

March 4, 2025

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Washington Department of Ecology
3100 Port of Benton Blvd Richland, WA 99354

RECEIVED

MAR 10 2025

Department of Ecology
NWP - Richland

Subject: Perma-Fix Northwest Dangerous Waste Permit Renewal

Dear Ms. McFadden:

Following are comments on Ecology's renewal of the 1999 Perma-Fix Northwest Dangerous Waste Permit. My residence is near this facility, so my family is affected by its operations. The comment period is January 27, 2025 to March 14, 2025. Thank you for considering these comments. I think DOE should treat its waste on-site at Hanford.

1. Advance Notification Email December 27, 2024. The Advance Notification stated that the draft Mixed Waste Permit Renewal would have a review concurrent with the supporting draft SEIS. However, the draft SEIS was not released until February 6, 2025. I would appreciate if Ecology will extend the review period for the DW Permit so that the reviews, as a minimum, end on the same day (March 24, 2025). Since the SEIS is the umbrella for approving the permit, it doesn't make sense to review the permit without the context and analyses provided in the SEIS. Please note that The Fact Sheet for the Proposed Permit Renewal, *Proposed Permit Renewal to the Perma-Fix Northwest Mixed Waste Facility Dangerous Waste Permit WAR000010355*, page 11, states that the draft Supplemental EIS is available online during this DW Permit renewal public comment period. Contrary to the Fact Sheet the draft supplemental EIS was not available until 10 days after the DW draft permit was made available.
2. Focus Sheet - Publication 25-05-001. The Focus Sheet states that the proposed permit is limited to updates to existing, installed, and operable treatment units. This update is against the Permit initially issued in 1999. I would appreciate if Ecology can make the current version of the 1999 permit publicly available on your web page. The lack of redline/strike outs in the review files makes it hard to understand the nature of the "updates" performed in support of permit renewal.
3. Focus Sheet - Publication 25-05-001. Page 1 of the Focus Sheet states that there is a Mixed Waste Thermal Area, but the DWMU list on page 2 does not include incineration in the Bulk Processing Units (Mixed Waste Thermal Area). The public has not been fully informed that PFNW is operating equipment that performs the exact same functions as an incinerator, even if it has a euphemistic name. Ecology should use the more generally understood, and appropriate, "incinerator" name. Tritium fed to this incinerator goes 100% up the stack to be disposed to the air.

4. Nuclear Waste Program Response to Comments Publication 21-05-009. In Publication 21-05-009, March 2021, Ecology noted that “Depending on the source of the treatment campaign, powder or brine generated from the secondary treatment train [from WTP/ETF] may require additional treatment (grout) to meet RCRA Land disposal Restrictions (LDRs), and waste acceptance criteria for the RCRA disposal facility [e.g., Integrated Disposal Facility (IDF)]. DOE stated to Ecology that two alternatives are being considered: (1) on- site treatment or (2) off-site treatment at PERMA-FIX Northwest (PFNW). DOE has not submitted a permit modification request to support either alternative. Ecology is separately preparing a SEPA evaluation (EIS supplement) to support renewal of the PFNW RCRA permit. The PFNW permit renewal will include Waste Acceptance Criteria that would address the potential hazards stated in this comment. **The WA State Department of Health separately imposes license limits for PFNW for the radionuclides stated in this comment.**

Of concern is that the WA State Department of Health continually receives poor results from program reviews conducted by the NRC. On October 4, 2024, the NRC published a letter regarding “Washington FY 2024 FINAL FOLLOW-UP IMPEP Report,” (John Lubinski, NRC, to Umair Shah, WA Secretary of Health.) Washington’s DOH performance was found to be “unsatisfactory for two performance indicators: Status of Materials Inspection Program and Technical Quality of Incident and Allegation Activities.” Other aspects were deemed to need improvement. There is a synergy between radioactive and chemical exposure such that exposure to both is worse than the sum of the parts. Ecology should be aware that reliance on DOH for control of radioisotopes is a risk to the public.

5. WA DOH has three licenses for PFNW, one for low level radioactive materials, one for mixed waste materials, and a radioactive air emissions license. PFNW has routinely and aggressively requested increases in license limits. For example, on December 22, 2020, PFNW requested an amendment to allow an individual isotopic limit of 2,000 Ci (74 TBq) of Tritium (Letter PFNW to Cheryl Rogers, DOH). By the time PFNW submitted the 2022 license renewal application, this value had morphed into a request for “2,000,000 Ci (74TBq)” or “**60,000,000 Ci (74 TBq)**”. In either case, the math in the application was wrong (see the attachment). There are about 29 Ci in 1 TBq. Had DOH not caught this, PFNW would be allowed thousands of times more than the limit proposed. Ecology should be aware of the PFNW Quality Assurance weakness in not recognizing obviously wrong calculations. Similar errors could occur in the DW Permit draft and in the draft SEIS.
6. Transmittal Letter, 25-NWP-001, from Ecology to Perma-Fix Northwest, notes that Ecology has found multiple areas of incompleteness and concern in the process of iterating the draft permit for renewal (starting in 2019). The letter states that Ecology “worked with” PFNW to resolve the deficiencies, with a final application received on August 28, 2024. For six years PFNW has been unable to produce a compliant

application. PFNW was only able to create a compliant application with coaching by Ecology. In fact, on Monday March 11, 2019, the Spokesman Review newspaper reprinted an article from the Tri-City Herald, entitled "State is Taking a New Look at this Richland Radioactive Waste Plant." The article states that in 2019 the permit was already a decade overdue for renewal, and that PFNW had been submitting applications for renewal beginning in 2009. Applications submitted in 2009, 2011, and 2015 were found by Ecology to be deficient, in addition to the ones from 2019 and 2021 mentioned in the Transmittal Letter. The Transmittal Letter is therefore incomplete because it omits prior failed applications. Further, the Tri-City Herald Article quotes Ecology as having conducted workshops with PFNW as "frequently as every week from 2015 to 2018" to help PFNW work through the process. If Ecology has been working weekly with PFNW for what looks like 10 years, this has the appearance of a conflict of interest, with Ecology now having ownership of this permit. An independent review is needed before this draft permit can be approved. Ecology should not be reviewing your own work, which is contrary to Quality Assurance requirements. With the long history of incompleteness, this permit should have been revoked, to protect public safety.

7. Permit Conditions, page i. Page i has a "TBD" for the effective period for this permit. The existing permit conditions (at least from May 28, 1999) show the effective period to be 10 years. Ecology should provide a definite effective period prior to public review. "TBD" is unhelpful. This permit should be limited, as a minimum, to the period for which the equipment is able to meet its design life. The facility is already well-used.
8. Permit Conditions Change Control Log – this change control log is blank, but there have been multiple changes. The last existing Permit Conditions section for this permit was issued on May 28, 1999, and it was identified as revision 9. The change control log should be edited to include all prior changes. The permit renewal is **renewal** of the existing permit, not issue of a brand-new permit.
9. Permit Conditions, page 8. Page 8 identifies 9 miscellaneous DWMUs for Mixed Waste. None of the bullets listed seems to identify a thermal unit, despite the Mixed Waste Thermal Unit being listed as a portion of the facility. Is a bulk processing mixed waste incinerator part of this permit? If not, the permit conditions should clearly prohibit thermal treatment (incineration or vitrification) of mixed waste. Does "stabilization" or "chemical oxidation/reduction" include incineration?
10. Permit Condition 1.2.2.1. No part of this permit should be transferable to the "Geomelt®" Vitrification System installed at PFNW, but belonging to a different company, Veolia. Geomelt® is in the process of preparing an NOC at the Benton Clean Air Agency – and those actions affect this permit. Veolia is preparing a non-Radiological emissions estimate. BCAA believes the Geomelt® activities should be

part of the PFNW permit.

11. Permit Condition 1.2.2.4. The Geomelt® Equipment should have financial assurance provided by Veolia, and Guaranteed by PFNW, due to shared off-gas equipment.
12. Permit Conditions 2.2.3-2.2.5. Profiles for all waste streams should be publicly available. Current waste stream profiles for the existing permit should be provided as part of the permit renewal public review so that the public can have a better idea of what is to be treated. The same profiles or profiles plus margin should be provided for public review in the draft SEIS, so that the extent of SEIS coverage is obvious.
13. Permit Condition 2.8.1. This condition refers to a “local emergency plan” without identifying the author. Can you specify whose plan this is and where it can be found?
14. Permit Condition Omissions – Permit Conditions omit conditions that are present in the May 28, 1999 permit (Modules I and II). Missing is the requirement for shutting down waste management operations if ventilation is lost, resulting in loss of negative air pressure. Also missing is the requirement to not down-blend PCBs to meet concentration requirements. What else has been deleted? The lack of a redline/strikeout on the permit conditions makes it hard to understand what has been changed. How about required notifications for receipt of mixed waste from foreign sources? Conditions are needed to limit maximum production and equipment capacity.
15. Addendum A – Part A Form. The form issued for public review is identified as Revision 4, August 2024. However, this is not the correct revision. The prior PFNW Dangerous Waste Part A Permit Form is dated July 12, 2013, and it is identified as Revision 5. Ecology should check all sections for the proper revisions and dates, to ensure good quality assurance. The change control log should be updated accordingly.
16. Addendum A - Part A Form. I checked some of the changes between the existing Part A Permit Application (Mixed Waste Facility Rev 5, dated July 12, 2013), and the currently proposed Part A. There are huge differences between these forms. Ecology should provide an explanation for all changes and a red line strike out copy. For example: The 8,000-gallon tank treatment capacity was removed. Did it undergo closure? Estimated annual quantities of wastes with codes D004 to D011 have been increased from less than a thousand metric tons per year to 10,000 metric tons per year. This is an increase by a factor of 10. Waste code F039 increased from 42 metric tons per year to 10,000 metric tons per year. Waste Codes WT01 and WT02 **increased from 1 metric ton per year to 10,000 metric tons** per year.

This is a major capacity increase. It will help if Ecology can explain why the changes are made.

17. The existing Part A Application underpinned a City of Richland Substantial Development Permit. With this new expansion, why is a new Substantial Development Permit not needed? The Part A, Rev 5 total treatment capacity (in 2013) was 8.2 short tons/hour plus 8,000 gallons/day. Assuming a density of 1 kg/L, the Part A Rev 5 mass capacity was 230 short tons per day. Today's proposal is for **503.6** short tons per day. It is more than a doubling of capacity.
18. Part A Form, Page 4. The last line on this page is for an unknown permit number Class V UIC Well for Building 13-001, registered in 2000. Building 13 is the Mixed Waste Facility. Why is an injection well located beneath this facility? Given that the facility is old, and its joints may be deteriorated, can this well direct spills to the water table? How much of this facility is approaching the end of its design life? These topics are omitted from the draft SEIS. These topics should be covered in the draft SEIS before including the activities in this permit.
19. Part A Form. Table A-1, Miscellaneous DWMU Summary has units of tons/day capacity (this is 2,000 lb/ton?) Sections XII and XIII use units of "N" for short tons per day. Section IX, however, uses metric tons "M" to describe the estimated annual quantity of each type of dangerous waste. The use of multiple units of measure makes it very difficult to determine how much of each material will be handled annually. Can you make all the units the same? For example, the estimated annual quantity of D003 waste (reactive/pyrophoric) is 69 Metric Tons treated (T04) and/or stored. This is 69,000 kilograms to be drained, encapsulated, cut, or benchtop treated. The process design capacity for T04 is 503.6 short tons per day. To compare the amount allowed with the capacity for each waste means repeatedly converting units. 503.6 short tons (2,000 lb each) is 228.43 Metric Tons/day. And to do this you have to look up the Part A form codes from EPA. The result here is that reactive waste is limited to about 1/3 day's design capacity. How are the processing limits verified? It's just hard to figure anything out.
20. The Part A Form clearly identifies Mixed Waste Thermal Treatment areas, but thermal treatment is not identified as an option in the treatment codes. EPA specifies "H040" as the code for incineration or thermal destruction of hazardous waste, excluding using it as a fuel. H040 seems to be a match, which would make the Part A much clearer. H040 must also be used on hazardous waste manifests, if the waste is to be thermally treated. Can you use the more correct code, so the public knows about the incineration? Please see:
https://www.epa.gov/system/files/documents/2022-12/excerpt_biennial_report_rcra_subtitleC_forms_and_instructions_updated_on_12_28_22.pdf. Using T04, "Other Treatment" is too vague. "X99" does not seem to be a valid process code for thermal treatment. H040 is a valid management and

treatment code.

21. Part A Table IV calls out Dangerous Waste Codes and annual "Estimated" quantities. However, many entries are for a range of codes. For example, U001 through U012 is allotted an estimated quantity of 10 Metric Tons per year. This range is for several chemicals including acetonitrile (Methyl Cyanide), which as a chemical product is U003, and acetone. Is the estimated amount a sum for all, or is it intended to be a limit for each? The entries should be clear, because the amount that can be held is very different if it is multiplied by 12. Is PFNW expecting to have 10 MT/year of the combined items? Who keeps track? What is the limit on the amount or concentration of acetonitrile?
22. Figure A-28 in the Part A attachment is a photograph that shows the MWNT-11 area to be very messy and to have what appears to be a big hose for ventilation. What is used to verify the integrity of this equipment?
23. Addendum A, Attachment A to Part A form Figures A-29 - A-31 show seams in the concrete floor. How are these verified to contain waste if there is a leak? Are there joints? How old are the joints? What is done to check for deterioration?
24. Addendum B, page B.6. The document states that the Low-Level Thermal Facility uses thermal processes (bulk processing unit incineration). Does the Mixed Waste Thermal Facility also use a similar thermal process? Where is the Geomelt[®] equipment located? The BPU's? Note that leaving unused but operable equipment out of the DW permit creates a risk that it will be operated in error, creating a safety hazard. Ecology should check for all unused/abandoned equipment to make sure it is removed/closed or locked and tagged out. If PFNW is planning to add new wastes or equipment, these should be considered now, since there are potential consequences to their simultaneous operation. The public should not be "surprised" with new equipment and wastes in the future. The public should also be given a list of prior equipment that has been removed.
25. Addendum B, page B.8. Railcar unloading was not analyzed in the 1998 SEIS.
26. Addendum B, page B.9 discusses chemical resistant water stops, but does not distinguish between newer and older parts of the facility. How is water stop integrity verified as the stops deteriorate over time? What is the design life of each part of the facility?
27. Addendum B, page B.15 describes land use in the vicinity but omits many neighbors, such as the adjacent Central Washington Corn Processors. This entry should be more complete. The map in the PFNW Emergency Plan, filed with the DOH, has a much better list, although it also omits the new apartments at the

intersection of Highway 240 and Kingsgate.

28. Addendum D – PFNW has been hosting the operations of Veolia's Geomelt® Vitrification Equipment which is high temperature treatment (just like incineration). Addendum D does not include the Geomelt® equipment, although Geomelt® is clearly called out by DOH licensees as an intermittently operated Mixed Waste process. DOH Air License Attachment RAEL-012, "Air Attachment to Radioactive Materials Licenses WN-I0393-1 and I0508-1," states that the DOH license covers temporary operations of the Geomelt® System. DOH identifies Geomelt® as a Mixed Waste Thermal Unit comprised of melt box assemblies, hood removal, and monolith packaging, with a connection to the PFNW Mixed Waste Thermal Unit Primary Exhauster. If this equipment is installed, it should be identified in Ecology's DW permit, with a statement about its status and plans for the future. This equipment vitrifies reactive, dangerous, mixed waste, such as sodium. If unused, it's a tripping hazard and it should undergo closure. If unused, its DOH license should be cancelled. If planned for use, it should not be omitted from this permit application.

Note that the DOH Attachment calls out an assumed decontamination factor for the effluent gas treatment system in the MWTU of 2000 (for the MWTH building filter train.) Except of course, tritium, and other gas phase isotopes from Geomelt® are not captured and go straight up the stack. Ecology should coordinate mixed waste scope with the other permits. An integrated permit plan and configuration sheet would be helpful.

29. Addendum D, Page D.7 identifies container storage units and miscellaneous DWMUs but omits the storage of mixed waste in the railcar unloading area. What is its capacity for solids and liquids? How long will waste be allowed to stay there? The railcar unloading area should be identified as a container storage area.
30. Addendum D, Page D.10 Table D-2 has a total MW treatment capacity of 727.78 short tons per day. How does this compare to SEIS alternatives? To past limits?
31. Addendum D, Page D.11, Table D-3 identifies waste codes accepted for treatment. However, U003 (Acetonitrile) is not among the accepted wastes, except for decanting (a bad batch) or storage. Is Acetonitrile a new waste to PFNW? How have the hazards been evaluated? Since acetonitrile is part of an effluent mixture, is it WT01 or WT02? What happens to it in the ventilation system? At the connections to a rail car? At the connections to a transport tote?
32. Addendum D and Permit Conditions - It would help to note specifically which wastes are prohibited from each piece of equipment. It's probably a short list, but it would be meaningful for understanding the permit. Reactive and shock sensitive waste should not undergo mechanical handling?

33. Addendum D, Page D-21 – this page provides that a maximum volume of 2 gallons liquid or 10 lb solid waste is treated in the bench scale waste treatment system at any time. Are liquids and solids allowed to be mixed? Is the limit a sum of fractions rule or liquids-only and solids-only? This limit would be helpful with a SHALL designation in the permit conditions. It would help to do the same thing for all units so that the limits are easy to find and understand. For air emissions, is there any emissions monitoring or treatment present for the exhaust system? Can volatiles escape?
34. Addendum D, Page D.50 – what is the age of the MWF and its chemical stops? Has the design life of the coatings and seals expired? How often does Ecology perform an inspection?
35. Addendum D, Page D.52 – It looks like air emission standards for equipment leaks should apply to the in-container mixer (plus other equipment) and not just the pump and hose, since the mixer may also contact liquids with at least 10% organics. Rail cars? If PFNW is relying on waste streams being below 10 wt% organics, there should be a permit condition requiring analysis before waste is shipped, and after waste arrives. Previous shipments received at PFNW have violated acceptance criteria and should be prevented. See Hanford Challenge's report "Risky Business at PFNW¹".
36. How are emissions prevented from railcars? Will the railcars contain ammonia or acetonitrile? Ammonia and acetonitrile spills and releases to the air are not analyzed in the draft SEIS.
37. Addendum E, Page E.9 – Addendum E, Page E.9 states that the MWF has not conducted corrective actions. This is contradicted by Corrective Actions listed in PFNW annual Environmental Reports, submitted to the DOH. For example, the following required corrective action:
- February 6, 2023 – pH too high, exposure to fumes while sampling treated waste. The reagents generated a gas. Correction was to use a sampling tent.
- July 19, 2023 – Tote pressure excursion resulted in material rupturing out of the fill port. Correction was to install pressure relief lids on the totes.
- June 8, 2022 – Brush fire, assumed to be caused by electrical failure of the environmental air sample pump. (So, this pump was out of service? For how long?)

¹ A copy of this report is located at

<https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fce533274a40730fbc928bf/1607357241336/2020+12.04+PermaFix+Report+updated.pdf>.

June 27, 2022 – Tanker dragged with brakes locked.

June 6, 2021 – Forklift ignited.

August 19, 2020 – Loss of radioactive material during container offload. Loss of contamination control.

April 1, 2019 – Mixed Waste Facility Water Leak. Standing water pumped into totes. Secondary containment insufficient?

May 17, 2019 – Mixed Waste Facility Package FIRE.

June 13, 2019 – Mixed Waste Facility Stack Sampling Filter Cross-Contamination. Exceeded the investigation level for stack effluent air.

November 12, 2019 – Mixed Waste Facility - Geomelt® Loss of Contamination Control. Contamination with Uranium Oxide powder – spread of contamination. NOTE: Uranium Oxide is a kidney toxin and is regarded as a hazardous waste. See <https://www.energy.gov/nnsa/articles/sds-uranium-oxide-u3o8>. Decay products of uranium include lead, which is also toxic.

December 16, 2019 – Mixed Waste Facility – Depleted Uranium turnings microencapsulation container fire. This is the ignition of a pyrophoric waste.

June 19, 2017 – Mixed Waste Facility Drum Leak.

October 27, 2016 – Process Off-gas Duct Breach – this resulted in a “temporary patch” for the LLW Off-Gas duct. How vulnerable is the MWF ductwork?

April 13, 2015 – Uncontrolled Material Rotation resulting in pinched supplied air-line, Mixed Waste Facility.

August 5, 2015 – Portable gantry crane tip over and containment damage.

October 14, 2015 – Rupture in Low Level Thermal Building Process Off Gas Line. **This item had been in service for 15 years.**

November 23, 2015 – Dry Spill in outdoor storage yard – forklift with sliding cover block. “Environmental Impact - This is an area that was currently under investigation due to elevated soil sample results. **This event may have contributed to the problem** but is well inside the owner controlled boundary and “not expected” to spread outside the radiological controlled area.”

June 19, 2013 – Release of Radioactive material from Package during container off-

load. Mixed Waste Facility Unloading Pad and Storage Bay. If radioactive material was released, dangerous waste was probably released too.

MORE: Additional Corrective Actions are detailed in the reports at the following links (the reports can be searched for “corrective actions.”):

<https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fbc6e44b7ee8e70758f05ba/1606184517426/Quick+Facts.pdf>

<https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fce533274a40730fbc928bf/1607357241336/2020+12.04+PermaFix+Report+updated.pdf>

38. Appendix IA.b, Closure Cost Estimate. The inflation adjustment is only for the year 2022. The inflation adjustment should be made to include 2025.
39. App DA-7, Process Flow Diagram – Omits the ventilation systems. The off-gas treatment systems should be shown on a PFD with details for all unit operations. How are chemicals such as ammonia and acetonitrile to be treated? How is the off-gas monitored for noxious fumes?
40. The Addendum C Waste Analysis Plan states that fingerprint testing parameters include cyanides if the waste produces hydrogen cyanide upon acidification below a pH of 2. Cyanide waste is to be stabilized and not treated with acid. Please note that the International Programme on Chemical Safety has a report about Acetonitrile². The report points out that Acetonitrile produces hydrogen cyanide when heated to decomposition *or when reacted with acids or oxidizing agents*.

Further, Addendum F, Procedures to Prevent Hazards, contains requirements to inspect and log data for dangerous material having total organics equal to or greater than 10%. Acetonitrile is both an organic waste and a cyanide bearing waste. It would be helpful to have a section of permit conditions specific to the acetonitrile-concentrate from ETF. (Please note that Addendum F refers to “Subpart BB” but does not define where Subpart BB is located. Is this RCRA Subpart BB?)

41. Addendum E, Releases from Solid Waste Management Units, Page Addendum E.9, claims that a Site Hazard Assessment by Jacobs Engineering in January 2000, concluded that “no further action” was warranted, that the current property is the same as existed under ATG at the time of the report writing in 2000. Yet there are “hot spots” and spills experienced. The Jacobs Engineering January 2000 report should be made available for public review and compared to today’s site.

² This report is located at <https://www.inchem.org/documents/ehc/ehc/ehc154.htm>.

Email Address <u>dutley@perma-fix.com</u>	X Attachment C, Duties of the Radiation Safety Officer, completed, signed, and attached or <input type="checkbox"/> Equivalent duties signed and attached.	
6. Radioactive Material (element and mass number of each)	7. Physical Form (liquid, solid, gas), and Chemical Form (bound or unbound), and/or Sealed Source Manufacturer and Model Number	8. Maximum Possession Limit (maximum activity the applicant will possess at any one time, in mCi)
A. <u>Any radioactive material Atomic Numbers 2-83</u>	A. <u>Solid or Liquid form (contamination as received or possessed, on equipment or in waste form) sources for processing, or irradiated hardware</u>	A. <u>380,000 mCi</u> <u>Iodine 129-500 mCi</u>
B. <u>Special Nuclear Material</u>	B. <u>Solid or Liquid form (contamination as received or possessed, on equipment or in waste form), sources for processing, or irradiated hardware</u>	B. <u>Not to exceed unity formula quantities as specified in WAC 246-220-010 under the definition "Special Nuclear Material in quantities sufficient to form a critical mass."</u>
C. <u>Source Material</u>	C. <u>Solid or Liquid form (contamination as received or possessed, on equipment or in waste form), sources for processing, or irradiated hardware.</u>	C. <u>6,000 kilograms total (2016 mCi if U-238)</u>
D. <u>Any other radioactive material, Atomic Numbers 84-103, except Special Nuclear material and source material.</u>	D. <u>Solid or Liquid form (contamination as received or possessed, on equipment or in waste form) sources for processing, or irradiated hardware</u>	D. <u>10,000 mCi</u>
E. <u>Radioactive material Atomic Numbers 1-83</u>	E. <u>Solid or Liquid form (contaminated as received or possessed, on equipment or in waste form). Half-life <=170 days</u>	E. <u>50,000 mCi</u>
F. <u>Radioactive material Atomic Numbers 1-103</u>	F. <u>Check or Calibration source in any form.</u>	F. <u>Total activity (exempt quantity sources not included) in total not to exceed 100 mCi (3.7 GBq)</u>
G. <u>Radioactive Material Atomic Number 1 (Tritium)</u>	G. <u>Solid form (contamination, as received or possessed on articles or in waste form) sources for processing, or irradiated hardware</u> <u>Liquid form, (containing contamination as received or possessed or in waste form), sources for processing</u>	G. <u>Total activity not to exceed 2,000,000 curies (74 TBq)</u>
H. <u>Radioactive Material Atomic Number 1 (Tritium)</u>	H. <u>Solid form (contamination, as received or possessed on articles or in waste form) sources for processing, or irradiated hardware</u> <u>Liquid form, (containing contamination as received or possessed or in waste form), sources for processing</u>	H. <u>Total activity not to exceed 60,000,000 curies (74 TBq)</u>
9.A. Use and/or Device Description (provide a brief description of the use and purpose of radioactive material, or for sealed source device in which source is used—lettering should correspond to lettering in Item 6 above)		
A-D	For Cutting, shearing, shredding, mixing, compaction, and encapsulation of dry waste. For solidification mixing of liquid wastes. For the thermal treatment of liquid or solid waste. For the use in the development	

State of Washington
Radioactive Materials License



License Number: WN-I0393-1
 Amendment Number 49

<p>6.D. Any other radioactive material, Atomic Numbers 84-103, except Special Nuclear Material and source material.</p>	<p>7.D.1. Solid form (contamination, as received or possessed, on articles or in waste form) sources or irradiated hardware, excluding RCRA or Washington State Dangerous, or explosive materials except as authorized in 9.A-D(11).</p> <p>7.D.2. Liquid form (containing contamination as received or possessed or in waste form) excluding RCRA or Washington State Hazardous, or explosive materials except as authorized in 9.A-D(11).</p>	<p>8.D. 10 curies (370 GBq) total, except as specified in License Condition 9.D.</p>
<p>6.E. Radioactive material, Atomic Numbers 1-83.</p>	<p>7.E. Dry packaged radioactive material/waste.</p>	<p>8.E. 50 curies (1.85 TBq).</p>
<p>6.F. Any radioactive material.</p>	<p>7.F. Specifically licensed check or calibration sources in any form.</p>	<p>8.F. Total activity not to exceed 0.1 curie (3.7 GBq).</p>
<p>6.G. Tritium (H-3)</p>	<p>7.G.1. Solid form (contamination, as received or possessed, on articles or in waste form) sources for processing, or irradiated hardware excluding RCRA or Washington State Dangerous, or explosive materials except as authorized in 9.G(11).</p>	<p>8.G. Total activity not to exceed 2,000 curies (74 TBq)</p>