0043520

Meeting Minutes Transmittal

324 REC/HLV CLOSURE PLAN
Project Managers Meeting
Ecology - Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above dated Unit Managers Meeting.

CR DeLannoy Date: 4/4/96
Charles R. Delannoy, Project Manager, RL

Jeanne J. Wallace Date: 4/4/96
Jeanne J. Wallace, Project Manager, Washington State Department of Ecology

---

324 REC/HLV Closure Plan, PNL Concurrence

Michael H. Schlender Date: 4/3/96
Michael H. Schlender, Contractor Representative, PNL

Purpose: Discuss Permitting Process

Meeting Minutes are attached. The minutes are comprised of the following:

Attachment 1 - Agenda
Attachment 2 - Summary of Discussion and Commitments/Agreements
Attachment 3 - Attendance List
Attachment 4 - Action Items
Attachment 5 - Status of 324 REC/HLV of DQO Process
Attachment 6 - Analysis of Melter Feed Canister Discrepancy

APR 1996
RECEIVED
EDMC

Distribution:

M. A. Barnard	RL	L4-40
R. C. Bowman	WHC	H6-24
G. D. Buckley	PNNL	P7-28
R. M. Carosino	RL	A4-52
C. E. Clark	RL	A5-15
B. J. Day	PNNL	P7-79
C. R. Delannoy	RL	A5-15
G. H. Fess	PNNL	P7-79
G. D. Hendricks	GSSC	B1-42
D. C. Langstaff	RL	K8-50
S. M. Price	WHC	H6-23
M. J. Riess	PNNL	P7-75
G. T. Thornton	PNNL	P8-45
H. T. Tilden II	PNNL	P7-79
P. J. Turner	PNNL	P7-34
M. C. Vargas	RL	K8-50
J. J. Wallace	Ecology	B5-18
RCRA Files/GHL	WHC	H6-23

ADMINISTRATIVE RECORD (Two Copies): 325 Hazardous Waste Treatment Unit, T-3-4 [Care of EDMC, WHC (H6-08)]

Washington State Department of Ecology Nuclear and Mixed Waste Hanford Files, P.O. Box 47600, Olympia, Washington 98504-7600

Please send comments on distribution list to D. K. Lutter (P7-79), (509) 376-5631.

Attachment 1

324 REC/HLV
Project Managers Meeting
Ecology Kennewick Office, Conference Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Agenda

1. Approval of Past Meeting Minutes (Ecology/RL/PNNL)

2. Status of DQO Process for Closure Plan Sampling and Analysis (PNNL)

3. Status of B-Cell shipments to PUREX (PNNL/RL)

4. Status on Inventory Removal of HLV Tanks (PNNL/RL)

5. Status on establishing monitoring and reporting procedures (Ecology/PNNL/RL)

6. Status on M-33 (M-90)(PNNL/RL)

7. Status of Action Items

11-08-95: 1	Preparation of integrated schedule for PNNL Units. CLOSED: M. Schlender, PNNL, provided a limited distribution integration schedule at the 1/11/96 PMM.
11-08-95: 3	Obtain status of findings/actions re:DNFSB visit. CLOSED: Item addressed on cc:mail message from Pl Weaver (PNNL) at the 1/11/96 PMM.
12-07-95: 1	Ecology notification letter concerning REC waste. CLOSED: M. Vargas, RL, confirmed the letter went out 11/14/95.
12-07-95: 2	324 REC/HLV tracking number for the Administrative Record. CLOSED: H. Tilden, PNNL, provided one at the 1/11/96 PMM.
01-11-96: 1	Meet to discuss Ecology expectations for monitoring and reporting procedures associated with the processing of HLV Tank liquids ACTION: J Wallace (Ecology)/P. Weaver and G. Sevigny (PNNL) OPEN
01-11-96: 2	Check with Ecology Chemist regarding the 1989 and 1990 analysis of HLV Tanks. CLOSED: Deferred to the DQO process.
01-11-96: 3	Delivery of DRAFT PMP and FS comment response summaries. CLOSED: D. Lutter (PNNL) delivered to Ecology 1/12/96.
01-11-96: 4	Status of Project Management Plan/Feasibility Study Report Comment Summaries CLOSED: RL official PMP transmittal to Ecology 1/18/96 and FS transmittal to Ecology on 1/19/96.

8. General Discussion (Ecology/RL/PNL)

9. New Action Items

10. Next Project Managers Meeting (Ecology/RL/PNL)
    - Next meeting - April 4, 1996
      337 Building, Mt. Hood Room, Richland, Washington
    - Proposed topics

Attachment 2

324 REC/HLV
Project Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Summary of Discussion and Commitments/Agreements

1. Approval of Past Meeting Minutes

The January 11, 1996 Project Manager Meeting minutes were approved. There was no Project Manager Meeting held in February 1996.

2. Status of DQO Process for Closure Plan Sampling and Analysis

T. Hosaka (PNNL) provided a status report for the two Data Quality Objective (DQO) meetings held in January and February 1996 (Attachment 5). The next two DQO meetings are scheduled for March 29, 1996 and April 11, 1996. A document summarizing the decisions resulting from the DQO process will be distributed within two weeks of the final DQO meeting.

3. Status of B-Cell Shipments to PUREX

P. Weaver (PNNL) stated that all of the containerized mixed waste from B-Cell has been shipped to PUREX. The remaining mixed waste, which is contact-handled lead, is presently under satellite accumulation.

P. Weaver (PNNL) stated that the PUREX Facility schedule is conflicting with the acceptance of B-Cell waste shipment schedule, and there are nine shipments of special case waste which have been put on hold. DOE-RL has initiated a study of the conflicting schedules in an effort to provide recommendations for coordinating the two schedules. B. Delannoy (DOE-RL) reported that the study has identified 11 alternatives, which are be categorized into two areas: actions that can be implemented quickly, and actions that will require a substantial length of time to implement.

P. Weaver (PNNL) stated that resolution of the schedules will not directly impact the project at this time. The B-Cell waste shipments have been removed from the critical path, and the cleanout schedule has been moved forward. When the waste shipment schedule issues are resolved, the shipments will be made at that time.

Ms. J. Wallace (Ecology) inquired about the type of waste that is on hold for shipment. P. Weaver responded that PNNL terms the waste as "special case waste" because there is no official definition for the waste. The special case waste does not have a disposal pathway (excluding the mixed waste), which puts the waste in a greater than

Category 3 mixed waste, remote handled TRU and high level waste.

P. Weaver (PNNL) continued with the status of the B-Cell waste shipments to PUREX, stating that PNNL's log book entries reflect that between April and June 1993, 15 canisters were filled containing melter feed left over from the (FRG) canister production. During packaging of the last mixed waste shipment to PUREX, it was discovered that there were only 14 canisters. Pat distributed a brief report documenting PNNL's efforts to locate canister No. 15 (Attachment 6). Mr. Weaver added that a camera-mounted crane was used to search the cell. J. Wallace (Ecology) gave her approval to continue with the cleanout of B-Cell.

4. Status on Inventory Removal of HLV Tanks

G. Sevigny (PNNL) stated that the design is almost completed and ready for final review. The major procurements are on site. The tanks with the agitators and the metal filters are expected to arrive on site by the first part of May 1996.

G. Sevigny reported that the readiness assessment (RA) is in DOE-RL approval, and the RA will be completed in April 1996. The steam for taking the samples should be on in the building by the end of March 1996.

5. Status on Establishing Monitoring and Reporting Procedures

It was agreed that G. Sevigny(PNNL) will cc:mail J. Wallace (Ecology) a draft of PNNL's monitoring and reporting procedures associated with the processing of high level vault tank liquids. When the procedures have been reviewed and commented on by Ecology, PNNL will send a letter to Ecology stating that the 4 stipulations listed in the Ecology letter dated November 29, 1995, "Approval of High-Level Vault Waste Liquids Processing Approach for Completion of Hanford Federal Facility Agreement and Consent Order Milestone M-89-01", have been met.

G. Sevigny (PNNL) added that the Waste Analysis Plan (WAP) has been drafted and comments are being incorporated. The WAP should be completed at the same time the letter stating that the 4 stipulations have been met is submitted to Ecology.

M. Schlender (PNNL) noted that PNNL's intent is to provide Ecology information regarding the operational process, and not to establish an approval cycle.

6. Status on M-33 (M-90)

B. Delannoy (DOE-RL) stated that DOE-RL is reviewing Ecology's counterproposal to DOE-RL's original proposal. Due to major differences between the original proposal and the counterproposal, DOE-RL requested that the opening negotiations be deferred a week. Bob added that the Memorandum of Understanding (MOU) for the negotiations will be revised because the negotiations will not be completed by the end of March 1996. J. Wallace (Ecology) asked if the delay in negotiations will impact closure of the 324 unit. M. Vargas (DOE-RL) responded that Milestone M-

89 should not be impacted because it was removed from Milestone M-33.

B. Delannoy (DOE-RL) stated that DOE-RL's proposal regarding the special case waste is to roll it into Milestone M-90, and to establish a list of materials instead of specifically defining the waste.

J. Wallace (Ecology)inquired about the rest of the 300 Area. B. Delannoy responded that the proposal directly addressed the 324, 325 and 327 Building special case waste, and the remaining 300 Area units were combined. Bob pointed out that the remaining 300 Area is composed of several program activities (PNNL, WHC waste management, WHC facilities transition, and in the future Bechtel environmental restoration), which will pose an integration challenge.

7. Status of Action Items

11-08-95:1 Preparation of integrated schedule for PNNL Units.
CLOSED: 1-11-96 PMM.

11-08-95:3 Obtain status of findings/actions regarding DNFSB visit.
CLOSED: 1-11-96 PMM.

12-07-95:1 Ecology notification letter concerning REC waste.
CLOSED: Confirmed letter was transmitted to Ecology 11/14/95.

12-07-95:2 324 REC/HLV tracking number for the Administrative Record.
This action item was closed during the 1-11-96 PMM.

01-11-96:1 Meet to discuss Ecology expectations for monitoring and reporting procedures associated with the processing of HLV Tank liquids.
REVISED: G. Sevigny (PNNL) to provide Ecology with a Draft.

01-11-96:2 Check with Ecology chemist regarding the 1989 and 1990 analysis of HLV Tanks.
Deferred to the DQO process.

01-11-96:3 Delivery of draft PMP and FS comment response summaries.
CLOSED: The summaries were delivered 01-12-96.

01-11-96:4 Status of Project Management Plan/Feasibility Study Report comment summaries.
CLOSED: The PMP was transmitted to Ecology on 01-18-96, and the FS was transmitted to Ecology on 01-19-96.

8. General Discussion

J. Wallace (Ecology) stated that she reviewed DOE's draft integrated priority list associated with the budget, and she noted that 324 fell below the line for funding in 1997. J. Fulton (PNNL) responded that approximately 6.5 million dollars of the B-Cell cleanup project is unfunded for FY 1997. J. Fulton (PNNL) stated that the priority list dealt primarily with 1998 priorities, and that the project is fully

funded in the target case for fiscal year 1998. Mr. Fulton added that the DOE is reworking the 1997 priority list, and he speculated that B-Cell would move above the line for funding for FY 1997. Mr. Fulton stated that the 1997 priorities will be closely monitored, and Ecology would be apprised of the impacts if the funding shortage prevails.

J. Wallace (Ecology) inquired about 1996 funding for the B-Cell cleanout. Mr. Fulton responded that at the present time, the 1996 funding is sufficient.

M. Vargas (DOE-RL) stated that DOE-Headquarters are scheduled to be on site at the end of March 1996 to discuss funding, and she took an action to invite Ms. Wallace to attend the meetings.

J. Wallace (PNNL) reported that during a meeting for the 340 Building and the Radioactive Liquid Waste System (RLWS), there was a suggestion to close the 324 Building in an effort to resolve problems associated with 340. P. Weaver (PNNL) stated his understanding that there is no projected work load for the 324 Building beyond 1998. J. Fulton (PNNL) stated that PNNL is working with DOE-RL and WHC to coordinate the closure of 340 with the needs of the 325 Building.

9. New Action Items

03-07-96:1 Notify Ms. Wallace, Ecology, when DOE-HQ is on site to discuss funding.
Action: M. Vargas (DOE-RL)

03-07-96:2 DOE-RL will provide Ms. Wallace its new organization chart.
Action: C. DeLannoy (DOE-RL)

03-07-96:3 Impacts on current activities with transition of 324 Building to another contractor.
Action: C. DeLannoy/M. Vargas (DOE-RL)

10. Next Project Managers Meeting

- Next meeting
  April 4, 1996, 337 Building, Mt. Hood Room, Richland, Washington.

- Proposed topics
  Proposed topics may be submitted to D. Lutter (PNNL).

Attachment 3

324 REC/HLV Closure Plan
Project Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Attendance List

Name	Organization	Phone Number
Mike Schlender	PNNL	376-8795
Jeanne Wallace	Ecology	736-3019
Dolores Lutter	PNNL	376-5631
Terry Hosaka	PNNL	372-6502
Harold Tilden	PNNL	376-2499
Pat Weaver	PNNL	376-3075
Bob DeLannoy	DOE	372-4617
Tony Swaney	PNNL	376-0395
Brian T. Day	PNNL	376-3835
J. T. Fulton	PNNL	375-2557
Gerry Hendricks	GSSC	946-3687
MARIA VARGAS	DOE-RL/LMD	372-4996
Kathy Knox	Knox Reporting Services	946-5536

Attachment 4

324 REC/HLV
Project Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Action Items

Action Item #	Description
11-08-95:1	Preparation of integrated schedule for PNNL Units. CLOSED: 1-11-96 PMM.
11-08-95:3	Obtain status of findings/actions regarding DNFSB visit. CLOSED: 1-11-96 PMM.
12-07-95:1	Ecology notification letter concerning REC waste. CLOSED: Confirmed letter was transmitted to Ecology 11/14/95.
12-07-95:2	324 REC/HLV tracking number for the Administrative Record. This action item was closed during the 1-11-96 PMM.
01-11-96:1	Meet to discuss Ecology expectations for monitoring and reporting procedures associated with the processing of HLV Tank liquids. REVISED: G. Sevigny (PNNL) to provide Ecology with a Draft.
01-11-96:2	Check with Ecology chemist regarding the 1989 and 1990 analysis of HLV Tanks. Deferred to the DQO process.
01-11-96:3	Delivery of draft PMP and FS comment response summaries. CLOSED: The summaries were delivered 01-12-96.
01-11-96:4	Status of Project Management Plan/Feasibility Study Report comment summaries. CLOSED: The PMP was transmitted to Ecology on 01-18-96, and the FS was transmitted to Ecology on 01-19-96.
03-07-96:1	Notify Ms. Wallace, Ecology, when DOE-HQ is on site to discuss funding. Action: M. Vargas (DOE-RL)
03-07-96:2	DOE-RL will provide Ms. Wallace its new organization chart. Action: C. DeLannoy (DOE-RL)
03-07-96:3	Impacts on current activities with transition of 324 Building to another contractor. Action: C. DeLannoy/M. Vargas (DOE-RL)

Attachment 5

324 REC/HLV
Unit Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Status of 324 REC/HLV of DQO Process

Attachment 5

324 REC/HLV
Project Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Status of 324 REC/HLV of DQO Process

324 REC/HLV Project Manager Meeting
March 6, 1996

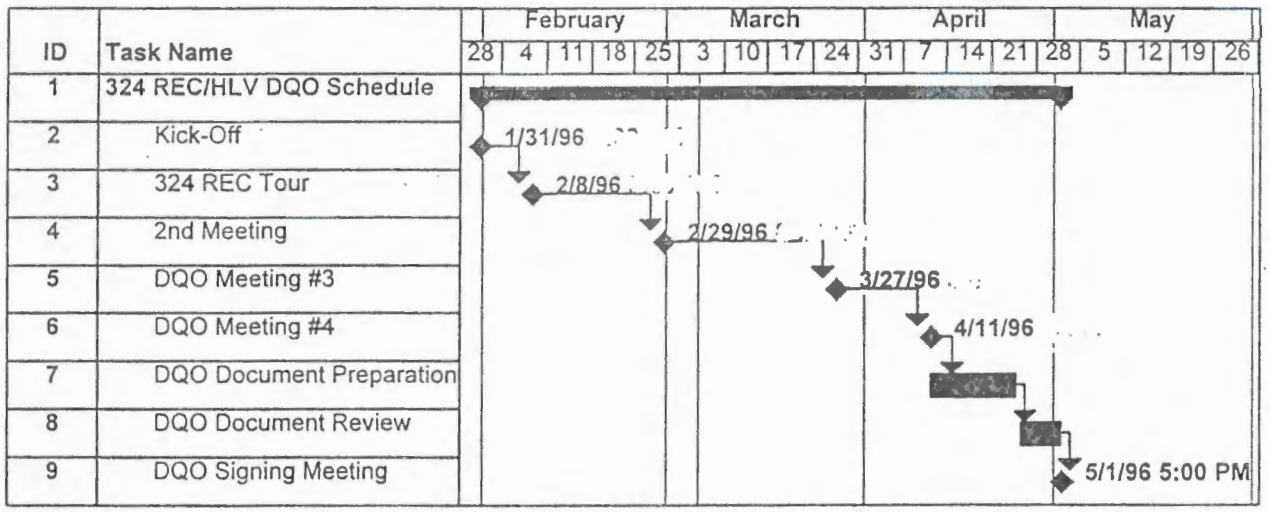
Status of 324 REC/HLV of DQO Process

The second DQO meeting was held on February 29, 1996. The discussion was focused on determining the unit boundary, and what components of the boundary will require "closure action." The final two DQO meetings have been scheduled, as follows:

DQO Meeting #3: March 27, 1996 1-5pm, 324 New Conference Room
DQO Meeting #4: April 11, 1996 1-5pm, 324 New Conference Room

A DQO document will be prepared upon completion of the fourth/final meeting. The DQO document will summarize each major decision determined through the process. The DQO document will be reviewed by all participating parties, and signed by each major decision maker.

A schedule for to complete the DQO process is provided below:



Attached is a copy of the meeting minutes for the first DQO meeting. These minutes are being submitted to help update the administrative record for the 324 unit.

Meeting Minutes Transmittal

324 REC/HLV CLOSURE PLAN
DATA QUALITY OBJECTIVES MEETING:1
EESB Building, Stampede Room
Richland, Washington

January 31, 1996

Purpose: Begin DQO Process; Discuss Permitting Process

The Meeting Minutes consist of the following:

RECEIVED
FEB 2 6 1995
T. Y. HOSAKA

A. Meeting Summary
A. Action Items
C. Attachments
1 -Draft Copy of Ecology Comments on Closure Plan
2 -PNNL Facility Review Presentation
3 -Process Knowledge Memo
4 -HLV Process Flow Diagram
5 -Resin Specification
6 -Waste Designation Table
7 -TPA Change Package M-89

Minutes prepared by MS Miller, President, EQM, and TY Hosaka, Project Manager, PNNL on February 16, 1996.

324 REC/HLV Data Quality Objectives (DQO)
Planning Process
Meeting Minutes
Meeting 1: January 31, 1996

Attendees: Bob Delannoy - DOE-RL; Gary Sevigny, Audrey Ignatov, Terry Hosaka, Patrick Weaver, Delores Lutter, Cindy Taylor, Taffy Almeida - PNNL; Jeanne Wallace, Joan Bartz - Department of Ecology.

Facilitator: Mitzi Miller - EQM

This is a summary of the discussions, presentations and interactions that occurred during the first DQO meeting, on January 31, 1996. This meeting summary is presented in three sections: A) a summary of the discussions and interactions, B) a list of action items, and C) an addendum of presentation materials or handouts used at the meeting.

Meeting Summary:

A. Discussions and Interactions

1. Introductions/Agenda Review

Ecology has submitted draft comments to the closure plan which was submitted to them on 12/22/95. Major issues identified in the draft comments will be addressed as part of the DQO. (Copy of comments in Section C)

EQM conducted an overview of the DQO process and established our working guidelines. The following are protocols established for documenting this DQO process:

> Meeting minutes will be approved at the following DQO meeting. There was some concern over regarding sign-off on the meeting minutes, however it was agreed that minute approval at the following meeting is adequate.
>
> A final DQO document will be prepared at the conclusion of the DQO session, that document will be issued to each decision maker (DOE and Ecology) for review. A follow up meeting will be held approximately 1 week after submittal of the DQO document. If no discrepancies are discovered in the final DQO document, the decision makers will sign the document.

Boundary issues were identified as one of the most significant problem areas associated with this DQO. Ecology requested that boundary issues be reviewed from a more global perspective, and that evaluation not be based on a preconceived notion of clean closure.

2. 324 Facility Review presentation - PNNL

A copy of the presentation notes is included in Section C.

Ecology requested that some of the detailed drawings presented be included in the closure plan.

3. HLV Tanks Process Knowledge Description - PNNL

A copy of the process knowledge memo is included in Section C.

Ecology agreed in principle that process knowledge can be used to shorten the list of constituents of concern down the lengthy Appendix 9 list to those metal and corrosive constituents known to be present in the HLV tank liquids.

4. HLV Liquid Process Description - PNNL

A copy of the HLV process flow diagram is included in Section C.

PNNL discovered a discrepancy in Table 4-7 of the closure plan. This table described analytical data of the liquids in each of the HLV tanks. *PNNL will update this table and provide updated copies at the next DQO meeting.

DOE indicated some concern about 1) the gas-generating potential of the planned rinsing procedure for the tanks (HNO3 solutions followed by carbonate solutions) and 2) the fittings used in the process equipment to be used in D Cell. DOE stated that adequate controls should be adopted to make sure that leaks are contained in the process equipment and not allowed to spread throughout the cell.

Ecology requested a copy of the specification for the resins to be used in the HLV process. A copy of the specification is included in Section C.

A table describing the waste designations for both the REC (B Cell and drum of waste in D Cell) and HLV tanks (104, 105, 107)was distributed and is included in Section C.

5. Boundary Discussions

Ecology requested that a copy of the TPA change package (M-89-94-01) be included in the closure plan, to identify the regulatory framework for this closure. A copy of the change package is in Section C.

Ecology also suggests including a copy of the inspection report (for the REC) in the closure plan. *PNNL will present a copy of the inspection report the next DQO meeting.

Process knowledge information did not reflect all programs listed in the closure plan. Much of the discrepancy is due to listing of programs affecting both the REC and HLV tanks. It was determined that a need exists for a chronological program description describing the activities that were conducted in both the REC and HLV from 1989 to date and should distinguish programs conducted in the REC vs. HLV. * PNNL will prepare a program description paper and present it at the next DQO meeting. The description should use the following criteria as a guide for evaluation:

90 day storage of waste
greater than 90 day storage of waste
movement of waste after 90 days
no hazardous/mixed waste operations

It was agreed that programs conducted before 1989 should not be considered at this time.

Evaluation of the REC unit should be based on all areas that may have housed hazardous waste operations: every hot cell (A, B, C, D), the air lock, sampling rooms, cask loading area, and truck lock. The SMF will not be included.

The Low Level Vault should also be reviewed to determine whether inclusion is warranted.

The HLV should include ancillary systems, including the piping and conduits that transfer liquids from the tanks to areas in the REC. A question of whether the pipe trench can be separated from the HLV unit description remained unresolved.

Clean closure on the HLV may ultimately rest on the PNNL's ability to conduct a breach assessment. PNNL is investigating whether a good indicator of tank breach may be continuous air monitoring to detect any air-borne rad contaminants released as a leak in a tank fell to the vault floor. Threshold values for the continuous air monitors, based on knowledge of tank concentrations, are currently being reviewed. Ecology views the issue in more practical terms, if visual inspection of the tanks and vault is impossible, then clean closure may not be an option, and sealing-off of the vault and tanks, deferring closure, may be the most acceptable option. Ecology requested information on any planned future missions for the tank * DOE will ascertain the future mission of the HLV tanks and report it at the next DQO meeting.

Tank 106 has been excluded as part of the closure plan. All indications, including analytical

data, support the concept that Tank 106 did not house mixed waste and may have been flushed when it was emptied. The last analytical report for Tank 106 reveals significantly reduced rad levels in the liquids (indicating that flushing the tank reduced rad levels). Ecology stated that inclusion of Tank 106 would require that it be flushed (as already planned) and the rinsate be sampled and analyzed to verify clean closure levels were met.

6. Adjourn Schedule For Next Meeting

The next DQO meeting was scheduled for Thursday February 29, 1996 from 1 to 5pm at the Ecology Office in Kennewick (Conference Room 4).

Summary of Action Items:

PNNL has the action to

1/31-01: update table 4-7 of the closure plan and provide updated copies at the next DQO meeting.

1/31-02: produce a copy of the inspection report and present it at the next DQO meeting.

1/31-03: prepare a program description paper describing activities occurring in the HLV and REC. The paper should clearly separate activities conducted in the HLV from those conducted in the REC, and should be chronological from 1989 to-date.

DOE has the action to

1/31-04: ascertain the future mission of the HLV tanks and report back at the next DQO meeting.

Supporting Documents:

1. Draft copy of Ecology Comments on Closure Plan

2. PNNL Facility Review Presentation Notes

3. Process Knowledge Memo

4. HLV Process Flow Diagram

5. Resin Specification

6. Waste Designation Table

7. TPA Change Package M-89

324 Building REC and HLV Tank Closure Plan
(M-20-55 Submit closure plan for Non-Permitted Mixed Waste Units
located in the 324 Building REC B-Cell, D-Cell and HLV)
Submitted December 22, 1995 Review due
Department of Ecology Notice of Deficiency
January 1996

State Environmental Checklist is not included WAC 197-11-960.

Format and terminology not consistent with standard Hanford closure plan format.

Does not describe the Hanford Site (one id number WA890008967).

Omits discussion of DOE/PNNL owner operator relationship. The executive summary only refers to the U.S. Army Corps of Engineers which could be interpreted as the owner/operator of this unit/facility.

Fails to address why this closure is being handled independently and uniquely from the Hanford Site Permit.

Part A not available for review because unit is a non-compliant TSD.
*

Chapter 1.0, Introduction

Provide summary

* Does not address operational ~~or~~ and permitting/compliance history specific to the unit being closure.

Does not describe the Hanford Site (one id number WA890008967).

Omits discussion of DOE/PNNL owner operator relationship.

* Fails to address why this closure is being handled independently and uniquely from the Hanford Site Permit.

Fails to address lack of interim status/Part A.

Page 1-1, line 4. The 324 REC (especially) and HLV have not been distinguished from the rest of the 324 Building, or the rest of the REC. The units relationship to the rest of the Hanford Site has not been presented.

Page 1-1, lines 7. Specify which B-Cell Safety Cleanout Project (BCCP) plans. Only one was submitted for regulatory review. HAS not been approved for implementation

Page 1-1, lines 4-23. It is not appropriate for the closure plan to rely on referenced documents for completeness. The referenced documents (B-Cell Safety Cleanout Project (BCCP) plans, the 324 Building REC HLV Interim Waste Management Plan (IWMP), the Project Management Plan for Nuclear Facilities Management 300 Area Compliance Program, land the 324 High Level Vault Interim Removal Action Project (project management plan (PMP)) were submitted to fulfill TPA milestones associated with an Ecology compliance action against the facility. The milestones were proposed to minimize risk, to achieve compliant management of waste, and to ensure long term protection of human health and the environment. The documents do not circumvent the requirement to fulfill WAC 173-303-610(3). Please revise to incorporate applicable information into the closure plan. The following is provided as guidance.

The documents were not processed in accordance with ...
therefore cannot fulfill the requirements

The closure plan must fulfill WAC 303-840 Procedures for decision making. In this, case the closure plan is managed analogous to the permit referred to in this regulation.
The department must assure the approved closure plan is consistent with WAC 173-303-610 (2), (3), (4), (5), and (6), and requirements specific to the type of unit. In order to make this determination the following information is required by WAC 173-303-610(3). The closure plan must at least:

- The closure plan must identify steps necessary to perform partial and or final closure of the facility at any point during its active life,
- description of how each dangerous waste management unit will be closure in accordance with WAC 173-303-610(2)
- maximum extent of operation,
- maximum inventory,
- detailed description of the methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the off-site dangerous waste management units to be used, etc.,
- detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment streams components, equipment, structures, and soils during partial and final closure, ...
- detailed description of other activities necessary to satisfy the closure performance standards, and
- a schedule for closure.

Page 1-1, line 25. The 324 REC (especially) and HLV have not been distinguished from the rest of the 324 Building, or the rest of the REC. It has not been demonstrated that the other hot cells of the REC and airlock are not part of the unit. Revise closure plan accordingly

Page 1-1, line 31. Tank 106 is subject to closure until it is demonstrated to the departments satisfaction that the tank never managed waste. In addition, the plan fails to address the containment system or ancillary equipment of the HLV tanks. Revise closure plan accordingly.

***

Chapter 2.0, Facility Description and General Provisions

2.3.1 General Description of the REC Complex

1. Provide ranges of ionizing radiation in the present radioactive material inventory . The plan states that all normal operations in the REC's are performed remotely due to the high dose rate of ionizing radiation. 2.3.1 lines 41-43.
2. List the remote equipment in detail used in the operations. Are there more than one? If so, list them with the function they provide.
3. State the future use of the equipment . Will the remote equipment be closed or reused?

2.3.2 Description of B-Cell

1. Designate all the materials. The B-cell only has mixed waste and dispersible radioactivity. Were other materials present? If yes, which ones and how will the wastes be managed? If no, what process was used for verification?
2. When will the dispersible radioactivity be removed or containerized?
3. Under what process will the dispersible radioactivity be removed or containerized?
4. Has wastes accumulated in the B-Cell?

Are the HEPA filters included in the closure? Is so, they will need to be designated and managed accordingly.

2.4.1 Tank 104

1. When did the hydrostatic test occur?
2. When did the leak test occur?

2.4.2 Tank 105

1. When did the hydrostatic test occur?

2. When did the leak test occur?

2.4.3 Tank 107

1. Why was the tank subject to dye-penetration testing and not leak testing and hydrostatic testing like the other tanks? This is a question of concern considering that wastes from Tank 107 can be transferred to Tank 104 and the B-cell tanks.
2. Was solution ever transferred from Tank 107 to Tank 104? If yes, please provide quantities, dates, and types of solutions.

2.4.4 Ancillary Equipment

1. Have the pipes been recently tests for integrity and pressure? Testing was great in 1965. If the pipes are going to be used for closure, recent testing or validation of integrity and pressure is needed.

***

Page 2-1, line 43. The terminology used in this section is so laden with industry specific jargon it has little meaning to the non-health physicist. The term "technical studies" is so vague it is meaningless. Specify if such studies involve waste regulation by the Dangerous Waste Regulations. Other vague or unquantified terms include natural background, full-process levels, basic and applied data, serious safety and environmental incidents. Please include a definition/description into the closure plan.

Page 2-2, line 1. Please provide a copy of the Hanford Plant Standard Criteria 4.1 Revision 2, 1959.

Page 2-2, line 15. Explain how the aqueous and solid radioactive and hazardous materials were managed regulatorially. What regulations were imposed on this material.

Page 2-2, line 21. Describe the entire REC complex boundary. Present logic for not including the entire complex in the unit for closure, addressing each component individually. In developing the logic for defining the boundary of the unit consult WAC 173-303-610 (3)(a)(ii), (iii) and (v), 173-303-610(5) and 173-303-640.

Page 2-2, line 23. The figures do not clearly delineate the REC complex from the rest of the 324 Building, or a proposed boundary of the unit to be closed from the complex. A legend would also be helpful. Please revise figures or provide additional figures for clarity.

Please include a definition/description into the closure plan. Please describe/explain electrostatic precipitator, high-efficiency particulate air (HEPA) filter, high-dose of ionizing radiation, present radioactive material inventory.

Explain, either here or reference other section of plan, the relationship and history of the BCCP to the closure of the unit.
This section fails to address the relationship and/or regulatory distinction of the airlock and hot cells A and C from those portions of the REC addressed for closure. this section provides information necessary to establish the boundary of the unit to be closed. A complete regulatory history of the entire complex would be a good first step.

Page 2-2, line 37. Specify regulations applicable to air emissions from the REC and explain briefly how such regulations are fulfilled, including RCRA Air Emission regulations (40 CFR 265 Subpart AA, BB, and CC).

Page 2-3. The closure plan fails to describe A Cell or the rationale for omitting it from closure.

Page 2-3, line 9. If process knowledge is to be used to limit constituents to be analyzed then detailed process descriptions must be provided. The process history must include all activities conducted in the unit.

Page 2-3, line 9. Define "high activity", "highly contaminated", cell waste, and radioactive material.

Page 2-3, line 14. Describe potential accident scenarios which could lead to a release of materials contained in B Cell.

Page 2-3, line 19. Describe methods to be implemented to verify that underlying soils have not been impacted **********

Page 2-3, line . The description of B Cell as presented implies that the operating galleries and sample hood is to be part of B Cell closure. Please clarify and provide logic.

Page 2-3, line 32. Provide the alarm levels of the sump alarm in B Cell and explain how liquid is removed from the sump, designated and disposed.

Page 2-3, line 35. Provide a list and detailed description of ANY occurrence in which negative pressure was not maintained in the cell. Discuss the potential to bring contamination into the cell via the ventilation inlets and service penetrations.

Page 2-3, line 42. Specify regulations applicable to air emissions from the REC and explain briefly how such regulations are fulfilled, including RCRA Air Emission regulations (40 CFR 265 Subpart AA, BB, and CC).

Page 2-4. The closure plan fails to address C Cell or provide rationale for omitting it from closure. Please revise to address deficiency.

Page 2-4, line 1. Provide the operational history of D Cell. Explain if, or how, C and D Cell are connected or separated. Describe any effluents and/or emissions from D Cell.

Page 2-4. This section fails to address how the hot cell are connected, separated, common utilities, ancillary equipment, maximum extent of operation, and how stuff moves into and out of the cells. *******Develop more*****

Page 2-4, line 13. Specify the duration, waste acceptance criteria, and actual waste streams (both radioactive and hazardous) managed in the High Level Vault Tanks (HLV).

Page 2-4, line 15. Define "high-activity". Definition section may be appropriate.

Page 2-4, line 18. Explain the rationale for constructing the tanks of stainless steel (shielding, corrossion resistence, etc).

Page 2-4, line 21. Explain the reason for using specific construction materials such as, stainless steel, concrete.

Page 2-4, line 21. Compare the "secondary containment" system describe in the closure plan to the requirements for secondary containment in the Dangerous Waste Regulations (WAC 173-303-640).

The closure plan fails to address the boundary of the HLV system. Please clarify what is proposed to be included in the closure of the HLV tanks.

Page 2-4, line 35. The sample room in not depicited in Figure 2-7 as stated in the text. Please revise to correct error. Clarify if it is proposed to include the sample room in the boundary of the unit to be closed. Provide rationale for proposal.

Page 2-4, line 39. This paragraph addresses installation of the tanks in 1964 while page 2-1, line 36 addresses completion of the 324 Building in 1965. For clarification and to fulfill closure requirements, please provide a complete construction and operational history of the 324 Building as related to the REC complete.

Incorporate design features and installation procedures for the vault tanks and ancillary equipment into the Administrative record. Because most of the vault tanks were constructed well before the 324 Building it is not clear how the installation in the 324 Building in 1964 would incorporat design features of the tanks. Please elaborate to clarify discussion provided in text.

Page 2-4, line 45. Tank 106 must be addressed in the closure plan.

Page 2-5, line 3. Please provide as build drawings and design, specify modications, previous location and function of tank 104. Describe the function or criteria for which tank 104 was originally built. Discuss the intire operational history of the tank.

Page 2-5, line 5-8. Describe the "radiograph" procedure and compare to current dangerous waste tank requirements or guidance.

Provide a discussion of equivalency of the integrity assessments performed to those required by the Dangerous Waste regulations for tanks managing dangerous waste.

Page 2-5, line 14. Please describe the material of the eighteen pads on which tank 104 rests. Specify if this material will be analyzed to determine if tank 104 containment has failed.

Page 2-5, line 19-22. The information provided in this paragraph is being interpreted as part of the tanks 104 system to be closed. Clarify if this is the intent. If not, address each portion individually providing supporting information to justify not closing as part of the unit. Keep in mind the closure plan must address the maximum extent of operation of the unit.

Page 2-5, line 27. Please provide as build drawings and design, specify modications, previous location and function of tank 105. Describe the function or criteria for which tank 105 was originally built. Discuss the entire operational history, including the non-operational management of the tank.
Page 2-5, line 29. Provide a discussion of equivalency of the integrity assessments performed the "radiograph" procedure to those required by the Dangerous Waste regulations for tanks managing dangerous waste.

Page 2-5, line 37. Please discuss the difference between 309 Coilumbium stainless steel and 304L stainless steel.

Page 2-5, line 42-44. The information provided in this paragraph is being interpreted as part of the tanks 105 system to be closed. Clarify if this is the intent. If not, address each portion individually providing supporting information to justify not closing as part of the unit. Keep in mind the closure plan must address the maximum extent of operation of the unit.

Page 2-6. Tank 106, 112, 114, 115, 118 and the load out station must be addressed in the closure plan.

Page 2-6, line 3. Please clarify if tank 107 was built specifically for use in the HLV. Explain why this tank was subjected to both radiography and dye-penetration testing of welds while tanks 104 and 105 were only subjected to radiography.

Page 2-6, line 10. Please explain why this tank operates at a negative pressure which is different from the other tanks.

Page 2-6, line 12-13. The information provided in this paragraph is being interpreted as part of the tanks 107 system to be closed. Clarify if this is the intent. If not, address each portion individually providing supporting information to justify not closing as part of the unit. Keep in mind the closure plan must address the maximum extent of operation of the unit.

Page 2-6, line 22. The piping which may terminate in the vault must extend beyond this area. Describe the maximum extent of all piping associated with the vault tanks. Discuss secondary containment system for piping extending beyond the HLV vault.

Page 2-6, line 27. Provide a discussion of equivalency of the integrity assessments performed on the piping to those required or by the Dangerous Waste regulations for tanks managing dangerous waste.

Page 2-7. Please address access limitations to non-TSD, 324 Building personnel.

Figures. Please provide a figure which indicates the portion of the building in which the 324 REC and HLV tanks are located. An enlarged figure of the building providing an outline of where the hot cells and vault tanks are located.

The boundry of the unit is not presented in any of the figures. A legend to describe the figures is necessary.

Figures 2-17 and 2-18. The designation codes are not defined. Many functions associated the the vault tanks have been neglected in the text and figures of the closure plan. Please define hot pilot cells, jet to pot, sump J-36, Pipe trench, sampler, dip tube to pipe treanch, pot to pipe treanch, jacket outlet. In addition, these various functions must be addressed in closure of the unit.

Chapter 3.0 Process Information

3.1.1 Waste Solidification Engineering Prototypes

1. Do real or estimated quantities of waste exist by tank and process. Please provide individual waste quantities generated annually and collectively.

3.1.3 Fabrication of Cesium and Strontium Heat and Radiation Sources Program (FRG Program)

1. Was there any bv-product in the production of heat sources? If yes, individually list the amounts by source and how they were managed.

3.1.4 Present Conditions

1. What solutions are contained in the vault tanks? Please list quantities by solution and in which tank.

***

General comments regarding chapter 3.

Closure plan must address all processes which generated waste managed by the REC/HLV. Not only will this support the use of process knowledge for defining data gaps and may be used to justify using indicator analytes.

Need flow diagrams representing waste transport. Need table listing all waste streams managed by portion of unit (one for REC, one for HLV), indicating the date of generation or period of management.

Page 3-1, line 5-8. Please provide these documents reference here for regulatory review and incorporate them into the administrative record for the unit. Explain if the Dangerous Waste regulations or regulatory guidance were considered in developing this chapter.

Page 3-1, line 13. When addressing REC specify if the REC complex or REC unit (portion proposed for closure) is being discussed.

Page 3-1, line 14. It is not appropriate to limit the process knowledge to only a portion of the projects conducted in the unit. The closure plan must include at least a description which identifies the maximum extent of operation of the facility and an estimate of the mazimum inventory of dangerous wastes ever on-site over the active life of the facility. (For an example, see 216-B-3 Expansion Ponds Closure Plan)

This section is inconsistant with major programs as presented on page 2-2. This section fails to address other other major programs are the Nuclear Waste Vitrification Program (NWVP), the Nuclear Waste Treatment Programs Pilot Scale Radioactive Liquid-Fed Ceramic Melter (FLFCM) Testing Task, and Metallographic investigations. Revise..... Specify all areas in which the HLV tanks can receive or distrube material. Discuss mechanisms which perclude waste generatecd outside the REC from entering the HLV tanks.

Describe process for investigating process knowledge of unit.

Page 3-1, line 20. Provide complete composition and designation of decontamination solutions.

Page 3-1, line 30. The WSEP program began in 1966 but line 13 or 3-1 states liquids generated within the REC have bee discharged at various time to the HLV tanks since 1968. Explain the function of these tanks during this period. Describe, if applicable, the verification process to determine the tanks were non-operational during the 1965-68 time frame. Discuss mechanisms which perclude waste from entering the HLV tanks during this period.

Page 3-1, line 34. Need full discription of processes conducted in the unit.

Page 3-1, line 42. Duration of WSEP program 66-72.
FYI. Pu-U w/Fe, Al, Mo, Ni, Co, Cu, K, Rb, Fe WSEP substitute chemicals.

Page 3-2, line 1. Duration of NWVP program 76-79.
No constuents described. Fully discribe processes conducted in the unit.

Describe activities associated with HLV tanks and hotcells during the period from 72 -76.

Page 3-2, line 9. Describe dangerous constituents, residues and waste streams associated with the NWVP. Describe management practices associated with the by-products.

Page 3-2, line 17. Duration of FRG program 86-87.
No constuents described but references are made to feed solutions, process condensates, and decontamination solutions. Text must be revised to address all dangerous waste constuents, residues, and decomposition products.

Page 3-2, line 15. Describe activities associated with HLV tanks and REC during the period from 79 - 87.

Page 3-2, line 30. Duration of storage of NWVP and FRG solutions for which no analytical information is presented from 87-present. Long term waste storage. Descibe management practices implemented during this period of storage.

Chapter 4.0 Waste Characteristics

4.1.1 REC Waste Inventory and Characteristics

1. What was the estimated amounts of the 1986 spill? Was the spill remediated or contained? Please describe actions taken to contain and remediate the spill. Where was the waste sent upon remediation?
2. Are these current quantities in Table 4.1. Please provide a historical accumulation of the wastes,
3. List any additional waste streams which exist. Also list how they have been designated and have or are being managed.

4.1.1.1 Dispersible Debris

1. List all the radioactive sources.
2. Provide a range of radioactivity from high to low.

4.1.1.5 Oil-Absorption Material

1. Was was the mixed waste managed?
2. What is the quantity of waste generated/
3. When did the leak occur, when was it fixed, Has the leaking window been fixed so no new additional wastes are being generated?

4.1.2 HLV Tank Waste Inventory and Characteristics

1. Has these tanks ever contained and managed multiple products generating different waste streams. How were these streams managed?

4.1.2.1 Tanks 104 and 105

1. Are the waste streams the same as in 1990? If not, have samples been taken more recently?

4.1.2.2 Tanks 106 and 107

1. What process was used to designate the wastes in Tank 106?

4.1.2.3 Process of Compiling Waste Characterization Information

1. What were the results of the Project Reports?

4.2.1 REC Waste-Treatment Plans

Provide detailed steps of decontamination. What equipment will be used? What is the capacity of the equipment? How will the equipment be managed upon completion of decontamination?

4.2.2 HLV Tank-Waste Treatment Plans

1. What is the estimated rate of evaporation?
2. Provide the process for isotope separation- What equipment is needed, estimated time for isotope separation, how will the isotope separation occur, etc...
3. Where will the wastes slated for disposal go?
4. Where will the recyclable material go?

***

Page 4-1, line 4. Please specify the time period from which the maximum estimated inventory and waste charateristics were derived. Provide basis for the time frame choosen. Explain the assumption that the maximum inventory existed just prior to initiation of the BCCP. Address the possibility that the maximum inventory may be generated during closure activities

Page 4-1, line 11. Although waste removal activities occurred prior to final issuance of the closure plan such activities are considered closure activities. The closure plan must include a detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contminated containent system components, equipment, structures, and soild during portial and final closure, including, but not limited to. procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing

surrounding soils, and criteria for determining the extent kof decontamination required to satisfy the closure performance standrd. And a detailed description of the method to to be used during partial and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or diswposing of all dangerous wastes, and identification of the types(s) of the off-site dangerous waste management units to be used, if applicable.

Facility owner/operators may conduct activities, including removing wastes and decontaminating or dismantling equipment and structures at any time prior to closure. Provided Ecology determines that such activities were conducted in accordance with the requirements for closure, they could be approved in the subsequently submitted closure plan.

In order for Eclogy to make such determinations, facility owner/operators must keep detailedc records documenting that all activities conducted prior to lcosure plan approval are consistent with clorue requirements. Information maintiained to supprot consistency with the closure requirements should, at a minimum, include the information required for closure certification.

Ecology connot accept activities if they are incosistent with the closure regulations or if adequate information is not available to supprot a determination of consistency with closure requirements. If Ecology determines activities were incosistent with the clsoure requirments and/or if adequate information is not available to determin consistency, Ecology can require facilitty owner/operators to conduc t additional act9ivites, including, but not limited to, removal and/or decontamination of wastes, waste residues., equipment and/or sturctires, additional sampling and analysis, and/or investigatory activities designed to determine the degree to which previous conducted activities comply with closure requirements. See WAC 173-303-610(3)(c)(iv) and 40 CFR 265.112(e) as referenced by WAC 173-303-400.

Page 4-1, line18. Specify the time frame from which the quantities and characteristics are being derived. Discuss the basis for choosing this period of time.

Specify if the residue is likely to remain in the REC and HLV tanks after closure of the unit.

Each waste stream has not been addressed in previous chapters of the closure. Only "major program" waste streams have been discussed. Please correct error.

Dangerous waste managemetn units must be clsoure in a manner that controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of.dangerous waste, dangerous constituents, leachate, and dangerous waste decomposition products.

Page 4-1, line 24. Specify the time frame from which the characteristics are being derived. See previous comment.

Page 4-1, line 32 Please reference section of closure plan which contains the sampling and analysis plan. The short comings ow EPA SW-846 methods as applicable to this facility must be fully addressed in the sampling and analysis plan.

Page 4-1, line 33. Address the possibility that the maximum inventory may be generated during closure activities

Page 4-1, line 41. Justify the statement that all REC mixed-waste generation occurred in B-Cell. Specify if REC refers to the entire complex or only those proposed for closure.

Specify the duration of research and development activities conducted in the unit. The 25-30 does not correlate to the cummulative 20 years presented in the process information chapter.

All material present in the portions to be closure must be presented in a manner which will allow potential impacts on closure activities to be considered.

Page 4-2, line 1. Closure plan must address all processes which generated waste managed by the REC/HLV. Not only will this support the use of process knowledge for defining data gaps and may be used to justify using indicator analytes.

It is not appropriate to limit the process knowledge to only a portion of the projects conducted in the unit. The closure plan must include at least a description which identifies the maximum extent of operation of the facility and an estimate of the mazimum inventory of dangerous wastes ever on-site over the active life of the facility. (For an example, see 216-B-3 Expansion Ponds Closure Plan)

Dangerous waste managemetn units must be clsoure in a manner that controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, and dangerous waste decomposition products.

The data developed to support clean closure certificiations and other clsoure decisions must be of sufficient quality to withstand any scientific and/or legal challenge. Seclection of the proper analytical constituents must consider all dangerous waste constituents generated or managed at the unit.

Page 4-2, line 4. Please clarify the use of the term debris. As used in referring to tools, manipulator boots, air howes. The next sentence claims some of this material may be dispersible. Section 4.1.1.1 provides a more definitive discription.

Page 4-2, line 9. Please specify the time frame for which such waste designations occured.

Page 4-2, line 26. This information will be considered as historical knowledge in regard to closure of the unit. Due to the lack of process and analytical information associated with activities conducted in the units more extensive sampling and analysis will be required. Therefore revise the plan to present historical data and remove Table 4-1 which implies these are the only dangerous waste characteristics associated with the unit. In addition, radiological constituents must be addressed.

4-3, line 7. **1/23

Chapter 5.0 Groundwater

5.0 Groundwater

1. What about soils? What steps have been taken to verify that wastes do not have contamination?
2.

***

Page 5-1, line 4. Delete lines 4-6. The statement is not correct. The definition of the operable unit is appropriate but does not fulfill the groundwater regulations, WAC 173-303-610, 640, 645, or 646, which are applicable to this unit.

Clean closureof units where pre-existing contamination exists may occur. Provided all dangerous wastes, constituents, and residues which originated from the unit or waste management activities associated with the unit are removed to appropriate clean closure levels, and the owner/operator demonstrates to Ecology's satisfaction that the remaining contamination did not emonate form the closuring unit.

Post-closure care is required when dangerous waste or waste residues are left in place at a closed unit. A post-clousre permit is typically required to ensure appropriate post-closure care. Ecology considers dangerous waste or wasdte residues left in place when dangerous waste constituents, residues, or

decomposition products at eh closure unit remain a concenttration above numeric cleanup levels determined using residential exposure assutions unit MTCA mehtod A or B.

See chapter 8, post-closure plan, comments.

Groundwater must be addressed under RCRA. There must be a committemtn to perform post-closure care if CERCLA remediation does not materialize or fulfill RCRA requirements (due to funding or authorization problems).

CERCLA does not supercede RCRA.

Any RCRA/CERCLA coordination efforts must be spelled out in the closure and contingent post-closure plan. At a minimum, explain how CERCLA documentation can be accessed.

In the event of confirmed or potential soil; contamination, groundwater monitoring may also be required to demonstrate or confirm clean closure. Groundwater monitoring may be required for any dangerous waste management unit, including those not subject to a regulatory requirement for groundwater monitoring under WAC 173-303-645 (i. e. a container storage area).

**1/23

Chapter 6.0 Closure Strategy and Performance Standards

Page 6-1, line 4. There needs to be a reference to applicable regulations (WAC 173-303). All options, not just clean closure, must be presented. Unknows associated with meeting clean closure performance standards are significant. Alternatives to clean closure must be presented, and committed to, if clean closure is not achieved.

In general, this chapter does not present performance standards. Too many exteraneous documents are referenced which have no regulatory oversight or enforcability. Revise plan to incorporate all cleanout activities (including prior to M-89) for regulatory review, public comment, and approval. Address complete closure strategy for closure of entire unit including ancillary equipment, all of the hot-cells, especially D-Cell, and LLV if appropriate.

Facility owner/operators may conduct activities, including removing wastes and decontaminating or dismantling equipment and structures at any time prior to closure. Provided Ecology determines that such activities were conducted in accordance with the requirements for clsoure. The facility owner/operators must keep detailed records documenting that all activities conducted prior to clsoure plan approval are consistent with closure requirments. At a minimum, include information required for clsure certification. Ecology cannot accept activities if they are inconsistent with the clsoure regulations or if adequate information is not available to support a determination of consistency. If Ecology determines activities were inconsistent with the clsoure requirments and/or if adequate 9nformation is not available to determin consistency, Ecology can require facility owner/operators to conduct additional activities, including, buth not limited to, removal and/or decontamination of wastes, waste reisdues, lequipment and/or strucures, additional sampling and analysis, and /or investigatory activites.

Page 6-1, line 10. Recommended revising the language to read somthing like "the 324 REC/HLV will pursue clean closure if this is not achieved the options ... will be implemented."

Remove the words "contingent", "above", "negotiated", and "contingency". All options of closure must be presented. Clean closure will occur if clean closure performance standards are met, not simply cleanup levels. Typically concentrations will be below specified levels. Again refer to applicable regulations. See comments on 7.3.

Page 6-1, line 16. The closure plan must detail activities conducted in pursuit of closure. The bullets do not provide the required detail.

Page 6-1, line 18. See WAC 173-303-610(3) for guidance on required contents of closure plan. Also, see first comment on this chapter. It is appropriate to reference more detailed sections of the plan.

Page 6-1, line 19. See WAC 173-303-610(3) for guidance on required contents of closure plan. Also, see first comment on this chapter. Address WAC 173-303-640 tank integrity assessment requirements and Ecology's *Guidance for Assessing and Certifying Tank Systems that Store and Treat Dangerous Waste.* Present a compartive and equivalency discussion for methods that speculated to deviate from the Dangerous Waste regulations or guidance due to high radiation or physical limitations.

It is appropriate to reference more detailed sections of the plan.

Page 6-1, line 20. See WAC 173-303-610(3) for guidance on required contents of closure plan. All closure plans must include a sampling and analysis plan to characterize the areal and vertical extent of contamination at and/or released from the closing unit and to confirm the effictiveness of clsure acitivities. The level of detail in the sampling and analysis plan should be commensurate with the complexity of conditions at the closing unit. Sampling and anaysis plans must include information necessary to insure proper planning and implementation of sampling activities. See Ecology's *Guidance for Clean closure of Dangerous Wste Facilties.*

It is appropriate to reference more detailed sections of the plan.

Remove "for the constituents of concern" and replace with a reference to closure performance standards.

Page 6-1, line 21. See WAC 173-303-610(3) for guidance on required contents of closure plan. Must commit to further actions if clean closure is non-attainable.

It is appropriate to reference more detailed sections of the plan.

Page 6-1, line 24. Remove "criteria" and "potentially" and "cleanup levels". Replace with discussion of how closure performance standards will be fulfilled.

Page 6-1, line 26. Remove "a cleanup level evaluation will be implemented to determine addition action required." These actions must be outlined in the closure plan.

Page 6-1, line 31. Remove "in the unlikely event that" and replace with "if". Address regulatory requirements and guidance, boundry for which the assessment will be applied, methods and verification for conducting the cell integrity assessment. See comments regarding the "visual" assessment, 6-4, line 44.

Page 6-1, line 34. Delete the sentence "the closure plan will require modification, and then closure activities will continue as detailed in this revised closure plan. See first comment on this chapter.

This application for a closure plan lacks so much detail it is cannot be considered for approval. See WAC 173-303-610 and Ecology's *Guidance for Clean Closure of Dangerous Waste Management facilities* for guidance

Modification of the closure plan must be addressed in regard to WAC 173-303-610(3)(b).

Note inconsistent language must be corrected. In many places of the closure plan such as; line 35 -this *revised* closure plan, 40 - *this* closure plan, inappropriate and confussing language is inserted or regulatory words are removed in discussing the enforcable closure plan. Replace such ambiguous words with "approved" in regard to performance of closure activities.

Page 6-1, line 37. This section fails to address WAC 173-303-640, Tank closure and post-closure care. Address WAC 173-303-640 tank integrity assessment requirements and Ecology's *Guidance for Assessing and Certifying Tank Systems that Store and Treat Dangerous Waste*. Present a compartive and equivalency discussion for methods that speculated to deviate from the Dangerous Waste regulations or guidance due to high radiation or physical limitations.

Address regulatory requirements and guidance, boundry for which the assessment will be applied, methods and verification for conducting the cell integrity assessment. Address potential post-closure care.

See previous comment on closure activities and modification.

Page 6-1, line 43. Delete or rewrite entire paragraph. Either closure performance standards and cleanup levels are achieved or not. Analytical data will be evaluated to determine extent and quantity of contamination and determine if further actions are necessary. Address potential post-closure care.

Page 6-2, Figure 6-1. Change title of figure to "REC closure path". Insert applicable regulations and sections of the closure plan into each step of the diagram where appropriate (integrity assessment, decontamination, sampling and analysis, etc)

Sampling and analysis will be necessary to determine the full extent of operation and contamination if the tanks have leaked. The contaminated area would be considered to be within the boundary of the unit. Closure options must be developed to address the potential for the determination that the containment system has been breached.

Although the B-Cell Clean out Project and Inventory removal was initiate prior to the closure plan development such activities must be incorporated into the closure plan. See first comment on chapter 6.

Remove the word "clean" from the "initiate clean closure plan" box. Remove "samples below characteric levels" and replace "meets closure performance standards".

Remove the pathway that allows clean closure to occur if the cell liner has been breached. This process has not been develop and therefore cannot be considered at this time. Insert options into the flowchart addressing various methods of closure based on the potential scenerios of waste remaining after closure.

Potential post-closure care must be addressed in the closure plan.

Page 6-3, Figure 6-2. Change title of figure to "HLV closure pathway". Insert applicable regulations and sections of the closure plan into each step of the diagram where appropriate (integrity assessment, decontamination, sampling and analysis, etc).

Sampling and analysis will be necessary to determine the full extent of operation and contamination if the tanks have leaked. The contaminated area would be considered to be within the boundary of the unit. Closure options must be developed to address the potential for the determination that the containment system has been breached.

Although the PMP and Inventory removal was initiate prior to the closure plan development such activities must be incorporated into the closure plan. See first comment on chapter 6.

Remove the word "clean" from the "initiate clean closure plan" box. Remove "samples below characteric levels" and replace "meets closure performance standards".

Remove the pathway that allows clean closure to occur if the cell liner has been breached. This process has not been develop and therefore cannot be considered at this time. Insert options into the flowchart addressing various methods of closure based on the potential scenerios of waste remaining after closure.

Potential post-closure care must be addressed in the closure plan.

Page 6-4, line 1. The closure plan must present all activities to be conducted to fulfill closure performance standards. Remove "the closure plan will be amended" and replace with discussion of activities to be performed in the event closure performance standards are not met through decontamination.

Page 6-4, line 4. Delete this paragraph. In the event that clean closure can not be achieved post-closure activities will be initiated in accordance with the contingent post-closure plan which is a requirement of this closure plan. There is no such thing as a 324 Building Closure and CERCLA requirements will not fulfill the the Dangerous Waste regulations applicable to this unit. Therefore, revise the plan to address other mechanisms of closure, besides clean closure, and post-closure care.

If it is determined that CERCLA activities can meet some of the Dangerous Waste Requirements for this unit. Each proposed equivalent activity must be presented for regulatory review and approval, and public comment, in the closure plan for this unit.

Page 6-4, line15. See comments regarding proposed certifications, section 7.14, which may require revision of this section of the closure plan. Discribe how activities conducted prior to closure plan approval will be certified (inventory removal, BCCP, and PMP, etc.).

Facility owner/operators may conduct activities, including removing wastes and decontaminating or dismantling equipment and structures at any time prior to closure. Provided Ecology determines that such activities were conducted in accordance with the requirements for clsoure. The facility owner/operators must keep detailed records documenting that all activities conducted prior to clsoure plan approval are consistent with closure requirments. At a minimum, include information required for clsure certification. Ecology cannot accept activities if they are inconsistent with the clsoure regulations or if adequate information is not available to support a determination of consistency. If Ecology determines activities were inconsistent with the clsoure requirments and/or if adequate 9nformation is not available to determin consistency, Ecology can require facility owner/operators to conduct additional activities, including, buth not limited to, removal and/or decontamination of wastes, waste reisdues, lequipment and/or strucures, additional sampling and analysis, and /or investigatory activites.

Page 6-4, line 21. Replace "this" with "the approved". The closure plan, and associated administrative record, shall be maintained for a minimum of ****until the 300 Area is remediated and released ***7 years following certification, if clean closure is achieved. Copies of the closure plan, and associated administrative shall be incorporated into the 300-FF-2 and 300-FF-5 unit regardless of the closure method. If post-closure is required the document will be maintained at the facility as well as in the administrative record and DOE Reading Room.

Please explain why the location provided here differs from the administrative record room located at the Seattle/Vancover/Tri-Cities repositories, 2440 Stevens and the DOE Reading Room located at the WSU-TC branch campus at 100 N. Sprout, Richland.

Page 6-4, line 31. Address WAC 173-303-630(10) requirements.

Page 6-4, line 33. Revise plan to provide a detailed description of the steps needed to decontaminate, remove, transport, treat, store, or dispose of all dangerous wastes.

Page 6-4, line 36. This sentence is unclear and must be revised. It states that wastes are used in processing of HLV tank liquids. The waste is the HLV liquids. Revise plan to provide a detailed description of the steps needed to decontaminate, remove, transport, treat, store, or dispose of all dangerous wastes.

Page 6-4, line 41. Remove the reference to the BCCP and incorporate closure activities into closure plan. Revise plan to incorporate all cleanout activities (including prior to M-89) for regulatory review, public comment, and approval. Address complete closure strategy for closure of entire unit including ancillary equipment, all of the hot-cells, especially D-Cell, and LLV if appropriate. See WAC 173-303-610(3) for required closure plan contents.

Facility owner/operators may conduct activities, including removing wastes and decontaminating or dismantling equipment and structures at any time prior to closure. Provided Ecology determines that such activities were conducted in accordance with the requirements for clsoure. The facility owner/operators must keep detailed records documenting that all activities conducted prior to clsoure plan approval are consistent with closure requirments. At a minimum, include information required for clsure certification. Ecology cannot accept activities if they are inconsistent with the clsoure regulations or if adequate information is not available to support a determination of consistency. If Ecology determines activities were inconsistent with the clsoure requirments and/or if adequate 9nformation is not available to determin consistency, Ecology can require facility owner/operators to conduct additional activities, including, buth not limited to, removal and/or decontamination of wastes, waste reisdues, lequipment and/or strucures, additional sampling and analysis, and /or investigatory activites.

Page 6-4, line 43. Provide a detailed discription of integrity assessment and a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 6-5, line 1. Provide a detailed discription of integrity assessment, decontamination, and seal procedures. Provide a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 6-5, line5. Remove this sentence. This closure plan shall be developed to address several methods of closure.

Page 6-5, line **********See Joan and Dave B**********

Provide a detailed discription of methods and performance standards. Address WAC 173-303-610, 630, 640, 645, and 646.

Page 6-5, line 10. Provide a detailed discription of integrity assessment and a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 6-5, line 15. Verification sampling is required to confirm achievement of clean closure.

Page 6-5, line17. Remove "clean closure" and present various closure senerios, including post-closure.

The list of activities fails to address all closure requirements, such as certification, notice in deed, and notice to local land authority.

Page 6-5, line 22. Remove the reference to the 324 HLV/RA Project PMP and incorporate closure activities into closure plan. Revise plan to incorporate all cleanout activities (including prior to M-89) for regulatory review, public comment, and approval. Address complete closure strategy for closure of entire unit including ancillary equipment, all of the hot-cells, especially D-Cell, and LLV if appropriate. See WAC 173-303-610(3) for required closure plan contents.

Facility owner/operators may conduct activities, including removing wastes and decontaminating or dismantling equipment and structures at any time prior to closure. Provided Ecology determines that such activities were conducted in accordance with the requirements for clsoure. The facility owner/operators must keep detailed records documenting that all activities conducted prior to clsoure plan approval are consistent with closure requirments. At a minimum, include information required for clsure certification. Ecology cannot accept activities if they are inconsistent with the clsoure regulations or if adequate information is not available to support a determination of consistency. If Ecology determines activities were inconsistent with the clsoure requirments and/or if adequate 9nformation is not available to determin consistency, Ecology can require facility owner/operators to conduct additional activities, including, buth not limited to, removal and/or decontamination of wastes, waste reisdues, lequipment and/or strucures, additional sampling and analysis, and /or investigatory activites.

Page 6-5, line 23. Revise the closure plan to provide a detailed discription of integrity assessment and a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance. Address the entire unit, including ancillary equipement and tank 106.

Revise the closure plan to provide a detailed discription of integrity assessment, and decontamination procedures. Provide a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 6-5, line26. Remove this sentence. This closure plan shall be developed to address several methods of closure, including post-closure.

Page 6-5, line 31. Revise to address closure performance standards and other potential closure senerios. Remove the reference to the surfaces of each unit. If contamination has spread beyond the engineered structures of the unit post-closure care may be required.

Page 6-5, line 39. Revise paragraph to address closure performance standards and potential post-closure.

Page 6-6, line3. Remove the word "clean". Address the use and appearance of surrounding area and how post-closure would impact the use and appearence of the surround area.

Page 6-6, line 10. Remove or revise this paragraph. The unit may not be able to clean close and closure activities have not been presented in Section 6.2 which would allow Ecology to evaluate consistency with closure requirments. Post-closure has been neglected.

Incorporate closure performance standards, closure alternatives, and detailed discussions of methods and procedures proposed to fulfill closure requirements. Post-closure must be developed and incorporated into the closure plan due to the significant chance clean closure cannot be achieved.

****

6.1 Closure Strategy

Need integrity assessment of pipes undergoing closure and those being used to transfer wastes (assuming those in transfer are not undergoing closure and will be reused for other purposes)

6.2 General Closure Activities

1. Define decontaminate and include all the steps intended to be used for decontamination
2. What equipment will be used?
3. Will additional wastes be generated?
4. How will the equipment and additional wastes be managed.
5. If remote equipment will be used, please specify the type
6. Provide the physical actions from set up to clean closure to management of all existing and newly generated wastes through closure operations

6.2.1 Closure Activities for B-Cell

1. What are the testing types? Who evaluates the testing.?
2. Provide the actual physical steps of clean closure

6.2.3 Closure Activities for HLV Tank
1. Attach 324 HLV IRA Project Map
2. Provide the actual physical steps intended for closure
3. Provide the steps to determine the extent of contamination of leaking tanks.
4. List the additional necessary decontamination steps if tanks have leaked.

6.3 Minimize the Need for Future Maintenance
1. Be specific to which cleanup level.
2. To which radioactive standard will the radioactive portion of the mixed waste be decontaminated to.? Rad standards are currently being developed. Will the site remain contaminated with radioactive wastes or residues?
3. How will the land be returned to previous appearance, will trees be planted, ect?

6.6 Compliance with Closure Requirements
1. Cleanup levels are not negotiated .

***

Chapter 7.0 Closure Activities

Page 7-1, line 6. Delete "once the closure plan is approved". Many activities occured prior to development of the closure plan. All activities conducted in pursuit of closure must be addressed in the closure plan. See WAC 173-303-610 or Ecology's *Guidance for Clean Closure of Dangerous Waste Facilities.*

Page 7-1, line 15. Provide a detailed discription of integrity assessment and a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 7-1, line 19. Provide a detailed discription of verification methods, alternative performance standards and a discussion of compliance or equivalency comparison to the Dangerous Waste Regulations closure requirements and guidance.

Page 7-1, line 22 Verification sampling is typically required to confirm achievement of clean closure.

Page 7-1, line
Page 7-1, line
Page 7-1, line
Page 7-1, line
Page 7-1, line
Page 7-1, line

****

7.2.1 324 Building B-Cell Safety Cleanout Project
1. Need to designate and characterize Suspect mixed waste to determine how the waste will be managed.
2. What equipment will be remotely operated? Describe physical steps of how equipment will be operated.
3. What safety precautions are being taken.

7.2.1.1.2 Dried Melter Felter
1. What type of treatment is anticipated?
2. When will the treatment occur?
3. List the appropriate permitted storage location.

7.3.11.2

1. Need to mark the hazards of the wastes in the SAA.
2. How will wastes be designated in SAA's.
3. How will the SAA be under control of the operator/owner?

7.3.11.3

1. Are the training records, contingency plan where the closure is occurring.

7.5 Integrity Assessment of the Units

1. Describe the integrity assessment of the pipes.

7.11 Schedule for Closure

1. Provide additional detail on the timing for steps involved in the closure.

***

Chapter 8.0 Postclosure Plan

If an owner/operator has a tank system that does not have secondary containment that meets the requirements of 173-303-640(4)(b) through (f)and is not exempt from the secondary containment requirements in accordance with 173-303-640 (4)(g) then; the closue plan must include both a plan for complying with 173-303-640(1)(a) and a contingent plan for complying with (b). A contingent post-closure plan for complying with (b) must be prepared and submitted as part of the closure plan. For the purposes of the contingent closure and post closrue plans, such a tanks system is considered to be a landfill.

The plan fails to address 610(7),(8),(9), (10), and (11). Revise to incorporate.

Post-closure care is required when dangerous waste or waste residues are left in place at a closed unit. A post-clousre permit is typically required to ensure appropriate post-closure care. Ecology considers dangerous waste or waste residues left in place when dangerous waste constituents, residues, or decomposition products at eh closure unit remain a concenttration above numeric cleanup levels determined using residential exposure assutions unit MTCA mehtod A or B.

Groundwater must be addressed under RCRA. There must be a committemtn to perform post-closure care if CERCLA remediation does not materialize or fulfill RCRA requirements (due to funding or authorization problems).

Any RCRA/CERCLA coordination efforts must be spelled out in the closure and contingent post-closure plan. At a minimum, explain how CERCLA documentation can be accessed.

Releases from regulated waste, WAC 173-303-645, must be addressed in closure of this unit.

See comments regarding chapter 5.

Chapter 9.0 Bibliography

The following documents were not included in the bibliolograpghy. It is recommended that these documents be consulted in revising the closure plan. Valerie Peery, NWP Librarian, can assist you in obtaining these documents at 736-3097.

- Chemical Testing Methods for Complying with the Dangerous Waste Regulations, 5/93, Pub #93-51;
- Dangerous Waste Permit Application Requirements, 2/95, Pub #95-402;

- Guidance for Assessing and Certifying Tank Systems that Store and Treat Dangerous Waste, 6/94, Pub #94-114;
- Technical Resource for the Storage and Treatment of Hazardous Waste in Tank Systems, 12/86, OSWER Policy Directive No. 9483.00-1, EPA/530-SW-86-044;
- Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste.

****

The following are my comments as a Kennewick Compliance Team member on the 324 Building Closure Plan. I appreciate being provided the opportunity to work with you as my knowledge on these issues increases. The comments listed directly below are separated by regulatory cocnerns and specific comments. There will likely be overlap in the comments.

Regulatory Concerns

1. Does not have language to return land to prvious appearance WAC 173-3030610(2)(a)(iii)
2. Does not reference MTCA cleanup levels WAC 173-303-610(2)(b)(i)
3. Does not address how equipement will be closed WAC 173-303-610(3)(a)(ii)
4. Verification if the actual volumes are the maximum inventory ever on-site of the active life of the facility. WAC 173-303-610(3)(a)(iii)
5. Does not provide detail on methods used for treating dangerous wastes including mixed wastes WAC 173-303-610(3)(a)(iv)
6. Does not address management of equipment used for closure WAC 173-303-610(3)(v)
7. Does not address the pipes, if they will be closed or not and how they will be managed WAC 173-303-610(3)(v)
8. Inadquate time schedules. Does not have specific time schedules for anticipated closure activities WAC 173-303-610(3)(vii)

2.3.1 General Description of the REC Complex

1. Provide ranges of ionizing radiation in the present radioactive material inventory . The plan sates that all normal operations in the REC's are performed remotely due to the high dose rate of ionizing radiation. 2.3.1 lines 41-43.
2. List the remote equipment in detail used in the operations. Are there more than one? If so list them with the function they provide.
3. State the future use of the equipment . Will the remote equipment be closed or reused?

2.3.2 Description of B-Cell

1. Designate all the materials. The B-cell only has mixed waste and dispersible radioactivity. Were other materials present? If yes which ones and how will the wastes be managed? If no, what process was used for verification?
2. When will the dispersible radioactivity be removed or containerized?
3. Under what process will the dispersible radioactivity be removed or containerized?
4. Has wastes accumulated in the B-Cell?

Are the HEPA filters included in the closure? Is so, they will need to be designated and managed accordingly.

2.4.1 Tank 104

1. When did the hydrostatic test occur?

2. When did the leak test occur?

2.4.2 Tank 105

1. When did the hydrostatic test occur?
2. When did the leak test occur?

2.4.3 Tank 107

1. Why was the tank subject to dye-penetration testing and not leak testing and hydrostatic testing like the other tanks? This is a question of concern considering that wastes from Tank 107 can be transferred to Tank 104 and the B-cell tanks.
2. Was solution ever transferred from Tank 107 to Tank 104? If yes, please provide quantities, dates, and types of solutions.

2.4.4 Ancillary Equipment

1. Have the pipes been recently tests for integrity and pressure? Testing was great in 1965. If the pipes are going to be used for closure, recent testing or validation of integrity and pressure is needed.

3.1.1 Waste Solidification Engineering Prototypes

1. Do real or estimated quantities of waste exist by tank and process. Please provide individual waste quantities generated annually and collectively.

3.1.3 Fabrication of Cesium and Strontium Heat and Radiation Sources Program (FRG Program)

1. Was there any bv-product in the production of heat sources? If yes, individually list the amounts by source and how they were managed.

3.1.4 Present Conditions

1. What solutions are contained in the vault tanks? Please list quantities by solution and in which tank.

4.1.1 REC Waste Inventory and Characteristics

1. What was the estimated amounts of the 1986 spill? Was the spill remediated or contained? Please describe actions taken to contain and remediate the spill. Where was the waste sent upon remediation?
2. Are these current quantities in Table 4.1. Please provide a historical accumulation of the wastes,
3. List any additional waste streams which exist. Also list how they have been designated and have or are being managed.

4.1.1.1 Dispersible Debris

1. List all the radioactive sources.
2. Provide a range of radioactivity from high to low.

4.1.1.5 Oil-Absorption Material

1. Was was the mixed waste managed?
2. What is the quantity of waste generated/
3. When did the leak occur, when was it fixed, Has the leaking window been fixed so no new additional wastes are being generated?

4.1.2 HLV Tank Waste Inventory and Characteristics

1. Has these tanks ever contained and managed multiple products generating different waste streams. How were these streams managed?

4.1.2.1 Tanks 104 and 105

1. Are the waste streams the same as in 1990? If not, have samples been taken more recently?

4.1.2.2 Tanks 106 and 107

1. What process was used to designate the wastes in Tank 106?

4.1.2.3 Process of Compiling Waste Characterization Information

1. What were the results of the Project Reports?

4.2.1 REC Waste-Treatment Plans

Provide detailed steps of decontamination. What equipment will be used? What is the capacity of the equipment? How will the equipment be managed upon completion of decontamination?

4.2.2 HLV Tank-Waste Treatment Plans

1. What is the estimated rate of evaporation?
2. Provide the process for isotope separation- What equipment is needed, estimated time for isotope separation, how will the isotope separation occur, etc...
3. Where will the wastes slated for disposal go?
4. Where will the recyclable material go?

5.0 Groundwater

1. What about soils? What steps have been taken to verify that wastes do not have contamination?

6.1 Closure Strategy

Need integrity assessment of pipes undergoing closure and those being used to transfer wastes (assuming those in transfer are not undergoing closure and will be reused for other purposes)

6.2 General Closure Activities

1. Define decontaminate and include all the steps intended to be used for decontamination
2. What equipment will be used?
3. Will additional wastes be generated?
4. How will the equipment and additional wastes be managed.
5. If remote equipment will be used, please specify the type
6. Provide the physical actions from set up to clean closure to management of all existing and newly generated wastes through closure operations

6.2.1 Closure Activities for B-Cell

1. What are the testing types? Who evaluates the testing.?
2. Provide the actual physical steps of clean closure

6.2.3 Closure Activities for HLV Tank

1. Attach 324 HLV IRA Project Map
2. Provide the actual physical steps intended for closure
3. Provide the steps to determine the extent of contamination of leaking tanks.
4. List the additional necessary decontamination steps if tanks have leaked.

6.3 Minimize the Need for Future Maintenance

1. Be specific to which cleanup level.
2. To which radioactive standard will the radioactive portion of the mixed waste be decontaminated to.? Rad standards are currently being developed. Will the site remain contaminated with radioactive wastes or residues?
3. How will the land be returned to previous appearance, will trees be planted, ect?

6.6 Compliance with Closure Requirements

1. Cleanup levels are not negotiated .

7.2.1 324 Building B-Cell Safety Cleanout Project

1. Need to designate and characterize Suspect mixed waste to determine how the waste will be managed.
2. What equipment will be remotely operated? Describe physical steps of how equipment will be operated.
3. What safety precautions are being taken.

7.2.1.1.2 Dried Melter Felter

1. What type of treatment is anticipated?
2. When will the treatment occur?
3. List the appropriate permitted storage location.

7.3.11.2

1. Need to mark the hazards of the wastes in the SAA.
2. How will wastes be designated in SAA's.
3. How will the SAA be under control of the operator/owner?

7.3.11.3

1. Are the training records, contingency plan where the closure is occurring.

7.5 Integrity Assessment of the Units

1. Describe the integrity assessment of the pipes.

7.11 Schedule for Closure

1. Provide additional detail on the timing for steps involved in the closure.

Department of Health (Randy Acselrod) Comments
January 9, 1996

A Notice of Construction must be submitted prior to conducting evaporation treatment process in D Cell.

The closure plan lacks detail, such as source term, contaminated equipment, partical size, etc.

Analytical waste charaterization necessary. Process knowledge is not adequately described.

Containerized feed tank heal must be describe and source term provided.

Provide acceptable handling limits for waste treatment.

Regulatory limits must be explained.

If operational approval is required from EPA regarding radioactive emissions then DOH must also be provided with a copy.

Please provide a copy of the HASP manual which is said to be the standard for Hanford Site radioactive work.

Need more information regarding the radiation limit. Note, WHC knows requirements (Appendix A information).

Presentation Notes: 324 Buiding REC and HLV Facility Descripton

Delores K Lutter

DQO Meeting, 31 January 1996

The 324 Building is located in the 300 Area of the Hanford Site. Construction and operation of the 300 Area began in the mid-1940s. However, the 324 Building was not constructed until 1965. At which time major research and development programs were undertaken by the Pacific Northwest Laboratory (as of 1995 the Pacific Northwest National Laboratory) for the U.S. Department of Energy (DOE). Its operations are covered under the Hanford Facility Wide Permit, EPA ID# WA7890008967. The current mission remains primarily focused on research and development programs.

The physical dimensions of the 324 Building are 205 ft by 235 ft in plan and 45 ft in height above ground level. The 324 Building has a partial basement and first, second and partial 3rd floors for a total of approximately 101, 709 sq. ft. of floor area. The foundation structure is poured-in-place reinforced concrete. The building was designed to the requirements of the 1961 UBC and Hanford Plant Standard (HPS) Standard Design Criteria (SDC) 4.1 Revision 2 (1959.

The 324 Building contains facilities for conducting diverse studies on the chemical characteristics of irradiated materials, and nonradioactive process development. These studies involve the use of materials having levels of

radioactivity ranging from natural background to Megacuries. The building contains laboratories, hot cell, support facilities, and office space used to pursue technical studies ranging from laboratory to pilot-plant scale. In addition, laboratory research develops basic and applied data in support of DOE programs.

Located in the north portion of the 324 Building is the Radiochemical Engineering Cell Complex (Complex). The Complex is comprised of four hot cells (A, B, C, and D Cells) and a central airlock. (Figure 2-8 in Closure Plan) The walls are constructed of 4-ft-thick high-density concrete or 4.5-ft-thick normal-density concrete. The cells and air lock are joined, forming a "T"-shaped structure with D-Cell located above C-Cell on the south side, and B-Cell at the bottom of the "T" figure. Access is by operating galleries on the first and second floor levels. The airlock is used primarily as a transition zone for maintenance, decontamination, and transfer of material and equipment into and out of adjoining hot cells.

All normal operations in the REC Complex are performed remotely. Manned entry into the cells is prohibited due to the high dose rate of ionizing radiation from the present radioactive material inventory.

The 324 Building also houses two shielded underground vaults. One of the vaults is used for low- to intermediate-activity-level solutions, while the

other is used for liquids and feed stock solutions of high activity level. The vaults are located under the floors of the regulated shop and the cask handling areas, respectively. Each vault contains 4 stainless steel tanks which have been used as temporary holding tanks for feed solutions, feedstock tanks for process solutions, and/or collection tanks for process effluents being managed within the facility.

The four Low Level Vault (LLV) tanks are used as waste accumulation and /or transfer vessels for process wastes from the REC and other generation activities. The tanks are used to send wastes to the double shell storage tanks in the 200 Area via the Radioactive Liquid Waste System (RLWS) receiving facility, 340 Building. The tanks are generator accumulation tanks and do not hold mixed wastes for longer than 90-days and are expected to be closed under a generator closure plan when they are no longer needed.

Three of the four High Level Vault (HLV) tanks currently contains leftover research feed materials which were declared mixed waste when no further use was identified for the material. The fourth tank is empty and a review of operating records indicates that it never contained dangerous or mixed wastes.

Clean out of the hot cells was initiated in 1988 as part of the 324/325 Building's Hot Cell Restoration Program. The original Program documentation

was prepared to cover a large scope of work which included a variety of activities: removal and disposal of laboratory and pilot-scale equipment systems used in various R&D programs; packaging and transferring (either to storage or disposal) radioactive materials generated during R&D programs including spent nuclear fuel, borosilicate glass, miscellaneous equipment and debris; and decontamination of cell walls, floors and ceilings.

A-Cell had a 90-Day Accumulation Area within the cell. The waste, phosphoric acid, was removed and the closed per mixed waste generator requirements.

C-Cell clean out was initiated in 1988 and completed in 1990. The cell is 12 ft long by 19.3 ft w and 15 ft high. It is constructed of 4 ft high density concrete and its walls and floor are lined with stainless steel.

Since 1988, but before the initiation of Tri-Party Agreement (TPA) negotiations in 1994, the scope was changed to include only B-Cell and is now referred to as the 324 Building B-Cell Safety Clean out Project (BCCP).

Two of the cells in the Complex are subject to Resource Conservation and Recovery Act (RCRA) closure due to the mixed wastes stored those cells. The first facility is the unit designated as the Radiochemical Engineering Cell or REC. It is comprised of the B-Cell and one drum of mixed waste in D-Cell. The second facility to be closed is the High Level Vault Tanks (HLV Tanks).

The High Level Vault houses four stainless steel tanks. Three of the four tanks contain mixed waste (104, 105, and 107)and are therefore subject to closure. The fourth tank, 106, is not subject to closure because it does not contain mixed waste.

Since the late 1960s, B-Cell has been used to demonstrate chemical engineering pilot scale processes for high-activity waste management. These programs have left the B-Cell filled with highly contaminated equipment, cell waste, radioactive materials and quantities of materials that have been designated as mixed waste. B-Cell also contains dispersible radioactivity that must be removed or containerized to prevent release in case of an accident.

B-CELL

B-Cell is the largest of the four cells, measuring 25 ft x 22 ft x 30.5 ft. The floor and walls, up to 27 ft are lined with a 1/8" stainless steel plate that is fully welded at the seams. Under the floor plate is a 6 "-thick slab of concrete and under the concrete is packed native soil. The cell is surrounded on three sides by operating galleries on the first and second floors and on two sides by a gallery at the basement level.

The floor of B-Cell is sloped to a trench and sump to prevent liquids from accumulating in the cell. The floor of B-Cell is constructed with a 2 % slope

from the high point located along the west side of the cell to the low point on the east side. Any liquids accumulating in B-Cell drain across the floor to a trench that runs the length of the east side of the cell. The trench is sloped to a sump located in the northeast corner of B-Cell. The cell is equipped with an alarm to notify operating staff of any liquids accumulating in the cell.

Penetrations for services such as manipulators and electrical cables are not completely sealed, but rely on the negative pressure in the cell to prevent escape of contamination. In April 1994, the low-efficiency filters were replaced with HEPA filters to minimize the dust entering the cell. Prior to that time, the inlet air contained particulate matter from the outside some of which settled to the floor as it entered the lower velocity cell air.

The B-Cell ventilation outlet passes through an electrostatic precipitator located upstream of a bank of HEPA filter. The air exhaust from B-Cell is filtered through two HEPA filter banks in addition to the in-cell HEPA filters before being exhausted from the building. The primary and final HEPA filters each remove at least 99.5% and collectively 99.95% of any particulate contain the ventilation exhaust from the REC.

D-CELL

D-Cell is physically located directly over C-Cell in the southern end of the REC Complex. It is accessible only from the second floor. D-Cell measures 20 ft long x 12 ft wide x 16 ft high. The floor is lined with 1/8" stainless steel and the walls are lined with carbon steel and protective paint. The cell is adjoined by the airlock on the north side and by a service gallery on the south side. Shielding walls are constructed of 4 ft-thick high-density concrete.

HLV AND HLV TANKS

The HLV is located under the floor of the cast handling area. The vault contains four stainless steel tanks: 104, 105, 106, and 107. The HLV is 21.5 ft wide x 13 ft long x 14.5 ft deep. A 6 ft ledge is at one end enlarges the upper level of the HLV to 27 ft wide x 13 ft long x 14.7 ft deep.

The vault is constructed of concrete with the floor and walls lined with welded 1/8" stainless steel plates, which cover the floor and extend 3.5 ft up the walls. On the side with the ledge, the stainless steel plate extends 6" above the highest point on the ledge. The stainless steel plates provide secondary containment. The floor of the vault is sloped to a sump, which is equipped with a liquid sensing alarm and steam jet to transfer any liquids to tank 104 within the system.

Due to radioactivity hazards, entry to the vault is prevented by a set of 4 ft thick concrete shielding blocks in place over cover blocks constructed of 2 ft thick concrete that have overlying removable steel-plate ventilation barriers with integral manhole covers.

When the vault tanks were install in the 324 Building in 1964, they included design features that are now required or encouraged under current State and Federal RCRA regulations. These design features which provide protection against releases of waste to the environment, include corrosion-resistant stainless steel tanks and ancillary piping, the use of welded pipe connections, tanks with top-entering penetrations only, secondary containment around tanks and piping plus instruments to control the fill level of the tanks and to control leaks.

The HLV Tanks are fitted with manometers for measuring liquid level, specific gravity, and static pressure. Thermocouples are used for measuring temperature. Instrument readings are logged daily. The tanks are also equipped with high-liquid-level and high-temperature alarms. Each of the tanks are cylindrical, have a flat roof, a sloped floor (except for Tank 107 which has a concave floor), and have cooling jackets. Currently the cooling jackets are not in used for cooling and there is only air between each tank and its shell. All are operated at slightly negative pressure, and vented through a common-vessel vent system that pulls air and tank vapors through two

HEPA filters and discharges them to the main 324 Building stack. A sample room for sampling each of the four tanks is located in Room 145 (Figure 2-7 in Closure Plan). The HLV Tank samplers are enclosed in a shielded hood, and sampling is performed remotely with a manipulator.

TANK 104

Tank 104 was modified before being moved to its current location in the 324 HLV. All of the circumferential-shell and long-seam welds were completely radiographed as part of the facility modification (1964). In addition, this tank was leak tested by filling it with water after the modifications were completed, and jacket hydrostatically tested to 20 pounds per square inch gage (psig) (1964).

Tank 104 is 9 ft diameter by 8.9 ft high and has a design capacity of 3,912 gallons.

It is construct of 0.5 " thick 304L stainless steel. The tank is equipped with a cooling jacket also constructed of 304L stainless steel.

TANK 105

Tank 105 was also modified before being placed in its current location in the

324 HLV. All of the circumferential shell and long seam welds were completely radiographed as part of the facility modification (1964). Tank 105, was also leak tested by filling it with water after the modifications were completed, and the jacket hydrostatically tested to 20 pounds per square inch gage (pisg) (1964).

Tank 105 is 9.5 ft diameter by 8.88 ft high, and has a design capacity of 4,792 gallons.

This tank is constructed of 0.5" thick 309 Columbium stainless steel. It is equipped a cooling jacket constructed of 18-8 Columbium stainless steel.

TANK 106

Tank 106 is positioned on the ledge of the HLV beside Tank 107. It is 4.0 ft in diameter by 5 ft high and has a storage capacity of 450 gallons. The tank's walls and bottom consist of 0.25" thick 309 Columbium stainless steel plate with a 0.375" (3/16)thick 25-12 Columbium stainless steel plate jacket. The tank roof consists of 0.188" (3/8") 18-8 Columbium stainless steel. This tank is empty.

TANK 107

Tank 107 was subjected to radiography and dye-penetration testing of the welds prior to use in its current location on the ledge in the HLV. It is 5.5 ft in diameter by 6.0 ft high and has a storage capacity of 958 gallons. The tank's walls, top, and bottom are consist of 0.25" thick 309L stainless steel plate. The tank's jacket extends 3.5 ft above the base of the tank.

ANCILLARY EQUIPMENT

Piping connected to the HLV Tanks serves a variety of functions, including liquid transfer, instrumentation, access, tank venting and sparging, cooling water supply and return, and sampling. The 324 Building HLV piping for radioactive liquids is constructed of 1.5" and 2.0" diameter stainless steel with welded joints. The piping was constructed above the tanks and drains to the tanks by gravity flow. The gravity piping system was designed with a fall of 0.0625" per ft of run. This slope yields a flow capacity of 8 gallons per minute for the 1.5" diameter pipe and 16 gallons per minute for the 2.0" diameter pipe. The HLV serves as secondary containment.

Material is also moved through the piping by way of steam jets. The steam jets create a venturi suction that serves to move liquid through the piping system. Instrumentation piping, vent piping, sparging piping, and sampling piping are constructed with a continuous upward slope from the vault tanks. This construction was designed to eliminate the potential for backflow to

develop in these particular piping systems.

The pipes are typically hung by harness and strap from the joist system of the floor above. Piping within the building is not encased except were it passes through a concrete structure. At these point, it is encased in a 4.0" diameter fiberglass reinforced epoxy pipe. All building piping was pressure tested at 3 psi for gravity flow piping and at 250 psi for steam jetting piping without any pressure loss in 24 hours at the time of installation (1965).

PROCESS INFORMATION

Liquids generated within the REC have been discharged at various times to the HLV Tanks since 1968. Three programs have generated the majority of the liquids: the Waste Solidification Engineering Prototypes (WSEP) program, the Nuclear Waste Vitrification Project (NWVP) and the Fabrication of Cesium and Strontium Heat and Radiation Sources Program (FRG Program).

The WSEP program begin in 1966 and continued through 1972. The program was designed to demonstrate three methods of solidifying highly radioactive waste: Pot Solidification, Spray Solidification, and Phosphate Glass Formation.

The NWVP objective was to provide a demonstration of the vitrification of

high-activity liquid waste from spent fuel discharged from an operating light water reactor. The NWVP encompassed two tasks of the Commercial High-Level Waste Immobilization Program: Waste Preparation and Radioactive Demonstration of Vitrification. The project was started in April 1976 and terminated in June 1979.

From 1986 to 1987, the 324 Building facilities were used to produce 30 isotopic heat sources in canisters for the Federal Republic of Germany (FRG) to be used as part of a repository testing program. The 30 canisters were filled, closed, and decontaminated during these activities. The canister filling and decontamination processes used the vault tanks to contain feed solutions, process condensates, and decontamination solutions.

Since 1987, no major programs have involved the vault tanks. The primary use of the HLV Tanks since 1987 has been to contain solutions remaining from the NWVP and FRG Program.

Terry Hosaka will be discussing the process knowledge shortly.

CLOSURE STRATEGY AND PERFORMANCE STRATEGY

The primary goal for closure of the 324 Building REC and HLV Tanks is clean

closure. It may be difficult to comply with all of the WAC requirements while maintaining compliance with DOE radiation protection requirements. Performance of WAC activities will be planned in accordance with DOE policy of optimization of radiation protection - ALARA. Clean closure is contingent upon verification that dangerous waste constituents in the REC and HLV Tanks are not present in the concentration above Ecology/DOE/PNNL regulatory levels.

Materials in B-Cell will continue to be cleaned out per the BCCP. Clean Closure levels will use Ecology's "Debris Rule".

Closure of the drum in D-Cell will be a visual inspection of the one 55-gallon drum, which contained solid materials and no liquids, . At this time the drum has been repackaged and sent to the PUREX tunnel #2 for permitted storage.

D-Cell will house the unit used to process MW liquids in the HLV Tanks and as well as the rinse solutions. This task will remove the high-activity MW currently stored in Tanks 104, 105 and 107. The solutions will be stabilized by filtration, isotope separations and evaporation to solids that permitted TSDs are capable of handling. The process unit will have double containment and all tanks will be rinsed to below regulatory limits. Gary Sevigny will discuss this process in detail.

The process equipment will be cleaned, size reduced if appropriate and

disposed of as LLW.

Figures 6-1 and 6-2 in the Closure Plan show the clean-closure strategy for the REC and HLV Tanks respectively. Closure activities will be monitored by a registered professional engineer who will certify that, in his or her judgement, closure was accomplished in accordance with the specifications decided upon in the DQO process.

Initiation of the Closure Plan and successful clean closure is based on the assumptions that:

1) The BCCP will be successful in removing the inventory of waste from B-Cell and the drum of MW in D-Cell, leaving B-Cell with visibly clean Walls, ceiling, and floor, and

2) The inventory-removal plan for the HLV Tanks will be conducted successfully, including the triple rinsing of each tank.

Battelle
Pacific Northwest Laboratories

Project No.

Internal Distribution

YB Katayama
MH Schlender
HTT:File/LB (96008)

Date February 15, 1996

To TY Hosaka

From HT Tilden

Subject PROCESS KNOWLEDGE EVALUATION FOR HLV TANKS

I have evaluated the information available to me concerning the high level vault (HLV) tanks and their contents. My conclusions are as follows.

Purpose of This Review

The purpose of this task is to evaluate the adequacy of process knowledge to eliminate the need to analyze HLV tank contents for all chemicals shown on the 40 CFR 264 Appendix IX groundwater monitoring list. Appendix IX is frequently chosen for a starter list for analysis of under-characterized wastes, because it is comprehensive and is frequently referred to during closures as a list of chemicals which may indicate releases from solid waste management units.

Many of the chemicals listed in Appendix IX are organic chemicals (solvents, pesticides, carcinogens, and chemicals frequently used in commerce.) The inorganic chemicals shown in Appendix IX are generally those known to be toxic via ingestion (such as through contamination of drinking water supplies).

Operating History of the HLV Tanks

The HLV Tanks have been in use in the 324 Building since 1968. They have been utilized to contain feed materials for, and waste materials from, three major programs which have utilized the 324 Radiochemical Engineering Cells (REC):

- Waste Solidification Engineering Prototype Program (1966-1972)
- Nuclear Waste Vitrification Project (1976-1979)
- Fabrication of Cesium and Strontium Heat and Radiation Sources Program (1986-1987)

The contents of the tanks were utilized in the projects noted above; not every tank was utilized in every project. Some tanks were used as "backup" in case of tank failure or process malfunction.

The tanks are within a vault which is monitored continously for leaks and has secondary containment. The only use of the tanks since 1987 has been to contain the leftover process solutions from the above projects.

Waste Determination for Process Solutions

When the Cesium/Strontium Program was cancelled in 1987, the process solutions were retained in the HLV tanks pending further project use. In 1993, an evaluation was conducted to determine if the solutions were needed for any project purpose. The evaluation concluded that the materials had no further usefulness, although the contents of TK-105 are rich in Strontium-90, the precursor to Yttrium-90 (an emerging medical isotope against certain forms of cancer). No sponsor for the Y-90 recovery could be located during the evaluation period. As a result, the Laboratory determined that the leftover process solutions were waste, and thus hazardous waste, on April 20, 1994.

Since the declaration of the leftover process solutions as waste, a sponsor has requested that the strontium be recovered from the solutions for utilization in the medical isotope program. As a result, the HLV tank closure strategy has incorporated recovery of the Sr-90 into its treatment process.

Laboratory Analysis of Process Solutions

In 1990, a comprehensive analysis of inorganics and selected other parameters was conducted on the solutions stored in the HLV tanks, except that ICP analysis was not performed on the contents of Tank 105. This analytical work was used to assign waste codes to the waste streams in the tanks, and to corroborate process knowledge concerning the solutions introduced to the tanks during the projects which utilized them.

Process Knowledge Concerning Tank Contents

The Waste Solidification Engineering Prototype Program utilized a process solution which was intended to simulate waste streams generated at PUREX. Evidently the solutions used were prepared at PUREX and brought to 324. The process solution was stored in tank TK-107 before being transferred to the B-Cell makeup tank. TK-104 was utilized to receive alkaline wastes from the process, and TK-105 was utilized to receive acid wastes. No detailed composition of the process solution is given in the references, however, it was highly radioactive (52 Mci of radioactivity in the solution).

The Nuclear Waste Vitrification Program utilized a process solution which was generated in the REC, transferred to the 325 Building for recovery of uranium and plutonium, and then returned to 324 for vitrification. The transfer to 325 utilized a tank in the REC. The return transfer to 324 was received in tank TK-106. The materials were then transferred to TK-107 for addition of uranium and simulants to more closely approximate typical waste. It was this solution which was then transferred to the REC for vitrification. Once again, TK-

104 was utilized to receive alkaline wastes and TK-105 acid wastes from the vitrification process. The contents of TK-106 were transferred to TK-107 in FY 1984.

During the Fabrication of Cesium and Strontium Heat and Radiation Sources Program (commonly called the FRG program), TK-104 and TK-105 were utilized as process solution tanks. These solutions were prepared at B-Plant for this program and were reclaimed from tank wastes. No use of TK-106 or TK-107 for the FRG program is known. At the conclusion of the FRG program, the leftover process solutions were retained in the tanks.

Although the tanks were almost certainly rinsed one or more times between or during these projects, data is not available on when they were rinsed or how much water was used. Rinsates would likely have been transferred to the adjacent low level vault tanks and thence to the 300 Area Radioactive Liquid Waste System. TK-107 would not have been rinsed after the NWVP. The analysis of TK-106 from 1990 indicates that it may have been rinsed.

In summary, the contents of the tanks may be characterized thus:

- TK-104: Dilute cesium nitrate solution used as feed for FRG Program
- TK-105: Dilute strontium nitrate solution used as feed for FRG Program
- TK-106: Empty, last contained low-level process solution
- TK-107: Feed materials from NWVP Program

A comprehensive listing of compounds utilized or likely to be found in the HLV Tanks has been prepared based on historical records.

Operational Profile of HLV Tanks

The melter feed solutions were all radioactive. The total radioactivity handled during the three programs was approximately 62 MCi. Since 1987, the conclusion of the FRG Program, the contents of the HLV have remained approximately constant with the exception of TK-106. The current radiation level in the HLV has been estimated as in excess of 10^6 R/hr.

The tanks have been monitored for temperature during their operational life. On occasion the temperature in one or more tanks has been higher than 50°C. The cooling jacket on TK-107 has been utilized in the past to cool the tank's contents.

The HLV is served by a HEPA-filtered ventilation system which provides frequent air changes in the cell.

Analysis

It has been established that addition of organic substances to the HLV Tanks has been very limited. These substances should have been present only in the WSEP solutions (last activity in 1972), introduced during cell cleaning activities, or as contaminants. In addition, the high temperatures and constant air flow in the vault argue against the survival of volatile organics in the vault tank contents. Finally, the high radiation fields found in the cell would degrade organic molecules over a period of time such as that lapsing since the conclusion of the FRG program.

As a result, it may be concluded from process knowledge that the presence of organic chemicals in the current inventory of HLV tank wastes is extremely unlikely. Since most constituents of the Appendix IX listing are organic molecules, this results in the elimination of most of the Appendix IX list from consideration for analysis during any further characterization of tank contents, or during evaluation of HLV cleanup actions.

The target list of Appendix IX analytes may thus be expected to be limited to inorganic compounds, as follows:

Antimony[1]	Arsenic[1,2]	Barium[1,2]
Beryllium[2]	Cadmium[1,2]	Chromium[1,2]
Cobalt[1,2]	Copper[1,2]	Lead[1,2]
Mercury	Nickel[1,2]	Selenium[1,2]
Silver[1]	Thallium	Tin[1]
Vanadium[2]	Zinc[2]	

[1]Element appears on list of chemicals known or believed to be used during one or more of the projects which have utilized the HLV Tanks.

[2]Element detected during ICP analysis of one or more of the HLV Tanks' contents during 1990.

Although mercury and thallium are not expected to exist in the HLV in the elemental state due to volatility, and they were never added to incoming process solutions, the highly acidic medium in the tanks may allow certain salts of these elements to persist if they had been introduced as impurities in the incoming solutions.

If you have any questions concerning the data or conclusions presented in this memo, please let me know.

Attachment: References

REFERENCES

40 CFR 264, Appendix IX, *Ground-Water Monitoring List.*

Katayama, Y. B., cc:Mail to H. T. Tilden dated 1/11/96, "324 HLV".

PNL letter to RL dated June 20, 1994 (B. D. Shipp to J. J. Sutey), "Notification of Mixed Waste Generation in the 324 Building's High Level Vault Tanks."

PNL letter to RL dated June 23, 1995 (P. J. Weaver to M. C. Vargas), untitled.

PNNL, "324 Building REC and HLV Tanks Closure Plan", PNL-10890, December 1995.

SAIC, "Integrity Assessment Plan for PNL 300 Area Radioactive Hazardous Waste Tank System, Final Report", July 30, 1993.

UOP
Molecular Sieves
307 Fellowship Road
Suite 207
Mt. Laurel, NJ 08054
Telephone: 609-727-9400
Fax: 609-727-0545

MOLSIV ADSORBENTS
A PRODUCT OF UOP

Date: September 21, 1994

FAX Correspondence

To: Kriston Brooks
Battelle PNL
(509) 376-1867

From: Dennis Fennelly

Subject: UOP IONSIV™ IE-95 & IE-96

Attached is a data sheet for IONSIV™ IE-95 and a similar table providing typical properties for IONSIV™ IE-96.

Pricing for the products is given below. Pricing is FOB Mobile, AL for minimum shipments of four 55 gallon, 300 pound net weight drums of each product. Prices are firm for products shipped by 12/31/94. Payment terms are net 30 days from invoicing and the sale is subject to the attached provisions.

Product	Price ($/LB)
IONSIV™ IE-95	4.50
IONSIV™ IE-96	7.21

As I mentioned in our phone conversation, we are also working with Sandia Labs on a Co-operative Research and Development Agreement (CRADA) to deveop a commercial manufacturing process for a crystalline silico-titanate (CST) ion exchanger jointly developed by Sandia and Texas A&M. In tests run by Sandia, the CST showed significantly higher Cs equlibrium ion exchange capacity compared with IONSIV™ IE-96 or any other ion exchanger tested. Please call me if you would like to get a copy of a paper providing more information on the CST's. Lane Bray of Battelle should also have some data comparing CST's and other materials. We expect to complete development of a commercial manufacturing process for an engineered form of the CST in late 1995.

Please call me at (609) 727-9400 if you have any questions.

Best Regards,

Dennis Fennelly

ADSORBENTS

PRODUCT INFORMATION

MOLECULAR ADSORBENTS
a product of UOP

IE-95 ION EXCHANGER

Description

UOP IE-95 Ion Exchanger is an alkali metal alumino silicate primarily of the chabazite structure type supplied in the mixed ionic (Na^+, Mg^{++}, Ca^{++}) form.

Chemical Formula

$(Na_2O, MgO, CaO) \cdot Al_2O_3 \cdot 4\text{-}6\ SiO_2 \cdot H_2O$

Shipping Information

IE-95 Ion Exchanger is available in 20×50 mesh form. Samples may be obtained on request.

Regeneration

Typically, regeneration may be accomplished by the use of NaCl solution of the regenerant fluid.

Typical Properties

Partical Size	Mesh (20×50)
Pore Openings	3.7×4.2 Å and 2.6 Å
Bulk Density	
As shipped	40 lbs/cu.ft. 640 kg/cu.m.
Hydrated, packed	46 lbs/cu.ft. 740 kg/cu.m.
BS&D Density (hydrated)	38 lbs/cu.m. 610 kg/cu.m.
H_2O Content	
As shipped	1–10 wt.%
Hydrated	12–17 wt.%
Ion Exchange Capacity	2.0–2.5 meq/gm (anhydrous)

Typical Application Areas

UOP IE-95 Ion Exchanger products have been found to be effective for recovery and storage of radio-nuclides and for cation exchange from acid solutions.

Additional Information

Bulletins discussing additional applications of UOP Molecular Sieves are available. Call or write your nearest UOP Molecular Sieve Sales Office.

Sales Offices

UOP
Molecular Sieve Adsorbents
25 E. Algonquin Road
Des Plaines, IL 60017-5017
(708) 391-2000

EASTERN REGION
Molecular Sieve Adsorbents
307 Fellowship Drive
Suite 207
Mt. Laurel, NJ 08054

MIDWESTERN REGION
Molecular Sieve Adsorbents
10 South Riverside Plaza, Suite 2200
Chicago, IL 60606-3882
(312) 454-2230

Molecular Sieve Adsorbents
25111 Country Club Blvd.
Suite 265
N. Olmsted, OH 44070
(216) 734-0086

SOUTHWESTERN REGION
Molecular Sieve Adsorbents
13105 Northwest Freeway
Suite 650
Houston, TX 77040
(713) 744-2640

PACIFIC REGION
Molecular Sieve Adsorbents
12300 Lewis Street, Suite 201
Garden Grove, CA 92640
(714) 750-1551

CANADA
UOP Canada, Inc.
Suite 1600, 444-5th Ave., S.W.
Calgary, Alberta T2P 2T8, Canada
(403) 294-1757

UOP Canada, Inc.
120 Eglinton Ave. East
Suite 304
Toronto, Ontario, M4P 1E2, Canada
(416) 488-4752

EUROPE
UOP M.S. S.p.A.
Via Durini 27
20122 Milano, Italy
39-2-76004773

UOP
Molecular Sieve Adsorbents
P.O. Box 9248, U. 25
Dubai International Trade Centre
Dubai, United Arab Emirates
(971-4) 313-841

FAR EAST
UOP K.K.
Singapore Representative Office
Molecular Sieve Adsorbents
101 Thomson Road
11-05 United Square
Singapore 1130
(65) 253-1652

UNION SHOWA K.K.
Molecular Sieve Adsorbents
Sanwa Building
27-17 Hamamatsu-cho, 1 Chome
Minato-ku, Tokyo 105 Japan
(81) 3-3432-7553

Typical Properties
IONSIV IE-96

Property	Typical Value
Bulk Density	55 LBS/FT3
Particle Size	20 X 50 Mesh
Ion Exchange Capacity	2.0-2.5 meq/gm (anhydrous)
Pore Openings	3.7 X 4.2 Å and 2.6 Å
H_2O Content	10-15 wt%
Chemical Formula	$(Na_2O, MgO, CaO) \cdot Al_2O_3 \cdot 4\text{-}6\ SiO_2 \cdot H_2O$

HO#3

Table 1
Hazardous Mixed Wastes Located in the REC and Preliminary Designations

Waste Type	Volume of Waste (estimate)	Amount Collected	Location of Waste	Status (LDR apply)	Waste Codes
Dispersible Debris (Solid, non-waste water, S01)	2.49 m^3 (88 ft^3)	1.05 m^3 (37 ft^3)	B-Cell <90 day	[b]Designated (40 CFR 268.41)	WT02, D006 D007, D008
Elemental Lead (Solid, non-waste water, S01)	1.02 m^3 (36 ft^3)	0.51 m^3 (18 ft^3)	[a]B-Cell Satellite Accumulation (Central Waste Complex)	[c]Designated (40 CFR 268.41)	D008, WT01
Liquid Metal Seal (Solid, non-waste water, S01)	<0.20 m^3 (<7 ft^3)	<0.20 m^3 (<7 ft^3)	B-Cell <90 day	[c]Designated (40 CFR 268.41)	D006, D008 WT01
Oil Absorption Material (Solid, non-waste water, S01)	<0.20 m^3 (<7 ft^3)	<0.20 m^3 (<7 ft^3)	PUREX	[c]Designated (LDR does not apply - State only waste)	WT02
Tank 104 (Liquid, waste water, S02)	1500 liters (400 gal)	1500 liter (400 gal)	High Level Vault Tanks <90 day	[b]Designated (40 CFR 268.43)	D002 D008, WT02
Tank 105 (Liquid, waste water, S02)	1500 liters (400 gal)	1500 liter (400 gal)	High Level Vault Tanks <90 day	[b]Designated (40 CFR 268.43)	D002 D008, WT02
Tank 107 (Liquid, waste water, S02)	619 liters (165 gal)	619 liters (165 gal)	High Level Vault Tanks <90 day	[b]Designated (40 CFR 268.43)	D002, D005, D006, D007, WT02
Dried Melter Feed (Solid, non-waste water, S01)	0.17 m^3 (6 ft^3)	0.17 m^3 (6 ft^3)	PUREX	[c]Designated (40 CFR 268.41)	D007, D008 WT01

a Collected lead which is contact-handled is shipped to the Hanford Central Waste Complex, Remote-handled lead is currently located in satellite accumulation area within B-Cell.

b Designation is based on analytical data.

c Designation is based on generator knowledge of the waste stream composition.

Change Number	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date
M-89-94-01		3/13/95

Originator
TPA Negotiation Team Members

Phone
(509) 372-1772

Class of Change
[X] I - Signatories [ ] II - Project Manager [ ] III - Unit Manager

Change Title

Complete closure of non-permitted Mixed Waste (MW) units in the 324 Building Radiochemical Engineering Cell (REC) and High Level Vault (HLV).

Description/Justification of Change

This change package: (1) will result in the establishment of a schedule for closure of non-permitted MW units located in the 324 Building, 300 Area, Hanford site, and (2) represents a proposed compliance action necessary to correct noncompliance with chapter 173-303 WAC and 40 CFR Part 265 as cited in an Ecology voluntary compliance letter transmitted to USDOE and PNL on February 16, 1995. The approach leading to closure includes: 1) achieving compliance with interim status requirements; 2) stabilization of dispersible materials in the REC B-cell; 3) removal of liquid MW in the HLV tanks; and 4) Submittal of a closure plan under milestone M-20-55 and closure of non-permitted MW units in the 324 Building (REC B-cell, REC D-cell, and High Level Vault).

(See Attachment for continuation of Description and proposed milestones)

Impact of Change

This change request establishes a new major milestone, M-89-00, to complete the closure of non-permitted MW units in the 324 Building (REC B cell, D-cell, and HLV). Interim milestones necessary to achieve compliance with interim status standards, stabilization and removal of MW, and closure of non-permitted MW storage units are proposed.

These milestones impact Tri-Party Agreement milestone M-20

Affected Documents

Hanford Federal Facility Agreement and Consent Order, Appendix D

Approvals

This change form approved by Amendment Five to the Hanford Federal Facility Agreement and Consent Order executed by the signatories on July 28, 1995.

DOE J. D. Wagoner	Date	___ Approved	___ Disapproved
EPA C. Clarke	Date	___ Approved	___ Disapproved
Ecology M. Riveland	Date	___ Approved	___ Disapproved

Description/Justification of Change (Continued)

The REC complex of the 324 Building is designed to handle high activity radioactive wastes and materials in a research setting, with remote handling capabilities, and with appropriate shielding and unique space considerations.

A 324 hot cell restoration project (the B-Cell Cleanout Project (BCCP)) has been initiated in an effort to clean out and stabilize high activity, dispersible MW that have accumulated in the REC B-cell. Work under The BCCP will also result in the removal of MW, inactive research equipment, and other materials housed in the B-cell. Containerized MW are currently being stored in the REC (primarily in B-cell). One container of oil and absorbent from a 1994 B-cell shielded viewing window leak is stored in the D-cell. Containerized storage of high activity MW in the B-cell will continue until a technically sound pathway for storage elsewhere, and/or treatment and disposal is developed. Containerized MW storage in the REC may include waste transferred from the HLV tanks as a result of implementation of the preferred option identified via milestone M-89-01A. The (M-89-01A) report will identify the preferred option, provide planning/execution details and allow implementation of actions necessary to ensure safe handling and removal of liquid MW in the HLV tanks. Treatment and storage of HLV tank wastes in the REC will require development of an acceptable technical process and compliance with regulatory requirements.

High activity liquid MW is being stored in the 324 Building HLV tanks (e.g.,TK-104, -105, -107). These wastes were originally utilized as radioactive feed materials for research and development projects conducted in the REC.

Initial assessment by USDOE of the waste management options for these materials has determined that they present difficult management challenges in that (at present) no definitive workplan for transportation, treatment and disposal, and/or long term permitted storage exists. Because of the location of the 324 building with respect to the Columbia River and the Tri-cities, the high activity of the wastes, and the dispersibility of the waste in the B-cell, these wastes pose a significant environmental, worker safety, and public health risk. These milestones have been proposed to minimize these risks in the near term, to achieve compliant management of the wastes, and to ensure long term protection of human health and the environment.

The following Milestones set the Schedule for key actions necessary to achieve compliance and complete closure of non-permitted mixed waste units in the 324 Building Radiochemical Engineering Cell (B-cell and D-cell), and High Level Vault:

M-89-00	Complete Closure of Non-Permitted Mixed Waste Units in the 324 Building REC B-cell, REC D-cell, and High Level Vault. *A date will be established for this Major Milestone immediately following Ecology approval of the REC/HLV closure plan (see M-20-55).	TBE*
M-89-01	Complete removal of 324 Building HLV tank MW (e.g., TK-104, TK-105, TK-107) with the exception of residues which may remain following flushing and draining to the extent possible.	10/31/96
M-89-01A	USDOE will submit to Ecology a report identifying the preferred option for management of liquid MW in the HLV tanks.	3/31/95

Description/Justification of Change (Continued)

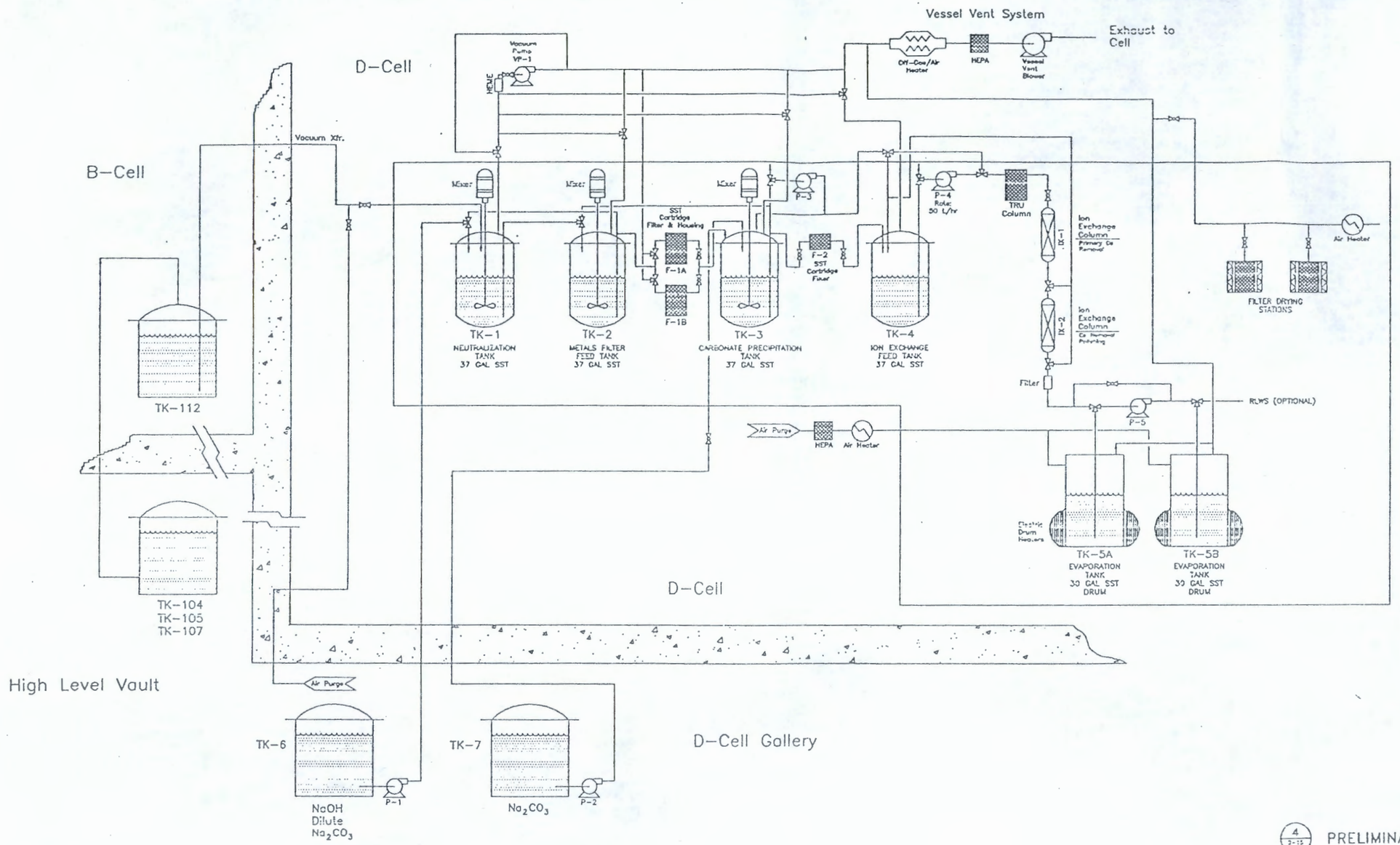
M-89-02	Complete removal of 324 Building REC B-cell MW and equipment. Actions under this milestone include containment and removal of all B cell dispersible materials, excess equipment and debris. Containerized MW will be managed in compliance with chapter 173.303 WAC, thereby reducing risks to human health and the environment. Any remaining residues following removal actions will be managed through the final closure process. USDOEs' 324 building REC B cell clean-out project (BCCP) will be used as a guide for containerizing dispersible MW and removing unnecessary equipment and materials from B-cell.	5/31/99
M-89-03	Achieve compliance with interim status facility standards at non-permitted 324 building MW units. Because of high radiation fields associated with MW stored in the REC and HLV tanks, alternative compliance measures for some interim status requirements are expected. In these instances USDOE will propose alternative measures for Ecology approval no later than March 31, 1995.	3/31/95
M-89-04	Submit to Ecology a report identifying MW management alternatives and USDOE's proposal for achieving clean closure of the 324 Building REC B-cell, D-cell and HLV. This report will aid development of the 324 Closure Plan required by milestone M-20-55. The proposal will outline a feasible and cost effective program to achieve clean closure of the non-permitted storage units and compliant management of the MW currently stored in them.	6/30/95
M-20-55	Submit closure plan for Non-Permitted Mixed Waste Units located in the 324 Building REC B-cell, REC D-cell and HLV.	12/31/95

TABLE 4.5 ANALYTICAL RESULTS OF HLV TANKS (JUNE 7, 1990)				
ANALYSES	TANK 104	TANK 105	TANK 106	TANK 107
pH	1.4	1.5	6.19	0.7
Sr90, d/m-ml	1.52e+09	1.40e+10	3.54e+06	9.23e+10
Total U, μg/ml	0.17	0.96	0.04	4.9
Fluoride, ppm	--	648[a]	34	--
Chloride, ppm	<500[b]	3678[a]	152	<15[b]
Nitrite, ppm		300[a]	89	
Nitrate, ppm	6287	38650[a]	??	123600
Phosphate, ppm	--	<40[a]	<40	--
Sulfate, ppm	--	1976	<40	--
Cs-137, d/m-ml	1.09e+09	2.64e+10	5.22e+06	1.42e+11
Cs-134, d/m-ml	--	--	4.22e+04	6.47e+08
Eu-154 d/m-ml	--	3.77e+05	5.69e+04	1.50e+09
Am-241 d/m-ml	8.50e+03	1.55e+05	--	--
Total α d/m-ml	1.65e+04	8.00e+05	9.00e+04	2.32e+09

a - Samples were taken 7/1/90 b- Samples were taken 6/18/90

TABLE 4.6 Inductively Coupled Plasma Analytical Results				
Constituent	HLV Tank (μg/ml)			
	104	105	106	107
Al	3		367	175
As			(4.9)	
B	5.47		262	131
Ba	1.9		78.6	1074
Ca	12.6		165	394
Cd				44
Ce				800
Cr	0.48		(0.43)	405
Cs	67.7	619		2451
Cu	5.04		26.8	
Dy	2.84			
Fe	7.88		144	12200
K	2.1		22	
La	2			820
Mg	2.84		13	44
Mn	2.42		0.51	220
Mo				1340
Na	45.9		731	
Nd				190
Ni	1.46		3.6	
P	11.5			360
Pb	15.6		2.1	
Ru				830
Se				
Si	19.6		190.8	390
Sr	15.4	217	1.6	660
Te				
Ti	0.19		2.8	130
U	0.6	1.3		5
V				
Zn	1.2		5.2	93
Zr	2.78		1.4	620

Values in ( ) are approaching or at detection limits



PRELIMINARY

NOT APPROVED FOR CONSTRUCTION

JS OSBORN	U. S. DEPARTMENT OF ENERGY
	PACIFIC NORTHWEST LABORATORY
	HIGH LEVEL VAULT EVAPORATION PROCESS SYSTEM FLOW DIAGRAM
	HIGH LEVEL VAULT INTERIM REMOVAL ACTION
	F / XXXX / 324 / WS-HLV-2 / 0

REFERENCE DRAWINGS

REVISIONS

CADDOCK 3D:IBM:ACD2:13.0:SS | CADFILE HLV2_1

Attachment 6

324 REC/HLV
Project Managers Meeting
Ecology Kennewick Office, Room 4
Kennewick, Washington

March 7, 1996
1:00 p.m. to 2:00 p.m.

Analysis of Melter Feed Canister Discrepancy

ANALYSIS OF MELTER FEED CANISTER DISCREPANCY

March 5, 1996

Background:

With the completion of the Federal Republic of Germany Heat and Radiation Sources (FRG cans), the radioactive liquid fed ceramic melter (RLFCM) was taken off line. The residual feed material was left in two RLFCM feed tanks and eventually dried to a solid material. The dried melter feed was designated as a mixed waste based on the composition of the original melter feed. In April 1993, staff members working on the B-Cell cleanout project began to size reduce the two RLFCM feed tanks. As part of the size reduction process, the dried melter feed was removed from the tanks and placed into storage containers. The containers consisted of 23" long schedule 40 6" pipe with welded bottom plates and aluminum screw on lids (capacity: approximately 3 gallons). A logbook review indicates that fifteen (15) containers where filled with dried feed material. The containers were attached to two lengths of chain fitted with lifting bails which allowed the containers to be moved around the cell using the overhead crane.

As part of the efforts to expedite the B-Cell cleanout, a plan was established to transfer all of the B-Cell mixed waste to the PUREX tunnels. The tunnels are a permitted storage facility which is currently storing wastes similar in nature to the dried melter feed. In preparations for transferring the melter feed to PUREX, the melter feed canisters were removed from the chain lengths and loaded into a transportation container. During the loading process, each canister number was verified to ensure the correct waste was being loaded. During the verification process, it was discovered that what was believed to be a melter feed canister was actually a 5-gallon bucket of vitrified glass samples and that canister #14 was unaccounted for. This was the only discrepancy discovered.

Corrective Actions:

After the discovery of the inventory discrepancy several corrective actions were taken:

1. Logbook records were reviewed to verify the number of canisters loaded.

   The logbook entries from April 9, 1993 to June 4, 1993 were reviewed. The logs indicate that 15 canisters were loaded with melter feed material. The logbook also indicates that dose profiles of the canisters read 10,140 R/hr to 15,900 R/hr.

2. Remote cameras were used to search B-Cell for canister #14.

   The overhead cell crane was used to move a remote viewing camera into all areas of the cell in order to look for the canister. With the exception of the large equipment racks, items were moved to allow unobstructed viewing of each area. The camera was positioned on the

cell floor to view under the equipment racks which could not be moved.

3. Other high dose containers within B-Cell were unloaded to verify that they did not contain the melter feed canister.

   The high dose rate of each canister provides an easy mechanism for detection if it had been packaged inside a waste container. Waste containers with high dose rates, which could not employ this method, were emptied to allow the contents to be searched for the canister.

Analysis of the Current Situation:

The high dose rate of the melter feed provides a mechanism for ensuring that the unaccounted for canister has not been removed from the cell. Prior to any waste package being removed from B-Cell, it is extensively dose profiled. This is a routine practice which has been in place since the initiation of the cleanout project. Prior to the discovery of the discrepancy, there had not been any high dose waste packages removed from B-Cell. All packages removed from B-Cell had been limited to a dose rate of 800 R/hr. This includes all LLW sent to the Hanford Site Burial Grounds and early shipments to the PUREX facility. Each high dose shipment made to PUREX since the discrepancy discovery has had the contents verified to ensure that the canister was not removed. From this it can be safely concluded that the canister has not been removed from B-Cell. Using the same operational controls, future shipments can continue with a high degree of certainty that melter feed canister #14 will not be inadvertently removed from B-Cell.

Recommendation:

The restricted operating space within B-Cell limits the options available for the continued search for canister #14. These options include continuing to search the cell or proceed with cleanout operations using due caution to verify that the canister does not get removed from the cell inadvertently.

The preferred approach is for the cleanout project to continue operations. Operations would be monitored using the current controls to ensure that melter feed canister #14 is not inadvertently removed. The recommendation is based on the following factors:

1. The through search already conducted of the cell indicates that continuing to search at this time would provide little added benefits.

2. Continued operations will open up addition cell area and allow the large equipment racks to be removed allowing for a more detailed search.

3. There is a possibility that the canister never existed and was only being tracked due to a clerical error.