



Response to Comments

241-AP NOC Approval Order - DE19NWP-003

Sept. 26 – Oct. 28, 2022

For the **Nuclear Waste Program**

Washington State Department of Ecology

Richland, Washington

November 2022, Publication 22-05-026



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Author

Matt Williams, Environmental Engineer

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Contact Information

Daina McFadden
Permit Communication Specialist
Nuclear Waste Program
3100 Port of Benton Blvd
Richland, WA 99354
Phone: 509-372-7950
Email: Hanford@ecy.wa.gov

Website²: [Washington State Department of Ecology](#)

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¹ <https://apps.ecology.wa.gov/publications/summarypages/2205026.html>

² www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties Served	Mailing Address	Phone
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Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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DEPARTMENT OF
ECOLOGY
State of Washington

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Introduction

The Washington State Department of Ecology’s Nuclear Waste Program (Ecology) regulates air pollution sources at the Hanford Site. Ecology is the permitting authority for new or modified sources requiring new source review under Washington Administrative Code (WAC) 173-400-110 at Hanford.

When a new order or a modification to an existing order is proposed, Ecology may hold a public comment period to allow the public to review the proposed order and provide formal feedback. (See WAC 173-400-171 for Public Notice and Opportunity for Public Comment requirements for approval of a notice of construction application.)

The Response to Comments is the last step before issuing the final permit, and its purpose is to:

- Specify which provisions, if any, of a permit will become effective upon issuance of the final permit, providing reasons for those changes.
- Describe and document public involvement actions.
- List and respond to all significant comments received during the public comment period and any related public hearings.

This Response to Comments is prepared for:

Comment period	241-AP Notice of Construction (NOC) Approval Order - DE19NWP-003, Sept. 26 – Oct. 28, 2022
Approval Order Number	DE19NWP-003
Permittees	United States Department of Energy – Office of River Protection (Energy)
Original Issuance date	Nov. 30, 2022
Effective date	Nov. 30, 2022, with certain testing requirements deferred for up to 180 days

To see more information related to the Hanford Site and nuclear waste in Washington, please visit our webpage, [Hanford Cleanup](https://www.ecology.wa.gov/Hanford)³.

³ <https://www.ecology.wa.gov/Hanford>

Reasons for Issuing the Permit

Approval Order DE19NWP-003 will authorize necessary exhauster operations at the 241-AP Double-Shell Tank (DST) Farm for storage, processing, and transfer of mixed waste related to historical research and production operations at the Hanford Site. Previously, operations at 241-AP were authorized under Approval Order DE11NWP-001, Revision 4, with the 241-SY and 241-AY/AZ exhausters. The 241-SY and 241-AY/AZ exhausters will continue to be authorized under DE11NWP-004, Revision 4.

Previously, Energy was only allowed to simultaneously disturb waste in two of the eight 241-AP DSTs. Waste disturbance includes mixing, blending, transferring between tanks, and other activities which have the potential to increase the short-term emission rate of air pollutants by disrupting the waste surface or releasing gases trapped in the waste itself. Under DE19NWP-003, all eight tanks may be simultaneously disturbed. Increased emissions testing will be used to demonstrate that relaxing this limit will not lead to exceedance of an ambient air standard.

The permittee, Energy, will use 241-AP to process and stage waste for treatment at the Waste Treatment and Immobilization Plant (WTP). WTP is not yet operational, but the Low-Activity Waste (LAW) portion of WTP is approaching initial startup and commissioning steps. Once LAW is operational, it will be necessary to sample incoming waste, remove cesium through the Tank Side Cesium Removal (TSCR) system, and potentially dilute, blend, or otherwise process the waste to ensure it meets WTP acceptance criteria. Energy expects that there will be periods where these activities will need to involve more than two tanks at a time. A single transfer of waste inside 241-AP involves at least two tanks, which would have prevented any other waste disturbing activities under the previous limit.

Public Involvement Actions

Ecology encouraged public comment on the draft approval order and technical support document during a 30-day, public comment period held Sept. 26 to Oct. 28, 2022.

The following actions were taken to notify the public:

- Emailed a notice announcing the start of the comment period to the Hanford-Info email list, which has 1,425 recipients.
- Posted the comment period notice on the Washington Department of Ecology – Hanford’s Facebook and Twitter pages.
- Posted the comment period notice on the Washington Department of Ecology, Nuclear Waste Program’s website.

The following public notices for this comment period are in [Appendix A](#) of this document:

- Notice sent to the Hanford-Info email list.
- Notices posted on the Washington Department of Ecology – Hanford’s Facebook and Twitter pages.

- Notice posted on the Washington Department of Ecology, Nuclear Waste Program’s website.

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the 241-AP Approval Order and Technical Support Document. The comments and responses are in [Attachment 1](#).

Commenter	Organization
Green, Bill	Citizen
Anonymous	Anonymous
Anonymous	Anonymous
Peterson, Nikolas	Hanford Challenge
Washington River Protection Services	Contractor for Permittee

Attachment 1: Comments and Responses

Description of comments:

Ecology accepted comments from Sept. 26 through Oct. 28, 2022. This section provides a summary of comments that we received during the public comment period and our responses, as required by Revised Code of Washington (RCW) 34.05.325(6)(a)(iii). Comments are grouped by individual, and each comment is addressed separately.

I-1: BILL GREEN

Comment I-1-1

Comment 1: A new public review will be required before conditions in this NOC Order (DE19NWP-003) can be added to Hanford's Air Operating Permit (AOP), because the current public review conducted under WAC 173-400 does not meet the minimum requirements for public review pursuant to WAC 173-401, Ecology's Operating Permit Regulation.

Once approved, Order DE19NWP-003, becomes an "applicable requirement" under 40 CFR 70 and Ecology's Operating Permit regulation, WAC 173-401. As an "applicable requirement" this order will be incorporated into Hanford's Air Operating Permit (AOP).

It appears the permittee has elected to exercised its ability under WAC 173-400-111 (2) to separate public review required by WAC 173-400 from public review required by Ecology's Operating Permit regulation, WAC 173-401. The permittee's choice effectively requires Ecology to expended additional resources and time necessary to administer a second public review. Because WAC 173-401 is supposed to be self-funded through fees imposed on a source (40 CFR 70.4), hopefully, Ecology will recover the additional costs from the permittee for conducting a second public review.

While certain of the lost resources may be recoverable, it is not possible for Ecology to recover its lost time, time that would allow Ecology the ability to better comply with certain time requirements in its own regulation [for example, WAC 173-401-730] and the statutory requirements for administration of an operating permit program under title V of the federal Clean Air Act [CAA § 502 (b)(4); 42 USC 7661a(b)(4)].

This choice by the permittee to suffer 2 public reviews, which can be separated by several years and sometimes inconsistent with a timeline specified in WAC 173-401-730 (1)(a), imposes risks to the proposed action. An example of one such risk occurs in fulfilling the "gap-fill" monitoring requirement of 40 CFR 70.6 (a)(3)(i)(B), a requirement that appears unique to the Operating Permit program and title V of the federal *Clean Air Act*.

The specific deficiencies between this public review and a public review conducted pursuant to WAC 173-401 include:

- failure to publish a public notice in the Permit Register [WAC 173-401-805 (2)];
- failure to provide a thirty-day comment period as specified in WAC 173-401-800 (3); and
- failure to provide notification via Ecology's mailing list. [WAC 173-401-800 (2)(c)]

That portion of Washington's SIP codified at WAC 173-400-111 (2)¹ requires that a notice of construction application designated for incorporation into the source's AOP must be processed in accordance with the operating permit program procedures and deadlines. Such procedures and deadlines are codified at WAC 173-401. It is apparent from the bulleted items above that the application was not processed in accordance with the procedures required to revise an AOP. Therefore, a new public review will be required before conditions in this regulatory order can be added to Hanford's AOP.

¹ 79 Fed. Reg. 59,653, 59,655 (Oct. 3, 2014)

Response to I-1-1

Thank you for your comments. Ecology agrees that public notice under WAC 173-401-800 will be necessary before the requirements of Approval Order DE19NWP-003 are integrated into the Hanford Air Operating Permit (AOP), Washington AOP Number 00-05-006. WAC 173-400-111(2) states that a permittee "may elect to integrate" reviews under Chapters 173-400 and 173-401 WAC.

It is not Ecology's standard practice to conduct, or encourage permittees to seek, integrated reviews. Rather than streamlining the process, Ecology's experience is that simultaneously meeting all requirements of Chapters 173-400 and 173-401 WAC will typically complicate the process and delay issuance of the Approval Order required by WAC 173-400-110(2)(a).

Additionally, application fees related to Chapter 173-400 WAC are set in WAC 173-455-120 and must be paid before issuance of the associated Approval Order. The AOP program is funded through fees which are set under WAC 173-401-900. AOP fees are based, in part, upon actual emissions for the previous calendar year.

To conduct an integrated review, Ecology needs to separate work done to satisfy Chapter 173-400 WAC from work done to satisfy Chapter 173-401 WAC to ensure that the proper fees are collected at the proper time. This accounting is much more straightforward and transparent with independent processes.

Comment I-1-2

Comment 2. General: Provide the public with the total risk to our health anticipated from this proposed action.

The proposed action does not assess anticipated risks from radioactive emissions, even though there is no possible way to separate non-radioactive air emissions from radioactive air emissions expected from this action. By failing to account for all emissions with the potential to negatively impact human health, Ecology is effectively depriving the public of the opportunity to be informed of the total risk resulting from the proposed action. After all, the potential risk to the public is from the total of all regulated air pollutants attributable to the proposed action. Because non-radionuclide air emissions may be below levels of concern, and separately, radionuclide air emissions may be below levels of concern does not guarantee the total emissions from the combination of radionuclide and non-radionuclide air emissions, or any synergistic reactions between/among the constituents in these emissions will be below levels of concern. Through the public comment process, the public must have the ability to impact the air we breathe resulting from ALL regulated air pollutants from the proposed action before this action commences. Any meaningful impacts from public participation need to occur before the proposed action becomes operational.

There is no question the proposed action will release radionuclides.

“The waste contained in the tanks is commonly referred to as being of three types: highly radioactive sludge and lower level radioactive supernate and saltcake. The high-

level waste (HL W) sludges contain concentrations of both radionuclides and chemicals (bismuth, cadmium, chromium, iron, nickel, etc.) at very high levels.” TVAR at 11 of 153:

. . . and

“The baseline cost was then adjusted to consider the challenges of installation and operation of technology in the radiological tank farm environment.” NOCTSD at 10 of 27

. . . and

“Gases are generated by the reaction of radioactive and hazardous chemicals in the tanks.” NOC-5297 at 12

Washington Administrative Code 173-480-070(1) designates the Washington Department of Health (Health) as the agency responsible for administration of radionuclide air emissions including those attributed to Hanford. (See also RCW 70A.388 and WAC 246-247.) Emissions of radionuclides from Hanford are also regulated federally by 40 CFR 61 subpart H.

Terms and conditions to control radionuclide emissions must eventually appear in Hanford’s Air Operating Permit (AOP), a permit issued and enforced by Ecology pursuant to WAC 173-401. Under WAC 173-401, Ecology must have the authority to enforce all applicable requirements including those provisions regulating radionuclide air emissions (40 CFR 70.4, including (k)). That portion of an activity with the potential to emitting radionuclide air emissions is regulated by Health via terms and conditions in a license. Terms and conditions in a Health-issued license are only subject to public participation when Hanford’s AOP is re-opened for renewal. Such renewal is required to occur only once every 5 (five) years. Thus, an activity emitting radionuclides can operate for many years before the public has any knowledge of the activity.

At no time in the regulatory process is the public provided with the total risk of the proposed action from all expected regulated air pollutants, both non-radioactive and radioactive emissions combined. While Ecology is not allowed under state law to administer requirements for control of radioactive air emissions until such requirements eventually appear in a permit issued under WAC 173-401, Ecology is not prohibited from informing the public of the TOTAL risk to our health anticipated from a proposed action. (Health risks, rather than specific project activities that are barred from the public by statute.) Furthermore, Ecology contracts with Health regarding implementation of requirements for control of radionuclide emissions from Hanford. It seems Ecology could easily obtain from Health any needed expertise about anticipated risks from exposure to radionuclides (NOT project-specific details).

The public is not the enemy, rather we are the victim of a regulatory scheme that mandates ignorance. However, it is Ecology’s choice whether we the public will receive an assessment of the TOTAL risks to our health anticipated from the proposed action.

Response to I-1-2

Ecology must enforce regulations, both state and federal, as they are written. WAC 173-400-111(3)(b) and (h) require that the permittee demonstrate emissions of non-radiological air pollutants will not cause a violation of ambient air standards, which are set on a per-pollutant basis and do not address radiological air emissions.

Ecology does not contract with the Department of Health (Health) for implementation of 40 C.F.R. Part 60, Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities (NESHAP Subpart H). The United States Environmental Protection Agency (EPA) directly delegates this authority to Health under 40 C.F.R. 61.04(c)(10).

Ecology is required to include, in the AOP under Chapter 173-401 WAC, any applicable requirements that Health determines are necessary to ensure that the 10 millirem annual standard of NESHAP Subpart H will not be exceeded. However, project review and setting of specific requirements for NESHAP Subpart H is outside the scope of this permitting action under Chapter 173-400 WAC.

For more information on this topic, please see Section C of the denial of Petition No. X-2019-8, from EPA to Mr. Bill Green on February 19, 2020.

Comment I-1-3

Comment 3. Regulation of emissions from the proposed action needs to consider emissions from all ongoing activities associated with the same overall project, whether or not those associated activities have been permitted separately.

The permittee's application seems to suggest there are multiple activities closely aligned with the proposed action that Ecology has permitted under separate orders. Segmenting emissions permitted by previous orders for associated activities overlooks the total impact to the public from the all expected emissions from a single project. It appears the permittee is segmenting the total project into smaller parts, resetting the regulatory limit for each part, thereby avoiding regulatory limits for the combination of all associated emissions. Section 4.3 of the NOC for this proposed action [TOC-ENV-NOC-5297, Rev. 01] lists five (5) issued permits for associated activities:

“ . . . with nearly all subject to air emissions permitting through the Washington Department of Ecology (Ecology). WTP operations, and any potential future permits associated with the IDF, are excluded from the scope of the DFLAW operations within the Hanford Tank Farms mission . . . ” [NOC-5297 at 10]

The 5 previously-issued permits are: 1) DE05NWP-001, Revision 2, 241-AN Tank Farm Ventilation, 2) DE05NWP-002, Revision 2, SST Retrieval Ventilation, 3) DE07NWP-003, Revision 1, Effluent Treatment Facility, 4) DE11NWP-001, 241-AP, 241-SY, and 241-AY/AZ Tank Farms Ventilation, and 5) DE18NWP-001, Revision 4, 241-AW Tank Farm Ventilation. It appears that, 2 to 3 other specific activities are pending approval. All ongoing emissions associated with the overall project should be regulated as emissions from a single emissions unit.

Response to I-1-3

The definition of emissions unit in WAC 173-400-030(31) is "any part of a stationary source or source which emits or would have the potential to emit." A stationary source is defined in WAC 173-400-030(91) as "any building, structure, facility, or installation which emits or may emit any air contaminant." Also note that the definition of major source for the AOP in WAC 173-401-200(19) specifically states that it can be "any group of stationary sources" meeting specific criteria.

It is unclear why Ecology should consider a wastewater treatment plant and multiple tank farms to be a single emissions unit. These are distinct facilities which each emit air pollutants from multiple stacks and vents. In accordance with WAC, Ecology typically considers them as separate stationary sources with multiple emissions units for permitting under Chapter 173-400 WAC.

Ecology determines when it is appropriate to aggregate modifications at these stationary sources into a single project for New Source Review under WAC 173-400-110. This is generally based upon timing, physical separation, and interdependence of the modifications. Ecology did not aggregate New Source Review for projects related to the five cited Approval Orders for the following reasons:

- 1. 241-AN is approximately 1,450 feet from 241-AP, fence line to fence line. The last revision of DE05NWP-001, Revision 2, was issued December 20, 2019. The Permittee will not be using 241-AN to process and stage waste for WTP. Ecology determined that operations at 241-AN do not appear to be changing and it would be appropriate to retain the existing operational restrictions.*
- 2. The most recent revision of DE05NWP-002 was Revision 2, issued on July 31, 2007. There are no indications that Energy is modifying the approved activities for single shell tank retrievals.*
- 3. The Effluent Treatment Facility (ETF) treats wastewater to meet discharge standards. Additionally, it is approximately one mile from ETF to 241-AP. Issuance of Revision 2 on September 9, 2022, primarily authorized an acetonitrile steam stripper and brine loadout which were added to help process a new wastewater stream from WTP. Although both projects are related to anticipated startup of WTP, Ecology determined that the distance and lack of physical connection between the facilities was sufficient to consider the modifications to be separate projects.*
- 4. 241-SY is over 5 miles from 241-AP and 241-AY/AZ is at least 800 feet from 241-AP, fence line to fence line. The Permittee will not be using 241-SY or 241-AY/AZ to process and stage waste for WTP. Ecology determined that operations at the 241-SY and 241-AY/AZ tank farms do not appear to be changing and it would be appropriate to retain the existing operational restrictions. DE19NWP-001 better addresses the unique operations which will occur at 241-AP and specifically rescinds all conditions of DE11NWP-001, Revision 4, which were related to 241-AP.*
- 5. 241-AW is approximately 300 feet from 241-AP, fence line to fence line. There is no Revision 4 of DE18NWP-001. The permit was issued on December 20, 2019, and has not been revised. The Permittee will not be using 241-AN to process and stage waste for WTP. Ecology determined that operations at 241-AW do not appear to be changing and it would be appropriate to retain the existing operational restrictions.*

Comment I-1-4

Comment 4: (Section 6 of NOC-5297, Chemical and Physical Processes, at 12) Ecology should suspend action on the subject NOC application and rescind approval for all previous activities

that assume, incorrectly, tank waste to be a homogenous mixture, UNTIL the permittee resolves the considerable discrepancy between the TVAT and NOC- 5297.

In the above-referenced "Section 6", the permittee states:

"For [Hanford tank] waste transfer operations. . . mixer pumps will be run to ensure that the waste is a homogeneous mixture for sampling and delivery to the WTP" emphasis is mine. NOC-5297 at 12

It appears the permittee assumes, incorrectly, that activating the mixer pumps somehow removes the impacts of radionuclides in tank waste and the resulting radiocatalytic and radiolytic processes.

With regard to Hanford tank waste; in 2014 the permittee considered the following as factually accurate:

"The Hanford tank waste is a complex matrix of aqueous soluble and insoluble inorganic salts combined with an inventory of water and organic components that number into the thousands. These organic components are constantly undergoing radiolysis from the tank radioactivity plus thermal and chemical reactions with tank contents." TVAR at 16 of 153

. . . and

"The waste material is radioactive, continually generating heat, continually catalyzing both known and unknown chemical reactions in all layers, and continually generating gases and known and unknown chemical products that are continuously created and destroyed via chemical, thermal, radiocatalytic and radiolytic processes in all layers." TVAR at 21 of 153

. . . and

"It is the head space composition that determines the composition of the vent, stack, and most fugitive emissions. . . Waste disturbing activities can greatly alter the concentration and composition of the head space gases and vapors." TVAR at 23

. . . and

"However, it was noted that waste-disturbing activities can profoundly disturb the temporal concentrations of chemicals in the head space. More specifically, waste disturbing activities associated with sluicing of waste with water jets, dissolution and transfer pump operations are believed to have the highest potential to release a large fraction of retained gas and vapors over a short time period (citation omitted). The effects are dramatic resulting in organic vapor concentrations increasing by several orders of magnitude (citation omitted)." TVAR at 38 of 153

Thus, the permittee acknowledges as fact that in such an environment, it is not possible to have a homogeneous mixture.

There is a huge difference between the homogenous mixture the permittee is now proposing to deliver to WTP and the impossibility of a homogeneous mixture even existing. Ecology should

require the permittee to address this discrepancy before acting further on this NOC application. Any submittal by the permittee addressing this discrepancy should also be subject to public review.

The TVAR and NOC-5297 were prepared to address different issues. The TVAR was prepared to investigate worker exposure to tank vapor emissions. [TVAR at 9 of 153] The purpose of NOC-5297 is to justify, or help justify, a new order of approval replacing DE11NWP-001, Rev. 4 to “. . . increase the number of 241-AP tanks conducting waste disturbing activities from two to eight.” [NOC-5297 at 1]

There are several other differences; the TVAR contains many pages of references that include many documents authored by Hanford employees and employees from the Pacific Northwest National Laboratory on Hanford-specific topics. The NOC-5297 can boast of no comparable pedigree. “The TVAR underwent a factual accuracy review by WRPS and the Department of Energy's (DOE's) Office of River Protection (ORP), and the TVAT [Tank Vapor Assessment Team] [] incorporated corrections identified in that factual accuracy review into this report.” TVAR at 9 of 153 The extent of review afforded NOC-5297 is uncertain, but likely not comparable.

There are at least two similarities between the TVAR and NOC-5297. Both were prepared under the auspices of WRPS, and both are based, in very large part, on Hanford tank waste.

Response to I-1-4

Energy has conservatively estimated emissions for 241-AP using a "supertank" approach where emissions of each chemical are based upon the worst-case emission rate found in historical testing of tank headspaces and stacks. This is a conservative assumption, because no waste on site could contain the underlying concentrations of all chemicals at once. A more refined approach to try to separate different wastes by composition would reduce estimated emissions and would therefore be less conservative.

WAC 173-400-111(3)(b) and (h) require a demonstration that air emissions will not cause or contribute to violation of an ambient air standard outside the ambient air boundary. Real-world air sampling, both for estimating emissions and demonstrating compliance, keeps the emissions estimate as closely connected to the off-site impact as possible.

Comment I-1-5

Comment 5. Provide validation or verification for using a single factor of 10 to “. . . bound impacts of waste disturbing activities.” [NOC-5297 at 1. Also, "To ensure that potential emissions were conservative, the flux rate was multiplied by . . . 10 to account for increased emissions during waste disturbance." NOCTSD at 8 of 27.]

In the NOC Application (NOC-5297), and in the Technical Support Document (NOCTSD) submitted to Ecology, the permittee uses a single factor (multiplier) of 10 applied to tank waste in a quiescent state to arrive at the expected increase in emissions owing to waste disturbing activities. In some contexts, the permittee associates this factor of 10 with the word "conservative" in a rather transparent attempt to add veracity where it is not warranted. However, there doesn't appear to be any justification for using this single factor of 10. It seems to be only an assumption that has never been validated/verified against actual emission

measurements. In fact, this single factor of 10 appears to be considerably smaller than the factor reported in a reputable publication and previously approved by the permittee.

An independent panel of nationally recognized experts, hired (funded) by WRPS, [WRPS is the same company that prepared this NOC application and the technical support document (NOCTSD)], note that:

"[t]ank head space vapor/gas concentrations can increase several orders of magnitude during tank-disturbing activities."

emphasis is mine, TVAR at 52 of 153

[One order of magnitude is a factor of 10 larger, or 10 times larger; 2 orders of magnitude is 100 times larger; and 3 orders of magnitude is 1,000 times larger, etc.]

As of 2014, the permittee believed the expected increase in emissions owing to waste disturbing activities was represented by a multiplier of 1,000 or greater.

"The draft report underwent a factual accuracy review by WRPS and the Department of Energy's (DOE's) Office of River Protection (ORP), and the TVAT [Tank Vapor Assessment Team] [] incorporated corrections identified in that factual accuracy review into this report." TVAR at 9 of 153

Whether the 1 order of magnitude multiplier cited in NOC-5297 and NOCTSD was ever validated or verified against actual emission measurements remains a question. The "several orders of magnitude" multiplier noted by the independent panel of nationally recognized experts in the TVAR appears to be partially validated for some regulated pollutants by analyses of samples taken from emissions from Tank C-101.

"As waste materials are being transferred from the SST to a DST, there is the additional potential for transient peaks in the emissions from the DST.

Table 4-1 below shows the pre-, initial-, and mid-point analyses of samples taken from Tank C-101. Mercury levels continue to rise, whereas others have peaked.

Table 4-1 Percent of Occupational Exposure Limit

Compound	Pre-start	Start	Midway
Mercury	12	147.3	923.3
N-Nitrosodimethylamine	19	2390	469
Formaldehyde	26.7	91	65.3
Ammonia	2.7	21.1	2.7

TVAR at 27 of 153

NOTE: While the TVAR and NOC-5297 address different emission-related concerns, both focus, in part, on the impact of emission increases from tank waste disturbing activities.

The permittee's use of a single factor of 10 in its NOC application, seems to have never been validated or verified, even in part, against actual emission measurements. Table 4-1 above confirms such measurements are indeed possible because they have already been performed.

Because any modeling is only as reliable as the inputs, an increase in those inputs of at least 2 factors of 10 will significantly increase the emission estimates the permittee used for this project, as well as, the number of toxic air pollutants addressed by WAC 173-460.

Given both values were approved by WRPS (the TVAR-reported multiplier was additionally reviewed and approved DOE ORP), Ecology should require the permittee provide validation or verification for using a single factor of 10 to ". . . bound impacts of waste disturbing activities." [NOC-5297 at 1]

Response to I-1-5

Estimated emissions for this NOC Application are based upon real-world testing results that include sampling during both quiescent periods and waste disturbing activities. The underlying impact of waste disturbance discussed in this comment have already been factored in, to the degree possible, through the use of these testing results.

The factor of 10 helps compensate for the fact that sampling may not have always occurred with the specific combination of the worst-case concentration of a chemical under the worst-case waste disturbance. It will continue to be regularly validated through the emissions testing required in Approval Condition 5.

A safety factor of 10 has been used in emissions estimates for NOC Applications at the Hanford site for years. Real-world testing, so far, has confirmed that it is reasonably conservative for estimating the off-site impact of tank emissions for Chapter 173-460 WAC. If testing were to demonstrate that it was not conservative enough, Energy would then potentially be subject to enforcement and penalties for violating permit limits.

Comment I-1-6

Comment 6: (draft NOC Approval Order: General condition # 7b; "Legible copies of. . .request by Ecology") The permittee should be required to supply Ecology with copies of "any O&M manual(s) . . ." and update such manuals, promptly, as necessary.

Ecology needs to have in its possession all documents required to conduct an inspection.

Response to I-1-6

Ecology's general practice for air Approval Orders, state-wide, is to only require manuals be provided upon request. Manuals may be frequently updated and Ecology typically reviews at the time of inspection. If permittees are able to provide manuals in a reasonable timeframe this is sufficient to meet inspection needs.

Comment I-1-7

Comment 7: (General – approval order format) For efficiency and reduction of time, Ecology may wish to consider changing the format of this Order of Approval document to match the formatting used in Hanford's Air Operating Permit (AOP).

Once DE19NWP-003 is approved, terms and conditions in this order become subject to inclusion in Hanford's AOP. Ecology could save time and avoid future editing concerns should Ecology opt to re-format the terms and conditions in this order to match those in Hanford's AOP. Such inclusion could be as simple as copying-and-pasting.

Response to I-1-7

Ecology often uses paraphrasing, incorporation by reference, and other practices to reduce the size and complexity of applicable requirements when they are included in the AOP under Chapter 173-401 WAC. These streamlining methods may not be appropriate for Approval Orders setting applicable requirements under Chapter 173-400 WAC. Therefore, Ecology has maintained a separate format for these Approval Orders.

I-2: ANONYMOUS ANONYMOUS

Comment I-2-1

The DOE analysis says that providing a condenser on the discharge from the AP ventilation system is not feasible, and a condenser is not included in the approval order. There are several erroneous assumptions in the DOE analysis that cause the cost to be inflated.

In 2022, the Ecology air permitting engineer committed that Ecology would require a condenser on the exhaust. Meeting minutes are available for that.

The 241-AY/AZ DST tank farms currently have five (5) condensers installed in the tank ventilation systems. Those systems demonstrate the feasibility of using condensers and their effectiveness at reducing discharges of DW to the environment.

Response to I-2-1

Ecology did plan to require a condenser system as best available control technology (BACT) and BACT for toxics (tBACT), in part due to disagreement over costs and feasibility. However, Ecology accepted an alternative approach of a VOC limit with regular testing. This is discussed in Section 4.c of the Technical Support Document for Approval Order DE19NWP-003.

The definition of BACT in WAC 173-400-030(13) states that BACT is "an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques."

When applying BACT and tBACT, Ecology generally follows the guidance in Ecology Publication AQP-GUI-2022 BACT and tBACT, issued April 21, 2022. The preferred option is presumptive BACT, but Ecology did not think that the 241-AY/AZ condenser was sufficient to qualify condensation as presumptive BACT. It demonstrates feasibility, but there are many tank systems holding liquids with similar volatility throughout the state that aren't required to have a condenser. Therefore, Ecology and Energy reviewed cost effectiveness as part of top-down BACT.

Under the assumption that all eight tanks would be disturbed constantly throughout the year, Energy initially estimated that 241-AP had the potential to emit 88 tons of volatile organic

compounds (VOC) per year. In Ecology's view, this made a condenser cost effective at reducing VOC and volatile toxic air pollutants (TAPs). However, this is not a realistic operating scenario. Energy then refined their emissions estimate to 20 tons of VOC per year based upon an average of 3.27 tanks being constantly disturbed. Ecology believes this is still a conservative estimate, but is more realistic for the expected operations.

At 20 tons of VOC per year, Ecology considered a condenser to be on the edge of cost effectiveness due to disagreement on costs. Eventually, Ecology and Energy agreed upon a more restrictive limit of 4.4 tons per year of VOC with regular testing. If actual emissions approach this limit, VOC testing increases in frequency and Energy must begin testing for additional TAPs which have the potential to exceed their small quantity emission rate or de minimis threshold listed in WAC 173-460-150.

4.4 tons of VOC per year is approximately the limit Ecology might have set if a condenser were used to reduce uncontrolled emissions of 88 tons per year. With potential emissions of 4.4 tons per year, using a condenser to further reduce emissions would be significantly more expensive, on a dollar per ton basis, than Ecology has required historically at Hanford or other facilities.

The definition of BACT in WAC 173-400-030(19) allows Ecology to consider processes and techniques, rather than control devices, when setting BACT limits. Based upon this, Ecology determined that compliance with the annual limit would provide similar reduction in emissions to that which would theoretically be provided by the condenser. It will also provide more information regarding tank emissions through increased testing and encourage Energy to voluntarily reduce emissions further to avoid testing for a greater library of TAPs.

Comment I-2-2

Analyses of the AZ-301 condensate from the AY/AZ condensers have shown the condensate contains significant amounts of DW and radionuclides, especially acetone and tritium (which is part of the water molecule). Without a condenser on the 241-AP ventilation system, VOC and tritium will simply pass through the heaters and filters. That is no different than disposing of tank waste to the environment. Was EPA involved in reviewing the approval order was tritium discharges considered.

With the operation of TSCR, feed to WTP and waste returns, and operation of the remaining AP tanks, there are a minimum of eight (8) simultaneous waste disturbing events that may occur. The composition of the ventilation discharge will change greatly over just short periods of time. This is not reflected anywhere in the approval order.

Response to I-2-2

Acetone, tritium, and dangerous waste regulations are outside the scope of this approval order, which is issued to address air New Source Review requirements under WAC 173-400-110. Acetone and tritium are not criteria pollutants which must be reviewed for WAC 173-400-113 or TAPs listed in WAC 173-460-150. Treatment, storage, and disposal of dangerous waste are separately reviewed and permitted under Chapter 173-303 WAC.

The shortest applicable averaging period for this permitting action is one hour, which is reflected in the emission estimates and limits for Approval Order DE19NWP-003. While short-

term fluctuations are a potential concern in estimating emissions, using the worst-case sampling result and a safety factor of 10 is designed to ensure that the total emissions in an hour with such a spike would be considered in dispersion modeling and limits.

I-3: ANONYMOUS CITIZEN

Comment I-3-1

DOE Letter 20-ECD-0037, "EVALUATION OF POTENTIAL TANK SIDE CESIUM REMOVAL SYSTEM AIR EMISSIONS," July 8, 2020, which is part of the review package, states that "As part of future operational contingency, a transfer line will be installed to allow for liquid waste to be transferred from WTP to the AP Farm. Yet the rest of the documentation is unclear as to whether the wastes potentially to be transferred from WTP will increase the amounts of volatile chemicals, such as acetonitrile. Can you ensure that WTP transfers to AP farm are prohibited until an appropriate flowsheet analysis is conducted? The 2022 updated modeling document does not seem to address the source of the waste in AP farm.

Response to I-3-1

Thank you for your comments. When estimating emissions, Energy did include the expected waste profiles for the WTP Effluent Management Facility (EMF) to ensure that acetonitrile and other volatile chemicals which might be contained in waste transferred back to 241-AP would be included. This is addressed in Energy's response to Ecology Comments 1 and 3 in TOC-ENV-NOC-52971, Revision 1, which was included as a supporting document for this public notice.

Comment I-3-2

Also, transfers of waste from WTP to AP farm as described above can add a considerable amount of corrosive chemicals. Has a compatibility analysis been completed for the contingency WTP waste? Has the analysis undergone appropriate quality assurance checking? Note that single shell tanks are experiencing spalling of concrete in their domes, which is a sign of corrosive attack on the rebar. Double shell tanks are also not immune from corrosion. Adding even more chemicals to counteract corrosion just adds to the waste treatment costs. An evaluation would be helpful.

Response to I-3-2

Waste compatibility for the transfer lines is beyond the scope of Ecology's New Source Review authority under Chapter 173-400 WAC, General Regulations for Air Pollution Sources.

Comment I-3-3

The draft approval order states that "the project proposes to increase waste disturbing activities and modify allowable streams that can be received at 241- AP to support future operation of the Waste Treatment and Immobilization Plant (WTP) in the Direct Feed Low Activity Waste (DFLAW) design." I agree that a separate approval order is appropriate, given the changing conditions that are likely to occur in this tank farm in support of WTP startup and operations. However, I believe Ecology should limit the scope of approved AP farm operations to those that support onsite, WTP operations or other onsite treatment/disposal. My concern is

that "issues" with WTP startup will lead DOE to try to ship DFLAW feed to the Perma-Fix Northwest Facility inside the Richland City Limits. Doing so would change the air effluent release to be closer to city residents.

Of concern is that PFNW stated in its August 6, 2022 earnings conference call that "DOE has the ability to ship -- start shipping us for grouting, the waste that's generated from the TSCR system, which right now sits at approximately 300,000 gallons. " PFNW also stated that PFNW is "already permitted and now fitted to safety and component grout up to 30,000 gallons per month with the ability to expand to well over 1 million gallons annually..." For the complete transcript, please see <https://seekingalpha.com/article/4530955-perma-fix-environmental-services-inc-cespico-mark-duff-on-q2-2022-results-earnings-call>.

PFNW already exceeds the whole Hanford Site for tritium discharges to the air. In 2021, PFNW released 1,270 Ci of tritium near to Richland residents, versus 360 Ci of tritium released on the entire Hanford Site. No DFLAW feed transfers to PFNW should be allowed under the proposed Approval Order, and the Approval Order should explicitly state this. Risk should not be transferred from Hanford to Richland residents and businesses.

I would appreciate also if Ecology will, in addition, confirm whether the current dangerous waste permits for PFNW would allow this transfer of AP tank farm waste and if Ecology will provide for the public the associated permit change requests and records. No such volume of waste was ever envisioned when the City of Richland prepared the 1998 PFNW EIS, and no new EIS has ever been produced. Thank you for looking at this.

Response to I-3-3

Ecology does not have the authority to address or limit Perma-Fix Northwest, Inc. (PFNW) in an Approval Order issued under Chapter 173-400 WAC. EPA excluded Benton County from Ecology's jurisdiction for Chapter 173-400 WAC, except for certain specific cases such as major sources subject to WAC 173-400-700. The Hanford Site is subject to WAC 173-400-700 and, therefore, under the jurisdiction of Ecology.

PFNW does not meet any of the specific exceptions and is under the authority of the Benton County Clean Air Authority instead. Please see 40 C.F.R. 52.2470(c), Tables 2 and 4 for this delegation.

Permitting for Chapter 173-303 WAC, Dangerous Waste Regulations, is also outside the scope of this Approval Order issued under Chapter 173-400 WAC, General Regulations for Air Pollution Sources.

Comment I-3-4

Ecology notes in the web page announcement that future operations in AP farm can lead to increased emissions of volatile chemicals. I would appreciate if you will consider whether a thermal oxidation process is appropriate, similar to the Research and Development approach being used at 241-BY-108. See letter 21-NWP-218, "Transmittal of the Research, Development, and Demonstration (RD&D) Permitting Plan for the NUCON Thermal Oxidation System (TOS) at Single-Shell Tank (SST) 241-BY-108," March 14, 2022. Given the increase in disturbed waste,

and the potential for more volatiles to be dumped back to AP farm from WTP, a system like this could prevent future exposures.

Response to I-3-4

Ecology could require a VOC control device as part of a BACT determination, but thermal oxidation with both a standard system and the experimental system failed to qualify under Ecology guidelines AQP-GUI-2022 BACT and tBACT, issued April 21, 2022.

A standard thermal oxidation system was rejected due to the fact that the cost to install and operate such a system would significantly exceed the thresholds Ecology has generally considered reasonable, on a dollar per ton basis. It would also have additional negative environmental consequences, due to combustion emissions.

The experimental thermal oxidation system is currently in development and has never been tested in a real-world scenario. It does not meet the standard of "available" for BACT, as clarified in the most recent EPA guidance on the matter. The "2022 BACT Clarification" issued by EPA on August 31, 2022, states that "a technology that can be obtained through commercial channels" would be available for BACT. Once the initial experimental system has been completed and tested, similar systems might become commercially available from the manufacturer for future permitting actions.

O-1: HANFORD CHALLENGE

Comment O-1-1

Thank you for the opportunity to submit comments on the Notice of Construction (NOC) Approval Order proposing to modify the exhauster systems which control air emissions from double-shell tanks at the 241-AP Tank Farm (241-AP).

Hanford Challenge is a non-profit, public interest, environmental, and worker advocacy organization located in Seattle, WA. Our mailing address is P.O. Box 28989, Seattle, WA 98118. Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington with a mission to create a future for the Hanford Nuclear Site that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Hanford Challenge has members who work at the Hanford Site. Other members of Hanford Challenge work and/or recreate near Hanford, where they may also be affected by hazardous materials emitted into the environment by Hanford. All members have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for themselves and for current and future generations, and who are therefore affected by conditions that endanger human health and the environment.

Currently, holistic negotiations concerning the management, treatment, and disposal of Hanford's tank waste continue between the State of Washington and the U.S. Department of Energy (U.S. DOE). The lack of open and transparent communications with the broader Hanford community is concerning. We ask that, before any formal agreement is reached during holistic negotiations, a process is developed and implemented that provides meaningful engagement with the public and effective government to government negotiations with the tribal nations.

Response to O-1-1

Thank you for your comment. Holistic negotiations are outside the scope of this public notice period.

Comment O-1-2

The public's accessibility to engage in meaningful comment is vital for Hanford cleanup. The difficulty accessing information is an issue that must be addressed not only for public comment, but also for Hanford workers. Given that the approval order acts as the rule book for operations at 241-AP, the lack of accessibility to specifics due to incorporation by reference is concerning.² We ask that any documents included by reference be added as appendices to the approval order for easy accessibility on the State's website for public comment and for worker reference.

Response to O-1-2

Incorporating the requirements of Approval Order DE11NWP-001, Revision 4, which are specific to 241-AP by reference is a short-term solution to ensure that the permittees properly prepare for new testing required at 241-AP. Ecology determined that a reasonable transition period under the old requirements would help ensure that both Energy and Ecology can review and consider new testing plans. Without the incorporated requirements, Energy would not be required to continue with current testing as they prepare.

Fully repeating the text of DE11NWP-001, Revision 4, would significantly increase the size of Approval Order DE19NWP-003. It would also potentially make it more confusing when the applicable requirements are incorporated into the AOP. Approval Order DE11NWP-001, Revision 4, has been and will continue to be available on the Ecology website at https://fortress.wa.gov/ecy/nwp/permitting/air/noc/current/current_noc.html throughout the period in which they apply to 241-AP.

Comment O-1-3

Given the increase in activity at 241-AP from disturbing two tanks simultaneously to eight tanks, we ask that the permit specify the coinciding worker protections. Further, we ask the State to consider whether a thermal oxidation process is appropriate to help protect workers by preventing future exposures.

Response to O-1-3

Specific worker protections are addressed through other requirements, not outlined in Ecology's New Source Review authority under WAC 173-400-110. WAC 173-400-111(3) lists the criteria that Energy must meet for Ecology to issue an Approval Order for this project. These requirements include demonstrating that emissions will not cause or contribute to an exceedance of ambient air standards under WAC 173-400-113 and Chapter 173-460 WAC, but do not include requirements related to the potential concentration of air pollutants inside the

² See e.g. "DE11NWP-001, Revision 4, has not been rescinded and remains active" NOC Approval Order No. DE19NWP-003 (Draft Approval Order) at 1; and Draft Approval Order parts 3.a.-c. Operations and Maintenance reference manufacturers manuals and permittee developed operations and maintenance manuals (O&M manuals).

ambient air boundary. Worker protection is addressed under separate regulations and enforcement authority.

A thermal oxidation system was reviewed for this permitting action under the approach specified in Ecology Guidance AQP-GUI-2022 BACT and tBACT, issued April 21, 2022. Ecology is not aware of such systems being common for similarly-sized tanks with similarly volatile contents, which precluded thermal oxidation as presumptive BACT or tBACT. With the 4.4 ton per year limit on VOC, a standard thermal oxidation system would not be cost effective as top-down BACT or tBACT.

Energy is working on an experimental system which is expected to be installed on tank BY-108 in the future. An experimental, untested, and currently one-of-a-kind system does not meet the standard of BACT or tBACT.

Comment O-1-4

We appreciate that the State included sections in the NOC for monitoring/recordkeeping³ and reporting.⁴ The sections do not include procedures for potential accidents, malfunctions, or otherwise negative reports, nor was this information found elsewhere within the available documents. In addition, the sections reference manuals that are not available for review. We believe the manuals should be added as appendices to the approval order, or at a minimum information should be provided on how to access the manuals. We ask that the procedures for monitoring/recordkeeping and reporting be expanded upon to ensure all necessary measures and appropriate checks and balances are taken.

Response to O-1-4

If accidents, malfunctions, or similar incidents lead to excess emissions then reporting is required under WAC 173-400-107. Ecology does not include this requirement in Approval Orders because it is already enforceable by rule. Additionally, Ecology has requested an update to the State Implementation Plan to transition to the requirements of WAC 173-400-108 and 173-400-109 instead. If EPA were to approve this request, WAC 173-400-107 would no longer be in effect and the Approval Order would no longer be in accordance with state regulations.

Additionally, Chapter 173-400 WAC does not provide Ecology any authority over accidents, malfunctions, or other negative events that have no impact upon air emissions. A requirement to submit such reports would have no regulatory basis in an Approval Order issued under WAC 173-400-111.

Manuals specific to air permitting are not publicly available. Ecology, state-wide, does not typically require that manuals be submitted as part of NOC Applications or include them with the associated Approval Order. In part, this is because issuance of the Approval Order is required before the associated construction can commence. In many cases, manuals are not available at the time of application because equipment has not been purchased or does not yet exist. Additionally, any manual included in an Approval Order would potentially become out of date and cause confusion. Approval Orders issued under WAC 173-400-111 do not expire and do not

³ Draft Approval Order part 4.a.-h. Monitoring and Recordkeeping.

⁴ Draft Approval Order part 6.a.-e. Reporting.

require regular renewals or updates. The Hanford Site has active Approval Orders dating back to the 1990s, if manuals had been included at issuance they would almost certainly be obsolete.

Ecology routinely requests current manuals when conducting air inspections. This ensures that the inspection reviews maintenance records against the most current requirements and demonstrates that permittees are keeping manuals on hand as part of their current maintenance program. A manual submitted at the time of application, potentially decades earlier, would only demonstrate that air permitting staff had once been aware of the requirement to have manuals.

Comment O-1-5

The lack of information regarding the transfer of wastes to 241-AP from the Waste Treatment Plant (WTP) is concerning⁵. It is unclear whether this transfer will increase the amounts of volatile chemicals, such as acetonitrile⁶, and/or corrosive chemicals. As there are current signs of corrosion in single shell tanks, it follows that corrosion prevention should be addressed for 241-AP's double shell tanks. We ask the State to (1) provide clarity on the transfer source(s) and waste(s) routed to 241-AP, (2) require an appropriate flowsheet analysis be conducted before transfers from WTP to 241-AP are allowed, and (3) require a compatibility analysis for contingency WTP waste with appropriate quality assurance checking.

Response to O-1-5

Treatment, storage, and disposal of dangerous waste are regulated and permitted under Chapter 173-303 WAC and are outside the authority of an Approval Order issued under Chapter 173-400 WAC. When estimating emissions, Energy did include the expected waste profiles for the WTP EMF to ensure that acetonitrile and other volatile chemicals which might be contained in waste transferred back to 241-AP would be included. This is addressed in Energy's response to Ecology Comments 1 and 3 in TOC-ENV-NOC-52971, Revision 1, which was included as a supporting document for this public notice.

Comment O-1-6

The lack of specificity in the approval order as to offsite treatment of waste is concerning, especially with the potential that waste may be treated at Perma-Fix Northwest (PFNW) located within Richland city limits⁷. PFWN has a disturbing history of accidents, violations, findings, and non-compliances that raise serious concerns about its treating waste from Hanford Nuclear Site. We ask that the State (1) limit the scope of 241-AP operations to those that support onsite waste treatment/disposal and (2) prohibit DFLAW feed transfers to PFWN explicitly.

Response to O-1-6

Treatment, storage, and disposal of dangerous wastes are regulated and permitted under Chapter 173-303 WAC and are outside the authority of an Approval Order issued under Chapter 173-400 WAC.

⁵ DOE Letter 20-ECD-0037, Evaluation of Potential Tank Side Cesium Removal System Air Emissions.

⁶ Hanford Challenge argues that acetonitrile should be destroyed rather than stored

⁷ See Risky Business at Perma-Fix Northwest, <https://www.HanfordChallenge.org/pfnw>, 12/4/2020.

Comment O-1-7

The “increased emissions of volatile organic chemicals”⁸ is especially concerning given the focus on increased testing frequency rather than prevention. With the increase in disturbed waste and potential for more volatiles to be transferred into 241-AP from WTP, a system like the thermal oxidation process could prevent future exposures. We ask that the State consider whether a thermal oxidation process is appropriate, similar to the Research and Development approach being used at 241-BY-108.

The supporting documents indicate that (1) “technologies considered [...] were eliminated due to **technical infeasibilities** or because the costs exceeded the amounts the Washington Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) considers to be **economically justifiable**”⁹ and (2) “this reduces potential to emit to a level where condensation is **clearly too expensive**.”¹⁰ We ask that the State provide its analysis as to how it determines that each action is “infeasible” or its costs are not “economically justifiable.”

We ask the State for clarification regarding the purpose of the Technical Support Document as it includes overly broad language and/or language that seems to show pending determinations.¹¹ For example, these parts are overly broad: “To smooth the transition between approval orders, DOE may continue meeting the sampling and testing requirements from DE11NWP-001, Revision 4, **until they operate 241-AP in a manner that is inconsistent with the previous approval order**”¹² and “DOE has proposed to modify the 241-AP Tank Farm (241-AP) to identify new equipment and **reduce restrictions on authorized waste handling operations**”¹³ For example, this part seems to be an unfinished conversation with pending determinations: “The Permittee’s evaluation assumes that five people are required for each operation and maintenance task. [...] Operation and maintenance tasks were assumed to take 1.5 hours rather than 0.5 hours[.] [...] Ecology disagreed with assuming that the cost of all five workers and tripled task time could be directly considered in evaluating BACT.”¹⁴

Response to O-1-7

When determining BACT and tBACT, Ecology generally follows the process outlined in AQP-GUI-2022 BACT and tBACT, issued April 21, 2022. This guidance is based upon the definitions of BACT in WAC 173-400-030(13), single-topic guidance released by the EPA, and the draft October 1990 "New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting" which is commonly called the "Puzzle Book." The Puzzle Book is still used as a reference because EPA has never released an equivalent formal guidance on application of BACT.

⁸ 241-AP Notice of Construction Approval Order Public Comment period webpage, https://ecology.wa.gov/Waste-Toxics/Nuclear-waste/Public-comment-periods?utm_medium=email&utm_source=govdelivery.

⁹ 20-ECD-0066 Attachments (Attachments) at page 2 (emphasis added).

¹⁰ Technical Support Document at page 12 (emphasis added).

¹¹ Attachments at page 11 (emphasis added).

¹² Technical Support Document at page 3 (emphasis added).

¹³ Technical Support Document at page 1 (emphasis added).

¹⁴ Technical Support Document at page 11 (emphasis added).

Ecology rejected a standard thermal oxidation system due to the fact that the cost to install and operate such a system would significantly exceed the thresholds Ecology has generally considered reasonable, on a dollar per ton basis. It would also have additional negative environmental consequences, due to combustion emissions. For more information on this process, please see the discussion of top-down BACT in AQP-GUI-2022 BACT and tBACT.

The experimental thermal oxidation system is currently in development and has never been tested in a real-world scenario. It does not meet the standard of "available" for BACT, as clarified in the most recent EPA guidance on the matter. The "2022 BACT Clarification" issued by EPA on August 31, 2022, states that "a technology that can be obtained through commercial channels" would be available for BACT. Once the initial experimental system has been completed and tested, similar systems might become commercially available from the manufacturer for future permitting actions.

The Technical Support Document is a non-enforceable explanation of the Approval Order, what Ecology considered in development of the Approval Conditions, and potentially information which might be helpful for interpretation of these conditions in the future. Depending upon the permitting authority and type of permit (AOP vs. New Source Review), these documents might also be called Statements of Basis or Fact Sheets. EPA considers them to be required for Title V AOPs and highly recommends their use for minor New Source Review.

For more information on BACT and New Source Review, please see <https://www.epa.gov/nsr/new-source-review-policy-and-guidance-document-index>.

For more information on Statements of Basis, specifically for the Title V program, please see <https://www.epa.gov/title-v-operating-permits/statement-basis-guidelines>.

Comment O-1-8

Finally, we ask the State for clarification regarding the (1) definition of SAPs which “must be periodically reviewed and include criteria [...] for future reviews;”¹⁵ (2) process as to where emissions from Tank Side Cesium Removal System-MISC are to be routed as “emissions do not need to go directly to an exhauster;”¹⁶ (3) compliance determination made by Ecology to satisfy WA Administrative Code (WAC) §§ 173-400 and 173-460;¹⁷ and (4) discrepancies between the draft approval order and the current approval order regarding (a) items listed to

¹⁵ Draft Approval Order part 4.b. Monitoring & Recordkeeping; SAPs is referenced elsewhere but not defined.

¹⁶ Draft Approval Order part 2.b.i.A. Equipment/Activity Restrictions.

¹⁷ Draft Approval Order part 2.b.ii.A-B. Equipment/Activity Restrictions.

be included in each exhauster¹⁸, (b) HEPA filter system ratings¹⁹, and (c) the Emission Limits chart.²⁰

The safe and effective treatment of Hanford's high-level tank waste is essential to the protection of human health and the environment. All facilities that are a part of managing, storing, and treating Hanford's tank waste are a top concern of Hanford Challenge. We appreciate the work the State of Washington is doing to hold the Department of Energy to its commitments and can see that reflected in the permit conditions for 241-AP.

Response to O-1-8

Item 1: Sampling and Analysis Plan (SAP) is an industry-standard term which Ecology does not believe needs to be defined within the Approval Order itself, but it should generally be understood to be a document that outlines how testing will be conducted to demonstrate compliance with Approval Order Condition 5. In general, a SAP should describe the testing purpose, process, analysis procedures, and other information in sufficient detail to show that the results will be appropriate for comparison to Approval Order limits. The exact details of each SAP will depend upon the analyte(s) and method(s), but Energy is already providing acceptable SAPs for Ecology review under other Approval Orders.

Item 2: While operating, TSCR must be sealed so that any gas generated by the process is carried with waste and/or condensate back into a DST. Please see the sentence prior to the one cited in comment footnote 15. It states "Emissions, condensate, and liquid effluent from TSCR-MISC waste processing operations are routed back to a 241-AP DST that is controlled by 296-A-048 and/or 296-A-049." This is made enforceable by Approval Condition 2.b.i, which requires that the emissions from TSCR-MISC then be controlled by 296-A-048 and/or 296-A-049. If emissions were vented directly to the atmosphere they would not be controlled by an exhauster.

Item 3: Based upon comment footnote 16, Ecology is assuming that Item 3 is specifically regarding Approval Conditions 2.b.ii.A and 2.b.ii.B. The compliance demonstration is testing specified in Approval Condition 5.

Item 4: It appears the heater was inadvertently left out of the exhauster control train description. Although the exhauster heaters do not directly control emissions, they reduce relative humidity to prevent condensation and wetting of the High Efficiency Particulate Air (HEPA) filters. This ensures that the HEPA filters will continue to operate properly and meet or exceed the minimum design control efficiency. Ecology has added heaters to Approval Condition 2.b.i.

¹⁸ Compare Draft Approval Order part 2.b.i. (each exhauster must include a moisture de-entrainer, pre-filter, and two banks of nuclear grade HEPA filters in series) to Approval Order DE11NWP-001 part 14.a. (each exhauster must include a moisture de-entrainer, heater, pre-filters, and a two-stage High Efficiency Particulate Air (HEPA) filtration system in service in each treatment train).

¹⁹ Compare Draft Approval Order part 3.b.i.B. ("The HEPA filter system utilized in the ventilation systems must be rated to remove particles as small as 0.3 micrometers in diameter with a rated particulate matter removal efficiency of no less than 99.95%") to Approval Order DE11NWP-001 (contains no specifics).

²⁰ Compare Draft Approval Order part 2.c.i. Table 3: Emission Limits and Approval Order DE11NWP-001 (contains no such table). Further, the following Table 3 emission limits are unclear: N/A for Carbon monoxide and nitrogen oxides, M01 for Arsenic, and M08 for Chromium.

Regarding footnote 18, Ecology has added a minimum design control efficiency requirement for the HEPA filters as an additional point of compliance for the limits on solid TAPs such as arsenic and chromium (VI). This is to update conditions to current permitting practices Ecology uses state-wide. The minimum control efficiency for other requirements, such as nuclear safety or radioactive air emissions licensing, may be more stringent. Energy must ensure that the HEPA design meets all requirements, including those which may be more stringent than the Approval Order.

Regarding footnote 19, Ecology has added Table 3 to update DE19NWP-003 to current permitting practices Ecology uses state-wide. Ecology practice is now to include a table with limits for all TAPs exceeding the Small Quantity Emission Rate (SQER) in emissions calculations. Arsenic is limited to 2.64E-03 pounds per year and chromium (VI) is limited to 3.68E-01 pounds per year. A Chemical Abstract Services number is not included for these metals because the WAC 173-460-150 standards are for all chemicals which contain these metals, not specific chemicals.

DE19NWP-003 does not have a limit for carbon monoxide (CO) or nitrogen oxides (NOx). The inclusion of modeled values for CO and NOx in Table 3 is unusual, because Ecology does not believe that generation of these chemicals exceeds the exemptions in WAC 173-400-110(5). They are not subject to New Source Review and Ecology does not have the authority to limit them in the Approval Order. However, a background concentration of these chemicals is always present in the atmosphere and Energy detects them in their testing.

Unlike most facilities in the state, Ecology wants Energy to test for entire suites of chemicals instead of limiting testing to only those chemicals which are expected. This will continue to generate results for CO and NOx, due to background. The modeled values in Table 3 are meant to acknowledge that Energy includes these results in their sampling databases and includes the worst-case value in their modeling. At a facility which produced CO and NOx, Ecology would require testing that could detect and remove the background concentration to determine the actual generation rate. The modeling rates are included only to help an inspector confirm that CO and NOx testing results remain consistent with background concentrations.

OTH-1: PERMITTEE/WRPS

Comment Oth-1-1

The draft proposed approval order includes numerous conditions that reflect an allowable 90 day implementation period. After further review of the draft approval order, WRPS has determined that additional time is necessary to fully implement the sampling and monitoring requirements. A period of at least 180 days, but preferably as much as one year, is requested to allow sufficient implementation time.

Response to Oth-1-1

Ecology extended the transition period from 90 to 180 days in Approval Conditions 5.a and 5.b. This was partly due to the fact that EPA allows up to 180 days for stack testing of new stationary sources subject to federal standards under 40 C.F.R. Parts 60 and 63, as specified in 40 C.F.R. 60.8(a) and 63.7(a)(2). Although 241-AP is already operating and not subject to any specific federal standards, the new testing requirements of Approval Order DE19NWP-003 will

require development of several new SAPs, and preparation for test methods which may not have been previously employed at the Hanford Site. The planning needed for this is comparable to commissioning entirely new equipment and preparing for testing under federal standards.

Based upon the current status for WTP and 241-AP, Ecology believes it is unlikely that it will be necessary to disturb more than two tanks simultaneously during this period. However, doing so would trigger new testing requirements immediately. The new testing requirements would also be triggered if 241-AP receives waste which would not have been consistent with the assumptions for Approval Order DE11NWP-001, Revision 4. The most likely source of such a waste stream would be WTP, which is not yet operational and will not be processing tank waste in the next 180 days.

Comment Oth-1-2

The permittees have significant concerns with this condition as written. The use of "worker protection" sample results as an indicator for potential TAP emissions presents potential personnel privacy issues as certain IH sampling programs are specific to individual employees (e.g., personal monitoring) that may not be available for review to implement this condition. In general, any IH sampling done for purposes of worker protection (either personal or general area monitoring) would not be appropriate and relevant indicators of potential stack TAP emissions. In addition, the provision that the permittee must "demonstrate" that the detected chemical comes from non-tank waste sources (cleaning, maintenance, etc.) is not practical. Paints, chemicals, adhesives, barrier covers, etc. are all routinely present within the AP farm boundary due to ongoing work activities, but it's not clear how it would even be possible to "demonstrate" they are the source of potential detections. Given the low estimated emissions from the AP Farm stack, it seems unnecessary to require a search/evaluation of "all IH data" in the hopes of identifying the presence of a TAP not previously identified. From an editorial perspective, it also appears the reference to approval condition 5.c.v contained within the proposed text of this condition should actually be a reference to condition 5.c.vi.

Response to Oth-1-2

Ecology review indicates that Approval Condition 5.c.vii may have exceeded the authority for New Source Review under WAC 173-400-110 and may lead to the Permittee reducing the amount of industrial hygiene and worker protection sampling on site. Testing outside tank headspaces and stacks is not always related to tank emissions and may be conducted using faster screening techniques, but with less ability to differentiate and identify chemicals. This is appropriate when trying to prevent worker exposure, where it may not be possible to collect large sample volumes or wait days or weeks to get sample results from a lab.

Based upon this concern, draft Approval Condition 5.c.vii has been removed. WAC 173-400-110 and 173-400-107 would still create a general requirement for Energy to ensure that tank emissions have been properly evaluated. If industrial hygiene sampling showed that tank emissions included a TA) which hadn't been addressed, Ecology could take this information into account during enforcement. For permitting under WAC 173-400-110, Energy has historically reviewed all data from the Tank Waste Information Network System and Site Wide Industrial

Hygiene Database for applicability when estimating emissions. This is Ecology's expectation going forward.

Ecology is also including two corrections to the draft Approval Condition 5. Approval Condition 5.g now states that Ecology may approve alternative "sampling and analytical methods" rather than just analytical methods. The intent was to include both aspects of testing in analytical methods, but this might have been unclear.

Additionally, Ecology has corrected the trigger for Method 30B mercury trigger to exceeding 5.77E-06 grams per second throughout Approval Conditions 5.c.v. This is the correct value for one half of the elementary mercury SQER, if emissions were maintained for an entire 24-hour period. It appears that the initial calculation was off by a factor of 10.

*Mercury SQER Short-Term Rate: $2.2E-03$ [pounds/24-hours] / $(60*60*24)$ [seconds/24-hours] = $2.546E-08$ [pounds/second]*

*Conversion to Grams per Second: $2.546E-08$ [pounds/second] * 453.592 [grams/pound] = $1.155E-05$ [grams/second]*

1/2 Mercury SQER Short-Term Rate: $1.155E-05$ [grams/second] / 2 = $5.775E-06$ [grams/second]

Appendix A. Copies of All Public Notices

Public notices for this comment period:

- Notice sent to the Hanford-Info email list.
- Notices posted on the Washington Department of Ecology – Hanford’s Facebook and Twitter pages.
- Notice posted on the Washington Department of Ecology, Nuclear Waste Program’s website.

From: [Washington Department of Ecology](#)
To: [McFadden, Daina \(ECY\)](#)
Subject: 241-AP Approval Order public comment period
Date: Monday, September 26, 2022 10:01:39 AM



241-AP Notice of Construction Approval Order

241-AP tank farm

Ecology is holding a 30-day public comment period for a Notice of Construction (NOC) Approval Order proposing to modify the exhauster systems which control air emissions from double-shell tanks at the 241-AP Tank Farm (241-AP). The permittee is the U.S. Department of Energy (Energy). The 241-AP tank farm is located on the Hanford Site in southeastern Washington.

Start date: **Sept. 26, 2022**

End date: **Oct. 28, 2022**

Proposed changes

Energy is proposing to modify the exhauster systems which control air emissions from double-shell tanks at 241-AP, which has triggered the requirement to seek a NOC Approval Order under Washington Administrative Code (WAC) 173-400-110. 241-AP will be used to process tank waste with the Tank Side Cesium Removal (TSCR) system and then stage this waste for treatment at the Waste Treatment and Immobilization Plant (WTP). The activities and equipment associated with this modification are needed for WTP to begin operating in the Direct-Feed Low Activity Waste configuration.

Currently, 241-AP is authorized under Approval Order DE11NWP-001, Revision 4, with several other tank farms. Due to the addition of TSCR and anticipated need to disturb more tanks simultaneously, we are splitting 241-AP into a separate Approval Order DE19NWP-003. The new Approval Order removes the current restriction of disturbing no more than two tanks at once but increases testing frequency, especially if these operations lead to increased emissions of volatile organic chemicals.

[Review](#)

How to comment

The proposed modification is available for review online at the Nuclear Waste Program's [public comment page](#).

Please submit comments by **Oct. 28, 2022**, electronically (preferred), or deliver to:

Daina McFadden
3100 Port of Benton Blvd
Richland WA 99354

Public hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden

Permit Communication Specialist

✉ Hanford@ecy.wa.gov

☎ 509-372-7950

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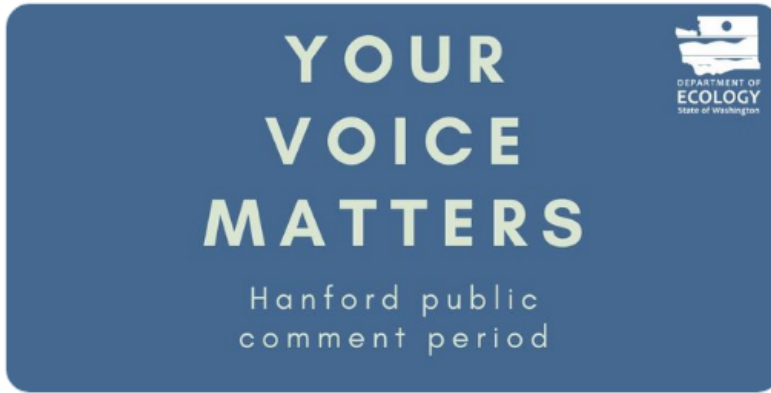
This email was sent to dmc461@ecy.wa.gov using GovDelivery Communications Cloud on behalf of:
Washington Department of Ecology · 300 Desmond Drive SE · Lacey, WA 98503





Ecology - Hanford @ecyHanford · 12s

A new public comment period started today regarding the 241-AP NOC Approval order. Submit your comments by Oct. 28, 2022: [ecology.wa.gov/.../Nuclear.....](https://ecology.wa.gov/.../Nuclear...)

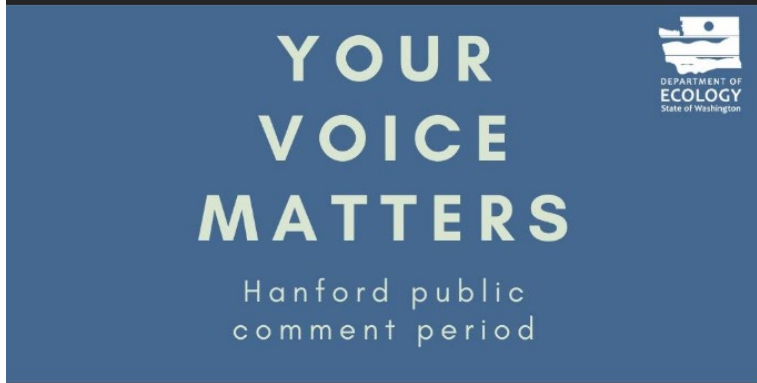


Washington Department of Ecology - Hanford

Published by Anna Eco Alvarez · 2m ·

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Washington Department of Ecology - Hanford Hanford Site U.S. EPA, Region 10 U.S. Department of Energy, Office of River Protection



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Review and comment

Copies of the proposed approval order and supporting documents are available below.

Please submit comments by **Oct. 28, 2022**, [electronically](#), (preferred) or deliver to:

Daina McFadden
3100 Port of Benton Blvd
Richland WA 99354

Public hearing

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509-372-7950

Documents

[Draft Approval Order](#)
[Draft Technical Support Document](#)
[Letter 20-ECD-0066](#)
[20-ECD-0066 Attachments](#)
[Letter 21-ECD-002996](#)
[2022 Updated Modeling](#)
[Letter 20-ECD-0037](#)