Tri-Party Agreement

Mr Michael A Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
1315 W. Fourth Avenue
Kennewick, Washington 99336

Dear Mr. Wilson:

FINAL AGREEMENT FOR HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (HFFACO) CHANGE REQUEST M-45-05-01 FOR MODIFICATION OF THE M-45 MILESTONE SERIES

I am pleased to submit HFFACO Change Control Form M-45-05-01 for modification of M-45-05A and M-45-15; and deletion of M-45-13-T01, M-45-15-T01, and M-45-05N-T01 Milestones and target dates. Both U.S. Department of Energy (DOE), Office of River Protection, and the State of Washington Department of Ecology (Ecology) offices have worked diligently to come to agreement on the subject change package.

As you can see, I have signed the form as signatory on behalf of DOE and request that you do likewise on behalf of Ecology. Following your approval, the attached M-45-05-01 Change Request will be incorporated into the HFFACO.

Sincerely,

Roy J. Schepens
Manager

ORP:JER

Attachment

cc w/attach:
M. N. Jarayassi, CH2M HILL
K. Tollefson, CH2M HILL
S. Harris, CTUIR
S. Dahl, Ecology
J. J. Lyon, Ecology
J. S. Hertzel, FHI
R. Morrison, FHI
A. Almaraz, INNOV
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K. Niles, Oregon Energy
W. Russell, ORP
T. Z. Smith, ORP
R. Jim, YN
J. Shorin, WA AGO
Administrative Record

Change Number Draft M-45-05-01	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date July 21, 2005

Originator US DOE-ORP **Phone** 376-2247

Class of Change

[ ] I – Signatories [X] II – Executive Manager [ ] III – Project Manager

Change Title

Modification of Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestones M-45-05A and M-45-15; and deletion of M-45-13-T01, M-45-15-T01, and M-45-05N-T01.

Description/Justification of Change

This change request:

- Extends Milestone M-45-05A (Retrieval of 241-S-102) from July 31, 2005 to March 31, 2007;
- Extends Milestone M-45-15 (Interim Completion of Tank S-102) from March 31, 2006 to December 31, 2007 ;
- Extends Milestone M-45-13 (Interim Completion of Tank S-112 SST Waste Retrieval and Closure) from March 31, 2006 to December 31, 2007.
- Deletes Milestone M-45-13-T01 (Final Completion of Tank S-112 Retrieval and Closure Demonstration Project),
- Deletes Milestone M-45-15-T01 (Final Completion of Tank S-102 Retrieval and Closure Demonstration Project),
- Deletes Milestone M-45-05N-T01 (Final Completion of Tank C-106 SST Retrieval and Closure Demonstration Project)

Newly discovered waste conditions in 241-S-102 tank have made it necessary to request a change to the following milestones:

- Extend **M-45-05A** (Complete Initial Waste Retrieval from S-102) from July 31, 2005 to March 31, 2007.
- Extend **M-45-15** (Interim Completion of Tank S-102 SST Waste Retrieval and Closure) from March 31, 2006 to December 31, 2007 The changes are due to unexpected technical challenges encountered since the previous M-45-04-05 Change Request was approved on January 10, 2005. These challenges are summarized below. More detailed information is provided on the following pages.
- Extend **M-45-13** (Interim Completion of Tank S-112 SST Waste Retrieval and Closure) from March 31, 2006 to December 31, 2007

New Challenges - Summary

241-S-102. The startup of the S-102 retrieval system using the progressive cavity pump began on December 17, 2004. Difficulties with retrieval were immediately observed and negligible waste was retrieved. It is believed that the system was unable to retrieve liquids from the tank due to sludge tightly packed around the intake screen. Attempts to retrieve waste yielded minimal results: only 118 gallons of waste (from a total of 464,000 gallons) was retrieved in December 2004. Many attempts were made to improve the retrieval system performance (e.g., raising the pump, nitrogen and air sparging, and water injection around the pump intake), but each attempt failed to produce a sustainable retrieval operation. With each attempt, the system would retrieve waste briefly then apparently clog up. Approximately 21,000 gallons were retrieved in February 2005 and 16,000 gallons were retrieved in March as part of the attempted startups. Approximately 427,000 gallons of

waste remain in the tank as of April 20, 2005. It is believed that the reason the retrieval system does not function properly and effectively is that the lower mud-like sludge layer of waste is compressed by the weight of the upper saltcake layer such that a well or open space around the pump intake cannot be sustained. This well is necessary to allow a pathway for the diluted waste to get to the pump intake which is located at the bottom of the tank Although the pump screen cannot be visually inspected, it is believed that the pump screen is plugging with waste. To address this challenge, a new pumping system was identified and installed and became operational on May 31, 2005. During the month of June 2005, approximately 79,000 additional gallons of waste has been retrieved. Meeting the July 31, 2005 milestone M-45-05A as currently defined is not possible using either the existing system or the new pump.

Additionally, the S-102 retrieval operations have been impacted by SST and DST storage space issues including completion of the cross site transfer line and accompanying transfer outage, deferral of the next cross site transfer from May 2005 to February 2006, and available space in the DST System for waste receipt during the transfer outage period.

Impact of Change

This change request moves Milestone M-45-05A to March 31, 2007, M-45-13 to December 31, 2007 and M-45-15 to December 31, 2007. The change also deletes final completion milestones for S-102, S-112 and C-106.

Affected Documents

The HFFACO, as amended, including Action Plan Appendix D, and Hanford Site internal planning, management, and budget documents (e.g., DOE and DOE-contractor Baselines, Baseline Change Control documents; Site-Wide System Engineering Control documents; Project Management Plans; and the Hanford Site Integrated Priority List

Approvals

_____ Disapproved Ecology	_____ Date	_____ Approved
Roy J. Schepens ~~Disapproved~~ DOE - ORP	JUL 29 2005 Date	✓ Approved

Description/Justification of Change (Continued in Detail)

Consent Decree Background

This change request is directly related to the Consent Decree in *State of Washington, Department of Ecology v. Department of Energy*, Case No. CT-99-5076-EFS (September 30, 1999). In the Third Amendment to Consent Decree (September 9, 2003), the parties agreed to hold the interim stabilization requirements of the Consent Decree in abeyance for Tanks S-102 and S-112 in order to accelerate retrieval of these tanks, provided that Energy performed certain retrieval work described by reference to HFFACO milestones by the dates specified in the Consent Decree. That amendment expressly reserved Ecology's rights to take enforcement action under the HFFACO if Energy failed to meet the referenced HFFACO milestones. At the same time, the amendment to the Consent Decree also provided that, if Energy failed to perform the specified retrieval work for a Tank by the date referenced in the Consent Decree, Ecology could require that Energy complete interim stabilization of that Tank within 18 months of written notification by Ecology. The date referenced in the Consent Decree for Initial Waste Retrieval of Tank S-102 (per HFFACO milestone M-45-05A) is 3/31/05. In January 2005, the parties agreed to extend HFFACO milestone M-45-05A to 6/30/05 and in June 2005, the parties agreed to extend the HFFACO milestone to July 31, 2005. (The parties did not amend the Consent Decree at these times. Therefore, Ecology's

right to require interim stabilization of S-102 was triggered on 3/31/2005.) Energy has determined that completion of milestone M-45-05A as currently scheduled in the HFFACO is at risk and, therefore, in accordance with the provisions of the HFFACO, is submitting this change request.

Energy understands that by approval of this change request, Ecology reserves its right to require Energy to complete interim stabilization within 18 months of notifying Energy of Ecology's decision.

Current Retrieval Status (June 2005)

Tank 241-S-102: Installation of the Tank 241-S-102 waste retrieval system was completed on March 4, 2004. Due to the slower than anticipated retrieval rates encountered on tank S-112, ORP determined that concurrent retrieval of S-112 with S-102 would be necessary to meet HFFACO milestones. This concurrent retrieval required installation of a manifold jumper in the SA Valve Pit. This manifold was installed in the SA Valve Pit on December 4, 2004, to provide the ability to alternate between the retrieval operations of S-102 and S-112. The anti-siphon slurry distributor (ASSD), which was installed in Tank SY-102, was determined to be plugged in June 2004. This device, which distributes solids under the liquid surface in the receiving DST, is required for the S-102 retrieval. The plugged device was removed from the tank and replaced with a newly designed ASSD on December 4, 2004. Retrieval operations were initiated on December 17, 2004; however, it appears that the waste physical properties and the waste flow dynamics have not behaved as predicted from analytical laboratory waste analysis. As of April 20, 2005, approximately 37,000 gallons of waste have been retrieved and approximately 427,000 gallons of waste remained in the tank. An alternate pump was installed on May 31, 2005 in an attempt to improve retrieval performance. Since that time approximately 79,000 gallons of waste ha been retrieved. The cumulative total waste volume retrieved to the end of June 2005 is 116,000 gallons with 348,000 of waste remaining in Tank S-102.

More detailed descriptions of the retrieval challenges are included in the subsequent sections.

Justification of Change

This change request is being submitted in accordance with HFFACO, Attachment 2, Action Plan, section 12.3.2, Article XL, Good Cause for Extensions, Sections 120. As provided in Section 12.3.2 of the Action Plan, the HFFACO requires that ORP submit a request for extension in writing that specifies:

A. The timetable and deadline or schedule for which the extension is sought;
B. The length of the extension sought;
C. The good cause for the extension; and
D. Any related time table and deadline or schedule that would be affected if the extension were granted.

This information is provided as follows:

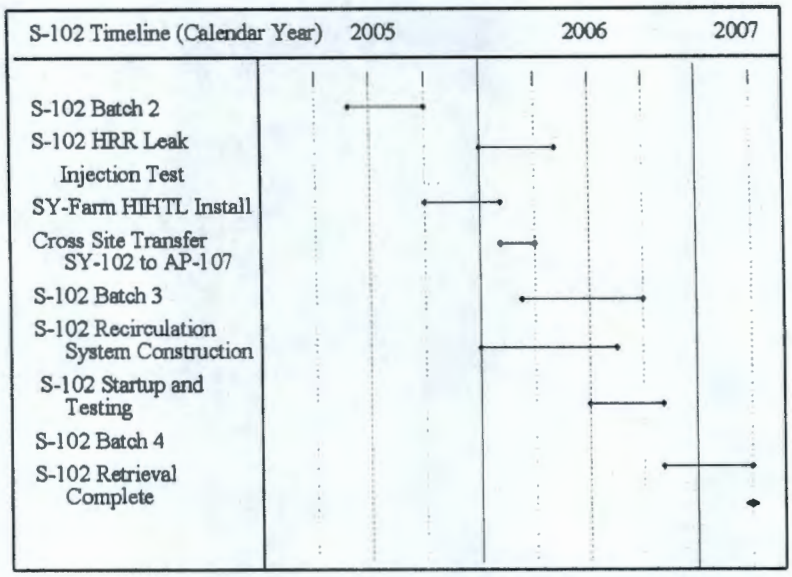
A. Timetable and Deadline. The timetable and deadline or schedule for which the extension is sought.

Milestone	Brief Description	Due Date	New Proposed Date
M-45-05A	Complete Initial Waste Retrieval from S-102	July 31, 2005	March 31, 2007
M-45-15	Interim Completion of Tank S-102 SST Waste Retrieval and Closure Demonstration Project	March 31, 2006	December 31, 2007
M-45-13	Interim Completion of Tank S-112 SST Waste Retrieval and Closure Demonstration Project	March 31, 2006	December 31, 2007

B. The Length of Extension Sought.

241-S-102 (M-45-05A). The length of the extension sought is 608 days to accommodate the following retrieval activities:

- Completion of Batch 2 dissolution. At the end of Batch 2, S-102 will be ~50% retrieved and the SY-102 DST will be at capacity.
- Perform the HRR Leak Injection Test. The time between Batch 2 and Batch 3 may be adequate to perform the initial portion of the leak injection test. The remaining leak injection test activities can be performed during ongoing retrieval.
- Installation of an SY hose in hose transfer line between SY pits. This is required for future cross-site transfers from SY-102. Batch 3 dissolution retrieval cannot begin before this is completed.
- Cross-site transfer from SY-102 to AP-107. Batch 3 dissolution retrieval cannot begin before this is completed.
- Complete Batch 3 dissolution. The retrieval system will be operated until dissolution retrieval is no longer possible.
- Complete supernatant recirculation system construction. This is required for Batch 4 retrieval.
- Complete S-102 startup and testing.
- Complete Batch 4 using the supernatant recirculation system.



C. Good Cause for Extension - Good cause for this request results from the interaction of several different events that implicate the Good Cause provisions of the HFFACO. These events are described below. The parties agree pursuant to HFFACO Paragraph 120 E that the events, taken together, constitute good cause for the requested extension. Ecology does not concede that DOE's inability to timely complete one or more of the above activities constitutes good cause for any further extensions.

S-102 Retrieval Challenges

Startup of the S-102 retrieval system using the progressive cavity pump was commenced on December 17, 2004. The progressive cavity pump was selected based on its industry-proven capability to pump slurries and

our belief that it was sufficiently robust to remove S-102 waste. At the outset, negligible amounts of waste were retrieved. Under normal operations, the pump is started (i.e., primed) with 100% dilution water in the pump. Once flow is established in the pump, the amount of dilution water is reduced to allow waste to be pulled into the pump intake. However, when waste does not flow into the pump, only dilution water is transferred. This is what occurred during startup of S-102 retrieval.

The progressive cavity pump was installed on the bottom of the tank based on experience in S-112 and the belief that this would remove the maximum amount of waste in order to achieve TPA retrieval residual volume goals. The S-102 retrieval system design duplicated S-112 and was based on the process whereby water was added to dissolve the saltcake from the top layer downward. It was thought that a space or "well" would be created around the pump intake such that dissolved waste could flow downward to the bottom of the tank, through the screen, and into the pump intake. It is believed that the reason why the system does not retrieve properly is that the lower mud-like sludge layer (~80 inches thick) is compressed by the weight of the upper saltcake layer (~90 inches thick) such that a well or open space around the pump intake cannot be sustained to allow a diluted waste pathway to the pump intake. The pump screen appears to be plugging with waste.

As of December of 2004 only 118 gallons of waste was retrieved. The original plan to start retrieval was to add approximately 5,000 gallons of water to the tank through the pump dilution water line at the bottom of the tank and let the water dissolve a column around the pump shaft for the brine to run down to the pump inlet. After waiting a couple of hours, the resulting brine and any liquor which drains from the tank would be pumped out. This was unsuccessful. The water went into the tank but when the pump was started only the water that was being injected into the pump at the time waste was transferred to SY-102. Essentially, no brine or waste was removed from the tank using this method. At least six attempts were made using this method. Based on review of the data, it was concluded that the pump inlet screen was being plugged by the waste. It was also speculated that the brine was not able to flow around the pump shaft to get to the screen because of the sludge-like nature of the lower waste in the tank.

Several different approaches and attempts were made to improve the performance of the retrieval but each attempt, after running for a short period of time, failed to produce a sustained waste retrieval operation. The different approaches included raising the pump level, back-flushing the pump, and nitrogen/air sparging.

An attempt was made to increase the retrieval rate in tank S-102 by taking advantage of the pump's natural tendency to wobble due to the weight distribution of the rotor as it rotates. It was decided to lift the pump so that it would not be anchored to the bottom of the tank. This was expected to allow the screen and shaft to move in a small circular motion which might maintain a flow path for the brine to get to the pump suction. During January 2005, the pump was raised 9 inches off the tank bottom and retrieval was restarted.

The second approach attempted was to back-flush the pump prior to starting retrieval in order to create free space around the pump. However, it appears that the back-flushing with water before starting the pump was not able to move the surrounding sludge solids so that the pump could move. In any event, these attempts to start the transfer were no more successful then previous attempts.

Review of the data suggested that greater agitation was needed to fluidize the waste around the pump shaft and inlet. Therefore, the third approach was made using a nitrogen supply attached to the pump dilution line to attempt to get greater agitation by nitrogen sparging. Initial trials using this technique at low flow rates of 10-15 cubic feet per minute (CFM) showed promise but did not sufficiently stir things up to allow the waste to be transferred, so higher flow-rates of 100 to 150 CFM were tried. At these rates, a nitrogen bottle only lasted for about 1.5 minutes and then had to be changed. Sparging at these high rates showed that a transfer could be started but that it would not maintain flow of waste into the pump for longer than approximately 5 minutes.

Based on these somewhat promising results, the nitrogen supply was redesigned to use a 1,500 gallon liquid nitrogen container. Using this system and sparging at > 100 CFM for a little over 1 hour, the first successful transfer of significant volumes of waste was accomplished on February 9, 2005 with about 1400 gallons of waste transferred in some 7,500 gallons total transferred to SY-102. Based on this success and the expectation that performance would improve with experience, retrieval of waste proceeded with 26,000 gallons of actual waste retrieved in February and 21,000 gallons in March 2005. However, the efficiency of this method decreased with each transfer attempt in March and smaller and smaller quantities were retrieved before the waste stopped flowing to the pump. In addition, no transfer was able to achieve the planned 1.27 density average. This density is necessary to stay within the DST space allotted for this tank retrieval.[1]

After evaluating the process performance and the extremely long time necessary to complete retrieval, ORP decided to install a new pump that was designed and located to retrieve the waste at a higher rate. This new pump is designed to hang on the end of a cable and flexible hose and allow retrieval from the top down. Installation and operation of this new pump at this time will not support meeting the current June 30, 2005 M-45-05A milestone.

S-112 retrieval Challenges

The justification for extending the M-45-13 Milestone for interim completion of Tank S-112 SST waste retrieval and closure demonstration project is to allow time to evaluate the new remote water lance retrieval technology. After the successful completion of retrieval of this tank, the tank residuals will be characterized, risk assessment will be updated, and the final draft of the closure plan will be submitted to Ecology for commencement of public comment and consequently their approval to satisfy this milestone. If the evaluation of this technology concludes it is ineffective for this tank, this milestone will be renegotiated.

Cross Site Transfer Line /Transfer Outage/SY Tank Space

Completion of S-102 retrieval is dependant upon sufficient DST space being available for receipt and storage of the retrieved SST waste. Tank S-102 retrieves waste into the SY tank farm. The SY tank farm is restricted in the amount of waste it is able to receive due to the limited capacity in SY tank farm and single cross site transfer line available for sending waste from SY tank farm to the 25 other DSTs in the 200 East Area tank farms. It is estimated that 700 k gallons of SY tank space will be available for retrieval of S-102 until the next cross site transfer is completed. This tank (S-102) is estimated to need approximately 1.2 Million gallons to complete retrieval.

TPA milestone M-43-00 required completion of DST system upgrades by June 30, 2005. An important part of this milestone was completion of the cross-site transfer line to bring that line into compliance with Resource Conservation and Recovery Act of 1976 (RCRA) standards. During completion of the cross-site transfer line tie-in, no waste transfers from SY tank farm to the East area tank farms will be feasible. The cross site transfer line outage began in May 2005. The cross site transfer line is projected to be available again December, 2005 after completion of the following work:

- Cut and weld new cross site transfer lines
- Operational acceptance test for new transfer line system
- Test Master Pump shut down systems
- Install AN-101 jumpers (needed for new cross site supernatant line)
- Install Jumpers in AY farm (needed for first cross site route)

Deletion of Final Completion Milestones

- Delete Milestone M-45-13-T01 (Final Completion of Tank S-112 Retrieval and Closure Demonstration Project),

[1] 1.35 million gallons of DST space have been allocated for the S-102 retrieval.

- Delete Milestone M-45-15-T01 (Final Completion of Tank S-102 Retrieval and Closure Demonstration Project),
- Delete Milestone M-45-05N-T01 (Final Completion of Tank C-106 SST Retrieval and Closure Demonstration Project)

The justification for deleting milestones M-45-13-T01, M-45-15-T01, and M-45-05N-T01 is based on approval of the Tank Closure Environmental Impact Statement and its direct link to processing of Tank-Specific Closure Plans. Once the Closure EIS ROD has been issued, tank-specific closure decisions will be made in accordance with the ROD and Agreement Appendix I.

D. Any related time table and deadline or schedule that would be affected if the extension is granted.

N/A

Modifications to the M-45 Milestone incorporated into the HFFACO by approval of this M-45-05-01 Change Request are shown here as either shaded additions or ~~strikethrough~~ deletions

M-045-05A	Complete ~~initial~~ waste retrieval from Tank S-102. The S-102 ~~initial~~ waste retrieval technology (or technologies) will be selected based on the principle criteria of maximizing the retrieval of mobile, long-lived radioisotopes and non-radiological hazardous constituents. The parties recognize and agree that this action is for ~~initial~~ waste retrieval purposes. ~~Completion of this initial retrieval shall be by approval of DOE and Ecology~~ ~~Goals of this initial waste retrieval project shall include the retrieval to safe storage of approximately 490 curies of mobile, long-lived radioisotopes and meet the retrieval criteria set by Milestone M-45-00 (per DOE Best-Basis Inventory data, 8/01/2000).~~ Retrieval shall be performed in accordance with goals and criteria specified in M-45-00. Completion of S-102 ~~initial~~ waste retrieval is subject to safe storage space availability consistent with M-45-00B.	~~06/30/05~~ 3/31/2007
M-45-13	Interim completion of Tank S-112 SST waste retrieval and closure demonstration project. The S-112 SST waste retrieval and closure demonstration project will be considered interim complete when the following criteria have been met: 1. Full scale waste retrieval has been completed in accordance with applicable regulatory requirements including Washington's Hazardous Waste Management Act, requirements set by this agreement, and the approved S-112 initial waste retrieval technology functions and requirements document (DOE will document project data and results in a Retrieval Data Report). 2. Remaining wastes have been adequately characterized, and a risk assessment, approved by Ecology, has been completed for residuals that remain in the tank. 3. The S-112 Component Closure Activity Plan has been submitted by DOE and approved by Ecology, i.e. incorporated into the site-wide permit. 4. If appropriate, DOE has requested, and Ecology has approved an exception to waste retrieval criteria pursuant to agreement Appendix H.	~~03/31/2006~~ 12/31/07

Modifications to the M-45 Milestone incorporated into the HFFACO by approval of this M-45-05-01 Change Request are shown here as either shaded additions or ~~strikethrough~~ deletions

M-45-15	Interim completion of Tank S-102 SST waste retrieval and closure demonstration project. The S-102 waste retrieval and closure demonstration project will be considered interim complete when the following criteria have been met: 1. Full scale waste retrieval has been completed in accordance with applicable regulatory requirements including Washington's hazardous waste management act, requirements set by this agreement, and the approved S-102 initial waste retrieval functions and requirements document (DOE will document project data and results in a Retrieval Data Report). 2. Remaining wastes have been adequately characterized, and a risk assessment, approved by Ecology, has been completed for residuals that remain in the tank. 3. The S-102 Component Closure Activity Plan has been submitted by DOE and approved by Ecology, i.e. incorporated into the site-wide permit. 4. If appropriate, DOE has requested, and Ecology has approved an exception to waste retrieval criteria pursuant to agreement Appendix H.	~~03/31/2006~~ 12/31/2007
~~M-45-13-T01~~	~~Final completion of Tank S-112 SST retrieval and closure demonstration project.~~ ~~Completion of the Tank S-112 retrieval and closure demonstration project is defined as the completion of necessary field project actions required by the approved S-112 waste retrieval and closure demonstration plan.~~	~~03/31/2007~~
~~M-45-15-T01~~	~~Final completion of Tank S-102 SST retrieval and closure demonstration project.~~ ~~Completion of the Tank S-102 retrieval and closure demonstration project is defined as the completion of necessary field project actions required by the approved S-102 waste retrieval and closure demonstration plan.~~	~~03/31/2007~~
~~M-45-05N-T01~~	~~Final Completion of Tank C-106 SST Retrieval and Closure Demonstration plan~~ ~~Completion of the tank C-106 retrieval and closure demonstration project is defined as the completion of necessary field project actions required by the approved C-106 waste retrieval and closure demonstration project~~	~~06/30/2005~~