

Waste Control Plan for the 200-WA-1 Uranium Sequestration Pilot Test

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

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788



**P.O. Box 1600
Richland, Washington 99352**

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P.O. Box 1600
Richland, Washington 99352

APPROVED

By Ashley R Jenkins at 4:07 pm, Aug 11, 2015

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Date

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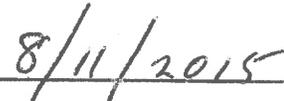
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Concurrence: M.W. Cline
U.S. Department of Energy, Richland Operations Office



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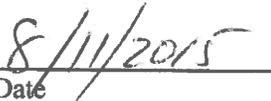


Date

C.E. Cameron
U.S. Environmental Protection Agency



Signature Rod Celos for



Date

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Terms

CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CWC	Central Waste Complex
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
IDW	investigation-derived waste
MSW	miscellaneous solid waste
OU	operable unit
RCT	Radiological Control Technician
RO/RO	roll-on/roll-off
SWITS	Solid Waste Information Tracking System
USPT	Uranium Sequestration Pilot Test
WPC	Waste Planning Checklist

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1 Introduction

This waste control plan establishes requirements for management and disposal of investigation-derived waste (IDW) generated at the 216-U-8 Crib in the 200-WA-1 Operable Unit (OU). IDW will be generated at this OU in accordance with characterization activities specified in DOE/RL-2010-87, *Field Test Plan for the Uranium Sequestration Pilot Test*, and DOE/RL-2010-88, *Sampling and Analysis Plan for the Uranium Sequestration Pilot Test*, and will be managed in accordance with DOE/RL-2011-41, *Hanford Site Strategy for Management of Investigation Derived Waste*, hereinafter referred to as IDW Strategy 2011.

1.1 Purpose

The 200-WA-1 OU is composed of 145 waste sites that were previously managed within the 200-UW-1, 200-LW-1/2, 200-PW-2/4, 200-MG-1/2, 200-MW-1, 200-SC-1, 200-TW-1/2, and 200-UR-1 Source OUs. These waste sites are listed in Appendix A of DOE/RL-2010-49, *Remedial Investigation/Feasibility Study Work Plan 200-WA-1 and 200-BC-1 Operable Units*.

The waste site being investigated under this work scope is the 216-U-8 Crib, which received chemical and radiological waste streams via the 270-W Neutralization Tank in the form of steam and/or process condensate from the uranium recovery process performed at the 221-U Building (U Plant). The waste stream was known to contain uranium, nitrate, technetium-99, and other fission products such as strontium-90 and cesium-137. Samples taken during performance of the Uranium Sequestration Pilot Test (USPT) will be used to supplement other characterization to describe the nature and extent of contamination underlying the 216-U-8 Crib.

USPT is being implemented to evaluate the effectiveness of uranium sequestration via ammonia injection to decrease the mobility of uranium, and other similar contaminants, in order to protect the underlying groundwater. USPT will require drilling up to eight wells or boreholes to a depth of approximately 24.4 m (80 ft) below ground surface on the south side of the 216-U-8 Crib (Figure 1), one of which will serve as the ammonia injection well. Five surrounding wells will be equipped with instrumentation to monitor the ammonia/sediment pore water reaction process and collect data to evaluate ammonia injection as a potential remedy to protect groundwater from mobile contaminants. Upon conclusion of the pilot test, two additional boreholes will be drilled, sampled, and decommissioned.

1.2 Waste Generating Activities

Activities that will generate wastes to be managed in accordance with this waste control plan are limited to those necessary for the performance and evaluation of the 200-WA-1 USPT. These activities are expected to include drilling, sampling, well construction, ammonia injection, monitoring, well decommissioning, and related work at the wells identified in Table 1.

Table 1. Well Identification and Location Summary

Well Identification	Well Name	Type	Northing (m)	Easting (m)	Surface Elevation (m)
C9515	299-W22-117	Monitoring Well	134669.01	567612.96	212.4
C9516	299-W22-118	Injection Well	134669.01	567615.96	212.4
C9517	299-W22-119	Monitoring Well	134669.01	567617.96	212.4

Table 1. Well Identification and Location Summary

Well Identification	Well Name	Type	Northing (m)	Easting (m)	Surface Elevation (m)
C9518	299-W22-120	Monitoring Well	134669.01	567620.96	212.4
C9519	299-W22-121	Monitoring Well	134666.01	567615.96	212.2
C9520	299-W22-122	Monitoring Well	134663.01	567615.96	212.1
C9522	N/A	Post-Treatment Characterization Borehole	TBD	TBD	TBD
C9523	N/A	Post-Treatment Characterization Borehole	TBD	TBD	TBD

N/A = not applicable
TBD = to be determined

1

2 **1.3 Projected Waste Streams**

3 One or all of the following waste streams are anticipated and may fall into any combination of waste
4 categories (radioactive, mixed, hazardous, dangerous, suspect radioactive, suspect dangerous, suspect
5 mixed, and nonregulated):

- 6 • Miscellaneous solid waste (MSW) (e.g., rubber, glass, paper, personal protective equipment, cloth,
7 plastic, and metal)
- 8 • Drill cuttings, soils, and slurries
- 9 • Equipment and construction materials (e.g., well casing, drill string, drive barrel, construction
10 equipment and materials, sampling equipment, decommissioning materials, and wooden pallets)
- 11 • Nondangerous/no-radiation-added (nonradioactive) solid waste (e.g., paper, wood, construction
12 debris, metal, plastic, and glass)
- 13 • Unplanned release and associated cleanup material
- 14 • Decontamination fluids
- 15 • Purgewater

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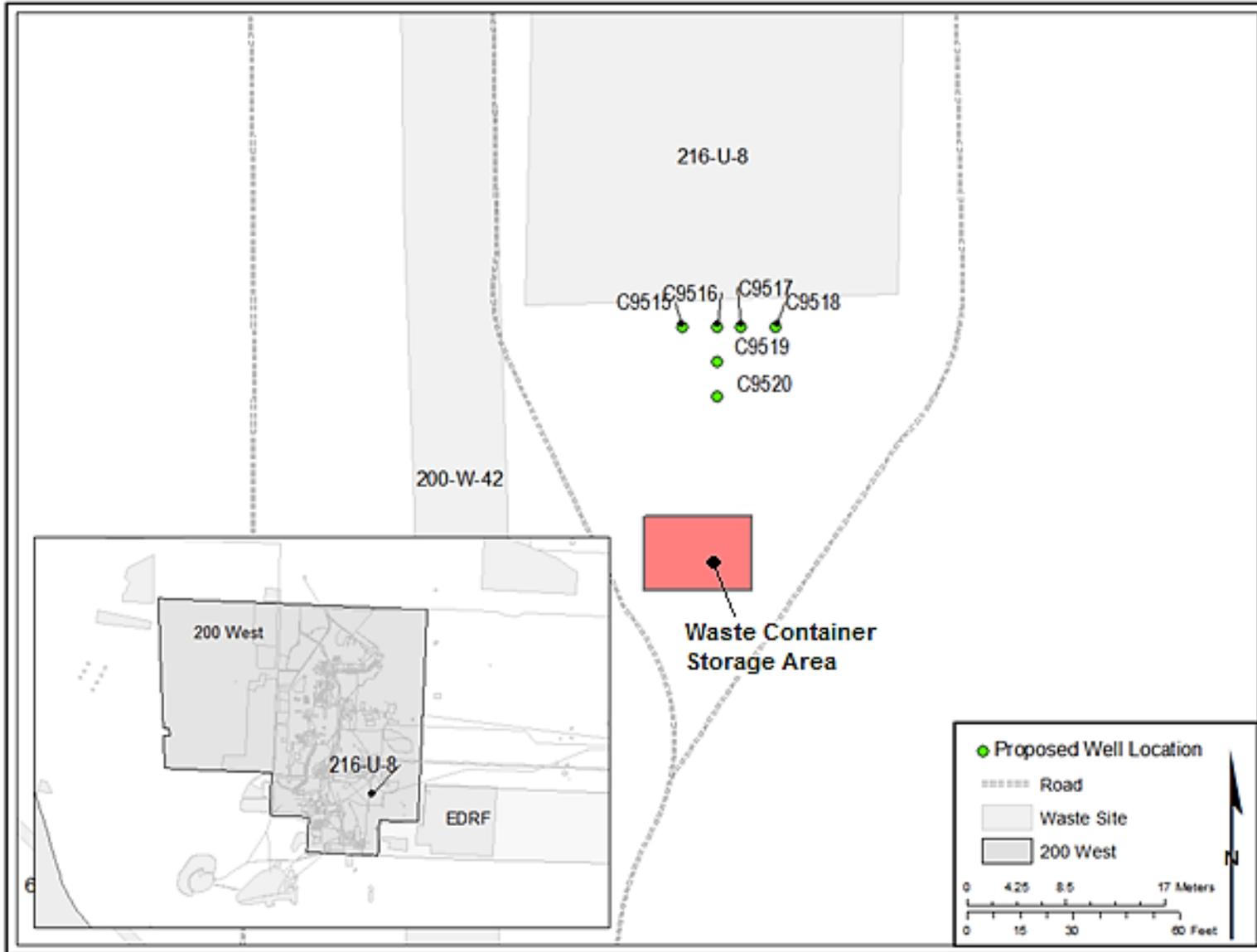


Figure 1. 200-WA-1 Uranium Sequestration Pilot Test Layout

2 General Waste Management Requirements

All 200-WA-1 OU IDW will be managed in accordance with this waste control plan and applicable federal and state regulations. Every effort will be made to minimize waste generation from this OU.

2.1 Waste Packaging and Labeling

Waste packaging and labeling will be performed in accordance with a Waste Planning Checklist (WPC).

Waste packaging and labeling during storage and transportation will comply with IDW Strategy 2011 (DOE/RL-2011-41), Chapter 7, “Container Management.” All containers of IDW will be managed in accordance with the applicable substantive federal and/or state requirements including labels that define the known major risk(s), dangerous waste codes, and if awaiting analysis, wording that states “waste pending analysis” with the date of initial sampling.

U.S. Department of Transportation (DOT) requirements will also apply, as appropriate. For waste shipments on the Hanford Site, non-DOT packaging may be used if the container will provide an equivalent degree of safety and approval documents are in place. Materials requiring collection will be placed in containers appropriate for the material and receiving facility. DOT approved drums may be used for some materials (e.g., drill cuttings); however, packaging or containment for large or irregular waste or large volume waste (e.g., drill casing and excavated soil) may require containers other than drums. The packaging or containment may include, but is not limited to, plastic wrap, 55-gallon drums, 4 ft × 4 ft × 8 ft boxes, and Environmental Restoration Disposal Facility (ERDF) roll-on/roll-off (RO/RO) containers.

Waste generated from well monitoring, maintenance, decommissioning activity, and geophysical logging may be bagged. The bags will be marked with details of the generation to identify the activity associated with the waste. Small volume MSW materials may be bagged, taped, and labeled with the well identification number at the wellhead and the date the waste was generated. The bagged material may be transported in a protective manner (i.e., material is contained), while proceeding between boreholes in the OU, and will be placed in a container at the waste container storage area identified in Figure 1.

Containers will be labeled and marked appropriately to match the waste designation established for each waste stream.

2.2 Waste Storage

IDW may be stored at the waste container storage area shown in Figure 1 or temporarily at the point of generation (e.g., waste site or well site) pending final disposition. The depiction of the size and location of the waste container storage area in Figure 1 is approximate and may be adjusted to accommodate operational requirements. Segregation and staging of waste containers or packages will be performed in accordance with the WPC. Signage will clearly identify this as a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)* IDW storage area, and the amount of waste stored will be kept to a minimum. The Waste Management Representative or Waste Supervisor will be contacted when containers are full to prepare for disposal as quickly as economically feasible. Designated dangerous waste will be stored in accordance with this waste control plan, including meeting substantive requirements of WAC 173-303-630, “Dangerous Waste Regulations,” “Use and Management of Containers.” Dangerous waste, waste pending analysis, and waste containers waiting to be sampled will be inspected weekly. Nondangerous waste storage areas will be inspected monthly. The waste container storage area for the 216-U-8 waste site and USPT project is shown in Figure 1.

IDW waste (e.g., drill cuttings) may be temporarily accumulated near the point of generation and then moved to the waste storage location prior to disposal (Figure 1). Most IDW will be disposed at ERDF if it meets the waste acceptance criteria (WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*). However, based upon field screening instrumentation and/or analytical data, it may be determined that management of certain types of IDW at another approved facility, rather than ERDF, is more appropriate.

IDW that cannot meet the ERDF waste acceptance criteria (WCH-191) will remain at the waste site or at the approved waste container storage area pending disposal at an appropriate facility approved by the U.S. Environmental Protection Agency (EPA). After characterization of the waste is completed, if the waste must be stored for longer than six months, the U.S. Department of Energy (DOE) will obtain concurrence from the lead regulatory agency on the current storage, treatment, and disposal options and schedule a date for disposition of the waste.

2.3 Waste Disposal

IDW generated at the 200-WA-1 OU may be disposed at ERDF if the waste meets ERDF waste acceptance criteria as defined in WCH-191 and 0000X-DC-W0001, *Supplemental Waste Acceptance Criteria for the Environmental Restoration Disposal Facility*. If waste does not meet the ERDF acceptance criteria (WCH-191), the waste may be stored at the Central Waste Complex (CWC) or sent to an offsite disposal facility that holds applicable permits under RCRA, and has been authorized by EPA to receive, treat, or dispose of hazardous waste originating from a CERCLA remedial action, in accordance with 40 CFR 300.440, “National Oil and Hazardous Substances Pollution Contingency Plan,” “Procedures for Planning and Implementing Off-Site Response Actions.” The waste must be treated, if necessary, in accordance with 40 CFR 268.48, “Land Disposal Restrictions,” “Universal Treatment Standards,” prior to disposal.

Soil IDW containing hazardous and radiological constituents below dangerous waste designation limits and soil cleanup standards from the most recent Table 740-1 of WAC 173-340-900, “Model Toxics Control Act—Cleanup,” “Tables,” that have been released from a radiological perspective, may be returned to the ground at or near the point of excavation. Miscellaneous material that does not require disposal in ERDF will be disposed at an appropriate solid waste disposal facility.

2.4 Records

Original copies of all waste inventory documentation will be forwarded to the assigned waste management specialist to be included in the waste file and to initiate waste tracking in the Solid Waste Information Tracking System (SWITS), as applicable (ERDF RO/RO containers are not tracked in SWITS). The completed waste files will be included in the project file following final waste disposition in accordance with applicable records management processes.

3 Stream-Specific Waste Management Requirements

Stream-specific waste will be managed in accordance with this waste control plan and applicable federal and state regulations, and will be minimized to the extent possible. The following subsections describe types and management of expected wastes.

3.1 Drill Cuttings

Drill cuttings may be treated as radioactive, mixed, hazardous, dangerous, suspect radioactive, suspect dangerous, suspect mixed, suspect hazardous, or nonregulated, based on process knowledge and field screening results.

Nonregulated drill cuttings may be collected in stockpiles on plastic sheeting near the point of generation. Radioactive, mixed, hazardous, dangerous, suspect radioactive, suspect dangerous, or suspect mixed drill cuttings will be properly containerized or packaged to mitigate the spread of contaminants to the environment. Containers and packages will be properly marked and labeled. The containers will be segregated from other materials, as appropriate, and then staged at the designated waste container storage area or temporarily near the point of generation. The containers of drill cuttings will be dispositioned using process knowledge and/or analytical results associated with the contaminated media contacted.

IDW soil not designated as dangerous waste in accordance with WAC-173-303; below WAC 173-340-740, "Unrestricted Land Use Soil Cleanup Standards," Method B cleanup standards; is determined low risk for radiological contamination; and has been field surveyed to verify no detectable radioactivity above background may be returned to the ground at or near the point of generation. Any saturated drill cuttings generated at boreholes drilled to groundwater will be dewatered. Free liquids remaining in the container will be removed through decanting or through the addition of sorbent material prior to disposal, as necessary.

3.2 Purgewater

No purgewater is expected to be generated as a result of USPT. If the project scope is expanded and purgewater is generated, it will be managed in compliance with IDW Strategy 2011 (DOE/RL-2011-41) and collected and contained at the wellhead until transported to the purgewater modular storage units, 200 West Pump and Treat Facility, or other approved facility.

3.3 Decontamination Fluids

Decontamination fluids (water and nondangerous cleaning solutions) generated from cleaning equipment and tools in the OU will be contained, transported, and discharged at the modular storage units in accordance with IDW Strategy 2011 (DOE/RL-2011-41), 200 West Pump and Treat Facility, or other approved facility. If necessary, decontamination fluids can be containerized and stored at the designated site-specific waste container storage area or temporarily near the point of generation (e.g., accumulated drilling waste). Small volumes of decontamination fluids may be stabilized to eliminate free liquids and then disposed to ERDF, provided the waste acceptance criteria (WCH-191) can be met.

3.4 Equipment and Construction Materials

Equipment and construction materials in contact with suspect dangerous and suspect mixed waste will be decontaminated with a three-bucket wash or a high-temperature and high-pressure wash (180°F and >1,000 lb/in.²) within a wash basin capable of retaining rinsate, or it will be treated as MSW. All water used for decontamination activities will be potable (i.e., Hanford Site potable water or City of Richland

water). Rinsate shall be managed as decontamination fluid, as described in Section 3.3. All sampling equipment will be cleaned and decontaminated for chemical contamination after radiological release by a Radiological Control Technician (RCT). If contamination is determined to be fixed for any equipment or materials, the RCT and task manager will decide to remove the contamination using more aggressive methods or to dispose of the equipment. As necessary, equipment and construction materials will be containerized or packaged to prevent the potential spread of contamination. The equipment and construction materials may be stored either at the designated site-specific waste container storage area or near the point of generation.

3.5 Nondangerous/No-Radiation-Added Solid Waste

All nondangerous/no-radiation-added (nonradioactive) solid waste that is radiologically released may be disposed to an offsite solid waste landfill. This waste will not have contacted any suspect dangerous or mixed waste and will be free of any liquids. Items in this category include, but are not limited to, paper, wood, construction debris, metals, plastic, food waste, and glass. Nondangerous/no-radiation-added solid waste can be containerized, segregated, and stored at the designated site-specific waste container storage area or near the point of generation, as necessary.

3.6 Unplanned Release

The initial response to emergency and nonemergency events and conditions will follow the directions provided in the health and safety plan. The appropriate Environmental Compliance Officer will be notified as soon as possible. All statutory and regulatory spill or release reporting requirements will be met, as required by DOE O 232.1A, *Occurrence Reporting and Processing of Operations Information*. The CH2M HILL Plateau Remediation Company spill reporting single point of contact will be notified immediately (within 15 minutes of release) of the spill, as required, and will determine if additional reporting to regulatory or emergency response agencies is required by law, including CERCLA, RCRA, EPCRA, CAA, CWA, etc. Once the initial assessment is completed and appropriate measures have been taken to curtail and contain the spill or release, the waste container(s) will be properly marked, labeled, and segregated from other materials based on process knowledge, field screening results, and location. Wastes associated with spill cleanup will be managed in accordance with Chapter 2 of this plan.

3.7 Miscellaneous Solid Waste and Well Decommissioning Waste

MSW including, but not limited to, rubber, glass, paper, personal protective equipment, cloth, plastic, and metal will be generated during drilling, geophysical logging, sampling, well decommissioning, and other activities. MSW that has contacted suspect dangerous or suspect mixed waste will be treated as such. Field screening may be used to segregate radioactive investigative-derived MSW from no-radiation-added (nonradioactive) investigative-derived MSW. MSW may be placed in a plastic bag, taped closed, and marked to identify the activity associated with the waste. Container(s) will be managed in accordance with Chapter 2 of this plan. Containers of MSW will be dispositioned using process knowledge or analytical results obtained from the drill cuttings or other environmental media, as appropriate.

Process knowledge and representative analytical data will be used to profile the well decommissioning wastes. Some waste associated with decommissioning may be considered environmentally controlled material or non-dangerous/no-radiation-added (nonradioactive) solid waste, based on process knowledge or representative analytical or field data. Decommissioning waste will be containerized, marked, segregated, staged, and dispositioned in accordance with Chapter 2 of this plan.

4 References

- 0000X-DC-W0001, 2010, *Supplemental Waste Acceptance Criteria for the Environmental Restoration Disposal Facility*, Rev. 12, Washington Closure Hanford, Richland, Washington.
- 40 CFR 268.48, “Land Disposal Restrictions,” “Universal Treatment Standards,” *Code of Federal Regulations*. Available at: <http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol26/xml/CFR-2010-title40-vol26-sec268-48.xml>.
- 40 CFR 300.440, “National Oil and Hazardous Substances Pollution Contingency Plan,” “Procedures for Planning and Implementing Off-Site Response Actions,” *Code of Federal Regulations*. Available at: <http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol27/xml/CFR-2010-title40-vol27-sec300-440.xml>.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 USC 9601, et seq., Pub. L. 107-377, December 31, 2002. Available at: <http://epw.senate.gov/cercla.pdf>.
- DOE O 232.1A, 1997, *Occurrence Reporting and Processing of Operations Information*, U.S. Department of Energy, Washington, D.C. Available at: http://www.wipp.energy.gov/library/Information_Repository_A/Supplemental_Information/DOE%20Order%20232.1.pdf.
- DOE/RL-2010-49, 2011, *Remedial Investigation/Feasibility Study Work Plan 200-WA-1 and 200-BC-1 Operable Units*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0093514>.
- DOE/RL-2010-87, 2015, *Field Test Plan for the Uranium Sequestration Pilot Test*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=008164H>.
- DOE/RL-2010-88, 2015, *Sampling and Analysis Plan for the Uranium Sequestration Pilot Test*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0081163H>.
- DOE/RL-2011-41, 2011, *Hanford Site Strategy for Management of Investigation Derived Waste*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0093937>.
- WAC 173-303, “Dangerous Waste Regulations,” *Washington Administrative Code*, Olympia, Washington. Available at: <http://apps.leg.wa.gov/wac/default.aspx?cite=173-303>.
- 303-630, “Use and Management of Containers.”
- WAC 173-340, “Model Toxics Control Act—Cleanup,” *Washington Administrative Code*, Olympia, Washington. Available at: <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-340>.
- 340-740, “Unrestricted Land Use Soil Cleanup Standards.”
- 340-900, “Tables.”
- WCH-191, 2014, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 3, Washington Closure Hanford, Richland, Washington. Available at: <http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0081250H>.