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Project Title/Work Order		EDT No.
Multi-Function Waste Tank Facility, Phase Out Basis		ECN No. 623156

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A COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN No 623156

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	N. G. Awadalla, 74460, R2-76, 373-9243	[] Yes [X] No	04/20/95
	5. Project Title/No./Work Order No. Multi-Function Waste Tank Facility	6. Bldg./Sys./Fac. No. N/A	7. Approval Designator N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-W236A-ER-021, Revision 0	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	Cog. Engineer Signature & Date	Cog. Engineer Signature & Date

12. Description of Change

Total rewrite of document

13a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

Revisions made to incorporate missing information

14. Distribution (include name, MSIN, and no. of copies)

See attached.

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A-7900-013-2 (11/94) GEF095

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15. Design Verification Required	16. Cost Impact N/A				17. Schedule Impact (days) N/A	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	N/A	[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
n/a		

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER		
Cog. Eng.	K G Ausdenbl	4-20-95	PE		
Cog. Mgr.	J J Thennes	4-20-95	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		
			DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

RELEASE AUTHORIZATION

Document Number:	WHC-SD-W236A-ER-021, REV.1
Document Title:	Multi-Function Waste Tank Facility Phase Out Basis
Release Date:	April 20, 1995

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz — April 20, 1995

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SUPPORTING DOCUMENT

1. Total Pages 42

2. Title	3. Number	4. Rev No.
Multi-Function Waste Tank Facility Phase Out Basis	WHC-SD-W236A-ER-021	1

5. Key Words

Multi-Function Waste Tank Facility
MWTF
Phase Out Basis

6. Author

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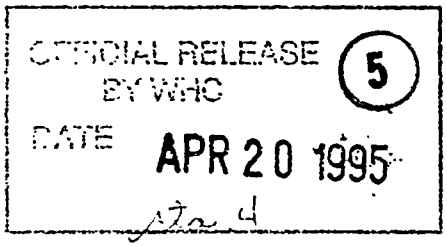
Signature

Organization/Charge Code 74460/DPMTF

7. Abstract

Additional double-shell tank storage capacity is not needed until FY 2004 or later. The waste volume in the current baseline program can be managed within the existing tank capacity. However, this requires implementation of some risk management actions and significant investment in software and hardware to accomplish the actions necessary to maximize use of existing storage tank space.

8. RELEASE STAMP



MULTI-FUNCTION WASTE TANK FACILITY
PHASE OUT BASIS

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1.0 EXECUTIVE SUMMARY

On January 13, 1995, Westinghouse Hanford Company (WHC) recommended to the U.S. Department of Energy, Richland Operations Office (RL) that Project W-236A, Multi-Function Waste Tank Facility (MWTF), should be phased out (Reference 1). The most recent information shows that wastes in the Tank Waste Remediation System (TWRS) current baseline can be managed within the existing waste tank capacity through fiscal year (FY) 2003. Additional double-shell tank storage capacity is not needed until FY 2004, or later.

As the retrieval, pretreatment, and immobilization programs further mature during FY 1996-1998, as well as privatization initiatives, so will clarification of specific needs for additional waste storage capacity. Managing the present and projected wastes within the existing double-shell tank system requires accepting increased risk, and implementing several new waste management actions. The primary objective of these actions is to ensure that the projected waste volume will not exceed the available waste storage capacity. Additional funding will be required to implement these actions, because none of the actions are presently in the TWRS baseline. As a minimum, these funds are needed for the present FY (1995) and for each of the two following FYs (1996 and 1997). The level of funding for each of these fiscal years will vary depending on the implementation schedule.

The basis for the recommendation centers around the most recently updated Operational Waste Volume Projections (OWVP) as shown in Appendix 3. The key factors considered in the projections include, but are not limited to, the following:

- Active mixing pump mitigation of the flammable gas safety issue in tank 241-SY-101 with no passive mitigation needed for the other flammable gas watch list tanks
- Reduced waste volume generation by the Hanford Site facilities
- Improved tank space use
- Elimination of the contingency space
- Capability to manage waste in 200 West Area without two new tanks
- No anticipated additional storage needs from TWRS privatization initiative
- Unlikely that any existing double-shell tank will leak during the next 10 years
- Increased waste inventory estimates due to increased single-shell tank porosity estimates
- Decreased waste volume reduction factors for evaporator operations
- Concentration of waste to the specific gravity operating limit in all future evaporator campaigns
- Waste segregation requirements are revised

This document contains further details that address the above basis. In addition, risk management issues, description of waste management actions, and implementation plans are included. Consequences of this recommendation including impact on TWRS programs, TWRS integrated schedule, and the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) milestones are also discussed.

2.0 BACKGROUND

The Justification of Mission Need for the Multi-Waste Remediation Facility, which included the MWTF, was approved by the U.S. Department of Energy Under Secretary on January 19, 1993 as a line item Major System Acquisition project. The present MWTF scope includes six waste tanks to be used primarily for dilution and storage of waste from tanks such as tank 241-SY-101 with priority safety issues.

Since the inception of the project, progress in the waste tank safety program has concluded that waste mixing is a preferable alternative to dilution for tank 241-SY-101. Also, the Hanford Site facilities made significant progress in reducing their waste generation rates and projected demand on the existing waste tank capacity. In late 1994, increased emphasis was placed on examining the OWVP annual report and challenging its assumptions. Numerous new factors came together to affect the projections sufficiently so that the need for new waste storage capacity could no longer be demonstrated. (For details, see Appendix 1).

3.0 SUMMARY CONCLUSION

Additional double-shell tank storage capacity is not needed until after FY 2004 or later. The waste volume in the current baseline program can be managed within the existing tank capacity. However, this requires implementing of some risk management actions and significant investment in software and hardware to accomplish the actions necessary to maximize use of existing storage tank space.

Adequate storage capacity can be obtained through several avenues. These include combining the existing neutralized current acid wastes (NCAW) and, separately, combining the neutralized cladding removal wastes (NCRW); designating the evaporator feed and receiver tanks as spare storage; and using the existing and new cross-site transfer lines.

4.0 ASSUMPTIONS

The successful implementation of several key waste management actions will be necessary to accommodate phasing out the MWTF project. The fundamental need for the success of these actions is the availability of adequate funding. The major assumptions providing the basis for the recommendation to phase out the MWTF project are described in Appendix 2.

5.0 OPERATIONAL WASTE VOLUME PROJECTIONS

The OWVP is a system simulator of the evaporator, the 28 double-shell tanks and their transfer systems, and the inputs and processes that take place in the system. Its purpose is to project tank space needs for storage of waste under base case and alternative 200 Area operational scenarios. The OWVP simulator accounts for the chemistry, mass, and evaporation of the waste, and the operational logistics necessary for the system to operate and the segregation rules associated with different waste types.

The OWVP is updated on an annual basis by September of each year. Revision 20 of the OWVP (Reference 3) was issued in 1994, and was based on data available July 1994. A special review team updated the information of Revision 20 on January 4, 1995, which prompted new inquiries into the historic segregation rules and the possibility of managing tank wastes within existing waste tanks. Further review of projection assumptions and possible initiatives for reducing tank space requirements resulted in a new special update of the projections.

The OWVP provides a current status and future projection of the waste volumes to be generated and stored. Using this information, scenarios can be developed to evaluate the impact of proposed actions on waste volumes. Key decisions may be developed for strategies to change the required waste volumes. Segregation of wastes, evaporator operations, and control of waste generation can be evaluated for their effect on waste volume. The OWVPs are located in Appendix 3.

The results of the special OWVP are illustrated in Figure 1. The dotted line labeled L947BC represents the base case projection shown in OWVP, Revision 20. The dashed line is the planning base that results from the changes in waste management practices and updated information resulting from the studies discussed in Appendix 1. The solid line indicates the incremental additional space savings available, if a technical basis is developed that will allow concentration of the wastes to historic levels without causing new watch list tanks to be created. The changes in required storage volumes are influenced by the following factors.

The active mixing pump mitigation of the flammable gas tanks such as tanks 241-SY-101 and -103 can be safely mitigated without retrieval and dilution and maintain safe storage. Other watch list tanks can be mitigated in a similar manner. Therefore, no additional tank space for the mitigation of these tanks is required. This results in a reduction of the number of required tanks by two.

The reduction in waste generated by the Hanford Site facilities from waste minimization efforts reduces the need for additional tank space. The projected waste flows have been reduced from previous projections of 93.0 Kgal/month to the range of 18.9 to 34.6 Kgal/month.

Changing the waste segregation practices of the past, such as combining similar wastes, results in additional reductions. Retrieval of some double-shell tank solids may be necessary during FY 1996-1998 to ensure that sufficient spare tank capacity is available. Combining two tanks containing NCRW into one tank would free up .98 Mgal of space. Combining two tanks containing NCAW into one tank would free up .98 Mgal of space.

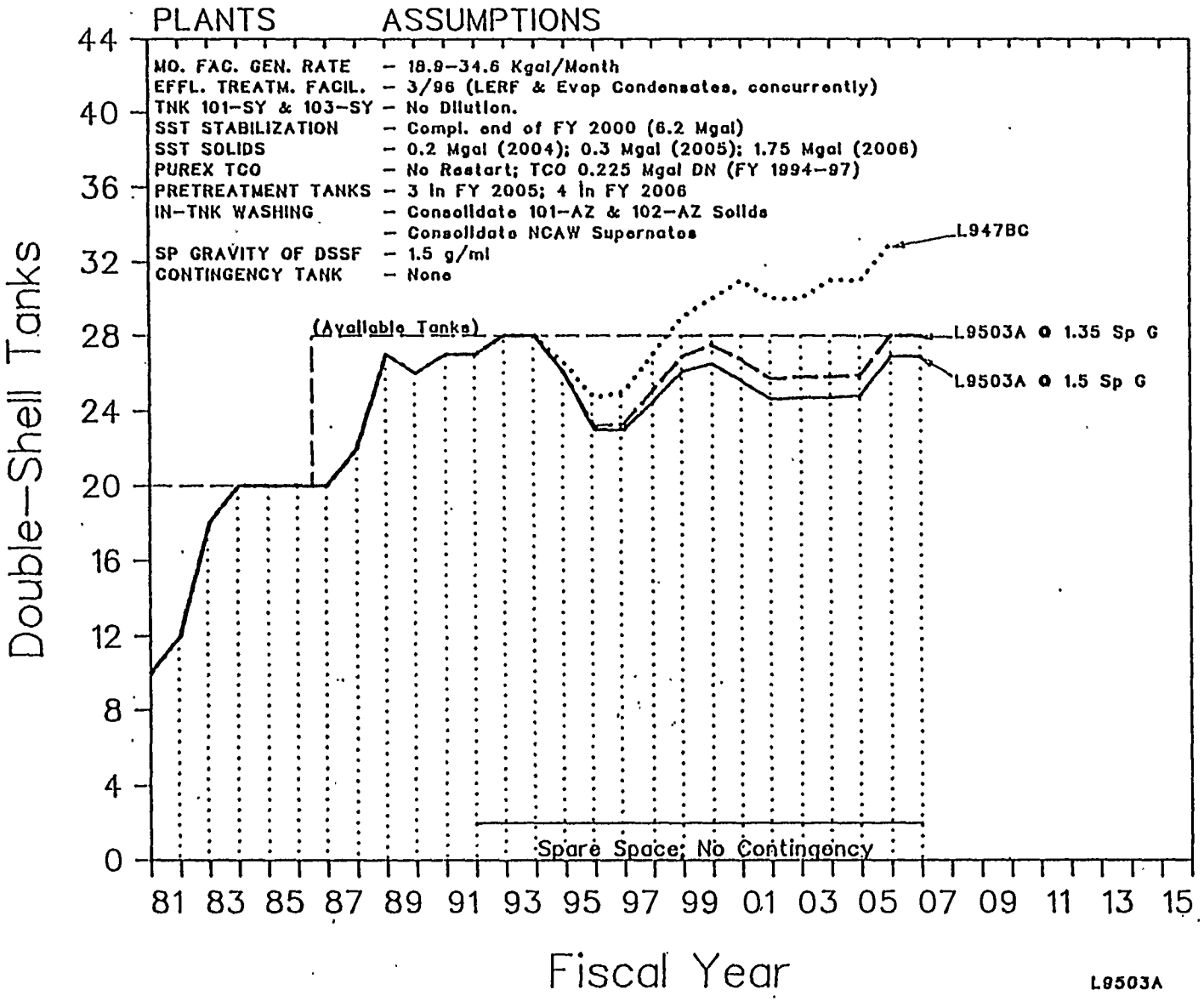
Using the evaporator feed and receiver tanks (241-AW-102 and -106) for additional space may be necessary. This space is currently used for evaporator operation. This action would free up 0.72 Mgal of tank space for emergency use.

Additional space for operational flexibility in the 200 West Area tank farms could be provided if additional actions can be taken. The primary issue is the use of tanks in 241-SY tank farm. Tanks 241-SY-101 and -103 are flammable gas watch list tanks that prohibit the use of their unused capacity. Tank 241-SY-102 is the current single staging point for 200 West Area transfers to 200 East Area. This tank has limited use due to questions concerning the compatibility of the transuranic (TRU) solids in the heel of the tank and organic wastes now stored in some of the single-shell tanks. Resolving the compatibility issue will offer more flexibility in the ability to transfer the wastes in 200 West Area.

The current projection of storage needs extends through FY 2004 when the retrieval, treatment, and immobilization program will be initiated. Approximately seven years lead time is required to provide additional storage tanks, should they be needed. Consequently, a decision to add storage capacity can be delayed until 1997. This would allow time to provide additional storage capacity for the retrieval, treatment, and immobilization programs. In addition, annual evaluations and decisions on additional storage capacity are required by the M-46 Tri-Party Agreement milestones.

Figure 1

L9503A (3/95 DOE SPECIAL) VS 7/94 BASE CASE



6.0 IMPACTS

Impact Management

Implementing the recommendation to phase out the MWTF project requires diligent management of the waste volume, and entails potential financial and programmatic impacts. The approach will be to manage the impacts using a systems engineering methodology and developing two tools: a risk management list and an action logic chart.

Initially, a risk assessment will be performed as part of the decision/risk analysis waste management action (see Section 7.0). The known risks will be compiled into a risk management list as will any risks discovered during the assessment. The risk management list will contain impacts, degree of risk, actions to be taken to reduce or mitigate the risk, and the responsible manager. The list will be a living document and will be managed as part of the waste management action plan until the actions are completed, and then managed as part of the OWVP process.

A functional flow chart will be prepared as part of the plans for fall back positions waste management action (Section 7.0) that includes all of the credible undesirable events that could occur. The flow chart will be used as a guideline in selecting the appropriate predetermined contingency actions for immediate implementation if required. The functional flow chart and risk management list will be compared to ensure that all risks are appropriately considered.

Impact Identification and Mitigation Strategy

This section will describe how WHC plans to use the systems engineering tools to identify and mitigate the impacts of phasing out the MWTF project. From a systems engineering viewpoint, phasing out the MWTF project is not a declaration that no new tanks will ever be built. It is a statement that unless a comprehensive, technically defensible position is established that requires storage space beyond current capacity, no resources will be diverted for the purpose of building new waste tanks. "No new storage space" will serve as a constraint on the functions and interfaces both within and outside of TWRS unless it can be shown that no other viable alternative is reasonably achievable.

The first step will be to modify the TWRS Functions and Requirements Waste Storage System conceptual architecture. The enabling assumption concerning double-shell tank storage space will be changed to show the selection of the alternative to consolidate waste by blending and concentration, without new double-shell tanks, in place of the alternative to consolidate the tank waste and build new double-shell tanks. To accomplish this change, the requirements in the store waste function will need to be changed by removing the constraints which refer to the Tri-Party Agreement milestones about building new tanks. Note that the architectural selection will be retained as an enabling assumption until the ongoing studies have been accepted as complete required analyses. At that time, the studies will become the rationale for selection and the architectural choice will no longer be based on an enabling

assumption. The formal decision/risk analyses, together with the updated waste volume projections, are expected to meet all or at least most of the needs for completing the required analyses.

The modified Waste Storage System conceptual architecture will then pass down a revised double-shell tank storage capacity to its daughter functions and architectures. The daughter functions and associated architectures are currently in development and will be part of the Technical Requirements Specifications. The limits of this revised capacity will then be shared with affected functions through controlled interfaces. This will require affected functions to consider conceptual architecture alternatives what allow the double-shell tank Waste Storage System to stay within its capacity. Interface negotiations will be used to determine the optimal use of existing capacity. The revised conceptual architecture is expected to meet the needs and performance requirements of the Manage Tank Waste function. The needs and performance requirements of the Process Waste function are not well enough defined at this time to make a defensible determination of the adequacy of the conceptual Waste Storage System for disposal purposes. If many of the affected Process Waste daughter functions determine their most cost-effective architecture alternatives require more storage space than is available, the issue of whether and when to build new storage capacity will be revisited.

The Technical Requirements Specifications will then be used to allocate requirements and constraints into project Design Requirements Documents. The Design Requirements Documents then become part of the projects' design baselines, and in this way the design of all affected projects will reflect any constraint imposed by the decision to not build any new tanks.

Expected Impacts on TWRS and Other Site Facilities

The TWRS integrated schedule was reviewed and the only impacts identified prior to FY 2004 are discussed below. As this process evolves, the impacts should become better defined and more impacts may be identified.

- TWRS Systems Engineering

  Impacts to TWRS Systems Engineering are minimal because the project technical basis development is proceeding well in advance relative to functional development.

  TWRS Systems Engineering objectives include development of Design Requirements Documents (DRD) for projects that evolve from the analysis, and to perform a comparison of existing projects' DRD-related activities to insure program level traceability of requirements. The Defense Nuclear Facilities Safety Board (DNFSB) has recommended early systems engineering concentration on existing project DRDs.

  TWRS is currently committed to delivery of a DRD for the MWTF project by September 1995. With the MWTF phase out, that milestone would not be necessary. This commitment should be deleted from the TWRS baseline.

- Project W-058

  The phasing out of the MWTF project will require Project W-058 to reincorporate provisions for infrastructure needs like a control room, diversion boxes, power, and water. These elements have been removed from the existing project baseline. A detailed evaluation of these impacts, including the projected cost for reincorporation, is in development.

  These impacts should not affect the Systems Engineering work for Project W-058 because the project specific DRD will focus on Manage Tank Waste requirements.

- Projects W-211, Initial Tank Retrieval System, and W-151, Tank 241-AZ-101 Waste Retrieval System

  These retrieval-related projects will be minimally effected if the necessary changes are directed within an adequate timeframe. The only changes should be which waste tanks are planned for retrieval and the small design modifications to support that plan. These changes are part of the necessary waste management actions (Section 7.0) required to support the MWTF project phase out. The impact could escalate if the time frame for the needed retrievals is pushed forward.

- Waste Generators

  Waste generators both within and outside TWRS have been successful in reducing waste output. The results of these efforts have already been incorporated in the OWVPs included within this document. Any impact to waste generators will most likely be related to terminal cleanouts of excess facilities. For these future activities, such as decommissioning and decontamination, reducing the generated waste and continuation of waste minimization efforts should be followed. If, however, available storage capacity is inadequate to support the activities of waste generators, a systems engineering approach will be applied to determine the most cost-effective path forward.

- TWRS Operations

  TWRS Operations support will be required for the retrievals and transfers that are part of the waste management actions (Section 7.0). Operational procedures, operational safety limits, and the operation safety document will require revision. Other safety basis documents may require revision as well. Suitable preparations must be made to support these actions.

- Waste Characterization Program

  Sampling of tanks targeted to increase space for waste will be required. The schedule established by the waste characterization program will require revision to support the MWTF phase out. NCAW, NCRW, TRU, and complexant waste tanks will be required to be characterized on an expedited schedule.

Tri-Party Agreement Milestones

Several Tri-Party Agreement milestones are directly affected by the project phase out as shown in Table 1.

Presently, strategies are being developed to negotiate potential changes to these milestones. In addition, a Tri-Party Agreement Change Request and Tri-Party Agreement notification letters are being developed.

TABLE 1

Tri-Party Agreement Milestones Affected by Project Phase Out

Milestone #	Title	Date	Reason
Directly Affected			
M-42-00	Provide Additional Double-Shell Capacity	12/31/1998	These milestones are the MWTF Tri-Party Agreement milestones directly affected by the ultimate path forward (page D-77, Tri-Party Agreement milestone document, see Reference 20)
M-42-01	Initiate "Hot" Operations of the MWTF 200W Area Tanks	02/28/1998	
M-42-01-T02	Initiate Construction of the MWTF 200W Area Tanks	09/30/1994	
M-42-02	Complete Construction of the MWTF 200E Area Tanks	09/30/1998	
M-42-02-T01	Initiate Construction of the MWTF 200E Area Tanks	02/28/1995	
M-42-02-T02	Complete Detailed Design of the MWTF 200E Area Tanks	01/31/1996	

7.0 PLAN OF ACTION

Waste Management Actions

The projected waste volume inventory can be managed until FY 2004 or later without the additional double-shell tank storage capacity that would have been provided by Project W-236A. Although this position is technically feasible, several waste management actions are needed to mitigate the potential shortfall of storage capacity near the end of the decade (see Reference 1). The actions are separated into several categories. Several actions require retrieval operations and additional operational procedure limits. Other actions are technical and require the performance of engineering evaluations to validate operating limits. The remaining actions, however, are a combination of both.

These waste management actions consist of the following:

7.1 Consolidate the neutralized current acid waste (NCAW)

Neutralized current acid waste is presently stored in two double-shell tanks. Tank 241-AZ-101 contains 791 Kgal and tank 241-AZ-102 contains 434 Kgal of this type of waste for a total of 1,225 Kgal (Reference 4). This total volume can be concentrated to allow storage in one tank. Therefore, combining NCAW into one tank would free up 980 Kgal of space with an estimated 500,000 BTU/hour heatload in the resulting tank. This heatload may exceed current operating procedure limits. Both tanks containing NCAW are designed for significantly higher heatload than the anticipated heatload resulting from combining the waste. However, recent operating procedures limits require lower solids loading than the level that may result from waste consolidation. Feasibility evaluations and safety assessments will be prepared before initiating NCAW consolidation. If double-shell tank retrieval is appropriate, Project W-211, Initial Tank Retrieval Systems, will be rebaselined to accomplish this action on a schedule consistent with the technical basis of the projected waste volume inventory over the next decade.

7.2 Consolidate the neutralized cladding removal waste (NCRW)

Similar to NCAW, NCRW is stored in two double-shell tanks, 241-AW-103 and -105. Tank 241-AW-103 contains 487 Kgal of solids, while tank 241-AW-105 contains 388 Kgal of solids of this type of waste for a total of 875 Kgal (Reference 4). Combining NCRW into one tank frees an additional tank. Another way of providing additional capacity is to store double-shell slurry feed (DSSF) on top of NCRW. Project W-211, "Initial Tank Retrieval Systems," has been initiated to provide the capability to mix, dilute, and remove waste stored in 10 of the 28 double-shell tanks. Tank 241-SY-101 was originally designated as the first tank to be retrieved. Project management has recently requested RL concurrence to proceed with Title I design for tank 241-AW-105 as the first tank to be retrieved instead of tank 241-SY-101, thus achieving the consolidation of NCRW no later than FY 1998/1999, (Reference 5). As stated in Reference 2, safety

issues, characterization, and environmental documentation requirements will be performed concurrently with the design activities.

7.3 Validate waste Specific Gravity numerical limit

Waste specific gravity and dilution ratio are two interdependent factors in controlling waste chemistry and avoiding a specific chemistry condition that may result in enhanced gas retention capabilities within the waste. Investigations (Reference 6) show that a waste specific gravity limit of 1.35 would preclude gas retention characteristics of the waste. Waste concentration to specific gravity values higher than 1.35 may cause unacceptable gas retention capabilities followed by periodic episodic gas release events. However, higher waste specific gravity numbers may be found to be acceptable after further investigation. Waste volume projections are highly dependent on the degree at which the various types of wastes are concentrated through the evaporator (Reference 7). Because of the highly dependent relationship, a validated technical basis for the waste specific gravity is needed. Development of this technical basis would ensure close coupling between the evaporator performance and gas retention capabilities of the waste. Part of this technical basis includes consideration of process controls (e.g., instrument error bands) to ensure that the specific gravity limit is not exceeded. In turn, the technical basis would reduce the uncertainties in the future waste volume projections and validate the numerical limit for acceptable waste specific gravity.

7.4 Evaluate evaporator feed and receiver tanks as spares

To account for a potential shortfall in the existing waste storage capacity the evaporator feed and receiver tanks may be considered as spares. Tanks 241-AW-102 and 241-AW-106 are the evaporator feed and receiver tanks respectively. Portions of these two tanks are available to store concentrated waste as long as the evaporator operations are required. These tanks could provide the required space capacity in an emergency or upset condition (e.g., a postulated scenario where a flammable gas double-shell tank leaks). Evaporator operations, however, could not resume until space in these two tanks is recovered. The objectives of this task are to validate the feasibility of this action and identify operational constraints.

7.5 Resolve complexant/transuranic (TRU) waste in 200 West Area

Complexed waste was generated in the 1970s from the B Plant strontium recovery process and subsequently stored in single-shell tanks in 200 West Area. Recent estimates indicate that the pumpable liquid in west area single-shell tanks is approximately 3.6 million gallons but may be as high as 4.4 million gallons. Approximately 40% of this liquid waste (1.4 million gallons) may be considered complexant (Reference 8). Tank 241-SY-102 is the only double-shell tank in 200 West Area designated as a staging tank to transfer the pumped waste to 200 East Area. The other two tanks, 241-SY-101 and -103 are both flammable gas watch list tanks and could not readily be considered as staging tanks to transfer the

waste from 200 West to 200 East Area. Reference 8 provides additional details on tanks 241-SY-101 and -103 and the reasons for considering tank 241-SY-102 as the only available staging tank in 200 West Area.

To reduce the amount of waste that requires more costly disposal options, complexed waste and TRU wastes have been segregated. The waste segregation was also accomplished to comply with DOE Order 5820.2a, "Radioactive Waste Management." Additionally, waste evaporation of the combined complexant and noncomplexant wastes may result in a significantly thick, viscous slurry affecting the resulting volume reduction factor and the waste volume projections (Reference 8). The objectives of this waste management action are to: 1) identify the 200 West Area single-shell tanks without compatibility concerns; 2) develop additional information required to evaluate compatibility issues of complexed and/or TRU wastes within the context of the only staging tank in 200 West Area (241-SY-102); 3) identify waste management actions to resolve this issue (these actions may range from cleaning and retrieving the TRU waste in tank 241-SY-102 to simply using it as a staging tank in its present condition); and 4) develop an emergency pumping and interim stabilization plans for the 200 West Area single-shell tanks with compatibility issues. Some tanks have not been sampled, the samples characterizing the waste must be obtained through the characterization program on a tank-by-tank basis.

The new 200 West Area tanks would not be operational in time to support resolution of this issue since they would not be available prior to FY 1999.

7.6 Tri-Party Agreement Milestones Negotiations

Several Tri-Party Agreement milestones are directly affected as a result of the project phase out (see Table 1).

A negotiation team consisting of RL and WHC personnel is being assembled to begin negotiations with the Tri-Party Agreement stakeholders. In addition, a similar team is being assembled to discuss project close-out issues with the public and other stakeholders.

Technical and administrative efforts are being planned to provide the above teams with the tools and information for timely completion of the Tri-Party Agreement negotiations. In addition, this information can be used to accurately respond to issues raised by the public and other stakeholders.

7.7 Perform a formal Decision/Risk Analysis

The objective of this action is to perform a formal decision/risk analysis in accordance with established Hanford Systems Engineering principles and procedures. The decision/risk analysis will address the overall impact of the MWTF project phase out recommendation. These impacts will encompass all of TWRS programs including, but not limited to, disposal, retrieval, privatization initiatives, storage, and

pretreatment (Reference 9). Decision analyses will be used as appropriate to develop action plans when needed to mitigate risks.

7.8 Perform OWVP Contingency Space Analysis

In Reference 1, the waste volume projections summary was based on Revision 20 of WHC official waste volume projection document (Reference 3). This summary, however, included several updates to the waste volume as given in Reference 3.

Examples of these updates discussed in the following sections:

- 7.8.1 - Continue to actively mitigate Tank 241-SY-101 via the intermittent operation of the mixer pump. Selection of active mitigation technique in lieu of passive mitigation (dilution) resulted in a reduction of waste volume projection of 1.0 million gallons. Additionally, tank 103-SY may not require passive mitigation as well, and the results will be an additional reduction of 1.0 million gallons.

- 7.8.2 - Eliminate the one contingency tank space in calculating the waste volume projection. This action resulted in a reduced demand on the double-shell tank storage system of an additional 1.0 million gallons.

Further details on the updates to the waste volume projections are outlined in Reference 1.

One objective of this action is to analyze and investigate the validity of this action and assess the impact of not having the contingency space in the OWVP calculations.

7.9 Additional Costs to Project W-058, Cross-Site Transfer System

Project W-058, Replacement Cross-Site Transfer System, has been initiated to replace the aging transfer pipe lines. This project and the new tanks project have been integrated in order to reduce overall cost. The integration of these two projects have been achieved by sharing common purpose facilities, such as power and control rooms. By phasing out the MWTF project, the new cross-site transfer system scope will be revised to provide these needed services independently of the MWTF project. Therefore, the purpose of this action is to perform a detailed estimate for the required additional costs that must be added to the baseline cost of the cross-site transfer system.

7.10 Develop Plans for Fall Back Positions

Within this waste management action, identification and evaluation of alternative and fall back options will be addressed using the decision/ risk analyses. These options may be necessary should a shortage in waste tank storage capacity occur within the next 10 years. These options will be developed in a generic format and yet in sufficient detail to enhance mitigating the risks associated with potential waste storage shortfall in the future.

8.0 PROJECT PHASE OUT ALTERNATIVES

Project phase out scenarios are presently in preparation. One of these scenarios will consider rapid project ramp down with little or no consideration for the ability to restart. Another scenario will consider the completion of the design packages, or a portion thereof, before ramping down. Cost and staffing requirements necessary to orderly phase out the project will vary, depending on the selected phase out scenario. Details regarding the MWTF demobilization planning are presently available in a draft form in Reference 10.

9.0 REFERENCES

1. Letter, W. T. Alumkal, WHC, to T. R. Sheridan, RL, "Multi-Function Waste Tank Facility Decision Paper," #9550111, dated January 13, 1995.

2. Letter, M. A. Payne, WHC, to R. F. Christensen, RL, "Current Plans for Hydrogen Mitigation Program," #9551009, dated February 24, 1995.

3. WHC-SD-WM-ER-029, Revision 20, "Operational Waste Volume Projection," September 1994.

4. WHC-EP-0182-82, Revision 82, "Waste Tank Summary for Month Ending January 31, 1995," March 1995.

5. Letter, M. A. Cahill, WHC, to B. L. Nicoll, RL, "Continuing Project 94L-EWW-211, Initial Tank Retrieval Systems," #9551250, dated March 15, 1995.

6. PNL-10417, "An Assessment of the Dilution Required to Mitigate the Hanford Tank 241-SY-101," February 1995.

7. WHC-SD-WM-TI-690, Revision 0, "Waste Volume Reduction Factors for Potential 242-A Evaporator Feed," April 1995.

8. Internal Memo, D. A. Reynolds to A. M. Umek, "Options for Pumping Complexed Waste in 200 West Area," #71330-95-001, dated March 14, 1995.

9. Letter, J. E. Kinzer, RL, to President, WHC, "Multi-Function Waste Tank Facility - Project W-236A Decision Paper," #95-TOP-027, dated March 17, 1995.

10. DRAFT, "Project W-236A Multi-Function Waste Tank Facility Demobilization Plan," March 1995.

11. WHC-SD-W236A-ER-011, Revision 0, "Position Paper, Need for Additional Waste Storage Capacity and Recommended Path Forward for Project W-236A, MWTF," September 26, 1994.

12. WHC-SD-ES-012, Revision 0, "MWTF Path Forward Engineering Analysis Technical Task 3.3 Single-Shell Tank Liquid Contents," April 1995.

13. WHC-SD-W236A-015, Revision 0, "Waste Segregation Analysis for Saltwell Pumping in the 200 West Area," April 1995.

14. WHC-SD-W236A-ES-014, Revision 0, "Multi-Function Waste Tank Facility Path Forward Engineering Analysis Technical Task 3.6, Estimate of Operations Risk in the 200 West Area," April 1995.

15. WHC-SD-W236A-ES-013, Revision 0, "Passive Versus Active Mitigation Cost Analysis," April 1995.

16. WHC-SD-W236A-ES-011, Revision 0, "Retrieval Sequence," April 1995.

17. Operational Waste Volume Projects Work Group, "Double-Shell Tank Inventory and Available Space," Revision 0, December 27, 1994.

18. Multi-Function Waste Remediation Facility, Justification of Mission Need, January 14, 1993.

19. WHC-SD-WM-ER-432, Revision 0, "Life Management of 28 Double-Shell Tanks," April 1995.

20. 89-10, Revision 3, "Hanford Federal Facility Agreement and Consent Order Fourth Amendment," January 1994.

21. Letter, A Hon to T. R. Sheridan, "Operational Waste Volume Projections - Current Data," January 4, 1995.

APPENDIX 1
BACKGROUND INFORMATION

Existing Status

In March, 1995, a Path Forward Task Team was formed to address necessary actions involved with the RL/WHC recommendation to phase out the MWTF project. This team comprises representatives from several TWRS organizations whose efforts are crucial in resolving the issues necessary for an orderly phase out. The primary team objectives are to:

- Develop a clear technical basis for the project phase out
- Identify the Tri-Party Agreement milestones affected by the tanks decision
- Define what is required for, and begin the negotiation of, changes to the Tri-Party Agreement milestones
- Develop a detailed MWTF project phase out plan
- Plan and implement Waste Management Actions necessary to support the tanks decision
- Define the impact of the project phase out on other TWRS programs

Project History

1990-1993

In 1990, the MWTF was initiated to provide additional storage capacity through the design and construction of four new, double-shell one-million-gallon tanks. This capacity was required to support continued tank farm operation, pretreatment, and disposal. The project was validated in 1991 as a 1993 Major System Acquisition with a scope of four tanks (and support facilities) at an estimated cost of $435M. The scheduled completion date was 1999. Conceptual Design was completed in 1992.

Milestones were established in the Tri-Party Agreement under the M-31 series to complete up to four tanks by 1999. In December of 1992, direction was received to achieve maximum acceleration of the MWTF, and to also reduce scope associated with the support of pretreatment and the High-Level Waste Vitrification Project.

In February 1993, the revised Justification of Mission Need (JMN) (Reference 18) provided the basis for the additional four storage tanks. The primary purposes of these tanks are dilution and storage of waste from tanks with priority safety issues such as Tank 241-SY-101.

Subsequent to this direction, additional storage capacity needs which exceeded the proposed four new tanks was identified. The additional needs, plus concerns for operational flexibility in the 200 West Area, led to a presentation in March 1993 to the U.S. Department of Energy-Headquarters (DOE-HQ), Director of Environmental Waste Management (John Tseng). This presentation proposed adding two tanks in 200 West Area, accelerating these two tanks to a 1998 completion, and reducing costs of the project through a series of specified activities to maintain a total project cost of $435M for all six tanks.

A Baseline Change Proposal was prepared to document these changes, and direction to proceed on the six-tank concept was received from RL in September 1993. Following the concurrence with the six-tank concept, a change request to modify the Tri-Party Agreement milestones was initiated. This change request was rolled into the overall renegotiation of the Tri-Party Agreement, and resulted in the current milestones established under the M-42 series.

The project scope at this time was six tanks, scheduled to be complete in 1999, with an estimated Total Project Cost of $413M.

September 1994 Position

Reviews at this time raised several issues regarding the mission, scope, and schedule of the MWTF. The decision to build new tanks, and if so how many, must address several factors, such as operational risk and needs, the amount of waste that the site will generate in the future, safety, availability of existing double-shell tanks, and impact on other projects. Operational risk and flexibility must be managed such that any identified risk is reduced as soon as practicable, and additional needed tank capacity must be made available to support operations. The retrieval of waste from single-shell tanks and watch list tanks will require subsequent storage in a double-shell tank, and therefore, will add to the total amount of waste that must be stored. The aging condition of the existing 28 double-shell tanks becomes significant as time passes. Also, other projects depend on Project W-236A (e.g., integration and use of common utilities, systems, and support facilities).

Based on the above, a new path forward was developed (Reference 11) which recommended that two new tanks were needed for safe waste storage in the 200 West Area, and they should be constructed as soon as practicable. It was also recommended that the design should continue for the tanks in the 200 East Area with a decision made by September 1995 on whether to construct them. The construction of the cross-site transfer line should proceed as scheduled.

To implement this new path forward, the following steps were recommended:

- Revise W-236A and other project baselines as required.
- Complete the Environmental Impact Statement; revise the scope as necessary.

- Complete systems engineering to validate the need and requirements for the MWTF, Cross-Site Transfer Line, and their technical bases by September 1995. The work includes:
  - Obtaining approval of the Functions and Requirements Document from the U.S. Department of Energy (DOE).
  - Developing the Technical Requirements Baseline and obtain approval from the DOE.
  - Developing a Design Requirements Document (DRD) for MWTF.
  - Comparing the MWTF DRD with the existing Functional Design Criteria.
  - Performing necessary trade studies. (These trade studies evolved into the 10 technical tasks discussed below).

Eight technical tasks were identified as part of a comprehensive strategy to provide a firm technical foundation for the MWTF recommendation (Reference 11). All of the eight tasks and results are summarized at the end of this appendix.

November 1994 OWVP Work Group

A joint work group was formed in November 1994, consisting of DOE, WHC and Ecology representatives, to review Revision 20 of the OWVP report (Reference 3). The group focused management attention on waste segregation rules and other assumptions built into the inventory management structure. The work group issued a special report on January 4, 1995 (Reference 17). The projections displayed in the report showed that projected Hanford wastes could be handled without new waste tanks, if certain compensatory actions were taken to maximize the use of available tank space. This included consideration of the success of mixing pump mitigation of the waste tank SY-101 flammable gas issue and a pending safety program conclusion that active mitigation currently has less uncertainty than passive mitigation by dilution.

January 1995 Recommendation

TWRS was asked to reassess the need for additional double-shell storage space due to funding limitations for FY 1995 and outyears. Current waste volume projections, risk associated with not having additional tanks in FY 1999 and beyond, and waste management alternatives were considered in this assessment. Based on this assessment, WHC recommended to RL that the MWTF Project be phased out (see Reference 1). This phase out should be done in such a way that the project team can be reassembled and construction completed on the two 200 West area tanks five years after a project restart decision is reached, if necessary.

Although management of the waste volume is technically feasible, this decision places some financial, programmatic, and safety risks on TWRS (see Reference 1). Key assumptions leading to this decision are provided in Appendix 2.

A comparison of existing waste volume capacity relative to the waste tank volume requirements indicate that the waste volume will overtake the space available in 1999 (see Reference 1). Therefore, waste managements actions are necessary to accommodate current waste volume projections (see Section 7.0).

March 1995 RL Concurrence

On March 17, 1995, RL concurred with the WHC recommendation (Reference 9) by responding that recent changes and analyses indicate that double-shell tank storage capacity is not needed until at least FY 2004. The waste volume in the current baseline program can be managed within the existing tank capacity until then, but with higher risks. RL directed WHC to proceed with the actions described in Reference 1 and to address the comments in attachment 2 of the RL Letter (Reference 9). RL also requested an action plan and change request to implement the recommended actions. In addition, RL directed WHC to make preparations for negotiation of changes to affected Tri-Party Agreement milestones.

Technical Task Summaries

- Optimum Safe Dilution Ratio and Specific Gravity

  The dilution ratio to prevent gas retention and allow waste transfer to 200 East Area was determined to be 1:1. The minimum safe specific gravity limit was determined to be approximately 1.35 for evaporator operation. Laboratory tests to validate dilution ratio will be conducted by July 1995. See Reference 6.

- Evaporator System Performance

  The volume of slurry needing storage at a specific gravity (SpG) of 1.35 is 6.04 Mgal. This compares with the upper bound of 5.44 Mgal of slurry indicated in OWVP Revision 20 at the DSSF slurry limit (approximately a 1.5 SpG). A net increase of slurry volume needing storage in the double-shell tanks is realized because of the evaporator endpoint change from DSSF to a 1.35 SpG limit.

  Reference 7 includes waste volume reduction factors by stream; for slurry conditions of 1.2 SpG, 1.35 SpG, and DSSF (approximately 1.5 SpG). Operating uncertainties including instrument accuracy are addressed. Planned and actual waste volume reduction factors are shown for historic 242-A campaigns.

- Single-Shell Tank Liquid Contents

  Liquid to be pumped for stabilization of single-shell tanks is 4.3 Mgal in 200 West Area and 1.8 Mgal in 200 East Area. This is 2.0 Mgal more than the amount shown in the OWVP, Revision 20.

  Flush water will also require interim double-shell tank storage of 1.6 Mgal of water until volume reduction through the evaporator can be accomplished.

A review of pumping records back to the 1970s shows that typically more liquid was pumped from tanks than would be predicted by saltcake porosity (interstitial liquid). The pure saltcake porosity does not account for liquid found in pockets or layers. A calculation was developed to account for liquid found in pockets or layers, using a "projection porosity". The data show the projection porosity of the saltcake in single-shell tanks to be on an average around .63 (see Reference 12).

- Waste Segregation Analysis

  Current estimates of waste yet to be pumped in 200 West Area are 4.3 Mgal. Up to 1.4 Mgal may be complexed waste. The only double-shell tank farm in the 200 West Area is the 241-SY farm. Two of the tanks in that farm, 241-SY-101 and -103 are on the flammable gas watch list. This makes it impractical to be considered for receipt of the pumped waste. This leaves 241-SY-102 as the only double-shell tank that can receive waste in the 200 West Area. 241-SY-102 contains a layer of sludge in the bottom which is highly TRU. Current rules, as outlined in the Waste Compatibility Program Plan, prohibit commingling complexed waste and TRU waste. The current strategy is to pump waste that can be commingled into 241-SY-102. Additional studies are being planned to decide ont he best course of action for the complexed waste in the 200 West Area. See Reference 13.

- Life Management of Existing Double-Shell Tanks

  A remaining-life assessment indicated that the double-shell tanks and their associated waste transfer pipelines should be able to maintain their integrity for the next 10-years. This is based on the assumption that normal operational controls and limits are not exceeded and that adequate, periodic inspections and additional reinforced concrete analyses do not reveal any unexpected weaknesses. Available analyses do not thoroughly address either concrete creep effects or thermal-cycling effects.

  Some double-shell tanks appear to be more sensitive to stress-corrosion cracking than the others. This means that any future in-tank waste processing in those sensitive tanks must have adequate chemical corrosion inhibition controls maintained at all times; in addition periodic liner inspections are necessary to see if any aggravated crack growth-to-leakage damage could be occurring.

  Constrictions exist in some facilities in that only one or two pipelines feed these sites; a single- or double-failure would preclude waste transfer until repair or replacement of line. See Reference 19.

- Estimate of Operational Risk

  There is a probability of experiencing difficulties in operating the 200 West Area tank farm in the next ten years. There is a high probability of encountering difficulty in managing leaking single-shell tanks containing complexed or noncomplexed waste in the near term.

Other major observations follow: 1) In general, operating the 200 West Area tank farm successfully is highly dependent on operability of the present cross-site transfer line, 2) waste volumes projections are inherently uncertain and can easily vary between plus or minus 3 Mgal, and (3 building two new 200 West Area million-gallon tanks increases our ability to manage contingencies and unplanned events

Reference 14 highlights several paths into the future and quantifies the risks and impacts for risk management consideration.

- Cost of Passive Versus Active Mitigation

  Without consideration of waste storage costs, passive mitigation appears to be slightly more cost effective than active mitigation. However, this cost advantage may change when waste storage costs are considered. For details see Reference 15.

- Waste Retrieval Sequence

  Reference 16 documents the waste retrieval study. The study found that the decision to phase out the MWTF project will not have a significant impact on the retrieval sequence.

APPENDIX 2
ASSUMPTIONS

The decision to phase out the MWTF project is based on the following assumptions:

1. Wastes in NCAW tanks can be consolidated.

   Combining NCAW into one tank frees up nearly .98 Mgal with an estimated heat load of 500,000 BTU/hour, possibly exceeding the current operating limits. The tanks were designed for significantly higher heat loads but current operating plans require lower solids loading.

2. Wastes in NCRW tanks can be consolidated.

   Combining the NCRW solids into one tank or storing concentrated DSSF on top of NCRW will provide .98 Mgal additional tank capacity. The capability to transfer NCRW solids does not exist at this time. Capital upgrades would be required to provide this capability.

3. Active mitigation of flammable gas watch list tanks is acceptable.

   The ongoing active mitigation of 241-SY-101 and the contingency plan for installation of mixer pumps in 241-SY-103 and 241-AW-101 if required, must continue to be an acceptable mitigation action for this safety issue (Reference 2). No passive mitigation by dilution of any hydrogen safety issue will be required.

4. The evaporator operating tanks can be used for spare capacity.

   Tanks 241-AW-102 and -106, used to support the 242-A Evaporator operations, are the feed and receiver tanks. A portion of the feed and the receiver tanks is available to store concentrated waste material as long as evaporator operations are required.

   These tanks could provide additional emergency capacity for situations such as a flammable gas double-shell tank leak. The negative effect of this is no evaporator operations would be allowed until the tank space is made available.

5. The waste incompatibility issue for tank 241-SY-102 will be resolved allowing the pumping of complexant single-shell tank liquids.

   Complexed waste liquid is considered incompatible with the high transuranic sludge in 241-SY-102 because it may dissolve the transuranics. If the complexed waste liquid dissolved the transuranics it would increase disposal costs and could lead to processing problems in the evaporator. Waste sampling and an engineering study are required to determine which single-shell tanks contain complexed waste and evaluate the options for handling the complexed waste. Any tanks determined to be complexed should first be evaluated for dissolution of transuranics from

241-SY-102 solids, and detrimental crystal behavior and high viscosity resulting from evaporation. Then the engineering study should evaluate the options and associated impacts for handling the complexed waste. These include complexed waste which does not dissolve the transuranics, accepting increased operating costs and risks from complexed waste which does dissolve the transuranics, and cleaning out 241-SY-102 before transferring any complexed waste. Determination of a complexant handling strategy will increase the capability of using 241-SY-102 for waste collection and transfers.

6. The existing cross-site transfer lines are adequate to transfer wastes from 200 West Area to 200 East Area until the replacement transfer line is operational in 1998.

   Two of the original six cross-site transfer lines built in the 1950's remain in service. The two remaining lines will be tested this year for leaks. These lines are required to transfer 241-SY-102 waste as well as the single-shell tank pumpable liquid waste.

7. Waste management actions for reducing TWRS risk will be deemed adequate by the Tri-Party Agreement negotiating parties.

   An agreement with the Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy to eliminate the construction of additional tanks and to accept an increased level of programmatic risk is required to complete the shutdown of the MWTF project. It is assumed that the waste management actions for reducing TWRS risk will be deemed adequate by the negotiating parties.

8. No double-shell tank problems will occur that limit their use.

   The life management activities for the double-shell tank waste storage system will ensure an adequate remaining life (minimum 10 years) for the double-shell tanks with no problems limiting their use. Any unexpected problems with the existing double-shell tanks could significantly increase the programmatic risk.

9. Adequate storage capacity will continue to exist in the 200 East Area.

   Any actions needed to ensure adequate storage space in the 200 East Area to accept 200 West Area tank farm waste will be implemented. The continued operation of the 242-A Evaporator to reduce waste volumes and the potential use of the evaporator operating tanks as spare capacity are included in this assumption.

APPENDIX 3
SPECIAL WASTE VOLUME PROJECTION
IN SUPPORT OF THE MWTF CANCELLATION EVALUATION

Operational Waste Volume Projection, Revision 20 was issued in September 1994 (Reference 3). Since its issue, studies (Reference 1, 21) have been conducted to assess alternative scenarios for operating the tank farms, with special emphasis on operating without constructing new tanks at least through 2004. Reference 9 requested a special long range waste volume projection that would incorporate the latest facility waste generation rates, draft information provided by the MWTF path forward tasks and many of the space saving actions proposed in Reference 1. This letter presents the operational planning basis and graphics for the special waste volume projection completed in response to this request.

The Waste Volume Projection (WVP) system is a complex system simulation which was developed to assist in managing the tank farms and identifying if new tanks were needed. It was relied heavily upon during the evaporator outage to assist in managing the generation and receipt of waste so that available space was not exceeded.

The WVP system simulates the evaporator operation, the 28 double-shell tanks, and the associated transfer systems. It takes into account the effects of chemistry, mass, volume and operational logistics to evaluate various operational scenarios. Although any simulation is dependent upon the correctness of the input information, this projection is based upon the best estimates of waste generation and composition provided by the waste generators. The special WVP has shown that it is possible to manage the double-shell tanks in such a way as to not require the construction of any new double-shell tanks before 2006. A specific set of actions is identified which will allow this to be done. These are discussed in the discussion of planning basis section below.

Attachment 1 presents an executive summary of the operational planning basis for DOE Special Projection L9503A. For comparison purposes, the basis used for the July 1994 Baseline Case (L947BC) has been included. Plans that have been changed between the projections have been shaded.

Attachment 2 presents a detailed operational planning matrix comparing the plans used in DOE Special Projection L9503A with those used for the July 1994 Baseline Case. Flush factors and Waste Volume Reduction Factors (WVRFs) have been included in the table.

Attachment 3 is the standard long range projection graphic for this special projection depicting tank needs through 2006. Tank needs are shown for both the 1.35 (estimated) and 1.5 specific gravity end points for evaporation.

Attachment 4 is a bar graph showing waste inventory and available space for different waste categories. This presentation of the information was used in Reference 21 and has been found to increase understanding of the details of space usage. Numerical annotations and notes have been included with this graphic explaining inventory changes.

Attachment 5 is a spreadsheet that attempts to summarize the waste additions, evaporations, and losses that occur during this projection. This spreadsheet attempts to approximate the waste changes on an annual basis even though these changes may be occurring at the end of a fiscal year (FY).

Attachment 6 is a tabular representation of space usage similar to Table 2 of Reference 1.

Discussion Planning Basis. Major planning changes are discussed below:

1. Combination of partially full separate NCAW and NCRW tanks.

   The in-tank washing scenario used in this projection assumed that the NCAW solids from Tanks 241-AZ-101 (35 Kgal of solids) and 241-AZ-102 (102-AZ) (95 Kgal of solids) would be combined into Tank 102-AZ after in-tank washing of the solids had been completed (FY 1999). The NCAW supernates and washes were assumed to be concentrated and combined into Tank 241-AY-101.

   The PFP TRU (PT) solids in Tank 241-SY-102 (143 Kgal PT); the NCRW solids from Tank 103-AW (487 Kgal PD); and the NCRW solids from Tank 241-AW-105 (388 Kgal PD) were all consolidated into Tank 241-AW-103 during FY 1999. Tank 241-AW-103 contained 1018 Kgal of solids after the combinations had been completed which could complicate solids retrieval.

2. Mitigation of Watch List Tanks.

   Active mitigation of Tank 241-SY-101 was continued through FY 2006. In addition, it was assumed that passive mitigation of other watch list flammable gas double-shell tanks would not be necessary.

3. Spare Space.

   Operational space in Tanks 241-AW-102 and 241-AW-106 was used to provide 0.72 Mgal of the required 2 Mgal of spare space starting in FY 1999. This action was taken to decrease tank space needs. This action would require that special procedures be written to make certain that the required volume was being maintained and that proper sequence of operations would allow this space to be used should a leak occur in a double-shell tank.

4. Use of Tank 241-SY-102 for pumping complexed SWL.

Current SWL pumping practices require that a double-shell tank be available for receiving the liquid wastes pumped out of single-shell tanks. SWL pumping in the 200 West Area requires that one of the three tanks located in the 200 West Area be used as a receiver tank. Two of the tanks in 200 West Area (Tanks 241-SY-101 and -103) are on the flammable gas watch list and therefore cannot receive waste additions. This means that all SWL pumped in the 200 West Area will be routed through Tank 241-SY-102.

Tank 241-SY-102 contains a sludge layer of PT solids. Pumping non-complexed SWL to Tank 241-SY-102 with the PT solids in the bottom should not present a problem. However, complexed wastes and TRU solids have been segregated both to minimize the expense of disposal and to comply with DOE Order 5820.2A. This required the solids in Tank 241-SY-102 be removed from the tank prior to pumping of complexed SWL in the 200 West Area (see item 1 for additional information). Questions about the reliability and/or plugging of current transfer lines and the long-lead time required for retrieval projects would delay the retrieval of the solids until December 1998. After consulting with retrieval organizations, this projection assumed that the retrieval of solids in Tank 241-SY-102 would start in December 1998 and be completed in one month using the new cross-site transfer line. The pumping of complexed SWL was started in January 1999. This date allows all SWL to be completed by the end of FY 2000. WHC is investigating accelerating 241-SY-102 retrieval and alternative methods of dealing with the 200 West Area SWL including sampling of the liquors to confirm their classification, relaxing of the segregation rules, and initiating transfers from smaller available tanks. The purpose of these studies is to advance the completion of SWL pumping as much as possible. By so doing we are confident that SWL pumping can be completed before the end of FY 1999.

5. Cross-site transfer lines.

Per the request for this projection, cross-site transport of wastes from 200 West Area to 200 East Area is assumed to be available.

6. Contingency space.

At the request of DOE and WHC upper management, previous operational waste volume projections have added one tank of contingency space in the long range portion (1999 on) to account for any inaccuracies in waste generation rates or in the determination of WVRFs. The contingency tank has been removed (References 1 and 9) from this projection.

7. SWL Volumes.

Based on preliminary information from the MWTF Path Forward Task Studies, this projection assumed that 6.2 Mgal (previously 3.6 Mgal) of single-shell tank wastes would be pumped from 1995-2000. Approximately 42% of this waste was assumed to be complexed resulting in 2.6 Mgal of complexed SWL (previously 0.5 Mgal). The newly revised WVRFs (to DSSF) was 55 for non-complexed SWL and 10 for complexed SWL. The revised WVRF for non-complexed SWL is based on an estimated SWL content in Tank 101-AN and needs to be verified in the future when more single-shell tanks have been characterized.

8. Facility Generation Rates.

The total facility generation rate used in this projection varied from approximately 18.9 to 34.6 Kgal/month (previously 93 Kgal/month for the July 1994 Baseline Case).

9. Preliminary Multi-Function Waste Tank Facility (MWTF) Path Forward Task.

Preliminary information obtained from the MWTF Path Forward Tasks were included in these projections. The most significant of these items were increased SWL pumping volumes (see item 7) and new WVRFs (new values are included for appropriate waste streams in Attachment 2).

10. Privatization.

TWRS Program privatization concepts are not included in this study. However, it is currently believed to have no negative impact.

11. Pretreatment.

At the time this projection was started, final information had not been received designating which tanks of waste would be pretreated first. This projection assumed that pretreatment would begin with wastes that were at the desired 5 M Na concentration. Using this logic frees up tank space faster since the feed doesn't require dilution prior to pretreatment. Tanks 241-AN-106 and 241-AP-105 were pretreated in FY 2005.

Next the wastes in Tanks 241-AW-101, 241-AN-104, and 241-AN-105 were pretreated in FY 2006 to decrease the flammable gas watch list waste inventory. Pretreating these wastes in 2006 is compatible with a 6 Mgal/Yr (5 M Na feed) pretreatment rate since these tanks will require some dilution:

Tank	Inventory (Kgal)	Concentration Na, M
241-AW-101	1127	~10.
241-AN-104	1060	~ 7.85
241-AN-105	1127	~ 7.85

As in the July 94 Baseline Case projection, it was assumed that one Low Level Waste (LLW) receipt tank and one High Level Waste (HLW) receipt tank would be required in FY 2005. An additional LLW receipt tank was added in FY 2006.

12. Single-Shell Tank Solids Retrieval.

The amount of solids retrieved in FY 2004 and 2005 was the same as that used in the July 1994 Baseline Case projection: 0.2 Mgal of solids in 2004 and 0.3 Mgal of solids in 2005. The amount of solids retrieved in 2006 had to be reduced to 1.0 Mgal to reduce double shell tank need to the available 28 double shell tanks.

Discussion of Projection Results

The graphic shown in Attachment 3 indicates that tank space needs can be managed within the available tank space provided the consolidation of NCAW tanks and NCRW tanks can be completed as outlined in item 1 above. Because of the lead time for retrieval systems to allow consolidation of the waste and the needs of interim stabilization, there is a pinch point in 1999 which will have to be closely managed.

As currently modeled, all four aging waste tanks are filled with high-heat wastes during 1997 and 1998. This leaves us without a spare tank for high-heat wastes in the event of a leak in one of these tanks. We are exploring possible scenarios which will allow us to avoid this condition and believe that a number of solutions can be developed which will lower this risk.

This projection was completed before the MWTF special studies had been finalized and was completed with preliminary information. It is likely that planning changes will occur before the OWVP, Rev. 21 projection is completed:

1. The WVRF for non-complexed SWL provided on 3/14/95 was 55. It is likely that this value will be changed to 47. This would increase our tank space requirement by approximately a third of a tank by the end of 2000.

2. The retrieval of Tank 241-SY-102 solids was completed in December 1998. It is possible that this date could be pushed forward if funds were available.

Table 1. Summary Comparing the 7/94 Baseline and DOE Special Projection Cases

Facility or Project	Baseline Case (L947BC) - Plans	DOE Special Case (L9503A) - Plans
Total Monthly Facility Generations	93 Kgal/month	18.9-34.6 Kgal/month
PUREX TCO	TCO FY94-97 (0.4 Mgal dbSSF)	TCO FY94-97 (0.225 Mgal dbSSF)
B Plant TCO	TCO FY97-01 (0.56 Mgal DN)	TCO FY97-01 (0.450 Mgal DN)
100 Area TCO	TCO FY95-99 (0.57 Mgal DSSF)	TCO FY95-99 (2 Mgal DN for 100K & 100N)
Evaporator Restart	04/1994; LERF 13 Mgal	04/1994; LERF 13 Mgal
Effluent Treatment Facility Startup Rate TOE	06/1995 150 gpm 70%	03/1996 Unofficial TPA change 150 gpm 70%
Single-shell tank Stabilization Porosity Complexed SWL, Kgal Volume Pumped	35% 0.5 Mgal 3.6 Mgal by end of FY 2000	65% (Delay West Area complexed) 2.6 Mgal 6.2 Mgal by end of FY 2000
PFP Stabilization Volume	561 Kgal	70 Kgal
Grout	No Restart--Use Grout Feed Tanks	No Restart--Use Grout Feed Tanks
Tank 101-SY Dilution (Date)	1:1 Dilution (FY 1998)	None
Tank 103-SY Dilution (Date)	1:1 Dilution (FY 2000)	None
Single-shell Tank Solids Retrieval 106-C solids (start; receiver tank) SST Solids Retrieval Start Rate SST Waste Retrieval Complete SST Site Closure Complete	FY 1997; Tank 102-AY 09/2003 0.2 Mgal (0.8 Total) in FY 2004; 0.3 Mgal (1.2 Total) in FY 2005 FY 2018 FY 2024	FY 1997; Tank 102-AY 09/2003 0.2 Mgal (0.8 Total) in FY 2004; 0.3 Mgal (1.2 Total) in FY 2005 FY 2018 FY 2024
LLW Pretreatment Facility startup	12/2004	12/2004
LLW Operational Tanks	3 in FY 2005; 4 in FY 2006	3 in FY 2005; 4 in FY 2006
LLW Vitrification	06/2005; 2 Mgal DSSF in 2005	06/2005; 2 Mgal DSSF in 2005
In-Tank Washing (FY 1995-2000)	Consolidate Washed 101-AZ & 102-AZ solids. Consolidate all NCAW supernates.	Consolidate Washed 101-AZ & 102-AZ solids. Consolidate all NCAW supernates.
HLW Enhanced Sludge Washing	06/2008	06/2008
HLW Vitrification startup	12/2009	12/2009
Evaporation Limit for Wastes--SpG	1.5	1.35 (estimated)
New Tanks in West Area	2 in 02/1998	None
New Tanks in East Area	4 in 12/1998	None
Contingency Tank	One starting FY 1999	None
Retrieve Tank 102-SY Solids Consolidate NCRW Solids	No No	Yes (12/1998) Yes (FY 1999)

Attachment 2
Table 2. Operational Planning Matrix
Comparison of 7/94 OWVP Baseline Case & DOE Special Projection
(All Years are Fiscal Years)

	7/94 OWVP Baseline Case	DOE Special L9503A Case
Facility Generations		
Total Limit, Kgal/mo	93	18.9-34.6
PUREX		
Monthly Rate, Kgal/mo	0	0
TCO Scheduled	1994-1997	1994-1997
TCO Volume, Kgal	400 dDSSF	225 DN
Flush for TCO	10%	10%
WVRF for TCO (to DSSF)	65	99
UO_3 Facility		
Monthly Rate, Kgal/mo	0	0
B Plant		
Monthly Rate, Kgal/mo	23	5 (1995-2001)
Monthly Rate, Kgal/mo	N/A	0.5 (2002-2028)
Flush for misc. waste	5%	0%
WVRF for misc. waste (to DSSF)	91.5	99
TCO Scheduled	1997-2001	1997-2001
TCO Volume, Kgal DN	562	450
Flush for TCO	5%	10%
WVRF for TCO (to DSSF)	91.5	99
S Plant		
Monthly Rate, Kgal/mo	18	1.7 to 2.5
Flush for misc. waste	6%	22%
WVRF for misc. waste (to DSSF)	98	99
T Plant		
Monthly Rate, Kgal/mo	15	0.13 to 15
Flush for misc. waste	6%	22%
WVRF for misc. waste (to DSSF)	97	99
100 Area		
Monthly Rate, Kgal/mo	0	0
100-N		
TCO Scheduled	1995-1999	1995-1996
TCO Volume, Kgal	571 DSSF	1500 DN
100-K Basin Cleanout		
TCO Scheduled	None	1998
TCO Volume, Kgal	0	530
105-F & 105-H Basin		
Total in 1995-96, Kgal	225	225
Flush for ALL 100 Area Waste	44%	44%
WVRF for ALL TCO waste (to DSSF)	97	99

Table 2. Operational Planning Matrix
Comparison of the 7/94 OWVP Baseline Case & DOE Special Projection
(continued)

	7/74 OWVP Baseline Case	DOE Special L9503A Case
300 Area		
Monthly Rate, Kgal/mo	5	1.6
Flush for misc. waste	44%	44%
WVRF for misc. waste (to DSSF)	98	94
400 Area		
Monthly Rate, Kgal/mo	1	0.5
Flush for misc. waste	44%	44%
WVRF for misc. waste	98	94
WSCF		
Monthly Rate, Kgal/mo	0.7	0.0
Tank Farms		
Monthly Rate, Kgal/mo	30	10
WVRF for flushes (to DSSF)	99	99
Solid Waste Mixed Waste Trench 31 Leachate		
Monthly Rate, Kgal/mo	0	0
WVRF (to DSSF)	95	99
Tank 107-AN Caustic Addition		
One Time Addition in 1995, Kgal	50	50
Salt Well Liquid Pumping		
Total Volume remaining, Mgal	3.6	6.2
West Area Receiver	Tank 103-SY	Tank 102-SY
Start Complexed SWL in 200W	1995	1999
Completion, FY	2000	2000
Meets TPA Milestones	Yes	No
Total Dilute Complexed SWL, Mgal	0.5	2.6
Porosity (apparent)	35%	65%
Flush for SWL Pumping	10%	25%
WVRF for non-complexed (to DSSF)	32	55
WVRF for complexed (to DSSF)	14	10
Single-Shell Tank Solids		
Tank 106-C Retrieval	1997	1997
SST Waste Retrieval Demo	2003	2003
Tank Farm Closure start	2018	2018
Retrieval Dilution Ratio	3:1	3:1
Vol. retrieved in 2004(Mgal)	0.2	0.2
Vol. retrieved in 2005(Mgal)	0.3	0.3
Meets TPA Milestones	Yes	Yes
No. SSTs Retrieved	149	149
Sludge Retrieved (Mgal)	12.2	12.2

Table 2. Operational Planning Matrix
Comparison of the 7/94 OWVP Baseline Case & DOE Special Projection
(continued)

	7/94 OWVP Baseline Case	DOE Special L9503A Case
Low Level Waste (LLW) Pretreatment Facility		
Includes New Evaporator	Yes	Yes
Start Construction(mo/yr)	11/1998	11/1998
Constr. complete(mo/yr)	12/2003	12/2003
Hot Start	12/2004	12/2004
Complete processing(mo/yr)	12/2028	12/2028
TWRS completion date	2020	2020
Starting Feed	DSSF/SST Saltcake	DSSF/SST Saltcake
Rate(12/2004-6/2007),Mgal/yr	6	6
LLW Feed Tank (filled)	1	1
LLW Receipt Tanks; 2005	1	1
LLW Receipt Tanks; 2006 on	2	2
HLW Receipt Tanks; 2005 on	1	1
Saltcake Retrieved (Mgal)	23.4	23.4
LLW Vitrification Facility		
Start Construction(mo/yr)	12/1997	12/1997
Constr. complete(mo/yr)	12/2003	12/2003
Hot Start	06/2005	06/2005
Complete vitrification	12/2028	12/2028
Characterization time per tank	0.5 year	0.5 year
Rate (6/2005-6/2007),Mgal/yr	6	6
Vol. vitrified 2005, Mgal	2	2
In-Tank Washing		
Start	11/1994	9/1995
Scenario #	Case 2	Case 2
Basic description of solids combination.	Combine washed 101-AZ & 102-AZ solids.	Combine washed 101-AZ & 102-AZ solids.
High Level Waste (HLW) Pretreatment (Enhanced Sludge Washing)		
Start Construction(mo/yr)	06/2001	06/2001
Hot Start(enh. sludge wash)	06/2008	06/2008
Complete processing	12/2028	12/2028
HLW Vitrification Facility		
Start Construction(mo/yr)	06/2002	06/2002
Constr. complete(mo/yr)	12/2007	12/2007
Hot Start	12/2009	12/2009
Complete vitrification	12/2028	12/2028
Characterization time per tank	1.5 years	1.5 years
Production rate (metric ton/day)	20	20

Table 2. Operational Planning Matrix
Comparison of the 7/94 OWVP Baseline & DOE Special Projection
(continued)

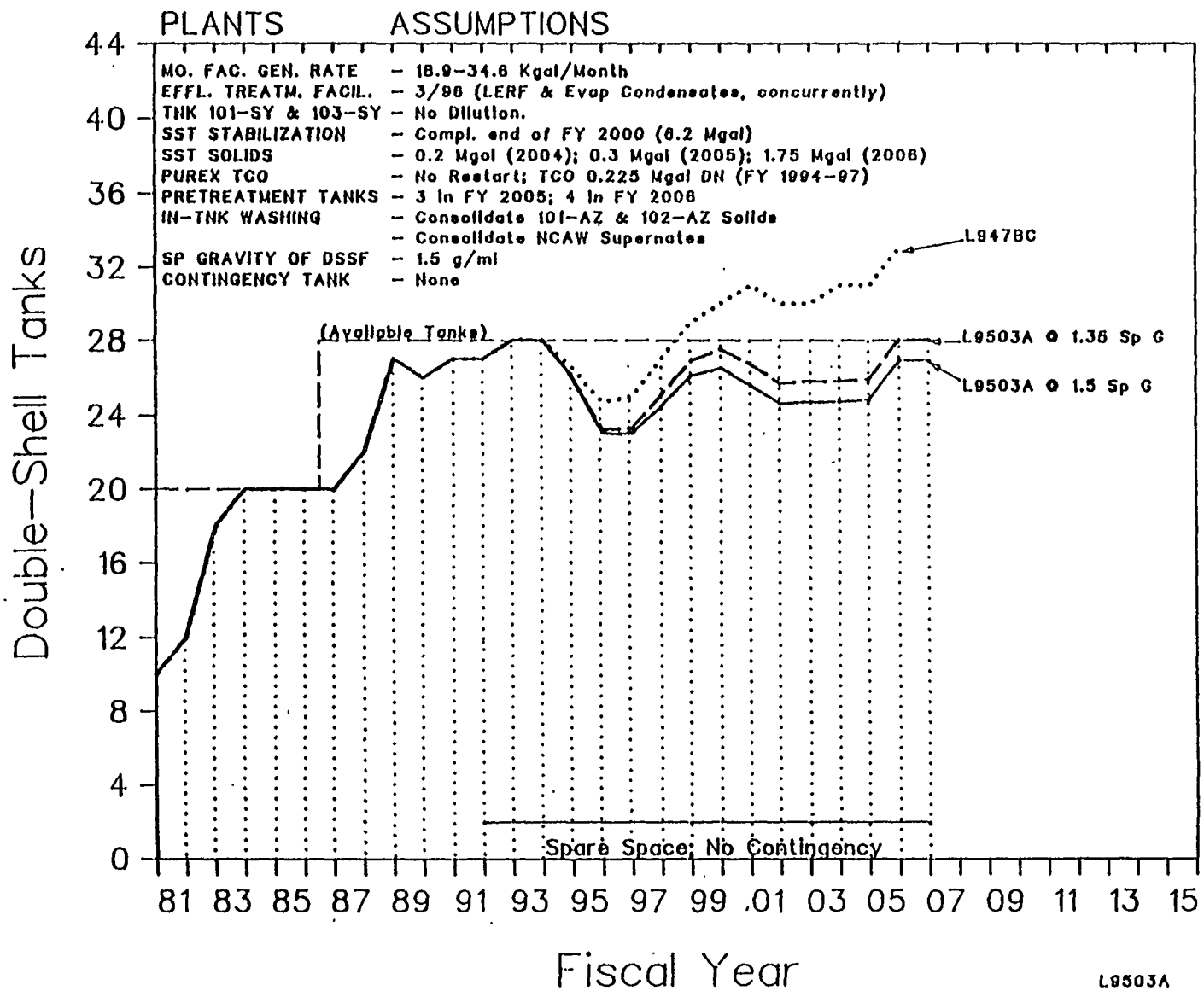
	7/94 OWVP Baseline Case	DOE Special L9503A Case
PFP Stabilization		
Start	1998 on	1995-2006
Volume, Kgal	561	70
Flush	6%	22%
WVRF	63	81
Evaporator		
Next Outage Date	>2005	>2005
Evaporation Product	DSSF	dDSSF
Evaporation Limit (g/ml)	1.52	1.35 (estimated)
LERF capacity (Mgal)	13	13
Gal. condensate/gal. WVR	1.3	1.3
Yearly evaporation of DN (i.e., maintain currency)	Yes	Yes
Liquid Effluent Treatment Facility		
Start date (mo/yr)	06/1995	03/1996 (requested TPA change; not official yet)
Rate	150 gpm	150 gpm
TOE	70 %	70 %
Watch List/Safety		
101-SY Dilution & date	1:1 (1998)	None
103-SY Dilution & date	1:1 (2000)	None
Spare/Contingency Space		
Spare Space, Mgal	2.28	2.28
Use Operational space in 106-AW as part of spare space	No	Yes (0.72 Mgal)
Contingency space, Mgal	1.14	None
-date	(1999 on)	N/A
Waste Segregation		
Loss of Waste Segregation	No	No
Store DSSF on NCRW solids	No	No
Segregate Complexed wastes	Yes	Yes
Loss of DST Space		
Number Tanks Removed from Service	None	None
Date Tank Removed	N/A	N/A
New DST Construction		
New West Area Tanks	2	None
Date Constructed	2/98	N/A
New East Area Tanks	4	None
Date Constructed	12/98	N/A

Table 2. Operational Planning Matrix
Comparison of the 7/94 OWVP Baseline & DOE Special Projection
(continued)

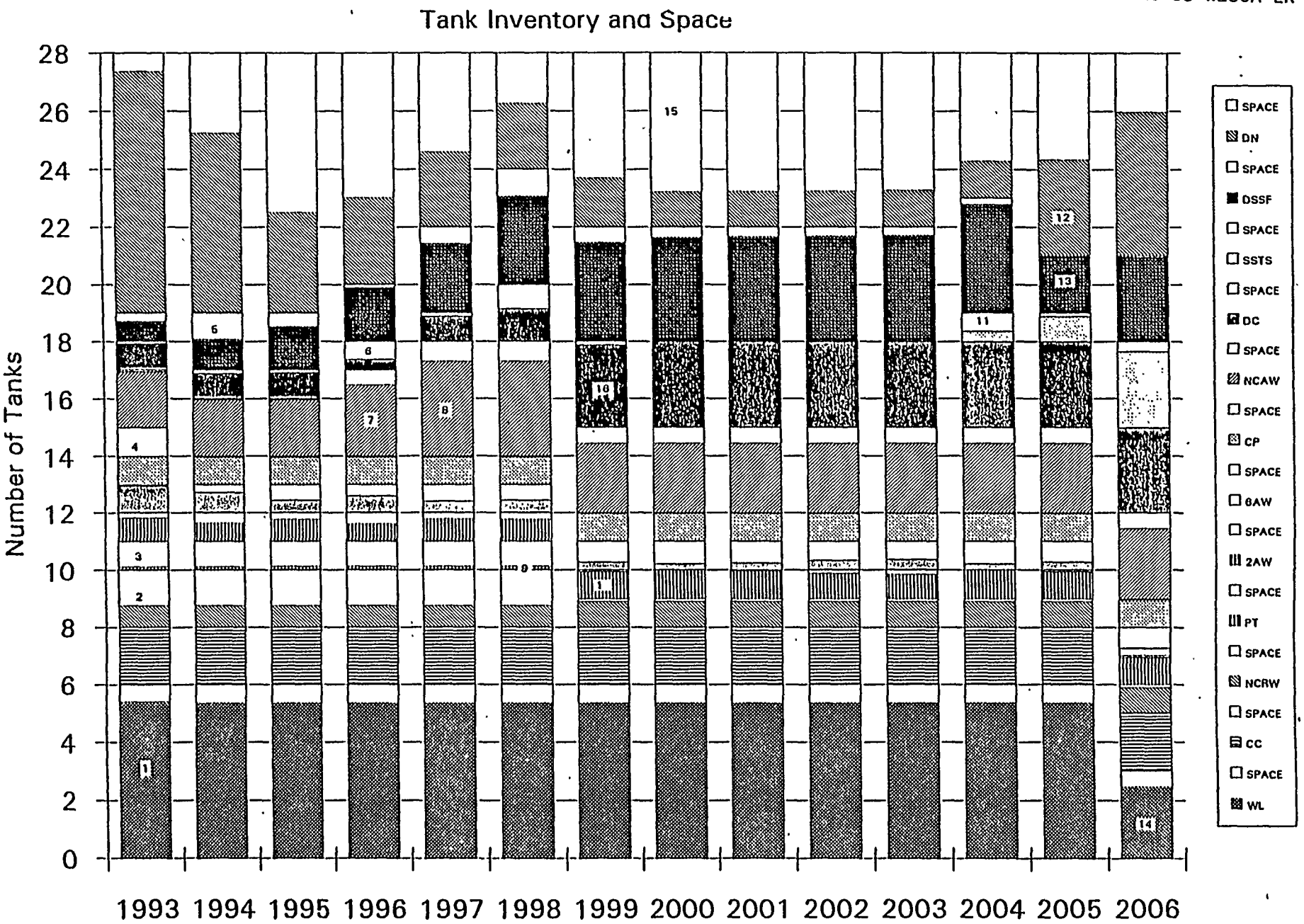
	7/94 OWVP Baseline Case	DOE Special L9503A Case
DST Retrieval		
Retrieval of 102-SY solids to allow complexed SWL pumping	None	Yes (12/1998)
Consolidation of NCRW solids in 103-AW & 105-AW	None	Yes (9/1999)

Attachment 3

L9503A (3/95 DOE SPECIAL) VS 7/94 BASE CASE



Attachment 4



General Information for "Tank Inventory and Space" Graphic--L9503A

This bar chart graphic is meant to show the increase and decrease in the various waste categories or waste types for DOE Special Projection L9503A. Tank space needs for "in-tank washing" have been included. Spare and pretreatment receipt tanks are not shown. Beginning in 1999, a portion of the evaporator operational space maintained in tanks 241-AW-102 and -106 will also be considered as spare space to decrease tank space needs. Dilution of tanks 241-SY-101 and -103 are not included in this projection through FY 2006. Levels of Dilute Noncomplexed waste (DN) in the dilute receiver and evaporator tanks will vary with time. The bar for each year depicts the tank space needs for the end of that fiscal year.

Numbered Comments for "Tank Inventory and Space" Graphic

1. "Watch List" tank inventories are constant from 1995-2005. It is assumed that complexed saltwell liquid pumping in 200 West Area would be added to Tank 241-SY-102 after the PT solids were retrieved (see note 9).

2. Space above NCRW solids is routinely used to store DN waste. For clarity, the graph shows this DN inventory in with the other DN inventory toward the top of the graph. (i.e., to ascertain "free" space, add the space shown in the NCRW group to that shown in the DN group).

3. Space above PT solids is used to store DN waste, (see note 2).

4. In 1994 there is a step change in the space in the Concentrated Phosphate (CP) group (two tanks). In 1993 the CP waste occupies part of two tanks. In 1994 the material is combined so that it occupies only one tank; the space freed is then added to the DSSF group in 1994. This represents a transfer of a small amount of CP waste from tank 241-AN-106 to tank 241-AP-102. In 1994, tank 241-AN-106 was used to store DSSF.

5. The DSSF group shows increases in available space over time (e.g., 1994). When a DSSF tank becomes full, a new tank must be added, which obviously has empty space in it. This is shown graphically year-to-year with step increases in the number of DSSF tanks and variations in the available space shown in the group. Increase in DSSF volumes occur due to saltwell liquid (SWL), evaporated dilute wastes, and terminal cleanout (TCO) wastes.

6. In 1996 there is an increase in space above the dilute complexed (DC) waste inventory. This results from pumping the DC waste from tank 241-AY-101 (980 Kgal) to tank 241-AP-103 (1140 Kgal), thus creating more net headspace. Reduction in the DC waste inventory in 1996 is caused by an evaporation. Evaporation is necessary to prevent overfill of tank 241-AP-103. Projection L9503A included approximately 2.1 Mgal of additional complexed SWL as compared to the previous projection for the July 1994 OWVP.

7. The increase in NCAW inventory and tank needs starting in 1996 were caused by in-tank washing of the NCAW solids. The final result of the operations were completed by the end of FY 1999 and included:
   - Washed NCAW solids from tanks 241-AZ-101 and -102 were combined into tank 241-AZ-102.
   - NCAW supernates and washes were evaporated and combined into tank 241-AY-101.
   - Tank 241-AZ-101 was "freed up" by the end of FY 1999 and used as aging spare space/dilute receiver.

8. Increase in NCAW inventory in 1997 results from the retrieval of tank 241-C-106 solids to tank 241-AY-102. These are high-heat solids that have been added to the NCAW waste category (must be stored in aging waste tanks, e.g., tank 241-AY-102).

9. The PT solids from tank 241-SY-102 were cross-site transferred to tank 241-AW-103 beginning December 1998. Therefore, the PT waste category and space are eliminated by the end of FY 1999.

10. NCRW solids from tank 241-AW-105 were retrieved to tank 241-AW-103 in FY 1999. This resulted in a decrease in NCRW tanks by one tank by the end of FY 1999. Tank 241-AW-103 would contain 1018 Kgal of solids after the solids in tanks 241-AW-103, 241-AW-105, and 241-SY-102 have been consolidated.

11. Retrieval of single-shell tank solids was started in FY 2004 in TX tank farm. Initial single-shell tank solids will be stored in tank 241-SY-102.

12. The increase in stored DN in 2005 caused by retrieval of single-shell tank solids with 3:1 retrieval water; some of retrieval water is being stored prior to evaporation.

13. Decrease in DSSF inventory in 2005 results from pretreatment and vitrification of 2 Mgal of DSSF.

14. Decrease in watch list inventory and tank needs in 2006 results from pretreatment and vitrification of 3.3 Mgal of DSSF from the watch list category (tanks 241-AW-101, 241-AN-104, and 241-AN-105).

15. Years 2000-2004 appear nearly constant in DSSF and DN inventory and total waste inventory. By the end of FY 2000, all SWL pumping and Hanford facility terminal cleanouts have been completed. Only nominal volumes of very dilute waste are being received, which is reduced by the evaporator with little generation of DSSF.

16. Increase in DC inventory caused by pumping of complexed SWL in 200 West Area after the solids have been moved out of tank 241-SY-102 (December 1998).

Attachment 5

SECTION 3 T9503A1.WR1---created from T947BC3.WR1 (DOE SPECIAL)
20-Apr-95 2AZ IN--OTHER HEADSPACE NOT ACCOUNTED FOR
03:14 PM

FISCAL YEAR----->	9/30/93	9/30/94	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BASELINE SPACE UTIL														
STARTING INVENTORY	25507	22992	22992	20252.	20117.	21727.	22379.	23291.	23068.	23131.	23178.	23240.	23743.	24525.
SPARE SPACE	2280	2280	2280	2280	2280	2280	2280	2280	2280	2280	2280	2280	2280	2280
CONTINGENCY SPACE		0	0	0	0	0	0	0	0	0	0	0	0	0
WATCH LIST TANK SPACE AVAIL.	673	726	726	726	726	726	726	726	726	726	726	726	726	726
SEGREGATED SPACE AVAIL.	1038	605	584	2094.7	1557.5	1405	581.75	447	447	447	447	447	447	447
PRIORITY/OPERATIONAL AVAIL.	1174	1641.	2183	2117	2087	2251	2548	2891	1878	1854	1799	1399	3630	3630
MISC. HEADSPACE AVAIL.	194	66												
NEW WASTE ADDITIONS														
PUREX MISC.			0	0	0	0	0	0	0	0	0	0	0	0
UO3			0	0	0	0	0	0	0	0	0	0	0	0
B PLANT			60	60	60	60	60	60	60	5	5	5	5	5
S PLANT			20	25	30	30	30	30	30	30	30	30	30	30
T PLANT			28	37	47	49	68	89	112	135	180	180	180	180
300 AREA			19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
400 AREA			6	6	6	6	6	6	6	6	6	6	6	6
WSCF			0	0	0	0	0	0	0	0	0	0	0	0
TANK FARM (LINE, ALC)			120	120	120	120	120	120	120	120	120	120	120	120
EVAPORATOR FLUSHES			70	70	70	70	70	70	70	70	70	70	70	70
PFP LAB W/ SOLIDS			6	6	7	7	7	7	6	6	6	6	6	6
TK 101-SY DILN/RETRVAL			0	0	0	0	0	0	0	0	0	0	0	0
TK 103-SY DILN/RETRVAL			0	0	0	0	0	0	0	0	0	0	0	0
TK 106-C SOLIDS RETRVAL			0	0	800	0	0	0	0	0	0	0	0	0
PUREX TCO (94-97) W/ FLUSH			124.3	124.3	0	0	0	0	0	0	0	0	0	0
B PLANT TCO (97-2001) W/ FLUSH			0	0	99	99	99	99	99	0	0	0	0	0
100N TCO (95-99) W/ FLUSH			1241.2	1241.2	0	0	0	0	0	0	0	0	0	0
PFP STABILIZATION			0	0	0	0	0	0	0	0	0	0	0	0
SWL PUMPING W/O FLUSH			99	1432	1500	1428	1265	513	0	0	0	0	0	0
IN-TANK WASHING OF 101-AZ			0	0	0	0	1000	0	0	0	0	0	0	0
SST SOLIDS RETRVAL			0	0	0	0	0	0	0	0	0	800	1200	4000
100 AREA F&H			112	112	0	0	0	0	0	0	0	0	0	0
107-AN CAUSTIC			50	0	0	0	0	0	0	0	0	0	0	0
FAC.GEN.+SWL+x-site FLUSHES			95	432	452	434	397	214	91	96	106	106	106	106
NEW WASTE ADDITIONS TOTAL			2050.7	3684.7	3210.2	2322.2	3141.2	1227.2	613.2	487.2	542.2	1342.2	1742.2	4542.2
TOTAL WASTE BEFORE EVAP		22992	25042.	23937.	23327.	24049.	25521.	24518.	23681.	23618.	23720.	24583.	25485.	29067.
YEARLY CALC WVR FROM ABOVE														
CUM CALC WVR FROM ABOVE														
*** ACTUAL EVAP WVR *******			-4790	-3820	-1600	-1670	-2230	-1450	-550	-440	-480	-840	-960	-2900
*** CUM ACTUAL EVAP WVR ***			-4790	-8610	-10210	-11880	-14110	-15560	-16110	-16550	-17030	-17870	-18830	-21730
PRETREATMENT/VITRIF LOSS*			0	0	0	0	0	0	0	0	0	0	-2000	-3314
NET INVENTORY CHANGE			-2739.	-135.2	1610.2	652.2	911.2	-222.8	63.2	47.2	62.2	502.2	782.2	1642.2
END OF YEAR INVENTORY	25507	22992	20252.	20117.	21727.	22379.	23291.	23068.	23131.	23178.	23240.	23743.	24525.	26167.
TOTAL CAPACITY	31280	28310	26025.	27335.	28378.	29041.	29426.	29412.	28462.	28485.	28492.	28595.	29608.	29936.
	28.0	25.4	23.4	24.5	25.5	26.0	26.4	26.4	25.5	25.5	25.6	25.6	26.5	26.8
	9/30/93	9/30/94	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006

Attachment 6

WASTE TANK VOLUME REQUIREMENTS IN MILLIONS OF GALLONS

WASTE TYPE AND NEEDS	FISCAL YEAR											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Concentrated Waste	14.8	15.2	16.1	17.5	18.3	17.9	18.0	18.1	18.1	18.2	18.7	17.1
Supernate Liquid	9.1	5.8	4.8	5.0	4.9	5.0	4.8	4.8	4.8	4.8	4.8	6.5
Waste from Site Generators	***	***	***	***	***	***	***	***	***	***	***	***
200W Receiver Tank	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
241-AW-102 and 241-AW-106 Evaporator Support	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Spares	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Sludge Washing Demo	***	***	***	***	***	***	***	***	***	***	***	***
Impact of Evaporator Limits (Specific Gravity of 1.35 versus 1.5)	0.0	0.2	0.3	0.6	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1
Impact of Higher Single-Shell Tank Liquid (Porosity of 0.45 versus 0.35)	***	***	***	***	***	***	***	***	***	***	***	***
Segregated Space **	1.5	2.4	1.9	1.1	1.1	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Passive Mitigation 241-SY-101 and 241-SY-103	NO PASSIVE MITIGATION											
TOTAL *	31.20	29.40	28.90	30.00	30.90	30.40	30.40	30.50	30.50	30.60	31.10	31.20

* 28 double-shell tanks provide 31.28 million gallons of capacity
** Additional cost for hardware, safety analyses, and other impacts will be incurred
*** Included with concentrated waste values.