	0.394	inches
feet	0.305	Meters	meters	3.281	feet
yards	0.914	Meters	meters	1.094	yards
miles	1.609	Kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	Hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	Grams	grams	0.035	ounces
pounds	0.454	Kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	Milliliters	milliliters	0.033	fluid ounces
tablespoons	15	Milliliters	liters	2.1	pints
fluid ounces	30	Milliliters	liters	1.057	quarts
cups	0.24	Liters	liters	0.264	gallons
pints	0.47	Liters	cubic meters	35.315	cubic feet
quarts	0.95	Liters	cubic meters	1.308	cubic yards
gallons	3.8	Liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	Millibecquerel	millibecquerel	0.027	picocuries

1.0 INTRODUCTION

This closure plan is being submitted in accordance with *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989a) Milestone M-20-39, which requires submittal of a closure plan for the 216-S-10 Pond and Ditch *Resource Conservation and Recovery Act of 1976* (RCRA) treatment, storage, and/or disposal (TSD) unit by March 31, 2006. With the exception of the postclosure groundwater monitoring plan described in Chapter 8.0, documents and information sources mentioned in this closure plan are not intended for incorporation in WA7890008967, *Hanford Facility RCRA Permit.*

Based on current agreements, the 216-S-10 Pond and Ditch TSD unit will be incorporated into the *Hanford Facility RCRA Permit.* When the permit modification to incorporate the TSD unit becomes effective, the provisions of *Hanford Facility RCRA Permit* Condition II.Y.2.c will apply. Permit Condition II.Y.2.c establishes the corrective-action status of the waste site following certification of closure. This closure plan is written to address only the dangerous waste constituents of concern relating to RCRA TSD unit operations (TSD unit constituents). Therefore, any other constituents of concern described in DOE/RL-2004-17, *Remedial Investigation Report for the 200-CS-1 Chemical Sewer Group Operable Unit,* related to past-practice activities at this waste site will be addressed under past-practice authority, in accordance with Permit Condition II.Y.2.C.ii. Any physical activities necessary to complete remediation of non-TSD unit constituents are outside the scope of this closure plan and will be performed in conjunction with Tri-Party Agreement past-practice activities for the 200-CS-1 source operable unit (OU) and the 200-UP-1 groundwater OU.

The development of this closure plan has been coordinated with the 200-CS-1 source OU in accordance with Tri-Party Agreement milestone M-15-39C. This coordinated approach was established in June 2002 following the completion of negotiations between the U.S. Department of Energy, U.S. Environmental Protection Agency, and Washington State Department of Ecology (Ecology) on the modifications to 200 Areas waste site cleanup milestones through Tri-Party Agreement change requests M-13-02-01, M-15-02-01, M-16-02-01, and M-20-02-01. As a result, much of the text contained in this closure plan has been obtained from existing 200-CS-1 OU *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) documentation.

The proposed closure strategy for the 216-S-10 Pond and Ditch soils is clean closure; the groundwater will require postclosure monitoring. The 216-S-10 Pond and Ditch soils meet the clean-closure standards. This strategy is based upon analytical data provided in DOE/RL-2004-17. The postclosure groundwater strategy is based on groundwater data contained in the *Hanford Environmental Information System* database (HEIS).

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2.0 UNIT DESCRIPTION

This chapter provides a physical description of the 216-S-10 Pond and Ditch and describes security related to the 216-S-10 Pond and Ditch.

2.1 PHYSICAL DESCRIPTION AND OPERATIONS

The 216-S-10 Pond and Ditch are located on the Hanford Site near the 200 West Area (Figure 1) southwest of the Reduction-Oxidation (REDOX) Plant or S Plant complex. The pond and ditch begin approximately 445 m (1,460 ft) southwest of the 202-S Canyon Building and 4.05 m (133 ft) south of 10th street and end approximately 1330 m (4,364 ft) southwest of the 202-S Canyon Building.

The 216-S-10 Ditch was an uncovered, unlined man-made ditch that received wastewater from the REDOX Facility. The ditch originated outside the 200 West Area perimeter fence and was estimated to be 686 m (2250 ft) long and 1.8 m (6 ft) wide and averaged 1.8 m (6 ft) depth.

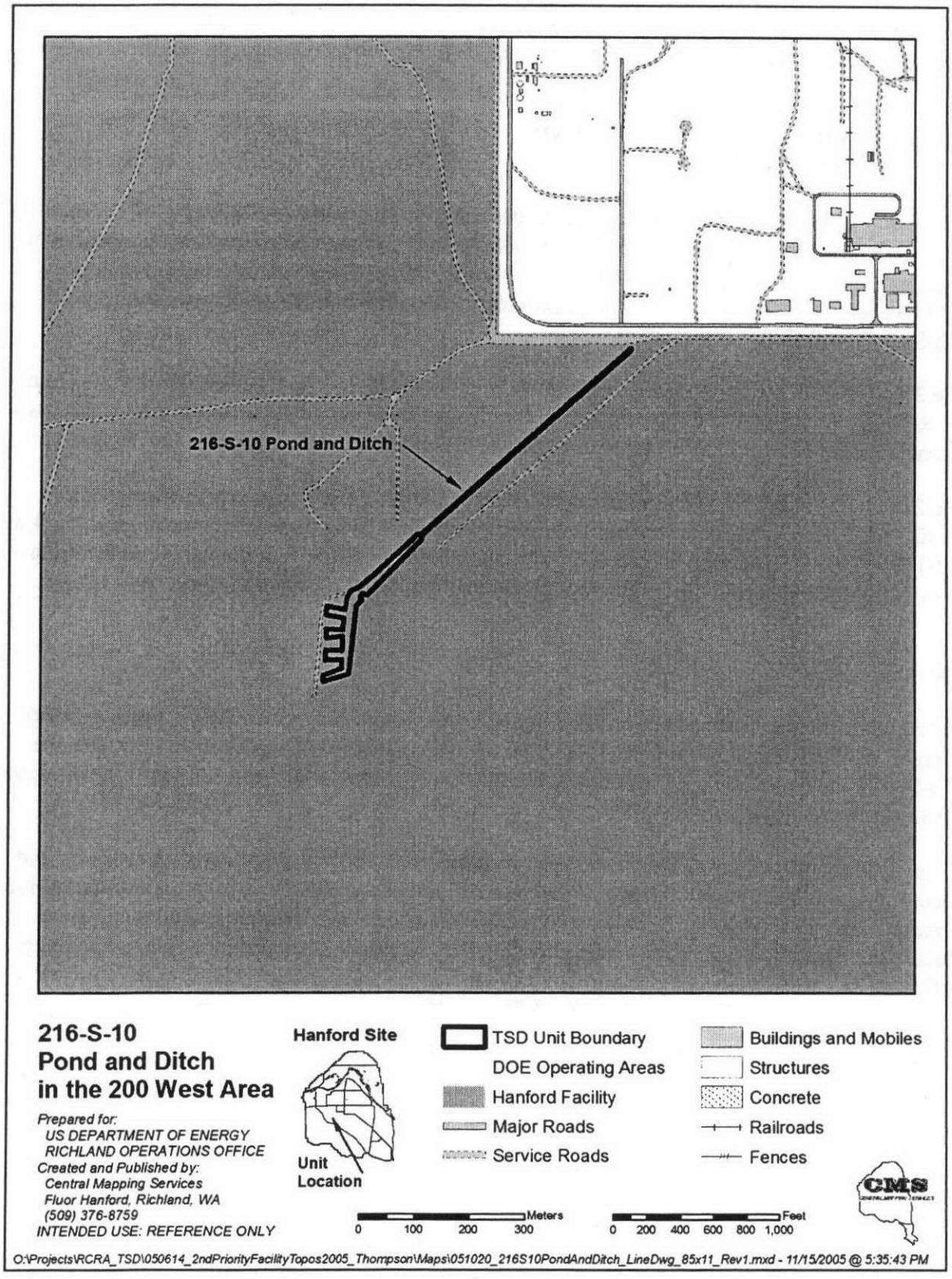
The 216-S-10 Pond was an irregular-shaped, man-made pond that covered approximately 20,300 m^2 (5 acres) and included four finger-leach trenches. The pond was approximately 2.4 m (8 ft) deep at its deepest point. The 216-S-10 Ditch fed the pond. Both the pond and the ditch were designed to disposal of liquids through percolation into the soil columns.

2.2 SECURITY

Security information for the Hanford Facility is discussed in DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application*, Section 6.1, General Information Portion. Because the 216-S-10 Pond and Ditch are located near the 200 West Area, the security information pertaining to the 200 Areas applies to this TSD unit.

Changes to security are expected to occur during the course of 200 West Area deactivation and decommissioning activities. Security measures will remain in place that limit entry to authorized personnel and that preclude unknowing access by unauthorized individuals. Following clean-closure certification of this TSD unit, as described in Section 7.8, security provisions no longer will apply.

Figure 1. 216-S-10 Pond and Ditch Site Plan.



3.0 PROCESS INFORMATION

The 216-S-10 Pond and Ditch were designed to percolate approximately 570,000 L (150,000 gal) of waste per day. The process design capacity reflects the maximum volume of water discharged daily rather than the physical capacity of the 216-S-10 Pond and Ditch. See Section 7.1 for additional information on physical isolation of the TSD unit.

3.1 216-S-10 DITCH

The 216-S-10 Ditch started receiving discharge from the REDOX Facility in 1951. After an unplanned release of uranium in May 1954, the ditch was dredged and then covered with 0.6 m (2 ft) of soil.

Approximately 50 waste streams contributed to the 216-S-10 Ditch. The routine waste stream sources include the compressor cooling water from the 202-S Canyon Building and the sanitary water overflow from the water tower. The remaining sources were infrequent additions and include 202-S Canyon Building floor drains, chemical sewer line manholes, and 276-S Solvent Handling Facility floor drains. The effluent to the chemical sewer was composed of approximately 60 percent REDOX Facility raw water, 20 percent sanitary water, and 20 percent steam condensate.

3.2 216-S-10 POND

The 216-S-10 Pond received discharge from the REDOX Facility. Both the pond and the ditch were designed to dispose of liquids through percolation into the soil column. The 216-S-10 Pond was dug in 1954 at the southwest end of the 216-S-10 Ditch to provide additional percolation surface. The 216-S-10 Ditch fed the Pond. The contributors to the pond are similar to those of the 216-S-10 Ditch.

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4.0 WASTE CHARACTERISTICS

This chapter identifies the estimate of maximum inventory and the characteristics of the waste disposed of at the 216-S-10 Pond and Ditch.

4.1 ESTIMATE OF MAXIMUM INVENTORY OF WASTE

During operations, the maximum volume of wastewater discharged daily to the 216-S-10 Pond and Ditch was approximately 568,000 L/day (150,000 gal/day). The annual volume of effluent discharged was approximately 1.9×10^8 L (5.0×10^7 gal).

4.2 WASTE CHARACTERISTICS

The dangerous waste received at the 216-S-10 Pond and Ditch includes sodium nitrite, sodium hydroxide, sodium phosphate, sodium fluoride, sodium chloride, and potassium di-chromate. Some of these chemicals are regulated under WAC 173-303, "Dangerous Waste Regulations," as a dangerous waste because of the characteristic of corrosivity (D002). Potassium di-chromate is regulated because of the chromium (D007). In addition, other constituents are regulated because they are mentioned in the state-only waste codes WT01 and WT02.

The 216-S-10 Pond and Ditch received one documented discharge of dangerous waste. This dangerous waste discharge occurred in September 1983 and was from the Chemical Engineering Laboratory. The discharge was sent via the sewer to the pond and ditch and consisted of 450 kg (1,000 lb) of simulated double-shell tank slurry, consisting of sodium nitrate (46 percent) sodium hydroxide (41 percent), and small quantities of sodium phosphate, sodium fluoride, sodium chloride, and potassium di-chromate.

Based on the dangerous waste received at the 216-S-10 Pond and Ditch, the TSD unit constituents of concern for RCRA closure are sodium (from sodium hydroxide), potassium (from potassium di-chromate), nitrite (from sodium nitrite), phosphate (from sodium phosphate), chloride (from sodium chloride), fluoride (from sodium fluoride), and chromium/chromium VI (from potassium di-chromate). These constituents constitute the scope of the TSD unit RCRA closure activities (Table 1). The pH range of the 216-S_10 Pond and Ditch soils are reported as 6.0 to 9.3 and are well within the noncorrosive range from WAC 173-303-090(6), "Dangerous Waste Characteristics," "Characteristic of Corrosivity."

Table 1. Comparison of 216-S-10 Pond and Ditch Remedial Investigation Data to Clean-Closure Levels.

TSD Unit Constituent Related to Part A Waste Codes D001, D002, D007, WT01, and WT02	Maximum Concentration Shallow-Zone Soil (mg/kg)	Maximum Concentration Deep Zone Soil (mg/kg)	Hanford Site Soil Background (mg/kg) [1]	Environmental Protection Ecological Receptors for Shallow Zone Soils [2] (mg/kg)	Human Health Protection Soil Direct Contact [3] (mg/kg)		Soil Concentration Protective of Groundwater [4] (mg/kg)	Clean Closure Driver [5]	Meet Clean Closure Standard?
	Pond/Ditch	Pond/Ditch	90% Log Normal Distribution		Carcinogen	Non-carcinogen			
Sodium	193 / 176	Not in RI, Table 4-3	690	N/A	N/A	N/A	N/A	Not regulated	Yes
Potassium	1,230 / 856	Not in RI, Table 4-3	2,440	N/A	N/A	N/A	N/A	Not regulated	Yes
Nitrite (as N)	0.146 / 0.106	ND / ND	-	N/A	N/A	8,000	4	Soil concentration protective of GW	Yes
Phosphate	3.8 / 1.5	2.6 / 2.4	11.7	N/A	N/A	N/A	N/A	Not regulated	Yes
Chloride	2 / 11.5	3.96 / 31.9	0.785	N/A	N/A	N/A	1,000	Soil concentration protective of GW	Yes
Fluoride (using fluorine)	1.1 / 0.7	ND / 0.718	100	N/A	N/A	4,800	24.1	Background	Yes
Chromium (total)	26.2 / 815	39 / 29.8	18.5	N/A	N/A	N/A	2,000	Soil concentration protective of GW	Yes
Chromium VI	2.7 / 14.1	1.57 / 1.8	Not listed	N/A	N/A	240	18.4	Soil concentration protective of GW	Yes

[1] DOE/RL-92-24, Volume 1, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 3.

[2] WAC 173-340-740(3)(b)(ii), "Unrestricted Land Use Soil Cleanup Standards," "Method B Soil Cleanup Levels for Unrestricted Land Use," "Standard Method B Soil Cleanup Levels," "Environmental Protection." Environmental protection ecological receptors are not clean up levels based on WAC 173-340-7493(2)(a)(i), "Site-Specific Terrestrial Ecological Evaluation Procedures," "Purpose."

[3] WAC 173-340-740(3)(b)(iii)(B)(I) and (II), "Unrestricted Land Use Soil Cleanup Standards," "Method B Soil Cleanup Levels for Unrestricted Land Use," "Standard Method B Soil Cleanup Levels," "Human Health Protection," "Soil Direct Contact," "Noncarcinogens" and "Carcinogens." Equations found in 740-1 (non-carcinogens) and 740-2 (carcinogens) for human health direct contact. Point of compliance is surface to 15 feet [WAC 173-340-740(6), "Unrestricted Land Use Soil Cleanup Standards," "Point of Compliance"].

[4] WAC 173-340-740(3)(b)(iii)(A), "Unrestricted Land Use Soil Cleanup Standards," "Method B Soil Cleanup Levels for Unrestricted Land Use," "Standard Method B Soil Cleanup Levels," "Human Health Protection," "Ground Water Protection." Point of compliance is soils throughout the site [WAC 173-340-740(6)].

[5] Represents the most restrictive level after ensuring that the most restrictive level is not less than natural background and for analytical considerations as indicated in WAC 173-340-700(6)(d), "Overview of Cleanup Standards," "Requirements for Setting Cleanup Levels," "Natural Background and Analytical Considerations."

GW = groundwater.
N/A = not applicable.
ND = not detected.
Part A = DOE 2002, *216-S-10 Pond and Trench Part A, Form 3 Dangerous Waste Permit Application*, Rev. 6.
RI = remedial investigation (DOE/RL-2004-17, *Remedial Investigation Report for the 200-CS-1 Chemical Sewer Group Operable Unit*).
TSD = treatment, storage, and disposal (unit).

5.0 GROUNDWATER MONITORING

The 216-S-10 Pond and Ditch groundwater closure approach is postclosure monitoring under a final-status detection monitoring program. The closure approach is based on the data gathered to date from the monitoring network (PNNL-11793, *Hanford Site Groundwater Monitoring for Fiscal Year 1997*), the groundwater data contained in the HEIS, and text provided in PNNL-15070, *Hanford Site Groundwater Monitoring for Fiscal Year 2004*, Section 2.9.3.3 for the 216-S-10 Pond and Ditch. Groundwater monitoring, as described in this chapter, has shown an elevated level of chromium in an upgradient well. The source of this contamination has not been conclusively determined and, because chromium is a TSD unit constituent, the 216-S-10 Pond and Ditch cannot currently be ruled out as the source of the contamination. Table 2 shows a comparison of the TSD unit constituent levels in groundwater to clean-closure levels. The clean-closure levels for groundwater are the calculated overall groundwater clean-up levels. Therefore, postclosure groundwater monitoring for chromium will be required. Postclosure activities are described in Chapter 8.0.

The current interim-status groundwater monitoring plan (as required by WAC 173-303-400, *Dangerous Waste Regulations*, *Interim Status Facility Standards*, and 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart F, "Ground-Water Monitoring") is contained in a separate document, PNNL-14070, *Groundwater Monitoring Plan for the 216-S-10 Pond and Trench*. This document contains further details regarding the geology, hydrology, and current groundwater monitoring programs for the RCRA TSD unit. Excerpts from PNNL-15070 are presented below and provide more recent monitoring network and groundwater conditions.

5.1 HISTORY OF RCRA GROUNDWATER MONITORING

RCRA groundwater monitoring of the 216-S-10 Ditch began in the third quarter of 1991 with an interim-status indicator parameter evaluation (detection-level) program (DOE/RL-92-03, *Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1991*). The wells were sampled quarterly for one year to establish background levels. Semiannual sampling for indicator parameters evaluation was instituted in 1992. Upgradient wells were sampled quarterly in 1997 to reestablish the critical mean for total organic halides, and the wells were sampled semiannually thereafter (PNNL-11793). The only exceedance of maximum contaminant levels occurred in the shallow upgradient well 299-W26-7 for hexavalent chromium (above the 100 µg/L drinking water standard).

Table 2. Comparison of 216-S-10 Pond and Ditch Groundwater Data to Clean-Closure Levels.

TSD Unit Constituent Related to Part A Waste Codes D001, D002, D007, WT01, and WT02	Maximum Concentration in Groundwater in HEIS (μg/L)	Hanford Site Groundwater Background (μg/L)[1] (90 % Log Normal Distribution)	Overall Groundwater Cleanup Level (μg/L)	Clean Closure Driver [2]	Meet Clean Closure standard?
Sodium	27,000	26,998	N/A	Not regulated	Yes
Potassium	5,200	9,122	N/A	Not regulated	Yes
Nitrite (as N)	1 U[3]	93.7	1,000	MCL	Yes
Phosphate	2,100	162	N/A	Not regulated	Yes
Chloride	23,700	15,630	250,000	SMCL	Yes
Fluoride (fluorine)	1,200	1,047	4,000	MCL	Yes
Chromium (VI)	576[4]	2.4	48	WAC 173-340-720[5]	No

[1] DOE/RL-96-61, *Hanford Site Background: Part 3, Groundwater Background.*

[2] Listed values represent the most restrictive level of the groundwater pathways after evaluation of this value to ensure that it is not less than natural background and for analytical considerations as indicated in WAC 173-340-700(6)(d), "Overview of Cleanup Standards," "Requirements for Setting Cleanup Levels," "Natural Background and Analytical Considerations."

[3] All values reported as undetected with variable detection limits ranging from 61 μg/L to 1 μg/L

[4] This analysis is a total chromium analysis on a filtered sample. Elevated chromium concentrations were detected in the past in a well that has gone dry. The maximum chromium concentration in all other wells is a single sample at 61 μg/L, and all others are less than 48 μg/L.

[5] WAC 173-340-720, "Ground Water Cleanup Standards."

HEIS = *Hanford Environmental Information System.*
MCL = maximum contaminant level.
N/A = not applicable.
Part A = DOE 2002, *216-S-10 Pond and Trench Part A, Form 3 Dangerous Waste Permit Application*, Rev. 6.
SMCL = secondary maximum contaminant level.
TSD = treatment, storage, and disposal (unit).
U = undetected.

5.2 AQUIFER IDENTIFICATION

The uppermost or unconfined aquifer beneath the 216-S-10 Pond and Ditch is about 61 m (200 ft) thick and is contained within sediments of the upper unit of the Ringold Formation and the Ringold Unit E. The aquifer extends from the water table to the lower mud unit of the Ringold Formation. Groundwater flow is to the east-southeast from 0.007 to 0.3 m/day (0.023 to 0.98 ft/day). The water table beneath the pond and ditch has declined significantly since the discharges to the U Pond system ceased in 1984.

5.3 WELL LOCATION AND DESIGN

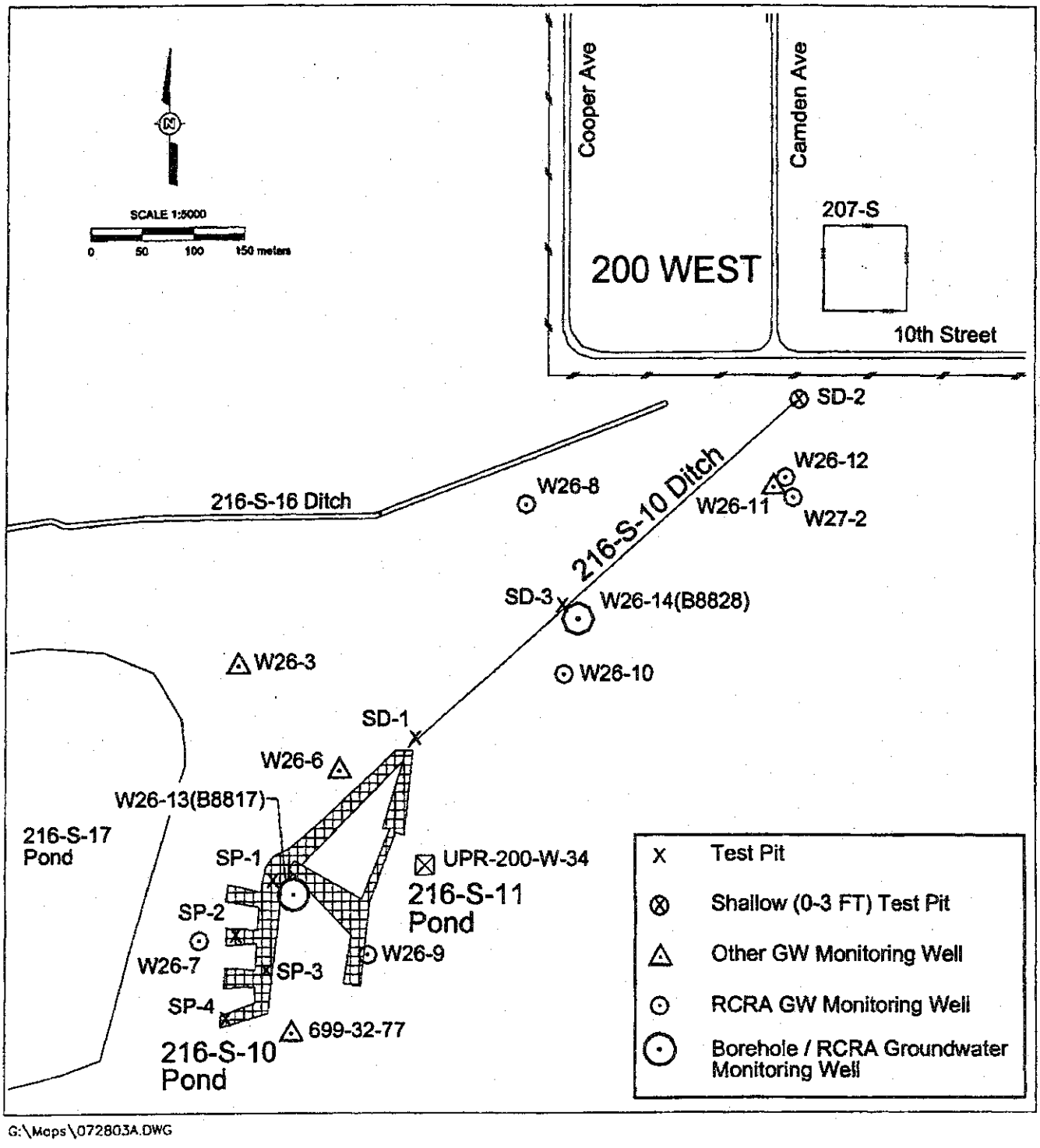
The current monitoring well network consists of just three downgradient wells, 299-W26-13, 299-W26-14, and 299-W27-2 (Figure 2). Well 299-W26-13 monitors the uppermost aquifer downgradient of the 216-S-10 Pond, 299-W26-14 monitors the uppermost aquifer along the 216-S-10 Ditch, and 299-W27-2, located at the former discharge end of the 216-S-10 Ditch, is a deep monitoring well screened just above the top of the Ringold lower mud unit. The two shallow wells are replacement wells for the initial monitoring network. A replacement well was selected after a well went dry because of regional groundwater declines. The original RCRA network consisted of six wells; two upgradient wells (299-W26-7 and 299-W26-8), and four downgradient wells (299-W26-9, 299-W26-10, 299-W26-12, and 299-W27-2). All of the wells were sampled semiannually with dedicated sampling pumps.

Construction of the initial six network wells followed RCRA standard well-construction specifications. The standards in WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," were used to set the basic design requirements for network wells. The initial six interim-status groundwater monitoring network wells for the 216-S-10 Pond and Ditch were constructed from 1990 through 1992. Five of the wells are constructed with screens at the water table. The remaining well is screened above the top of the lower mud unit of the Ringold Formation. The two new wells, 299-W26-13 and 299-W26-14, were added as replacements in 2000 and 2003, respectively. Construction summaries and details of drilling and design specifications for all of the wells in the interim-status groundwater monitoring system are contained in PNNL-11793. Two dry upgradient wells (299-W26-7 and 299-W26-8) were selected to determine the groundwater background chemistry.

5.4 RCRA INTERIM-STATUS GROUNDWATER MONITORING DATA

The RCRA indicator parameters are specific conductance, pH, total organic carbon, and total organic halides. Groundwater quality parameters are chloride, iron (filtered), manganese (filtered), phenols, sodium (filtered), and sulfate. The RCRA interim-status indicator parameter evaluation (detection level) program groundwater monitoring of the 216-S-10 Pond and Ditch began in 1991.

Figure 2. Borehole and Test Pit Locations.



In fiscal years 1996 and 1997, total organic halides were detected in upgradient well 299-W26-8. Quarterly sampling of the upgradient wells occurred for one year to reestablish critical mean for total organic halides, and then the wells were sampled semiannually. The cause of the upgradient total organic halides is probably the upgradient carbon tetrachloride plume.

Chromium has been found at levels above the maximum contaminant level in upgradient well 299-W26-7, which is now dry. The source for this contamination has not been determined. The source of this contamination is currently under investigation. Chromium concentrations in well 299-W26-7 have varied in the past 10 years; this may be caused by short-term releases traveling through the vadose zone. The June 2003 chromium value was 209 µg/L, and in December 2002 the value was 200 µg/L. Elevated chromium concentrations at well 299-W26-7 (now dry) have varied above the 100-µg/L drinking water standard during the past 10-year life of the well.

Nitrate concentrations were covariate with chromium concentrations in dry wells 299-W26-7, 299-W26-9, 299-W26-10, and 299-W26-12. The upgradient well 299-W26-7 had the highest nitrate concentrations. Although chromium and nitrate were elevated in the dry upgradient well 299-W26-7, significant concentrations of these constituents have not been detected in the downgradient wells. Chromium concentrations in new well 299-W26-13 (located nearby and just downgradient of well 299-W26-7) are only slightly elevated above the chromium concentrations in the other two downgradient wells, which are near background. Because the only upgradient well, 299-W26-7, went dry in year 2003, the comparison of RCRA indicator parameters (specific conductance, pH, total organic carbon, and total organic halides) between upgradient and downgradient wells was conducted using the most recent collected background values of contaminant indicator parameters from well 299-W26-7 before it went dry (see PNNL-15070, Appendix B). When data from a new upgradient well become available, new background values will be calculated and used for the required upgradient/downgradient comparisons. Based on fiscal year 2004 statistical evaluations of the contamination indicator parameters, there are no statistically significant differences (i.e., constituents in the downgradient wells are not elevated compared to the upgradient well). Therefore, this site remains in detection monitoring.

Based on regional groundwater elevations, the groundwater flow direction continues toward the east-southeast and continues to decline. The average linear velocity has not changed significantly from that of 2002 and ranges from 0.007 to 0.3 m (0.02 to 1 ft) per day.

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6.0 CLOSURE STRATEGY AND PERFORMANCE STANDARDS

This chapter identifies the 216-S-10 Pond and Ditch closure strategy and closure performance standards for soils. Groundwater is discussed in Chapters 5.0 and 8.0.

6.1 CLOSURE STRATEGY

The 216-S-10 Pond and Ditch soils meet clean-closure standards without a need to perform further physical closure actions. The standards for closure of Hanford Facility interim-status TSD units are contained in WAC 173-303-610, "Dangerous Waste Regulations," "Closure and Post-Closure," based on *Hanford Federal Facility Agreement and Consent Order Action Plan* (Tri-Party Agreement Action Plan) (Ecology et al. 1989b), Section 5.3. The possibility for clean closure for all TSD units at the Hanford Facility is described in the Tri-Party Agreement Action Plan, Section 6.3.1.

6.2 CLOSURE PERFORMANCE STANDARDS

This section identifies general clean-closure performance standards and the specific closure standards for the soils.

6.2.1 Treatment, Storage, and Disposal Unit Closure Performance Standards

The closure performance standards of WAC 173-303-610(2)(a)(i - iii), "Dangerous Waste Regulations," "Closure and Post-Closure," "Closure Performance Standard," require the owner or operator of a TSD facility to close the facility in a manner that: (1) "minimizes the need for further maintenance," (2) "controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, postclosure escape of dangerous waste, dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere," and (3) "returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity." These standards will be met by the clean-closure removal or decontamination standard of WAC 173-303-610(2)(b)(i).

Potential contaminant exposures and health impacts to humans are largely dependent on land use. The land use for the 200 Areas selected by The U.S. Department of Energy through 64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS), is industrial. The 216-S-10 Pond and Ditch are located outside of the industrial zone.

The first approach to examine for TSD unit closure is clean closure. Clean closure will eliminate the need for future inspections and maintenance necessitated by TSD unit constituent contamination. Clean closure also will eliminate the need for future postclosure monitoring and maintenance of the soils. Clean closure using WAC 173-340-740(3) , "Unrestricted Land Use

Soil Cleanup Standards," "Method B Soil Cleanup Levels for Unrestricted Land Use," as referenced by WAC 173-303-610(2)(b)(i) were examined. If the DOE/RL-2004-17 data showed that the concentration of TSD unit constituents in soils is at or below the WAC 173-340-740(3) values as is without further remediation, the TSD unit would meet the criteria for clean closure.

If the TSD unit constituent concentrations in soil did not meet the WAC 173-303-740(3) values, then other approaches would be considered, such as soils removal, before concluding that postclosure was required.

6.2.2 Soil Closure Standards

The clean-closure requirements are established in WAC 173-303-610(2)(b) and the surface impoundment standards in WAC 173-303-650(6)(a), "Dangerous Waste Regulations," "Surface Impoundments," "Closure and Post-Closure Care," to remove or decontaminate unit soils that are contaminated above clean-closure standards. These soil clean-closure cleanup levels are the numeric levels identified in WAC 173-340-740(3) that are either (1) levels calculated using the most restrictive WAC 173-340-740(3) formulas for unrestricted use or (2) background levels (DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*) when the most restrictive WAC 173-340-740(3) formulas are more stringent than Hanford Site background concentrations.

WAC 173-340-740(3) contains the following potential clean-closure standards: environmental protection related to ecological receptors, soil concentrations protective of groundwater, soil direct-contact carcinogens, soil direct-contact noncarcinogens, soil direct-contact petroleum vapors, and soil vapors. The 'environmental protection related to ecological receptors' values are not a clean-closure standard for TSD unit closure, based on WAC 173-340-7493(2)(a)(i), "Site-Specific Terrestrial Ecological Evaluation Procedures," "Problem Formulation Step," "The Chemicals of Ecological Concern." The 'soil concentrations protective of groundwater,' 'soil direct-contact carcinogens,' and 'soil direct-contact noncarcinogens' are applicable and are identified in Table 1. The 'soil direct-contact petroleum vapors' and 'soil vapors' standards do not apply, because there are no petroleum compounds and no volatile organic compounds related to TSD unit closure, respectively.

7.0 CLOSURE ACTIVITIES

This chapter summarizes clean-closure activities for the 216-S-10 Pond and Ditch soils performed as part of the 200-CS-1 OU remediation process. The physical closure activities included TSD unit physical isolation, borehole drilling, and soil sampling and analysis. These activities are completed. The only action remaining is administrative (e.g., certification).

7.1 TREATMENT, STORAGE, AND DISPOSAL UNIT PHYSICAL ISOLATION

To preclude any further discharges to the unit, and in support of TSD unit closure, the 216-S-10 Pond and Ditch were physically isolated from receipt of effluent in 1994.

The south end of the 216-S-10 Ditch remained in use until 1984, when two-thirds of the ditch was backfilled and stabilized. In 1984, concurrent with the 216-S-10 Ditch, the 216-S-10 Pond was stabilized. The north end of the 216-S-10 Ditch last received discharges during 1991, and the supplying pipeline was plugged with concrete near the outfall in July 1994. The concrete plug was poured in manhole #2 to achieve positive assurance of isolation.

7.2 TREATMENT, STORAGE, AND DISPOSAL UNIT SAMPLING AND ANALYSIS

The following sections describe sampling and analysis activities that have been completed for the 216-S-10 Pond and Ditch.

7.2.1 Soil Sampling and Analysis

As part of the 200-CS-1 OU remedial investigation, data were collected to characterize the nature and vertical extent of contamination and the physical conditions in the vadose zone underlying the 216-S-10 Ditch and the 216-S-10 Pond. Drilling, test pit excavation, surface and borehole geophysical surveys, and soil sampling and analysis were conducted during the field activities. Borehole and test pit locations are shown in Figure 2.

Borehole B8828 was drilled and sampled adjacent to the 216-S-10 Ditch, and Test Pits SD-1, SD-2, and SD-3 were excavated and sampled in the 216-S-10 Ditch located in the 200 West Area. Borehole B8828 was completed as a RCRA monitoring well and renumbered as well 299-W26-14 to support the RCRA monitoring program.

Test Pit, SD-3 was excavated in the 216-S-10 Ditch to gather characterization data below the waste site. Borehole B8828 was located adjacent to the ditch. Test Pits SP-1, SP-2, SP-3, and SP-4 were excavated and sampled in the 216-S-10 Pond. Borehole B8817 was drilled and sampled adjacent to the 216-S-10 Pond in fiscal year 1999, and details are provided in PNNL-13198, *Borehole Data Package for the 216-S-10 Pond and Ditch Well 299-W26-13*. Borehole B8817 was completed as a RCRA monitoring well and renumbered as well 299-W26-13.

The test pit locations were prepared by removing 0.3 to 0.6 m (1 to 2 ft) of topsoil from the site. The test pits were excavated to a maximum depth of 7 m (25 ft) below ground surface using a track-hoe. Samples were obtained directly from the track-hoe bucket at intervals of approximately 0.7 m (2.5 ft). Before being placed in a sample jar, soil samples were screened in the field to assist in selecting sample points, to support worker health and safety, and to provide shipping information. Samples were analyzed for chemical and physical properties. The test pits were backfilled in the reverse order from which they were excavated using the track hoe, and a front-end loader was used to backfill the site with topsoil and/or gravel.

Soils from the boreholes and test pits were screened in the field both for indications of contamination and for assisting in determining the discrete sample locations or depths before the samples were collected. Soil samples were collected for analysis and determination of physical properties. The sampling approach generally required a greater sample frequency near the bottom of the waste site, which is the area of highest suspected contamination. Sample collection was always attempted at depths of 4.6 and 7.6 m (15 and 25 ft) below ground surface to define contamination profiles. Sample frequency generally was reduced to 6.1 to 15.2 m (20- to 50-ft) intervals below a depth of 7.6 m (25 ft) in the boreholes.

Soil samples were analyzed for the constituents of concerns from DOE/RL-2004-17. Samples were analyzed selectively for field bulk density and moisture content. In addition, ditch bottom samples from each of the test pits were analyzed for an expanded list of compounds, to satisfy waste designation requirements. Soil descriptions were recorded to better define stratigraphic relationships in the OU. The results obtained from previous characterization activities also were evaluated as part of this remedial investigation.

7.2.2 Soil Sample Results

Analytical results obtained from the remedial investigation were intended for RCRA closure decisions and are defensible for use in this closure plan. Table 1 identifies the maximum concentration of TSD unit constituents in shallow soils and deep-zone soils from DOE/RL-2004-17, Tables 4-1 and 4-3. As a first review, the maximum values were compared to the clean-closure levels described in Section 6.2.2.

Table 1 shows that all eight of the TSD unit constituents (sodium, potassium, nitrite, phosphate, chloride, fluoride, chromium (total), and chromium VI) either meet the clean-closure standard or the constituent is not regulated. The data show that the 216-S-10 Pond and Ditch soils qualify for clean closure, because concentrations of TSD unit constituents of concern have been shown by remedial investigation sampling to be below the action level for soil prescribed by WAC 173-303-610(2)(b)(i). Because the maximum concentration levels meet the clean-closure standard, evaluation of the 95 percent upper confidence levels found in DOE/RL-2005-63, *Feasibility Study for the 200-CS-1 Chemical Sewer Group Operable Unit*, was not required.

7.3 OTHER ACTIVITIES REQUIRED FOR CLOSURE

No other physical activities are required for closure. After closure, appearance of the land will be consistent with land-use determinations of the Hanford Facility.

7.4 INSPECTIONS

The TSD unit has been inspected to ensure that it meets interim-status requirements. Annual inspections are performed based on Ecology approval in 2003. Following closure certification as described in Section 7.8, inspections for the 216-S-10 Pond and Ditch will be discontinued.

7.5 TRAINING

A dangerous waste training plan has been maintained for the TSD unit, to meet interim-status requirements. The duties associated with dangerous waste management activities include performing inspections, notifying Ecology of any potential threats to human health and the environment, and performing groundwater monitoring. Following closure certification as described in Section 7.8, inspections for the 216-S-10 Pond and Ditch will be discontinued. A dangerous waste training plan will be maintained for groundwater monitoring during postclosure monitoring.

7.6 SCHEDULE OF CLOSURE

No OU-related activities are required for closure. Following submittal of this closure plan to Ecology, Ecology's 90-day review period begins in accordance with the Tri-Party Agreement Action Plan, Figure 9-2.

7.7 AMENDMENT OF CLOSURE PLAN

As required by WAC 173-303-610(3)(b), "Dangerous Waste Regulations," "Closure and Post-Closure," "Closure Plan; Amendment of Plan," the closure plan will be amended if changes to closure activities require a modification of the approved closure plan. However, no changes are expected, because closure activities relating to the soils are complete.

7.8 CERTIFICATION OF CLOSURE

In accordance with WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," "Certification of Closure," within 60 days of completion of TSD unit closure, the U.S. Department of Energy will submit to the lead regulatory agency (Ecology) a certification of closure. The 60-day period will begin upon Ecology approval of this closure plan. Both the U.S. Department of Energy and the Co-Operator identified on the current Part A Permit Application (DOE 2002, *216-S-10 Pond and Trench Part A, Form 3 Dangerous Waste Permit Application*, Rev. 6) will sign the certification of closure, and an independent Registered

Professional Engineer will state that the unit has been closed in accordance with the approved closure plan. The certification will be submitted by registered mail or an equivalent delivery service. Documentation supporting the independent Registered Professional Engineer's certification will be placed in the Administrative Record.

8.0 POSTCLOSURE PLAN

The closure strategy for the 216-S-10 Pond and Ditch is clean closure of the soil with regard to TSD unit constituents for soils. Therefore, no postclosure plan for the soils is required.

Clean closure of the groundwater is not possible because of chromium contamination in the groundwater. A postclosure final-status detection monitoring program is required. Postclosure groundwater monitoring will be performed as described in a postclosure RCRA groundwater monitoring plan to meet the postclosure plan requirements of WAC 173-303-610(8)(b)(i), "Dangerous Waste Regulations," "Closure and Post-Closure," "Post-Closure Plan; Amendment of Plan," and the WAC 173-303-645, "Releases from Regulated Units," requirements stated in WAC 173-303-610(8)(b)(ii).

Postclosure requirements of WAC 173-303-810(8)(b)(ii) regarding planned maintenance activities and frequencies do not apply except as required for groundwater monitoring. The alternative requirement provisions identified in WAC 173-303-610(8)(b)(iv) are not being applied to the 216-S-10 Pond and Ditch postclosure plan. Concerning the contact information required by WAC 173-303-810(8)(b)(iii), the following information is provided for the postclosure period:

Name:	Director, Environmental Services Division, U.S. Department of Energy, Richland Operations Office
Address:	P.O. Box 500, Richland, Washington 99352
Phone Number:	(509) 372-3468

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9.0 REFERENCES

40 CFR 265, Subpart F, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart F, "Ground-Water Monitoring," Title 40, *Code of Federal Regulations*, Part 265, as amended.

64 FR 61615, "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)," *Federal Register*, Vol. 64, No. 218, pp. 61615-61625, November 12, 1999.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601 et seq.

DOE 2002, *216-S-10 Pond and Trench Part A, Form 3 Dangerous Waste Permit Application*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington, July 1, 2002.

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PNNL-11793, 1998, *Hanford Site Groundwater Monitoring for Fiscal Year 1997*, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-13198, 2000, *Borehole Data Package for the 216-S-10 Pond and Ditch Well 299-W26-13*, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-14070, 2002, *Groundwater Monitoring Plan for the* 216-S-10 Pond *and Ditch*, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-15070, 2005, *Hanford Site Groundwater Monitoring for Fiscal Year 2004*, Pacific Northwest National Laboratory, Richland, Washington.

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

WA7890008967, *Hanford Facility RCRA Permit*, Washington State Department of Ecology, Richland, Washington, as amended.

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-090(6), "Dangerous Waste Characteristics," "Characteristic of Corrosivity," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-400, "Dangerous Waste Regulations," "Interim Status Facility Standards," *Washington Administrative Code,* as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-610, "Dangerous Waste Regulations," "Closure and Post-Closure," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-610(2), "Dangerous Waste Regulations," "Closure and Post-Closure," "Closure Performance Standard," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-610(3), "Dangerous Waste Regulations," "Closure and Post-Closure," "Closure Plan; Amendment of Plan," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-610(6), "Dangerous Waste Regulations," "Closure and Post-Closure," "Certification of Closure," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-610(8), "Dangerous Waste Regulations," "Closure and Post-Closure," "Post-Closure Plan; Amendment of Plan," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-645, "Releases from Regulated Units," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303-650(6)(a), "Dangerous Waste Regulations," "Surface Impoundments," "Closure and Post-Closure Care," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-340-720, "Ground Water Cleanup Standards," *Washington Administrative Code,* as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-340-740(3), "Unrestricted Land Use Soil Cleanup Standards," "Method B Soil Cleanup Levels for Unrestricted Land Use," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

WAC 173-340-7493(2)(a)(i), "Site-Specific Terrestrial Ecological Evaluation Procedures," "Problem Formulation Step," "The Chemicals of Ecological Concern," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington.

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STATE ENVIRONMENTAL POLICY ACT
ENVIRONMENTAL CHECKLIST

FOR THE

HANFORD FACILITY,
216-S-10 POND AND DITCH CLOSURE

REVISION 0

March 2006

WASHINGTON ADMINISTRATIVE CODE
ENVIRONMENTAL CHECKLIST
[WAC 197-11-960]

A. BACKGROUND

1. Name of proposed project, if applicable:

This *State Environmental Policy Act* (SEPA) *of 1971* Environmental Checklist is being submitted for closure of the Hanford Facility, 216-S-10 Pond and Ditch. This area will be closed with respect to dangerous waste contamination that resulted from treatment operations as a *Resource Conservation and Recovery Act* (RCRA) *of 1976* treatment, storage, and/or disposal (TSD) unit.

2. Name of applicants:

U.S. Department of Energy, Richland Operations Office (DOE-RL).

3. Address and phone number of applicants and contact persons:

U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Contact:

Keith A. Klein, Manager
Richland Operations Office
(509) 376-7395

4. Date checklist prepared:

March 2006.

5. Agency requesting the checklist:

Washington State Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

6. Proposed timing or schedule: (including phasing, if applicable):

This SEPA Environmental Checklist is being submitted concurrently with a closure plan prepared in accordance with Washington Administrative Code (WAC) 173-303 Dangerous Waste Regulations. The closure plan will be submitted to the Washington State Department of Ecology by March 2006.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No. The closure plan is being submitted in accordance with Tri-Party Agreement (Ecology et al) Milestone M-20-39 that requires submittal of a closure plan for the 216-S-10 Pond and Ditch RCRA TSD unit by March 31, 2006.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

This SEPA Environmental Checklist is being submitted to Ecology to address the 216-S-10 Pond and Ditch closure activities. Environmental information that has been prepared directly related to this proposal is contained in DOE/RL-2004-017, *Remedial Investigation Report for the 200-CS-1 Chemical Sewer Group Operable Unit* and groundwater data contained in the Hanford Environmental Information System (HEIS). Environmental information that will be prepared directly related to this proposal will be contained in the post closure groundwater monitoring plan. Any other information related to 216-S-10 Pond and Ditch after closure of the TSD unit will be performed in conjunction with Tri-Party Agreement past practice activities for the 200-CS-1 source operable unit and 200-UP-1 groundwater operable unit.

General information concerning the Hanford Facility environment can be found in the *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415, Revision 17, September 2005. This document is updated annually by Pacific Northwest National Laboratory (PNNL), and provides current information concerning climate and meteorology, ecology, history and archeology, socioeconomic, land use and noise levels, and geology and hydrology. These baseline data for the Hanford Site and past activities are useful for evaluating proposed activities and their potential environmental impacts.

9. Do you know whether applications are pending for government approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No other applications are pending. However, see response to A8 regarding physical activities necessary to complete remediation of non-TSD unit constituents.

10. List any government approvals or permits that will be needed for your proposal, if known.

DOE-RL forwards the aforementioned 216-S-10 Pond and Ditch closure plan, and the postclosure groundwater monitoring plan to Ecology for approval.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

The DOE-RL proposes clean closure for the 216-S-10 Pond and Ditch soils; groundwater will require post-closure monitoring.

The south end of the 216-S-10 Ditch remained in use until 1984, when two-thirds of the ditch was backfilled and stabilized. In 1984, concurrent with the 216-S-10 Ditch, the pond was stabilized. The north end of the 216-S-10 Ditch last received discharges during 1991 and the supplying pipeline was plugged with concrete near the outfall in July 1994. The concrete plug was poured in manhole #2 to achieve positive assurance of isolation. To preclude any further discharges to the unit and in support of TSD unit closure, the 216-S-10 Pond and Ditch were physically isolated from receipt of effluent in 1994.

Existing data show all eight of the TSD unit constituents (sodium, potassium, nitrite, phosphate, chloride, fluoride, chromium (total) and chromium VI) either meet the clean closure standard or the constituent is not regulated. The data shows the 216-S-10 Pond and Ditch soils qualify for clean closure because concentrations of TSD unit constituents of concern have been shown by remedial investigation sampling to be below the action level for soil prescribed by WAC 173-303-610(2)(b)(i).

The 216-S-10 Pond and Ditch groundwater closure approach is post closure monitoring under a final status detection monitoring program. Groundwater monitoring has shown an elevated level of chromium in an upgradient well. Clean closure of the groundwater is not possible, due to chromium contamination. A post closure final status detection monitoring program is required for TSD unit groundwater monitoring. Post closure groundwater monitoring will be performed in order to meet the post closure plan requirements of WAC 173-303-610(8)(b)(i) and the WAC 173-303-645 requirements of WAC 173-303-610(8)(b)(ii).

No physical activities are required for soils clean closure. After closure, appearance of the land will be consistent with land use determinations of the Hanford Facility. Groundwater monitoring activities will be coordinated with monitoring requirements for the 200-UP-1 groundwater operable unit.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The 216-S-10 Pond and Ditch are located in the Hanford 200 West Area southwest of the REDOX complex. The pond and ditch begin approximately 445 m, (1,460 ft) southwest of the 202-S Building and 133 ft south of 10th street and end approximately 1330 m (4,350 ft) southwest of the 202-S Building.

The 216-S-10 Ditch was an uncovered, unlined man-made ditch that received wastewater form the REDOX Facility. The ditch originated outside the 200 West Area perimeter fence and was estimated to be 686 m (2250 ft) long, 1.8 m (6 ft) wide and averaged 1.8 m (6 ft) deep. The 216-S-10 Pond was an irregular-shaped, man-made pond that covered approximately 20,300 m^2 (5 acres) and included four finger-leach trenches. The pond was approximately 2.4 m (8 ft) at its deepest point. The 216-S-10 Ditch fed the pond. Both the pond and ditch were designed to disposal of liquids through percolation into the soil columns.

TO BE COMPLETED BY APPLICANT | **EVALUATIONS FOR AGENCY USE ONLY**

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other_____.

Flat.

b. What is the steepest slope on the site (approximate percent slope)?

The approximate slope of the land is less than 2 percent.

c. What general types of soils are found on the site? (for example, clay, sandy gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Soil types consist mainly of eolian and fluvial sands and gravel. More detailed information concerning specific soil classifications can be found in the *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415, Revision 17, September 2005. Farming is not permitted on the Hanford Facility.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

No filling or grading is required.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

No.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Not applicable. No construction is proposed as part of this project.

TO BE COMPLETED BY APPLICANT

EVALUATIONS FOR AGENCY USE ONLY

h. **Proposed measures to reduce or control erosion, or other impacts to the earth, if any:**

None.

2. Air

a. **What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities, if known.**

Routine postclosure monitoring activities would generate dust.

b. **Are there any off-site sources of emissions or odors that may affect your proposal? If so, generally describe.**

No.

c. **Proposed measures to reduce or control emissions or other impacts to the air, if any?**

None since no emissions are anticipated for the closure of the 216-S-10 Pond and Ditch.

3. Water

a. Surface

1) **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

No. The 216-S-10 Pond and Ditch are over 7 kilometers from the Columbia River.

2) **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

The work would not require any activity in or near the described waters and drainage.

3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and**

TO BE COMPLETED BY APPLICANT | **EVALUATIONS FOR AGENCY USE ONLY**

indicate the area of the site that would be affected. Indicate the source of fill material.

There would be no dredging or filling from or to surface water or wetlands.

4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

No surface water withdrawal or diversion would be required.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

The 216-S-10 Pond and Ditch are not within the 100-year or 500-year floodplain [*Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415, Revision 17, September 2005].

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No.

b. **Ground**

1) **Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.**

Besides the usual groundwater monitoring under post closure monitoring, no groundwater will be withdrawn and no water will be discharged during closure.

2) **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

None.

TO BE COMPLETED BY APPLICANT

EVALUATIONS FOR AGENCY USE ONLY

c. **Water Run-off (including storm water)**

1) **Describe the source of run-off (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

The Hanford Facility receives only 15.2 to 17.8 centimeters of annual precipitation. Precipitation runs off the existing buildings and seeps into the soil on and near the buildings. This precipitation does not reach the groundwater or surface waters.

2) **Could waste materials enter ground or surface waters? If so, generally describe.**

No waste materials can enter ground or surface waters as a result of closure.

d. **Proposed measures to reduce or control surface, ground, and run-off water impacts, if any:**

No measures are proposed to reduce or control surface, ground, and run-off impacts.

4. **Plants**

a. **Check or circle the types of vegetation found on the site.**

- ☐ deciduous tree: alder, maple, aspen, other
- ☐ evergreen tree: fir, cedar, pine, other
- ☒ shrubs
- ☒ grass
- ☐ pasture
- ☐ crop or grain
- ☐ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
- ☐ water plants: water lily, eelgrass, milfoil, other
- ☐ other types of vegetation

The most common vegetation community in the 200 West Area is sagebrush/cheatgrass or Sandberg's bluegrass. Native vegetation resides in the immediate vicinity of the 216-S-10 Pond and Ditch.

TO BE COMPLETED BY APPLICANT

EVALUATIONS FOR AGENCY USE ONLY

b. What kind and amount of vegetation will be removed or altered?

No vegetation would be removed or altered during 216-S-10 Pond and Ditch closure activities.

c. List threatened or endangered species known to be on or near the site.

No known threatened or endangered species are known to be on or near the 216-S-10 Pond and Ditch. Additional information on species can be found in *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415 (Revision 17, September 2005).

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

None.

5. Animals

a. Indicate (by underlining) any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: Raptors (burrowing owls, ferruginous, redtail, and Swainson's hawks) eagles, songbirds,
animals: deer, elk, coyotes, rabbits, rodents.

Additional information on animals can be found in *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415 (Revision 17, September 2005).

b. List any threatened or endangered species known to be on or near the site.

One federal and state listed threatened or endangered species has been identified on the 1,517 square kilometer Hanford Site along the Columbia River (the bald eagle) and three in the Columbia River (steelhead, spring-run Chinook salmon, and bull trout). In addition, the state listed white pelican, sandhill crane, and ferruginous hawk also occur on or migrate through the Hanford Site.

TO BE COMPLETED BY APPLICANT

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c. **Is the site part of a migration route? If so, explain.**

The Hanford Site is a part of the broad Pacific Flyway. However, the 216-S-10 Pond and Ditch location is not known as a haven for migratory birds.

d. **Proposed measures to preserve or enhance wildlife, if any:**

This project contains no specific measures to preserve or enhance wildlife.

6. **Energy and Natural Resources**

a. **What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

None.

b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No.

c. **What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:**

None.

7. **Environmental Health**

a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.**

Clean closure of the groundwater is not possible, due to potential chromium contamination. A post closure final status detection monitoring program is required.

1) **Describe special emergency services that might be required.**

No special emergency services are known to be required.

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2) Proposed measures to reduce or control environmental health hazards, if any:

Clean closure of the groundwater is not possible, due to chromium contamination in the groundwater. A post closure final status detection monitoring program is required.

b. Noise

1) What type of noise exists in the area which may affect your project (for example: traffic, equipment, operation, other)?

There could be a minor amount of traffic associated with post closure well monitoring operations.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Minor amounts of noise from traffic and equipment are expected for operation and maintenance of post-closure monitoring wells.

3) Proposed measures to reduce or control noise impacts, if any:

None.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The 216-S-10 Pond and Ditch site is not in use. Adjacent properties are industrial/research.

b. Has the site been used for agriculture? If so, describe.

No portion of the 200 West Area has been used for agricultural purposes since 1943.

c. Describe any structures on the site.

There are no structures at the 216-S-10 Pond and Ditch site.

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d. Will any structures be demolished? If so, what?

Not applicable. There are no structures on the site (refer to Section B.8.c).

e. What is the current zoning classification of the site?

Does not apply. The site is located on Federal lands and as such is not subject to the Growth Management Act (State of Washington land use authority). However, for completeness, the Hanford Site is currently included in the Benton County Comprehensive Plan (June 22, 1998) as the undesignated "Hanford Sub-Area".

f. What is the current comprehensive plan designation of the site?

The Federal land management decision process has determined through NEPA [*Hanford Comprehensive Land-Use Plan Environmental Impact Statement Record of Decision* (64 FR 61615, November 12, 1999)] that the 200 West Area geographic area, designated Industrial-Exclusive. The 216-S-10 Ditch crosses the boundary, and the 216-S-10 Pond is outside of the boundary.

g. If applicable, what is the current shoreline master program designation of the site?

Does not apply.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Minimal staff would provide appropriate surveillance and maintenance of the post-closure wells after closure.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Does not apply.

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l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Does not apply (refer to Section B.8.f.).

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

Does not apply.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No new structures are being proposed.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

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b. **Could light or glare from the finished project be a safety hazard or interfere with views?**

No.

c. **What existing off-site sources of light or glare may affect your proposal?**

None.

d. **Proposed measures to reduce or control light and glare impacts, if any:**

None.

12. **Recreation**

a. **What designated and informal recreational opportunities are in the immediate vicinity?**

None.

b. **Would the proposed project displace any existing recreational uses? If so, describe.**

No.

c. **Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any?**

None.

13. **Historic and Cultural Preservation**

a. **Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.**

No places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or next to the 216-S-10 Pond and Ditch.

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b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

There are no known archaeological, historical, or Native American religious sites on or near the 216-S-10 Pond and Ditch.

c. Proposed measures to reduce or control impacts, if any:

None.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Does not apply.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No. The distance to the nearest public transit stop is approximately 50 kilometers, located at Washington State University Tri-Cities.

c. How many parking spaces would the completed project have? How many would the project eliminate?

Not applicable.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

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f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

No additional vehicular traffic will be required. Groundwater monitoring requirements will be coordinated with similar activities supporting the 200-UP-1 groundwater operable unit.

g. **Proposed measures to reduce or control transportation impacts, if any:**

None.

15. Public Services

a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.**

No.

b. **Proposed measures to reduce or control direct impacts on public services, if any:**

Does not apply.

16. Utilities

a. **Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:**

No utilities currently are available at the 216-S-10 Pond and Ditch.

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

No utilities are proposed supporting closure of the 216-S-10 Pond and Ditch.

SIGNATURES

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

_____ _____

Keith A. Klein, Manager Date
U.S. Department of Energy
Richland Operations Office