

**WASTE TREATMENT AND IMMOBILIZATION PLANT
CHAPTER 6.0
PROCEDURES TO PREVENT HAZARDS
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

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PROCEDURES TO PREVENT HAZARDS

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ACRONYMS

<u>DST</u>	<u>double-shell tank</u>
<u>EMF</u>	<u>Effluent Management Facility</u>
<u>FM</u>	<u>Factory Mutual</u>
<u>IHLW</u>	<u>immobilized high-level waste</u>
<u>ILAW</u>	<u>immobilized low-activity waste</u>
<u>NFPA</u>	<u>National Fire Protection Association</u>
<u>TSD</u>	<u>treatment, storage, or disposal</u>
<u>WTP</u>	<u>Waste Treatment and Immobilization Plant</u>

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6.0 INTRODUCTION

This chapter addresses hazard prevention at the ~~River Protection Project~~ Waste Treatment and Immobilization Plant (WTP). It covers the following topics: security; preparedness and prevention requirements; preventive procedures, structures, and equipment; and prevention of reaction of the ignitable, reactive, and incompatible waste at the WTP. Information is presented in two formats: narrative and table. The Inspection Plan can be found in Appendix 6A.

~~Information is presented in two formats: narrative and table. See Appendix 6A for example inspection tables.~~

6.1 Security

~~This section describes WTP security procedures and equipment. Hanford Site security measures are discussed in the Hanford Facility Dangerous Waste Permit Application, General Information Portion (DOE RL-1998).~~

6.1.1 Security Procedures and Equipment

~~The following sections describe the barrier and warning signs that support security and control access to the WTP.~~

6.1.1.1 24 Hour Surveillance System

The entire Hanford Site is a controlled-access area. For surveillance information of the Hanford Site, refer to the Site-wide Permit.

6.1.1.2 Barrier and Means to Control Entry

~~The WTP will use two fences, one around the facility's perimeter, and a second inner fence that controls access to dangerous waste management areas. The inner fence will be of sufficient height and construction to prevent people, livestock, and wildlife accidental access to the WTP. Vehicle access to the WTP administration building will be through a normally open gate in the perimeter fence. Visitors must check in at the administration building and will be escorted as required.~~

~~WTP personnel entry to the process areas will be through a controlled pedestrian gate. Service vehicles delivering supplies will enter process areas through a controlled gate. See the topographic map in Chapter 2.0 for further information regarding barriers and vehicular access.~~

~~The following sections describe the procedures and equipment used to prevent the unknowing entry, and to minimize the possibility for unauthorized entry into the WTP. Security methods include barriers, entry control through facility entrances and warning signs that support security and control access to the WTP.~~

6.1.1.3 6.1.2 Warning Signs

Warning signs, written in English, stating, "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT" ~~(or an equivalent legend);~~, are provided in sufficient numbers to be seen from areas that contain dangerous or mixed waste, are legible from a distance of at least 25 feet, and visible from any angle of approach to the WTP. These warning signs will be posted ~~in~~ at the following locations ~~such as~~:

- ~~• Around the perimeter of the WTP fenced areas.~~
- ~~• On each entrance, gate, and other access points to portions~~ active portion ~~of the WTP facility actively managing dangerous waste facilities.~~
- ~~• On entrances and exits to other enclosed areas within the plant that contain buildings (i.e., LAW) where dangerous or mixed waste is actively managed.~~

~~Points of access into waste handling and storage areas will have clearly marked warnings for radiation exposure and the major health risks associated with the waste. Access points into these areas will be~~

1 ~~strictly controlled. In addition, signs~~ Signs will be posted at the main site access entrance, instructing
2 visitors to report to the WTP administration building to gain access to the WTP (Washington
3 Administrative Code [\(WAC\) 173-303-310\(2\)\(a\)](#)).

4 **6.1.4 — Waiver**

5 ~~Sign posting locations will be added to the WTP permit prior to managing any dangerous or mixed waste.~~

6 **6.1.3 Surveillance and/or Barriers**

7 ~~The entire Hanford Site is a controlled-access area. For continuous surveillance information of the~~
8 ~~Hanford Site, refer to the Site-wide Permit. At the WTP facility, independent security contractors~~
9 ~~perform 24/7 guard coverage. The security force is responsible for controlling entry into the WTP facility~~
10 ~~via two access gates. In addition, the security force will perform random vehicle inspections, routine~~
11 ~~facility patrols and will be responsible for issuing visitor badges. Visitors must check in at the~~
12 ~~administration building located next to the main entry gate and will be escorted as required. Refer to~~
13 ~~Chapter 2.0 for information about the WTP fencing and control access gates.~~

14 ~~The WTP facility uses two fences, one around the facility's perimeter and a second inner fence that~~
15 ~~control access to dangerous waste management areas. The perimeter and inner fences are approximately~~
16 ~~7-foot-high and made of chain link.~~

17 **6.1.4 Waiver**

18 No waivers of the security procedures and equipment requirements for the WTP are requested.

19 **6.2 — Inspection Plan**

20 ~~The following sections describe the WTP dangerous waste inspection plan. The WTP will use a graded~~
21 ~~approach to preventing and detecting malfunctions, deterioration, operator errors, and discharges that will~~
22 ~~range from daily inspections to integrity assessments. This graded approach is comprised of activities~~
23 ~~that, at a minimum, will meet the inspection requirements and will include more precautions for~~
24 ~~equipment at higher risk of failure. Monitoring via instrumentation will be used to perform remote~~
25 ~~inspections in areas of high radioactivity, including, but not limited to, the Pretreatment areas, the LAW~~
26 ~~vitrification area, and the HLW vitrification area. Due to the radioactive nature of the waste and~~
27 ~~consistent with as low as reasonable achievable (ALARA) principles, monitoring by instrumentation will~~
28 ~~be the primary means of fulfilling the inspection requirements in these areas. The WTP will also use~~
29 ~~cameras, windows, process control, function checks, and preventive maintenance to comply with~~
30 ~~inspection requirements.~~

31 ~~Example inspection schedules, which are part of the inspection plan, are presented as tables in Appendix~~
32 ~~6A. Each table addresses a particular dangerous waste management unit, or group of units, such as tanks.~~
33 ~~Within each management unit table, the inspections are presented by system, and are further broken down~~
34 ~~by individual component in each system.~~

35 **6.1.4 — General Inspection Requirements**

36 ~~This section describes general, WTP-wide inspection requirements used to help prevent, detect, or~~
37 ~~respond to environmental or human health hazards related to dangerous waste handling, treatment, and~~
38 ~~storage at the WTP. The inspection schedules are provided in Table 6A-1.~~

39 ~~Instruments, such as those used for overfill detection, will be connected to the Process Control System~~
40 ~~(PCJ). The PCJ will be the computer system that continuously monitors the instruments' data. Should~~
41 ~~the PCJ detect a reading outside the range of acceptable operation, control personnel will be alerted (in~~
42 ~~real time) by alarm in the control room. The monitoring system will provide trending of selected~~
43 ~~monitoring data, graphics, and equipment summary displays. The WTP will use a maintenance~~
44 ~~management system to plan and track preventive maintenance activities and function testing at the WTP.~~
45 ~~Other methods of performing inspections at the WTP will be visual where safe and effective to do so.~~

6.2..1 — Items to be Inspected

The WTP inspection plan will include specific inspection schedules that meet the requirements. In Appendix 6A are example inspection schedules of the types of items to be inspected. The following are listed in the inspection schedule tables:

- General inspections for safety and emergency equipment, security, and preparedness and prevention
- Tank systems
- Containers
- Container storage areas
- Miscellaneous units
- Containment building areas

6.2..2 — Types of Problems to Look for During Inspections

The example inspection tables in Appendix 6A include a column titled “inspections”. This column specifies the type of inspection activities to be performed (such as verifying the operability of equipment and problems to look for) for each inspected item.

6.2..3 — Frequency of Inspections

In the example inspection tables in Appendix 6A, the column titled “frequency” provides the frequency of inspection for each item. Inspection frequencies were developed using a graded approach that will be finalized prior to the start of operations, and are based on the following:

- Regulatory requirements where specified.
- Rate of possible deterioration of equipment.
- Probability of a release to the environment.
- Potential to cause harm to human health and the environment.
- Manufacturer’s specifications.
- Integrity assessments of tank systems.
- Operating experience and knowledge.

6.2..4 — Schedule Location

Controlled copies of the inspection plan will be kept at the WTP facility. The project document control manager, or equivalent, will be responsible for ensuring that controlled copies of the inspection plan are kept current when revisions to the inspection plan are made.

6.2..5 — Employee Positions Responsible for Conducting Inspections

Personnel performing dangerous waste inspections will have the appropriate facility specific training as required by the *Personnel Training Plan* (Chapter 8.0) and as defined in the *Waste Treatment Plant Dangerous Waste Training Plan*. The training program will identify the individuals qualified to perform dangerous waste related inspections.

6.1.4 — Inspection Log

Hand written records of inspections (the inspection log) will include the date and time of inspection; the legible, printed name and hand written signature of the inspector; a notation of the observations made; and an account of spills or discharges. Most of the daily inspections will be recorded as part of the process control data recording system and will therefore be fully retrievable and auditable. Repairs, and remedial or corrective actions needed, will become part of the WTP’s corrective action system and the

1 ~~date and nature of repairs or remedial actions taken will be recorded in the inspection log. The inspection~~
2 ~~log will be stored in the WTP operating record for at least 5 years from the date of inspection.~~

3 ~~Electronic media and hard copy media may be used for recording inspections at the WTP, electronic~~
4 ~~media will be used where it is sensible, cost effective, and/or consistent with ALARA practices.~~
5 ~~Inspection records will be readily retrievable. Dangerous waste inspection requirements will be~~
6 ~~incorporated into the operating procedures and documentation. The procedures and operating~~
7 ~~requirements that satisfy compliance with WAC 173-303 (including inspection requirements) will be~~
8 ~~identified so that they are distinguishable within the larger universe of facility operational requirements.~~

9 **6.1.4—Schedule for Remedial Action for Problems Revealed**

10 ~~Remedial action will be taken as soon as practicable by facility management to implement the *Waste*~~
11 ~~*Treatment Plant Emergency Response Plan* (ERP) (Chapter 7.0) if an inspection identifies an unplanned~~
12 ~~spill, release, fire, or explosion, unplanned spill or release involving a dangerous waste, or an imminent~~
13 ~~hazard to human health or the environment.~~

14 ~~An investigation will begin within 24 hours upon detection of unplanned release in the plant. Depending~~
15 ~~upon the scope of the hazard, volume of the release, or the characterization of the release, cleanup may be~~
16 ~~completed within 24 hours, or as soon as practicable, after completion of the initial investigation period.~~
17 ~~However, the time required to cleanup the release will depend on factors such as analytical turnaround~~
18 ~~time, radioactivity, and volume.~~

19 ~~When inspections reveal problems that do not present an immediate threat to human health or the~~
20 ~~environment, nor result in a release of hazardous material (cracks in secondary containment coatings,~~
21 ~~nonfunctioning instrumentation, and labeling errors or omissions), such inspection findings will be logged~~
22 ~~and response actions scheduled and tracked within 24 hours as corrective actions. The following steps are~~
23 ~~used, in general, to resolve corrective actions:~~

- 24 ~~● Problem identification and documentation~~
- 25 ~~● Classification~~
- 26 ~~● Cause analysis~~
- 27 ~~● Corrective action~~
- 28 ~~● Follow up investigation~~

29 ~~Non-emergency corrective actions will be completed within 24 hours if possible; however, additional~~
30 ~~response time may be required because of the radioactive component of the waste being managed at the~~
31 ~~WTP.~~

32 ~~The precise title of the personnel that will be responsible for authorizing such corrective actions has not~~
33 ~~been decided; however, the position will be one equivalent to a shift operations manager.~~

34 **6.1.4—Specific Process or Waste Type Inspection Requirements**

35 ~~The following sections describe specific process inspection requirements.~~

36 **6.2.1—Container Inspections**

37 ~~The WTP will store immobilized low activity waste (ILAW) in containers, immobilized high level waste~~
38 ~~(IHLW) in canisters, and secondary dangerous and mixed waste in containers. For purposes of IHLW,~~
39 ~~the term canisters is used to specifically address the unique disposal requirements of the filled containers.~~
40 ~~Throughout this section, general references to containers apply to the IHLW canisters. Secondary waste~~
41 ~~refers to newly generated waste (or a waste by product from treating the Hanford tank waste) that is~~
42 ~~designated as dangerous waste or mixed waste. Secondary waste also will be generated by laboratory~~
43 ~~activities, from maintenance waste, and failed contaminated equipment. The location and design~~
44 ~~description of the containers and their associated storage areas are included in Chapter 4.0. Inspections of~~

1 container storage areas will be performed weekly when waste is in the storage areas. Table 6A-2 provides
2 examples of container and container storage area inspection schedules for ILAW, IHLW, and secondary
3 waste.

4 Immobilized Low Activity Containers and High Level Waste Canisters

5 Filled ILAW containers and IHLW canisters will be radioactive and thus, inspections must be performed
6 remotely. Therefore, in lieu of conventional container inspections while the containers are in storage,
7 each container will be inspected before and after filling, and when it is moved into and out of the ILAW
8 and IHLW containment buildings or container storage areas. The containers will not contain free liquids,
9 will be chemically and physically stable (not ignitable or reactive), and will have either a welded closure
10 (IHLW) or pressed fitted closure seal (ILAW). The IHLW canisters will be placed in special racks inside
11 the storage areas that will prevent them from toppling. The immobilized waste containers and storage
12 areas are described in Chapter 4.0.

13 The WTP will inspect the ILAW and IHLW container storage or containment building areas, when they
14 are in use, weekly by remote means. These remotely managed process storage areas do not include thirty-
15 inch aisle spacing. The example inspection schedules (Appendix 6A) specify the problems for which to
16 look and how inspections are performed.

17 The dangerous waste container labeling requirements will be met by using a unique alphanumeric
18 identifier that will be welded to each container. Deterioration of the identifier is not expected due to the
19 permanent nature of these markings and provisions for subsequent handling that will safeguard against
20 damage to the containers and the identifying marks.

21 Using the identification on each container, a tracking system will record key movements of each
22 immobilized waste container through the facility. Information about the waste canister tracking system is
23 in Chapter 4.0. For each container of ILAW and IHLW produced, the system will track the following:

- 24 • The location of each container in process and storage areas.
- 25 • The date that waste was first placed in the container.
- 26 • The date the container was shipped from the facility, and its destination.
- 27 • The nature of waste in the container, including dangerous waste designation codes, and land
28 disposal restriction requirements.

29 Secondary and Miscellaneous Waste in Containers

30 Example inspection schedules for secondary dangerous waste and mixed waste container storage areas are
31 given in Table 6A-2.

32 **6.2..2 Tank Systems Inspections and Corrective Actions**

33 A description of the tank systems, and their safety and interlock controls, at the WTP can be found in
34 Addendum C. Examples of tank system inspections, inspection frequencies, and problems to look for are
35 given in Table 6A-3. Following is a brief discussion of the tank system inspections.

36 Inspection procedures and the complete inspection schedule will be available at the WTP prior to starting
37 operation. Each tank, or grouping of identical tanks, is shown as a line item in the inspection schedule
38 tables. Each inspection item includes a description of problems to look for, and the frequency of
39 inspection.

40 Cathodic Protection

41 Cathodic protection systems will be used to prevent or mitigate metal corrosion on underground
42 dangerous waste transfer lines where the outermost pipes are in contact with the soil. The cathodic
43 protection systems are described in Addendum C. Example inspection schedules for cathodic protection
44 systems and sources of impressed current are in Table 6A-4.

1 Tank Integrity Assessments

2 A periodic integrity assessment approach will be developed for the WTP waste tanks to ensure that the
3 tanks' systems remain fit for use. The schedule for performing periodic integrity assessments will be
4 developed during the new tank design assessment placed in Appendix 7.15.

5 **6.2..3 Tank Systems Corrective Actions**

6 Operating procedures describing corrective actions will be developed prior to operations.

7 **6.2..4 Storage of Ignitable or Reactive Wastes**

8 Dangerous waste codes assigned to the waste in the *Double Shell Tank System Dangerous Waste Part A*
9 Permit Application (DOE-RL-1996) apply to the waste feed the WTP will receive. The waste feed will
10 include the waste codes for ignitability (D001) and reactivity (D003), but the waste is not expected to
11 exhibit the characteristics listed in WAC 173 303 090 for these two waste codes. Based on past process
12 knowledge that includes the age, temperature, history, and chemical composition of the waste feed stored
13 in the Double Shelled Tank (DST) system, the waste codes D001 and D003 will be removed by the WTP.
14 See the Waste Analysis Plan (Appendix 3A) for specific information on the waste codes and their
15 removal.

16 Consequently, only the waste feed receipt tanks will be inspected for tanks storing ignitable and reactive
17 waste. The remainder of the process tanks will not contain ignitable or reactive waste. Ignitable or
18 reactive secondary waste may be stored in tanks or containers at the WTP. Annual inspections of all
19 areas managing D001 and D003 waste will be conducted by personnel familiar with the Uniform Fire
20 Code, or in the presence of the local, state, or federal fire marshal. Inspections will be entered into the
21 WTP operating record and maintained at the WTP for 5 years (see Table 6A-5 for the inspection schedule
22 for ignitable or reactive wastes).

23 **6.2..5 Air Emissions Control and Detection Inspections, Monitoring, and Corrective**
24 **Actions**

25 Air Emissions from Process Vents (Subpart AA)

26 The WTP does not use any of the regulated devices or processes listed; therefore, the WTP will not be
27 subject to regulation under Subpart AA (40 CFR 264).

28 Air Emission Standards for Equipment Leaks (Subpart BB)

29 WAC 173 303 691 and Subpart BB (40 CFR 264) applies to equipment that contains or contacts
30 hazardous wastes with organic concentrations of at least 10 percent by weight. This provision will not
31 apply to the facility because the WTP will not accept or treat wastes with organic concentrations at or
32 above 10 percent by weight. Compliance with this provision will be documented through analyses of
33 verification samples, as described in the Waste Analysis Plan.

34 Air Emission Standards for Tanks, Impoundments, and Containers (Subpart CC)

35 The regulations specified under WAC 173 303 692 and 40 CFR Part 264 Subpart CC, incorporated by
36 reference, do not apply to the WTP mixed waste tank systems and containers. These tanks and containers
37 qualify as waste management units that are "used solely for the management of radioactive dangerous
38 waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the
39 Nuclear Waste Policy Act" and are excluded under WAC 173 303 692(1)(b)(vi). Containers or tanks
40 bearing nonradioactive, dangerous waste, such as maintenance and laboratory waste, that are not excluded
41 under WAC 173 303 692(1)(b)(ii) or 40 CFR 264.1082(e), will comply with the container and tank
42 standards specified under 40 CFR part 264 Subpart CC.

1 **6.2.6 — Miscellaneous Unit Inspections**

2 ~~The WTP melter are miscellaneous units under WAC 173-303-680. Remote inspections and monitoring~~
3 ~~will be performed by instrumentation that will be supplemented by camera(s) and viewing through~~
4 ~~shielded windows because of the high levels of radiation in process areas. Other miscellaneous units will~~
5 ~~be visually or remotely inspected based on accessibility. Inspections will verify the integrity of melter~~
6 ~~equipment and detect malfunctions, deterioration, leaks, or operator errors that have the potential to~~
7 ~~release dangerous waste into the facility or the environment. An example miscellaneous unit inspection~~
8 ~~schedule is provided in Table 6A-6.~~

9 **6.2.7 — Containment Building Inspection**

10 ~~Containment buildings will be inspected for items listed in Table 6A-7. The WTP containment building~~
11 ~~example inspection schedules include the requirements from 40 CFR 264 Subpart DD. Example~~
12 ~~inspection schedules for tank systems and miscellaneous units located within containment buildings are in~~
13 ~~Tables 6A-3 and Table 6A-7.~~

14 **6.2.8 — Waste Pile Inspection**

15 ~~Operation of the WTP does not involve the placement of mixed waste in piles. Therefore, this section is~~
16 ~~not applicable to the WTP.~~

17 **6.2.9 — Surface Impoundment Inspection**

18 ~~Operation of the WTP does not involve the placement of mixed waste in a surface impoundment.~~
19 ~~Therefore, this section is not applicable to the WTP.~~

20 **6.2.10 — Incinerator Inspection**

21 ~~Operation of the WTP does not involve using a waste incinerator. Therefore, this section is not applicable~~
22 ~~to the WTP.~~

23 **6.2.11 — Landfill Inspection**

24 ~~Operation of the WTP does not involve the placement of mixed waste in a landfill. Therefore, this section~~
25 ~~is not applicable to the WTP.~~

26 **6.2.12 — Land Treatment Facility Inspection**

27 ~~Operation of the WTP does not involve the land treatment of mixed waste. Therefore, this section is not~~
28 ~~applicable to the WTP.~~

29 **6.36.2 Preparedness and Prevention Requirements**

30 ~~The following sections document~~ This section describes the preparedness and prevention measures to be
31 taken at/employed by the WTP to avoid or mitigate the possibility of a fire, explosion, or any unplanned
32 sudden release of dangerous waste or dangerous waste constituents to air, soil, or surface water that could
33 threaten human health or the environment.

34 **6.2.1 Equipment Requirements**

35 The following sections describe internal and external communications, and emergency equipment
36 required and located at WTP.

37 **6.2.1.1 Internal Communications**

38 The onsite communication system at the WTP provides immediate emergency information to facility
39 personnel, and includes public address and alarm systems. The public address system provides for verbal
40 instruction and communication to WTP personnel. The internal communication system also notifies
41 personnel of the following local or plant-wide alarm-activated emergency situations: building

1 evacuations, fire or explosion, radioactive discharges, and high airborne contamination. ~~The ERP~~The
2 Contingency Plan found in Chapter 7.0 provides additional information on the response activities.

3 **6.2.1.2 External Communications**

4 The WTP is equipped with devices for summoning emergency assistance from the Hanford Fire
5 Department, the Hanford Hazardous Materials Response Team, or local emergency response teams, as
6 necessary. External communication ~~will be~~is via a telephone communication system. Telephones ~~will~~
7 ~~be~~are available for staff use at numerous locations throughout the facility. Under no circumstances will
8 only one staff member be at the WTP site. In addition, the current Hanford communication system ~~will~~
9 ~~be~~is utilized as described in the *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.2.

10 **6.2.1.3 Emergency Equipment**

11 Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination
12 equipment are available to personnel at the WTP. A list of emergency and decontamination equipment is
13 provided in the ~~ERP~~Contingency Plan, Chapter 7.0.

14 **6.2.1.4 Water for Fire Control**

15 The primary water supply for fire protection ~~will be~~is provided from the 200 East Area raw water
16 distribution system. The fire water supply system comprises two water storage tanks designed to
17 National Fire Protection Association (NFPA) 22, *Standard for Water Tanks for Private Fire Protection*
18 (NFPA 1998); and Factory Mutual (FM) Data Sheet 3-2, *Water Tanks for Fire Protection* (FM 2001a).
19 Each water storage tank ~~will be~~is capable of supplying fire-water for a minimum of two hours at the
20 maximum anticipated demand.

21 The pumping system is being designed to NFPA 20, *Standard for the Installation of Stationary Pumps for*
22 *Fire Protection* (NFPA 1999a), and Factory Mutual Data Sheet 3-7N, *Stationary Pumps for Fire*
23 *Protection* (FM 2001b). A fire pump ~~will be~~is installed and connected to each water storage tank. Each
24 pump ~~will be~~is capable of providing the maximum system demand and ~~will be~~is connected to the
25 underground distribution system in a manner that ~~will prevent~~prevents single failure from disabling both
26 water supplies.

27 The underground distribution piping and valving ~~will be~~is designed and installed according to NFPA 24,
28 *Standard for Installation of Private Fire Service Mains and Their Appurtenances* (NFPA 1995); and
29 Factory Mutual Data Sheet 3-10, *Installation and Maintenance of Private Fire Service Mains and Their*
30 *Appurtenances* (FM 2000).

31 The distribution system in the various buildings and structures are being designed following the various
32 appropriate codes and standards that apply to their specific occupancy. The standards include NFPA 13,
33 *Standard for the Installation of Sprinkler Systems* (NFPA 1999b); NFPA 14, *Standard for the Installation*
34 *of Standpipe, private Hydrant, and Hose Systems* (NFPA 2000); NFPA 15, *Standard for Water Spray*
35 *Fixed Systems for Fire Protection* (NFPA 1996); and the appropriate Factory Mutual standards, as
36 required.

37 **6.46.3 Aisle Space Requirement**

38 ~~Sufficient aisle space~~Aisle spacing will be maintained throughout the facility buildings to allow access of
39 personnel and equipment responding to fires, spills, or other emergencies.

40 ~~Alternate~~Evaluation of the 30-in. aisle ~~spaces~~spacing requirement by the DOE, WTP, EPA, and Ecology
41 for ILAW and IHLW and ILAW container storage area containers/canisters concluded that aisle spacing
42 in the range of 4 to 16 in. was adequate based on personnel safety and the immobilization of the waste.

43 Additional information about the ILAW and IHLW containers/canisters is ~~explained~~located in
44 Chapter Appendix 6A, Section 6A.4.01. Secondary wastes stored in container storage areas will meet the
45 30-inch minimum aisle space requirement.

6.4 Preventive Procedures, Structures, and Equipment

The following sections describe preventive procedures, structures, and equipment. Refer to Chapter 4.0 for additional information on feed transfer piping and tank overflow protection structures, equipment, and instrumentation.

6.4.1 Unloading/Loading Operations

Waste feed to be treated at the WTP ~~will be~~ received from the DST system staging tank through ~~a pipeline-underground waste transfer lines. These waste feed transfer lines are equipped~~ with secondary containment; leak detection; and cathodic protection, ~~where. During DFLAW configuration, the waste transfer lines are in contact with~~ have been designed to be isolated from the soil- environment; thus, not requiring cathodic protection. The WTP will not receive waste for treatment in containers.

The filled ILAW and IHLW containers and canisters ~~will be~~ loaded for transport using special shielding and heavy lifting equipment. The immobilized waste ~~will present~~ presents no hazards from spills, leaks, run-off, or chemical exposures to personnel from the dangerous waste constituents because the waste ~~will be~~ solid (contains no free liquids) and the containers ~~will be~~ permanently sealed.

Containers of secondary waste bound for transport to another treatment, storage, and disposal facility (TSD) will be packaged according to the federal, state, and local regulations ~~in place at the time. (Because the WTP will not begin generating secondary waste for several years, information such as the procedures, structures, and equipment is not yet available.)~~, as detailed in Chapter 4.0, Process Information.

6.4.2 Runoff

Waste stored and treated inside the ~~plants~~ LAW & HLW facilities and Pretreatment Plant cannot come into contact with precipitation and therefore, cannot contaminate runoff from WTP structures, nor can precipitation enter secondary containment for the process and storage areas within the plants. Additionally, the process ~~condensate~~-vessels located outside ~~the Pretreatment Plant will be~~ surrounded by a concrete berm lined with a protective coating for secondary containment. The ~~secondary containment~~ concrete berm will ~~collect and be designed to~~ hold ~~leaks and 100% of the capacity of the largest tank within the berm; in addition to, capable of containing the volume of a 24-hour rainfall as determined by a 25-year storm. Spills, leaks, or precipitation until in the liquid can~~ berm will be removed. There will be collected in a sump located within the bermed area and analyzed. Based on the analysis results, the waste may be ~~no contaminated runoff from the outside tanks. containerized and managed as secondary waste or pumped back into the associated process.~~

6.4.3 Contamination of Water Supplies

The active portions of the facility are being designed with robust structural features such as thick, reinforced concrete floors and walls; secondary containment (lined with stainless steel or other protective coating); and off-gas treatment systems. The structural features alone are designed to prevent waste feed from contacting the environment. Operation of the WTP is also intended to prevent a release of waste to the environment. The WTP design, construction, and operation ~~will prevent~~ waste feed and secondary waste from contaminating groundwater and drinking water supplies (see Chapter 4.0 for structural design information).

Raw and potable water ~~will be~~ supplied to the WTP via separate underground lines from the 200 East Area water treatment and distribution system. Backflow preventers or interconnection breaks ensure that in the event water is contaminated at the WTP, the water cannot flow back into the water systems' sources. There will be no connections between potable water and raw water systems, or between the potable water system and piping that will contain mixed waste.

1 **6.4.4 Equipment and Power Failures**

2 Should there be a partial or total loss of electrical power to the WTP, automatic measures ensure the plant
3 is in a safe operational configuration. ~~(Safe operational configuration is defined as a shutdown to~~
4 ~~minimal operations that will prevent releases and prevent unnecessary damage to the equipment.)~~

5 The emergency power system will consist of two diesel turbine- driven automatically controlled
6 emergency diesel-generators and one standby diesel engine standby generator. The ~~automatic-emergency~~
7 and standby generators are connected to three separate 4.16kV emergency switchgears. ~~The two~~
8 ~~emergency turbine generators support safety class systems in the PT and HLW facilities. The standby~~
9 ~~diesel generator supports the non-safety systems in the LAW facility. In the DFLAW configuration,~~
10 ~~emergency power will be reliant on uninterruptible power supply systems.~~

11 Upon loss of power the emergency diesel turbine generators will automatically start. The emergency
12 diesel turbine generators are capable of starting, accelerating, and being loaded with the design load in a
13 specified time limit. The standby diesel generator is started manually or automatically in the event of a
14 prolonged loss of offsite power. The emergency power system will be connected to essential loads in
15 order to ensure only a short-term power interruption for those loads designated as essential. Critical
16 indications and controls are backed up by uninterruptible power supplies and batteries. ~~The plant will~~
17 ~~remain in a safe condition during loss of electrical power.~~

18 Egress lighting will consist of self-contained fixtures with battery packs and charging systems. These
19 lighting systems will be located in stairways, exit routes, and fire alarm stations and will come
20 on automatically upon loss of normal power to the fixture. A selected part of the normal lighting
21 will operate as essential lighting, and will provide a minimum level of illumination throughout the plant
22 to aid in restoring the plant to normal operation. Essential lighting will be powered by the emergency
23 power system and will be available ~~after an offsite whenever power loss, following a delay required to~~
24 ~~start the emergency power supply diesel generators and for the generators to pick up the essential~~
25 ~~loads; supplies are interrupted.~~

26 Selected instrumentation and controls will be unaffected by a loss of offsite power, since many of
27 these instruments and controls will be powered by uninterruptible power supply systems. The
28 uninterruptible power supply systems will be battery backed, and the battery chargers will be
29 connected to the emergency power supply. Emergency lighting, such as in the central control room, will
30 be connected to an uninterruptible power supply system. Radiation monitoring using continuous air
31 monitors and area radiation monitors are also powered by these systems and continue operating during
32 power failure.

33 **6.4.5 Personal Protection Equipment**

34 Facility design, operating practices, and administrative controls are the primary means of preventing
35 personnel exposure to dangerous and mixed waste. The following practices, structures, and equipment
36 are intended to minimize personnel exposure to chemicals, radioactive contamination, and radiation
37 exposure:

- 38 • Remote operation and viewing.
- 39 • Active ventilation that moves air from uncontaminated zones to progressively more contaminated
40 zones.
- 41 • Waste cutoff systems that automatically keep operations in a safe condition.
- 42 • Secondary containment for liquids.
- 43 • Offices, control rooms, change rooms, and lunchrooms that are situated to minimize casual
44 exposure of personnel.

1 Before the start of an operation that might expose employees to the risk of injury or illness, a review of
2 the operation ~~will be~~ performed to ensure the appropriate protective gear is selected. Personnel ~~will~~
3 ~~be~~ instructed to wear personal protective equipment in accordance with training, posting, and
4 instructions. The inspection schedule for personal protective equipment is found in Table 6A-1; however,
5 the specific items listed as personal protective equipment ~~will be~~ in the ~~ERP (Contingency Plan, Chapter~~
6 ~~7.0), Table 7.5-4~~ and not duplicated here.

7 **6.4.6 Prevent Releases to the Atmosphere** ~~[WAC 173 303 806(4)(a)(viii)(F)]~~

8 The WTP off-gas treatment systems are the primary means of preventing contaminated releases to the
9 atmosphere. The procedures, structures, and equipment used in these systems ~~will be~~ described in
10 Chapter 4.0.

11 **6.5 Prevention of Reaction of Ignitable, Reactive, and/or Incompatible Waste**

12 ~~While operating in the Direct Feed LAW configuration, WTP will not accept and/or treat mixed waste~~
13 ~~that carries the D001 (ignitable) waste code and/or the D003 (reactive) waste code. While operating in~~
14 ~~the baseline configuration, WTP may accept mixed waste that carries the D001 (ignitable) waste code~~
15 ~~and/or the D003 (reactive) waste code. Once waste has been received, process knowledge will be used to~~
16 ~~remove the D001 and D003 waste codes. Waste initially characterized as reactive and/or ignitable will~~
17 ~~only be stored in dangerous waste management units designed for these waste codes.~~

18 ~~The following analyses, at a minimum, will be conducted for each new DFLAW feed campaign in~~
19 ~~accordance with the methods prescribed in WAC 173-303-110: ammonia, pH, metals, organic acids,~~
20 ~~mercury, cyanide, volatiles, semi-volatiles, PCBs/pesticides, anions, total organic carbon, and~~
21 ~~compatibility (ASTM Method D5058-90). Additionally, an evaluation of the LAW feed will have been~~
22 ~~performed to ensure that it does not carry waste codes D001 (ignitability) and D003 (reactivity) when~~
23 ~~transferred to the LAW Facility.~~

24 Tanks

25 ~~Dangerous waste codes assigned to the waste in the Double-Shell Tank System Dangerous Waste Part A~~
26 ~~Permit Application (DOE-RL 1996) apply to the waste feed the WTP receives. The waste feed includes~~
27 ~~the waste codes for ignitability (D001) and reactivity (D003), but the waste is not expected to exhibit the~~
28 ~~characteristics listed in WAC 173-303-090, Dangerous Waste Characteristics for these two waste codes.~~
29 ~~Based on past process knowledge that includes the age, temperature, history, and chemical composition of~~
30 ~~the waste feed stored in the DST system, the waste codes D001 and D003 will be removed by the WTP.~~
31 ~~The WTP will receive waste feed that is designated as ignitable or reactive; the WTP may store, in~~
32 ~~containers, secondary waste that is designated as ignitable, reactive, or incompatible (see Chapter 3.0 and~~
33 ~~Waste Treatment Plant Prior to receiving waste from the tank farms, waste must meet the criteria in the~~
34 ~~Waste Analysis Plan, (Appendix 3A).~~

35 ~~Process knowledge, administrative controls, and the active ventilation system prevent the~~
36 ~~formation or release of ignitable vapors that could harm human health or the~~
37 ~~environment.~~
38 Containers

39 ~~Small amounts of ignitable (D001) and reactive (D003) waste may be generated as secondary waste~~
40 ~~during maintenance and laboratory operations. Secondary waste streams that designate as ignitable~~
41 ~~and/or reactive are managed in accordance with administrative procedures. Storage of ignitable wastes~~
42 ~~are protected from sources of ignition or reaction. When ignitable waste is being handled, smoking and~~
43 ~~open flames are prohibited from the vicinity of the ignitable waste. Smoking is prohibited within the~~
44 ~~WTP process buildings and areas where dangerous waste is managed. In addition, "No smoking" signs~~
45 ~~are placed wherever a hazard exists from ignitable or reactive waste.~~

46 ~~Large quantities of potentially incompatible waste are not expected to be generated through maintenance~~
47 ~~and laboratory operations. Administrative barriers will be put in place to prevent storage of incompatible~~

1 waste within proximity to each other. For example, acids and bases are stored on separate portable
2 secondary containment; oxidizers are stored in areas separate from combustible materials; and corrosive
3 chemicals are stored on a separate secondary containment. In addition, storage areas are clearly marked
4 with signs indicating appropriate waste type.

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