



LB# 4209

AIR 14-911
NOC 933

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

OFFICE OF RADIATION PROTECTION
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September 26, 2014

Mr. Kevin W. Smith, Manager
United States Department of Energy
Office of River Protection
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

Dear Mr. Smith:

Per your request and pursuant to Chapter 246-247 of the Washington Administrative Code (WAC), the reinstatement of Emission Unit 296-A-21A (EU 1294) is hereby approved according to the enclosed emission specific license for:

**Operation of 242-A Evaporator Building K-1 Exhauster, 296-A-21A, (Replaced NOC 794)
(NOC 933; EU 1294)**

The conditions, controls, monitoring requirements, and limitations of this license must be observed in order for you to be in compliance with WAC 246-247. Failure to meet any provision of this license may result in the revocation of approval, the issuance of Notices of Violation, or other enforcement actions under WAC 246-247-100.

This license will be included in the next revision of the United States Department of Energy's Hanford Site Radioactive Air Emissions License (FF-01).

If you have any questions regarding this approval, please contact Ernest McCormick at (509) 946-0624.

Sincerely,

John Martell, Manager
Radioactive Air Emissions Section

Enclosure: Applicable Portion of License

cc: (see next page)



cc: Ruth Allen, WRPS
Matthew Barnett, PNNL
Lee Bostic, BNI
Dennis Bowser, USDOE-ORP
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Ernest McCormick, WDOH
Valarie Peery, Ecology
John Schmidt, WDOH
Maria Skorska, Ecology
Jeff Voogd, WRPS
Davis Zhen, EPA
Environmental Portal
RAES Tracking: NOC 933; EU 1294

Emission Unit ID: 1294

200E P-242A-003

296-A-21A

This is a MINOR, ACTIVELY ventilated emission unit.

242-A Evaporator

Emission Unit Information

Stack Height: 50.00 ft. 15.24 m. Stack Diameter 3.00 ft. 0.91 m.

Average Stack Effluent Temperature: 80 degrees Fahrenheit. 27 degrees Celsius.

Average Stack Exhaust Velocity: 47.10 ft/second. 14.36 m/second.

Abatement Technology BARCT WAC 246-247-040(3), 040(4)

state only enforceable: WAC 246-247-010(4), 040(5), 060(5)

Zone or Area	Abatement Technology	Required # of Units	Additional Description
K-1 Exhaust System	Prefilter	3	3 parallel flow paths, 1 bank (3 x 3 array) per flow path, 2 in operation, 1 in standby
K-1 Exhaust System	HEPA Filter	3	3 parallel flow paths, 2 bank (3 x 3 array per bank) per flow path, 2 in operation, 1 in standby
K-1 Exhaust System	Fan	2	1 in operation, 1 in standby

Monitoring Requirements

state enforceable: WAC 246-247-040(5), 060(5), and federally enforceable: 40 CFR 61 subpart H

Federal and State Regulatory	Monitoring and Testing Requirements	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	40 CFR 61, Appendix B Method 114(3)	TOTAL ALPHA TOTAL BETA	1 week sample/4 times per year

Sampling Requirements Record Sample

Additional Requirements

The exhaust air from the stack is monitored by a record sampler through shrouded probe extraction nozzle on sample probe located in the stack. The filter paper is analyzed and the results of the analysis document emissions.

Additional monitoring or sampling requirements established by this License will be listed in the Conditions and Limitations section, if applicable.

Operational Status The 242-A Evaporator Building K-1 ventilation system is designed for air flow from areas of lesser contamination to areas of greater contamination. The contaminated K-1 zones are maintained at a negative pressure to control the spread of contamination. The K-1 ventilation system exhaust rooms in the Hot Zones: evaporator; pump; condenser; load out and hot equipment storage; and loading rooms; and the ion exchange enclosure.

This Emission Unit has 1 active Notice(s) of Construction.

Project Title	Approval #	Date Approved	NOC_ID
Operation of 242-A Evaporator Building K-1 Exhauster, 296-A-21A, (Replaced NOC 794)	AIR 14-911	9/26/2014	933

Conditions (state only enforceable: WAC 246-247-040(5), 060(5) if not specified)

- 1) The total abated emission limit for this Notice of Construction is limited to 1.30E-06 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 6.40E-02 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 2) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

The 242-A Evaporator Building Ventilation Systems are designed for air flow from uncontaminated to progressively more contaminated zones. The contaminated (hot) zones are maintained at a negative pressure, while the non-contaminated (cold) zones are maintained at a positive pressure. This is considered a secondary

confinement for liquids and airborne particulates released to the building. Maintaining the proper pressure in each zone will ensure that any leakage between the zones will always flow from a cold to a hot zone minimizing the spread of contamination.

The K-1 Ventilation system exhausts the following rooms in the Hot Zone:

- Evaporator Room
- Pump Room
- Condenser Room
- Ion Exchange Enclosure
- Load-Out and Hot Equipment Storage Room
- Loading Room

Air is exhausted from the condenser, ion exchange, evaporator, and pump rooms through separate underground ducts into a common header to the three exhaust filter trains.

Exhaust air from this common header passes through the two exhaust trains having a pre-filter section and two stages of HEPA filters in series, with a third filter train being redundant as backup, before it is exhausted through stack 296-A-21A.

Air flow moves from areas of lesser contamination to areas of greater contamination, while maintaining a negative air pressure. This system has two fans, each with a 100 percent system flow capability, with one in operation and the other fan as back-up. Failure to maintain a specified flow will cause the shutdown of the primary fan and initiate the startup of the backup exhaust fan. The ventilation system will have an approximate flow rate of 18,000 cfm (max 19,500 cfm). Each filter train will have a 50 percent system flow rate, or approximately 9,000 cfm.

Negative pressure in the hot zones is maintained by the operation of the vortex damper mounted on the suction of electric exhaust fan. The backup fan has a similar vortex damper. Both dampers are adjusted automatically to maintain a preset negative pressure in the Evaporator room when their respective fan is operating.

The exhaust air from the stack will be monitored by a record sampler and a beta continuous air monitor (CAM). The stack radiation detector monitors the exhaust air discharged out of Stack 296-A-21A and initiates an automatic shutdown of both exhaust fans if beta radioactive emissions exceed the set point. A sample of the exhaust air is withdrawn from the stack through a shrouded probe and is sent to a record sampler where radioactive particulates are collected on a filter paper. The filter paper is analyzed and the results of the analysis document emissions from the 291-A-21A Stack.

Any other replacement, replacement-in-kind, or upgrades of parts and/or equipment not here specified, shall require review, and/or review and approval (WAC 246-247-030(16), WAC 246-247-030(19)).

3) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac - 227	Alpha - 0 based on Am-241	4.20E-03	Am - 241
Am - 243	Ba - 137 m		Beta - 0 based on Sr-90
C - 14	Cd - 113 m		Cm - 242
Cm - 243	Cm - 244		Co - 60
Cs - 134	Cs - 137		Eu - 152
Eu - 154	Eu - 155		H - 3
I - 129	Nb - 93 m		Ni - 59
Ni - 63	Np - 237		Pa - 231

Pu - 238	Pu - 239	Pu - 240
Pu - 241	Pu - 242	Ra - 226
Ra - 228	Ru - 106	Sb - 125
Se - 79	Sm - 151	Sn - 126
Sr - 90	Tc - 99	Th - 229
Th - 232	U - 232	U - 233
U - 234	U - 235	U - 236
U - 238	Y - 90	Zr - 93

- 4) The Technical Basis Document required by ANSI N13. 1-1999 (Clause 4) is required for review prior to startup operations of the stack.
- 5) Ensure the HEPA manufactures temperature, humidity, and air flow ratings are not exceeded (i.e, to ensure HEPA filter media is not ruptured nor performance compromised).
- 6) To verify the alternate potential-to-emit calculation method, annually provide the back-calculation using the measured emission rates and in situ measurements of the control equipment efficiencies (WAC 246-247-030(21)). A re-evaluation of the need for this requirement may be requested after 5 years of operation.
- 7) Periodic confirmatory monitoring (PCM) shall be required to verify low emissions monitoring during construction, deactivation, and operation activities. The PCM, as described in ALARACT 5, will be used to verify low emissions during manual soil excavation.

If a regulated Filtered Vacuum Truck (FVT) is used, the PCM will be performed as required by either NOC_ID 774 "Operation of the Guzzler™ in Tank Farm Facilities" or NOC_ID 658 "Use of the Guzzler™ (Filter Vacuum Truck) Vacuum Excavation System for Radiologically Limited Activities on the Hanford Site," or one of the latest WDOH approval of these two licenses. A FVT log will be used to track these emissions.

Monitoring during equipment installation and deactivation activities will be in accordance with the following ALARACT Demonstrations and the WRPS Radiological Control Manual:

- ALARACT 4 - Tank Farm ALARACT Demonstration for Packaging and Transportation of Waste
- ALARACT 15 - Tank Farm ALARACT Demonstration for Size Reduction of Waste Equipment for Disposal Contaminated Ventilation Systems Components
- ALARACT 16 - Tank Farm ALARACT Demonstration for Work on Potentially Contaminated Ventilation System Components
- HNF-5183 - Tank Farms Radiological Control Manual.

- 8) A report of closure for 296-A-21 is required when this emission unit is permanently deactivated and isolated, so the department can perform a closure inspection prior to the system's disposal.
- 9) The facility shall notify the department of any unplanned shutdown of exhaust fans (e.g., triggered by a high exhaust stack beta radiation level).