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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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June 27, 1994

Mr. Patrick Willison
U.S. Department of Energy
P.O. Box 550
Richland, WA 99352

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Dear Mr. Willison:

Re: Notice of Deficiency for the 242-A Evaporator

The supplementary Notice of Deficiency (NOD) comments for the 242-A Evaporator are enclosed. The enclosed NOD comments consist mostly of technical observations dealing with the information in the Part B Permit application. A complete review was deemed inappropriate at this time for two reasons: 1) the permit application that was reviewed was seriously dated (June 1991) and conditions have changed considerably since then (see General Comments 1 and 4 on the first page of the NOD comments), and 2) the Washington State Department of Ecology (Ecology) has requested that the Part B Permits for the 242-A Evaporator, 200 Area Effluent Treatment Facility, and 200 Area Liquid Effluent Treatment Facility be combined into a single application. Therefore a more complete review would be appropriate when the next revision is issued.

If you have any questions, please call me at (509) 736-3018.

Sincerely,

Alex Stone, Unit Manager
Nuclear Waste Program

AS:mf
Enclosure

cc: Cliff Clark, USDOE
Joe Coenenberg, WHC
Sue Price, WHC
Dan Duncan, EPA
Administrative Record

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242-A Evaporator
Notice of Deficiency (NOD)

General Comments:

There are a number of comments that are applicable throughout the complete permit application. These are:

1. It is the reviewer's understanding that the Part B Permit Application for the 242-A Evaporator will be combined with those for the 200 Area Liquid Effluent Retention Facility (LERF) and the 200 Area Effluent Treatment Facility (ETF), thereby combining three separate units into one complete system. The new document that will be produced by this compilation will require detailed review, as the issues that face each facility individually will substantially change when all three facilities are combined. Therefore, the following permit review is not as strenuous as would be typical for a permit that was expected to undergo less substantial revision. Topics that will be addressed in more detail once the facilities are combined are given only a cursory evaluation and a complete and detailed inspection of the new Part B permit application will be necessary once it is issued. There are points, however, where issues that need to be addressed in the combined permit are mentioned to provide an indication of what detail is needed. This type of comment, however, is meant as an indication of the level of detail that will be required throughout the new, combined Part B Permit application.

2. It is the reviewer's understanding that not all sections of the present permit application will be enforceable. There are sections that will be superseded because of inconsistencies with the conditions of the Hanford Facility Wide Permit for the Treatment, Storage and Disposal of Dangerous Waste. Assuming this understanding is correct, Ecology and USDOE will have to discuss and determine which sections of the application will be "permit conditions" (i.e., enforceable), and which sections will be considered general information. Pending issuance of the above referenced Facility Wide permit, this deficiency may remain "open" if necessary. This issue is addressed at several points throughout the NOD comments to provide further information on the topics that need to be clarified. In general, however, this permit application is in variance at several points with the proposed Facility Wide permit and it is necessary to address potential conflicts at this point.

3. Throughout this permit application, there exists insufficient reference to the regulations along with the general comment that the criteria delineated in these citations will be fulfilled. An effort should be made to quote the regulations in the appropriate sections along with the commitment to fulfill the regulatory requirements within.

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4. The Part B Permit for the 242-A Evaporator, sections of which were reviewed for these NOD comments, is seriously dated. The reviewed version is dated June 6, 1991, and in the past three years, plans and objectives dealing with the cleanup of the Hanford Site have altered substantially. Therefore, a major requirement for the next revision of the Part B Permit application is to review all sections and update the information where necessary. Several NOD comments provide examples of information that has changed (See NODs 3,5,8, et al). These NODs, however, are not to be treated as the only areas where improvement is necessary, but solely as an indication of the type of update which is necessary.

5. It is the reviewer's understanding that the 242-A Evaporator began operation in April 1994, and is either currently condensing waste or has just recently completed the first campaign. The Part B Permit needs to be updated to present the results from this and any subsequent campaign before the next revision is submitted for review. In addition, it is important to encompass as much detail as possible about future campaigns including the tanks that will be used as a source of material for condensation, the types of wastes expected in the process condensate, and any unusual variables that must be addressed for the specific wastes involved. It is also important to note how information gleaned from future campaigns will be reflected in later permit revisions. It would be appropriate to incorporate all pertinent operational information including a schedule of expected campaigns along with the downtime between and the procedures that will be followed at this time.

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242-A Evaporator Dangerous Waste Permit Application

1. Foreword: Page i, line 2

"The radioactive portion of mixed waste is interpreted by the US Department of Energy to be regulated under the *Atomic Energy Act of 1954*."

It is the reviewer's understanding that the Hanford Facility Wide Draft Permit for the Treatment, Storage and Disposal of Dangerous Waste addresses this issue. It is the reviewer's preference that such statements be identified as interpretations and that all applicable parties' interpretations be included. If this preference is not agreeable to the applicable parties, it would be the reviewer's preference to delete such statements. Pending issuance of the above referenced permit, this definition may remain open. See general comment #2 on the first page of this document.

Part A

2. Part A Form 1: 1st Page , line 2

"Name & Title: Lawrence, Michael J., Mgr."

Provide the name and phone number of the current Facility contact and any information in the Part A that needs to be updated.

Chapter 2: FACILITY DESCRIPTION AND GENERAL PROVISIONS

3. 2.1.4 The 242-A Evaporator Description: Page 2-, lines 18-2

"Currently (1991), the 242-A Evaporator has been taken out of service for general maintenance and upgrade . . ."

This information needs to be updated to coincide with the current status of the evaporator that began operation earlier in the year (1994).

4. 2.1.4.1 Process Buildings: Page 2-4, lines 12-16

"Figures 2-5 and 2-6 provide floor plans . . . Figure 2-7 provides building elevations."

Additional information needs to be provided in Figure 2-7 including height, length, and width measurements for all buildings and indication of ground level.

5. 2.1.4.1.10 Ion Exchange Column Room: Page 2-9, lines 1-10

"The ion exchange enclosure is a small area that holds the ion exchange column . . ."

This information needs to be updated, as it is the current understanding of the reviewer that the ion exchange column has been removed from the treatment train. The Part B permit application needs to be changed to reflect this revision of the process.

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6. 2.3.1 Seismic Consideration: Page 2-12, line 16-19

"The 242-A Evaporator is located in Benton County, Washington, and is not . . ."

WAC 173-303-420 (3) (c) does not provide an exemption to seismic consideration for USDOE facilities and therefore needs to be addressed. Seismic considerations have been included within the Part B permit application for other treatment, storage, and disposal facilities within the Hanford Site near the 242-A Evaporator (the 200 Area Effluent Treatment Facility is an example). This section needs to be rewritten to reflect compliance with seismic regulations.

7. 2.3.2.1 Demonstration of Compliance: Page 2-13, lines 1-15

"The 242-A Evaporator is not located within a 100-year floodplain. Therefore, no demonstration of compliance is required."

Flood plain compliance is required. Flood plain considerations have been included within the Part B permit application for other treatment, storage and disposal facilities within the Hanford Site near the 242-A Evaporator (the ETF, for example). This section needs to be rewritten to include flood compliance considerations.

8. 2.5.1.4 Process Condensate: Pages 2-17, lines 7-9

"The process condensate will be stored at the LERF until an appropriate effluent treatment system becomes operational. The waste will then be disposed of."

This section needs to be rewritten to increase clarity. Currently, waste from the 242-A Evaporator will be stored in LERF until the 200 Area Effluent Treatment Facility (ETF) becomes operational. At that point further discharge to the LERF basins will be discontinued. This may change if current efforts underway to permit continued use of the LERF basins after the ETF becomes operational are successful. In any case, the permit needs to be rewritten to reflect the situation before the next version is issued.

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9. 2.5.1.4 Process Condensate: Pages 2-17, lines 9-17

"A portion of the ion exchange discharge stream is routed through a radiation monitoring and diversion system (Chapter 4.0) and returned to the process condensate tank. High radiation readings, which provide an early warning of constituents in the process condensate exceeding limits for discharge to the LERF . . ."

It is the reviewer's understanding that the ion exchange system has been removed from the process stream. This section needs to be updated to indicate how the removal of the ion exchange system affects the above mentioned safety measures.

10. 2.5.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle, Reclaim, and Recover Waste Material to the Extent Economically Feasible Page 2-23, lines 19-23

"Recent additions and future planned additions of the monitoring and control . . ."

It is the reviewer's understanding that future updates have been restricted. Therefore, this section needs to be updated to reflect current conditions.

11. 2.7.1 Notification: Page 2-25, lines 49-50

"In case of any release of dangerous waste, the building emergency direction immediately notifies Environment Protection."

This section is unclear on what groups are involved in notification. For example, the above quote referring to Environment Protection does not make clear if it is a regulatory agency or an office within Westinghouse/USDOE. The section needs to be updated and expanded to improve clarity.

12. 2.7.2.3 Restoration of Impacted Area: Page 2-29, lines 42-46

"Because of the remote location of the 242-A Evaporator (near the center of the Hanford Site), spills or discharges occurring on property that . . ."

WAC 173-303-806 (C) requires that methods leading to the restoration of impacted areas be described. The federal government is not exempt from these regulations. This section therefore needs to be updated and expanded to fulfill the requirements of 173-303-806 (C).

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13. 2.8.1 Procedures for Receiving Shipments: Page 2-30, line 9

- "Process condensate transfer from the 242-A Evaporator to the LERF"

Under current conditions, this statement is valid only until the ETF becomes operational, at which point the LERF basins can no longer be used. The possibility of extending the usage of the LERF basins is currently under discussion. The Part B Permit application needs to be updated to reflect the conditions at the time the permit is reissued.

14. 2.8.3 Provisions for Nonacceptance of Shipment Page 2-32 and 2-33, lines 47-49 and lines 1-4, respectively

"Transfers into the feed tank, 241-AW-102, are preapproved and designated . . ."

Additional information needs to be provided within this section concerning the conditions that exist which would prevent a transfer into the feed tank as well as what designation process is used. It is insufficient to state that a transfer is "preapproved and designated" without including information on what exactly is entailed within those processes.

Chapter 3.0: WASTE CHARACTERISTICS

15. 3.1.1 Waste Generators: Page 3-2, lines 9-10

"Waste feed to the 242-A Evaporator is generated by various Hanford Site operating plants . . ."

This section needs to be updated to reflect current information concerning potential waste streams. It is the reviewer's understanding that several additional waste sources have been identified and need to be reflected within the Part B Permit application. An example of an additional source not reflected in this application is PUREX deactivation flush solutions.

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16. 3.1.3.1 The 242-A Evaporator Waste Feed Analysis Data: Page 3-4, lines 40-44

"Waste analysis data for the 242-A Evaporator waste feed from the most recent 4 years of operation are summarized in Table 3-2. The source data . . ."

Additional information needs to be provided in the section that explains exactly what information is contained in Table 3-2. Examples of points that are unclear are what is exactly meant by N (number of samples) and why N is zero for several species (barium, cadmium, mercury, nickel and total organic halides). In addition, the whole table can be updated using information from current campaigns.

17. 3.1.10.1.1 Slurry Product: Page 3-11, lines 30-34

"Table 3-6 presents representative constituent analysis for slurry product. The table presents . . ."

The data in this table and the Appendix 3A upon which it is based need to be updated to reflect information from recent campaigns run at the 242-A Evaporator.

18. 3.1.10.1.2 Process Condensate: Page 3-13, lines 2-5

"If the process condensate stream is designated using the data from Table 3-7 . . ."

The data in this table needs to be updated to reflect information from recent campaigns run at the 242-A Evaporator.

19. 3.1.10.1.5 Vessel Ventilation Exhaust Air: Page 3-14, lines 7-9

"An organic sampling system designed to be equivalent to the volatile organic sampling train method (EPA 1986) currently is being added to the vessel ventilation system."

What is the current status of this upgrade? In addition, provide information on what species will be analyzed, the levels detected, and the particular method used to obtain these results.

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20. 3.2 242-A Evaporator Operation: Page 3-15, lines 8-11

"The 242-A Evaporator is used to reduce the volume . . . that will require treatment and disposal at the Grout Treatment Facility (DOE-RL 1989)."

It is the reviewer's understanding that the Grout Treatment Project has been discontinued and that this section is no longer applicable. Update the information to reflect the current project repository of the wastes concentrated at the evaporator.

21. 3.2.2 Modeling the 242-A Evaporator Operation: Pages 3-17 through 3-23

"This section discusses the models used for determining the organic and inorganic separation capabilities of the 242-A Evaporator. Included are . . ."

The section deals with predictive models that approximate the various outputs from the evaporator. This information needs to be compared with the results from the current and any subsequent evaporator campaigns to determine both the validation of the model itself and the usefulness of the information provided.

22. 3.2.3.1.1 Model Application: Page 3-20, lines 17-39

"Typically, a continuous stirred tank reactor model is applicable to systems in which the fluid phase is not particularly viscous and the reactor is well mixed (Hill 1977)."

The above paragraph provides considerable information on why the model is applicable to the evaporator system because the matrix is well mixed. However, the viscosity problem is barely addressed. Information needs to be provided on viscosities of the waste material being condensed and how these viscosities affect the use of the model. In addition, the issue of the increase in viscosity with time as the waste is condensed and the effect this increased viscosity has upon the validity of model needs to be presented and discussed.

23. 3.3 Waste Analysis Plan Waste Feed: Page 3-27, lines 20-21

"This section presents the waste analysis plan . . ."

This section needs to be updated to include reference to the Data Quality Objective (DQO) process currently being conducted along with an explanation of the DQO process and the objects of the various steps.

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24. 3.3.1 Parameters and Rationale: Page 3-27, lines 49-50

"Further detail on the specific analyses to be performed is provided in Appendix 3G, Section 5.1.2."

Appendix 3G was not available for review. In the next Part B Permit application, include the information designated for Appendix 3G. Review and comments will be provided at that time.

25. Table 3-9 Constituent Concentrations for the 242-A Evaporator Used Raw Water Effluent Streams: Page T3-9

A number of concentrations are listed in this table as BDL (Below Detection Limit). This listing needs to be changed to reflect the detection limit preceded by a less than sign (<) to denote below detection limit.

26. Table 3-12 The Land Disposal Restriction Treatment Standards for F003 through F005 Solvent Contaminated Waste: Page T3-9

This table contains a column of "LDR treatment standard for nonwaste water (mg/L)," which needs to be updated to reflect the current LDR limits.

Chapter 4.0: PROCESS INFORMATION

27. 4.0 Process Information: Page 4-3, lines 2-3

"Noncondensable vapors are drawn through a series of filters and vented to the atmosphere."

Additional information needs to be provided on the type and relative quantity of "noncondensable vapors" that are discharged from the facility. If this information is available in documents for other regulatory agencies such as the State of Washington's Department of Health, then a reference needs to be provided along with a general summary of the information.

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28. 4.0 Process Information: Page 4-3, lines 8-13

"Condensed vapors that contain the volatile organic constituents . . . are passed through an ion exchange column . . ."

This information needs to be updated as it is the reviewer's understanding that the ion exchange column has been removed from the process.

29. 4.0 Process Information: Page 4-3, lines 33-35

"During standby, the evaporator is monitored to detect changes in radiation levels or process variables . . ."

Additional information needs to be provided on how this monitoring process is effected. This information should include the parameters monitored and the permissible ranges for all the variables involved.

30. 4.2.2.1 Waste Feed System: Page 4-5, line 26

"The feed pipeline is equipped with leak detection systems."

Additional information needs to be provided on the leak detection systems. This information should include details on how a leak is detected, along with location of the detectors and what the final any leaked material.

31. 4.2.2.1 Waste Feed System: Page 4-5, line 33

"A sample can be taken from the waste feed when needed."

Additional information needs to be provided on exactly what the words "when needed" means. This information should include the conditions that determine when a sample is required along with the species monitored. Lastly, it is important to include details on how the process is altered based upon this information.

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32. 4.2.2.3 Slurry System: Page 4-13, lines 12-13

"The slurry system removes treated waste from the recirculation loop when specified process parameters are met."

Additional information needs to be provided on the process parameters mentioned in the above quote. Important details include the species evaluated and the levels that define any actions.

33. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 28-29

"Condensed vapors drain through a 20-inch (0.51-meter) hot well . . ."

No definition of the term "hot well" is provided. Throughout this Part B Permit application terms such as hot well are used without a definition that would allow one to understand both the function and purpose of the items involved. It is recommended that a glossary be constructed and technical terms throughout the document be defined within.

34. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 36-38

"Temperature and pressure of the vapors discharged . . . are closely monitored to ensure that these remain within operating limits."

What are the "operating limits" described in the above quote? This information should include the variables being monitored and the levels of these variables that precipitate a response.

35. 4.2.2.4.1 Primary Condenser: Page 4-16, lines 45-46

"This monitor will shut off valve HV-EC1-2 . . ."

Under what conditions and to what purpose does this monitor take effect? This type of information is lacking throughout Chapter 4, which needs to be rewritten to make sure that when such statements are made, the appropriate information is provided.

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36. 4.2.2.4.3 Aftercondenser: Page 4-18, lines 16-17

"The tubes are arranged with a 0.937 inch (0.024) pitch."

This sentence is unclear and needs to be rewritten to clarify exactly what is meant by the information provided.

37. 4.2.2.4.3 Aftercondenser: Page 4-18, lines 22-24

"Used raw water flow . . . is controlled to achieve the desired temperatures . . ."

This sentence needs to be expanded to provide information on what are the "desired temperatures" and what actions are taken to assure that these correct temperatures are maintained.

38. 4.2.2.5.1 Condensate Collection Tank: Page 4-19, lines 36-37

"An array of monitoring devices are used to continuously detect problems . . ."

This sentence must be expanded to include additional information on what "problems" can be expected and how the list of devices that follows addresses the potential problems.

39. 4.2.2.5.4 Ion Exchange Columns: Pages 4-20 and 4-21, lines 46-52 and 1-32, respectively

"Process condensate flows from the primary condensate filter . . ."

It is the reviewer's understanding that the ion exchange column has been removed from the process stream. Therefore, this section needs to be removed. It would be advantageous if the ion exchange information is included in a section that deals with processes that no longer exist, as the ion exchange facilities will have to be addressed at some point in the future when the 242-A Evaporator is closed according to the regulatory requirements stated in 173-303-610.

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40. 4.2.2.5.5 Radiation Monitoring and Sampling: Page 4-21, lines 47-48

"The system will alarm if radiation levels exceed the established threshold."

This sentence needs to be rewritten to include information directly addressing the "established threshold." Information needs to be included which defines these thresholds and what dangers exist if the thresholds are exceeded.

41. 4.2.2.5.6 Seal Pot: Page 4-18, lines 45-47

"A seal pot collects the drainage before discharge into the condensate collection tank."

The previous page of this document addresses radiation monitoring and sampling, and it is stated "a portion of the process condensate stream is diverted into the radiation monitoring and sampling enclosures." In this section, however, it states that an additional source of contamination is sent to the condensate collection tank and no information is included to demonstrate that this additional source is also sampled. If it is not sampled, the effect this source has upon the overall chemical quality of the material within the collection tank needs to be addressed. In addition, it is necessary to indicate any other streams into the collection tank that are not included in the process condensate sampling routine.

42. 4.2.3.2.1 Flow Measurement Tank: Page 4-30, lines 1-3

"The flow quantity of the steam condensate from . . . some 242-A building drains . . ."

This section needs to be expanded to include information on exactly which drains are involved, their source, and the potential contaminants from these drains.

43. 4.2.3.2.1 Flow Measurement Tank: Page 4-30, lines 18-20

"If excess radiation levels are detected . . ."

Information needs to be included on the type of analyses involved and the levels that precipitate a response.

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44. 4.2.3.2.2 Radiation Monitor and Sampling System: Page 4-30, lines 35-37

"If either radiation monitor detects radiation above normal background levels, . . ."

Information should be included either defining the exact background levels or a reference must be made directing the reader where the information can be found.

45. 4.2.3.2.3 Steam Condensate Basins: Page 4-31, lines 34-36

"The three steam condensate collection basins each have . . . 2 feet (0.62 meters) of freeboard."

This section needs to include a definition for the term "freeboard" or place it in a glossary along with an appropriate definition.

46. 4.2.4.1.2 Strainers: Page 4-33, lines 29-30

"The strainer screens are fabricated of 20 mesh monel."

Either a definition needs to be provided for the term "monel" or it should be included in a glossary along with an appropriate definition.

47. 4.2.4.1.2 Strainers: Page 4-33, lines 38-40

"The valves are operated automatically . . . above preset limits."

It is necessary to include information on the variables being monitored and the levels of each variable that trigger a response.

48. 4.2.5.1 Decontamination System: Page 4-37, lines 29-31

"The decontamination cycles are followed by water washes . . ."

The reviewer was unable to determine the final destination of both the decontamination and water washes. This information needs to be included in the next permit revision.

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49. 4.2.5.2 Effluent System: Page 4-39, lines 28-30

"The eluant pump . . . pump eluant from the eluant tank . . ."

The reviewer was unable to determine the chemical composition of the "eluant" mentioned in the above quote. This information needs to be included in the next permit revision.

50. 4.2.5.6 Condenser Corrosion Inhibitor System: Page 4-42 lines 37-38

"The corrosion inhibitor tank, TK-C-500, holds 3 gallons (11.4 liters) of corrosion inhibitor liquid."

The reviewer was unable to determine the chemical composition of the "corrosion inhibitor liquid" mentioned in the above quote. This information needs to be included in the next permit revision.

51. 4.2.6.3.4 Air Sampling and Monitoring System: Page 4-49, lines 48-49

"An air sampling pump, P-AS-1, draws air through the room radiation monitors, which alarm if radiation levels exceed preset limits."

The reviewer was unable to determine either the variables monitored or the "preset limits" mentioned in the above quote. This information needs to be included in the next permit revision.

52. 4.2.7.6 Response to Spills or Leaks and Disposition of Unfit-for-Use Tanks: Page 4-51, lines 9-11

"If the condensate collection tank is determined to be unfit for use before the planned closure of the 242-A Evaporator, the tank will be decontaminated and disposed of in accordance with the closure plan (Chapter 11.0)."

This phrase "and in accordance with the regulations as defined in 173-303-640 (8)" needs to be included in the above quotation. The lack of citations of the regulations is a serious deficiency that is found throughout this document (refer to General Comment #3).

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