



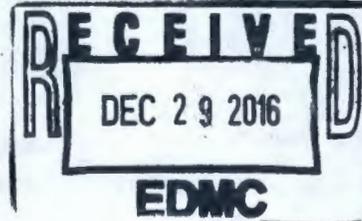
OFFICE OF RIVER PROTECTION  
P.O. Box 450, MSIN H6-60  
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DEC 29 2016

16-TF-0142

Ms. Alexandra K. Smith, Program Manager  
Nuclear Waste Program  
Washington State  
Department of Ecology  
3100 Port of Benton Blvd.  
Richland, Washington 99354



Ms. Smith:

THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION SUBMITTAL OF REPORTS FOR THE RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION AND CORRECTIVE MEASURES STUDY FOR WASTE MANAGEMENT AREA C IN COMPLETION OF HFFACO MILESTONE M-045-61A

References: 1. ORP letter from K.W. Smith to J.A. Hedges, "The U.S. Department of Energy, Office of River Protection Submittal of the Draft Resource Conservation and Recovery Act Facility Investigation Report for Waste Management Area C in Completion of Milestone M-045-61", 14-TF-0131, dated December 23, 2014.

1227926

2. OPR letter from K.W. Smith to A.K. Smith, "The Transmittal of Responses to Washington State Department of Ecology's Comments on RPP-RPT-58339, Phase 2 Resource Conservation and Recovery Act Facility Investigation Report for Waste Management Area C", Rev. A Draft, 16-TF-0059, dated June 02, 2016.

1238804

This letter transmits RPP-RPT-58339, *Phase 2 RCRA Facility Investigation Report (RFI) for Waste Management Area C*, Rev. 0 and RPP-RPT-59379, *Waste Management Area C Phase 2 Corrective Measures Study Report*, Rev. 0 as required by Hanford Federal Facilities Agreement and Consent Order (HFFACO) Milestone M-045-61A, "Submit to Ecology for review and approval as an Agreement primary document, a Phase 2 Corrective Measures Study, and revision 0 update to the RFI Report for WMA C." HFFACO Milestone M-045-61A requires that the attached be submitted to the Washington State Department of Ecology (Ecology) by December 31, 2016.

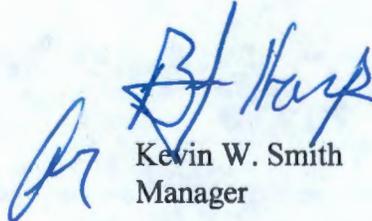
A draft version of RPP-RPT-58339 was provided to Ecology in December 2014 (Reference 1), and responses to Ecology's comments on the draft report were provided in June 2016 (Reference 2).

DEC 29 2016

Alexandra K. Smith  
16-TF-0142

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If you have any questions, please contact Glyn D. Trenchard, Acting Assistant Manager for Tank Farms Projects, Office of River Protection, at (509) 373-4016.



Kevin W. Smith  
Manager

TPD:JMJ

Attachments

cc w/attach:

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Environmental Portal, LMSI

TPA Administrative Record WMA C

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cc w/o attach:

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**ATTACHMENT 1**

**16-TF-0142**

**RPP-RPT-58339**

***Phase 2 RCRA Facility Investigation Report for Waste Management Area C***

**Rev. 0**

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# **Phase 2 RCRA Facility Investigation Report for Waste Management Area C**

**Prepared by**

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**Date Published**

December 2016



washington **river**  
**protection** solutions

Prepared for the U.S. Department of Energy  
Office of River Protection

Contract No. DE-AC27-08RV14800

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RPP-RPT-58339, Rev. 0

**EXECUTIVE SUMMARY**

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## EXECUTIVE SUMMARY

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3 The Waste Management Area (WMA) C Phase 2 *Resource Conservation and Recovery Act of*  
4 *1976 (RCRA) Facility Investigation (RFI)* is part of the overall RCRA corrective action process  
5 for WMA C soils, which have been contaminated as a result of past leaks and releases from the  
6 Hanford Site 241-C Tank Farm (C Farm) tanks and equipment. As described in both the  
7 *Hanford Federal Facility Agreement and Consent Order (Ecology et al. 1989) (HFFACO)*  
8 *Action Plan Appendix I and EPA 530/SW-89-031, Interim Final on RFI Guidance Volume I of*  
9 *IV Development of an RFI Work Plan and General Considerations for RCRA Facility*  
10 *Investigations*, the RCRA corrective action process is a multi-step process for evaluating the  
11 nature and extent of releases to the environment, determining whether corrective action is  
12 necessary, and implementing a corrective action. The corrective action process for WMA C soils  
13 is part of a larger set of activities being undertaken to support closure planning for WMA C.  
14 Appendix I of the HFFACO Action Plan also describes the waste retrieval and closure process  
15 that is to be implemented for Hanford Site single-shell tank (SST) systems. Section 2.3 of  
16 HFFACO Action Plan Appendix I states that closure decisions for Hanford Site SST system soils  
17 will be made through the RCRA corrective action process.

18  
19 The purpose of the WMA C RFI is to obtain information on the nature, extent, and migration of  
20 releases to the environment to support determinations about whether interim corrective measures  
21 and/or a corrective measures study (CMS) may be necessary. This report presents background  
22 information about C Farm, as well as contaminant distribution information necessary to draw  
23 conclusions about the nature and extent of soil contamination at WMA C, and risks associated  
24 with the soil contamination, to support corrective action decision-making.

## BACKGROUND

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29 This RFI report specifically presents the results of a Phase 2 RFI undertaken for soils at WMA C,  
30 located in the Hanford Site 200 East Area (Figures ES-1 and ES-2). WMA C includes the  
31 C Farm, which is regulated under the *Resource Conservation and Recovery Act of 1976 (RCRA)*.  
32 The C Farm RCRA unit fenceline coincides with the boundary of WMA C, and WMA C  
33 occupies 3.4 ha (8.5 ac) in the Hanford Site 200 East Area. The Phase 2 RFI/CMS study  
34 boundary encompasses a slightly larger area, as shown in Figure ES-2, and was defined  
35 vertically from the ground surface to the capillary fringe immediately above groundwater  
36 (i.e., a depth of ~61 to 73 m [200 to 240 ft] bgs).

37  
38 C Farm was constructed in 1944 and 1945 and was one of the first Hanford Site tank farms built.  
39 Operations at C Farm began in 1946. The C Farm is nearing completion of waste retrieval  
40 operations in preparation for closure as part of WMA C.

**ATTACHMENT 2**

**16-TF-0142**

**RPP-RPT-59379**

***Waste Management Area C Phase 2 Corrective Measures Study Report***

**Rev. 0**

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# **Waste Management Area C Phase 2 Corrective Measures Study Report**

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Date Published

November 2016



washington **river**  
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Prepared for the U.S. Department of Energy  
Office of River Protection

Contract No. DE-AC27-08RV14800

RPP-RPT-59379, Rev. 0

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## RPP-RPT-59379, Rev. 0

**EXECUTIVE SUMMARY**

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3 This corrective measures study was prepared in support of Hanford Federal Facility Agreement  
4 and Consent Order (Ecology et al. 1989) Milestone M-45-61A. The purpose of this study is to  
5 identify and evaluate alternatives that reduce potential impacts to human health and the  
6 environment from vadose zone soil contamination at Waste Management Area C. Past leaks at  
7 Waste Management Area C have resulted in soil contamination distributed in both the shallow  
8 (upper 4.6 meters [15 feet]) and deep (greater than 4.6 meters [15 feet]) vadose zone soils.  
9 Shallow soil contamination in localized areas represents a human health and ecological risk from  
10 direct-contact exposure, while deep soil contamination associated with mobile contaminants  
11 represents a potential impact to groundwater quality.  
12

13 A conceptual site model for the corrective measures study was developed using available  
14 characterization data presented in the Phase 2 Resource Conservation and Recovery Act of 1976  
15 (RCRA) Facility Investigation report<sup>1</sup>, historical data, inventory estimates for past leaks<sup>2</sup>, and the  
16 baseline risk assessment for Waste Management Area C<sup>3</sup>. Localized areas were identified where  
17 unplanned releases resulted in shallow soil contamination at concentrations that exceed risk  
18 thresholds. The contamination at depth (at or near the water table) is widely distributed and not  
19 well defined spatially. The potential groundwater impacts described in the baseline risk  
20 assessment indicate that peak groundwater impacts from past releases at Waste Management  
21 Area C are anticipated to occur in approximately 2019. This indicates that the mobile  
22 contaminants associated with past leaks at Waste Management Area C have migrated to depth  
23 and are near the groundwater.  
24

25 A range of technologies were considered for both shallow and deep soil contamination, and it  
26 was concluded that no practicable or effective technologies were readily available to mitigate  
27 peak impacts to groundwater from mobile contaminants at Waste Management Area C. The  
28 corrective measures that were evaluated focused on addressing shallow soil contamination.  
29 After developing corrective measures alternatives, performance was assessed – relative to  
30 protecting human health and the environment, implementability, and cost – to identify which  
31 alternative best meets the corrective action objectives.  
32

33 The corrective measures study recommendation for a preferred alternative for Waste  
34 Management Area C is implementation of an isolation barrier and infiltration barrier system  
35 (Alternative 4). The estimated cost to implement Alternative 4 is between approximately \$19  
36 and \$41 million dollars. Implementation of Alternative 4 would mitigate human health and  
37 environment risks by placing concrete isolation barriers over localized areas where shallow soil  
38 contamination levels exceed risk thresholds. The infiltration barrier system would reduce  
39 infiltration and slow the migration of contaminants to the groundwater. While the infiltration  
40 barrier would not reduce the anticipated peak impacts to groundwater, there would be a reduction  
41 in contaminant flux over the long-term. The isolation barriers would reduce the risk of

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<sup>1</sup> RPP-RPT-58339, "Phase 2 RCRA Facility Investigation Report for Waste Management Area C," Draft A.

<sup>2</sup> RPP-ENV-33418, "Hanford C-Farm Leak Inventory Assessments Report," Rev. 3.

<sup>3</sup> RPP-RPT-58329, "Baseline Risk Assessment for Waste Management Area C," Rev. 2.

## RPP-RPT-59379, Rev. 0

1 direct-contact exposure to acceptable human health risk levels and reduce infiltration, pending  
2 placement of the final closure cap that will be installed as a part of Waste Management Area C  
3 closure. This final closure cap represents the permanent risk-mitigation measure for protecting  
4 human health and the environment for Waste Management Area C and will be installed as part of  
5 the closure process after implementing the preferred alternative (Alternative 4) of this corrective  
6 measures study.  
7