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DEPARTMENT OF ECOLOGY

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October 4, 1999

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Mr. Alan J. Dobson, Head of Operations and Safety
British Nuclear Fuels Limited, Inc.
River Protection Project – Waste Treatment Plant
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Dobson:

Thank you for your letter of August 10, 1999, (received August 13, 1999) outlining British Nuclear Fuels Limited, Inc.'s (BNFL's) proposed approaches for design and operation of dangerous waste tank systems. Thank you also for the briefing your staff provided Washington State Department of Ecology (Ecology) staff on the same issue, July 27, 1999.

This letter is to communicate in two (2) areas. First, a summary of the requirements from the Dangerous Waste Regulations (Chapter 173-303 Washington Administrative Code [WAC]) that Ecology believes apply to dangerous waste tank system design and operation; and second, a summary of Ecology's understandings of your proposals to comply with the regulations and our response. The regulation summaries, understandings of your proposals, and Ecology responses are grouped by the four (4) issue areas identified in your letter: overflow protection approaches for tanks, tank integrity evaluation, secondary containment system for tank systems, and tank inspection approach. We have also included information on additional dangerous waste tank system requirements that were not specifically addressed in your proposal. Please note, the regulation summaries are to support this discussion only. For all future work and for reference, you should refer to the actual regulations.

In addition, for each issue area, we have included in our responses specific information on the types of permit conditions for dangerous waste tank system design and operation that Ecology anticipates based on the documents we have reviewed to date. For ease of discussion, these paragraphs are numbered consecutively from the beginning to end of this letter. Please note, this is for discussion purposes only. As you know, final permit conditions are developed through a public process in which both your proposals and the concerns of the public and other stakeholders will be considered. As part of promoting an open and inclusive permitting process for the River Protection Project – Waste Treatment Plant (RPP – WTP), we will post this letter on Ecology's Internet page about RPP – WTP permitting. We would also like to post your letter of August 10, 1999; to facilitate, please send an electronic copy.

As you know, the current schedule calls for a final decision to be made about the RPP – WTP permit modification to the dangerous waste portion of the Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit significantly in advance of when you plan to begin to accept dangerous or mixed waste at the RPP – WTP facility. Schedules of compliance can be used in the final permit to address some issues after the final permitting decision is made (but before waste is accepted) at the RPP – WTP facility. To the extent you are interested in taking this approach for any given issue, please let us know.

Finally, Ecology has prepared this letter in consideration of our discussions to date. As work on your permit application continues, new issues may be identified and Ecology's thinking on these issues may evolve. The information in this letter is specific to the RPP – WTP and should not be taken as an indication of Ecology policy at any other dangerous waste treatment, storage; or disposal unit or facility.

Overflow Protection Approach

Under WAC 173-303-640(5)(b), owners/operators who treat or store dangerous waste in tanks must use appropriate controls and practices to prevent spills and overflows from tanks or containment systems. These must include: spill prevention controls (e.g., check valves, dry disconnect couplings, etc.); overfill prevention controls (e.g., level sensing devices, high level alarms, automatic feed cutoff, or bypass to a standby tank); and maintenance of sufficient free board in uncovered tanks to prevent over topping by wave or wind action or by precipitation.

To meet these requirements, you have proposed to prevent overflows from dangerous waste tanks through a combination of vessel capacity, inventory control, primary tank level monitoring, high-level instrument control system alarms, and automatic interlock/trip action. For most tanks, you have proposed to prevent overflows through inventory control and primary tank level monitoring. You have proposed that tank level alarms will be appropriately set within high and low level ranges and will annunciate when there are deviations from set operating limits. For tanks with high operational and environmental impact in terms of an accident or release consequence, in addition to inventory control and primary tank level monitoring, you have proposed to prevent overflows with an automatic interlock/trip action which will shut off feed to the affected tank(s) when high level settings are exceeded.

In the event of an overflow, you have proposed that designated overflow piping will route materials to other tanks rather than overflowing directly to secondary containment. You have proposed to use the logic outlined in the Tank Overflow Design Decision Matrix (Figure 1) to determine overflow design for individual tanks. The first step in the matrix is to decide whether or not the individual tank needs overflow protection. Ecology understands that all dangerous waste tanks will have overflow protection. The second step is to determine if case-specific overflow design needs to be incorporated due to waste viscosity, solids content, or adverse chemical or physical reactions, or if standard design can be used. The next series of steps determines the destination for the overflow: can it go to the sending or receiving tank, to a nearby tank, etc., or as a last resort, to the cell sump.

Based on your proposal, Ecology's understanding of anticipated facility design and operation, and the dangerous waste regulations, we anticipate that permit conditions for dangerous waste tank overflow protection will, at a minimum, require you do the following:

1. Provide each tank used to treat, store, or accumulate dangerous or mixed waste with: a primary tank level monitoring device; a high level alarm; and if needed, an automatic interlock/trip action that automatically shuts down feed to affected tank(s) when high level settings are exceeded. When possible, overflows should be routed to another tank and not discharged directly to secondary containment. Ecology anticipates this condition will specify the details of your overfill prevention strategy for each tank, including: the operation and maintenance of a tank inventory tracking system that will, during plant operations, record tank inventory in real time; operation and maintenance of specific tank level monitoring devices; operation and maintenance of specific tank level alarms

including set levels for tank alarms; operation and maintenance of specific automatic interlock/trip actions; and, in the event of an overflow, specific overflow destinations and tracking of overflow amount. So Ecology may consider your plans when developing this permit condition, in your permit application, please provide by dangerous waste tank, your proposed details for the overfill protection strategy including those specific details identified above.

Material and Design Standards

Under WAC 173-303-640(3)(a), owners/operators who treat or store dangerous waste in new tank systems or components must obtain a written assessment certified by an independent, qualified, professional engineer registered in the state of Washington attesting that the tank system will have sufficient structural integrity and is acceptable for treating or storing dangerous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be treated or stored, and corrosion protection to ensure that it will not collapse, rupture, or fail. At a minimum, the assessment must include: structural design standards and criteria used with reference to applicable industry standards and recommended practice codes; dangerous characteristics of the wastes to be handled; specific information on corrosion potential and prevention for new systems or components in which the external shell of a metal tank or any external metal component of the tank system will be in contact with the soil or water, including requirements under WAC 173-303-640(g) where owners/operators of dangerous waste tank systems must provide the type and degree of corrosion protection recommended by an independent corrosion expert; design considerations to ensure that tank foundations will maintain the load of a full tank, tank systems will be anchored to prevent flotation or dislodgment where the tank system is either placed in a saturated zone or is located less than five-hundred (500) feet from a fault which has had displacement in Holocene times, and tank systems will withstand the effects of frost heave; and, for underground tank system components that are likely to be adversely affected by vehicular traffic, a determination of design or operational measures that will protect the tank system against potential damage. Also, please note facility design and operational requirements are also governed by Hanford Facility RCRA Permit general condition II.L.

To meet these requirements, you have proposed to construct the majority of tanks that will be used to treat, store, or accumulate dangerous waste out of austenitic stainless steel and to use ASME Boiler & Pressure Vessel Code, Section VIII, Div. 1 (ASME Section VIII code) as minimum design standards. Other materials of construction you are considering include hastelloy, titanium, zirconium, and inconel. For tank system ancillary equipment, you have proposed to use ASME B31.3 Process Piping Code for tank system process piping, and ASME B16.5 and B16.34 for tank system flanges and valves, applying corrosion protection measures as necessary. You propose that all in-cell piping will be seamless and all joints will be welded (no flanges will be allowed). You have not specifically identified material selection for ancillary equipment. You propose to operate most tanks at or near atmospheric pressure conditions, and assert tank integrity will be reinforced by additional requirements of the tank group and the seismic category assigned to each tank. Tank groups are from 1 through 5, with 1 being highest integrity tanks, 2 and 3 being high integrity tanks, 4 being medium integrity tanks, and 5 being commercial standard tanks. The tank group assignment determines the percentage of specific welds in each tank group that will be inspected by radiography examination. You propose to designate all in-cell tanks as group 1, 2, or 3 tanks. Seismic classifications to be used are SC-1 through SC-IV; SC-1 meaning system, structure, and components (SSC) are important to safety and have a seismic safety function; SC-II meaning SSC are important to safety whose failure during a seismic event could prevent a SC-1 SSC from performing its seismic safety function; SC-III meaning SSC

are important to safety but without a seismic safety function or SSC are not important to safety but have a significant inventory of radioactive or hazardous material; and SC-IV meaning SSC is not important to safety and is without a significant inventory of radioactive or hazardous waste. You propose to assign seismic classification for each tank group as follows; group 1 tanks are assigned SC-1 seismic classification, group 2 tanks are assigned SC-II seismic classification, and group 3 tanks are assigned SC-III seismic classification.

Based on your proposal, Ecology's understanding of waste tank system operations, and the dangerous waste regulations, permit conditions for design of dangerous waste tank systems will, at a minimum, require you do the following:

2. Treat, store, accumulate, and transfer dangerous waste only in specific, approved tank systems. The approved tank systems will be specified in your permit. So Ecology can consider your plans in this area, please ensure that your permit application specifically identifies each tank and all ancillary equipment that you would like to use to treat, store, accumulate, or transfer dangerous waste and the specific types of dangerous waste (and their associated dangerous or hazardous characteristics) that will be treated, stored, accumulated, or transferred in each tank or in ancillary equipment.

3. Construct all tank systems used to treat, store, accumulate, or transfer dangerous waste out of a material that is compatible with the waste to be treated, stored, accumulated, or transferred, and that will provide adequate corrosion protection as required by WAC 173-303-640(3)(a)(iii) and WAC 173-303-640(3)(a)(g). Ecology anticipates that this condition will specify, by tank system, the materials of construction. So Ecology can consider your plans in this area, please include specific information on and justification for materials of construction in your permit application.

4. Design all tanks that will be used to treat, store, or accumulate dangerous waste according to the ASME Section VIII code or other Ecology approved design standards. If the ASME standard does not specifically address the design criteria specified in WAC 173-303-640(3)(a)(v), in addition, design according to standards which specifically address these design factors. So Ecology can consider your plans in this area, in your permit application, please specify and justify, tank system, the design standards you plan to use. If you would like Ecology to consider design criteria and standards in addition to the ASME standards (e.g., API Standard 650), please specify, in your permit application, the tank systems to which those criteria and standards will be applied and justify the appropriateness of the standard(s).

5. Design all ancillary equipment that will be used to treat, store, accumulate, transfer, distribute, meter, or control the flow of dangerous waste according to the ASME B31.3 code for process piping and the ASME B16.5 and B16.34 code for flanges and valves or other Ecology approved design standards. If the ASME standard does not specifically address the design criteria specified in WAC 173-303-640(3)(v), in addition, design according to standards which specifically address these design factors. So Ecology can consider your plans in this area, in your permit application, please specify and justify, by tank system component, the ancillary equipment design standards you plan to use. If you would like us to consider design criteria and standards in addition to the ASME standards, please specify, in your permit application, the tank system components to which those criteria and standards will be applied and justify the appropriateness of the standard(s).

Integrity Assessment

Under WAC 173-303-640(2), owners/operators of existing tank systems must obtain and keep on file a written assessment that attests to the tank system integrity. Under WAC 173-303-640(3)(a), owners/operators of new tank systems or components must obtain a written assessment, reviewed and certified by an independent, qualified, registered, professional engineer, attesting that the new tank system has sufficient structural integrity and is acceptable for treating or storing dangerous waste, as discussed above. In addition, under WAC 173-303-640(3)(b), owners/operators of new tank systems or components must develop a schedule for conducting integrity assessments over the life of the tank system to ensure that the tank retains its structural integrity and will not collapse, rupture, or fail.

Under WAC 173-303-640(3)(c), owners/operators of new tank systems must ensure that proper handling procedures are followed during installation to prevent damage to the system. In addition, prior to covering, enclosing, or placing a new tank system or component in use, owners/operators must obtain an inspection by an independent, qualified, installation inspector or an independent, qualified, registered, professional engineer, for weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, and other structural damage or inadequate construction/installation. All discrepancies must then be remedied before a tank system is covered, enclosed, or placed into use.

Under WAC 173-303-640(3)(d), owners/operators of dangerous waste tank systems must ensure that new tank systems or components that are placed underground, and that are backfilled, are provided with a backfill material that is noncorrosive, porous, and homogenous. The new tank systems or components must be installed in such a way that the backfill material is placed completely around the tank, and compacted to ensure that the tank and piping are uniformly supported.Under WAC 173-303-640(3)(e), owners/operators of dangerous waste tank systems must ensure that prior to covering, enclosing, or placing the tank system into use all new tanks and ancillary equipment is tested for tightness. If leaks are found in the tank system during tightness testing, all repairs necessary to remedy the leaks must be made prior to the tank system being covered, enclosed, or placed into use.

Under WAC 173-303-640(3)(f), owners/operators of dangerous waste ancillary equipment must ensure that the ancillary equipment is supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, and contraction.

Under WAC 173-303-640(g), owners/operators of dangerous waste tank systems must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information required under WAC 173-303-640(3)(a)(iii), or other corrosion protection if Ecology believes it is necessary to ensure tank system integrity. Any installation of a field fabricated corrosion protection system must be supervised by an independent corrosion expert.

Also, please note facility design and operational requirements are also governed by Hanford Facility RCRA Permit general condition II.L.

In addition to your proposals discussed under material and design standards, to meet the requirements of WAC 173-303-640(3)(a)-(g), you have proposed that an independent, professional engineer will attest to the adequate design and integrity of dangerous waste tanks and ancillary equipment. You have proposed to manage tank assessment activities through "issued specifications" for design, fabrication, and supplementary elements (e.g., heat exchangers). The specifications for design will cover the requirements for pressure

vessel design, specify application of data sheets and standards, and provide guidelines for tank component design. The specifications for fabrication will cover minimum requirements for the design, fabrication, inspection, testing, and certification of tanks and provide guidelines for various processes employed during fabrication. You propose to submit the specifications to Ecology for review as part of the supporting documentation associated with your permit application. In addition, you propose to develop a tank system and component installation and inspection plan to identify key components to be confirmed during installation and testing activities. You propose to submit to Ecology completed tank system integrity assessment reports after tank systems have been installed and tested.

Based on your proposal, Ecology's understanding of waste tank system operations, and the dangerous waste regulations, permit conditions for completing and submitting integrity assessment and installation and testing information for dangerous waste tank systems will, at a minimum, require you do the following:

6. Prior to beginning construction on each portion of the RPP – WTP, submit to Ecology for review and approval a written, tank system design assessment report reviewed and certified by an independent, qualified, registered, professional engineer, attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of dangerous waste in accordance with WAC 173-303-640(3)(a). If the assessment is submitted after your request for a modification to the Hanford Facility RCRA Permit, it must be certified in accordance with WAC 173-303-810(13). Also, please note permit modification and certification requirements are also governed by Hanford Facility RCRA Permit general conditions I.C and I.F.

   Ecology will consider allowing the assessment report to be submitted in increments; however, at a minimum, we anticipate that you will be required to submit the assessment for an entire treatment system at once (e.g., assessment for LAW Feed Receipt system, assessment for LAW Feed Evaporator system, assessment for LAW Ion Exchange system). Prior to construction of each major portion of the RPP – WTP, Ecology anticipates that you will be required to have an approved assessment that covers the entire portion of the RPP – WTP to be constructed. For example, prior to construction of the Pretreatment portion of the RPP –WTP, even if the assessment was originally submitted for individual Pretreatment system components, we anticipate you will be required to obtain Ecology review and approval of a complete assessment of the Pretreatment tank system design. (Of course, we do not anticipate duplicating reviews that have already occurred. If assessments for all the individual system components have already been reviewed and approved, this last review will be to confirm that the individual components will, as a group, continue to meet applicable requirements.)

7. Prior to receiving dangerous waste at the RPP – WTP facility, submit for Ecology review and approval a schedule for conducting integrity assessments over the life of the tank system to ensure that the tanks retain their structural integrity and will not collapse, rupture, or fail. The frequency for conducting these future integrity assessments must be based on the results of any past integrity assessments, age of the tank system, materials of construction, characteristics of the waste, and any other relevant factors as required by WAC 173-303-640(3)(b). If the integrity assessment schedule is submitted after your request for a modification to the Hanford Facility RCRA Permit, it must be certified in accordance with WAC 173-303-810(13). Also, please note permit modification and certification requirements are also governed by Hanford Facility RCRA Permit general conditions I.C. and I.F.

8. Prior to covering, enclosing, or placing the new tank system or component in use, submit for Ecology review and approval an installation inspection report, certified by an independent, qualified,

installation inspector or an independent, qualified, registered, professional engineer, either of whom is trained and experienced in the proper installation of tank systems or components. The inspection report must include all applicable requirements as detailed in WAC 173-303-640(3)(c-g). If the installation inspection report is submitted after your request for a modification to the Hanford Facility RCRA Permit, it must be certified in accordance with WAC 173-303-810(13). Also, please note permit modification and certification requirements, and certification of construction or modifications are also governed by Hanford Facility RCRA Permit general conditions I.C., I.E.12, and I.F.

Secondary Containment

Under WAC 173-303-640(4)(a)(i), owners/operators of new tank systems or components must provide secondary containment prior to the tank system or component being put into service. Under WAC 173-303-640(4)(b), secondary containment systems must be designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system, and must be capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

Under WAC 173-303-640(4)(c), at a minimum, secondary containment systems must be: constructed of or lined with materials that are compatible with the wastes to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients, physical contact with the waste, climatic conditions, and the stress of daily operations; placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression or uplift; provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous waste or accumulated liquid in the secondary containment system within twenty-four (24) hours, or at the earliest practicable time; and sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Under WAC 173-303-640(4)(d), secondary containment for tanks must include one or more of the following: a liner; vault; double-walled tank; or equivalent device approved by Ecology.

To meet these requirements, you have proposed to locate dangerous waste tanks and tank systems within indoor, enclosed, process cells built of reinforced concrete and lined with stainless steel. You have proposed that the process cells be designed to contain the volume of the largest vessel in a cell and have a sloped floor to allow drainage to a stainless steel lined sump. You have proposed that each process cell will include a washdown system to allow spray down of the stainless steel liner.

You have proposed to design the process cells so that any releases will eventually drain to an in-cell sump. You propose that alarmed level detection instruments located in each sump will alert operations to a possible release to secondary containment. In the event that material is detected in a sump, you propose to determine the type of material in the sump and the origin and release mechanism for the material. In addition, whenever material is detected within a sump, you propose to begin an investigation within twenty-four (24) hours and to remove sump contents within twenty-four (24) hours. If you are unable to remove sump contents within twenty-four (24) hours (due, e.g., to waste volume released or sump content sampling and analysis), you propose to notify Ecology and provide justification.

Based on your proposal, Ecology's understanding of waste tank system operations, and the dangerous waste regulations, permit conditions for design of tank system secondary containment and removal of accumulated waste and liquids within secondary containment will, at a minimum, require you do the following:

9. Design and construct secondary containment for tank systems as completely enclosed process cells, constructed of reinforced concrete greater than 1 meter thick for all sides, top, and bottom. Line each process cell with a material that is compatible with the waste to be treated, stored, or accumulated in the cell, at an adequate height, width, and depth to contain 100% of the capacity of the largest tank within the cell and to contain any water that would result from fire suppression and liner wash down.[1] Provide each process cell with a sump and provide for detection of material in the sump and sampling of material in the sump. Design and construct each process cell floor with a slope to allow drainage of materials to the sump. While Ecology understands you are currently developing an approach for dealing with possible ignitable and reactive waste handling issues, if you plan to accept waste that meets the definition of ignitable under WAC 173-303-090(5) or reactive under WAC 173-303-090(7), and that may form ignitable or explosive vapor, the secondary containment must be designed to protect against the formation of and ignition of vapors within the cell.

10. Design and operate the sump in each process cell so that you can detect a release of dangerous waste, or accumulated liquid, in the secondary containment system within twenty-four (24) hours. So Ecology can consider your plans in this area, in your permit application, for each process cell please specify: the minimum volume of material released to secondary containment that could be detected within twenty-four (24) hours by the level detection instrument in the sump; the level detection set-points that would initiate an alarm; how often liquid level data is reviewed; and, in wet sumps, a description of how sump liquid level evaporation rates are accounted for, and how, if at all, this affects leak detection times.

11. Remove any spilled or leaked waste, or other accumulated liquids, from the secondary containment system within twenty-four (24) hours, if possible. If you are unable to remove liquids or wastes from the secondary containment system within twenty-four (24) hours, notify Ecology as soon as this determination is made (and no later than twenty-four (24) hours after the spill, leak, or accumulated liquid was discovered), and remove the materials within as timely a manner as possible. Ecology anticipates that this permit condition will specify the details for removal of materials from secondary containment. So Ecology can consider your plans in this area, for each process cell, in your permit application, please identify: each type of potential release you anticipate could not be removed from secondary containment within the required twenty-four (24) hour time period; which types of potential releases will require sampling and analysis, and the amount of time required for completion of sampling and analysis; the volume of material in the secondary containment system that could not be removed within twenty-four (24) hours; and, any and all other factors that could affect your ability to remove wastes from the secondary containment system within twenty-four (24) hours.

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[1] Ecology understands that based on experience with DOE-complex wastes at Oak Ridge national laboratory and Savannah River Technology Center, you are planning to use austenitic stainless steel for the liner and believe that austenitic stainless steel is physically and chemically compatible with Hanford tank waste. Ecology understands that studies are on-going to document and confirm your beliefs. Like you, Ecology knows of nothing that leads us to believe austenitic stainless steel would be incompatible with Hanford tank waste and anticipate that it will be an appropriate material for the tank system; however, of course, a final determination of compatibility cannot be made until the studies are complete. We look forward to the results of your studies.

12. Provide each process cell with a washdown system for decontamination or other necessary purposes, of the cell, sump, and liner. Design and operate the washdown system with sufficient temperature, pressure, residence time, agitation, surfactants, and detergents to remove contamination. As indicated in the February 12, 1999, letter from Ms. Suzanne Dahl to Mr. Lee Bostic, because sumps that are designed as "wet sumps" will always contain a certain amount of clean water so the leak detection instrumentation to properly, it's important that the wet sumps be decontaminated after any waste release. Ecology anticipates that this permit condition will specify the details of design, operation, and maintenance of the washdown system and of sump decontamination. So Ecology can consider your plans in this area, in your permit application, please describe the details of the washdown system (including the details identified above) and please describe the procedures you plan to use to decontaminate sumps, including any associated sampling, analysis or other verification procedures.

Inspections

Under WAC 173-303-640(6), owners/operators who treat or store dangerous waste in tanks must conduct three types of inspections. First, they must develop and follow a schedule and procedure for inspecting overfill controls. Second, they must, at least once each operating day, inspect: aboveground portions of the tank system, if any, to detect corrosion or release of waste; data gathered from monitoring any leak detection equipment to ensure that the tank system is being operated according to its design; and the construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of release of dangerous waste. Third, they must inspect cathodic protection systems, if present. Owners/operators must document these inspections in the facility operating record and keep an inspection log. In addition, under WAC 173-303-320, owners or operators of dangerous waste facilities must inspect all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that help prevent, detect, or respond to hazards to public health or the environment. This includes equipment associated with tank systems. Please note, inspections, record keeping, and reporting requirements are also governed by Hanford Facility RCRA Permit general conditions I.E., I.H., II.H., II.I., and II.O.

You have proposed to comply with these requirements through daily tank monitoring activities which consist of the following elements: instrument data management; process control; operator training; alarm handling; procedures and administrative controls; and maintenance management. Because people cannot go into the process cell due to the high radiation dose, you propose to conduct all inspections through remote means. You propose to include design features within the tank system to allow periodic, "ad hoc inspections" by remote operated camera. These unscheduled camera inspections will be performed on an as needed basis. In addition, you propose that a scheduled camera inspection will be performed once every five (5) years. You have proposed that all process and leak detection instrumentation readouts will be continuously relayed to an Integrated Control System within a continuously staffed and monitored Central Control Room and that trained staff will be responsible for continuously monitoring, performing trend analysis, and recording of plant status in operator logs. You have proposed that any instrumentation critical to assurance of tank integrity will be subject to a maintenance and testing program and that the testing program will be based on instrument reliability data and past operating experiences. You propose to sample and analyze sump contents during functionality checks of the sump level detection unit. You propose to calibrate the sump level detection unit and alarms by adding a known quantity of water to the sump following emptying.

As justification for this approach, you ask Ecology to consider that integrity of the tank systems will be assured by the application of stringent tank design code, the tank quality assurance program, and the tank integrity assessment. Ecology agrees that the designs of your tank system are more robust than those of typical aboveground dangerous waste tank systems (i.e., in addition to the requirements for aboveground tank systems, the system you propose will meet many of the requirements for below ground systems, including completely enclosed secondary containment; stainless steel lined cell and sump; built-in leak detection system continuously relayed to an integrated control system within a continuously staffed, central control room; seamless in-cell piping, welded joints and connections – flanges will not be allowed.) Ecology also understands that there is a need to accommodate remote inspection techniques due to high radiological hazards. However, we will not waive the daily inspection requirement for the aboveground portion of the tank system in favor of an inspection which will occur once every five (5) years.

Based on your proposal, Ecology's understanding of waste tank system operations, and the dangerous waste regulations, permit conditions for tank system inspections will, at a minimum, require you do the following:

13. During cold operations, conduct daily visual inspections of the tank system in accordance with WAC 173-303-640(6)(b).

14. Conduct at specified frequencies, visual inspections of the tank system by remote operated camera or other specified means. The frequency for conducting these visual inspections will be based on the human and environmental hazard potential of each tank system. During visual inspections, at a minimum, look for evidence of corrosion or releases of waste. Ecology anticipates that this condition will require that your permit application document that all areas of the tanks and tank systems can be seen and inspected by the remote visual inspection system. For example, if cameras will be used to carry out visual inspections, your permit application should identify the placement and ranges of permanent cameras and the access points and ranges for other cameras and demonstrate that the cameras can be used to visually inspect the entire aboveground portion of the tank system. So Ecology can consider your plans in this area, in your permit application, please identify, by tank system, the frequency of visual inspection you propose and the reasons you believe your proposal properly considers human and environmental hazards. Based on the potential for human and environmental hazards, you may wish to inspect some elements of a tank system or secondary containment more frequently than other elements of a tank system or secondary containment. For example, you may wish to inspect the LAW feed evaporators more often than other tank system components.

15. After beginning hot operations, visually inspect, by remote operated camera or other specified means, the tanks and tank systems on an "ad hoc" basis. During visual inspections, at a minimum, look for evidence of corrosion or releases of waste. So Ecology can consider your plans in this area, in your permit application, please identify and describe all criteria and conditions that would cause you to initiate an ad hoc visual inspection. For example, you might initiate an ad hoc visual inspection in response to an unexplained liquid level rise in a cell sump.

16. Design, install, and maintain a visual inspection system (e.g., if remote cameras are to be used, design, install, and maintain the remote cameras). Ecology anticipates that this condition will include requirements to have all equipment necessary to carry out visual inspections available at the facility at all times and to maintain all elements of the visual inspection system including, for example, camera equipment, lighting to ensure that cameras can accurately record the conditions of

the tank systems, camera deployment equipment, and any associated video or other monitoring equipment. So Ecology can consider your plans in this area, in your permit application, please specify the equipment you plan to use for visual inspections and the procedures you plan to use to deploy and maintain the equipment.

17. Once each operating day, inspect data gathered from monitoring any leak detection equipment (e.g., pressure or temperature gauges) to ensure that the tank system is being operated according to its design. So Ecology can consider your plans when developing this permit condition, in your permit application, please include the following: a description of problems to look for when reviewing daily monitoring data or performing preventative maintenance/testing; a description of the types of leak detection and monitoring equipment to be used which prevent, detect and/or respond to releases from the tank system; a description of the locations of the leak detection and monitoring equipment used throughout the tank system; a description of the preventative maintenance/testing of leak detection and monitoring equipment to be performed to ensure equipment is working properly; and, finally, identify a frequency of inspection for the leak detection and monitoring equipment.

18. Once each operating day, inspect the construction materials and area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect signs of releases of dangerous waste. So Ecology can consider your plans when developing this permit condition, in your permit application, please identify the areas immediately surrounding the externally accessible portion of your tank systems, including the secondary containment systems. For example, the externally accessible portion might be a hallway adjacent to a process cell within the pretreatment building.

19. For those portions of the tank system that will have cathodic protection, for example, any tanks or ancillary equipment located outside RPP – WTP process buildings in contact with soil, inspect the cathodic protection system to confirm proper operation within six (6) months after initial installation, and annually thereafter, and inspect and/or test as appropriate, all sources of impressed current at least bimonthly (i.e., every other month). So Ecology can consider your plans when developing this permit condition, in your permit application, please identify the tank system portions that will require cathodic protection. Please identify the tank system locations where cathodic protection system inspections/testing will take place, describe the type of cathodic protection to be used, and describe the inspection/testing procedures and problems you plan to look for during inspections and testing.

Other Tank System Requirements

Other tank system requirements not addressed in your letter of August 10, 1999, as you know, will also need to be included in your permit application. For example:

ξ For any tank or containment system that could contact, store, and/or treat dangerous or mixed waste, you must provide spill prevention controls as described in WAC 173-303-640(5)(b)(i). If you believe what you've proposed for overflow prevention adequately addresses spill prevention control requirements, please include this information in your permit application. If you plan to use spill prevention controls in addition to currently proposed overflow prevention controls, in your permit application, please identify the specific spill prevention controls you plan to use for affected tanks. Include design detail documenting safety interlock locations and affected waste flows within the tank system.

ξ Under WAC 173-303-640(7), in the event of a leak or spill from the tank system or secondary containment system, or a determination of "unfit for use," you must remove the tank and containment system from service immediately, in accordance with the following requirements: you must immediately stop the flow of waste into the tank system or secondary containment system and inspect the system to determine the cause of the release; if the release was from the tank system, you must, within twenty-four (24) hours after detection of the leak or at the earliest practicable time, remove as much of the waste as is necessary to prevent further release of waste to the environment and to allow inspection and repair of the tank system to be performed; and, if the material released was to a secondary containment system, all released materials must be removed within twenty-four (24) hours or in as timely a manner as is possible to prevent harm to human health and the environment. So Ecology can consider your plans when developing this permit condition, in your permit application, please include a description of tank system shutdown procedures.

ξ Under WAC 173-303-640(7)(e), a tank system that has been taken out of service because it is unfit for use, or due to a release, may not be returned to use unless the following are completed: if the cause of the release was a spill that has not damaged the integrity of the system, the owner/operator may return the system to service as soon as the released waste is removed and repairs, if necessary, are made; and, if the cause of the release was a leak from the primary tank system into the secondary containment system, the system must be repaired prior to returning the tank system to service. Any major repairs as detailed in WAC 173-303-640(7)(f) must be certified by an independent, qualified, registered, professional engineer in accordance with WAC 173-303-810(13)(a) that the repaired system is capable of handling dangerous wastes without release for the intended life of the system. This certification must be submitted to Ecology within seven (7) days after returning the tank system to use. If you plan to repair unfit for use tank systems and return them to service, please address these requirements in your permit application.

Thank you again for your continued attention to these important issues. Ecology looks forward to continuing to work with you and the rest of the Hanford community as you develop your permit application. I understand that Ecology's ability to make timely dangerous waste permitting decisions is critical to achievement of a tank waste treatment facility, if you have any questions, or if I can be of further assistance, please feel free to contact me at (509) 736-5705. You may also direct questions to Elizabeth McManus, who is coordinating Ecology's review of your permit application, at (360) 407-6524.

Sincerely,

for Suzanne Dahl, Tank Waste Disposal Project Manager
Nuclear Waste Program

SD:EM:sb
Enclosure

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