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Richland Operations Office

DATE: JUN 09 2015

REPLY TO ATTN OF: AMRP:ETG\15-AMRP-0223

SUBJECT: MISCELLANEOUS RESTORATION REPORT: 100-D/H AREA DEBRIS REMOVAL

TO: Memo to File

The purpose of this memo is to transmit the subject document to the Administrative Record. If you have any questions, please contact me at (509) 376-5828.

Ellwood T. Glossbrenner, Project Lead
for the 100 Area Field Remediation

Attachment

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Administrative Record, H6-08

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Rev. 0

Miscellaneous Restoration Report: 100-D/H Area Debris Removal

Prepared for the U.S. Department of Energy by Washington Closure Hanford

December 2014

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TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PURPOSE AND SCOPE 1

1.2 REMOVAL REQUIREMENTS 1

1.3 HISTORICAL ACTIVITIES 3

1.4 KEY TERMS AND DEFINITIONS 3

2.0 MISCELLANEOUS RESTORATION ACTIVITIES 4

2.1 MISCELLANEOUS DEBRIS REMOVAL 4

2.2 MISCELLANEOUS RESTORATION FENCE REMOVAL 10

2.3 MISCELLANEOUS RESTORATION DEBRIS DISPOSAL 10

2.4 VERIFICATION OF REMOVAL 10

3.0 PROJECT COST SUMMARY 10

4.0 REFERENCES 11

FIGURES

1. Location of the 100-D/H Area Within the River Corridor 2
2. 100-D/H Miscellaneous Restoration Debris Locations. 8
3. DDR-174 Debris Prior to Removal. 9
4. DDR-174 Post-Debris Removal Activity. 9

TABLES

1. 100-D/H Miscellaneous Restoration Debris Items 5
2. Cost Summary for Removal and Disposal of Miscellaneous Restoration Debris Items. 10

ACRONYMS

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
DOE-RL	U.S. Department of Energy, Richland Operations Office
ERDF	Environmental Restoration Disposal Facility
MR	miscellaneous restoration
RCCC	River Corridor Closure Contract
WCH	Washington Closure Hanford

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document summarizes the miscellaneous restoration (MR) activities that were performed by Washington Closure Hanford (WCH) within the 100-D/H Area. The coverage area described in this report is approximately 2,030 ha (5,017 ac) as shown in Figure 1. The scope was performed per the River Corridor Closure Contract (RCCC) statement of work, Section C.2.10 Activity 10: Miscellaneous Restoration.

Miscellaneous restoration activities involve removal and disposal of materials from the River Corridor lands that have the potential for contamination with *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) hazardous substances. Washington Closure Hanford has implemented the MR work scope within the RCCC in two distinct components: (1) large-scale features, and (2) small, isolated scattered debris. The large-scale features typically consist of engineered features that extend into multiple areas of the Hanford Site. These include abandoned railroad lines, abandoned above-grade utilities, and abandoned fencing. The small, isolated scattered debris typically consist of potentially hazardous surface debris that is identified during orphan sites evaluations and includes items such as large concrete debris that stands out above the natural terrain, empty drums, large stockpile areas of wood and debris, transite piping, and isolated piping. Other non-CERCLA debris is documented and identified as stewardship elements as a part of the orphan sites evaluation processes. Stewardship elements include items such as glass, electrical components, metal, wiring, or wood. General trash/garbage and small, isolated pieces of debris are scattered throughout the Hanford Site and are not typically recorded as either MR or stewardship elements. Debris items subject to cleanup were removed and disposed to the Environmental Restoration Disposal Facility (ERDF).

1.2 REMOVAL REQUIREMENTS

Removal and disposal of miscellaneous items to support site completion was selected in DOE/RL-2010-22, *Action Memorandum for General Hanford Site Decommissioning Activities,* and is further described in Sections 2.5 and 2.6 of DOE/RL-2010-34, *Removal Action Work Plan for River Corridor General Decommissioning Activities*. As specified in DOE/RL-2010-34, debris will be removed from any given area using industry standard methods (e.g., front-end loaders, dump truck). Completion documentation for removal and disposal of miscellaneous debris is required to be documented in a report and to include a description of the work performed, quantity of material removed and disposed, and cost information.

Figure 1. Location of the 100-D/H Area Within the River Corridor.

Date: 7/2/2014 WCH: \\MCFLIGHT01\MCFlightData\HGIS\MapDocuments\DDR\DDR-sitewide.mxd

1.3 HISTORICAL ACTIVITIES

The 100-D Area contains two water-cooled, graphite-moderated plutonium reactors (100-D and 100-DR), all of which have been shut down and decommissioned. Construction of the 105-D Reactor began in November 1943 and startup occurred in December 1944. During early operations, the reactor was thought to be failing because of the uncontrollable expansion of the graphite core. Consequently, the 105-DR Reactor was built as a replacement, with construction beginning in December 1947 and startup occurring in October 1950. The 105-D Reactor shut down in June 1967 and was interim stabilized in 2004. The 105-DR Reactor was shut down in December 1964 and interim stabilized in 2002. As of 2014, the only two other major facilities in the 100-D Area that still remain include the 181-D River Pumphouse and the 182-D Reservoir and Pumphouse.

The 100-H Area contains one water-cooled, graphite-moderated plutonium reactor (105-H Reactor) that has been shut down and decommissioned. Construction of the 105-H Reactor was initiated in 1948 and startup occurred in October 1949. The 105-H Reactor was placed in final shutdown mode between 1965 and 1970. During shutdown activities, it had been determined that the fuel storage basin had leaked (DOE/RL-2001-18, *Sampling and Analysis Plan for Interim Closure of the 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils*). The 100-H Area included several major buildings, among them the 105-H Reactor Building and several structures associated with the treatment and storage of reactor cooling water. Most were deactivated with the reactor in 1965 and have since been decommissioned. As of 2014, only the 105-H Reactor Building, the 1713-H Warehouse, and portions of the 183-H Water Treatment and Storage Facilities remain standing.

1.4 KEY TERMS AND DEFINITIONS

Miscellaneous Restoration (MR): An RCCC scope element that includes removing abandoned railroad lines, abandoned above-grade utilities, abandoned fences, and surface debris such as concrete that are not otherwise addressed by the CERCLA decision documents and that are considered contaminated or potentially contaminated with CERCLA hazardous waste. All below-ground debris and structures are excluded from the MR scope. Miscellaneous restoration also excludes de minimis volumes of non-CERCLA debris (small, scattered nonhazardous surface debris).

Orphan Sites Evaluation: A systematic approach involving historical review and field investigation activities to identify new source unit waste sites within the **River Corridor** that are not identified for characterization or cleanup within the existing CERCLA decision documents (records of decision). Results of each orphan sites evaluation are presented in a summary report including a description of the process and a listing of identified orphan sites. Listings of **MR** items and stewardship elements that are captured during the course of the evaluation are also included in the summary report. Orphan sites evaluations are performed for the **reactor/operational areas** and for the inter-areas of the **River Corridor**.

Reactor/Operational Areas: The primary activity areas within the **River Corridor** that supported the Hanford Manhattan Project and subsequent Hanford Cold War Era. An **orphan sites evaluation** is conducted for each identified **reactor/operational area** including the 100-B/C, 100-D, 100-F, 100-H, 100-K, 100-N, 100-IU-2, 100-IU-6, 300, and 400 Areas.

River Corridor: A portion of the Hanford Site that is defined by the RCCC. The River Corridor is more than 56,296 ha (139,000 ac) in size and is bounded on one side by the Columbia River.

Stewardship Elements: Manmade features, items, or activity areas within the **River Corridor** that (1) do not meet the Tri-Party Agreement TPA-MP-14 criteria for waste site identification (RL-TPA-90-0001), (2) are not part of **MR** scope, and (3) are anticipated to remain after completion of the RCCC. Examples may include, but are not limited to, groundwater wells, building foundations, and physical hazards. Stewardship elements also include unsubstantiated historical research artifacts that were investigated.

Stewardship Information System: A WCH relational database consisting of four components: waste sites, facilities, **MR** items, and **stewardship elements**. The Stewardship Information System is a primary WCH resource for capturing information in support of closure for **River Corridor** waste sites, facilities, reactors, miscellaneous debris items, and **stewardship elements**.

2.0 MISCELLANEOUS RESTORATION ACTIVITIES

The following section describes the debris removal activities performed in the 100-D/H Area. Specific summary reports regarding individual MR debris item removal, including photographs, are accessible from the WCH Stewardship Information System database.

2.1 MISCELLANEOUS DEBRIS REMOVAL

The 100-D/H surface debris items were identified based on a review of the features recorded during the orphan sites evaluation process. Site evaluations were conducted between November 2005 and January 2011 as documented in the following reports: OSR-2006-0001, *100-D Area Orphan Sites Evaluation Report*; OSR-2008-0002, *100-H Area Orphan Sites Evaluation Report*; and OSR-2011-0001, *100-F/IU-2/IU-6 – Segment 4 Orphan Sites Evaluation Report.*

Forty-six debris items identified for removal in the 100-D/H Area were provided in correspondence from WCH to the U.S. Department of Energy, Richland Operations Office (DOE-RL) in Letter 158712, "Identification of Miscellaneous Restoration Debris Items for the 100-BC, 100-D, 100-H, 100-K, 100-N, 300, and 400 Areas." The DOE-RL concurred with the list of MR debris items for the 100-D/H Area in a follow-on letter (Letter 164211, "Contract No. DE-AC06-05RL14655 – Identification of Miscellaneous Restoration Debris Items for the 100-BC, 100-D, 100-H, 100-K, 100-N, 300, and 400 Areas"). Of the 46 items, 32 are located in the 100-D Area and 14 are located in the 100-H Area.

An additional 35 debris items were subsequently identified for removal in the area between the 100-D and 100-H Areas in correspondence from WCH to DOE-RL in Letter 166371, "Contract No. DE-AC-06-05RL14655 – Identification of Miscellaneous Restoration Items for IU 2 and IU 6 Including Segment 4 and Segment 5." The DOE-RL concurred with the list of MR debris items for the Segment 4 Area in a follow-on letter (Letter 168645, "Contract No. DE-AC06-05RL14655 – Identification of Miscellaneous Restoration Debris Items for IU-2 and IU-6 Including Segment 4 and Segment 5").

Table 1 describes the 79 MR surface debris item locations that were removed within the 100-D/H Area.

Table 1. 100-D/H Miscellaneous Restoration Debris Items. (3 Pages)

Orphan Site Evaluation Identification	Date Removed (mo/yr)	Description	Debris Quantity (US tons)
DDR-004 [a]	April 2014	Scattered power poles, cables, and miscellaneous power line components	778 [b]
DDR-031 [a]	Removed with 100-D-8 [c]	Concrete footing	--
DDR-035 [a]	February 2014	Cyclone fence posts with concrete footings	[b]
DDR-070 [a]	Removed with 116-DR-8 [c]	Fence posts with concrete footings	--
DDR-102 [a]	[c]	T-posts	--
DDR-118 [a]	March 2014	Concrete footing	[b]
DDR-134 [a]	Removed with 100-D-77 [c]	Bollards with concrete footings	--
DDR-144 [a]	Removed with 100-D-100 [c]	Demolished asphalt mixed with miscellaneous metal debris	--
DDR-172 [a]	January 2014	Wood pallets	[b]
DDR-174 [a]	January 2014	Concrete footings, miscellaneous metal, and power poles	[b]
DDR-175 [a]	January 2014	Cyclone fencing	[b]
DDR-176 [a]	April 2014	Fence posts	[b]
DDR-177 [a]	April 2014	Demolished asphalt	[b]
DDR-182 [a]	Removed with 100-D-31:1 [c]	Concrete burial ground monuments	--
DDR-189 [a]	[c]	Stockpile of railroad ties	--
DDR-190 [a]	[c]	Stockpile of demolished asphalt, concrete, and railroad ties	--
DDR-199 [a]	April 2014	Fence posts with concrete footings and concrete loading ramp	[b]
DDR-219 [a]	[c]	Metal frame from unknown structure	--
DDR-227 [a]	[c]	Demolished asphalt	--
DDR-232 [a]	[c]	Cyclone fencing	--
DDR-256 [a]	[c]	Metal utility poles with other metallic debris	--
DDR-260 [a]	Removed with 100-D-31:3 [c]	Metal utility poles	--
DDR-270 [a]	Removed with 100-D-56:1 [c]	Cyclone fencing	--
DDR-271 [a]	April 2014	Electrical panel	[b]
DDR-274 [a]	Removed with 100-D-104 [c]	Metal frame from unknown structure	--
DDR-278 [a]	[c]	Electrical conduit	--
DDR-325 [a]	Not removed [d]	Vent pipe attached to bollard	--
DDR-336 [a]	Removed with 100-D-31:8 [c]	Fence post with concrete footings and wood utility pole remnants	--
DDR-350 [a]	Removed with 100-D-31:2 [c]	Electrical cable	--

Table 1. 100-D/H Miscellaneous Restoration Debris Items. (3 Pages)

Orphan Site Evaluation Identification	Date Removed (mo/yr)	Description	Debris Quantity (US tons)
DDR-351 [a]	Removed with 100-D-31:7 [c]	Wood pallets and railroad ties	--
DDR-361 [a]	Removed with 100-D-31:7 [c]	Demolished asphalt and wood debris	--
DDR-366 [a]	April 2014	Concrete burial ground monuments	[b]
H-024 [e]	Removed with 600-151 [c]	Cast iron pipe and glass vial debris	--
H-037 [e]	Removed between 2009 and 2011 [c]	Wood, metal and transite debris	--
H-044 [e]	January 2014	Two 132-L (35-gal) steel drums	[b]
H-045 [e]	November 2013	Four pieces of nonfriable transite pipe	[b]
H-048 [e]	March 2014	Corrugated pipe culvert in concrete block	[b]
H-055 [e]	Removed between 2011 and 2012 [c]	Two stockpiles of railroad rails	--
H-059 [e]	March 2014	Corrugated pipe outfall in concrete block	[b]
H-069 [e]	March 2014	Four concrete footings	[b]
H-073 [e]	March 2014	Two electrical conduit foundations	[b]
H-074 [e]	March 2014	Two electrical conduit foundations	[b]
H-077 [e]	January 2014	Cast iron pipe	[b]
H-079 [e]	March 2014	Four concrete footings	[b]
H-082 [e]	[c]	Six square concrete posts	--
H-091 [e]	January 2014	Cast iron pipe	[b]
SG4DH-012 [f]	November 2013	Lead conduit with copper wire	[b]
SG4DH-035 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-045 [f]	August 2013	Two 208-L (55-gal) drums with one containing grout	[b]
SG4DH-049 [f]	August 2013	Guy wire and galvanized guard	[b]
SG4DH-061 [f]	August 2013	Metal debris and two spools of metal cable	[b]
SG4DH-072 [f]	August 2013	Aluminum angle stock	[b]
SG4DH-077 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-080 [f]	August 2013	114-L (30-gal) drum	[b]
SG4DH-081 [f]	August 2013	114-L (30-gal) drum	[b]
SG4DH-084 [f]	August 2013	Wire rope and cable	[b]
SG4DH-086 [f]	January 2014	Steel pipe	[b]
SG4DH-088 [f]	November 2013	Two utility poles	[b]
SG4DH-091 [f]	August 2013	Guy wire and galvanized guard	[b]
SG4DH-098 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-100 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-103 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-123 [f]	November 2013	8-L (2-gal) bucket containing tar and vehicle gas tank	[b]
SG4DH-124 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-126 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-129 [f]	August 2013	57-L (15-gal) drum	[b]

Table 1. 100-D/H Miscellaneous Restoration Debris Items. (3 Pages)

Orphan Site Evaluation Identification	Date Removed (mo/yr)	Description	Debris Quantity (US tons)
SG4DH-131 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-132 [f]	[c]	208-L (55-gal) drum	--
SG4DH-140 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-143 [f]	November 2013	One utility pole	[b]
SG4DH-153 [f]	August 2013	Galvanized culvert pipes	[b]
SG4DH-154 [f]	August 2013	Galvanized guy wire guards	[b]
SG4DH-157 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-167 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-169 [f]	Not removed [g]	Transite siding debris	--
SG4DH-183 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-199 [f]	August 2013	208-L (55-gal) drum	[b]
SG4DH-204 [f]	August 2013	57-L (15-gal) drum	[b]
SG4DH-207 [f]	Not removed [g]	114-L (30-gal) and 19-L (5-gal) drums	--
SG4DH-221 [f]	August 2013	Galvanized guy wire guards and metal cable	[b]
SG4DH-229 [f]	November 2013	Transite siding and wood debris	[b]

[a] Source from OSR-2006-0001, *100-D Area Orphan Sites Evaluation Report*.
[b] All quantities combined from the 100-D/H Area are estimated to equal 778 US tons.
[c] Item was removed as part of remediation or other activities.
[d] Item was not removed because it appears to be part of an active system.
[e] Source from OSR-2008-0002, *100-H Area Orphan Sites Evaluation Report*.
[f] Source from OSR-2011-0001, *100-F/IU-2/IU-6 Area – Segment 4 Orphan Sites Evaluation Report*.
[g] The two MR debris items have not been removed due to issues with cultural clearance.

-- = debris was not included in removal quantity
MR = miscellaneous restoration

Locations of these debris items are shown in Figure 2. Debris removal was performed by use of track-hoe, rubber-tired back-hoe, and hand methods. An example of a 100-D/H MR debris item before and after removal is shown in Figures 3 and 4, respectively. Two miscellaneous debris items (SG4DH-169 and SG4DH-207) were not removed as part of this activity because of issues with cultural clearance. These features may be removed at some point in time in the future if resolutions of cultural issues are obtained.

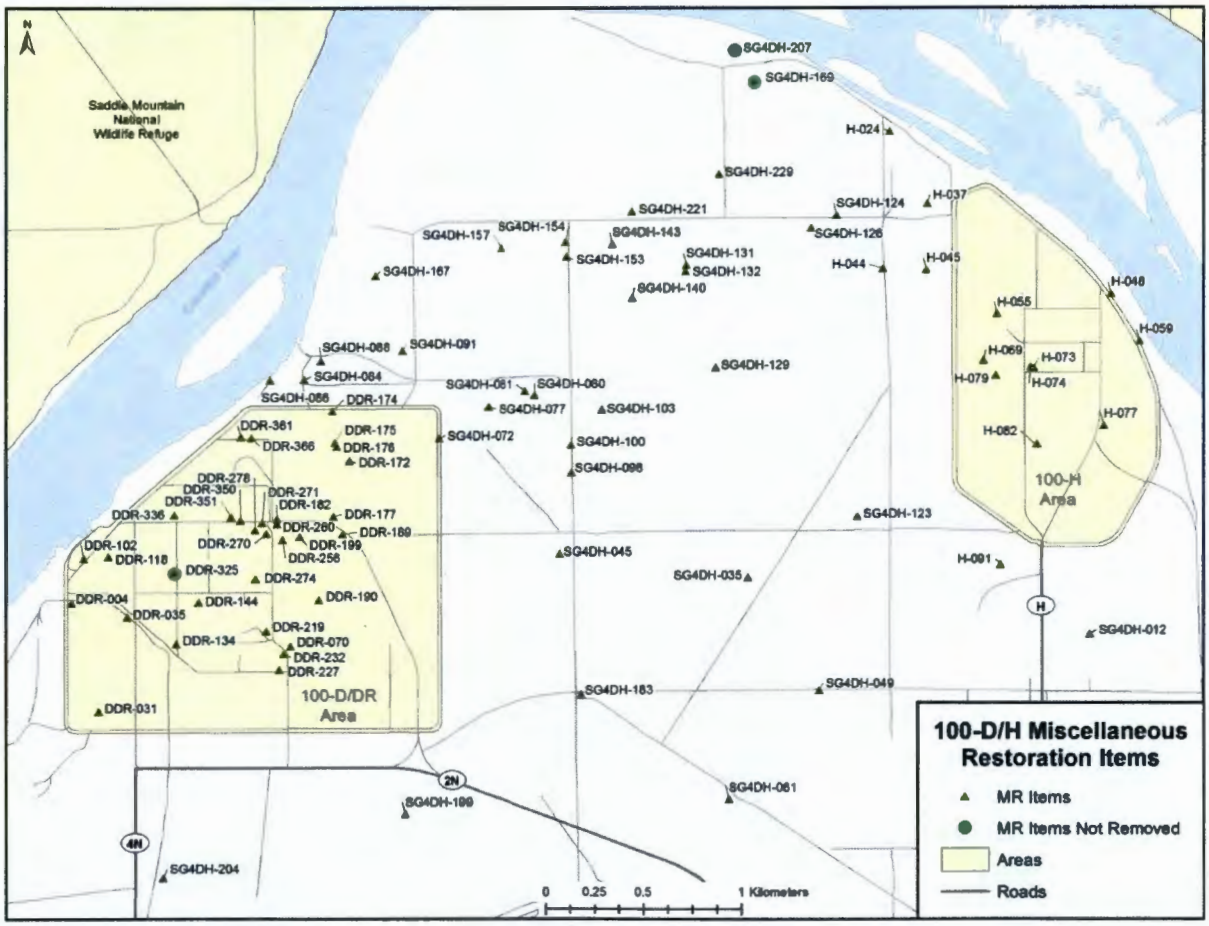

Figure 2. 100-D/H Miscellaneous Restoration Debris Locations.

Figure 3. DDR-174 Debris Prior to Removal.

Figure 4. DDR-174 Post-Debris Removal Activity.

2.2 MISCELLANEOUS RESTORATION FENCE REMOVAL

The fencing identified for removal in the 100-D/H Area is shown in Letter 157277, "Identification of Miscellaneous Restoration Fence Removal Scope." The fencing associated with both the 100-D and 100-H Areas were removed as part of either remedial or demolition activities, and the quantity/cost associated with these removal activities are not included in this report. In addition, the fencing around the 151-D substation (identified to remain in letter 157277) was also removed as part of the decommissioning activities of the substation which was subsequently added to the RCCC.

2.3 MISCELLANEOUS RESTORATION DEBRIS DISPOSAL

Collected debris from the remaining MR locations within the 100-D/H Area had a combined total weight of approximately 778 US tons. The debris was collected into ERDF roll-off containers using back-hoes and/or track-hoes. Material removed from the 100-D/H debris locations were transported to ERDF for final disposal.

2.4 VERIFICATION OF REMOVAL

Upon completion of most of the removal activities a field walkdown was performed to verify removal of the surface debris items. The DOE-RL area representative accompanied the WCH project manager into the field and observed selected locations where debris items had been removed. The walkdown was performed in August 2014 and documented in Content ID# 0659198, "Management Walkthrough Observation Sheet for 100D, 100H, and SG4D/H Miscellaneous Restoration Debris Item Completion Walkdown."

3.0 PROJECT COST SUMMARY

This section presents a summary of the project costs associated with the removal and disposal and backfill/revegetation, as required, for the 100-D/H MR debris items. The total combined cost of work performed for these MR activities was approximately $245,866. As shown in Table 2, the average unit rate for work performed was approximately $316/US ton.

Table 2. Cost Summary for Removal and Disposal of Miscellaneous Restoration Debris Items.

Debris Area	Waste Quantity (US tons)	Removal ($K)	Disposal ($K)	Total ($K)	Average Cost ($K/US ton)
100-D/H	778	229.5	16.4	245.9	0.32

The removal cost data represent the fully burdened labor, equipment, and materials cost for the work performed. Data presented in this summary include project costs for removal and loadout, waste transportation, and disposal at ERDF. The cost data do not include costs associated with removal action work plan document development or other work control documentation, or those removed as part of remediation or other activities.

Details for the ERDF disposal costs (provided in Table 2) are based on an average unit rate of $21.05/US ton (fiscal year 2013 disposal rate). Transportation costs to ERDF are included in the removal costs.

4.0 REFERENCES

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

Content ID# 0659198, 2014, "Management Walkthrough Observation Sheet for 100D, 100H, and SG4DH Miscellaneous Restoration Debris Item Completion Walkdown," Washington Closure Hanford, Richland, Washington.

DOE/RL-2001-18, 2001, *Sampling and Analysis Plan for Interim Closure of the 105-D and 105-H Reactor Below-Grade Structures and Underlying Soils*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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DOE/RL-2010-34, 2013, *Removal Action Work Plan for River Corridor General Decommissioning Activities*, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Letter 157277, 2011, "Identification of Miscellaneous Restoration Fence Removal Scope," external letter to J. J. Short, U.S. Department of Energy, Richland Operations Office, from S. L. Feaster, Washington Closure Hanford, Richland, Washington, March 22.

Letter 158712, 2011, "Identification of Miscellaneous Restoration Debris Items for the 100-BC, 100-D, 100-H, 100-K, 100-N, 300, and 400 Areas," external letter to J. J. Short, U.S. Department of Energy, Richland Operations Office, from S. L. Feaster, Washington Closure Hanford, Richland, Washington, June 1.

Letter 164211, 2012, "Contract No. DE-AC06-05RL14655 – Identification of Miscellaneous Restoration Debris Items for the 100-BC, 100-D, 100-H, 100-K, 100-N, 300, and 400 Areas," external letter to C. A. Johnson, Washington Closure Hanford, Richland, Washington from J. J. Short, U.S. Department of Energy, Richland Operations Office, Richland, Washington, February 10.

Letter 166371, 2012, "Contract No. DE-AC-06-05RL14655 – Identification of Miscellaneous Restoration Items for IU 2 and IU 6 Including Segment 4 and Segment 5," external letter to J. J. Short, U.S. Department of Energy, Richland Operations Office, from S. L. Feaster, Washington Closure Hanford, Richland, Washington, June 27.

Letter 168645, 2012, "Contract No. DE-AC06-05RL14655 – Identification of Miscellaneous Restoration Debris Items for IU-2 and IU-6 Including Segment 4 and Segment 5," external letter to C. A. Johnson, Washington Closure Hanford, from J. J. Short, U.S. Department of Energy, Richland Operations Office, Richland, Washington, November 13.

OSR-2006-0001, 2009, *100-D Area Orphan Sites Evaluation Report,* Rev. 0, Washington Closure Hanford, Richland, Washington.

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