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ADDENDUM F
PREPAREDNESS AND PREVENTION REQUIREMENTS

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ADDENDUM F
PREPAREDNESS AND PREVENTION REQUIREMENTS

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1 **F PREPAREDNESS AND PREVENTION REQUIREMENTS**

2 The following section documents the preparedness and prevention measures taken in the
3 DST System, and internal and external communications and emergency equipment required.

4 **F.1 Notification System**

5 The Permittees' notification system applies to all Permittees activities, personnel, and facilities.
6 The Permittees' procedure provides instructions to Permittees' personnel for implementing the
7 notification system for reporting spills, releases, leak detection system equipment outages and
8 alarms, permit exceedances or discrepancies, fires and explosions to DOE-Office of River
9 Protection (ORP) and to the regulatory agencies.

10 The DST System is equipped with communication systems to provide immediate emergency
11 instructions to personnel. The communication systems include telephones, two-way radios, and
12 alarms located throughout the 200 Areas.

13 Telephone number 911 is the emergency contact point for the Hanford Site and 373-0911 if
14 calling from a cell phone. Upon notification, the Hanford Patrol Operations Center notifies
15 and/or dispatches required emergency responders. Portable two-way radios provide
16 communication among the 200 Areas shift/field offices, field personnel, personnel performing
17 inspections, and operations shift managers.

18 Fire detection alarms (fire-sensing units) or manual activation units (pull boxes) are connected to
19 a system continually monitored by the Hanford Fire Department.

20 **F.1.1 Emergency and Safety Equipment**

21 Emergency and safety equipment is maintained throughout the 200 Areas and is inspected
22 visually through a systematic inspection and maintenance program conducted by the Hanford Fire
23 Department and Tank Farm Operations. Visual inspections occur on a daily, weekly, monthly, or
24 biennial basis in accordance with the dangerous waste inspection plan (see Addendum I). The
25 descriptions and locations of emergency and safety equipment specific to the tank farms and
26 support buildings can be found in Addendum K, Contingency Plan.

27 The DST farms have limited spill control kits (see Addendum K), because the DSTs and
28 associated ancillary equipment primarily are below ground. Spill prevention and response is
29 integral to the work planning process. In addition, spill control equipment (for organic/inorganic
30 chemical spills) is available during the operation to facilitate cleanup in the event of a spill. Spill
31 control equipment includes absorbent material, dike material, and protective gloves/clothing.

32 **F.1.2 Water/Foam for Fire Control**

33 Fire protection sprinklers are located throughout the 242-S Evaporator and the Aging Waste
34 Ventilation System buildings/facilities, and in applicable tank farm instrument building and
35 control rooms. In case of an actual fire, the sprinkler system and alarms automatically activate in
36 the affected area, and alarms activate at the 200 Areas Fire Station to provide emergency
37 notification to personnel.

38 Although fire hydrants are located in the vicinity of the DST farms, the primary source of water
39 and foam for fire control is provided by the Hanford Fire Department trucks; therefore, there is no
40 emergency backup power for fire water systems using hydrants.

41 Hanford Fire Department has trucks for fires requiring high-water volume and pressure supply
42 water for fire control at the DST System. Additional equipment used to supply water is listed in
43 Appendix C of the Hanford Emergency Management Plan (Attachment 4)

1 **F.1.3 Aisle Space Requirement**

2 Sufficient space is maintained in each of the DST farm instrument buildings to allow the
3 unobstructed movement of personnel, fire protection equipment, or spill control equipment.

4 **F.2 Preventive Procedures, Structures, and Equipment**

5 The following sections describe preventive procedures, structures, and equipment used to prevent
6 hazards and contain spills, prevent contamination of water supplies, mitigate the effects of power
7 failure, and prevent undue exposure of personnel to dangerous waste.

8 **F.2.1 Runoff Control**

9 The DST system is constructed and operated to protect the environment from run off due to
10 release of waste. The DST System is constructed and operated as RCRA compliant tanks and
11 ancillary equipment except where a variance from secondary containment requirements has been
12 granted by the Department of Ecology.

13 Physical and operational run off controls include:

14 Use of secondary containment on tanks and ancillary equipment:

- 15 • Double shell tanks,
- 16 • Pipe-in-pipe encased underground transfer lines,
- 17 • Pit or diversion box used to collect and hold leaks and precipitation until the liquid can be
18 removed.
- 19 • Pits and diversion boxes act as secondary containment and drain back to the DSTs.

20 Above grade features:

- 21 • Berms of various sizes around individual tank farms are used to cover and shield transfer
22 lines within and between farms also help control run-off.
- 23 • Pits extend above grade and are covered when not in attendance

24 Leak detection:

- 25 • Primary tank level monitors
- 26 • Annulus tank leak detection (Enrafs)
- 27 • Pit leak detectors
- 28 • Transfer piping encasement leak detectors

29 Administrative controls:

- 30 • Use of controlled transfer procedures
- 31 • Mass balance calculations during waste transfers
- 32 • Inspections of monitoring equipment
- 33 • The Double Shell tank Emergency Pumping Guide (Addendum J) directs the transfer of
34 liquids held in the tanks annulus.

35 **F.2.2 Interlock Systems and Manual Transfer Shutdown**

36 In order to prevent a release to the environment, a manual shutdown process is implemented
37 during DST transfers. A transfer shutdown criteria list is established for each transfer. The
38 transfer shutdown criteria list the situations where a Nuclear Chemical Operator (NCO) must
39 manually shutdown the transfer pumps. During a transfer a NCO is stationed at a Human
40 Machine Interface (HMI) screen. The HMI monitors the transfer route and annunciates in the
41 event of an alarm. The NCO monitors the operation of the transfer system and compares it to the

1 transfer shutdown criteria. If a leak detector is alarming in the process route, then the pump
2 shutdown button is pressed to shutdown operation of the transfer pump. This stops active flow in
3 the transfer system.

4 **F.2.3 Pressure and Limit Switches**

5 Pressure switches are used in flush pits where raw water is supplied for tank farm use. The
6 isolation valves to the pressure switches are open only when raw water is required for flushing the
7 transfer line. Excessive pressure at the switch may indicate backflow of dangerous waste into the
8 raw water supply. The switch prevents contamination of the Raw Water System by providing an
9 alarm or by de-energizing the associated waste transfer pumps. Operation of waste transfer
10 pumps is not allowed during line-flushing operations. Pressure switches are mounted at strategic
11 locations within the flush pit to sense line pressure fluctuations.

12 **F.2.4 Prevention of Contamination of Water Supplies**

13 The DST System is equipped with secondary containment to collect and detect any leaks or spills
14 from the Primary Containment System. Any waste leaks or accumulated precipitation are
15 removed from the DST System as soon as practicable.

16 **F.2.5 Equipment and Power Failures**

17 A generator supplies backup power to the 702-AZ Ventilation System and 241-SY Tank Farms.
18 These generators start automatically or are started manually when a power failure occurs.

19 In the event of transfer pump failure during a waste transfer, the transfer lines will be flushed with
20 raw water to remove remaining waste, and the failed pump will be replaced before using that
21 transfer route. In the event monitoring capability of transfers pit leak detection, liquid level,
22 primary tank vapor pressure, and/or primary tank temperature is lost during transfer operations,
23 the transfer will be stopped until monitoring capability is returned unless otherwise directed by
24 the operations shift manager.

25 **F.2.6 Control of Air Emissions**

26 The Permittees have programs and procedures to anticipate, evaluate, recognize, and control
27 hazardous air emissions to ensure the health and safety of the workers and public. The Permittees
28 operate a work planning process and an industrial hygiene program that address chemical
29 releases. During the work planning process, potential releases and personnel exposure are
30 evaluated and appropriate controls are specified based on the nature of the work to be completed.
31 The Permittees hierarchy of controls used in designing hazard mitigation is engineering the work
32 to eliminate the hazard, administratively limiting exposure to hazards, and assigning personal
33 protective equipment. The work control procedure planning process specifies industrial hygiene
34 monitoring required during the actual work. When industrial hygiene monitoring is required, an
35 industrial hygienist will develop a monitoring and sample strategy to provide direction to
36 Permittees industrial hygiene technicians.

37 **F.2.7 Monitoring and Maintenance Schedule**

38 Monitoring and maintenance activities (including functional testing) and scheduled frequencies
39 for DST System components are identified in Addendum I "Dangerous Waste Inspection
40 Schedule." Maintenance activities that temporarily discontinue operation of the DST Leak
41 Detection System require notifications to Ecology.

1 **F.2.8 Personal Protective Clothing**

2 Personal protective clothing is available for personnel entering the tank farms facilities when
3 required. In addition to personal protective clothing, self-contained breathing apparatuses also
4 are available at each of the mentioned locations for emergency use. .

5 **F.2.9 Prevention of Reaction, and Handling of Ignitable, Reactive, and/or**
6 **Incompatible Waste**

7 The following sections describe precautions taken to prevent the reaction of ignitable, reactive,
8 and/or incompatible waste.

9 **F.2.10 Prevention of Reaction of Ignitable, Reactive, and/or Incompatible Waste**

10 Tank waste generates small quantities of hydrogen, ammonia, and other gases caused by
11 radiolysis of the waste. These gases normally do not accumulate in sufficient quantity to reach
12 combustible levels, because they are swept out of the tank vapor space by the ventilation systems.
13 However, certain waste-intrusive activities may defeat the ventilation system, which may result in
14 accumulation of 100 percent lower flammability limit (e.g., sampling drill string and push mode
15 sampling of tank waste). The flammable gas controls for waste-intrusive activities and for static
16 monitoring are addressed in Addendum B, Section B.4.1, to meet the requirements of
17 [WAC 173-303-395](#). Toxic gas generation is assessed under the industrial hygiene program and
18 as part of the work planning process.

19 In general, waste incompatibilities are addressed in Addendum B through a combination of the
20 compatibility data quality objective, the compatibility assessments, and the chemical addition
21 data quality objective.

22 In addition to controlling waste receipts, equipment may be used to prevent the accumulation of
23 gas or be designed to prevent the ignition of combustible gas even if it was present. Examples of
24 this are the use of mixers to control the release of accumulated gas and the use of explosion-proof
25 equipment to prevent the ignition of any combustible gas.

26 Administrative controls such as controlling smoking areas and requiring specific activities for
27 work performed around the tanks are used. The controls vary according to the specific activity
28 but may include monitoring the tank for flammable gas during the work activity, the use of
29 special equipment, and/or the use of physical barriers.

30 **F.2.11 Precautions for Handling Ignitable, Reactive, and/or Incompatible Waste**

31 Addendum B addresses methods and measures in place to ensure that ignitable, reactive, and/or
32 incompatible waste are properly handled in the DST System or on transfer of such waste into the
33 DST System.

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