

**ENGINEERING CHANGE NOTICE**

1. ECN **654019**

Proj. ECN

2. ECN Category (mark one) Supplemental <input type="radio"/> Direct Revision <input checked="" type="radio"/> Change ECN <input type="radio"/> Temporary <input type="radio"/> Standby <input type="radio"/> Supersedure <input type="radio"/> Cancel/Void <input type="radio"/>	3. Originator's Name, Organization, MSIN, and Telephone No. Dan Johnson, 19500, L1-05, 373-4209		4. USQ Required? <input checked="" type="radio"/> Yes <input type="radio"/> No	5. Date 8-27-99
	6. Project Title/No./Work Order No. 324/327 Facilities Environmental Effluent Specifications		7. Bldg./Sys./Fac. No. 324/327	8. Approval Designator ESQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-3444, Rev. 0		10. Related ECN No(s). N/A	11. Related PO No. N/A
	12a. Modification Work <input type="radio"/> Yes (fill out Blk. 12b) <input checked="" type="radio"/> No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Completed N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECNs only) N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

The primary changes include:

- Removal of grace period for annual tests of airborne effluent equipment,
- Definition of annual,
- Clarification of regulatory notifications,
- Approved periodic sampling method for EP-327-02-V,
- Removal of tritium sampling references,
- Removal of PS/RPS pH and conductivity monitoring requirements,
- Updated RPS and RLWS,
- Added Appendix to trace requirements to implementing procedures and records.

13b. Design Baseline Document?  Yes  No

14a. Justification (mark one) Criteria Change <input type="radio"/> Design Improvement <input type="radio"/> Environmental <input checked="" type="radio"/> Facility Deactivation <input type="radio"/> As-Found <input type="radio"/> Facilitate Const. <input type="radio"/> Const. Error/Omission <input type="radio"/> Design Error/Omission <input type="radio"/>	14b. Justification Details Update to incorporate changes in requirements and the facilities.
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USQ REVIEW  
 Cat. Exclusion # NA  
 Scrw/Eval. # 324-3444-99-128  
27-08-99 / 12-21-99  
 Initials/Date Initials/Date

15. Distribution (include name, MSIN, and no. of copies)					
J. M. Steffen	L1-08	1	K. A. Hadley	R3-56	1
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RELEASE STAMP

AUG 30 1999

DATE: \_\_\_\_\_

STA: **15**

MANFORD  
RELEASE

ID: 20

# ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

654019

**16. Design Verification Required**

Yes  
 No

**17. Cost Impact**

**ENGINEERING**

Additional  \$ \_\_\_\_\_  
Savings  \$ N/A

**CONSTRUCTION**

Additional  \$ \_\_\_\_\_  
Savings  \$ N/A

**18. Schedule Impact (days)**

Improvement  \_\_\_\_\_  
Delay  N/A

**19. Change Impact Review:** Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

<p>SDD/DD <input type="checkbox"/></p> <p>Functional Design Criteria <input type="checkbox"/></p> <p>Operating Specification <input type="checkbox"/></p> <p>Criticality Specification <input type="checkbox"/></p> <p>Conceptual Design Report <input type="checkbox"/></p> <p>Equipment Spec. <input type="checkbox"/></p> <p>Const. Spec. <input type="checkbox"/></p> <p>Procurement Spec. <input type="checkbox"/></p> <p>Vendor Information <input type="checkbox"/></p> <p>OM Manual <input type="checkbox"/></p> <p>FSAR/SAR <input type="checkbox"/></p> <p>Safety Equipment List <input type="checkbox"/></p> <p>Radiation Work Permit <input type="checkbox"/></p> <p>Environmental Impact Statement <input type="checkbox"/></p> <p>Environmental Report <input type="checkbox"/></p> <p>Environmental Permit <input type="checkbox"/></p>	<p>Seismic/Stress Analysis <input type="checkbox"/></p> <p>Stress/Design Report <input type="checkbox"/></p> <p>Interface Control Drawing <input type="checkbox"/></p> <p>Calibration Procedure <input type="checkbox"/></p> <p>Installation Procedure <input type="checkbox"/></p> <p>Maintenance Procedure <input type="checkbox"/></p> <p>Engineering Procedure <input type="checkbox"/></p> <p>Operating Instruction <input type="checkbox"/></p> <p>Operating Procedure <input type="checkbox"/></p> <p>Operational Safety Requirement <input type="checkbox"/></p> <p>IEFD Drawing <input type="checkbox"/></p> <p>Cell Arrangement Drawing <input type="checkbox"/></p> <p>Essential Material Specification <input type="checkbox"/></p> <p>Fac. Proc. Samp. Schedule <input type="checkbox"/></p> <p>Inspection Plan <input type="checkbox"/></p> <p>Inventory Adjustment Request <input type="checkbox"/></p>	<p>Tank Calibration Manual <input type="checkbox"/></p> <p>Health Physics Procedure <input type="checkbox"/></p> <p>Spares Multiple Unit Listing <input type="checkbox"/></p> <p>Test Procedures/Specification <input type="checkbox"/></p> <p>Component Index <input type="checkbox"/></p> <p>ASME Coded Item <input type="checkbox"/></p> <p>Human Factor Consideration <input type="checkbox"/></p> <p>Computer Software <input type="checkbox"/></p> <p>Electric Circuit Schedule <input type="checkbox"/></p> <p>ICRS Procedure <input type="checkbox"/></p> <p>Process Control Manual/Plan <input type="checkbox"/></p> <p>Process Flow Chart <input type="checkbox"/></p> <p>Purchase Requisition <input type="checkbox"/></p> <p>Tickler File <input type="checkbox"/></p> <p>None <input checked="" type="checkbox"/></p>
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**20. Other Affected Documents:** (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
N/A		

**21. Approvals**

Signature	Date	Signature	Date
Design Authority <u>DL Johnson</u>	<u>8-27-99</u>	Design Agent <u>DL Johnson</u>	_____
Cog. Eng. <u>DL Johnson</u>	<u>8-27-99</u>	PE _____	_____
Cog. Mgr. <u>TL Erickson</u>	<u>8/27/99</u>	QA _____	_____
QA <u>HE Rev</u>	<u>8/27/99</u>	Safety _____	_____
Safety <u>AM Horner</u>	<u>8/30/99</u>	Design _____	_____
Environ. <u>DE Rasmussen</u>	<u>8/27/99</u>	Environ. _____	_____
Other _____	_____	Other _____	_____
<u>324/327 MinSafe Mgr: MS Wright</u>	<u>8/27/99</u>		
<u>324/327 Proj Mgr: SH Norton</u>	<u>8/27/99</u>		
<u>324 Fac Mgr: BG Foreman</u>	<u>8-27-99</u>		
<u>327 Fac Mgr: RW Stevens</u>	<u>8-27-99</u>		
_____	_____		
_____	_____		
_____	_____		
_____	_____		
_____	_____		

**DEPARTMENT OF ENERGY**  
Signature or a Control Number that tracks the Approval Signature

**ADDITIONAL**

9

# 324/327 Facilities Environmental Effluent Specifications

D. L. Johnson  
BWHC  
Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: Effluent, Specifications, Environmental, Monitoring,  
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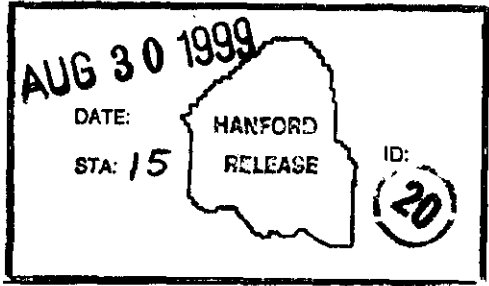
**Abstract:**

These effluent specifications address requirements for the 324/327 Facilities, which are undergoing stabilization activities. Effluent specifications are imposed to protect personnel, the environment and the public, by ensuring adequate implementation and compliance with federal and state regulatory requirements and Hanford programs.

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*Janis Aardal* 8/30/99  
Release Approval Date



Release Stamp

**Approved For Public Release**



# 324/327 Facilities Environmental Effluent Specifications

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## 1.0 INTRODUCTION

These effluent technical specifications address requirements for the 324/327 facilities, which are undergoing stabilization activities. Effluent specifications are imposed to protect personnel, the environment and the public, by ensuring adequate implementation and compliance with federal and state regulatory requirements and Hanford programs.

Effluent specifications include instrumentation/equipment operability requirements, control settings, calibration frequency, surveillance frequency and process variable operating limits and measurement requirements. Recording of various parameters (e.g., pressure, flow, operating status) is required in some cases to provide an auditable record of compliance with the specifications. The required data collection frequency and format is provided in plant operating procedures. Retention of these records for ready retrievability provides compliance with state regulations. These records are specified in the Appendix.

This effluent specification document is to serve a function similar to an Operational Safety Requirement (OSR) document. Just as facility operating safety requirements are summarized in OSRs, facility environmental requirements are summarized in these effluent specifications. (Some effluent specifications relate to certain OSRs, but they are generally derived from different sources than OSRs, and have a different range of scope. OSRs are derived from accident analyses and are intended to avoid large doses to the public under upset conditions. Effluent specifications are derived from environmental regulations/requirements that are concerned with upset conditions as well, but with emphasis on potentials for chronic low doses to the public under normal operating conditions.) Some effluent specifications reflect elements of some OSRs (HNF-SD-SPJ-OSR-001, Rev. 1, and HNF-SD-SPJ-OSR-002, Rev. 2). Related OSRs are referenced in the Basis for Limit section of the effluent specification. These effluent specifications have been reviewed to ensure consistency with related OSRs.

## 1.1 SCOPE

The airborne effluent specifications provided for the 324/327 facilities are based on requirements contained in:

- 40 CFR 61 Subpart H, “National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities”
- WAC 246-247, “Radiation Protection—Air Emissions”
- Facility-specific Notice of Construction (NOC) regulatory permits, including:
  - NOC for Cleanout of the WTEL B-Cell, 324 Building, AIR 95-903
- Hanford Site Air Operating Permit HNF-AOP-97-1, including the Hanford Radioactive Air Emission License FF-01 with the State of Washington Department of Health
- DOE Regulatory Guide DOE/EH-0173T
- FDH HNF-PRO-450 “Air Quality – Radioactive Emissions”; HNF-PRO-2364, “Radioactive Airborne Effluent Sampling”.
- Facility Effluent Monitoring Plans (FEMP) for the 324 and 327 facilities

Requirements and approval conditions provided in Notice of Construction (NOC) regulatory permits are considered regulatory requirements. These requirements may be implemented through facility procedures as appropriate (e.g., stack air sampling). Deviation from NOC or other regulatory requirements may not be made without appropriate concurrence from the regulator.

The liquid effluent specifications are based on the requirements contained in the *Waste Acceptance Criteria for the 300 Area Process Sewer & TEDF*, and the *Liquid Waste Certification Program*, both contained in WMH-320. The approved *300 Area Liquid Effluent Facilities Administration*, section 3.4, *Liquid Waste Certification Program* requirement states that waste generating facilities “Ensures all personnel who control discharge of materials to either the PS or RPS systems are aware of the system limitations.” These are driven by TEDF process control requirements and the EPA NPDES Permit WA-002591-7, which regulates TEDF discharge to the Columbia River.

Implementation of the effluent specifications for the 324/327 facilities will be accomplished through appropriate updates to operating procedures, instrument and equipment calibration data, preventive maintenance procedures, and personnel training. Operability testing and calibration schedules for equipment and instruments required to support the specific requirements are established and executed in accordance with HNF-IP-1264, section 4.2, “Preventive Maintenance.”

## 1.2 REPORTING REQUIREMENTS

In general, specification noncompliance including entry into a recovery action shall be reported by the responsible supervisor within eight hours of discovery to the 324/327 Facility Manager, to the Environmental Compliance Officer (ECO), and to the effluent cognizant engineer. However, noncompliance with certain effluent-related specifications requires notification of site Effluent Monitoring, the FDH point of contact, DOE, and regulatory agencies within 24 hours, as determined by the ECO. The FDH point-of-contact notifies WDOH, as appropriate.

Specification violations include:

- 1) exceeding certain specification limits
- 2) failure to comply with an operating specification and the associated Recovery Action, and
- 3) failure to perform a surveillance requirement (e.g. calibration or inspection) within the specified interval plus any allowable extension (see Section 1.3.1 for allowable extensions).

Specification violations that result in regulatory notifications include the following:

- Below minimum fan operation,
- Below minimum HEPA efficiency,
- Emissions above normal resulting from operational changes,
- Exceeding allowable monitoring/measurement equipment downtime,
- Positive pressurization of radioactive contaminant ventilation zones
- Exceeding annual test schedules for HEPA filter efficiency (Table 2.4), stack effluent measurement/monitoring instruments calibration (Table 3.2), and stack flow measurement

Specification violations may be indicative of degradation in the safety, environmental, or health protection performance of the facility. Formal occurrence reporting may be required when a violation occurs. Specification violations shall be reported/documented as directed by HNF-PRO-060, Reporting Occurrences and Processing Operations Information.



### 1.3 GENERAL SPECIFICATIONS/DEFINITIONS

#### 1.3.1 RECOVERY ACTIONS

In general, the Recovery Action lists those corrective actions that are necessary in order to correct or prevent non-compliant conditions. The Basis for Limit will clarify whether or not these are required or recommended actions. The time limits for initiation of repair or replacement in the recovery actions are generally provided as guidelines to ensure timely response to correct or prevent non-compliant conditions. When the specified time limits are based on specific regulating requirements, it will be noted in the Basis for Limit.

Unless specified otherwise in this document, the minimum calibration frequency for airborne effluent instruments shall be annual. The calibration frequency for liquid effluent instruments shall be as determined by the cognizant engineer, based on reliability of the instrument. Applicable instruments shall be in current calibration and operable prior to use. If an instrument is not calibrated or a preventive maintenance (PM) or a functional test is not performed within the specified frequency:

- For airborne effluent instruments/equipment, perform the calibration, PM or test within the month of the specified due date. If an annual calibration or test cannot be performed within the month due, the FDH point of contact and WDOH must be notified, and calibrations must be completed as soon as possible.
- For liquid effluent instruments/equipment, perform the calibration, PM or test within an extension of 25% of the specified frequency.

**Basis for Limit:** The above recovery action plans provide for flexibility that may be needed due to plant conditions or personnel shortages. The overview provided by the independent organizations ensures that personnel, environment and public safety are adequately considered.

The above 25% surveillance (see definition) extension limitation is based on Section II.2.1.i of DOE Order 5480.22 Attachment 1, "Guidelines for Technical Specification Requirements," (TSRs). The extension provides early warning and focuses attention on the problem in time to avoid a specification violation. The extension allowance is intended to provide operational flexibility both for scheduling and for performing surveillance. It should not be relied upon as a routine extension of the specified interval.

#### 1.3.2 ALTERNATE RECOVERY ACTIONS

If a specified recovery action for a non-compliant condition can not be completed within the specified time or, due to unusual circumstances/conditions, another action is more appropriate than that listed in this document, then:

- Prepare a plan and obtain written concurrence within 96 hours of the specified time or frequency from the 324/327 Facility Manager, ECO, WMH Effluent Monitoring, and the FDH point of contact (as appropriate).

## 1.4 DEFINITIONS

<u>Term</u>	<u>Definition</u>
AOP	Hanford Site Air Operating Permit, HNF-AOP-97-1 (draft)
Action	Prescribes remedial measures required under designated conditions for a specification.
Alternate	A backup for the primary instrument that is used to provide the required data or indication until the primary instrument is returned to service.
Annual	An interval from a given month to the end of that same month the following year.
Calibrate	To systematically standardize a quantitative measuring instrument.
Completion time	The amount of time allowed to complete a required Action referenced to the time of discovery.
CAM	Continuous Air Monitor.
Control	Devices or methods required to maintain safe conditions.
Daily	Normal business day, excluding weekends and holidays.
Data collection	Recording of various parameters (pressure, temperature, flow, volume, specific gravity, etc.) providing an auditable record of compliance with the specifications. The frequency and format is provided in plant operating procedures.
Deactivate	To prevent operation of a system, component, or device by precluding the application of the energy source required for operation and/or by providing engineered modifications to prevent the system, component, or device from performing its function(s).
Deactivation	Facility activities related to removing, reducing, and stabilizing the remaining radioactive and chemical materials from the facility, followed by eventual shutdown of the utilities and effluents.
Detection/Control	States how the variable associated with the limit is measured and/or controlled. Real time measurement is desired but may not always be possible.
ECO	Environmental Compliance Officer or delegate. Delegate may be the effluent cognizant engineer for purposes of these specifications.

<b>EPA</b>	The United States Environmental Protection Agency.
<b>ESP</b>	Electrostatic Precipitators (used as prefilters in 324 B-Cell).
<b>Facility</b>	The entire process and necessary support equipment as defined by the Safety Analysis Report (SAR) and FEMP.
<b>FEMP</b>	Facility Effluent Monitoring Plan.
<b>FDH</b>	Fluor Daniel Hanford, Inc.
<b>Functional Check</b>	The qualitative assessment of instrument or equipment behavior during operation by observation. This determination shall include, where possible, comparison of the output indication and/or status with other indications and/or status derived from independent instruments or equipment measuring the same parameter. A functional check is used to determine if the instrument or equipment is operable.
<b>Immediately</b>	Performing an Action without delay, but in a safe, controlled manner.
<b>Initiate repair</b>	The required maintenance work order has been initiated and planning is in progress. Response time limits are guidelines unless otherwise specified.
<b>In-service</b>	A system, component, device, instrument, or equipment piece shall be in-service when it is operable and being used.
<b>Interpretive Authority</b>	The interpretive authority for the Effluents Technical specifications shall be the 324/327 ECO/delegate.
<b>Isolate</b>	Provide a positive barrier to preclude any unwanted solution flow or material transfer from one vessel or system to another. Isolation is typically achieved by installing blanks, removing piping or jumpers, or deactivating transfer devices such as pumps.
<b>LEF</b>	Liquid Effluent Facilities. Includes TEDF, the 307 basins, and the 340 Facility (the 340 Facility has been shut down).
<b>Manager</b>	Term, as used in this document, includes delegated individual.
<b>Monitoring</b>	The measurement of a process variable; includes routine surveillance and testing, measurement of radioactive material by means of a radiation detector and/or withdrawal of representative samples for laboratory analysis.
<b>Noncompliance</b>	A condition outside the boundaries of the specification caused by commission or omission.

<b>Off-Normal Occurrence</b>	An abnormal or unplanned event that adversely affects, potentially affects, or is indicative of degradation in the safety, security, environmental, or health protection performance or operation of the facility.																		
<b>Operable</b>	A system, component, device, instrument, or equipment piece shall be operable when it is capable of performing its intended function(s), and all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment required for the system, component, device, instrument, or equipment piece to perform its intended function(s) are also capable of performing the related support function(s).																		
<b>Operating</b>	A system, component, device, instrument, or equipment piece shall be operating when it is operable and being used.																		
<b>Recovery Action</b>	General steps required to recover from not satisfying a specification limit consistent with response criteria contained in source documents. Time duration requirements are included if applicable.																		
<b>Specification Violation</b>	Failure to comply with an operating specification <u>and</u> associated Recovery Action. Also, failure to perform a surveillance requirement within the specified interval plus any allowable extension (see Section 1.3.1).																		
<b>Surveillance</b>	Activity related to test, calibration, or inspection to ensure the quality and operability of safety-related structures, systems, components, and associated support systems are maintained.																		
<b>Surveillance Frequency</b>	See the definitions given below from Section II.2.1.d of DOE Order 5480.22 Attachment 1, "Guidelines for Technical Specification Requirements," (TSRs). (Also applies to Data Collection Frequency.)																		
	<table border="0"> <thead> <tr> <th style="text-align: left;"><u>Notation</u></th> <th style="text-align: left;"><u>Minimum Frequency</u></th> </tr> </thead> <tbody> <tr> <td>S - Shift</td> <td>At least once per 12 hours.</td> </tr> <tr> <td>D - Daily</td> <td>Once per 24 hours.</td> </tr> <tr> <td>W - Weekly</td> <td>Once per 7 days.</td> </tr> <tr> <td>M - Monthly</td> <td>Once per 31 days.</td> </tr> <tr> <td>Q - Quarterly</td> <td>Once per 92 days.</td> </tr> <tr> <td>SA - Semi-annually</td> <td>Once per 184 days.</td> </tr> <tr> <td>C - Campaign</td> <td>Prior to each startup.</td> </tr> <tr> <td>A - Annually</td> <td>Once per 365 days.</td> </tr> </tbody> </table>	<u>Notation</u>	<u>Minimum Frequency</u>	S - Shift	At least once per 12 hours.	D - Daily	Once per 24 hours.	W - Weekly	Once per 7 days.	M - Monthly	Once per 31 days.	Q - Quarterly	Once per 92 days.	SA - Semi-annually	Once per 184 days.	C - Campaign	Prior to each startup.	A - Annually	Once per 365 days.
<u>Notation</u>	<u>Minimum Frequency</u>																		
S - Shift	At least once per 12 hours.																		
D - Daily	Once per 24 hours.																		
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SA - Semi-annually	Once per 184 days.																		
C - Campaign	Prior to each startup.																		
A - Annually	Once per 365 days.																		
<b>Technical Basis</b>	Describes the reason(s) for the stated limit and applicable safety considerations.																		
<b>TEDF</b>	300 Area Treated Effluent Disposal Facility.																		
<b>WDOH</b>	Washington State Department of Health.																		

## 1.5 RECORD RETENTION REQUIREMENTS

Surveillance and maintenance records on all systems identified in this procedure must be **retained for a minimum of five years at the facility** (327 records may be retained together at 324 facility) to ensure that records are “readily retrievable”, as required by WAC 246-247. DOE letter 97-EAP-388 documents the agreement between DOE and WDOH that “readily retrievable” is to be interpreted that records “shall be provided (to WDOH) by close of business the following business day of their request.” Since these records must be processed through FDH prior to being provided to WDOH, it is necessary to be capable of retrieving records from the facility in less than 24 hours. This generally makes storage of records at the facility necessary. Records are not required to be original documents; readable copies are adequate.

Records required to be maintained at the facility are included in the outline below, as applicable (list is excerpted from the Hanford Radioactive Air Emission License FF-01 with the State of Washington Department of Health, which is included in the Hanford Site Air Operating Permit HNF-AOP-97-1). Specific records that must be retained are listed in the Appendix.

### **Section 1 - Records Required by 40 CFR 61.14 (f) and WAC 246-247-080.**

[Note: For NESHAP Designated Stacks Only]

#### Calibration Records

- Records and procedures for stack sampling system instrumentation , functional checks/periodic calibrations (i.e. vacuum gauges, rotameters, and gas meters).

#### Monitoring Data

- Stack flow data, and sampling data including flow rate calculations (e.g. vent and balance).
- The Radioactive Air Emissions Report for the Hanford Site (NESHAP annual report)
- Documentation verifying compliance with Quality Assurance requirements of 40 CFR 61, Subpart H, Appendix B, Method 114 (e.g., The Quality Assurance Program for Radionuclide Airborne Emissions Monitoring, the Effluent Monitoring Quality Assurance Project Plan for Radioactive Airborne Emissions Data, and the Quality Assurance Plan for Facility Effluent Monitoring, Quality Assurance Plan No. FO-011)
- Records documenting periods of malfunction or in operation (i.e., monitoring system down time)

### **Section 2 - Records Required by 40 CFR 61.95 and WAC 246-247-080.**

[Note: As Applicable, For All Sources of Radioactive Air Emissions]

#### Monitoring Data (for powered, ventilated point sources)

- Stack flow data, and sampling data including flow rate calculations (e.g. vent and balance).
- The Radioactive Air Emissions Report for the Hanford Site (NESHAP annual report)
- NESHAP assessments

#### Passively Ventilated Point Sources (contained in Table 2.2)

- See compliance schedule

Nonpoint Source and Fugitive Emissions

- The Radioactive Air Emissions Report for the Hanford Site (NESHAP annual report)  
The annual Hanford Site Environmental Report

Notices of Construction

- Notice of Construction Applications
- Approval orders (letters) from EPA/WDOH including any additional approval conditions

**Section 3 - State-only Records Required by WAC 246-247-080(8)**BARCT and ALARACT Demonstrations

- Records of Best Available Radionuclide Control Technology (BARCT) and/or As Low As Reasonably Achievable Control Technology (ALARACT) demonstrations

Drawings and Blueprints (for major stacks)

- Configuration drawings and/or process flow diagrams of radioactive air emission unit effluent control and monitoring systems

Line Loss Studies (if performed)

- Estimated and documented line losses and sample collection efficiency studies completed at the direction of the WDOH

Calibration and Maintenance Records and Procedures

- Maintenance records, maintenance procedures, and all original strip chart records (major stacks) or equivalent for all stack sampling system instrumentation (e.g., continuous air monitors, probes, pumps, rotameters, flow regulators, pressure gauges, totalizers, gas meters, and flow switches) as appropriate for methods identified in Tables 2.0 and 2.1
- Functional checks/periodic calibration records and procedures for all nondesignated stack instrumentation (i.e., vacuum gauges, rotameters, and gas meters).
- Maintenance records and maintenance procedures for required abatement control technology equipment identified in Tables 1.0 and 1.1

Efficiency Tests of high efficiency particulate air (HEPA) filters

- Test procedures and results of the HEPA filter/aerosol tests.

Training

- Training records of personnel and supervisors specific to the operation and maintenance of radioactive air emission units.

Reports

- Reports of closure
- 10-day notification follow-up reports

Operation Log

- Categorically approved units

- Specific regulatory order approval condition

Quality Assurance Program

- Documentation verifying compliance with Quality Assurance requirements of WAC 246-247-075(6) (e.g., The Quality Assurance Program for Radionuclide Airborne Emissions Monitoring, the Effluent Monitoring Quality Assurance Project Plan for Radioactive Airborne Emissions Data, and the Quality Assurance Plan for Facility Effluent Monitoring, Quality Assurance Plan No. FO-011)

For portable units identified and given categorical approval to operate under this license, a log shall be maintained in accordance with WAC 246-247-080(7) and shall contain relevant operations parameters including, but not limited to the date, location, duration of the release, measured or calculated radionuclide concentrations, the type of emissions (liquid, gaseous, solid), and the type of emission control and monitoring equipment.

[WAC 173-401-615(2)]

2.0 AIRBORNE EFFLUENT CONTROL SPECIFICATIONS

2.1 EXHAUST FANS

<u>Variable</u>	<u>Specification</u>
Zones I & II Exhaust Fan Operability	See table below
Exhaust Fan Downtime, Below Normal	Exhaust fan downtime for scheduled maintenance to less than normal operation, but meeting the minimum operation requirements shall be limited to 24 hours unless prior approval is obtained from the ECO and/or effluent cognizant engineer.
Exhaust Fan Downtime, Below Minimum	Exhaust fan downtime for scheduled maintenance to less than minimum operation requires prior approval from the ECO and/or effluent cognizant engineer.

SYSTEM	NORMAL OPERATION	MINIMUM OPERATION
324 Zone I Exhaust	2 of 3 fans operating (typically EP-973 and EP-975 operating, EP-974 in standby)	1 fan operating
324 Zone II Exhaust	EP-971 and EP-972 operating	1 fan operating
327 Zone I (Hot Cell) Exhaust	HEF#1 or HEF#2 operating	1 fan operating
327 Zone II (Cold) Exhaust	CEF#1 and CEF#2 operating	1 fan operating
327 Decontamination Cell Exhaust	1 fan operating	1 fan operating

Detection/Control: Exhaust fan operation is verified as indicated on the Power Operator data sheets. Preventive maintenance is performed periodically to support operability.

Recovery Action: If active ventilation can not be immediately restored, take necessary steps as determined by 324/327 Facility Manager and cognizant engineer to minimize effects and curtail operations in the affected area as appropriate. Notify the ECO and/or effluent cognizant engineer. If exhaust fans become inoperable such that the minimum operability requirements are not met:

- Verify that the supply fans are off                   AND
- Verify that Zones I & II DP is maintained below the atmospheric reference pressure per specification 2.2  
  AND
- Notify 324/327 Facility Manager , ECO and effluent cognizant engineer (See 1.2)  
  AND



- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours of discovery and submit documentation of the event as required (see 1.2).

AND

- Initiate repair within 96 hours.

**Basis for Limit:** The uncontrolled spread of airborne contamination within and to outside of the process areas is prevented by the building ventilation system. The probability of contamination release to the environs is minimized by maintaining progressively decreasing pressures from uncontaminated or cold zones to the highly contaminated process cells or gloveboxes, and by pulling the exhaust air from these areas through high-efficiency filters. Also, the level of contamination within the various zones of the controlled area and the probability of an uncontrolled release within these zones are held acceptably low by maintaining the specified minimum exhaust capability and differential pressure.

Partial loss of exhaust capability does not present a direct hazard. If exhaust fans minimum operability requirements are not met, Zones I & II activity is limited to that necessary to maintain/restore safe conditions. The supply fans are off under these conditions to prevent pressurization of Zones I & II.

The ECO/delegate must give prior approval for scheduled downtime of greater than 24 hours. This ensures an opportunity for the ECO/delegate to provide alternate stack sample flow rate settings to facilitate representative isokinetic sampling. The basis is further described in the FEMP documents. Isokinetic sampling requirements are driven by 40 CFR 61, Subpart H.

The exhaust fan minimum operability requirements are based on AOP requirements. Exhaust fan operation prevents fugitive emissions from uncontrolled pathways by drawing building air through controlled and monitored effluent systems. Operation below these minimum requirements will prompt regulatory notifications (per AOP) and require alternate stack sample flow rate settings to facilitate representative isokinetic sampling (per FEMP and 40 CFR 61, Subpart H).

## 2.2 ZONES I &amp; II DIFFERENTIAL PRESSURES

<u>Variable</u>	<u>Specification</u>
Zones I & II DP	Zones I & II plenum pressure below* atmospheric reference pressure
DP Instruments	Operable and calibrated annually

\*Recommended  $\geq 0.1$  in. w.g. below atmospheric reference pressure

Detection/Control: The differential pressure (DP) between Zones I & II and atmospheric reference pressure is measured by the instrumentation listed below. Calibration of these instruments is conducted annually.

## ZONES I &amp; II PRESSURE INSTRUMENTS

FACILITY	INSTRUMENT	ALARM
324	Zone I Exhaust Plenum Pressure	High Exhaust Duct Pressure Zone I
	Zone II Exhaust Plenum Pressure	High Exhaust Duct Pressure Zone II
327	Hot Exhaust Plenum Static Pressure	HEF Low Static Pressure
	Cold Exhaust Plenum Static Pressure	CEF Low Static Pressure

Recovery Action: If the above DP limits cannot be met:

- Immediately cease all affected activities
- AND
- Evacuate and/or limit Zones I & II entry to only those personnel necessary to maintain/restore safe conditions
- AND
- Restore Zones I & II pressure to below atmospheric reference pressure.
- AND
- Notify 324/327 Facility Manager , ECO and effluent cognizant engineer (See 1.2)
- AND
- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours of discovery and submit documentation of the event as required (see 1.2).

If the primary instrument fails:

- Initiate repair/replacement of the primary DP instrument within 96 h.

**Basis for Limit:** Complete loss of negative pressure in the Cell results in a high risk of loss of containment and contamination control in those areas. Loss of ability to maintain the specified minimum Zones I & II differential pressure could potentially result in release of radioactivity to areas occupied by personnel and result in unmonitored fugitive emissions from the facility. Radioactive emissions are required to be monitored according to WAC 246-247 and 40 CFR 61, Subpart H. Loss of Zones I & II negative pressure would prompt a WDOH notification.

## 2.3 NEW HEPA FILTERS

<u>Variable</u>	<u>Specification</u>
HEPA Filter Particulate Removal Efficiency	≥99.97%

**Detection/Control:** High-efficiency particulate air (HEPA) filters for use in airborne effluent streams shall be tested for particulate removal efficiency prior to installation or placing the filter in-service. Testing shall be performed per the requirements of American National Standards Institute (ANSI) Standard N510. (Applies only to final exhaust filters (i.e., last filter bank prior to release to environment) of operating exhaust systems, as documented in the AOP, OSR and FEMP documents. Refer to Table 2.4 for the list of applicable filters. Although not required by this specification, testing is recommended for upstream exhaust filters upon replacement.)

**Basis for Limit:** The use and testing of new particulate air filters are intended to ensure radionuclide releases are maintained within acceptable concentration limits. Testing is performed on critical airborne effluent control systems. Testing is performed per the requirements of American National Standards Institute (ANSI) Standard N510. ANSI N510 is referenced in WAC 246-247 as a required technology standard. Per ANSI N510, “The filter shall exhibit a minimum efficiency of 99.97% when tested with an aerosol of essentially monodispersed 0.3 micron particles.”

## 2.4 INSTALLED FILTER EFFICIENCY

<u>Variable</u>	<u>Specification</u>
HEPA Filters* Particulate Removal Efficiency	≥99.95%
HEPA Test Frequency	Annual

**Detection/Control:** High-efficiency particulate air (HEPA) filters\* installed in airborne effluent streams listed in Table 2.4 shall be tested in place for particulate removal efficiency prior to use and at least annually thereafter until removed from service. For these filters, exceeding the annual test frequency is a specification violation. See 1.2 and 1.3.1.

\*Applies only to final exhaust filters (last filter bank prior to release to environment) of operating exhaust systems, as documented in the AOP, OSR and FEMP documents. (Refer to Table 2.4 for the list of applicable filters)

**Recovery Action:** If the above requirements cannot be met, take the appropriate action listed below:

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer (see 1.2)

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours of discovery

and submit documentation of the event as required (see 1.2).

AND

- Where available, place parallel filter systems in service and take the failed filters out of service within 72 h

OR

- Where no parallel filter system is available, shut down or limit operation of the offending exhaust system within 72 hours until the filters can be replaced or resealed

OR

- Restrict facility operations that have the potential to cause emissions.

If a HEPA filter listed in Table 2.4 is not tested by the annual due date (i.e. by the end of the month in which it comes due), then:

- Notify the 324/327 Facility Manager, ECO and effluent cognizant engineer (See Section 1.2)

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours of discovery, and submit documentation of the event as required (see 1.2)

AND

- Complete HEPA filter test as soon as possible.

**Basis for Limit:** The use and testing of high efficiency particulate air (HEPA) filters are intended to ensure radionuclide releases are maintained below acceptable concentration limits. Final HEPA exhaust filters are required to meet this specification. A review of the accident analyses in the SAR confirms that the maximum decontamination factor assumed for radioactive particulates was the equivalent of one stage of HEPA filtration. The high efficiency filter banks upstream of the final HEPA filters ensures exceeding the 99.95% efficiency assumed in the 324/327 SAR accident analyses and provides additional assurance of meeting discharge requirements. Credit for this additional decontamination has not been claimed from a regulatory standpoint and there are no conditions that require routine testing of these filters; however, it is recommended that they should be leak checked upon installation to ensure protection of the final filters.

The Nuclear Air Cleaning Handbook, ERDA 76-21, section 8.2 states that by definition a HEPA system must exhibit an installed decontamination factor of 2000; that is, an efficiency of 99.95 percent for aerosols having a median diameter less than 1 micrometer. ERDA 76-21 is referenced in WAC 246-247 as a required technology standard. The annual testing and efficiency requirement is consistent with facility OSR documents (324 OSR 2.1, 327 OSR 2.2). The recovery action timeframe is consistent with the more restrictive of facility OSR documents.

TABLE 2.4 REQUIRED HEPA FILTERS		
EMISSION POINT	VENTILATION ZONE	FILTER LOCATION*
EP-324-01-S	Zone I	final stage HEPA filters, Room 9
	Zone I	final stage HEPA filters, Room 10
	Zone I	POG, V/V final stage HEPA filters, Room 11
	Zone I	B-Cell, Electrostatic Precipitators (ESPs)
	Zone II	final stage HEPA filters, Room 6
	Zone II	final stage HEPA filters, Room 7
EP-327-01-S	Zone I**	Cells A through I final stage HEPA filters
	Zone I	Dry Cell final stage HEPA filters
	Zone I	Storage Cell (Lower SERF Cell) final stage HEPA filters
	Zone I	Rm15 (Low Level Lab) Hood HEPA
	Zone II**	Canyon Exhaust HEPA filters 1-15
	Zone II	Serf Cell final stage HEPA
	Zone II	Room 19 (E of SERF Cell) HEPA
	Zone II	Room 19 (W of SERF Cell) HEPA
	Zone II	Manipulator Repair, S Room 18 HEPA
	Zone II	Manipulator Repair, N Room 18 final stage HEPA
	Zone II	Room 17, PRTR Loadout HEPA
	Zone II	Basement 1-6 HEPA
	Zone II	Machine Shop Canopy HEPA
	Zone II	Vacuum Air Sample HEPA, VAS-HEPA-B001
	Zone II	Manipulator Decontamination Room 20 HEPA
	Zone II	Manipulator Decontamination Room 20 Hood HEPA
EP-327-02-V	Decontamination Cell & Waste Compactor final HEPA	

\* Reference drawings H-3-49514, H-3-70224, and H-3-70261

\*\* At 327, Zone I also termed Hot Exhaust and System C, Zone II also termed Cold Exhaust and System B.

## 2.5 INSTALLED FILTER DIFFERENTIAL PRESSURE (DP)

<u>Variable</u>	<u>Specification</u>
HEPA Filter Stage Normal Operating DP*	$\geq 0$ in. w.g. and $< 5.0$ in. w.g.
HEPA Filter Stage Maximum Operating DP*	8.0 in. w.g.
DP Instruments*	Operable and calibrated annually
324 B-Cell ESPs	Monitor ESP amperage and record daily (during B-Cell clean-out operations)

\*Applies only to final exhaust filters of operating exhaust systems prior to release to environment.

Detection/Control: See Table 2.4 for a complete listing of applicable filters. Calibration of DP instruments is conducted annually. The filters with DP instruments are verified daily. A calibrated portable device may be used as an Alternate for any DPI instrument.

Recovery Action: Any instrument deficiencies identified during the investigation or calibration shall be corrected. Malfunctioning instruments for filtration systems shall be brought to the attention of the 324/327 Facility Manager, ECO and cognizant engineer upon detection and repair/replacement shall be initiated within 96 hours or the affected filter banks must be taken out of service.

If the  $< 5.0$  in. w.g. DP specification listed above cannot be met, follow the appropriate response below:

Where parallel backup HEPA filter systems are available:

- Put the parallel system in service

Where no parallel HEPA filter system is available:

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer (see 1.2)

AND

- Initiate replacement of the HEPA filter within 96 hours.

AND

- If the HEPA filter DP increases to 8.0-in. w.g. before it can be replaced, monitor and reduce flow through the affected exhaust system (See section 2.1 for exhaust fan requirements).

Basis for Limit: The 5 in. w.g. DP limit for HEPA filters is required by FDH through HNF-PRO-450, and is therefore the basis for initiating HEPA filter replacement. The 8.0-in. w.g. maximum

HEPA filter DP is intended to ensure the HEPA filters are not breached. These values are very conservative as each HEPA filter stage is designed to withstand a DP of 10.0-in. w.g, and used HEPA filters should be able to withstand a DP of 8.0-in. w.g (Nuclear Air Cleaning Handbook, ERDA 76-21). The daily record of ESP amperage is a WDOH condition of the B-Cell Clean-out NOC permit AIR 95-903.



## 3.0 AIRBORNE EFFLUENT MONITORING SPECIFICATIONS

## 3.1 STACK RADIONUCLIDE EMISSION LIMITS

<u>Variable</u>	<u>Specification</u>
Emergency Radionuclide* Emission Limits	The emission quantity that would cause an offsite effective dose equivalent of 2 mrem/event. See Table 3.1 below.
Annual Radionuclide* Emission Limits	The combined discharge of radionuclide emissions in air from all Hanford Site facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year.
Measurement	Determine quantity and volume of radioactive materials emitted from each stack with potential radionuclide emissions.
Reporting	Report quantity/volume annually to the DOE and regulatory agencies.

TABLE 3.1 STACK RADIONUCLIDE* EMISSIONS EMERGENCY LIMITS		
Stack	EP-324-01-S	EP-327-01-S
Total Alpha	400 cps	40 cpm
Total Beta	7,000 cps	4,000 cpm

\*  $^{238}\text{Pu}$  is the most limiting alpha and  $^{90}\text{Sr}$  and  $^{137}\text{Cs}$  are the most limiting beta.

**Detection/Control:** The Emergency Limit for the 324/327 facilities is the emission quantity that would cause an offsite effective dose equivalent of 2 mrem/event. Early indication of a plant emergency is given by the appropriate monitor listed in Table 3.2 and confirmed or evaluated by laboratory analyses of record samples or grab samples. The authenticity of an emergency level is to be verified immediately upon onset of stack CAM alarms. Recovery actions are to be performed immediately once it is verified that the emissions are real. Confirmation of a problem is obtained by analysis of samples taken from the record sampler or an alternate location on an accelerated schedule.

The annual radionuclide emission limit is defined by 40 CFR 61, Subpart H, as an amount that

would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year. Compliance with the annual limit is demonstrated by laboratory analyses of record samples from all stacks with potential emissions. In the event of Hanford facility exceedance of annual emission limits, or if it appears likely that any DOE or contractor requirements are in jeopardy of being violated, particularly by the cumulative effect of multiple release points, facility operations may be restricted. If required by FDH, the Facility Manager may direct 324/327 and other facilities to limit the concentrations of radioactive materials released to the environment in airborne emissions during a specified period of time. All radionuclide releases are to be ALARA.

A warning trend is any significant radioactive emission trend increases (e.g. a rise of over 2 orders of magnitude) that are not consistent with the current plant condition. Routine analysis of record samples and daily review of stack CAM chart records for abnormal trends give indication of a warning trend or a reportable release.

Recovery Action: If a Plant Emergency Limit is exceeded:

- Suspend operations in areas ventilated by stack

AND

- Decrease stack flow by shutting down exhaust fans, as appropriate

AND

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer (see 1.2)

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours and submit documentation of the event (see 1.2)

AND

- Determine the cause and impact of the release

AND

- Prepare a written recovery plan with concurrence from the 324/327 Facility Manager, cognizant engineer and the ECO

If an annual limit is exceeded for a calendar year:

- Prepare a written response plan with concurrence from the 324/327 Facility Manager and the ECO.
- The ECO must notify WDOH within 24 hours of discovery.

If a warning trend is indicated:

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer(see 1.2)

AND

- Determine the cause and impact of the release.

**Basis for Limit:** The emergency limits ensure prompt action is taken to preclude exposure of the public and/or the work force to airborne effluent radionuclides exceeding the levels determined to be safe for continuous exposure. These limits are specified in units indicated by the stack monitors. The Emergency Limit for the 324 facility is the emission quantity that would cause an offsite effective dose equivalent of 2 mrem/event, as described in DOE/EH-0173T, as calculated in the FEMP. The 327 SAR establishes the Emergency Limit for the 327 facility as the emission quantity that would cause an offsite effective dose equivalent of 2 mrem/event, as described in DOE/EH-0173T, in a 4-hour period, as calculated in the FEMP. These limits assume  $^{238}\text{Pu}$  as the most restrictive alpha emitter present and  $^{90}\text{Sr}$  (324) and  $^{137}\text{Cs}$  (327) as the most restrictive beta emitters present.

Continuous sampling and monitoring of the higher risk effluents from radioactive control zones as required by Section 3.2 is necessary to ensure early detection of breakthrough of radioactivity, as well as to provide an auditable, continuing record of discharges. A continuous record is required by 40 CFR 61, Subpart H. Therefore, continuous operation of samplers and the monitors for stacks EP-324-01-S and EP-327-01-S is required with timely repair and, in some cases, backup monitors or samplers available in the event of malfunction of the primary equipment. Periodic operation of sampler for stack EP-327-02-V is required to confirm continued low emissions. Daily operability inspections of the primary systems are performed during equipment operation. Functional tests of the systems and instrument calibrations provide reasonable assurance that the systems are operating properly. Accumulations of the sample analytical results and flow measurement data supports annual reporting to the DOE and regulatory agencies, as required by 40 CFR 61, Subpart H and WAC 246-247-080.

## 3.2 STACK EMISSION MEASUREMENT/MONITORING EQUIPMENT OPERABILITY

<u>Variable</u>	<u>Specification</u>
Sampler Operability	Primary or acceptable alternate instruments listed in Table 3.2 for sampling particulate radionuclide emissions of stacks EP-324-01-S and EP-327-01-S shall operate continuously when the associated stack fans are in service. The EP-327-02-V stack sampling system must operate periodically to confirm low emissions.
Sample Flow Rate	Isokinetic to maintain representative sampling, as described in the FEMP.
Instrument calibration	Instruments in Table 3.2 shall be calibrated annually.
Radiation monitor test	Primary radiation monitoring systems listed in Table 3.2 shall be functionally tested on a monthly basis.
Monitor downtime	Stacks EP-324-01-S and EP-327-01-S monitoring system downtime for scheduled maintenance shall be limited to 4 h/day unless prior approval is obtained from the ECO.
Stack Flow Measurement	Annual Vent & Balance flow test, and following any long-term alterations to the exhaust system that could be expected to cause the average exhaust rate to differ by +/- 10% from the previously measured rate.

Detection/Control: Compliance with this limit is demonstrated by surveillance data sheets and preventive maintenance program records. For instruments listed in Table 3.2 and stack flow tests, exceeding the annual calibration or test frequency is a specification violation. See 1.2 and 1.3.1.

Recovery Action: If a primary instrument fails or malfunctions (stack EP-324-01-S or EP-327-01-S):

- Place an alternate system in service as quickly and efficiently as practicable after a failure is discovered

AND

- If a radiation monitor fails, place an alternate system in service within four hours or perform filter surveys at four-hour interval until replaced or corrected

AND

- Notify the 324/327 Facility Manager, ECO and effluent cognizant engineer (See Section 1.2)

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours if condition results in loss of emission measurement capabilities and persists for over 4 hours, and submit documentation of the event as required (see 1.2).

AND

- Initiate repair/replacement of the primary system within 96 hours.

If both the primary and alternate EP-324-01-S or EP-327-01-S instruments fail or malfunction:

- Discontinue operations with the potential to contribute airborne radionuclide emissions to the maximum extent compatible with safe operations within eight hours

AND

- Notify the 324/327 Facility Manager, ECO and effluent cognizant engineer (See Section 1.2)

AND

- Prepare a recovery plan with concurrence from the 324/327 Facility Manager and the ECO, which must be in effect within 72 hours.

If a stack flow measurement or Table 3.2 instrument calibration is not completed by the annual due date (i.e. by the end of the month in which it comes due), then:

- Notify the 324/327 Facility Manager, ECO and effluent cognizant engineer (See Section 1.2)

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours of discovery, and submit documentation of the event as required (see 1.2)

AND

- Complete instrument calibration or stack flow measurement as soon as possible.

**Basis for Limit:** Continuous sampling and monitoring of the higher risk effluents from radioactive control zones is necessary to ensure early detection of breakthrough of radioactivity and to provide an auditable, continuing record of discharges. A continuous record is required by 40 CFR 61, Subpart H. Therefore, continuous operation of samplers and the monitors for stacks EP-324-01-S and EP-327-01-S is required with timely repair and, in some cases, backup monitors or samplers available in the event of malfunction of the primary equipment. Periodic operation\* of stack EP-327-02-V sampler is required to confirm continued low emissions. The 4-hour monitor downtime limitation is based on DOE/EH-0173T as described in the 324/327 FEMP documents. For 327, the 4-hour monitor downtime limitation is also an OSR limit.

Daily operability inspections of the primary sampling and monitoring systems are performed during equipment operation, as required by HNF-PRO-450, HNF-PRO-2364, and by the 327

OSR 2.4. Monthly functional tests of the systems and annual instrument calibrations provide reasonable assurance that the systems are operating properly, as required by HNF-PRO-450, HNF-PRO-2364, and by the 327 OSR 2.4. Accumulation of the sample analytical results and flow measurement data permit filing of annual reports to the DOE and regulatory agencies, as required by WAC 246-247 and 40 CFR 61, Subpart H.

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\* Approval for redesignation of this stack was obtained from WDOH and EPA, which allows for periodic sampling. WDOH approved sampling for a period of 4-weeks, once annually, during a representative period of stack operation.

TABLE 3.2 STACK EFFLUENT MEASUREMENT/MONITORING INSTRUMENTATION

STACK	SYSTEM	PRIMARY	ALTERNATE
EP-324-01-S	Particulate Radionuclide Sample Flow	324D-SM-FI-001 & 324D-SM-PI-001	
	Alpha Particulate Monitor	324D-SMAB-RIS-001 AND 324-SM-UA-001 OR 324-SM-UA-003	324A-SMA-RIS-001 AND 324-SM-UA-001 OR 324-SM-UA-003 OR Surveillance of CAM chart recorder, or CAM or sample filter survey at ≤ 4-hour intervals.
	Beta/Gamma Particulate Monitor	324D-SMAB-RIS-001 AND 324-SM-UA-001 OR 324-SM-UA-003	324A-SMB-RIS-001 AND 324-SM-UA-001 OR 324-SM-UA-003 OR Surveillance of CAM chart recorder, or CAM or sample filter survey at ≤ 4-hour intervals.
EP-327-01-S	Particulate Radionuclide Sample Flow	327-SM1-FI-001 AND 327-SM1-PI-001	
	Alpha Particulate Monitor	327-SMA-RIS-001 AND 327-SM-RA-001 OR 327-SM-RA-002	
	Beta/Gamma Particulate Monitor	327-SMB-RIS-001 AND 327-SM-RA-001 OR 327-SM-RA-002	Surveillance of CAM chart recorder, or CAM or sample filter survey at ≤ 4-hour intervals.
EP-327-02-V	Particulate Radionuclide Sample Flow*	327-SM2-FI-001 & 327-SM2-PI-001	

\* Required periodically, during sampling periods only.

NOTE: Where a primary instrument is listed, all instruments that are necessary for the function of the listed instrument are included. For example, where a monitor alarm is listed, the radiation detector, vacuum pump, and sample collector must be operable.

3.3 STACK SAMPLE VACUUM PUMPS

<u>Variable</u>	<u>Specification</u>
Pump Operability	324-SM-P-001 or 002 operating Primary 327-VAS-BLW-B001 or B002 operating or local backup stack vacuum pumps operating.
Pump Switching Capability	Pressure switch 324D-SM-PS-001 operable, 327 FMCS VAS failure alarm operable.

Detection/Control: Pump operation is verified by the instruments listed below. Calibration of these instruments is conducted annually.

TABLE 3.3 INSTRUMENTS

EQUIPMENT	PRIMARY	ALTERNATE
324D-SM-P-001 or 324D-SM-P-002	SM-PS-001	SM-PAS-001
327-VAS-BLW-B001 or 327-VAS-BLW- B002	FMCS VAS Failure Alarm	VAS-PI-B001 or VAS-PI- B002

Recovery Action: If one primary vacuum pump fails:

- Ensure other primary vacuum pump is operating within 4 hours of failure

AND

- Notify 324/327 Facility manager, ECO and effluent cognizant engineer

AND

- Initiate repair within 96 hours.

If both primary vacuum pumps fail:

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer (see section 1.2)

AND

- Place an alternate vacuum pump in service within 4 hours

OR

- Discontinue operations with the potential to contribute airborne radionuclide emissions to the



maximum extent compatible with safe operations within eight hours

AND

- Provide additional notifications (i.e. to FDH, DOE, and WDOH) within 24 hours if condition persists for over 4 hours and submit documentation of the event as required (see 1.2).

AND

- Prepare a recovery plan, which also addresses airborne effluent sampling/monitoring and actions necessary to perform routine data collection/observation, approved by the 324/327 Facility Manager, ECO and effluent cognizant engineer.

**Basis for Limit:** A dedicated vacuum system is provided to service the 324 building main stack and effluent system samplers and monitors. Loss of this vacuum system would result in loss of airborne effluent samplers and monitors, requiring alternate effluent sampling methods. A central vacuum system is provided to service the 327 building room air samplers and monitors and effluent system samplers and monitors. Loss of the 327 centralized vacuum system would result in a loss of building and airborne effluent samplers and monitors, requiring operation of backup vacuum pumps.

EPA 40 CFR 61, Subpart H (NESHAP) requires continuous sampling of 324/327 main stack emissions for reporting purposes. Continuous monitoring of 324/327 main stack emissions is required by FDH through HNF-PRO-450 and by the 324/327 facility SARs (HNF-SD-SPJ-SAR-001, Rev 1, and HNF-SD-SPJ-SAR-002, Rev1).

## 4.0 LIQUID EFFLUENT SPECIFICATIONS

## 4.1 RPS/PS pH / pH MONITOR

<u>Variable</u>	<u>Specification</u>
Non-dangerous waste pH criteria	Between 2.0 and 12.5
TEDF waste acceptance pH criteria	Between 6 and 11
pH Alarm set points	N/A
pH Monitors operability	N/A
pH Monitor calibration	N/A

**Detection/Control:** Batches should be tested to determine pH if pH is suspect, according to process knowledge. Batches outside the TEDF pH criteria require 300 Area LEF approval prior to disposal.

**Basis for Limit:** The pH requirements for the RPS/PS are intended to prevent discharge of a dangerous waste and to support compliance with TEDF waste acceptance criteria. The 324/327 Facilities comply with WMH-320, *300 Area Liquid Effluent Facilities Administration*, section 3.4, *Liquid Waste Certification Program* requirement to “Ensure discharges continue to meet the Waste Acceptance Criteria” by various administrative and engineering controls. These controls include training, procedures, inventory, drain-design and posting. Conductivity and pH monitors have been determined to be unnecessary for 324/327 because sufficient administrative and engineering controls prevent out-of-spec releases. Hazardous material inventories are minimized. In addition, most PS and RPS floor drains and access points have been isolated, labeled or elevated prevent inadvertent chemical releases from spills. In addition to all this, the facilities have effective waste training and waste management programs to disposition all dangerous wastes without using PS/RPS drains.

#### 4.2 RPS/PS RADIONUCLIDE CONCENTRATIONS/ RPS RADIATION MONITORS/DIVERTERS

<u>Variable</u>	<u>Specification</u>
Annual-Average Radionuclide Concentration	See Table below.
Batch Radionuclide Concentration	Determine concentration of radioactive contamination for each potentially contaminated effluent batch that is discharged to 300 Area TEDF.
RPS Radiation Monitor/Diverter Operability	Required when there is RPS flow to the 307 basins (see Recovery Action).
Monitor Calibration	Annually.

#### ANNUAL RPS/PS CONCENTRATION LIMITS

Isotope	LIMIT (pCi/L)
Total Beta	50
Total Alpha	15

Detection/Control: Radiation alarms indicate detection of upset, and automatic diversion to the RLWS\* is the control. RPS diversions are indicated at the main facility alarm panels. Monthly functional tests ensure proper operation of the 324 Room 18 REC RPS radiation monitor. 300 Area LEF is responsible for surveillance, functional tests and calibration of the other monitors/diverters.

Compliance with the concentration limits is demonstrated by laboratory analyses of samples from batch transfers to the RPS with suspected potential radioactive contamination. If a batch exceeds the concentration limit, approval must be obtained from 300 Area LEF prior to disposal.

#### INSTRUMENTS

EQUIPMENT	PRIMARY
324 RPS MONITOR – Service Tunnel	Diversion Station Alarm, Service Tunnel
324 REC RPS MONITOR - Room 18	Diversion System Room 18 Divert Alarm
327 RPS MONITOR - Basement	Diversion Station Alarm

At the time of revision 1 of this document, the RPS diversion capability is dead-headed, i.e. it is isolated from the 340 Facility RLWS and internal facility RLWS. The diverters continue to

perform the function of preventing out-of-spec effluent from discharging to the 307 basins. Plans are in progress to reconnect the RPS diversion capabilities to alternate storage within the facilities.

Recovery Action:

If a radiation monitor/diverter alarm is activated:

- Isolate all RPS sources immediately to prevent potential flooding

AND

- Obtain a sample of the effluent, if possible,

AND

- Notify 324/327 Facility Manager, ECO, effluent cognizant engineer and 300 Area LEF (see 1.2)

AND

- Conduct an investigation to determine cause.

If Room 18 RPS radiation monitor fails:

- Cease activities that could result in out-of-specification effluent

OR

- Maintain proportional sampler and analyze for beta-gamma and alpha every week

AND

- Notify 300 Area Liquid Effluent Facility (LEF) of the malfunction

AND

- Initiate repair or replacement of monitor within 96 hours.

If the 324 service tunnel or 327 basement RPS radiation monitor fails:

- Cease activities that could result in out-of-specification effluent, as required, coordinating responses with 300 Area LEF.

If an annual limit is exceeded for a calendar year:

- Prepare a recovery plan with concurrence from the 324/327 Facility Manager, ECO, effluent cognizant engineer, and 300 Area LEF.

**Basis for Limit:** The 324 Facility is responsible for maintenance of the monitor located in room 18. The Room 18 monitor requirements will no longer apply once this stream is rerouted to the service tunnel monitor (bypassing the Room 18 monitor). The 300 Area LEF is responsible for maintenance of the RPS monitors located in the 324-service tunnel and the 327 basement.

The *300 Area Liquid Effluent Facilities Administration, Liquid Waste Certification Program* (WMH-320, section 3.4), states that waste-generating facilities “Ensure discharges continue to meet the Waste Acceptance Criteria”. The discharge limits for radionuclide concentrations in liquid effluent streams are specified in the *Waste Acceptance Criteria for the 300 Area Process Sewer and & TEDF*, section 3.3 of WMH-320. These limits are driven by the EPA NPDES Permit WA-002591-7, which regulates the 300 Area TEDF discharges. The RPS stream is intended to service potentially contaminated liquid effluents. The PS stream is intended to service non-potentially contaminated liquid effluents. In all cases ALARA will be practiced.

## 4.3 RPS/PS FLOW MEASUREMENT

<u>Variable</u>	<u>Specification</u>
Batch Volume Measurement	Determine quantity of each potentially contaminated effluent batch that is discharged to 300 Area TEDF.
Flow measurement	Continuous during flow to the 300 Area TEDF.
Maximum flow rates	See table below.
Flow measurement device calibration	Frequency as required through PM system, for equipment identified below.

Detection/Control:

RPS/PS FLOW MEASUREMENT

PRIMARY	ALTERNATE	MAXIMUM FLOW (gpm)
324 PS Flow meter	Periodic visual inspections	60
324 RPS Flow meter	Periodic visual inspections	11
327 RPS Flow meter	Periodic visual inspections	50

Recovery Action: If the flow recorder fails:

- Initiate repair or replacement of monitor

AND

- Estimate the flow based on plant conditions as required by 300 Area LEF.

Basis for Limit: In letter "Design Flowrates for Replacement 300 Area Process Sewer System", Project L-070, T.B. Veneziano to T.D. Chikalla, dated September 23, 1994, agreement was made to maintain 324/327 effluents within the maximum flow rates specified in the Facility Liquid Waste Certification Plan. The approved 324 facility *300 Area Liquid Effluent Facilities Administration, Liquid Waste Certification Program*, section 3.4 of WMH-320, states that waste generating facilities "Ensures all personnel who control discharge materials to either the PS or RPS systems are aware of the system limitations". The equipment operability requirements provide assurance that the flow measurement systems are in constant service during operation or alternate measures are taken to obtain the required information. The calibration requirements help to ensure the systems are functioning properly.

## 4.4 RPS/PS CHEMICAL CONCENTRATIONS

<u>Variable</u>	<u>Specification</u>
RPS/PS chemical concentrations	Below and dangerous waste limits. TEDF Waste Acceptance Criteria are provided in WMH-320, and dangerous waste limits are provided in WAC 173-303.
Special sample analyses	Required when there is any reason to believe that a hazardous substance is entering an effluent stream at levels which approach the specification limits.
Conductivity monitor operability	N/A
Conductivity monitor calibration	N/A

Detection/Control: Analysis of special samples.

Basis for Limit: The TEDF Waste Acceptance Criteria are provided in section 3.3 of WMH-320. The limits for dangerous wastes and other substances are provided in WAC 173-303. The 324/327 Facilities comply with WMH-320, *300 Area Liquid Effluent Facilities Administration*, section 3.4, *Liquid Waste Certification Program* requirement to “Ensure discharges continue to meet the Waste Acceptance Criteria” by various administrative and engineering controls. These controls include training, procedures, inventory, drain-design and posting. Conductivity and pH monitors have been determined to be unnecessary for 324/327 because sufficient administrative and engineering controls prevent out-of-spec releases. Hazardous material inventories are minimized. In addition, most PS and RPS floor drains and access points have been isolated, labeled or elevated prevent inadvertent chemical releases from spills. In addition to all this, the facilities have effective waste training and waste management programs to disposition all dangerous wastes without using PS/RPS drains.

## 4.5 327 RPS SUMP

<u>Variable</u>	<u>Specification</u>
RPS pump operability	Operable
Sump level indication/control operability	Calibrate annually.

Detection/Control: Routine observation/recording of level indication; pump functional checks.

Recovery Action: If one pump fails:

- Initiate repair of pump within 96 h

If second pump fails:

- Report condition to 327 Facility Manager, ECO and effluent cognizant engineer

AND

- Shut off sources to the sump

AND

- Initiate repair of pump within 96 hours.

If the level indicator fails:

- Initiate repair or replacement within 96 hours.

AND

Notify the 327 Facility Manager, ECO and effluent cognizant engineer

Basis for Limit: A small volume stream continues to be discharged to the 327 RPS sump. The sump is automatically pumped out to the 307 retention basins based on level controls. The sump level control calibration program helps ensure that the level control system will function properly and/or that alarms will sound to ensure that a pump will be turned on manually if the level exceeds the control value. The actions to shut off sources and initiate repair within 96-hours if pump fails is a recommendation to minimize overflow.



## 4.6 RPS/PS COMPOSITE SAMPLERS

<u>Variable</u>	<u>Specification</u>
Sampler operability	Not currently required by the 300 Area Treated Effluent Disposal Facility (TEDF). May remain out-of-service unless required by TEDF.
<u>Detection/Control:</u>	N/A
<u>Recovery Action:</u>	N/A

Basis for Limit: Sampling stations are located on the PS and RPS streams. The sampling stations include proportional samplers and sample flow-measurement totalizing instrument. Past samples were taken in preparation of the Liquid Waste Certification Plan, but are not currently required.

## 4.7 DISCHARGES TO THE GROUND

<u>Variable</u>	<u>Specification</u>
Discharge to the soil	Discharge to the ground must be in accordance with Department of Ecology permits.

Detection/Control: Routine surveillance.

Recovery Action: If an unplanned discharge is discovered:

- Notify 324/327 Facility Manager, ECO and effluent cognizant engineer (see 1.2)

AND

- Determine cause.

Basis for Limit: Tri-party agreements have restricted the use of cribs for disposal of waste, and Washington State Department of Ecology permits ST 4508 and ST 4509 regulate other discharges to the ground. Requirements are provided in HNF-PRO-455. If discharge could potentially result in radioactive air emissions, notification is required to FDH, DOE and WDOH in accordance with HNF-PRO-453, *ENVIRONMENTAL NOTIFICATION AND REPORTING*.

#### 4.8 DISCHARGES TO THE RLWS SYSTEM / RLWS SUMP

<u>Variable</u>	<u>Specification</u>
Discharge/Transfer to RLWS	Discharges/transfers are no longer allowed to the 340 facility. Lines connecting 324/327 RLWS to the 340 facility have been isolated.

Detection/Control: Discharge to the to the 327 RLWS pipe system is indicated by activation of the low-point alarm, which is triggered by a liquid detector is located in the 327 RLWS main line. Discharge to the 327 RLWS sump is indicated by the RLWS high alarm, which is triggered by a float located in the sump. Both alarm at the 327 main alarm panel.

Discharge into the 324 RLWS pipe system is detected and indicated by the High Liquid Level Room #4 RLWS Sump alarm and the Room 3F RLWS sump alarm which are on the main alarm panel (room 3F and tank-177 are currently isolated from the facility RLWS system).

Recovery Action:

If an RLWS Low Point Alarm activates,

- Notify 324/327 Facility Manager, ECO, effluent cognizant engineer and 300 Area LEF (see 1.2)
- AND
- Determine cause
- AND
- Perform and document an inspection of the visible accessible portions of the RLWS piping system and ancillary equipment within 24 hours of discovery of the discharge for potential leaks or releases. The visual inspection at 324 will consist of the RLWS piping from tank Tk-177 through the service tunnel, as appropriate. The visual inspection at 327 will consist of the visible accessible shielded RLWS piping, some at a distance due to high radiation concerns.

Basis for Limit: The 340 facility no longer provides RLWS service to the 327 & 327 facilities. On October 1, 1998, the RLWS lines between the 324/327 facilities and the 340 facility were isolated at the valve boxes to prevent any discharge to the 340 facility. In 1999, these routes to the 340 facility were permanently blanked. The facility diverters will remain active in order to prevent diverted water from discharging to the 307 basins, but will divert to the RLWS piping system within the facility. The 324/327 facilities currently have no contingency for diversions that could lead to flooding in the buildings other than isolating sources. The regulatory requirements for containment and detection of releases for the RLWS is from WAC 173-303-200(b), which calls for compliance with WAC 173-303-640(2) through (10) for any liquids containing dangerous waste.

## APPENDIX – SPECIFICATION TRACEABILITY MATRIX

SPECIFICATION TRACEABILITY MATRIX			
SPECIFICATION	REQUIREMENT SOURCE DOCUMENT	OPERATING / MAINTENANCE PROCEDURE	RECORD
1.2 REPORTING REQUIREMENTS	HNF-PRO-450	-----	Notifications, Occurrence Reports
1.5 RECORD RETENTION REQUIREMENTS	HNF-AOP-97-1 (draft) HNF-PRO-450 (BWHC scanning waiver)	-----	-----
2.1 EXHAUST FANS	HNF-AOP-97-1 (draft)	3I-SOP-PWR-002 3M-SOP-PWR-005 3I-PWR-ALM-001 3M-PWR-ALM-001	Surveillance Checklist
2.2 ZONES I & II DIFFERENTIAL PRESSURES	WAC 246-247-075(8)	3I-SOP-PWR-002 3M-SOP-PWR-005 3I-PWR-ALM-001 3M-PWR-ALM-001	*N/A
2.3 NEW HEPA FILTERS	WAC 246-247 (ANSI/ASME N510)	*N/A	*N/A
2.4 INSTALLED FILTER EFFICIENCY	WAC 246-247 (ERDA 76-21) HNF-PRO-450 HNF-SD-SPJ-OSR-001, Rev1 HNF-SD-SPJ-OSR-002, Rev2	3I05008 (DOS Test)	Data Sheets
2.5 INSTALLED FILTER DIFFERENTIAL PRESSURE (DP)	HNF-PRO-450 NOC AIR 95-903 (B-Cell) WDOH (Annual cal precedent)	3-IC-003 (DPI) 3-IC-008 (DPI) 3MVB001 (DP Test) 3I-SOP-PWR-002 3M-SOP-PWR-005	Calibration or Test Data Sheets, Surveillance Checklist
3.1 STACK RADIONUCLIDE EMISSION LIMITS	40 CFR 61.92-94 (limit, measurement, reporting) DOE/EH-0173T WAC 246-247-080 (reporting) HNF-SD-SPJ-OSR-002, Rev2	3IM-SOP-ENV-001 3IM-SOP-ENV-004 3I-PWR-ALM-001 3M-PWR-ALM-001	ERS Database, Annual Emission Reports

3.2 STACK EMISSION MEASUREMENT / MONITORING EQUIPMENT OPERABILITY	40 CFR 61.93 (ANSI N13.1) WAC 246-247-075 DOE/EH-0173T WDOH (Annual cal precedent) NOC AIR 95-903 (B-Cell) HNF-AOP-97-1 (draft) HNF-PRO-450 HNF-PRO-2364 HNF-SD-SPJ-OSR-002, Rev2 HNF-SD-SPJ-SAR-001, Rev1 HNF-SD-SPJ-SAR-002, Rev1	3IM-SOP-ENV-001 3IM-SOP-ENV-004 3IM-SOP-ENV-005 3I-SOP-ENV-006 3I-PWR-ALM-001 3M-PWR-ALM-001 3-IC-003 (PI) 3-IC-029 (324D alpha/beta monitor) 3I05005 (V&B Stack Flow) 3MVB018 (V&B Stack Flow)	Calibration Data Sheets, Daily Surveillance Checklists, Monthly Source-Check Data, Annual Stack Flow Data, COCs
3.3 STACK SAMPLE VACUUM PUMPS	40 CFR 61.93 (ANSI N13.1) WAC 246-247 DOE/EH-0173T HNF-PRO-450 HNF-PRO-2364 HNF-SD-SPJ-OSR-002, Rev2	3-IC-008 (PI/PAS) 3-IC-025 (PS) 3I23015 (Vacuum Blowers) 3I-SOP-PWR-002 3M-SOP-PWR-006 3I-PWR-ALM-001	*N/A
4.1 RPS/PS pH / pH MONITOR	WMH-320	*N/A	*N/A
4.2 RPS/PS RADIONUCLIDE CONCENTRATIONS / RPS RADIATION MONITORS/DIVERTERS	WMH-320	3I18010 (Rm 18) 3I-PWR-ALM-001 3M-PWR-ALM-001	*N/A
4.3 RPS/PS FLOW MEASUREMENT	WMH-320	Cal 50 Cal 51 3I-SOP-PWR-002	*N/A
4.4 RPS/PS CHEMICAL CONCENTRATIONS	WAC 173-303 WMH-320	*N/A	*N/A
4.5 327 RPS SUMP	BMP	3M18001 3M-PWR-ALM-001	*N/A
4.6 RPS/PS COMPOSITE SAMPLERS	N/A	-----	*N/A
4.7 DISCHARGES TO THE GROUND	Ecology permits ST 4508 and ST 4509 HNF-PRO-455	-----	-----
4.8 DISCHARGES TO THE RLWS SYSTEM/ RLWS SUMP	WAC 173-303-200(b) WAC 173-303-640(2)-(10) Silver List	3I-PWR-ALM-001 3M-PWR-ALM-001	-----

\* Since no direct control or monitoring regulatory data is obtained from this equipment, preventive maintenance or calibration records are not retained for regulatory purposes.