PERMIT ATTACHMENT 8
INSPECTION AND TRAINING PLAN FOR GROUNDWATER MONITORING WELLS
CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The **"Modification Number"** represents Ecology's method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

Modification Date	Modification Number
05/11/2020	8C.2020.2F

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PERMIT ATTACHMENT 8
INSPECTION AND TRAINING PLAN FOR GROUNDWATER MONITORING WELLS

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TERMS

BED	Building Emergency Director
Ecology	Washington State Department of Ecology
HGET	Hanford General Employee Training
ICS	Incident Command System
OJT	On-the-Job Training
RCRA	*Resource Conservation and Recovery Act of 1976*

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8.1 Inspection Plan for Groundwater Monitoring Wells

In accordance with Washington Administrative Code (WAC) 173-303-806(4)(a)(v), Dangerous Waste Regulations, *Final facility permits*; WAC 173-303-320, *General inspection*; and WAC 173-303-340, *Preparedness and prevention*, this inspection plan is designed to prevent malfunctions, deterioration, operator errors, and discharges at active *Resource Conservation and Recovery Act of 1976* (RCRA) resource protection groundwater monitoring wells (wells) on the Hanford Facility as defined by WAC 173-160-410(13), Minimum standards for construction and maintenance of wells, *What are the specific definitions for words in this chapter?* These events may cause or lead to the release of dangerous waste constituents to the environment or a threat to human health. This inspection plan is designed to provide early warning of the potential for such events in order to prolong the life of the wells, make timely corrections, or take preventative actions. Permittees will comply with inspection requirements as identified in Sections 8.1.1 through 8.1.4.

In accordance with WAC 173-303-645(8)(c), *Releases from regulated units*, all wells must be cased in a manner that maintains the integrity of the monitoring well borehole. This casing must allow collection of representative groundwater samples. Wells must be constructed in such a manner as to prevent contamination of the samples, the sampled strata, and areas between aquifers and water-bearing strata. Wells must meet the requirements applicable to resource protection wells, which are set forth in WAC 173-160. Applicable wells are listed in the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion Revision 8C, for the Treatment, Storage, and Disposal of Dangerous Waste* (Site-wide Permit) in the various Permit Parts III, V, and VI Unit Group's (Unit Group) Groundwater Monitoring Plans.

This inspection plan is applicable to various Unit Groups until certification of closure or post-closure care as applicable is submitted and approved by the Washington State Department of Ecology (Ecology).

8.1.1 General Inspection Requirements

Inspections within the schedule are performed by qualified personnel according to the frequency developed based on both regulatory requirements and permittee operating experience (Table 8-1). For frequencies that are not defined by specific regulatory requirements, a justification for the frequency are documented and maintained in Section 8.1.4. During an inspection, inspectors evaluate each inspection item against its associated acceptance criteria defined in the schedule (Table 8-1). The results of the inspections are documented, dated, signed by the inspector, and retained in the Hanford Facility Operating Record (appropriate Unit Group portion) for at least five years as required by WAC 173-303-380(1)(e), *Facility recordkeeping.*

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Table 8-1 Inspection Schedule

Inspection Item/Location[a]	Frequency[b]	Job Title/Position Conducting Inspection	Types of Problems and Acceptable Conditions
Groundwater Monitoring Well Data Review and Pumps			
Well pump	During groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: The well pump is not available, present, or operational. Or water is not able to be pumped to the surface. **Acceptable Condition**: The well pump is present and operational, as needed.
Well pump aboveground equipment	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: Well pump aboveground equipment is not functional (e.g., pipe threading or electrical plugs/cables are damaged or unsafe to operate). **Acceptable Condition**: Well pump aboveground equipment is functional and undamaged (e.g., pipe threading and electrical plugs/cable are operational).
Analysis of well corrosion data	No more than 30 days after all of the well corrosion data in Table 8-2 for a well groundwater sampling event are available in HEIS	Groundwater Scientist	**Problem**: Analysis of the well corrosion data in accordance with Section 8.1.4.2 indicates indeterminate issues with the below-grade portion of the well. **Acceptable Condition**: Analysis in accordance with Section 8.1.4.2 for the well corrosion data show no indeterminate issues with the below-grade portion of the well.
Security Equipment (Surface Protection Requirements)			
Well caps	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On aboveground wells, well cap not present or present with holes/damaged. **Acceptable Condition**: Well cap is in place and in good condition (i.e., no holes/ damage) on aboveground wells.

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Table 8-1 Inspection Schedule

Inspection Item/Location[a]	Frequency[b]	Job Title/Position Conducting Inspection	Types of Problems and Acceptable Conditions
Hasps and locks on well caps	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On aboveground wells, well cap is not locked or hasp is not in good condition. **Acceptable Condition**: Well cap is locked and hasp is in good condition on aboveground wells.
Well bolt-down lid	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On flush-mount wells, the bolt-down lid is not in place or not in good condition. **Acceptable Condition**: Bolt-down lid is in place and in good condition on flush-mount wells.
Securement of well bolt-down lid	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On flush-mount wells, the bolt-down lid is not secured with a locking bolt or other appropriate locking mechanism. **Acceptable Condition**: The bolt-down lid is secured with a locking bolt or other appropriate locking mechanism on flush-mount wells.
Aboveground well casings	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: Well casing is damaged (e.g., holes, bent) for aboveground wells. **Acceptable Condition**: Well casing is free of damage (e.g., holes, bent).
Bollards	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On aboveground wells, fewer than 3 bollards present and less than 2 ft from well. **Acceptable Condition**: At least 3 bollards are present and greater than or equal to 2 ft from well on aboveground wells.

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Table 8-1 Inspection Schedule

Inspection Item/Location[a]	Frequency[b]	Job Title/Position Conducting Inspection	Types of Problems and Acceptable Conditions
Concrete pads	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: On aboveground wells, cracks in pad present large enough to make surface seal ineffective at preventing direct pathways of contamination to the groundwater. **Acceptable Condition**: Concrete pad is free of cracks and gaps that make the surface seal ineffective on aboveground wells.
Operating and Structural Equipment (General Construction Requirements)			
Ecology well ID tag	Prior to groundwater sampling event	NCO – SGRP Groundwater Inspector	**Problem**: Ecology well ID tag not present. **Acceptable Condition**: Ecology well ID tag is present and legible.

[a]Inspections occur at the well locations detailed in the Site-wide Permit Unit Group Addendum D, "Groundwater Monitoring Plan." The well name will be notated on the inspection log.

[b]Groundwater sampling events are described in the Site-wide Permit Unit Group Addendum D, "Groundwater Monitoring Plan."

Ecology = Washington State Department of Ecology
HEIS = Hanford Environmental Information System
ID = Identification
NCO = Nuclear Chemical Operator
SGRP = Soil and Groundwater Remediation Project

This inspection plan addresses the following Unit Group specific items:

- Groundwater monitoring equipment.
- Security equipment.
- Operating and structural equipment.

Management-level staff are responsible for implementation of and training according to this inspection plan. These staff may include the Sampling Director, Manager, or Supervisor personnel. The designated Sampling Director, Manager, or Supervisor personnel who has oversight responsibility for this inspection plan for Groundwater Monitoring Plans. All inspectors shall have the appropriate training as outlined in Section 2.

Problems identified by the inspector are documented on the inspection log and reported to facility management for prioritization and scheduling of remedial actions to minimize potential impacts to environmental or human health incidents.

The inspection schedule (Table 8-1) is maintained in the Hanford Facility Operating Record.

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8.1.2 Inspection Log

Inspections implemented in accordance with this inspection plan will be documented on inspection checklists or log sheets in accordance with WAC 173-303-320(2)(d), *General inspection*. Inspection checklists or log sheets will note the date and time of the inspection, well name, and well identification number, and will list the items that will be assessed during each inspection. Any problems or discrepancies identified during the inspection will be recorded on the inspection checklist or log sheet, reported to the operating organizations, prioritized, and addressed in a timely fashion as described in Section 8.3.

When the inspection is complete, the inspector's full name (first and last) is printed and signed on the inspection checklist or log sheet. The inspection records and this inspection schedule will be maintained and stored in the Hanford Facility Operating Record (appropriate Unit Group portion) in accordance with the Site-wide Permit Condition II.I, Facility Operating Record, which complies with the record retention requirements set forth in WAC 173-303-320(2)(d) and WAC 173-303-380(1)(e).

8.1.3 Remedy Schedule

Problems identified during inspections are categorized into three general areas and addressed accordingly. The areas are imminent hazards to human health and the environment, problems that cannot be easily corrected without required planning and coordination, and problems that can be easily remedied with little or no planning. Examples of problems can be categorized into these three areas:

- When an identified problem may pose an imminent risk to human health or the environment, actions are taken appropriately to mitigate the hazard. This may include activation of the Building Emergency Plan for the appropriate Unit Group (located in the appropriate Site-wide Permit Unit Group Permit Addendum J, "Contingency Plan") and the Hanford Emergency Management Plan (located in Site-wide Permit Attachment 4, DOE/RL-94-02, *Hanford Emergency Management Plan*), when contingency plan action levels are exceeded. An example of problems that warrant immediate action include active release of untreated groundwater (i.e., purgewater) to the environment and evidence of failure of systems that mitigate potential releases (e.g., failure of the well surface seal or well casing corrosion resulting in a direct pathway of contamination to the groundwater).
- Problems that cannot be easily corrected (e.g., broken pump, electrical issues) are addressed on a prioritized schedule. Identified problems are entered into a work management system. Actions to assess and remedy such problems are assigned and a schedule for completion is determined. A priority is given to remedial actions that can be performed within the sampling time period so that groundwater can be sampled within the frequencies identified in the Site-wide Permit Unit Group's Addendum D, "Groundwater Monitoring Plan." Wells that need to be decommissioned for the above reason will be placed on the "well decommissioning list." The timing of the decommissioning activity will be dependent on availability of resources and scheduling of services to perform the decommissioning.
- Problems identified during an inspection that are easily corrected (e.g., no maintenance planning required); for example, Ecology well identification tag replacement, missing well caps, or locks will be corrected within 24 hours or tracked until completion.

An overall schedule for remedying problems would include time to develop a maintenance instruction in conjunction with any schedule constraints such as personnel resources, parts availability, fabrication, environmental, and facility access limitations. The time to develop a maintenance instruction is dependent on a number of factors including nuclear, radiological, and industrial safety hazards associated with the task; complexity of the task; human factors and performance considerations; skill of worker(s); and risk to the worker(s), public, or the environment.

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The inspection problem resolution process may include an inspection data sheet that identifies the criteria for the inspection and problems identified during the inspection, relays identified problems to the well maintenance organization for tracking (e.g., well concern report), and develops maintenance instructions (e.g., well maintenance report) to remedy problems. The remedies for problems identified are developed using maintenance instructions and prioritized on a schedule, as described above. Problems pending resolution and their associated tracking designation will be noted until the remedy is complete.

Information from the inspection checklist or log sheet will be maintained in the Hanford Facility Operating Record (appropriate Unit Group portion) in accordance with the Site-wide Permit Condition II.I.

Adverse weather conditions (e.g., wildland fire, lightning) and other unplanned unpreventable events (e.g., radiologic contamination issues, delay in receiving laboratory data) may delay or prevent the inspection detailed in this document from being performed. If nonperformance occurs due to these events, a note will be made in either the inspection log sheet/checklist or to the Hanford Facility Operating Record (appropriate Unit Group portion).

8.1.4 Justification of Frequency of Items to be Inspected

The frequency of items to be inspected under the scope of this inspection plan is not driven by any specific frequencies in the regulations; therefore, the justification for all frequencies is detailed in the following sections.

8.1.4.1 Items to be Inspected in Association with Each Sampling Event

Items to be inspected (Table 8-1) in conjunction with the sampling event will be inspected at the sampling frequency specified in the appropriate Site-wide Permit Unit Group Addendum D, "Groundwater Monitoring Plan." Inspections will not occur more frequently than the sampling frequency specified in the appropriate Site-wide Permit Unit Group Addendum D, "Groundwater Monitoring Plan," except when the sampling frequency is not at least annual, then wells identified in the network will be inspected at least annually (i.e., at least once per 12-month period). If problems are identified during inspections indicating a higher or lower rate of deterioration and probability of an environmental or human health incident, then the frequency will be reevaluated.

8.1.4.2 Groundwater Monitoring Well Data Review

Corrosion of well casing, screen, and other components is a process that occurs over time. Wells on the Hanford Facility are typically constructed using components made of stainless steel, which while being resistant to corrosion is not impervious to all corrosion effects. Well component corrosion has been observed to produce detectable amounts of specific metals in groundwater samples as well components deteriorate. Review of groundwater monitoring data for the presence of the stainless steel alloy metals and their relative concentrations can provide indication of well corrosion and provide a basis for initiating additional well assessment and rehabilitation activities.

The objective of reviewing groundwater monitoring data for the presence of corrosion products is to ensure both that wells are maintained in usable condition and that samples collected from the well(s) will be representative of the aquifer being monitored. The presence of metals originating from corrosion of well components in groundwater samples is a condition that is not representative of the surrounding groundwater.

Wells on the Hanford Facility may contain components made from one or more common stainless steel alloys such as 304, 304L, 316, and/or 316L. These alloys are industry standard materials and are fabricated from specified constituents within a relatively narrow range of defined content and are present in reasonably predictable ratios. The average weight percent of constituents in these alloys are shown in Table 8-2. The metallic constituents of these alloys (i.e., iron, chromium, nickel, molybdenum, and manganese) account for the largest fraction of the steel alloy and are readily detectable in laboratory analyses of water. These metals have been selected as indicators of well component corrosion. The ratios

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of the alloy metals to the iron content in the four common stainless steel alloys are shown in Table 8-3. If these metals are present in an unfiltered groundwater sample at ratios similar to those of the reference alloys, then this is an indication that stainless steel corrosion may be occurring in the subject well and further action is needed. The ratio comparison data is used to detect corrosion of stainless steel wells in order to prevent potential contamination of groundwater from unrecoverable deterioration in the subsurface well casing. An increase in the trend of stainless steel alloys in groundwater samples indicates corrosion of the well. The ratio analysis comparisons are completed after each sampling event to identify trends and take additional actions per Section 8.1.4.2. The documentation of that review must be provided as part of the inspection log identified in Section 8.1.2.

Table 8-2 Average Constituent Content in Selected Stainless Steel Alloys

Alloy	Iron (wt %)	Chromium (wt %)	Nickel (wt %)	Molybdenum (wt %)	Manganese (wt %)	Silicon (wt %)	Carbon (wt %)	Phosphorus (wt %)	Sulfur (wt %)
304	69	19	9.25	-	2	1	0.08	0.045	0.03
304L	68	19	10	-	2	1	0.03	0.045	0.03
316	65	17	12	2.5	2	1	0.08	0.045	0.03
316L	65	17	12	2.5	2	1	0.03	0.045	0.03

Reference: National Electronic Alloys (NEA), 2019, Stainless Steel 300 Series [Nominal Data Sheet{s}].

Table 8-3 Ratios of Alloy Metals Content to Iron in Reference Stainless Steel Alloys

Alloy	Iron: Iron (unitless)	Chromium: Iron (unitless)	Nickel: Iron (unitless)	Molybdenum: Iron (unitless)	Manganese: Iron (unitless)
304	1	0.28	0.13	-	0.03
304L	1	0.28	0.15	-	0.03
316	1	0.26	0.18	0.04	0.03
316L	1	0.26	0.18	0.04	0.03

Measurement results of total metal analysis of unfiltered samples from each monitoring event will be inspected for detectable concentrations of iron, chromium, nickel, molybdenum and manganese. If detectable concentrations for iron, chromium, nickel and manganese are reported in a sample, then that sample will be evaluated for potential corrosion effects. If molybdenum is reported as a detectable concentration, then molybdenum will be included in the evaluation.

The evaluation begins by dividing the detected concentrations of the target alloy metals in a single sample by the detected iron concentration to calculate a ratio of each alloy metal concentration to the iron concentration. The resulting ratios are then compared to the ratios of a reference alloy and inspected for similarity. This comparison is best performed using either bar charts or pie charts for comparison of the reference alloy to the monitoring sample results. Example pie charts of ratios of alloy metals to iron in 304 and 316 reference alloys (based on information in Table 8-3) are shown in Figures 8-1 and 8-2, respectively.

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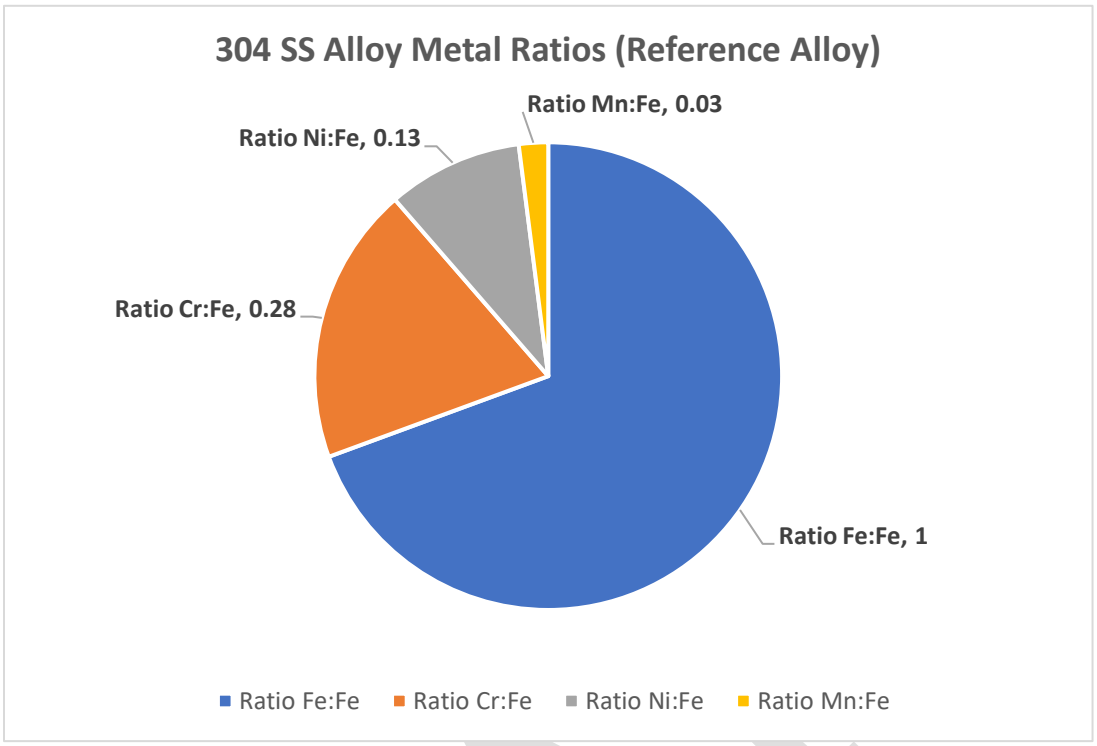

Figure 8-1 Ratio of Alloy Metals to Iron in 304 Stainless Steel Reference Alloy

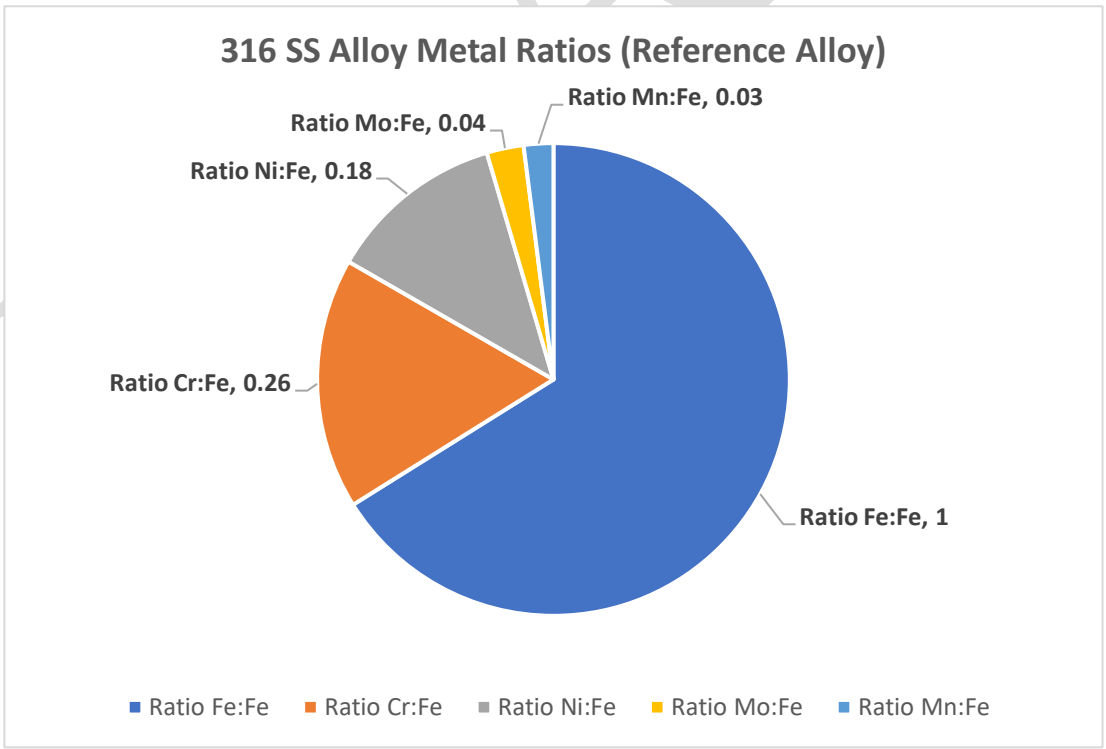

Figure 8-2 Ratio of Alloy Metals to Iron in 316 Stainless Steel Reference Alloy

If the data exhibit the general proportions for stainless steel alloys (shown in Table 8-2) on inspection, then the groundwater scientist will review the results and trending analysis with their direct manager or delegate within 2 weeks of the evaluation being complete. The outcome will then be reviewed with the appropriate sampling and maintenance management. Defined actions will be determined during the review. Possible actions include the following:

- Collect and observe additional groundwater samples/data.
- Perform a camera survey of the well interior surfaces.
- Perform well cleaning/rehabilitation.
- Other actions as identified by the Well Maintenance organization.

If a camera survey is the defined action, the survey will be initiated within 30 days. Once complete, the camera survey results will be reviewed by the groundwater scientist (and direct manager or delegate) as well as the appropriate sampling and maintenance management within two weeks and the outcome documented in the Hanford Facility Operating Record for the Unit Group portion. If the outcome of the review concludes that the corrosion is detrimental to well performance, well cleaning will be scheduled and completed before the next sampling event.

If the review determines that the corrosion encountered has progressed to a point that the well casing cannot be repaired, the well will be added to the "well decommissioning list" and identified for replacement if the well is determined to be required to maintain the facility monitoring well network.

If the outcome of the review of the camera survey indicates other non-corrosion problems internal to the well casing, appropriate maintenance actions (e.g., repairing well screens; cleaning well casing, screen, or perforations; removing debris and fill material; redeveloping the well) may be needed to address the identified problems.

If the review of well data and subsequent examination/inspection of the well confirms that corrosion of the well components is contributing alloy metals to the groundwater sample, then analysis of those metals will not be used for assessment of either detection or compliance of contamination attributed to the monitored facility. Depending on conditions observed, the well may remain in service for monitoring of other constituents not related to corrosion of stainless steel.

Table 8-1 identifies the items subject to inspection and their acceptable conditions.

For well casing made of carbon steel, a camera survey of the interior surface of the casing will occur every 10 years.

8.2 Personnel Training for Groundwater Monitoring Wells

This training plan discusses personnel training requirements based on WAC 173-303-330, *Personnel training*, and the Site-wide Permit for the well organization positions listed in this training plan.

Permittees will comply with the training outlined in Sections 8.2.1 through 8.2.3, which provide the training requirements for Hanford Facility personnel associated with dangerous and/or mixed waste management activities at the wells.

8.2.1 Introductory and Continuing Training Program

The dangerous waste training program consists of introductory and continuing training programs designed to prepare personnel to manage and maintain the wells on the Hanford Facility in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain the wells under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response

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training is consistent with the description of actions contained in the appropriate Site-wide Permit Unit Group Addendum J, "Contingency Plan."

The introductory and continuing training programs contain information addressing the following objectives:

- Train personnel to perform their duties in a way that ensures compliance with WAC 173-303.
- Train Hanford Facility personnel dangerous waste management activities (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed.
- Ensure that Hanford Facility personnel can respond effectively to emergencies.

The introductory and continuing training programs meet the requirements of WAC 173-303-330, *Personnel training*, through general Hanford Facility training, Contingency Plan training, Emergency Coordinator training, and Operations training as outlined in this section.

8.2.1.1 Introductory Training

Introductory training includes general Hanford Facility training and Unit Group specific training. General Hanford Facility training is described below. Unit Group specific training allows personnel to work unescorted and in some cases is required for escorted access. Personnel cannot perform a duty for which they are not properly trained except to gain required experience while under the direct oversight of a supervisor or coworker who is properly trained as described in Section 8.2.2.1. Personnel must be trained within six months after their employment at or assignment to the Hanford Facility or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Hanford Facility personnel will receive general Hanford Facility training described in Site-wide Permit Attachment 5, *Hanford Facility Personnel Training Program*, within six months of hire. This training provides an orientation on dangerous waste management activities being conducted at the Hanford Facility and includes the following:

- Description of emergency signals and appropriate personnel response.
- Identification of contacts for information regarding dangerous waste management activities.
- Introduction to waste minimization concepts.
- Identification of contact(s) for emergencies involving dangerous waste.
- Familiarization with the applicable portions of Site-wide Permit Attachment 4, DOE/RL-94-02, *Hanford Emergency Management Plan*.

The Permittees will provide the necessary training to non-well organization personnel or visitors as appropriate for the locations and activities undertaken. Non-well organization personnel or visitors include individuals not permanently assigned exclusively to the well organization and who do not have dangerous waste management or generation responsibilities or supervision of such activities. These individuals include but are not limited to administrative personnel, regulatory oversight, transient sampling personnel not permanently assigned to the well organization, and personnel utilized for temporary assignments. For Unit Group personnel, refer to the appropriate Site-wide Permit Unit Group Addendum G, "Personnel Training."

Contingency Plan training: Unit Group personnel receive training on applicable portions of Site-wide Permit Attachment 4, DOE/RL-94-02, *Hanford Emergency Management Plan* in the General Hanford Facility training. To ensure effective emergency response, personnel receive training on the content of the actions described in the appropriate Site-wide Permit Unit Group Addendum J, "Contingency Plan," as well.

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Emergency Coordinator training: Unit Group personnel who perform emergency coordinator duties (WAC 173-303-360, *Emergencies*) such as the Building Emergency Director (BED) within the Hanford Incident Command System (ICS) receive training on implementing the appropriate Site-wide Permit Unit Group Addendum J, "Contingency Plan," and ICS BED responsibilities. These personnel must also become thoroughly familiar with applicable contingency plan documentation, operations, activities, location, and properties of all waste handled, location of all records, and the unit/building layout.

Emergency Coordinator training consists of BED training courses required for Unit Group facility BEDs described in the appropriate Site-wide Permit Unit Group Addendum G, "Personnel Training."

Operations training: Dangerous waste management operations training (e.g., waste designation training, shipper training) will be determined on a unit-by-unit basis and shall consider the type of activities performed at the Unit Group (e.g., sampling). Training provided for the well organization is identified in Tables 8-4 and 8-5. Operations training consists of the following subjects:

- Safe and compliant sample and waste handling.
- Container management.
- Container packaging and labeling.
- Well maintenance and sampling.
- Position-specific training as detailed in Tables 8-4 and 8-5.

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Table 8-4 Personnel Training

Course Number	Course Title/Format[a]/Description	Frequency	Job Title/Position						
			FWS	WMR	Waste Shipper	NCO[b]	Well Maintenance Craft	ECO	Groundwater Scientist
General									
000001	Hanford General Employee Training (CBT) • *Standard alarms, chemical spills, security, hazards, signs, escorts, badge requirements, and overall safety.*	Annual	X	X	X	X	X	X	X
Facility Health & Safety[c]									
301850	SGRP Orientation (CBT) • *Overview of the groundwater organization and main operations. Review of employee's responsibilities to help assure a safe and healthful work environment.*	Initial	X	X	X	X	X	X	X
301851	SGRP FEHIC (CBT) • *Hazards communication, waste management, potential emergency conditions, and response actions for anyone with unescorted access to pump & treat facilities, drill sites, remediation areas, and controlled areas.*	Annual	X	X	X	X	X	X	X
Waste Management									
035100	Container Waste Management (Classroom) • *Waste minimization and pollution prevention, waste designation categories, recordkeeping, and container management.*	Initial	X[d]			X	X[d]		

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Table 8-4 Personnel Training

Course Number	Course Title/Format[a]/Description	Frequency	Job Title/Position						
			FWS	WMR	Waste Shipper	NCO[b]	Well Maintenance Craft	ECO	Groundwater Scientist
035110	Container Waste Management Refresher (CBT) • *Waste minimization and pollution prevention, waste designation categories, recordkeeping, and container management.*	Annual	X[d]			X	X[d]		
02006G	Waste Management Awareness (Classroom) • *Introductory waste management topics, waste minimization, waste generation duties and responsibilities, notifications, spills, recordkeeping.*	Initial	X[d]				X[d]		
Well Sampling Management									
301818[e]	SGRP Sampling/Characterization FWS Qualification Card (Self-Study, Classroom, CBT, and OJT) • *Establishes the training requirements and performance expectations for supervision of fieldwork activities ensuring fieldwork activities are properly supervised.*	Initial	X						
290520[e]	GRP Field Work Supervisor-Buyer Technical Representative Qualification Card (Self-Study, Classroom, CBT, and OJT) • *Establishes the training requirements and performance expectations for supervision of fieldwork activities ensuring fieldwork activities are properly supervised.*	Initial	X						

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Table 8-4 Personnel Training

Course Number	Course Title/Format[a]/Description	Frequency	Job Title/Position						
			FWS	WMR	Waste Shipper	NCO[b]	Well Maintenance Craft	ECO	Groundwater Scientist
Waste Services									
035010	Waste Designation (Classroom) • *Dangerous waste designation and land disposal restrictions according to WAC 173-303.*	Initial		X					
035012	Waste Designation Qualification (Classroom) • *Dangerous waste designation and land disposal restrictions according to WAC 173-303.*	Annual		X					
153020	Waste Fundamentals Qualification Card (OJT) • *Waste designation, waste management, land disposal restrictions, and recordkeeping.*	Initial		X					
153021	WMR Qualification Card (OJT) • *Work control activities, waste planning and packaging documentation, and transportation requirements.*	Initial		X					
020159	Advanced Hazardous Waste Shipper Certification Training (Classroom) • *Shipping techniques on hazardous waste labels, containers, packing, and manifesting.*	Initial			X				
020078	Advanced Mixed Waste Shipper Certification Training (Classroom) • *Shipping techniques on hazardous waste labels, containers, packing, and manifesting.*	Every 3 years			X				

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Table 8-4 Personnel Training

Course Number	Course Title/Format[a]/Description	Frequency	Job Title/Position						
			FWS	WMR	Waste Shipper	NCO[b]	Well Maintenance Craft	ECO	Groundwater Scientist
Environmental									
600100	Environmental Compliance Officer – Core (OJT) • *Knowledge of environmental regulations, permits, regulator inspections and notifications, recordkeeping, and pollution prevention practices.*	Initial						X	
290300[f]	SGRP – ECO (OJT) • *SGRP specific environmental requirements and processes, including management of regulated waste and environmental impacts from operations.*	Initial						X	

Reference: WAC 173-303, *Dangerous Waste Regulations*.

[a]Section 8.2.2 explains the self-study, classroom, computer, and OJT categories.

[b]See Table 8-5 for training needed for specific NCO positions/duties.

[c]Only SGRP Facility Health and Safety courses are included. Workers who perform duties inside active portions of Unit Groups unescorted will need the applicable FEHIC training from the Site-wide Permit Unit Group Addendum G, "Personnel Training." Those are courses 290200 (Central Plateau Surveillance and Maintenance FEHIC), 03E079 (ETF FEHIC), 290130 (Tank Farm Overview), 705705 (ETF Orientation), 300701 (Central Waste Complex Orientation), 301740 (Solid Waste Storage & Disposal FEHIC), or 600026 (Integrated Disposal Facility FEHIC).

[d]FWS and well maintenance craft may take course 02006G or 035100. If course 035100 is selected, then refresher course 035110 will be taken. If course 02006G is selected, then no refresher course is required.

[e]The FWS will take one of these courses, depending on who they are supervising.

[f]Required training only for permanently assigned ECO.

Annual = At least once per 12-month period ±30 days

Initial = Completed at the frequency in Sections 8.2.1.1 and 8.2.2.1

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Table 8-4 Personnel Training

Course Number	Course Title/Format[a]/Description	Frequency	Job Title/Position						
			FWS	WMR	Waste Shipper	NCO[b]	Well Maintenance Craft	ECO	Groundwater Scientist

CBT = Computer-based Training
CPCCo = Central Plateau Cleanup Company, LLC
ECO = Environmental Compliance Officer
ETF = Effluent Treatment Facility
FEHIC = Facility Emergency and Hazard Identification Checklist
FWS = Field Work Supervisor
GRP = Groundwater Remediation Project
NCO = Nuclear Chemical Operator
OJT = On-the-Job Training
SGRP = Soil & Groundwater Remediation Project
WMR = Waste Management Representative

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Table 8-5 Personnel Training for Specific Nuclear Chemical Operator Positions

Course Number	Course Title/Format*/Description	Frequency	Job Title/Position							
			GW Inspector	GW Sampler	Sample Shipper & Packager	Sample Equipment Cleaner	Multi-Media Sampler	Borehole Sampler	Routine Sampler	Remediation Sampler
Well Sampling Operations										
301805	SGRP Sampling Fundamentals (Classroom) • *Prepare and preserve sample bottles, take a basic groundwater level measurement, and use the water filtration/purification system.*	Initial	X	X	X	X	X	X	X	X
301806	SGRP Sampling Fundamentals OJT/OJE (Self-Study, Classroom, CBT, and OJT) • *Prepare and preserve sample bottles, take a basic groundwater level measurement, and use the water filtration/purification system.*	Every 2 years	X	X	X	X	X	X	X	X
301815	Sampling Instrumentation Fundamentals (Classroom) • *Use of sampling instruments.*	Initial	X	X	X	X	X	X	X	X
301802	Groundwater Monitoring & Sampling (Self-Study, Classroom, CBT, and OJT) • *Perform groundwater sampling activities.*	Every 2 years		X						
301813	Sample Packaging and Shipping (Self-Study, Classroom, CBT, and OJT) • *Perform packaging, shipping, disposition of samples, and all associated documentation at SGRP sites.*	Every 2 years			X					

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Table 8-5 Personnel Training for Specific Nuclear Chemical Operator Positions

Course Number	Course Title/Format*/Description	Frequency	Job Title/Position							
			GW Inspector	GW Sampler	Sample Shipper & Packager	Sample Equipment Cleaner	Multi-Media Sampler	Borehole Sampler	Routine Sampler	Remediation Sampler
301820	Cleaning Sampling Equipment Qualification (Self-Study, Classroom, CBT, and OJT) • *Conduct cleaning activities in support of sampling activities.*	Every 2 years				X				
301810	Multi-Media Sampling Qualification Card (Self-Study, Classroom, CBT, and OJT) • *Perform sampling of non-groundwater media inside of a RCRA site (e.g., general soil sampling) at SGRP sites and facilities.*	Every 2 years					X			
301812	Borehole Characterization and Waste (Self-Study, Classroom, CBT, and OJT) • *Perform soil borehole sampling inside of a RCRA site at SGRP sites and facilities.*	Every 2 years						X		
301811	Routine Sampling (Self-Study, Classroom, CBT, and OJT) • *Perform routine sampling activities of dangerous waste drums in a RCRA site at SGRP sites and facilities.*	Every 2 years							X	
301821	Remediation Sampling (Self-Study, Classroom, CBT, and OJT) • *Perform soil sampling through a RCRA WIDS and/or other RCRA sites at SGRP sites and facilities.*	Every 2 years								X

*Section 8.2.2 explains the self-study, classroom, computer, and OJT categories.

Annual = At least once per 12-month period ±30 day

Initial = Completed at the frequency in Sections 8.2.1.1 and 8.2.2.1

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Table 8-5 Personnel Training for Specific Nuclear Chemical Operator Positions

Course Number	Course Title/Format*/Description	Frequency	Job Title/Position							
			GW Inspector	GW Sampler	Sample Shipper & Packager	Sample Equipment Cleaner	Multi-Media Sampler	Borehole Sampler	Routine Sampler	Remediation Sampler

CBT = Computer-based Training
GW = Groundwater Well
OJE = On-the-Job Experience
OJT = On-the-Job Training
NCO = Nuclear Chemical Operator
RCRA = Resource Conservation and Recovery Act of 1976
SGRP = Soil & Groundwater Remediation Project
WIDS = Waste Information Data System

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8.2.1.2 Continuing Training

In accordance with the requirements of WAC 173-303-330(1)(b), dangerous waste workers participate in an annual review of training, including general Hanford Facility training and well organization specific training. The frequencies for individual training courses are described below and discussed in Section 8.2.1.1.

General Hanford Facility training: Annual refresher training is provided for general Hanford Facility training.

Contingency Plan training: Annual refresher training is provided for contingency plan training.

Emergency Coordinator training: Annual refresher training is provided for emergency coordinator training including the BED training course.

Operations training: Refresher training occurs on many frequencies (e.g., annual, every other year, every 3 years) for operations training. When justified, some training will not contain a refresher course and will be identified as a one-time only training course. Tables 8-4 and 8-5 specify the frequency for each training course.

8.2.2 Description of Training Program

The dangerous waste training program is overseen by a training manager who is knowledgeable in dangerous waste management procedures and is otherwise qualified to design a dangerous waste training program by a combination of education and relevant experience. These qualifications are listed in Table 8-6 as required by WAC 173-303-330(2)(a).

Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
Field Work Supervisor	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Supervise waste management activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records.	Requisite Skills 3 years of nuclear facility experience, or education/experience equivalent Education High school diploma or equivalent Other Qualifications As detailed in Table 8-4

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
Waste Management Representative	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Choose containers for storage, determine container markings, determine waste segregation practices. • Complete waste designations. • Initiate process for waste shipments to appropriate facilities on-site and off-site for storage or disposal. • Prepare and submit environmental records.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-4
Waste Shipper	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Prepare and certify waste shipment documentation for both on-site and off-site shipments of dangerous and/or mixed waste. • Prepare and submit environmental records.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-4
Well Maintenance Craft	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Maintain groundwater well and monitoring equipment. • Observe results from groundwater monitoring devices (e.g., camera). • Prepare and submit environmental records.	Requisite Skills 1 year of maintenance-related experience Education None Other Qualifications None

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
Environmental Compliance Officer	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Ensure operations are consistent with requirements contained in the Site-wide Permit and WAC 173-303. • Prepare and submit environmental records.	Requisite Skills Experience with the environmental regulations Education College BA/BS degree in a technical discipline or an equivalent combination of education and experience Other Qualifications As detailed in Table 8-4
Groundwater Scientist	• Perform inspections as assigned per Table 8-1. • Develop and maintain groundwater monitoring documents. • Review groundwater monitoring data. • Determine status and adequacy of groundwater monitoring network(s). • Support permit required reporting. • Prepare and submit environmental records.	Requisite Skills Knowledge of geology, hydrogeology, and chemistry Education College BA/BS degree in a technical discipline, or equivalent combination of education and experience Other Qualifications As detailed in Table 8-4
Training Manager	• Ensuring the application of graded, systematic approach to training program development and administration. • Ensure the training program will comply with WAC 173-303. • Approve training program content and provide final approval.	Requisite Skills 4 years nuclear facility experience Education College BA/BS degree, or equivalent combination of education and experience Other Qualifications None

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
NCO – SGRP Groundwater Inspector	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Perform inspections as assigned per Table 8-1. • Prepare sample containers. • Observe results from groundwater monitoring devices.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5
NCO – SGRP Groundwater Sampler	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Perform inspections as assigned per Table 8-1. • Prepare sample containers. • Observe results from groundwater monitoring devices. • Sample groundwater.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
NCO – SGRP Sample Shipper and Packager	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Package groundwater samples. • Ship groundwater samples.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5
NCO – SGRP Sample Equipment Cleaner	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Clean sample equipment.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5
NCO – SGRP Multi-media Sampler	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Prepare sample containers. • Sample non-groundwater media inside of a RCRA site (e.g., general soil sampling) at SGRP sites and facilities.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
NCO – SGRP Borehole Sampler	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Prepare sample containers. • Sample soil boreholes inside of a RCRA site at SGRP sites and facilities.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5
NCO – SGRP Routines Sampler	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Manage dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems. • Prepare and submit environmental records. • Prepare sample containers. • Sample dangerous waste drums in a RCRA site at SGRP sites and facilities.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5
NCO – SGRP Remediation Sampler	• Report discovered spills and releases. • Evacuate or take cover in response to specific incidents. • Generate and handle dangerous or mixed waste during work activities. • Use emergency and monitoring equipment. • Respond to and use communications or alarm systems.	Requisite Skills None Education High school diploma or equivalent Other Qualifications As detailed in Table 8-5

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Table 8-6 Job Descriptions

Job Title/Position	Job Description	
	Duties	**Requisite Skills, Education, Other Qualifications**
	• Prepare and submit environmental records. • Prepare sample containers. • Sample soil through a RCRA WIDS and/or other RCRA sites at SGRP sites and facilities.	

Reference: WAC 173-303, *Dangerous Waste Regulations*.
BA = Bachelor of Arts Degree
BS = Bachelor of Science Degree
NCO = Nuclear Chemical Operator
RCRA = *Resource Conservation and Recovery Act of 1976*
SGRP = Soil & Groundwater Remediation Project
WIDS = Waste Information Data System

Training elements of WAC 173-303-330(1)(e) applicable to the well organization include the following:

- Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment.
- Communications or alarm systems.
- Response to fires or explosions inside active Unit Groups.
- Response to groundwater contamination incidents.
- Shutdown of operations inside active Unit Groups.

Proper design of a training program ensures well organization personnel responsible for facilitating these elements are compliant with WAC 173-303 requirements. Actual job tasks, referred to as duties, include the above-referenced elements and are used to determine training requirements. As such, well organization personnel receive training pertinent to the duties they perform: Table 8-6 outlines well duties, and Tables 8-4 and 8-5 contain specific information regarding the training requirements for well organization personnel.

8.2.2.1 Qualification of Staff (Including On-the-Job Training)

Training consists of a combination of self-study, classroom instruction, computer-based training, and On-the-Job Training (OJT) through the use of a qualification card.

A qualification card is the formal mechanism used to document the specialized training and performance requirements of a specific duty (e.g., waste management, waste shipping). Qualification cards list the specific courses, required reading, and OJT activities that must be completed in order for personnel to perform the duty independently. OJT activities involve qualified personnel demonstrating a specific duty, then allowing the trainee to practice the duty under supervision of the qualified OJT instructor.

The trainee's knowledge and skills are then evaluated against established standards, which can include written and/or oral examinations, evaluations, and reviews to ensure that they are adequately trained commensurate to their job title(s)/position(s). Results of examinations, evaluations, and reviews are documented. Completed checklists, examinations, and evaluations are placed in each individual's training record.

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These qualification cards are generally required to be completed within six months, as a means to record that personnel who perform dangerous waste activities have been provided training within six months of assignment. Qualification/proficiency training may of necessity and in accordance with the provisions of collective bargaining agreements take longer than six months to complete. In no case would unqualified personnel be allowed to complete specified duties without direct oversight of qualified personnel.

8.2.2.2 Review of the Training Program

Permittee training provides for frequent, systematic review of the various components of the training program through multiple processes.

- All employees are required to complete Hanford General Employee Training (HGET) on an annual basis. This training is subject to biennial evaluation by HGET Approval Authorities who review and revise HGET lessons when deemed necessary.
- The Permittee accounts for rule changes, well organization or facility changes, observed difficulties, and staff feedback to incorporate changes to training curricula, and/or frequency to address such new or changing circumstances.
- Another element of the training program is to ensure employees are assigned the correct training. To accomplish this, annual employee training plan reviews are conducted by assigned managers.
- At the student level, the effectiveness of the training program is determined by reviewing student feedback (e.g., evaluation forms) and evaluating student performance (e.g., test scores). Any changes deemed necessary to the training will be addressed with a revision and documented in the Hanford Facility Operating Record.
- The training matrices (Tables 8-4 and 8-5) included in this training plan indicate regularly scheduled (required) refresher training frequencies of individual courses for the express purpose of ensuring a regimented review of course material at a topical level on a specified interval.

8.2.3 Description of Training Plan

The WAC 173-303-330 requirements for training are satisfied by this training plan. A description of how documentation meets the three items in WAC 173-303-330(2) is as follows:

- WAC 173-303-330(2)(a): "…the job title, job description, and the name of the employee filling each job. The job description must include requisite skills, education, other qualifications, and duties for each position."

  Description: The specific personnel job title/position is correlated to the dangerous waste management duties. Dangerous waste management duties relating to WAC 173-303 are correlated to training courses to verify that training is properly assigned.

  Only names of well organization personnel who perform duties relating to Unit Group dangerous waste management activities are maintained. A list of personnel assigned to the well organization positions in Table 8-6 will be provided on request.

  A summary of requisite skills, education, and other qualifications for job title(s)/position(s) is summarized in Table 8-6. Detailed information concerning job title, requisite skills, education, and other qualifications for personnel will be provided on request.
- WAC 173-303-330(2)(b): "A written description of the type and amount of both introductory and continuing training required for each position."

  Description: In addition to the outline provided in Section 8.2.1, training courses developed to comply with the introductory and continuing training programs are identified and described in Tables 8-4 and 8-5. Certain job titles/positions identified in Tables 8-4 and 8-5 may have some variability of duty assignment/responsibility. Personnel assigned specific dangerous waste management duties within a job title/position are only required to take the necessary training

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specific to those duties. Training for assigned dangerous waste management duties is located in Tables 8-4 and 8-5.

Note that equivalent training can be used to meet the dangerous waste training requirements outlined in Tables 8-4 and 8-5. Employees can substitute courses for the required training if the course is both similar in nature and quality and accomplishes the duties of the position to which he or she is assigned. Personnel must show documentation or certification that an employee's training has resulted in training equivalency to the training required.

- WAC 173-303-330(2)(c): "Records documenting that facility personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

  Description: As specified in Site-wide Permit Condition II.C.1, the Permittees will maintain documentation in accordance with WAC 173-303-330(2) and (3) in the Hanford Facility Operating Record.

Note that training records are maintained in accordance with the requirements of the *Privacy Act of 1974* promulgated in the *Federal Register* on April 11, 1994 (59 FR 17091). Training records for personnel are available for inspection purposes through this Act, which gives federal, state, and local government officers "routine use" access to training records where a regulatory program being implemented is applicable to a U.S. Department of Energy or contractor program.

8.3 References

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WAC 173-303, *Dangerous Waste Regulations*, Washington Administrative Code, Olympia, Washington. Available at: https://apps.leg.wa.gov/WAC/default.aspx?cite=173-303.

173-303-320, *General inspection*.

173-303-330, *Personnel training*.

173-303-340, *Preparedness and prevention*.

173-303-360, *Emergencies*.

173-303-380, *Facility recordkeeping*.

173-303-645, *Releases from regulated units*.

173-303-806, *Final facility permits*.

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