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Final

**Meeting Minutes Transmittal/Approval
Unit Managers Meeting: Low Level Burial Grounds**

Meeting Held November 7, 1991
EPA Region 10
1200 Sixth Avenue, Conference Room 12-A
Seattle, Washington

Appvl. *Clifford E. Clark* Date: 12/11/91
 Clifford E. Clark, Environmental Policy and Permitting, RL
 Unit Manager

Appvl. *Daniel L. Duncan* Date: 12/11/91
 Daniel L. Duncan, EPA Region 10, RCRA Program Manager

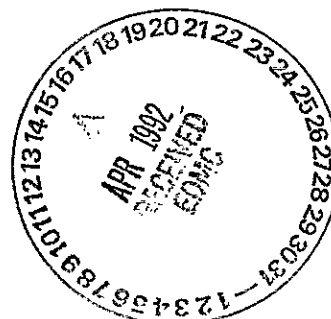
Appvl. *Joe Witczak* Date: 12/11/91
 Joe Witczak, Unit Manager, Washington State Department of Ecology

Appvl. *Richard Pierce* Date: 17/11/91
 Richard Pierce, ~~Unit Manager~~, Contractor Representative, WHC

PURPOSE:

Meeting Minutes are attached. These minutes are from the Unit Managers Meeting held November 7, 1991. Minutes are comprised of the following:

- Attachment 1 - Summary of Discussion and Commitments
- Attachment 2 - Attendance List
- Attachment 3 - Agenda
- Attachment 4 - Action Items List with Status
- Attachment 5 - W-025 Design Life Study
- Attachment 6 - Construction Inspection Policy
- Attachment 7 - Notice of Deficiency Comments



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Attachment #1

Low Level Burial Grounds
Unit Managers Meeting
EPA Region 10, 1200 Sixth Avenue, Suite 12-A
Seattle, Washington
November 7, 1991

Summary of Discussion and Commitments

W-025 Design Revisions

1. Discussion began with a presentation by Golder of a study on the design life of W-025 (See Attachment 5). The goal of the study was to investigate what would happen if Westinghouse increased the operating life of the facility from two years, which was the design life, to 20 years. Part of the study was to identify concerns and the appropriate engineering modifications to mitigate those concerns.
2. The approach used for this study was to develop a conceptual model of the landfill and the processes that affected it as well as potential deterioration mechanisms. After a screening process, three components of the landfill were identified which had some likelihood of being adversely affected by a long operating life: 1) the admix layer, 2) the geomembrane, and 3) chemical deterioration.
3. Several design changes were made to the existing design to enhance it and protect against the identified deterioration mechanisms: The operations layer will be increased from two to three feet; a foot and a half of admix will be placed under the primary geomembrane to form the double composite liner; polypropylene is to be used instead of polyester in the geotextiles. These changes will be in the next submittal of the Permit application.
4. Both polypropylene and polyester were subjected to 9090 testing in the Grout program. The testing simulation was more aggressive in the Grout program than conditions to be encountered in the W-025 trench. The Grout testing used higher temperatures, a pH level of 13 as opposed to 9.2, and radiation doses about 1,000 times higher than expected in the W-025 trench. RL will be asking the regulators to approve the use of polypropylene in the W-025 geotextiles based on the testing done under the Grout program. Ecology considered the change to polypropylene to be appropriate.
5. The discussion of changing to polypropylene prompted Ecology to raise the issue of "fingerprinting" the design specs. The fingerprint of the material to be installed in the W-025 geotextile needs to be close to the fingerprint from the Grout testing. RL is required to competitively bid its procurement contracts and therefore cannot guarantee the same manufacturer each time, nor can the specs be so stringent as to create a sole-source situation. A requirement by a regulatory agency to use a design spec which limits acquisition to only one supplier would probably subject the regulatory agency to liability associated with federal procurement laws. RL prefers to make the design spec tight enough to be compatible with the test simulation without preventing a competitive bid. Ecology stated that having only one

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supplier has caused problems at other Hanford projects and should be avoided if possible.

Draft Construction Inspection Policy

6. Ecology distributed a draft Construction Inspection Policy (CIP), which states the kind of documents or records that Ecology would expect to see at different stages of the contract (See Attachment 6). The CIP runs in parallel to WHC's Construction Quality Assurance (CQA). The formal version of the CIP will be an attachment to the new set of Notice of Deficiency comments (NODs).

7. There was concern on the part of Ecology that no mention was made in the CQA of double-ring infiltrometer testing on the liner. WHC currently plans to use Shelby tubes which would then be taken to a lab for analysis. Ecology noted that, even though the soils to be used at W-025 are exactly like those at LERF, there are other criteria involved, including the efficiency of the contractor and the compaction efforts. RL will not be able to wait for results to come in from double-ring infiltrometer testing without delaying construction for a year in order to avoid laying the liner during winter months. Ecology stated that RL can proceed at risk. Also, Ecology is considering the requirement of a lysimeter underneath the test pad. RL will be prepared to respond to the CIP at the next Unit Managers Meeting.

Responses to Notice of Deficiencies

8. A draft copy of responses to old NOD comments was distributed by Ecology (See Attachment 7). The document contains rebuttals to NOD responses. For the most part, NODs which are not listed have had concurrence. Discussion of the NODs included the following:

NOD 146: This NOD deals with using a 3-to-1 slope versus a 4-to-1 slope. Ecology will be requesting additional information on the 3-to-1 slope. Although Ecology normally requires 4-to-1 slopes, based on some of the circumstances of this project, 3-to-1 can be allowed. RL requested assurance from Ecology that 4-to-1 slopes would not be arbitrarily required in the future, especially for projects of similar construction. Ecology stated that the agency is always reasonable and willing to listen.

NOD 119: DOE Headquarters has explicitly instructed RL concerning the DOE position on authority to regulate radionuclides. Ecology suggested leaving this item to be among the last points of contention and then bringing it up to higher authorities for resolution.

NOD 122: Ecology objected to the statement "... received mixed waste and were backfilled..." and suggested insertion of the statement "discontinued receiving mixed waste." WHC stated, however, that operations were not discontinued. After some discussion, Ecology stated that Ecology will research previous correspondence and discussion on this matter and change this comment accordingly.

NOD 124: Revised drawings which show the surface area of the W-025 Landfill and location of trenches have been drafted.

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NOD 128: The Performance Assessment is not yet available for Low-Level Burial Grounds.

NOD 137: Clarification was requested by Ecology on ASTM Test 9045. ASTM Test 9045 was identified to WHC as the test method used in this case by a chemist at Manchester.

NOD 145: Ecology's concern with the asphalt operations layer involves a question of the possibility that contaminants might leach from the asphalt into the leachate sump and that there might be chemical incompatibility between leachate from the asphalt and the leachate sump liner.

NOD 230: The response in NOD 230 is not quite right since RL intends to provide information on anticipated costs for closure annually in a separate report, and the methodology for establishing the costs for closure will be the methodology RL uses now for doing construction estimates.

9. According to the Preliminary Safety Analysis Report, the W-025 trench is listed as Safety Class 3.

10. Ecology plans to transmit an informal copy of the NOD table by Friday, November 15, 1991. The final version will be sent after internal Ecology review.

Request for Exemption from Lined-Trench Requirements for SRC

11. Certain portions of the waiver request are being reconsidered to reflect recent information which indicates lower corrosion rates as well as the complexity and cost of cathodic protection. This information must be evaluated thoroughly before inclusion in the waiver request.

12. Responses to NOD comments regarding the submarine reactor compartments have to go through an extensive review process involving multiple agencies, including the shipyards at Puget Sound, Naval Programs, and the U.S. Navy. This increases the time needed for incorporating comments. NOD responses need to be in before the request for exemption can be fully addressed.

Schedule for Low-Level Burial Grounds Application

13. Ecology is giving priority for other units such as the Grout Treatment Facility to be included in the first modification of the Hanford Site-Wide Permit. An overall schedule is needed to determine the interval between modifications to the Site-Wide Permit and also for the inclusion of all permitted units into the Hanford Site-Wide Permit, and this is a continuing subject of concern at the site-wide level.

14. There was discussion of when the permit application for the Low-Level Burial Grounds should be certified. WHC/RL does not wish to divert resources from other units to certify the application for Low-Level Burial Grounds if Low-Level Burial Grounds is not going to be included in the next modification of the Site-Wide Permit. Ecology would at least like an uncertified

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application before construction begins. Such an uncertified application would have to contain a provision for further information to be included.

Action Items

15. 5-30-91:1 is open. RL would like a letter from Ecology which restates that Ecology agreed to construction under interim status so that this would be documented in case of changes, for instance, change of personnel. Ecology wishes to seek internal approval before writing a letter which would reiterate what is already in the regulations. Ecology expects that this letter would include some unresolved points of contention and problems that may arise during public comment, and will state that construction will be at risk for these reasons. Construction at risk will not be prevented because of open NODs.

16. The next LLBG Unit Managers Meeting is sheduled for the afternoon of Thursday, December 5, 1991 at the EPA Region 10 office in Richland, Washington.

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Attachment 2

Low Level Burial Grounds
(W-025 Mixed Waste Trench)
Unit Managers Meeting
November 7, 1991

Attendance List

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE #</u>
R. Benze	USN	(206) 476-1971
B. Broomfield	WHC	(509) 376-4966
C. Clark	RL	(509) 376-9333
K. Davis	CNES	(509) 376-0412
J. Divine	ChemMet	(509) 967-2309
D. Duncan	EPA	(206) 553-6693
E. Erpenbeck	WHC	(509) 376-8032
G. Evans	WHC	(509) 376-8939
R. Gilbert	RL	(509) 376-0618
R. Giroir	WHC	(509) 376-4294
M. Jaraysi	Ecology	(509) 546-2995
J. King	SWEC	(509) 376-4726
R. Krekel	RL	(509) 376-4264
S. Price	WHC	(509) 376-1653
F. Shuri	Goilder	(206) 883-0777
J. Witczak	Ecology	(206) 438-7557

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Attachment 3

Low Level Burial Grounds
(W-025 Mixed Waste Trench)
Unit Managers Meeting
November 7, 1991

Agenda

10:00 - 12:00 a.m.

- I Opening Remarks (C. Clark)
- II Discuss mixed waste trench design revisions for 20-year life.
(E. Erpenbeck)
- III Discuss Responses to the Notice of Deficiencies. (J. Witczak)
- IV Discuss status of Request for Exemption from Lined Trench Requirements
for SRC. (C. Clark)
- V Discuss proposed schedule for incorporating NOD responses into permit
application. (J. Witczak)

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Attachment 4

Low Level Burial Grounds
(W-025 Mixed Waste Trench)
Unit Managers Meeting
November 7, 1991

Commitments/Agreements Status

ACTION ITEM

COMMITMENTS/AGREEMENTS STATUS LIST

5-30-91:1 Provide a letter on interim status construction authorization and regulatory criteria for design. Action: Joe Witczak (Ecology) and Dan Duncan (EPA)

OPEN

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Attachment 5
W-025 Design Life Study

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W-025 Design Life Study

- **Effects of Increasing Operating Life From 2 to 20 Years**
- **If Concerns Exist, Identify Potential Engineering Modifications**

Approach

- **Develop Conceptual Model of Landfill System and Processes**
- **Identify Potential Deterioration Mechanisms (Include 9090 Test Results)**
- **Identify Detailed Parameters That Affect Deterioration**
- **Determine Most Significant Parameters**
- **Assess Likelihood of Changes With Time**
- **Evaluate Engineering Options to Mitigate Adverse Changes**

Deterioration Mechanisms

- **Admix Layer**
 - **Desiccation**
 - **Freeze/Thaw**
- **Geomembrane**
 - **Stress Cracking**
 - **Landfill Operations**
- **Geotextile**
 - **Chemical Deterioration**

Admix Desiccation

- **Drying and shrinking of clay component causes cracking**
- **Field studies suggest no problem if geomembrane is present and in good contact with admix**
- **Desiccation increases with higher temperatures**
- **Mitigating approaches at W-025 Landfill:**
 - **Careful construction to minimize wrinkles in geomembrane**
 - **Increase operations layer thickness from 2 to 3 feet**
 - **Higher load at geomembrane/admix interface**
 - **Reduce maximum temperature experienced by admix**

Admix Freeze/Thaw

- **Freezing and thawing can increase permeability of clay liners up to two orders of magnitude**
- **Maximum freezing depth at Hanford: 36 inches**
- **Mitigating approach at W-025 Landfill:**
 - **Increase operations layer thickness from 2 to 3 feet**

Geomembrane Stress Cracking

- **Long term, probably ongoing brittle cracking in stressed areas such as seams or wrinkles**
- **Difficult to eliminate. Careful installation, reduced temperature cycling will probably help**
- **Mitigating approach at W-025 Landfill:**
 - **Place 1.5 foot thick admix layer under primary geomembrane on landfill floor to form composite liner**

Geomembrane Damage from Landfill Operations

- **Undetected damage from puncture, equipment wheel shear, other factors**
- **Difficult to predict operational or equipment changes over 20 years**
- **Mitigating approach at W-025 Landfill:**
 - **Increase operations layer thickness from 2 to 3 feet**

Geotextile Chemical Deterioration

- **Some strength properties did not stabilize over the test period; many tests showed no significant change**
- **Mechanism probably hydrolysis - typical of polyester in alkaline environments**
- **Not a serious problem because:**
 - **Sideslope strength only needed prior to waste placement (i.e., no leachate present)**
 - **Significant leachate production unlikely until landfill is closed, when high drainage capacity is not needed**
 - **Geotextile strength generally much higher than required already**
- **To eliminate any concern, use polypropylene instead of polyester**

Comparison of 9090 Testing Programs

● Grout Facility

- Materials: HDPE, Polypropylene, Polyester, XR-5
- Max. Temp: 70°C and 90°C
- Radiation: 930 kRad and 39,000 kRad
- Leachate Composition: W-025 + Heavy Metals + Inorganic Salts + Organics
- Leachate pH: >13.9

● W-025 Landfill

- HDPE, Polyester
- 50°C
- 50kRad
- NaNO₃ + Minor Anions
- 9.2

9090 Test Results

- **Polyester, Grout Program:**
 - **Dissolved after 17 days**
- **Polypropylene, Grout Program:**
 - **No significant change in properties**
- **Polyester, W-025 Program:**
 - **Slight strength loss after 400 days**
- **Therefore, polypropylene should perform well in W-025 Landfill**

Summary of Design Changes

- 1. Increase operations layer thickness from 2 to 3 feet**
- 2. Place 1.5 foot thick admix layer under primary geomembrane on landfill floor**
- 3. Use polypropylene instead of polyester in geotextiles**

Attachment 6
Construction Inspection Policy

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**RADIOACTIVE MIXED WASTE LAND DISPOSAL FACILITY
NON-DRAG-OFF
DEPARTMENT OF ECOLOGY
CONSTRUCTION INSPECTION POLICY
-CIP-**

1.0 INTRODUCTION

1.1 Purpose of this CIP (ref CQA Plan 1.1)

This Policy will describe the procedure of inspection adopted by WDOE engineers, in conjunction with the assigned DOE/WHC/GAI/KEH CQA Officers to ensure conformance with all approved design specifications, procedures, and drawings.

1.2 Participants in Policy (ref CQA Plan 2.1.2 & 2.1.5.4)

In addition to WDOE Inspection Engineers and the assigned CQA Engineer (and his/her site reps) of GAI, all KEH Construction Forces and Sub-Contractors' senior site staff will implement the inspection procedure of this Policy in conjunction with the CQA Plan of GAI.

1.3 Construction Progress (ref CQA Plan 2.2)

Every two weeks a construction progress meeting will be held at WDOE offices between WDOE Inspection Engineer and the assigned CQA Officers. The purpose of these meetings will be to broadly evaluate the progress of site works and achievements, exchange views of newly emerging construction problems or obstacles, subsequent schedules and plans, ECNs, ICNs, and inspection procedure-related problems, if any come up.

2.0 GENERAL INSPECTION ACTIVITIES (ref CQA Plan 4.0 & 4.1)

- 2.1 All inspections, tests and sampling procedures shall be conducted to ensure the execution of construction activities in accordance with the standards listed in the following references:
1. EPA Technical Guidance Document "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities".
 2. Washington Administrative Code (WAC) 173-303.

2.2 The results of all site and off site tests and examinations will be verified by the assigned CQA Officer of GAI and submitted to WDOE Inspection Engineer for review.

2.3 CQA-KEH will submit the results of all destructive/nondestructive tests to the WDOE Inspection Engineer for review prior to commencement of activities affected by these test results.

2.4 CQA-GAI will submit their material verification reports to WDOE Inspection Engineer for review.

2.5 WDOE Inspector Engineer will request any testing equipment to be re-calibrated if he/she notices inconsistent test results. This request shall be put in writing to the CQA Engineer.

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3.0 SPECIFIC INSPECTION ACTIVITIES

3.1 Foundation and Backfill (ref CQA Plan 4.3.1)

After the removal of the silty sand top layer a notification form shall be submitted by CQA-KEH site staff to the WDOE Inspection Engineer to verify the grade levels prior to commencement of basin excavations. Also, the WDOE Inspection Engineer will inspect the excavated material designated to be used in the construction of the roadway top course and for structural backfill.

3.1.1 Land Survey Inspection (ref CQA Plan 4.3.1)

The CQA Officer shall submit the survey reports received from the registered professional land surveyor designated to this jobsite to WDOE Inspection Engineer prior to the commencement of consequent activities dependant on such reports. In general, survey reports shall be attached to all notification forms involving soil or membrane placement activities. The WDOE Inspection Engineer will request to carry out/observe random survey activities.

3.1.2 Structural Backfill

* WDOE Inspection Engineer will examine the structural backfill material as it is delivered to the jobsite and immediately prior to placement.

* In addition to the visual observation, WDOE Inspection Engineer will review the following documents generated by the CQA Engineer:

- The Contractor's "earthworks operation plan and schedule"
- Test reports of all tests run on the potential materials for the structural backfill.

3.1.3 Foundation Level Materials

WDOE Inspection Engineer will visually check the foundation materials immediately before placement of structural backfill. All results of the compaction and moisture tests carried out in the specified frequencies and locations shall be attached to the notification forms submitted for consecutive soil layers prior to placement of new layers.

3.2 Low-Permeability Admix Soil Liner (ref CQA Plan 4.3.2)

3.2.1 Materials:

* WDOE Inspection Engineer will examine the soil prior to placement, and give approval to use examined stock piles.

* CQA Officer/personnel will submit soil test results to WDOE prior to mixing.

* Soil mixing will be observed by WDOE Inspection Engineer, and the-results of the specified tests attached to the notification form submitted prior to placement.

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3.2.2

Soil Placement

- * WDOE will observe placement, spreading and compaction operations of the liner material.
- * Results of compaction and moisture content tests shall be attached to the notification form submitted by CQA Officer/personnel to WDOE prior to placement of consecutive lifts.
- * CQA Officer/personnel will submit a notification form after completion of placement of the low permeability liner to check for the following before placement of any protective membrane:
 - defects,
 - surface smoothness,
 - elevations.

3.2.3

Test Fill

- * Since the Test Fill will be constructed primarily to simulate construction of the actual facility, using the same equipment and construction methods to achieve the specified properties, it is necessary for the WDOE Inspection Engineer to follow up this operation as closely as possible.
- * All the relevant records and test results will be made available for review by WDOE engineers.
- * WDOE Engineer will be promptly notified by the Project Engineer of the commencement date of any construction or testing activity on the Test Fill.
- * Prior to the placement of the Soil Admix, WDOE will review the survey report for the set up of the Test Fill to verify the dimensions.
- * In addition to the field and lab tests listed in Appendix A of the CQA Plan, an SDRI destructive field permeability test will be started, in accordance with (ASTM D 5093) developed by Stephen Trautwein, on each of the Test Fills constructed. Test records will be kept for the SDRI to verify the achievement of the specified maximum permeability.
- * The CQA Officer will provide WDOE with the Test Reports of the SDRI on a regular basis for the period from the start of the test until the final completion of the Project.

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3.3 HDPE Geomembrane Liner (ref CQA Plan 4.4)

3.3.1 Material Verification (ref CQA Plan 4.4.1)

CQA Officer/personnel will submit to WDOE all the specified documents referring to the supply of the geomembrane including:

- manufacturer's qualifications
- manufacturer's quality control plan
- manufacturer's certified material test reports
- CQA's reports on membrane and resin tests.

3.3.2 Installation (ref CQA Plan 4.4.2)

3.3.2.1 * CQA Officer/personnel will submit to WDOE all the specified documents concerning the installation of the membrane liners including:

- installers' qualifications
- installation drawings
- repair recommendations
- report on recommended seam welding, testing and sampling procedures.

3.3.2.2 * CQA Officer/personnel will submit to WDOE Inspection Engineer a notification form for the installation of the geomembrane, and attach with it copies of the Certified Material Test Reports, to check the following before approval to proceed with installation of the membrane:

- smoothness and cleanliness of surfaces

3.3.2.3 * WDOE Inspection Engineer will observe the following activities during installation:

- placement of material relevant to drawings
- preparation of seaming
- sampling procedures relevant to specifications
- repairs
- anchorage of material
- nondestructive seam testing.

3.4 Drainage Net (ref CQA Plan 4.5.2.2)

CQA Officer/personnel will submit a notification form to the WDOE Inspection Engineer, and attach with it the test results reports of all the specified sampling and testing of the material to be used. The Inspection Engineer will observe the following during the placement of the Net:

- placement and anchorage relevant to specs and drawings
- usage of sound material
- sampling in accordance with specifications

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3.5

Geotextile and Geocomposite

* CQA Officer/personnel will submit a notification form to the WDOE Inspection Engineer, and attach with it the test results reports of all the specified sampling and testing of the material to be used. The following will be provided to WDOE prior to installation:

- method and drawings of installation
- installers' qualifications
- method of overlapping/seaming and repair
- manufacturer's certified material test reports

* WDOE Inspection Engineer will observe the following during the placement of the Geotextile material:

- placement relevant to specs and drawings
- usage of sound material
- sampling in accordance with specifications

3.6

Leachate Collection System (ref CQA Plan 4.5)

3.6.1

Drainage Gravel (ref CQA Plan 4.5.2.1)

* CQA Officer/personnel will submit a notification form to WDOE Inspection Engineer to inspect the Gravel when delivered on site, and attach with the form the following reports:

- the gradation analysis
- the constant head Permeability test
- method of placement of gravel

* WDOE Inspection Engineer will observe the Gravel placement operation for the following:

- placement locations relevant to specifications.
- thickness of layer placed
- condition of aggregate.

3.6.2

HDPE PIPING (ref CQA Plan 4.5.2.1)

CQA Officer/personnel will submit to WDOE a notification form prior to starting assembling the High-Density Polyethylene Piping, with Certified Material Test Reports for the piping material to be used, to review, check, and observe the following:

- proper placement and alignment
- pipe and pipe fittings jointing
- performance pipe testing
- backfilling and compaction after installation

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- 3.7 Mechanical and Electrical Systems (ref CQA Plan 4.8,4.9,4.10)
- 3.7.1 General Preconstruction Data
- 3.7.1.1 Mechanical Fittings and Installations
 CQA Officer/personnel will submit the documentation mentioned in the above reference concerning:
- manufacturers' catalogs and components data
 - installation instructions
 - installation, operation, and maintenance manuals for pumps and control valves
- 3.7.1.2 Electrical Instrumentation
 CQA Officer/personnel will submit the documentation mentioned in the above reference to the WDOE Inspection Engineer for:
- Leak sensors
 - level detectors
 - transformers and cable
- 3.7.2 Inspection During Construction
- 3.6.2.1 Mechanical Works
 WDOE Inspection Engineer will observe all piping and pipe fittings installations which shall be carried out in accordance with the approved drawings and specifications. After completion of all installation works, CQA Officer/personnel will submit to WDOE Inspection Engineer a notification form for the final operation and visual tests, prior to final Tie-In stage.
- 3.6.2.2 Electrical Works (ref CQA Plan 2.3.7.2.2)
 WDOE Inspection Engineer will observe all wiring and electrical fittings installations which shall be carried out in accordance with the approved drawings and specifications. After completion of all installation works, CQA Officer/personnel will submit to WDOE Inspection Engineer a notification form for the final operation and visual tests, prior to final Tie-In stage.

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4.0 INSPECTION FORMS AND PROCEDURES

4.1 The following is a description of the forms which will be used to expedite the inspection procedures carried out by both WDOE Inspection Engineer and the Project CQA Officer. The main aim behind using these forms is to record the site activities inspection and observation for all parties' present and future reference.

4.2 Activity Notification form

This form will be filled and submitted by the CQA Officer/personnel before commencing new activities. This form is, practically, a notification to the WDOE Inspection Engineers concerning an activity which is ready to be commenced by the contractors, so as he/she (WDOE Insp Engr) can check site works, approve the progress of the construction, and observe the execution of the works.

4.3 Construction Site Note

This is a site notification form issued by WDOE Inspection Engineer to contractor's site staff in response to one of the following cases:

- non-conformance with general safety regulations
- non-conformance with either specifications or drawings and refusing to rectify conditions.
- starting an activity before receiving the Notification form from the CQA Officer.

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Attachment 7
Notice of Deficiency Comments

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ENCLOSURE 2

NOD Comments for the Low-Level Burial Grounds

No. Comment

- 14
- Comment:
- Section 4.1.2.1, Test for Free Liquids, Page 4-3

The response indicates that the presence of free liquids is determined by real time radiography. The response also indicates that this method is not effective in shipments where lead shielding is used. The information in Appendix 4A indicates that a large percentage of shipments received at the Low-Level Burial Grounds have contained lead. Provide an estimate of the percentage of shipments which will contain lead and therefore cannot be accurately assessed for the presence of liquids. Estimate the percentage of shipments will be assessed by real time radiography.

- 15
- Deficiency:
- Section 4.6.1, List of Wastes, Page 4-4

The response indicates that the requested information is "already listed in Appendix 4A". However, Ecology has requested the following information which is not found in Appendix 4A: 1) a list of mixed waste received after November 23, 1987, 2) the "specific areas of the existing unlined trenches" which have received mixed waste, and 3) identification of the trench locations where liquids have been disposed.

Requirement: As noted in the last NOD, concurrence with this response will be based upon the additional information to be submitted. This information should be provided as soon as possible to facilitate our evaluation. In addition, information similar to that provided in Appendix 4A should be provided on all waste received after November 23, 1987, not just what Energy/WHC consider to be mixed waste. Also note that comment 15 was erroneously listed in the last NOD as having Ecology concurrence. Concurrence is now withdrawn pending submittal and review of the requested information.

- 16
- Deficiency:
- Section 4.6.2.1, Exemption Based on Existing, Pg 4-5

The response fails to address Ecology's requirements which are: 1) specify the portions of each trench which did not contain wastes on November 23, 1987, and 2) edit the term "notification of" to "approval from".

Requirement: The requested information must be provided and a commitment made to make the specified text corrections. It should also be noted that Federal Register language addressing HSWA defined differences between existing, new, replacement, and lateral expansion units (see July 15, 1985 Federal Register).

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- 21 Comment: Section 4.6.3.4, Liner Exposure Prevention, Page 4-14

Although covering the side slopes with an earthen cover should be adequate for short term protection, the erosional forces present on the Hanford Reservation will most likely thin this layer over a period of time. Precipitation and wind erosion will distribute this cover material to the toe of the slope. Discuss or reference the text which address the methods for determining the extent of such erosion over time.

- 31 Comment: Sections 4.6.5.3.3 and 4.6.6.6.1, Weight of Overlying Material and Stability of Drainage Layers, Pages 4-36 and 4-47

It is unclear if the last line of text in this response means that material test results will be submitted to Ecology "as requested" in the future or "as requested" in the NOD comment. It should be noted that all "Certified Material Test Reports" and similar material documents must be provided to Ecology. This is a permit requirement which should automatically be met without future requests from Ecology staff.

- 102 Deficiency: Section 11.1.1.2, Removal or Decontamination, Page 11-22

It is unsatisfactory to only address extremely hazardous waste (EHW) in this soil sampling plan. The plan should address all likely dangerous/hazardous constituents.

Requirement: Replace the phrase "extremely hazardous waste (EHW)" with "hazardous constituents".

- 103 Comment: Section 11.1.4.1, Retrievably Stored TRU Waste, Page 11-25

The report "Corrosion in Waste Drums from the 183-H Solar Evaporation Basin Cleanout Project" (WHC-IP-0716) states that "A significant accelerating factor was the high ambient temperature and direct sun exposure of the failed drums." and "...the cyclic temperatures experienced could lead to condensation of moisture inside the drums, lowering the pH and accelerating corrosion." Although Ecology recognizes that the climate alone did not result in the breached drums, it is evident that the open storage of dangerous waste drums in the Hanford environment should not be taken for granted. No further comment is necessary.

- 106 Comment: Section 11.1.5.2.1, General Description, Page 11-29

Although the response does not address the grade requirement specified in this comment, Ecology has located and concurs with the grade requirement found in the CQA Plan. No further comment is required.

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- 107 Deficiency: Section 11.1.5.2.2.1, Native Soil Grade Layer, Page 11-48

It is typical construction practice to place soil in 6 - 8 inch lifts when compaction or permeability are critical factors. Evaluating lift depths of up to 2 feet would only encumber the test pad evaluation.

Requirement: All soil and soil mixtures must be placed per the accepted practice of 6 - 8 inch lifts.

- 109 Comment: Section 11.1.5.2.2.6, Drainage Layer, Page 11-52

Comment 106 also applies here.

- 119 Comment: Section 2.1.1, Hanford Site, Page 2-4

Ecology recognizes the DOE-RL position on the regulation of radionuclides. However, our response to this position and further discussion on this issue will be addressed on a site-wide basis and not in this permit. Delete the sentence beginning on line 12.

- 120 Comment: Section 2.1.2.1, Past Practices, Page 2-6

In lieu of the proposed text addition, the text proposed in the response to comment 126 should also be used here.

- 122 Deficiency: Section 2.1.2.1, Past Practices, Page 2-11

The fact that the trenches were backfilled before the effective date of mixed waste regulations has no bearing on how the trenches are regulated. The relevant fact is whether the trench continued accepting mixed waste.

Requirement: Delete the term "received mixed waste and were backfilled before" and insert "discontinued receiving mixed waste prior to".

- 124 Comment: Section 2.1.2.3, Closure, Page 2-22

This comment will not be concurred with until after receipt of the revised drawings. These drawings should be provided as soon as possible because the overall permitting and closure strategy will be based upon this information.

- 128 Comment: Section 3.1.2, Containerized Waste, Page 3-4

The Performance Assessment must be provided to Ecology when available.

- 137 Comment: Table 3-2, Analytical Methodology, Page 3-17

The reference to EP Toxicity testing should be changed to TCLP testing. In addition, the procedure for determining the pH of a solid outlined in Ecology's Chemical Testing Methods, WDOE 83-13, should be referenced for corrosivity testing. WAC 173-303-090(8) (October 16, 1990)

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- 138 Deficiency: Section 3.2.9, Additional Requirements, Page 3-20

Annual audits of each generator are insufficient for waste verification of off-site generators.

Requirement: The waste verification program must include the physical verification of 10% of the waste received in each shipment transported to the site from non-Hanford Reservation generators.

- 139 Deficiency: Section 4.1.1, Containers with Free Liquids, Page 4-1

The text on line 28 indicates that the containers with free liquids are lab packs. Lab packs are specifically defined in WAC 173-303-161. Section 4.1.1.1 describes containers containing liquids which may not meet the regulatory definition of lab packs.

Requirement: WAC 173-303-161 and the federal regulations referenced therein should be reviewed to determine if all containers with liquids are indeed labpacks. If some containers are not lab packs, the text should be edited to identify the other type of free liquid containers which are located in the trenches.

- 143 Comment: Section 4.6.2.2, Exemption Based on Design, Page 4-5

This comment must be addressed in the next NOD Response Table.

- 144 Deficiency: Section 4.6.3, Liner System, General Items, Page 4-6

WAC 173-303-610(b) allows Ecology to set postclosure durations of any length based upon site conditions. Although a 30-year timeframe can be used to estimate future requirements, Ecology cannot specify the postclosure duration at this time.

Requirement: Delete the term "30-year".

- 145 Comment: Figure 4-1, RCRA Compliant Liner System, Page 4-7/8

Appropriate text changes need to be made within the permit application to specify asphaltic concrete. Are the truck staging and unloading areas within the lined part of the landfill? If so, what type of compatibility testing has been done on this material?

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147 Comment: Section 4.6.4.4.4, Stability of Slopes, Page 4-30

This issue will be addressed in comment 146. No further response is necessary.

151 Deficiency: Section 4.6.5.5, Soil Liners, Page 4-39

It is Ecology's experience that "the great deal of latitude for the Contractor (or Construction Manager) to determine the most suitable types of equipment and procedures for preparing and placing the admix liner" has been a key problem at the LERF site. Another problem has been the sampling and field test procedures utilized at LERF.

Requirement: Ecology highly recommends that the Contractor's flexibility be limited wherever possible. If Energy, WHC, or Kaiser are aware of a successful procedure or piece of equipment, it should be specified to the Contractor. If not, the requirement for the Contractor to submit a description of these activities should be augmented by a requirement to have the submittal approved by the WHC Project Engineer and the CQA Engineer. These submittals must also be approved by Ecology's construction inspector or unit manager.

157 Comment: Section 4.6.6.1.1, Primary System, Page 4-44

The text should be edited to reflect the response.

161 Deficiency: Section 4.6.6.5, System Compatibility, Page 4-47

There is insufficient data in the two references listed in the response to assess the fingerprinting program. It is not clear which parameters will be used or what will be the acceptance criteria.

Requirement: A discussion of the fingerprinting program must be presented in the text. It should include a list of the parameters for each synthetic material which have been analyzed, the reported values, and proposed tolerances for acceptance of future shipments of synthetic material to be used for this project.

165 Comment: Chapter 5, Groundwater

Although Ecology concurs with the previous NOD responses made on this chapter, a number of new comments on this chapter are presented and may address similar concerns. It is our understanding that this chapter has been extensively revised since this application's submittal. Therefore, although the specific Chapter 5 comments which follow may no longer be applicable, the following general requirements should be addressed in the revised text. Chapter 5 should address the following: 1) all stages of monitoring well installation and well sampling should be coordinated with Ecology; 2) all lab result reports must be provided to Ecology; 3) all well completion reports must be provided to Ecology; 4) the revised chapter should utilize post 1987 data as well as prior data; and 5) provide supporting descriptions for the well location model.

- 169 Deficiency: Section 5.2.3.2.3, Results of Water Quality, Page 5-26

The text states "The concentration of dissolved chromium exceeded drinking water standards...." However, the origin of the contamination and possible remedial actions are not discussed.

Requirement: The text must discuss the origin of this contamination as well as remedial actions which could be immediately undertaken to address this contamination. This comment also applies to any other constituents which were above drinking water standards.

- 171 Deficiency: Section 5.3.4, Regional Hydrogeology, Page 5-38

The text notes that "The base of the aquifer is the basalt surface, but semiconfining silts and clays are present above the basalt in some areas." However, the locations of these semiconfining layers is not presented.

Requirement: The locations of the semiconfining layers should be specified as well as a description of how these layers influence ground water flow and the entrapment of pollutants.

- 172 Comment: Section 5.3.4, Regional Hydrogeology, Page 5-39

The "actual amount of recharge" needs to be revised based upon the new data that is now available.

- 179 Comment: Section 5.3.5.2.4, Vadose Zone, Page 5-57

The text indicates the presence of an 8-15 foot thick section of unconsolidated loess. Was this section analyzed for its effect on pollutant migration? The applicable data supporting this effect, or the absence of an effect, must be provided.

- 181 Comment: Section 5.3.6, Underlying Aquifer, Page 5-60

The aquifer description should include how the new wells respond to monitoring. In addition, new data obtained during drilling and monitoring should be included.

- 185 Deficiency: Section 5.4.2, Travel Time, Page 5-70

The estimated travel times given here are not substantiated because aquifer parameters and flow paths are not presently known.

Requirement: New travel times should be specified based on more accurate calculations.

- 186 Comment: Section 5.4.4, Summary of Travel, Page 5-70

See above comment.

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191 Deficiency: Section 5.5.2.1.1, Background, Page 5-84

There is a need for monitoring the middle portion of the aquifer. The lithology between some "deep" and "shallow" portions might be such that it will retain pollutants.

Requirement: A portion of the monitoring wells must be screened to monitor the middle section of the aquifer if the aquifer thickness exceeds 40 feet.

199 Comment: Table 5-12, Well Installation Priority, Page 5-127

The preliminary results from drilling the priority 1 wells should serve as a base for drilling wells in the priority 2 list. Staging of wells should depend upon the results obtained during previous drilling.

206 Deficiency: Section 7.4.6, Treatment, Storage, or Disposal, Page 7-32

Ecology's concern in this comment is the handling of spill or emergency related residue material. WAC 173-303-340 does not fully address this issue.

Requirement: The text must be revised to indicate that WAC 173-303 requirements will be met in handling releases and release residues.

208 Deficiency: Section 11.1.4.3, Gas Sampling, Page 11-27

Because the gas sampling tubes are already in place, monitoring of the emissions, or lack of emissions from these sampling points should continue.

Requirement: An ambient air sampling monitoring plan should be developed and indicate points of monitoring, constituents to be assessed, sampling protocols to be used and the frequency of monitoring.

210 Comment: Section 11.1.5.2.1, General Description, Page 11-30

The extent of each landfill cover is still under consideration by Ecology and will be based, in part, on the new drawings to be provided in response to comment 124. Ecology requires 4H:1V slopes and a factor of safety of 2.0 for the cover. (See comment 146)

212 Deficiency: Section 11.1.5.2.2.1, Native Soil Grade Layer, Page 11-48

the response fails to address the comment's requirement for Ecology approval on the test pad plan.

Requirement: The text must indicate that this plan must receive Ecology approval before construction of the pad can commence.

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213 Deficiency: Section 11.1.5.2.2.3, Soil/Bentonite Layer, Page 11-49

It is not possible for on-site discing to allow the precise degree of control of bentonite and moisture percentage that pugmilling will afford. Furthermore, discing on the side slopes will be difficult with currently available tractor-harrow combinations. This is a critical liner which needs as much control as possible. Choosing to disk the admix would also require additional test pads to prove this method is equivalent to the pugmill method.

Requirement: The soil/bentonite material must be mixed in a pugmill. In addition, Ecology's remarks on contractor flexibility in comment 151 should be noted here.

214 Deficiency: Section 11.1.5.2.2.4, FML, Page 11-51

The EPA currently recommends a 45-mil flexible membrane liner in situations where the liner will be exposed to weathering. Furthermore, standard practice dictates that a 60-mil liner be used even if not exposed (see Grout and LERF designs).

Requirement: This geomembrane must be 60-mil thick.

216 Comment: Section 11.1.5.2.2.9, Vegetative Cover, Page 11-54

Concurrence will be based upon the results of the comprehensive search.

222 Comment: Section 11.1.5.5.1, Cover Drainage, Page 11-60

Measuring the amount of cover drainage can be easily accomplished and may provide data which supports or refutes use of the HELP model and the cover design. This issue was discussed and agreed to for the design of the 183-H Basins final cover. No permit limits will be set nor chemical analysis required.

225 Deficiency: Section 11.1.6, Schedule for Closure, Page 11-68

Concurrence will be assessed after Ecology reviews the outcome of this evaluation.

226 Deficiency: Section 11.2.1.2, Erosion Damage, Page 11-77

Precipitation is not the only cause of settlement.

Requirement: Surveying must initially be conducted quarterly. If early results show no significant settlement, annual surveys will be sufficient.

232 Comment: Section 12.3, Transporter Requirements, Page 12-6

details of transportation requirements required by Ecology can be found in the facility-wide permit application.

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- 236 Comment: Appendix 4A, List of Mixed Waste, Pages 4A-18,38, 44
Figure 2-9 must be edited to support the response.
- 239 Comment: Appendix 4F, Liner Material Specifications, Page 4F-1
The specific gravity of the liner must be no less than 0.94 and the maximum melt flow index must be no more than 0.3 grams per 10 minutes.
- 240 Comment: Appendix 4F, Liner Material Specifications, Page 4F-2
The geosynthetic quality assurance consultant must not only verify the specifications identified, or to be identified, in Table 4F-1, but also every fingerprinting parameter (see comment 161).
- 241 Comment: Appendix 4F, Liner Material Specifications, Table 4F-1
Why are four identical values given for some parameters? The fingerprinting parameters must also be listed, with limits, on this table.
- 245 Comment: Appendix 4F, Liner Material Specifications, Page 4F-20
Previous comments address these same issues. No further comment necessary.
- 246 Comment: Appendix 4F, Liner Material Specifications, Page 4F-21
In-situ permeability testing must be done with a sealed double ring infiltrometer.
- 248 Comment: Appendix 4F, Liner Material Specification, Page 4F-23
Transmissivity should be measured with the geonet sandwiched between the actual boundary materials, not steel plates. Explain why the condition in footnote "a" must be met. Comments 239 and 240 also apply here.
- 252 Deficiency: Appendix 4F, Liner Material Specifications, Page 4F-44
The response does not address preconstruction meetings and problem/work meetings.
Requirement: These two meetings must also be included in the response for Ecology notification requirements.
- 253 Comment: Appendix 4F, Liner Material Specifications, Page 4F-49
The facility design and specifications will be part of the dangerous waste permit. Therefore, any changes to or deviations from the design or specifications must be approved by Ecology. Ecology will treat these changes as Class I permit modifications requiring pre-approval. Ecology assumes that these changes and deviations will be handled through the

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Engineer Change Notice (ECN) process and Nonconformance Report (NCR) process such as used for the Grout project. If this is true, Ecology must be provided a copy of the draft ECN/NCR to allow response, if necessary, prior to implementing the change or dispositioning the nonconformant condition. This requirement may be fulfilled by either 1) hand delivering the draft ECN/NCR to Ecology's on-site construction inspector, if one is present, or 2) sending a facsimile copy (fax) to Ecology's LLBG unit manager. Ecology will notify DOE-RL if the modification should be upgraded to a Class II or III modification. This method of handling modifications is limited to design and specification changes which occur during construction. All other changes must be handled in accordance with WAC 173-303-830. A statement reflecting this discussion must be made in the application.

The following comments refer to Supplement 1 of the LLBG permit application, Request for Exemption from Lined Trench Requirements.

256 Comment: Section 2.3.2, Long-Term Migration, Page 2-8

This comment must be addressed in the next NOD Response Table.

258 Comment: Section 4.1, Waste Characteristics, Page 4-1

Are the bulkheads which are added at Bremerton Navy Yard welded with the same specifications and performance standards utilized in welding the original hull? Describe any differences between the specifications and standards used for the original hull and those used on the bulkheads welded for disposal purposes.

259 Comment: Section 5.1.1, Integrity of the SRC, Page 5-2

This section should include a discussion regarding: 1) the effects of radiation on corrosion rates; and, 2) the corrosion potential of original hull and new bulkhead welds.

261 Comment: App 5A, Conceptual Design of Cathodic Protection, Page 5A-1

This comment must be addressed in the next NOD Response Table.

262 Comment: App 5A, Conceptual Design of Cathodic Protection

This comment must be addressed in the next NOD Response Table.

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