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Meeting Minutes Transmittal/Approval
Unit Managers Meeting: SST Operable Unit
725 Stevens Center, Room 208
Richland, Washington

February 10, 1993

From/ Appvl: Wendell Wrzesinski Date: 3-10-93
Wendell Wrzesinski, SST Unit Manager, DOE-RL

Appvl: Scott E. McKinney Date: 3-10-93
Scott McKinney, SST Unit Manager,
WA Department of Ecology

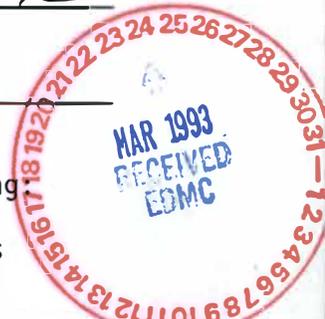
Appvl: Doug Sherwood Date: 3/10/93
Doug Sherwood, SST Unit Manager,
EPA Region X

Appvl: David Pabst Date: 3/10/93
David Pabst, WHC, Contractor Representative

Meeting Minutes are attached. Minutes are comprised of the following

- Attachment #1 - Meeting Summary/Summary of Action Items & Agreements
- Attachment #2 - Agenda for Meeting
- Attachment #3 - Attendance List
- Attachment #4 - DOE Letter, ACTION: REQUEST TO EMERGENCY PUMP SINGLE-SHELL TANK 241-T-101
- Attachment #5 - DOE Letter, EMERGENCY PUMPING OF SINGLE-SHELL TANK 241-T-101

- Handout 1 - Single-Shell Tanks Interim Stabilization/Isolation
- Handout 2 - Spectral Gamma Logging of C-105 and C-106 Drywells
- Handout 3 - Waste Level Measurement
- Handout 4 - Tank 241-C-105 and 106 Status
- Handout 5 - The Continuing Saga of SST 241-T-101
- Handout 6 - Single-Shell Tank Retrieval Technology Development (M-06-00)
- Handout 7 - Full-Scale Demonstration of Waste Retrieval Technology (M-07-00)
- Handout 8 - Full-Scale Single-Shell Tank Farm Closure Demonstration (M-08-00)
- Handout 9 - GAO/RCED-89-157/241-T-106 Vadose Zone Characterization
- Handout 10 - Letter from RL to EPA/Ecology on M-10-13-T02
- Handout 11 - Single-Shell Tank Characterization (M-10-00)



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T-101 Liquid Level Detection: (R. Popielarczyk (WHC) continued. Ecology (McKinney) stated that their concern was with reliability of the equipment and systems, more than absolute accuracy to meet the regulations.

241-C-105 and C-106 Status, (O. Wang, WHC). The C-106 emergency response plan was discussed. Refer to handout # 4. The plan has been received by both EPA and Ecology. Ecology stated they considered the plan well laid out and technically sound. Ecology is concerned with the impacts of TWR Re-baselining and potential HWVP delays on the plan.

The heat generation rate analysis was discussed. WHC (O. Wang) stated that it plans to discontinue water additions to tank C-105, thereby allowing the tank to self-stabilize. Tank C-106 still generates too much heat to make a similar request for that tank.

WHC (D. Pabst) discussed the sensitivities to adding water to C-106. There exist technical rationale as to why water must continue to be added to the tank. He stated that some groups outside of DOE and WHC consider the tank to be assumed to be leaking. These groups have voiced strong opposition to the continued water additions to tank C-106. WHC noted that water must be added periodically, or the tank contents would exceed design criteria for the tank and a severe safety issue would result. Ecology (S. McKinney) has no technical concerns with the data presented on the requirement to continue water additions to tank C-106. Ecology and EPA participants were asked to share any concerns they may have on adding water to tank C-106 to RL in order that they may be addressed in a timely, cooperative, and technical fashion.

AI-2/10/93-2. Ecology to provide comments on the C-106 Emergency Action Plan to RL.

Due Date: March 10, 1993

Actionee: S. McKinney

Tank T-101 Status, (G. Bishop, RL). The requests for authority to proceed were reviewed. Vapor sampling was scheduled to commence on February 10, 1993, with results due back within the week. Approval to pump had to be received by February 12, 1993, or the tank cannot start to be pumped by the milestone due date of March 15 (refer to handout #5). Copies of the letters requesting authority to proceed are provided as attachments 4 and 5 to these minutes.

Milestone M-06-00 Status, (M. Mahaffey, WHC). The review material was discussed (refer to handout #6). The retrieval dilution rate is planned to be less than 2:1, but the waste transfer dilution rate will be more than 3:1. EPA and Ecology voiced an interest in being invited to the upcoming demonstrations, both on-site and off-site.

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Milestone M-07-00 Status, (W. Wrzesinski, RL). Refer to handout # 7. The C-106 retrieval plan is in review at Ecology. RL and WHC desire Ecology's comments on that plan. Interim Milestone M-07-01 was delivered to EPA and Ecology on February 2, 1993, eight months ahead of schedule. Ecology's concurrence/non-concurrence per milestone M-07-02 is requested by March 31, 1993.

It was noted by RL that if the regulators determine that sub-surface barriers are required for the M-07-00 effort, the schedule will be negatively impacted.

The decision to transfer C-106 waste to the AY-tank farm was based on the heat load of the waste from C-106. AN-tank farm is designed to accommodate wastes generating up to 70K BTU/hour. AY-tank farm is designed up to 1,000K BTU/hour. C-106 waste is estimated at 100K BTU/hour, and therefore poses no problems to AY-tank farm tanks.

WHC (Henderson) discussed a study on possible leaks resulting from the sluicing of tank C-106, utilizing a 2-D model of the tank. The study assumed that stress/corrosion cracking was the source of a leak. The study assumed that if any cracks have occurred to-date they have been self-sealed by sludge, and would not be impacted until the sludge blocking that crack were removed as part of the waste retrieval process. It was estimated that the last 500 hours of operation may open some new cracks, or affect existing ones. The basic assumption, on this scenario, is that 2' waste liquid remains in the tank at this point of operations. The question posed was, "What would the impacts be?" The worst case event is a 30-35K gallon leak which in worst case environment would reach groundwater in 65 years. The credible event would be considerably less than this.

Milestone M-08-00. It was agreed that, due to time constraints, this milestone would not be discussed. The materials were distributed. Refer to handout # 8.

T-106 Vadose Zone Borehole, (J. Freeman-Pollard). An annular seal and a section of casing within the borehole had become contaminated as part of the borehole drilling process. The seal and eight inch casing were removed and replaced with a new seal and clean eight inch casing. It was noted that the Tank T-106 leak plume has reached the first caliche layer. It is not certain if the plume has penetrated below the caliche. Three separate incidents with the borehole activity were discussed. The first incident dealt with the contaminated seal.

The second was a vapor incident which affected work progress, but was not caused by the borehole activity. The third dealt with a trash fire at the borehole site. Appropriate occurrence reports were generated for the second and third incidents. Refer to handout #9.

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Single-Shell Tank Characterization: (P. Hernandez, RL). Refer to handout #10. The Rotary Mode Exhauster for the hard saltcake sampling system may impact timely completion of the M-10-13 interim milestone, due September 1993. The design for the exhauster system is based on a worst case tank contents and volume analysis of the off-gas to be filtered by the exhauster components during rotary mode core sampling operations, as well as complying with all regulatory requirements.

The rotary mode sampling truck is complete, and Acceptance test Procedures are in progress. The Operational Test Procedures are planned for the April/May 1993 time frame.

EPA (D. Sherwood) asked what rationale is used for adding/deleting analytes from the data packages. A specific example was Nickel 63 that had been dropped from the analytical reports in recent data packages. He wants to assure that changes to characterization activities are addressed to the Unit Managers, giving them the opportunity to comment on any changes. EPA stated that dropping the Nickel 63 from the reporting requirements should have been processed through a Class III Tri-Party Agreement change, approved by the lead agency, prior to implementation.

EPA also expressed a concern that 30% failed sample recovery rate was excessive. WHC and RL both stated this was due to equipment problems, not procedural, and that equipment fixes were in place to improve the sample recovery rate.

The meeting adjourned at 2:00 p.m.

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AGENDA
 TRI-PARTY AGREEMENT
 SINGLE-SHELL TANKS
Unit Managers Meeting

Attachment 2

February 10, 1993, 9:30 a.m. to 1:00 p.m.
 725 Stevens Center, Room 208, Richland, Washington

<u>Time</u>	<u>Topic</u>	<u>Presenter DOE/Contractor</u>
9:30	Opening Remarks / Introductions	Yerxa/Pabst
	o Review and Sign January Meeting Minutes	
10:00	Single-Shell Tank Interim Stabilization	Bishop/Raymond
	o New Milestone Status	
	o C-105/C-106 Status	
	o T-101 Status	
10:30	Single-Shell Tank Waste Retrieval (M-06-00 through M-09-00)	Nicoll/Henderson
	o Tank Selection Criteria for M-07	
	o Tank Leak Study Results	
	o 106-C Schedule/Critical Path/Regulator Interface/Scope	
	o Barrier Schedules	
11:00	T-106 Borehole Status	Werdel/Freeman-Pollard
11:20	Break	
11:30	Single-Shell Tank Characterization (M-10-00)	Hernandez/Propson
	o Rotary Mode Exhauster Re-design	
	o Rebaselining Characterization from SST Retrieval Planning Decision	
	o Validated Data Package Status	
	o Characterization Plan Status and Review	
	o Status on Core Sampling Stand-down	
	o Projected Core Sampling Schedule, Near Term	
12:30	Open Discussion	Yerxa/Pabst
1:00	Adjourn	All

SINGLE-SHELL TANK UNIT MANAGER MEETING

February 10, 1993

List of Attendees

Name	Organization	Telephone
JON YERVA	DOE - TPA	376 - 9625
Gene Senat	DOE - TWRS	372 - 2046
John C. Conner	WHC - TFSAD	376 - 2058
Rick Raymond	WHC - SSTT	373 - 2755
TAM RAINY	WHC - SSTP	373 - 3531
Low Bisser	DOE	372 - 1856
Les Sutton	WHC - Emerg Prep	373 - 5190
RK WELT	WHC - TST	3 - 1008
Ed Popilinski	WHC - TFE	3 - 5751
Scott E. McKinnon	ERL	376 - 107-200
Doug Sherwood	EPA	376 - 9529
Oliver Wang	WHC - WTSP	373 - 3011
Ann Atkinson	DDE	376 - 2348
JM Henderson	WHC - Retrieval	372 - 0377
WR WRZESINSKI	DDE - RL RETRIEVAL	376 - 6151
JK Mahaffey	WHC - TST	373 - 1120
J.R. Freeman-pollard	WHC - ERE	376 - 1882
BL Miller	WHC - ER	376 - 7966
B.W. WYRICK	WHC - ER	376 - 5066
DM WANEK	DOE - RL	6 - 5778
NA Wordel	DOE-RL/ER	376 - 5500
AL SAMPSON	WHC - RETRIEVAL	373 - 1519

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Attachment 4
TRI-PARTY AGREEMENT
SINGLE-SHELL TANKS
Unit Managers Meeting

February 10, 1993, 9:30 a.m. to 1:00 p.m.
725 Stevens Center, Room 208, Richland, Washington

DEPARTMENT OF ENERGY LETTER

ACTION: REQUEST TO EMERGENCY PUMP SINGLE-SHELL TANK 241-T-101

93128961626

Commitment

United States Government

Department of Energy

Richland Operations Office

memorandum

DATE: DEC 30 1992
 REPLY TO:
 ATTN OF: TWS:GEB 92-CAB-304
 SUBJECT: ACTION: REQUEST TO EMERGENCY PUMP SINGLE-SHELL TANK 241-T-101

TO: Leo P. Duffy, Assistant Secretary
 for Environmental Restoration
 and Waste Management, EM-1, HQ

ISSUE:

Emergency pumping of leaking single shell tank 241-T-101.

BACKGROUND:

Twenty-four single shell tanks (SST) at Hanford contain varying amounts of ferrocyanide (FeCN) compounds that were used to reduce radionuclides levels in tank supernatants during the 1950s. Laboratory testing has shown that FeCN in the presence of nitrates/nitrites also found in these tanks can be made to propagate and sometimes explode when heated to high temperatures (540°F). Recent studies at Westinghouse Hanford Company (WHC), Pacific Northwest Laboratory (PNL), and Los Alamos National Laboratory (LANL) indicate that the probability of a FeCN explosion is low due to the high moisture content and low temperatures of the waste.

The SST 241-T-101 was declared to be an assumed leaking tank on October 4, 1992. Pumping of SSTs is required pursuant to milestone M-05 of the Tri-Party Agreement. In addition the State of Washington has alleged that failure to pump this tank is a violation of WAC 173-303-145 and 40 CFR part 265(j).

This tank is currently on the list of tanks affected by an Unreviewed Safety Question (USQ) involving ferrocyanide content. Emergency pumping of this tank therefore requires a determination by the Department of Energy that pumping does not involve an unacceptable risk. In addition, the tank is also affected by the USQ involving criticality of the tank's contents. We must, therefore, also prove that pumping of this tank does not involve an unacceptable risk of creating a critical configuration in the tank.

WHC has prepared assessments of both the safety risks of pumping a ferrocyanide tank, and of the safety risks of creating a critical configuration in the tank as a result of pumping. Both of these assessments were previously submitted to your staff for review on November 30, 1992 and October 26, 1992, respectively. Both are also enclosed with this memorandum as enclosures one and two. WHC has concluded

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DEC 30 1992

that pumping this tank will not result in any significant risk from either a reaction on account of the ferrocyanide content, or from creation of a critical configuration. The Department of Energy, Richland Field Office (RL) concurs in both of these conclusions.

RL believes that improvements can be made to the Safety Assessment (SA). Comments have been received from others at EM-36. WHC is proceeding to revise the SA to include these comments. However, none of these comments changed the over-all conclusion, which is that this tank may be safely pumped. Therefore, RL believes that the SA is adequate in its present form for authorization to pump Tank T-101. The revised SA will be provided at a later date. Alternates to pumping this tank are addressed in the Hanford Defense Waste Environmental Impact Statement Record of Decision (Federal Register, Volume 53, Number 72, dated April 14, 1988). In addition, WHC is preparing a separate Engineering Evaluation of Alternatives for pumping this tank. However, this document will not be completed for some time, and will cause a significant delay in commencement of pumping. RL believes this document is not required for authorization to pump this tank.

RL believes that improvements are also possible to the Criticality Assessment. However, RL also believes that the Criticality Assessment is adequate in its present form for authorization to pump tank T-101.

WHC has also performed a safety evaluation to pump out this tank's contents. This evaluation is enclosed as enclosure three. WHC has concluded that there are no significant concerns in using a submersible pump in this tank. RL concurs in this conclusion.

RL has concluded that the pumping of tank T-101 is covered by the existing environmental Record of Decision for Hanford High Level Wastes (Record of Decision, HDW-EIS, Federal Register, Vol 53, No 72, dated April 14, 1988), and therefore does not require that an environmental assessment be prepared for the pumping of this tank.

Regarding the USQ the ferrocyanide hazard was analyzed in the Environmental Impact Statement (EIS) and considered in formulating the Record of Decision (ROD). The criticism of the ferrocyanide analysis in the EIS is based on the underestimating the consequences of a ferrocyanide explosion, not the threshold conditions. Therefore, no new NEPA documentation is required.

Questions concerning the effects of liquid removal on corrosion in single shell tanks have been raised, but not fully resolved. The DOE-HQ sponsored review October 15, 1992, of single shell corrosion drew preliminary conclusions that stabilized tanks are likely to be more corrosive, but not significantly so; that incremental corrosion effects from stabilization would not impact retrieval; and overall the effects of stabilization on corrosion may be positive due to reduction in hydrostatic head and total wetted surface area.

The schedule for pumping this tank shows that the critical path to commencement of pumping is approval of the SA by the Department. The Washington State Department of Ecology has demanded that pumping commence

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DEC. 30 1992

Leo P. Duffy

- 3 -

no later than February 15, 1993, as shown in their letter to RL included as enclosure four. Subsequent negotiations with the State have resulted in agreement on a March 15, 1993 date for start of pumping. They have stated they may proceed with enforcement action if this date is not met. WHC's current schedule shows that to meet this date, approval for pumping must be provided before the end of January 1993.

RECOMMENDATION:

The proposed action is to proceed with emergency pumping of tank T-101.

The SA has been previously transmitted to your staff. We have reviewed the SA and consider that implementation of the stated controls in the document will adequately reduce the risk associated with this activity.

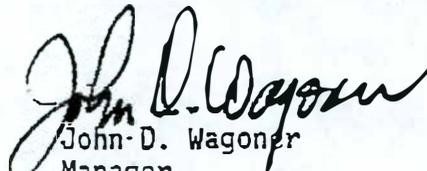
NEXT STEPS:

As required by the USQ process within DOE Order 5480.21 dated December 24, 1991, RL requests your authorization to proceed with these activities on tank T-101, subject to satisfactory completion of the Operational Readiness Reviews by the contractor, and the approval of the Criticality Assessment and Safety Assessment by the Department of Energy, Headquarters (HQ). RL will authorize commencement of the above described activities upon receipt of PSO approval, SA approval, Criticality Assessment approval, and verification by RL that the Operational Readiness Review has been completed, including full implementation of all the applicable controls in the SA for this tank.

In order to expedite the pumping of this tank, I respectfully request that you provide your approval to proceed with pumping within two weeks of receipt of this memorandum.

POINT OF CONTACT:

I remain available to discuss this matter with you personally. Details of the pumping preparations may be discussed with Mr. R. E. Gerton, Acting Deputy Program Manager, Office of Tank Waste Storage on (509) 376-9106.


John D. Wagoner
Manager

Enclosures: 4

cc: J. C. Tseng, EM-36, HQ

APPROVE: _____

Leo P. Duffy

DISAPPROVED: _____

Leo P. Duffy

DATE: _____

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C... ..

Attachment 5
TRI-PARTY AGREEMENT
SINGLE-SHELL TANKS
Unit Managers Meeting

February 10, 1993, 9:30 a.m. to 1:00 p.m.
725 Stevens Center, Room 208, Richland, Washington

DEPARTMENT OF ENERGY LETTER

EMERGENCY PUMPING OF SINGLE-SHELL TANK 241-T-101

93128961630

T101.009

United States Government

Department of Energy

Richland Operations Office

memorandum

Commitment

DATE: FEB 02 1993
REPLY TO:
ATTN OF: TOD:GEB 93-TOD-012
SUBJECT: EMERGENCY PUMPING OF SINGLE-SHELL TANK 241-T-101

TO: Assistant Secretary
for Environmental Restoration
and Waste Management, EM-1, HQ

Reference: Memorandum; J. D. Wagoner, RL, to Leo Duffy, EM, "Action:
Request to Emergency Pump Single-Shell Tank 241-T-101," dated
December 30, 1992.

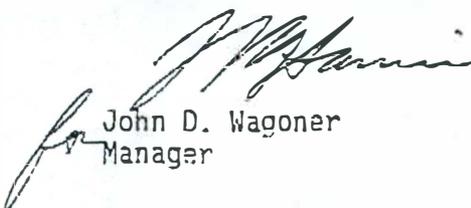
In the referenced memorandum, I requested permission to emergency pump
Tank 241-T-101, which was declared to be an assumed leaking tank in
October 1992. Due to the urgency which this issue deserves, I requested a
response by January 18, 1993. To date, no response to this request has
been received by the Department of Energy, Richland Field Office (RL).

RL has made agreements with the State of Washington Department of Ecology
(Ecology) to begin pumping this tank no later than March 15, 1993. In
order to meet this deadline, permission to pump the tank must be received
by RL no later than February 12, 1993, according to the current schedule
provided by Westinghouse Hanford Company.

As stated in the referenced memorandum, RL has identified no unresolved
safety concerns from pumping this tank.

I respectfully request that you provide your approval to proceed with
pumping of this tank within one week of receipt of this memorandum.

If you have any questions, please contact me or your staff may contact
R. E. Gerton of the Office of Tank Waste Storage on (509)-376-9106.


John D. Wagoner
Manager

cc: J. C. Tseng, EM-36, HQ

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**Single-Shell Tanks
Interim Stabilization/Isolation**

**T. E. Rainey
Single-Shell Tank Unit Managers Meeting**

February 10, 1993

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

ACCOMPLISHMENTS

COMPLETED MILESTONE M-05-18A (DUE JANUARY 1993)

**ISSUE REVISED DATA SHEETS AND ADMINISTRATIVE
PROCEDURES RELEVANT TO MONITORING 241-T-101 LIQUID
LEVEL AND IDENTIFYING AND REPORTING OUT OF
SPECIFICATION READINGS**

COMPLETED MILESTONE M-05-18B (DUE JANUARY 1993)

**ISSUE REVISED PROCEDURES TO CONTROL AND TRACK
DISCREPANCY REPORTS**

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

241-T-101 ACTIONS

SAFETY EVALUATION FOR SUBMERSIBLE PUMPING 241-T-101 IN REVIEW AT RL AND DOE-HQ

CRITICALITY JCO AND CSER TO ALLOW PUMPING OF 241-T-101 IN REVIEW AT RL AND DOE-HQ

SAFETY ASSESSMENT FOR INTERIM STABILIZATION OF FECN TANKS REVISED TO INCORPORATE DOE-HQ COMMENTS

COMPLETED ELECTRICAL REPAIRS TO T-FARM

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

PLANNED ACTIVITIES

MILESTONE M-05-13-T2 (DUE APRIL 1993)

**COMPLETE PHYSICAL LOGGING OF 14 DRYWELLS AT TANKS
241-C-105 AND 241-C-106 USING A SPECTRAL GAMMA PROBE
- LOGGING HAS STARTED**

PROPOSED MILESTONE M-05-14 (DUE MARCH 1993)

**COMPLETE ENGINEERING EVALUATION OF ALTERNATIVES FOR
RESPONSE TO 241-T-101 ASSUMED LEAK
- DRAFT IN REVIEW**

PROPOSED MILESTONE M-05-15B (DUE MARCH 1993)

**PROVIDE LETTER REPORT ON IN-TANK LIQUID LEVEL DETECTION
OPTIONS AVAILABLE FOR 241-T-101
- INITIAL DRAFT ISSUED**

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

PLANNED ACTIVITIES (cont'd)

**MILESTONE M-05-16 (DUE MARCH 15, 1993)
INITIATE FULL SCALE REMOVAL OF TANK 241-T-101 LIQUIDS**

**MILESTONE M-05-17A (DUE JUNE 1994)
DRAFT CURRICULA FOR UPGRADED MAINTENANCE PROGRAM
AND IMPLEMENTATION SCHEDULE**

**MILESTONE M-05-17B (DUE DECEMBER 1993)

COMPLETE PORTIONS OF NUCLEAR OPERATOR SYSTEMS CLASS
AND ON-THE-JOB TRAINING**

**MILESTONE M-05-17C (DUE JUNE 1993)

ISSUE SCHEDULE FOR COMPLETING OPERATIONS SUPERVISOR
AND SHIFT MANAGERS TRAINING**

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

PLANNED ACTIVITIES (cont'd)

**COMPLETE SAFETY ANALYSIS REPORT ADDENDUM TO ALLOW
ALTERNATE METHODS FOR TRANSFER OF RADIOACTIVE WASTE
WITHIN SINGLE-SHELL TANK FARMS**

**CONTINUE RESTORATION OF 244-U DOUBLE-CONTAINED RECEIVER
TANK**

**INITIATE SAFETY STUDY ANALYSIS ON INTERIM STABILIZATION OF
REMAINING NONWATCHLIST TANKS**

COMPLETE INTEGRITY ASSESSMENT OF TRANSFER LINES

**CHANGE REQUEST PROPOSAL PACKAGE FOR MILESTONE M-05
BEING PREPARED BY RL**

JANUARY 1993

SST INTERIM STABILIZATION/ISOLATION

ISSUES/CONCERNS

CORRECTIVE/ACTION

**CRITICALITY USQ HAS STOPPED
ALL SINGLE-SHELL TANK
TRANSFERS**

**APPROVAL OF JCO ADDENDUM
FOR 6 TANKS. USQ RESOLUTION
FOR REMAINING TANKS.**

**CONCERNS OF SAFETY
PROBLEMS DEVELOPING AS
RESULT OF REMOVING LIQUID**

**COMPLETE SAFETY STUDIES FOR
WATCHLIST TANKS.**

**FAILURE OF UNDERGROUND
TRANSFER LINES IN S FARM**

**DETERMINE REASON FOR FAILURE
AND PLAN OF ACTION.**

**M-05 MILESTONES CANNOT BE
MET AS CURRENTLY WRITTEN**

**NEGOTIATE MILESTONE
CHANGES.**

SPECTRAL GAMMA LOGGING OF C-105 AND C-106 DRYWELLS

BACKGROUND

On July 22, 1992, RL and Ecology jointly agreed to technical commitments that by end of March 1993 the 14 drywells (there are actually 15 drywells) around waste tanks C-105 and C-106 would be logged using the Spectral Gamma probe. This task was assigned TPA milestone number M-05-13-T2. On January 21, 1993, this milestone was changed to April 30, 1993 (based on delays caused by ice and snow in C Farm) and approved by RL, EPA and Ecology.

PLAN

The strategy developed to log the C drywells is the same as that used for T-101 wherein we parked the RLS van outside the tank farm fence, carried the probe to the drywells and utilized the Cask Sampling Truck boom to position the probe in the well. Each well around C-105/6 will be logged once and the data compared to the gross gamma logs. If good agreement is obtained, the spectral logging will be considered adequate for baselining. If any differences are noted, a second logging will be performed on that well.

SCHEDULE

We were scheduled to start logging in December, 92, upon availability of the RLS, but heavy snows and ice prevented entry into C Farm. A new schedule was developed on January 20, 1993. This schedule was predicated upon near term entry into the farm.

February 1, 1993 - Start Logging
March 3, 1993 - Complete Logging
March 10, 1993 - Rough Draft of Data Results
March 15, 1993 - Final Report

We are logging at 0.4ft/min. which for the deepest wells (135 ft.) requires six hours logging time. Setup, takedown and survey requires another hour so seven hours per well or one well per shift is production time.

STATUS

Logging was started on January 26, 1993. Eight drywells have been logged to date. There are two wells, (30-05-02, 30-05-03) that we may not be able to log due to obstructions. These two wells do not show any new radiation peaks in the gross gamma loggings.

February 10, 1993

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Handout 3

Waste Level Measurement

R. S. Popielarczyk

February 10, 1993

Waste Level Measurement

Gages Tested

- Robertshaw Model 185 Float Gage
- Enraf 8 inch Radar Gage
- Cannon Bear 4 inch Radar Gage
- Stanley Tool Laser Rangefinder
- Enraf Model 854 Advanced Technology Gage
- Robertshaw Model 185 Conductivity Gage (February)

Waste Level Measurement

Other Sites Consulted

- **Lawrence Livermore National Laboratory**
- **Idaho National Engineering Laboratory**
- **West Valley**
- **Oak Ridge National Laboratory**
- **Los Alamos National Laboratory**
- **Westinghouse Savannah River Company**
- **Jet Propulsion Laboratory**

Waste Level Measurement

Challenges

- **Different Waste Surfaces**
 - Liquid
 - Liquid with floating solids
 - Solid dry surface
 - Solid wet surface

- **Hostile Environment**
 - Highly caustic (ph. 13.3)
 - High radiation

- **Accuracy**
 - Operating = 0.25 inches
 - Statutory = 0.000043 inches

- **Crystal Build-Up on Contact Probes**

TANK 241-C-105 & 106 STATUS

by

**OLIVER WANG
WESTINGHOUSE HANFORD COMPANY**

93128961644

HISTORY

- High strontium waste unintentionally transferred to tanks 241-C-105 & -106 in late 1960's.
- Temperature in 241-C-106 increased to unacceptable levels and both tanks put on active ventilation with periodic water additions to maintain cooling.
- Water additions & active ventilation continued. Both tanks categorized as sound.

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STATUS

- Action plan for 106-C update (transmitted December 1992).
- Heat generation rate recalculated for both tanks.

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HEAT GENERATION RATE

- Reanalyzed using data from January-June 1992 (ventilation off/no water additions).

- C-105
 - Original estimate: 52,000 Btu/h
 - New estimate: 20,000 Btu/h
 - Letter in final preparation.

- C-106
 - Original estimate: 158,000 Btu/h
 - New estimate: 110,000 Btu/h
 - More study needed for mitigation/resolution.

9 3 1 2 8 9 6 1 6 4 7

EMERGENCY ACTION PLAN FOR TANK 241-C-106

- Required by Public Law 101-510, Section 3137, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation" (Wyden Amendment).
- Updated to incorporate Ecology comments provided in July 1992, as well as Department of Energy comments.
- Awaiting Ecology concurrence/comments.

93128961648

REQUIRED EMERGENCY ACTIONS FOR 106-C

- Monitor temperature increase.
- Add water if needed.
- Adjust ventilation rate.
- Accelerated retrieval (partial or all).
 - Requires emergency status to bypass standard 4700.1A and NEPA requirements.
 - Requires full support for expedited environmental permits.
 - Requires DST storage space.

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THE CONTINUING SAGA OF

SST 241-T-101

93128961650

**TANK WAS DECLARED TO BE AN ASSUMED LEAKER
ON OCTOBER 1, 1992.**

- Tank is on the FeCN Watch List

**VARIOUS SAFETY ISSUES REQUIRE EM-1 APPROVAL
OF:**

- Photographing the Tank interior.
- Obtaining a liquid sample from the Tank.
- Installing the submersible pump in the Tank.
- Pumping the tank due to the criticality issue.
- Pumping the tank due to the FeCN issue.

**VARIOUS SAFETY ISSUES REQUIRE RL APPROVAL
OF:**

- All of the issues requiring EM-1 approval.
- Obtaining "zip cord" level measurement.
- Installation of manual level tape in the Tank.
- Pressure testing of the transfer piping.
- Vapor sampling the Tank.

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STATUS OF VARIOUS APPROVALS TO-DATE:

-Approval to obtain "zip cord" readings was granted by RL on October 6.

-Approval to proceed with pressure testing the transfer lines was granted by RL on October 30.

9 3 1 2 8 9 6 1 6 5 2

**STATUS OF INSTALLATION OF MANUAL LEVEL TAPE
IN TANK TO-DATE:**

-Manual tape installed in Tank in late December.

9 3 1 2 8 9 6 1 6 5 3

STATUS OF PHOTOGRAPHY AND LIQUID SAMPLING TO DATE:

-WHC requested to perform photography and liquid sampling inside T-101 on November 4.

-WHC submitted "Letter of Applicability" (LOA) to cover these two activities. This is required by NEPA and DOE Orders.

-LOA found to be inadequate following EM-1 review, December 9.

-LOA was revised twice more by WHC to placate various HQ reviewers.

-RL submitted the LOA to HQ by FAX on January 12.

-No response has been received from HQ.

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STATUS OF VAPOR SAMPLING THE TANK TO-DATE:

- WHC requested to obtain a vapor sample on December 22.
- RL granted permission to sample on February 1.
- Sample scheduled to be taken on February 10.

9 3 1 2 8 9 6 1 6 5 5

STATUS OF THE INSTALLATION OF THE PUMP/ COMMENCE EMERGENCY PUMPING:

-Requires approval of the FeCN Safety Assessment:

-original SA submitted by WHC on September 30.

-RL reviewed the SA (and EA) and submitted them to HQ for approval.

-HQ deemed the SA (and EA) inadequate on November 18. RL will take exception to the comments.

-Comments returned to WHC by RL on November 25. WHC will rewrite the SA and EA.

-Revised EA submitted on January 29. Not forwarded to HQ.

-Requires approval of the criticality safety assessment (CSER.)

-WHC provided CSER allowing pumping of Tank on October 21.

-RL review provided to WHC on November 4, and HQ review on November 19. RL believes that CSER is acceptable, HQ does not.

-Revised CSER released by WHC on January 14.

-RL submitted revised CSER to HQ on January 27. No response received to-date.

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-Requires EM-1 approval to install pump and emergency pump the Tank.

-RL as disagreed with EM-36 on the need for an EA.

-RL has disagreed with EM-36 on the adequacy of the SA.

-RL has disagreed with EM-36 on the adequacy of the CSER.

-WHC submitted final package to commence pumping the Tank on December 15.

-RL requested permission to pump the Tank on December 30.

-No response received.

-Need for a response from EM-1 carried in "Critical Items List", with copy to HQ since January 3.

-RL again requested permission to pump the Tank on February 2. Prominent mention of the TPA milestone was made.

-No response received to-date.

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SINGLE-SHELL TANK RETRIEVAL TECHNOLOGY DEVELOPMENT

Milestone M-06-00

M. K. Mahaffey

Tank Waste Remediation System

February 11, 1993

Milestone Description

- **M-06-00** **Develop single-shell tank waste retrieval technology and complete scale model testing.**
- **Deliverable(s)** **Demonstrate retrieval technology for single-shell tank waste forms including sludge, saltcake and in-tank hardware. Show technology for support, control and deployment systems. Demonstrations to be performed in scale model tank, using simulated waste.**
- **Baseline Schedule** **Complete demonstrations in June 1994.**

Open Commitments

None

Accomplishments (Last three months)

- **Retrieval Demonstration for DOE Assistant Secretary - Duffy.**
- **Completed Bentonite Tests on Soft Waste Removal Device.**

Soft Waste Dislodging Tool

- **Bentonite Simulant**

- **Contents:**

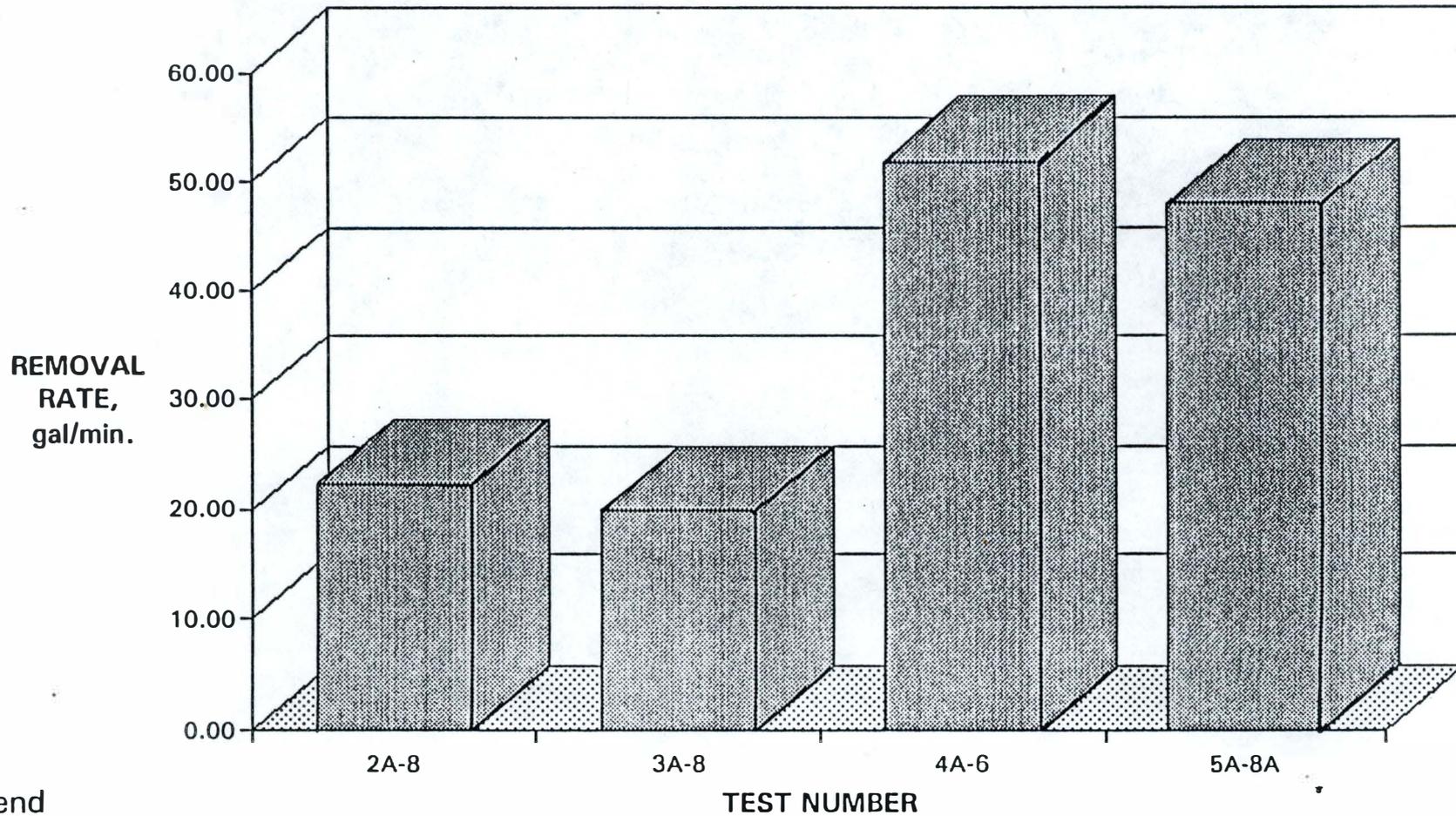
- **Bentonite Clay 15 wt%**
- **Barium Sulfate 33 wt%**
- **Water 52 wt%**

- **Properties:**

- **Density 95 to 96 lb/cu. ft**
- **Shear Strength 32,000 to 37,000 dynes/sq.cm**

SOFT WASTE DISLODGING TOOL

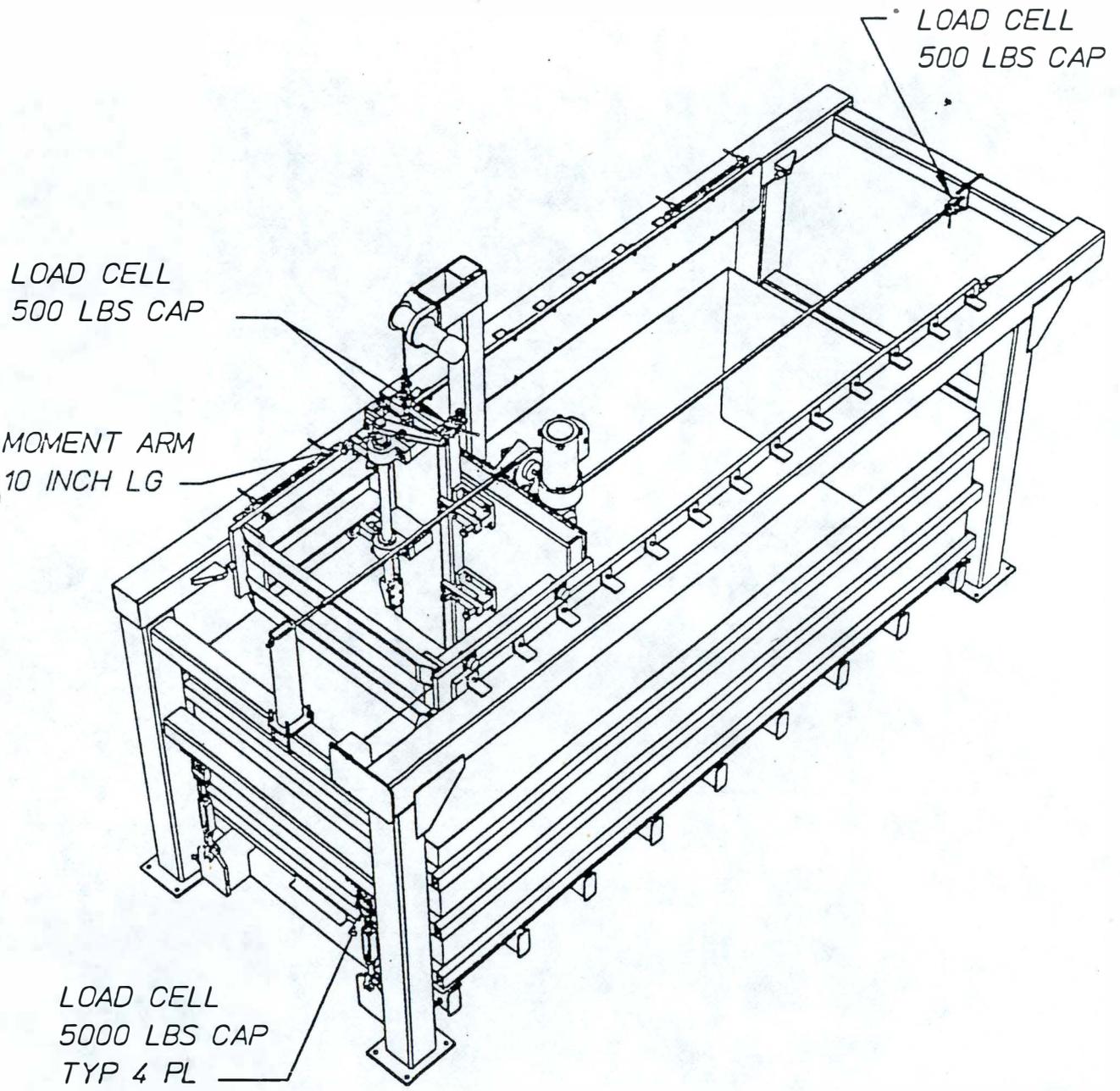
COMPARISON OF BEST TESTS FROM EACH SERIES



Legend

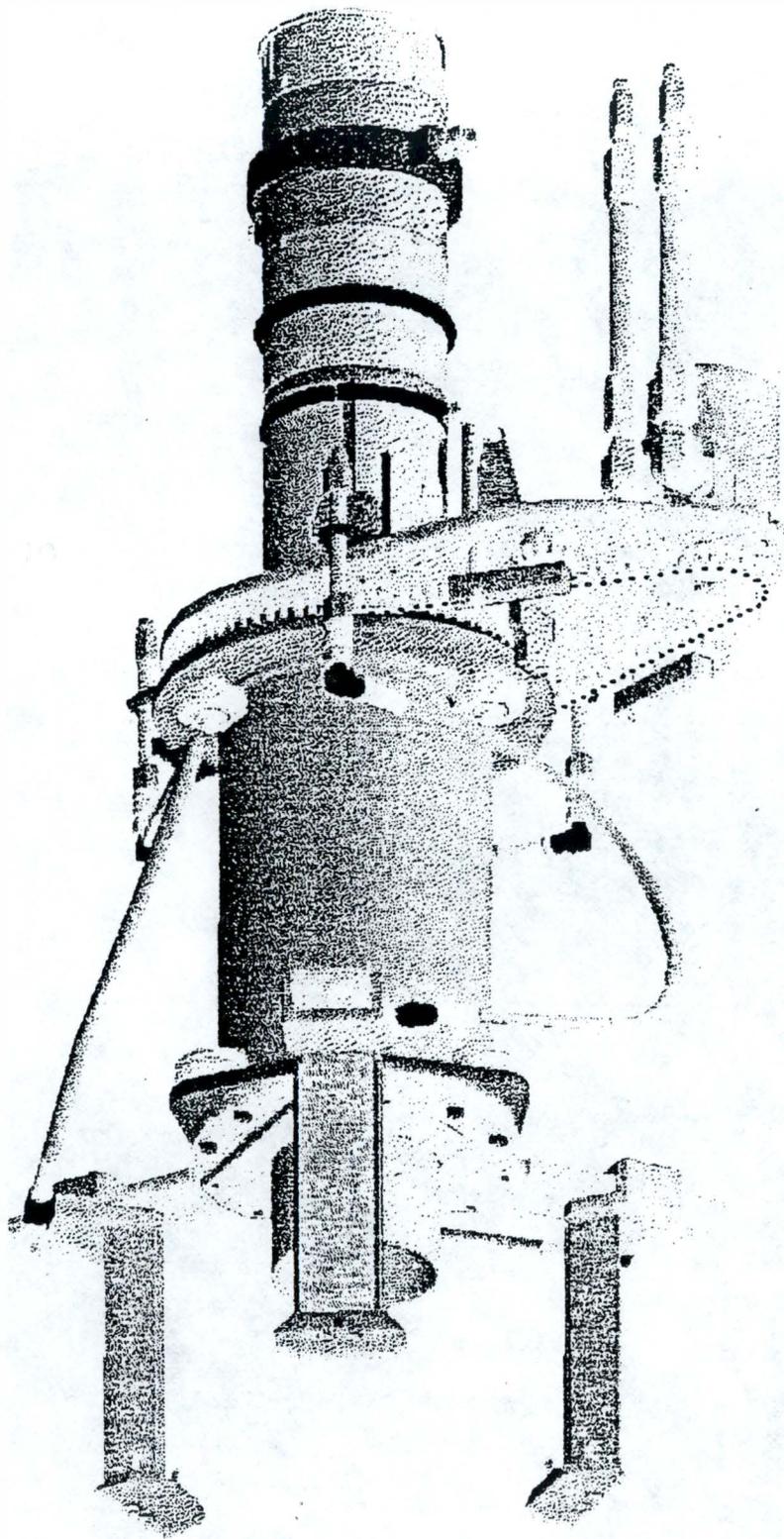
- 2A-8 = Mechanical agitator using air
- 3A-8 = Scarifier using air
- 4A-6 = Scarifier using water
- 5A-8A = Mechanical agitator using water

9 3 1 2 8 9 6 1 6 6 4



TEST FIXTURE ASSEMBLY

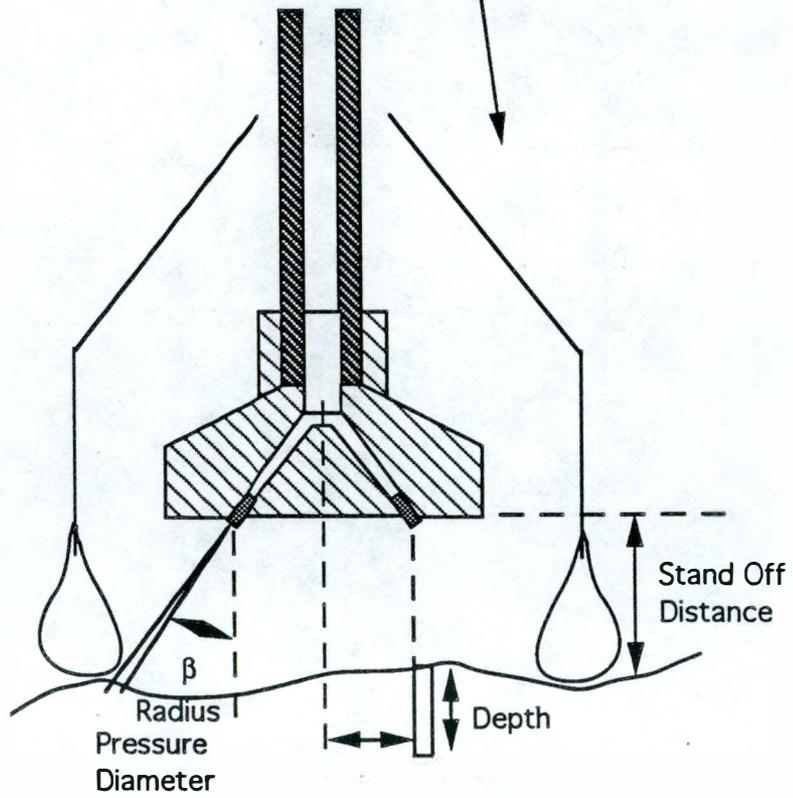
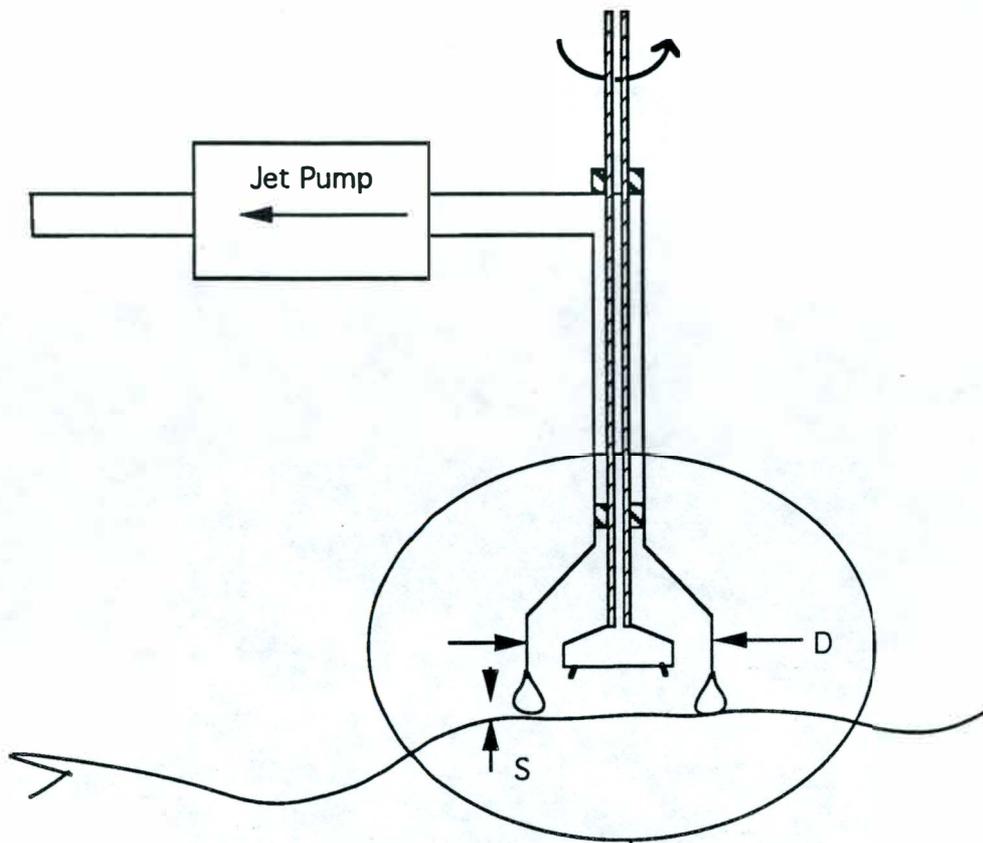
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**SLUDGE DISLODGING END-EFFECTOR ASSY
(ENGINEERING DEVELOPMENT UNIT)**

Planned Actions (Next six months)

- **Complete WHC tests of soft waste removal device with kaolin simulants (simulates dry sludge).**
- **Initiate tests of confined sluicing device at UM-Rolla (all waste forms)**
- **Initiate tests of water jets at Quest Industries - Kent, WA (all waste forms)**
- **Initiate tests of vacuum conveyance system at PNL Richland, WA (all waste forms)**
- **Optimize water cannon salt cake rubberizer at LLNL**
- **Test abrasive water jets and model 12" pipe cutter at Sandia for in-tank hardware removal.**



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Milestone Assessment

- **Schedule**
 - **M-06-02 start of testing met September 1992 -one month early**
 - **Expect completion on schedule June 1994**

- **Technical Scope**
 - **Early end effector tests show desired retrieval rates achievable.**
 - **Specific June 1994 deliverables to be defined by September 1993.**

- **Budget vs. Cost (\$ in Millions) - TBD**

Special Topics

No major issues.

FULL-SCALE DEMONSTRATION OF WASTE RETRIEVAL TECHNOLOGY

Milestone M-07-00

W. R. Wrzesinski

U.S. Department of Energy, Richland Field Office

J. M. Henderson

Westinghouse Hanford Company

February 1993

Milestone Description

- **M-07-00** **Initiate full-scale demonstration of waste retrieval technology**

- **DELIVERABLES** **Deliverable Initiation is defined as startup of the waste retrieval equipment in the selected single-shell tank**

- **BASELINE SCHEDULE** **Initiate retrieval operations - October 1997**

OPEN COMMITMENTS

- None

Accomplishments (Last three months)

- **M-07 Tank Selection criteria and recommendations (M-07-01) approved by DOE-RL and DOE-HQ**
- **To be presented to regulators February 1993, based on completion of preliminary feasibility assessment of hydraulic retrieval techniques by DOE-RL**
 - **This assessment to be based on WHC recommendation drawn from:**
 - **Engineering Study of Tank Leaks Related to Hydraulic Retrieval of Sludge from Tank 241-C-106**
 - **Letter report from KEH on sluicing system costs/schedules**
 - **Sub-surface barrier schedules and cost estimates from KEH**
 - **Final documents will be made available to WDOE in March - April, 1993**
 - **An open dialogue with the regulators must start in March-April**

Planned Actions (Next six months)

- **Complete M-07 tank selection (M-07-01 and 02)**
- **C-106 Sluicing Effort (Project W-320)**
 - **Tank C-106 Core Sampling and analysis**
 - **Complete Engineering Studies/Analyses**
 - **Field walk-downs in support of conceptual design**
 - **Preparation of Functional Design Criteria**
 - **Start Conceptual Design**
 - **Preparations of detailed plans for:**
 - Operations**
 - Quality Assurance**
 - Detailed Design**
 - **Regulatory compliance/safety documentation**
 - Initiate safety documentation**
 - Initiate environmental documentation (RCRA, CAA, NEPA)**
 - **DOE-HQ approvals required to initiate design activities**

Milestone Assessment

● **Schedule**

- **If sluicing is allowed for SST waste retrieval, initiation of retrieval by 10/97 possible**

- **Items on the critical path to achieve successful completion of the milestone:**
 - **Definition of the Retrieval System**
 - **Functional Design Criteria**
 - **DOE-HQ Approvals**
 - **Completion of Waste Characterization Analyses**
 - **Conceptual Design**
 - **Definitive Design**
 - **Construction**

- **Regulator input needed to:**
 - **Support RCRA and CAA permitting process (design stages)**

Milestone Assessment (Cont)

● **Technical Scope**

- **Retrieval options for M-07 tank include both sluicing and long-reach manipulator systems (reference technologies)**
- **Propose to initiate retrieval demonstration with sluicing**
 - **Sluicing proposed to resolve high heat safety issue (i.e., stop water additions to Tank 241-C-106)**
 - **Sluicing technique to be used similar to past-practice technique used at Hanford in 1950's and 1970's.**
 - **Utilizes low pressure water stream to mobilize waste into slurry stream which is pumped from the tank**
 - **No sub-surface barriers are planned to be utilized during retrieval of the M-07 waste tank**
- **Complete 95% waste retrieval with long-reach manipulator system, if required**

FULL-SCALE SINGLE-SHELL TANK FARM CLOSURE DEMONSTRATION

Milestone M-08-00

W. R. Wrzesinski

U.S. Department of Energy, Richland Field Office

J. M. Henderson

Westinghouse Hanford Company

February 1993

Milestone Description

- **M-08-00** **Initiate full-scale tank farm closure demonstration project**

- **DELIVERABLES** **Initiation is defined as full-scale waste retrieval**

- **BASELINE SCHEDULE** **Initiate full-scale closure demonstration - June 2004**

OPEN COMMITMENTS

- **Ecology feedback on functions and requirements for sub-surface barriers**

Accomplishments (Last three months)

- **Completed Phase I System Engineering Study for Sub-surface Barrier development**
 - **Identified mission/goals**
 - **Identified functions and requirements**
 - **Identified interfaces, issues, options**
 - **Selected top 3 options - developed schedule and cost estimate**
 - **Circulating Air Barrier**
 - **Cone Grouting**
 - **Encapsulation (Horizontal Jet Grout/Vertical Sheet Piling)**

Planned Actions (Next six months)

- **Complete Retrieval Program Plan**
- **Complete Retrieval Technology Plan**
- **Initiate Phase II of Sub-surface barrier development**
 - **Additional system engineering evaluation of functions and requirements (Mar-Oct)**
 - **Regulator input needed on expectations and requirements before commencement of Phase II barrier development work**
- **Establish near term DST/SST Retrieval Sequence for Pretreatment (Baseline) (March 1993)**

Milestone Assessment

- **Schedule**

- **Activities planned for FY 1993-1994 will support M-08 demonstration**
 - **Engineering studies and functional design criteria development**
 - **Technology evaluations**
 - **Detailed planning and scheduling**
 - **Support to NEPA documentation preparation for the SST EIS**
- **M-08 activities are on schedule**

Milestone Assessment (Cont)

- **Technical Scope**

- **Current TWRS plans are to demonstrate retrieval of waste for entire tank farm as part of closure demonstration**

Single-Shell Tank Unit Managers Meeting

**GAO/RCED-89-157 / 241-T-106
Vadose Zone Characterization**

J. R. Freeman-Pollard, Project Engineer

SST Vadose Zone and Ancillary Equipment Investigations

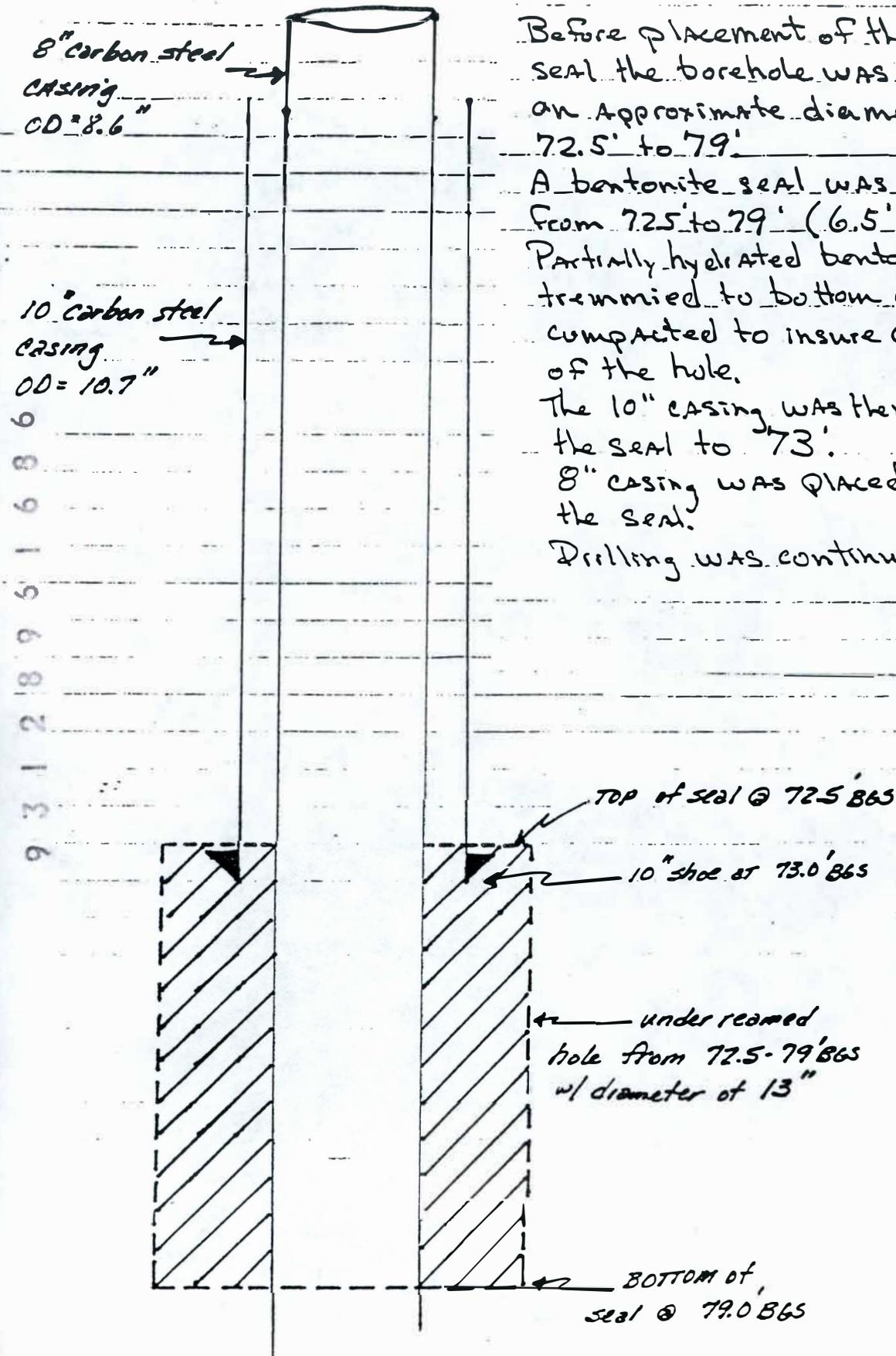
February 10, 1993

9 3 1 2 8 9 6 1 6 8 5

**BOREHOLE 299-W10-196
DRILLING STATUS**

- **DEPTH OF BOREHOLE - 90.8 FT (PERCHED OVER THE FIRST CALICHE)**
- **LITHOLOGY - FINE SAND/SILT**
- **SEALS - ~73FT (6.5 FT THICK AND ~2 INCHES ON SIDES)**

SEAL PLACEMENT AT INTERVAL 72.5' - 79.0' B65



Before placement of the bentonite seal the borehole was underreamed to an approximate diameter of 13" from 72.5' to 79'.

A bentonite seal was placed in the zone from 72.5' to 79' (6.5' total thickness). Partially hydrated bentonite balls were tremmied to bottom and mechanically compacted to insure complete filling of the hole.

The 10" casing was then pushed 5' into the seal to 73'.

8" casing was placed and driven through the seal.

Drilling was continued to present depth.

Present Configuration

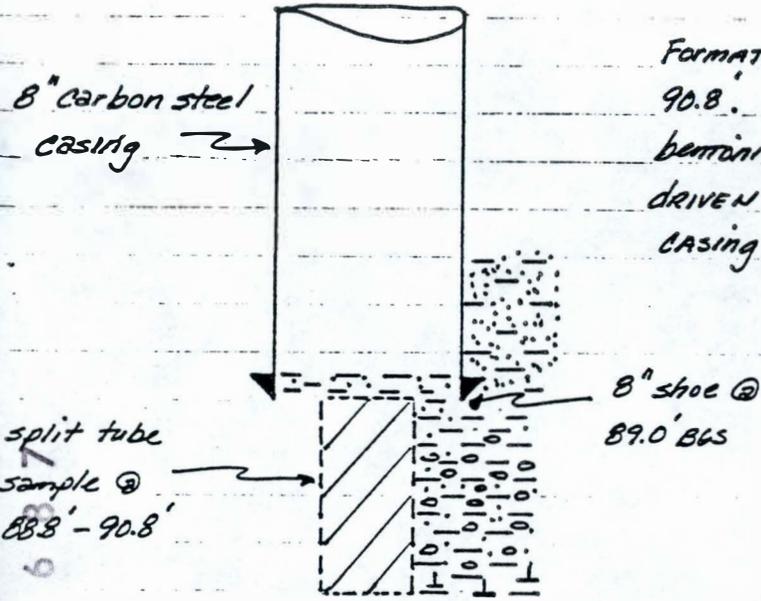


Fig. 1

Formation has been characterized with split tube to 90.8'. Sample area then backfilled with 8-20 mesh bentonite to avoid contamination. Casing has been driven into formation approx 1' with a 1' plug in casing. (Fig. 1)

Pipe is being scrubbed using wire wheel brush.

1. The plug and cleaning debris will be removed and the borehole will be opened out to ~ 91.0' BGS
2. A split tube sample will be used to identify the top of the caliche (est 92' BGS)
3. The 8" hole will be drilled approx. 1.0' into the caliche
4. The borehole will then be under reamed to ~ 12" nominal diameter from 88'-93' (This will require back pulling the 8" casing 1.5')
5. RLS Logging (60' - 93')

Figure # 2 depicts borehole @ end of step 4.

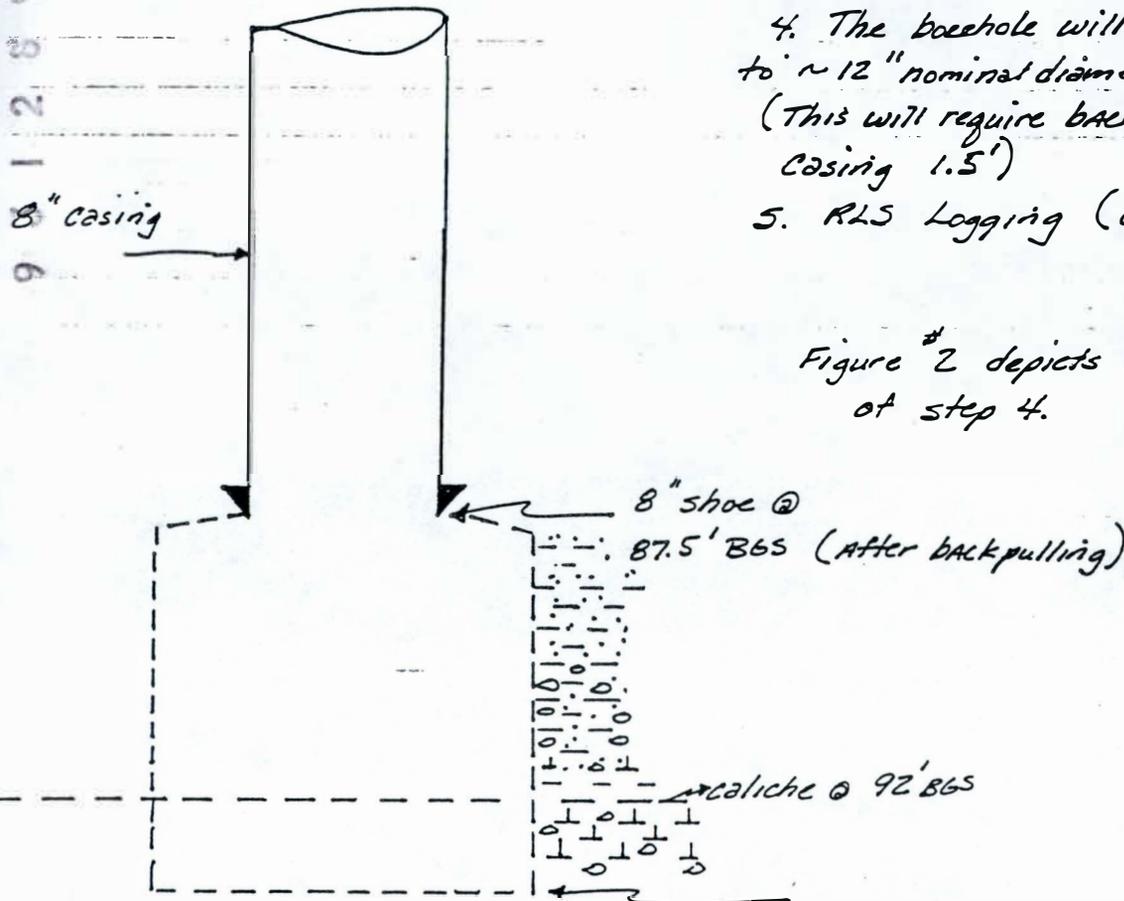


Fig. 2

Base of seal @ 93' BGS

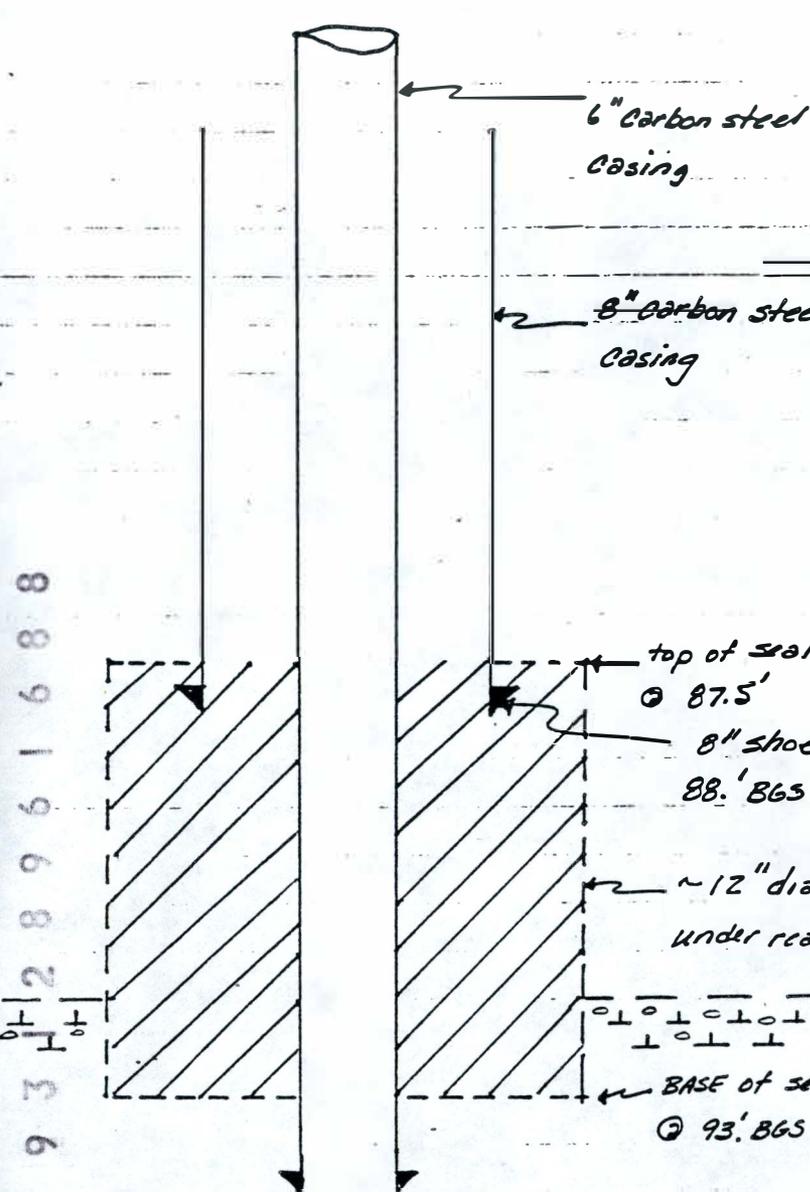


Fig. 3

1. The borehole will be filled with bentonite, tremmed to bottom as 6" carbon steel handmade balls of partially hydrated material and then mechanically tamped or compacted to completely fill the underreamed area.

2. This will result in a seal that will extend from 87.5' to 93'.

3. The 8" casing will be driven .5' into the bentonite seal. The 6" casing will be run thru the 8" and driven thru the bentonite seal.

Figure 3 depicts borehole conditions depicted after placement of seal and 6" casing

9 3 1 2 8 9 6 1 6 9 0

- indicates not detected in sample
- * indicates that for the volume of soil submitted and analyzed by GEA that this is the minimum detection limit

INCIDENTS

- **CONTAMINATED SEAL**
- **TANK FARM EVACUATION**
- **TRASH FIRE**

ISSUES

- **JANUARY SINGLE-SHELL TANK UNIT MANAGER MEETING MINUTES**
 - **BOREHOLE VARIANCE**

SINGLE-SHELL TANK CHARACTERIZATION

MILESTONE M-10-00

**Paul Hernandez - USDOE/RL
John Propson - WHC**

Single-Shell Tanks Unit Managers Meeting

**February 10, 1993
Richland, Washington**

SINGLE-SHELL TANK CHARACTERIZATION MILESTONE M-10-00

TOPICS

- **Accomplishments**
- **FY 1993 Milestone Status**
- **Special Topics**

ACCOMPLISHMENTS

- **WHC has received/implemented RL OPA Audit 93-02 response items and is cleared to resume core sampling Tank 241-T-107 as of February 3, 1993.**
- **Completed the first draft of the Characterization Strategic Plan.**
 - **The plan will identify characterization requirements and recommend one cohesive strategy.**
 - **A comprehensive plan directed toward timely M-10-00 completion and integrating other programmatic needs for characterization of > 10 mrem/hr wastes.**

ACCOMPLISHMENTS (cont)

- **Re-evaluation of Rotary Mode Modular Exhauster design criteria has resulted in a re-design to reduce size and potentially improve mobility.**

FY 1993 MILESTONE STATUS

- **M-10-13-T2 Complete R & D and installation of Hard Salt Cake Sampler and Hydrostatic Balance System - December 31, 1992**
 - **Completed ahead of schedule on December 2, 1992**
- **M-10-13 Complete deployment of the Rotary Mode Core Sampling System - September 30, 1993**
 - **Presently on schedule**
- **Near-Term Core Sampling Schedule includes Tanks T-107* Core 2, T-105, T-102, C-106*, C-111*, C-108* and possibly T-101***

* Safety issue tanks

SPECIAL TOPICS

- **Rotary Mode Exhauster Re-Design may effect progress towards meeting the M-10-13 Milestone**
 - **Impact, if any, will be identified during a review of the updated CPM schedule.**
 - **If necessary, a recovery plan will be developed to maintain milestone completion dates.**
 - **Status update at next UMM.**

SPECIAL TOPICS (cont)

- **Rebaselining TWRS Program**
- **Issue - Should the TWRS Waste Characterizations Program as presently required (and defined) by the TPA, be continued, given the "Retrieve All Wastes" decision?**

REBASELINING TWRS

- **Introduction to TWRS waste characterization rebaselining meeting with regulators proposed for week of February 22, 1993.**
- **Paperwork requirements - What are expectations of the regulators?**
 - **Is any documentation required beyond an issue paper and draft TPA change request? This would be similiar to what has been produced for HWVP, Grout, and/or stabilization programs.**
- **A quick response from the regulators is necessary to meet rebaselining target of 3/31/93.**

REBASELINING TWRS (cont)

- **Consider what changes (if any) the "Retrieve all Waste" decision has made to the basis of the presently defined Waste Characterization Program.**
- **Validated data packages - Do current requirements make sense?**
 - **Should a disposal form QA protocol be applied to a feed stock process sample?**
 - **Current VDP may not be representative of entire tank contents.**
 - **Consider content of VDP's during rebaselining effort.**



Department of Energy

9300214

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

DEC 21 1992

92-CHB-106

Mr. Paul T. Day
Hanford Project Manager
U.S. Environmental Protection Agency
Region 10
712 Swift Boulevard, Suite 5
Richland, Washington 99352



Mr. David B. Jansen, P.E.
Hanford Project Manager
State of Washington
Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600

Dear Messrs. Day and Jansen:

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (TRI-PARTY AGREEMENT)
TARGET MILESTONE M-10-12-TO2, "COMPLETE R&D AND INSTALLATION OF BOTH THE HARD
SALT CAKE SAMPLER AND THE IMPROVED HYDROSTATIC BALANCE SYSTEM"

This is to inform you that Westinghouse Hanford Company (WHC), Contractor for the Department of Energy, Richland Field Office (RL), has completed all requirements towards meeting the subject target milestone. This milestone requires completion of the research and development and installation of the Hard Salt Cake Sampler and the improved hydrostatic balance system onto the transport vehicle. This milestone was completed on December 2, 1992. Scheduled completion for this milestone, per the Tri-Party Agreement (TPA), was set for December 31, 1992. You and/or your representatives are welcome to visit the vehicle to observe the equipment installed.

With closure of this milestone, activities are now starting on the acceptance testing process, along with continued focus to the design and fabrication of the portable modular exhauster. All activities are aligned for meeting the TPA Milestone M-10-13, "Restore Rotary Mode Sampling Capability at the Hanford Site," on or before September 30, 1993.

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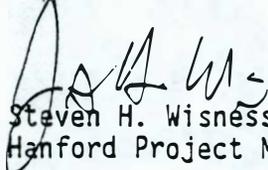
Mssrs. Day Jansen

-2-

DEC 21 1992

If you have any questions, please contact Mr. John M. Clark, Characterization Branch Chief on (509) 376-2246.

Sincerely,


Steven H. Wisness
Hanford Project Manager

SFD:PRH

cc: S. McKinney, Ecology
D. Sherwood, EPA
B. A Austin, WHC
J. G. Propson, WHC

93128961703



Distribution

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John M. Clark, RL, A4-02
Paula Clark, RL, A5-21
Jim Davis, RL, A5-21
Cherri Defigh-Price, WHC, R2-31
J.R. Freeman-Pollard, WHC H6-03
Vernon Hall, WHC, L4-88
John P. Harris, WHC, S4-55
Mark Henderson, WHC, S4-55
Paul Hernandez, RL, A4-02
Mike Mahaffey, WHC, L4-73
Dennis Maupin, WHC, R1-51
Scott McKinney, Ecology
Bruce Nicoll, RL, A5-10¹⁵
David B. Pabst, WHC, B2-35
John Propson, WHC, R2-18
Thomas E. Rainey, WHC, R1-49
Richard E. Raymond, WHC, R1-80
Al Sampson, WHC, R2-18
Gene Senat, RL, R2-62
Douglas R. Sherwood, EPA, B5-01
Donna Wanek, RL, A5-21
Oliver Wang, WHC, R2-31
Nancy Werdell, RL, A5-19
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Ben W. Wyrick, WHC, H6-29
Jon Yerxa, RL, A5-15
EDMC ~~44-82~~ **H6-08**

cc: James Bauer, RL, A5-19
John H. Anttonen, RL A5-10
Ronald Gerton, RL, A4-02
Roger Freeberg, RL, A5-19
Steven Wisness, RL, A5-19
Dan Duncan, EPA Region X
Paul Day, EPA Region X, B5-01
Toby Michelena, Ecology
ADMINISTRATIVE RECORD (SST) [Care of Susan Wray, WHC]
Washington State Department of Ecology, Nuclear and Mixed Waste Library,
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Environmental Protection Agency Region 10, Mail Stop HW-074

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