

1  
2  
3  
4

**FACT SHEET**  
**PART III, OPERATING UNIT GROUP 4, 242-A EVAPORATOR**

DRAFT

1  
2  
3

**This page intentionally left blank.**

DRAFT

1 **FACT SHEET**

2 **PART III, OPERATING UNIT GROUP 4, 242-A EVAPORATOR**

3 **UNIT DESCRIPTION**

4 The 242-A Evaporator, Operating Unit Group 4, is a mixed waste treatment and storage unit. It is in  
5 Hanford's 200 East Area. It is a conventional forced-circulation, vacuum evaporation system to reduce  
6 waste volume. It began operations in March 1977.

7 The evaporator treats the waste by removing water and most volatile organics. This creates a  
8 concentrated slurry waste stream that is routed back to the Double-Shell Tank (DST) System, and a  
9 process condensate stream routed to the Liquid Effluent Retention Facility (LERF). Off-gases from the  
10 treatment process are routed through a de-entrainment unit, a pre-filter, and high-efficiency particulate air  
11 filters before being discharged to the environment.

12 Tank C-A-1, the evaporator vessel, is in the evaporator room. It consists of two sections:

- 13 • A lower (liquid) section, a 4.3 meter (14-foot) diameter stainless steel shell.
- 14 • An upper (vapor) section, a 3.5 meter (11.6-foot) diameter stainless steel shell. The upper section  
15 contains two wire-mesh de-entrainment pads for the removal of liquids and solids that could be  
16 carried into the vapor header.

17 Process slurry from the reboiler discharges to Tank C-A-1. Concentrated process slurry exits the lower  
18 section of Tank C-A-1 through a 28-inch recirculating line. Vapor flows out of Tank C-A-1 through a  
19 42-inch vapor line at the top. The maximum design capacity of Tank C-A-1 is 103,217 liters  
20 (27,267 gallons).

21 Tank C-100, the condensate collection tank, is in the condensate room. It is a stainless steel 4.3 meter  
22 (14-foot) diameter by 5.9 meter (19-foot) high tank in the condensate room. It has a maximum design  
23 capacity of 67,380 liters (17,800 gallons). Process condensate from the primary condenser, inter-  
24 condenser, and after-condenser drain by gravity to Tank C-100. Tank C-100 also receives potentially  
25 contaminated drainage from the vessel vent system via a seal pot.

26 Concentrated slurry is pumped back into the DST System. The process condensate is routed through  
27 condensate filters before release to LERF.

28 **TYPE AND QUANTITY OF WASTE**

29 Waste going to the 242-A Evaporator is regulated as a mixed waste. The 242-A Evaporator receives  
30 waste (slurry) from the DST System feed tank 241-AW-102. The 242-A Evaporator can treat up to  
31 870,642 liters (230,000 gallons) of dangerous and mixed waste per day. It produces two waste streams.  
32 The first stream is concentrated slurry. The concentrated slurry is routed back to the DST System for  
33 storage pending further treatment. The second stream is process condensate. The Permittees pump the  
34 process condensate from Tank C-100 through the PC-5000 encased underground pipeline  
35 (pipe-within-a-pipe) to LERF.

36 **BASIS FOR PERMIT CONDITIONS**

37 This permit is intended to protect human health and the environment while ensuring proper management  
38 of waste at the 242-A Evaporator. The permit addenda are incorporated into this permit and are  
39 enforceable by reference.

40 The Department of Ecology bases the conditions and addenda for the 242-A Evaporator on:

- 41 • The Hanford Facility Dangerous Waste Permit, Revision 8C.
- 42 • Permit modifications to Revision 8C of the permit.
- 43 • Comment resolution meetings with the Permittees.

1 The permit includes requirements for complying with environmental standards and maintaining and  
2 modifying the permit. The permit conditions address specifics such as personnel training, adequate  
3 staffing, process controls, and inspection requirements.

#### 4 **GENERAL WASTE MANAGEMENT STANDARDS**

5 Condition III.4.B.1 authorizes the Permittees to accept dangerous and mixed waste into the 242-A  
6 Evaporator according to Addendum B, Waste Analysis Plan (WAP). The waste must satisfy the waste  
7 acceptance criteria of Addendum B.

8 Condition III.4.B.2 authorizes the Permittees to treat the waste.

9 Condition III.4.B.3 requires the Permittees to maintain the evaporator as described in Addendum C. This  
10 addendum describes the current design, construction, and configuration. The purpose of this condition is  
11 two-fold. First, this condition establishes a baseline of the facility configuration for inspection and  
12 modification. Any changes from this baseline require authorization through the permit modification  
13 process. Second, in establishing this condition, we find the evaporator is in compliance with the  
14 applicable requirements of Washington Administrative Code (WAC) [WAC 173-303](#).

15 Condition III.4.B.4 governs operation of 242-A Evaporator. It requires the Permittees to comply with the  
16 operating procedures in Addendum C. This condition requires that the systems be operated in compliance  
17 with permit conditions and in a manner that protects human health and the environment. This condition  
18 clarifies that the monitor and control system (MCS) described in Addendum C is considered to include all  
19 indicators, sensors, transducers, actuators, and other control devices connected to, but remote from, the  
20 centralized MCS computer.

#### 21 **WASTE ANALYSIS REQUIREMENTS**

22 Conditions III.4.C require the Permittees to perform all sampling and analysis for compliance with the  
23 permit according to the waste analysis plan (WAP) in Addendum B. The Permittees also must follow  
24 recordkeeping requirements to comply with [WAC 173-303-380](#). The WAP defines all sampling and  
25 analysis procedures to accept and manage wastes in the 242-A Evaporator.

#### 26 **RECORDKEEPING AND REPORTING**

27 Condition III.4.D follows the requirements of [WAC 173-303-380](#) and [WAC 173-303-810](#)(16) to ensure  
28 proper recordkeeping and reporting. The Permittees will comply with the requirements of Condition  
29 II.I.3.

#### 30 **SECURITY**

31 The 242-A Evaporator is within Hanford's secured area. Access to the operating area of the facility is  
32 subject to the general security provision of Permit Attachment 3 and Condition II.L. Security  
33 requirements applicable to the 242-A Evaporator are in Condition III.4.E and Addendum E, and are based  
34 on [WAC 173-303-310](#)(2).

#### 35 **PREPAREDNESS AND PREVENTION**

36 Condition III.4.F.1 and Addendum F contain the 242-A Evaporator's preparedness and prevention  
37 requirements. The requirements are based on [WAC 173-303-340](#). Addendum F includes:

- 38 • Internal and external communication systems used to communicate with 242-A Evaporator  
39 personnel and emergency responders (Hanford Fire Department, Hanford patrol).
- 40 • Emergency equipment in the event of releases, fire, or other emergency.
- 41 • Preventive procedures, structures, and equipment.
- 42 • Prevention of reaction of ignitable, reactive, and incompatible wastes.

1 **CONTINGENCY PLAN**

2 Condition III.4.G.1 requires the Permittees to comply with the contingency plan in Addendum J and  
3 Condition II.A. Addendum J requires the Permittees to immediately implement the plan when  
4 emergencies arise.

5 **INSPECTIONS**

6 Conditions II.X, III.4.H, and Addendum I define inspection requirements. Condition II.X requires the  
7 Permittees to establish a written inspection schedule and conduct periodic inspections following the  
8 schedule. [[WAC 173-303-320\(2\)\(a\)-\(c\)](#)] Addendum I has a written schedule for inspecting monitoring,  
9 safety, emergency, and security equipment. The inspections are to detect and prevent malfunctions,  
10 deterioration, operator error, or discharges that could harm human health or the environment.

11 Condition II.X requires the Permittees to take action to correct problems revealed during these inspections  
12 [required under [WAC 173-303-320\(3\)](#)]. It also requires the Permittees to follow inspection recordkeeping  
13 requirements [required under [WAC 173-303-320\(2\)\(d\)](#)].

14 **TRAINING**

15 The Permittees must have written training plan to ensure employees have the skills and knowledge they  
16 need to do their work safely. The Permittees must maintain the training requirements in Addendum G in  
17 a training plan prepared according to Conditions II.C and III.4.I.1. The training program and written  
18 training plan must meet the requirements of [WAC 173-303-330](#).

19 **OTHER GENERAL REQUIREMENTS**

20 Condition III.4.J.1 requires the Permittees to comply with [WAC 173-303-395\(1\)](#) for the management of  
21 ignitable or reactive wastes. The Permittees must take to take precautions to prevent risks from  
22 management of any potentially reactive or ignitable wastes.

23 The 242-A Evaporator is hard-piped to both the DSTs and LERF, so it does not have a load-in/load out  
24 area. No separate permit condition is necessary to ensure compliance with [WAC 173-303-395\(4\)](#).

25 Permit conditions for waste management in tanks require appropriate labels and markings for individual  
26 containers and tanks, and satisfy [WAC 173-303-395\(6\)](#).

27 **CLOSURE**

28 Condition III.K.1 requires the Permittees to implement the practices in Addendum H and Condition II.J  
29 when closing the 242-A Evaporator. The 242-A Evaporator will be clean closed. Closure performance  
30 standards are based on closure by removal or decontamination standards of [WAC 173-303-610\(2\)\(b\)](#), as  
31 well as the general closure performance standards of [WAC 173-303-610\(2\)\(a\)](#).

32 **TANK MANAGEMENT STANDARDS**

33 Tank management conditions generally follow the requirements of [WAC 173-303-640](#). They either  
34 incorporate WAC regulations by reference or closely parallel those requirements, or refer to applicable  
35 sections of Addendum C, satisfying the requirements of [WAC 173-303-815\(2\)](#).

36 Conditions III.4.P.1.a and b are based on [WAC 173-303-640\(3\)](#). Ecology is establishing an additional  
37 requirement through Permit Condition III.4.P.1.c to review and update, as necessary, the integrity  
38 assessment program whenever circumstances contradict or cast in doubt assumptions or recommendations  
39 in the initial integrity assessment program. Ecology has determined this is necessary to prevent  
40 unexpected corrosion and possible vessel failure. The basis for Condition III.4.P.1.c is the omnibus  
41 authority of [WAC 173-303-815\(2\)\(b\)\(ii\)](#) to protect human health and the environment.

42 Condition III.4.P.2.h.1 authorizes the Permittees to use alternative leak detection inspection methods to  
43 perform inspections in the condenser room per Addendum 1, Section I.1.2.3, during facility electrical or

1 ventilation outages. The Permittees must notify Ecology before they use the alternative leak detection  
2 inspection method. Use of the alternative method must be documented in the operating record.

3 The main bases for Permit conditions for operating and inspection are [WAC 173-303-640](#)(5) and (6). We  
4 have not set a specific condition based on the requirements of overfill controls in [WAC 173-303-](#)  
5 [640](#)(6)(a), because Condition III.4.B.4 addresses them adequately.

6 **REQUESTED VARIANCES OR ALTERNATIVES**

7 Daily operational inspections are impacted during facility electrical or ventilation outages. The  
8 Permittees may use an alternative leak detection inspection method to perform inspections in the  
9 condenser room during outages. The basis of this alternative is that it is too hazardous for workers to  
10 enter those areas when the electrical and ventilation systems are not operational.

11 The inspection will be performed with a camera placed above the floor drain in the condenser room.

12 **STATE ENVIRONMENTAL POLICY ACT (SEPA)**

13 The SEPA determination for the 242-A Evaporator is in the Hanford-Wide Permit Fact Sheet.

DRAFT

1  
2  
3  
4

**This page intentionally left blank.**

DRAFT