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Environmental Restoration
and Waste Management Division

HLW System Plan
Revision 0 (U)

Westinghouse Savannah River Company
Aiken, South Carolina

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Mission Statement

The mission for the HLW/DWPF System is to:

- safely and acceptably prevent/minimize, handle, treat, store, transport and dispose of DOE waste; and
- ensure that risks to the environment and to human health and safety posed by inactive and surplus facilities and sites are either eliminated or reduced to prescribed, acceptable levels.

This will be done using the most technically effective and cost-efficient means possible, and providing appropriate opportunities for public involvement.

Executive Summary

The purpose of this High Level Waste (HLW) System Plan is to document the baseline for the current HLW operations from the receipt of fresh wastes through the operation of the DWPF. It is not intended to be the mechanism for implementing the plan. It is merely a summary of the main assumptions, limitations, strategy and schedule for facility operations supported by the FY93 Annual Operating Plan (AOP) to meet regulatory and DOE milestones.

The key milestones relate to the processes required to safely remove radioactive waste from storage and process it into canisters of glass or into Saltstone. For the HLW operations, these milestones relate to the operation of the In-Tank Precipitation (ITP), Extended Sludge Processing (ESP) and Evaporation processes along with associated transfer operations. For the DWPF operations, the key milestones relate to successful cold chemical operation, initiation of radioactive feed and successful operation of the Late Wash (LW) process.

The Plan assumes success in related funding activities including reprogramming efforts. It also assumes that planned manpower and infrastructure needs will be met including the required level of support services (e.g., laboratory analyses including necessary new facilities, steam, electrical, water, etc.).

HLW/DWPF System

This Plan refers to the HLW/DWPF System as described in Appendix A. This includes all of the HLW Tank Farm Operations from receipt of fresh wastes to the process and transfer facilities to deliver feed to, and receive recycle from, the DWPF, the DWPF operation, and the key supporting operations such as the Effluent Treatment Facility (ETF) and Saltstone.

1.0 Principles / Guidelines

The principal driver for the HLW System Plan is to facilitate the removal of high level waste from the older style Type I, II and IV Tanks while maintaining adequate and safe storage of the remaining HLW. The secondary drivers are addressed by the following guidelines:

1.1 Regulatory Guidelines (See also Appendix J)

- RCRA: The Resource Conservation and Recovery Act (RCRA) and associated regulations currently apply to the operation and maintenance of the tank farms. Due to inadequacies in secondary containment, the tank farms are not in compliance with the regulations. Once a Waste Water Operating Permit is received (see below), the operation of the Tank Farms will no longer be regulated under RCRA. Secondary containment will then be governed per requirements in the Federal Facility Agreement (FFA). However, the generation of any solid hazardous waste from the Tank Farm will be RCRA regulated waste.

- LDR-FFCA: The Land Disposal Restrictions Federal Facility Compliance Agreement (LDR-FFCA) provides commitments relative to the DWPF, the use of Type I, II and IV tanks and the Consolidated Incineration Facility (CIF). The FFCA stipulates that no newly generated Land Disposal Restriction (LDR) waste can be placed in Tanks 13, 21, 22, or 23. Newly generated LDR waste is defined as waste generated after March 13, 1991. WSRC's position is that recycle streams associated with the processing of tank farm high level waste are not considered new LDR waste. Therefore, wastes from ITP, ESP, Late Wash, DWPF or any stream management step associated with tank farm operation (i.e., evaporation) does not constitute newly generated waste. Per Section V.6 of the LDR-FFCA, upon the effective date of the FFA, the provisions of the FFA related to tank systems will supersede these tank restrictions.

- FFA: The draft Federal Facility Agreement (FFA) provides standards for secondary containment, as well as provisions for the removal of leaking or unsuitable tanks from service. The FFA allows for the continued use of tanks that do not meet secondary containment standards as long as they are included on a schedule for the removal of such tanks from service. This schedule is required to be submitted to SCDHEC ninety days after the effective date of the agreement.

- Waste Water Operating Permit: A Waste Water Operating Permit for the High Level Waste Tank Farms is currently under negotiation with SCDHEC. Operation of the tank farms must be in compliance with the permit including any special conditions and significant changes to the tank farms may require a permit modification.

1.2 DOE Orders/Guidance/AOP/FYP

All facilities and operations required for removal, preparation, processing, and final disposal of high level liquid waste are in accordance with all applicable state and federal laws, regulations and DOE Orders. Where laws, regulations or DOE Orders do not exist to provide requirements and guidance, generally accepted industry standards, such as, INPO guidelines, ANSI/ANS standards, and National Fire Protection Association (NFPA) are utilized.

Specific guidance from DOE relative to this Plan is provided by a number of documents such as the Program Execution Guidance (PEG), the Annual Operating Plan (AOP), the Five Year Plan (FYP), and specific individual guidance letters as deemed necessary by DOE-SR. The specific funding guidelines and planning baselines for the HLW System Plan Rev (0) can be found in the FY93 Annual Operating Plan and the FY94 Five Year Plan. Changes to the baseline are controlled by a formal Change Control process.

1.3 Process Considerations

- Safety Analysis: Operations will be maintained within the defined boundaries of the appropriate Safety Analysis Report (SAR) and applicable addenda. See Appendix J for status of Safety documentation.

- Environmental: All conditions of the applicable permits will be met. See Appendix J for listing of applicable permits.

- Waste Removal from HLW Tanks: HLW at SRS is stored in carbon steel tanks. Some of these tanks do not provide full secondary containment and, in some cases, no secondary containment is provided. Several of the HLW tanks have leaked in the past. While no tanks have active leak sites and a formalized monitoring program exists, the risk to the environment that could result from a leak outside of containment will be reduced by removing the HLW from the current storage tanks. The waste will be processed through the DWPF into a stable borosilicate glass waste form contained in stainless steel canisters. The ITP, ESP, LW and DWPF are all new operations necessary to accomplish the mission of processing the waste into the glass form. The start up of these facilities are being expedited to ensure successful operability to support the waste removal mission.

- DWPF: The DWPF operation, being the cornerstone of the waste removal program and a one of a kind operation, is currently expediting startup operations to support radioactive operation beginning in 6/94. Subsequently, this drives the HLW operations as necessary to supply both the initial and continuous feed to the DWPF per the 6/94 startup schedule.

- Tank Space Availability: Ensuring the availability of sufficient operating space in specific tanks at specific need dates is a key consideration for operating strategy. Due to a number of factors, the most important of which has been the extended outage of the 1H Evaporator, the inventory of waste in the HLW

tanks is very high (~90 % of available capacity utilized). Process strategy, in addition to providing safe storage of waste and a feed stream to DWPF, must also generate additional space gain (surge capacity) in the form of available tank space. This recovered tank space results from waste removal through ITP or by processing of existing dilute HLW supernate through the evaporator systems. This space gain is extremely important for three reasons: 1) to maintain the evaporator systems on-line, 2) to provide space to receive the very large volume liquid transfers which are a part of the waste removal process as well as the large waste water recycle from DWPF, and 3) to ensure flexibility to handle unanticipated problems that could require additional tank space.

1.4 Waste Removal Sequencing Considerations

The current sequencing of waste removal from the HLW tanks is per the following generalized priority:

1) Control tank chemistry including radionuclide and fissile material inventory
2) Maintain adequate emergency space per the Tank Farm SAR
3) Remove waste from the tanks with a history of leakage
4) Remove waste from tanks which do not meet secondary containment requirements
5) Provide adequate salt receipt space to maintain the evaporator systems on line, which is necessary to process the waste and support the waste removal activities
6) Generate adequate available tank space (surge capacity) to handle the large volume waste transfers and waste removal processing recycle streams including DWPF recycle
7) Ensure blending of processed wastes meets the Saltstone and DWPF feed criteria
8) Maintain continuity of radioactive waste feed to the DWPF
9) Provide adequate receipt space for fresh wastes
10) Remove waste from the remaining tanks

While the principal driver for the HLW System Plan is the removal of waste from the older style tanks, it is necessary to remove waste from some of the Type III tanks to support the cleanup of the older tanks. Removal of wastes from new tanks is required to maintain the evaporator systems on-line and to provide space as required to receive the large transfers involved with the waste removal processes and DWPF recycle. For the current period, removal of salt from Type III Tanks 41, 25 and 29 must receive priority to support the key waste removal mission of the 2H, 2F and 1H Evaporator systems. Relative to planning, it is the complex interdependency of the HLW and DWPF safety and process requirements that drives the actual sequencing of waste removal from tanks.

2.0 Assumptions

2.1 Facility Startup and Operation:

2.1.1 DWPF

- Timely completion of the DWPF Startup Operational Readiness Reviews
- DWPF conducts successful Cold Chemical, Waste Qualification Runs and Hg Runs in a manner to support Radioactive Operation in 6/94
- DWPF Recycle waste water during cold chemical runs can be adequately processed by an off-site vendor or by processing on-site at the Effluent Treatment Facility or at TNX.
- Beginning with the Mercury (Hg) Runs, DWPF Recycle waste water will be returned to the HLW area.
- Late Wash Interarea Line modifications funded and completed to support DWPF start up on sludge only feed and recycle of waste water to HLW by 6/94.
- Scheduled DWPF outage 6/95 - 10/95 (if needed) to tie in late wash
- Resume operation on sludge and precipitate feed 10/95.
- Saltstone operation capable of supporting ITP operation beginning in 4/93
- The DWPF startup and operation is as follows:
  - Begin Radioactive Spike Test on 6/94
  - Transition into a radioactive sludge only feed in a staged manner to reach an initial equivalent rate of 70 KGals of sludge per year (~ 100 canisters per year)
  - DWPF outage 6/95-10/95 for LW tie-in
  - DWPF resumes feed with both sludge and precipitate 10/95 with continued process rate of ~100 cylinders per year until funding and HLW waste removal operations can support increased rate (~FY 98)

2.1.2 HLW Processing Facilities

- Resume Extended Sludge Processing (ESP) Startup 4/93 and operate Batch 1 at 200,000 gal/wash with the following number of washes required:
  Tank 42 - 3 washes
  Tank 51 - 6 washes.
  Future batches defined per the 1992 SRS Radioactive Liquid Waste Forecast issued on June 18,1992 (WER-CMD-92-0022) with minor changes to reflect current process knowledge
- In-Tank Precipitation (ITP) Startup 4/93 and operate per current processing baseline (Ref.: Inter-Office Memo, D. A. Pervis to M. J. Mahoney, "In-Tank Precipitation Operating Schedule", WER-ITP-920065).
- Current blending and process strategy will produce a sludge only feed meeting the DWPF feed acceptance criteria.
- No impact from technical resolution of ITP/ESP criticality, tank integrity or seismic evaluations
- New Waste Transfer Facility (NWTF) is operational 11/93. See Appendix G.

2.1.3 HLW Space Gain

- The schedule is based upon the following evaporator operational utilities when appropriate feed is available:

	Utility	Approx. Space Gain Gals Per Month
1H Evaporator	40%	84,000
2H Evaporator	60%	126,000
2F Evaporator	60%	126,000
Replacement High Level Waste Evaporator	80%	360,000

(Note: Utility is defined as the % of time the facilities are in operation. The values shown are based upon the availability of dilute feed, historical data and engineering judgment .)

- 1H Evaporator on-line 2/93 based upon receipt of a Waste Water Operating Permit and DOE startup approval by 2/93.
- 1H will continue to operate until shutdown is taken to tie in the Replacement High Level Waste Evapaorator
- Replacement High Level Waste Evaporator (RHLWE) on-line 8/96.
- 2F Evaporator conversion to High Heat Waste (HHW) service by 6/93 utilizing Tank 46F as a concentrate receipt tank.
- Continued use of Type IV single walled tanks for RBOF receipt, ITP/ESP wash water storage, and LW recycle, as required, until adequate space can be provided in Type III tanks to remove Type IV tanks from service.
- Continued use of Tank 13H as the 1H Evaporator Feed Tank until replaced by the RHLWE system.

2.1.4 Canyon Waste Receipts

- Canyon waste volumes will be per the current forecast (P&PD, 91-5, Rev. 1, June 26, 1992). This assumes reprocessing fuel through reactor charge K-14 and there are no new missions which will bring new waste streams into the system. (Note: A K-15 reactor charge, if processed, would have only a minor impact on the forecast.)

2.1.5 Waste Removal General

- Schedule is based on a generic construction through startup authorization duration of 22 - 30 months with a judgment factor applied for a given system. The actual schedule will depend upon the current status of completion and the complexity of the project. A more detailed evaluation of the overall startup authorization process and schedule is underway but not available for this initial issuance of the HLW System Plan.
- Waste Removal completion for Type I, II, and IV tanks is defined as the removal of as much waste as is practical from the tank primary and annulus (if applicable) through the use of currently designed waste removal facilities including agitation and transfer pumps, steam eductor jets, and tank interior spray washing equipment.
- When waste removal is complete, as defined above, the tank will be available for decommissioning by the Environmental Restoration (ER) Department

under applicable permit or regulatory requirements. However, the current schedule does not address this type of closure action by ER. As appropriate closure actions are defined, they will be added to the plan and schedule.

2.2 Resources

- Assumes authorization of FY92 Reprogramming Proposal, FY93 Budget Amendment, FY93 Reprogramming Proposal
- Funding for Waste Removal activities is provided as follows:
  - FY93 at approved Annual Operating Plan (AOP) and assuming successful change control ($27,043K) action currently in progress.
  - FY94 at FY94 Five Year Plan (FYP) Planning Case levels (~$54,000K).
  - FY95 and outyears at 10% growth rate above FY94 levels.

  (Note: The Waste Removal and Replacement High Level Waste Evaporator projects have been rebaselined and presented for validation. The rebaselined cost, schedule and scope are not in alignment with the FY94 FYP. Revised yearly funding requirements and scheduled activities will be incorporated into future revisions to the Plan when approved through the DOE change control process.)
- Project schedules for installation of Waste Removal facilities can be met. Typical project duration is approximately 30 - 36 months per tank. (See note above on project rebaselining activities.)
- Timely funding for Late Wash Facilities is provided to support project implementation
- Timely funding for the RHLWE is provided to support project implementation
- Manpower and Infrastructure (analytical laboratories, maintenance shops, training facilities, office buildings, etc.) requirements for Waste Removal, DWPF and HLW Operation can be made available as needed.

2.3 Support Services

- An adequate level of services (e.g., laboratory analyses including necessary facilities, steam, electrical, water, etc.) will be available to support the High Level Waste and DWPF operations. These absolute values will be further defined as the HLW System Plan is revised to support the update of the FYP.

2.4 Regulatory

- Commitments in the FFCA and FFA will be fulfilled by WSRC without impact to the current schedule.
- ITP Filter Treatability Variance will be approved by EPA prior to startup.
- Waste Water Operating Permit will be received to support ITP startup.
- Benzene Abatement will not be required for startup of ITP.
- Exemption will be received for mercury emissions from ESP prior to restart.
- SCDHEC permits the continued use of Type IV tanks and Tank 13.
- It is assumed that the DWPF receives timely approval of the SCDHEC Air Operating permit.

3.0 Limitations / Constraints of the HLW System Plan

A high confidence factor cannot be given to this Plan due to a number of factors. The most important of these is the lack of operating experience with the new processes as well as the startup authorization duration for the ITP, ESP, LW and DWPF facilities. There are both technical concerns and process knowledge that can be addressed only after experiencing actual radioactive operation. The limitations/constraints listed below provide the drivers for most of our research and technical improvement programs.

3.1 Process Knowledge

- Current process schedule is to provide an "effectively aged" 5 yr. old sludge and 15 yr. old precipitate feed to DWPF to minimize exposure to DWPF and Saltstone personnel as well as meet DWPF feed acceptance criteria.
- Success is based upon unproven attainment and capacity for the "new technology" operations (ITP, ESP, LW and DWPF).
- The baseline operating cycles for the ITP/ESP processes are being evaluated vs. current plant operating data. Changes to the cycle times or number of washes, etc., must be integrated into the schedule and depend upon specific tank conditions such as composition and temperature considerations.
- Current situation (with limited reactor operation) has not been rigorously reviewed for an optimum blending strategy to support earlier waste removal from older style tanks.
- Current strategy does not optimize Type III tank space recovery for blending of current supernates with older materials to avoid future salt cycle. (Supernate> Evaporator> Salt Storage> Waste Removal> ITP> DWPF> Recycle>Evaporator>etc. vs. Supernate> ITP> DWPF, etc.)
- Current schedule provides little to no contingency space for unanticipated Tank Farm problems. (e.g., unanticipated process problems or mechanical failures, limited use of older style tanks, transfer system problems, extended outages of particular system components)
- There has been little optimization work for the basic processes. (To date, the effort has been to demonstrate and prove that the new processes will work.)
- Current schedule does not attempt to minimize total canister production vs. long term storage requirements.

3.2 Schedule Mechanics and Site Integration

- Current schedule has not been fully manpower loaded nor leveled. The Plan requires significant manpower growth and assumes that manpower is available and that the associated infrastructure needs can be supported.
- Current schedule does not reflect change in site mission or future mission.
- Secondary interaction with other divisions such as Solid Waste Management, Environmental Restoration, and Site Services have not been fully integrated into the schedule.

3.3 External Influence

External factors, for which the operating group has no control, can have significant impact to the schedule.

- The current schedule is based from best understanding of administrative criteria from which the plant is to be operated. However, at least one evaporator system has experienced an unanticipated outage of over a year due to the time to resolve a regulatory permit issue. External intervention or application of new criteria, which result in deviation from the planned operation, can preclude removal of waste from the HLW tanks per the planning schedule . Timely resolution of concerns will of course depend on the nature of the specific issue.
- Current schedule has no contingency for unanticipated program changes resulting from interaction with oversight groups, changing regulatory requirements, or administrative delays.

3.4 Funding

- The current schedule reflects only use of funds authorized through the AOP and ongoing reprogramming efforts to support startup of the key facilities.
- This level of funding should support continuous feed to the DWPF at an attainment rate of at least 25%. The attainment limiter assumed for this plan is the ability to fund and implement the waste removal projects in a timely manner to ensure continuity of feed at higher rates.
- Current schedule does not reflect pursuit of additional funding to support full attainment at DWPF at the earliest possible date, or the earliest possible retirement of the older style tanks.

3.5 Process Interdependence Limitations

The schedule for the removal of waste from the SRS HLW Tank Farms is contingent upon a number of interrelated variables. As such, a change in any one of these variables can initiate a "domino" effect on the schedule itself. For example, the waste removal schedule assumes successful operation, up to design rates, of new technology operations such as ITP, ESP, LW and the DWPF. These new technology processes must operate to demonstrate success in actual radioactive HLW service. Moreover, the ability of the facilities to meet design throughput and performance will be established only after the facilities have experienced significant run times of one to two years. These four new operations are critically dependent on one another as well. A significant problem in any one of the facilities could have a major impact on the other three.

In addition to the uncertainty involved with the startup and operation of these new processes, there are other operations and actions with potential to significantly affect the schedule for removal of waste. The process of removing waste from the tanks, preparing feed for DWPF and the actual operation of the DWPF involves large quantities of process water and transfers of large quantities (100+ K gallons at a time) of the various process streams. The ability to handle

the water balance throughout the system depends upon successful operation of the HLW Tank Farm evaporator and transfer systems. The current schedule assumes continuity of historical operation of these systems under current criteria. Without successful evaporator operation, there is insufficient room to handle the fresh wastes, ESP sludge decant and wash water, and various recycle streams. The ability of the evaporator systems to remain on-line is dependent upon a successful ITP operation to remove the salt from the evaporator concentrate receipt (salt) tanks. The on-going ITP operation is in turn dependent upon a successful LW operation and DWPF operations including the ability of the HLW area to handle the large recycle streams from these operations. This interdependence of process operations is depicted in Appendix B.

3.6 Personnel and Infrastructure

The scheduled waste removal activity requires a significant growth in personnel to support the many new operations. This growth, however, will be controlled, as practical, to utilize personnel as they become available from other site operations which are reducing personnel levels. Availability of personnel, therefore, has the potential to limit the rate of change to the process operations. It is equally important to provide the infrastructure support to house and equip these personnel.

4.0 Integrated HLW/DWPF System Schedule

4.1 General

The Integrated Waste Management Schedule was initially developed from individual project schedules for the In-Tank Precipitation (ITP), Extended Sludge Processing (ESP), and New Waste Transfer Facility (NWTF). That information was summarized, interface points defined, and further expanded to include operational schedules for ITP, ESP, and waste removal to support the Defense Waste Processing Facility (DWPF) startup.

The input and impacts on Tank Farm available space from DWPF feed preparation, canyon waste generation, and DWPF recycle have been determined and documented annually in the SRS Radioactive Liquid Waste Forecast. These processing requirements have driven the need for additional waste storage capacity achieved by evaporation, and salt removal in order to sustain sludge removal and DWPF processing. These operational need dates have been balanced against the funding necessary to achieve them. The funding priority has been established to maintaining available waste receipt space in the Tank Farms and supporting continuous DWPF feed by 6/1/94. This strategy also supports waste removal from the old style tanks as soon as practical.

The schedule for HLW and DWPF Operations is contained in Appendices C, D, and E which highlight the HLW System Plan relative to appropriate drivers listed below. The sequencing of tanks is anticipated to be revised as improvements and optimization of processes are achieved.

4.2 Regulatory Based

Appendix C contains the waste removal schedule for which regulatory drivers exist. Those drivers are as follows:

- LDR-FFCA: 12/30/93 startup date for DWPF production runs (to be re-negotiated). Ninety (90) days following commencement of DWPF production runs, annual waste processing milestone schedule must be proposed to EPA along with a date for completion of waste processing.

- FFA: Provide removal schedule to SCDHEC 90 days after effective date of Agreement

- Waste Water Operating Permit: Permit application submitted to SCDHEC. Conditions of the permit yet to be issued.

4.3 Integrated Operations

Appendix D contains the current summary level planning schedule with emphasis on the interdependence of the DWPF and HLW process operations. The sequencing of these key events are logically tied to a need to meet the overall waste removal schedule and handle all byproducts and recycle streams from the processes. This schedule also includes the plan for the Consolidated Incinerator Facility (CIF) which is required to process the byproduct benzene from the DWPF operation. The CIF also has a logic tie based upon regulatory commitment in the FFCA.

4.4 Overall Waste Removal

Appendix E depicts the overall sequencing of waste removal from all of the Type III tanks per the principles listed in Section 1.5. This contains all of the HLW tanks not listed in Appendix C.

4.5 DOE Based Milestones

The DOE based milestones relative to execution of this schedule are listed in Appendix F.

5.0 Technical Issues

There are several technical issues and uncertainties that must be addressed to ensure success of the HLW System Plan. A description of these issues, the required date of resolution and the logic tie to the schedule are listed in Appendix G. Contingency planning is underway to provide alternatives or workarounds for many of the issues. However, for purpose of establishing a baseline only, those contingency actions have not been detailed in this initial issuance of the HLW System Plan. As such actions become the Plan, an appropriate change control will be utilized to authorize revision to the Plan and the related AOP activity.

6.0 SRTC Support Required

Savannah River Technology Center (SRTC) is performing the technology programs described below to support of the DWPF and HLW programs. These programs are funded per the FY93 AOP and the FY93 Reprogramming action. They have been generated per agreement of SRTC and the applicable WMER program line management. Milestones for these programs are listed in Appendix F.

6.1 HLW Programs

6.1.1 HLW Storage/Tank Farm Support

The HLW chemistry is studied to ensure continued safe storage. Corrosion data, corrosion mechanisms and waste chemistry data bases are maintained. Assistance is also provided for operation of the HLW evaporators, pumps and pumping problems, dispersion of inhibitors into the tanks, stress analysis on equipment due to operations/events, impacts of new streams on operations, determination of the ultimate fate of species introduced into the tanks and evaluation of on-going or new operations involving HLW.

6.1.2 Safety Analysis

Safety analyses and documentation is provided for all HLW facilities. Justifications for Continued Operation will be provided until Safety Analysis Reports can be upgraded to current standards. Support of Unreviewed Safety Question Determinations and interactions with various outside oversight organizations will be provided. And a complete Safety Analysis Report Reference Document will be provided. Preparation and update of safety documentation will be done in accordance with DOE Order 5481.1B, 5480.5, and SROM 5480.5-1. Compliance with new DOE Orders 5480.23 and 5480.22 is unfunded.

6.1.3 Tank Farm Remote Equipment

Remote equipment is developed to improve HLW Tank Farm operation and reduce personnel radiation exposure. Development of remote equipment to disassemble components and reduce waste volume is included. Current tasks include improvement of pumps to reduce maintenance requirements, improvement of HLW samplers, evaluation of requirements for salt mining equipment, and modification of the soil disposal box to improve handling.

6.1.4 ITP/ESP

Technology support is provided for start-up of ITP and ESP. This includes technical documentation, chemistry studies of the process, testing to provide cold feeds reliability, determining cleaning requirements for equipment, addressing of problems of benzene generation and reduction of emissions to the environment ... and testing of pumps for use in these processes.

and testing of pumps for use in these processes. Support for associated SRTC facilities at TNX is also included.

6.1.5 Performance Improvements in HLW Processing and Waste Handling

Operations of the HLW Tank Farm are improved by providing technology to enhance current operations. This activity supports initial development support for experimentation and testing of potential improvements and process operations. However this activity is unfunded.

6.1.6 F/H Effluent Treatment Facility

Support is provided for treatment of low level radioactive effluents from the F and H Area generators. Studies and testing will be performed in support of filter fouling problems, ion exchange columns and reverse osmosis, control of biological growth in operations and influent streams; associated sampling programs are included.

6.1.7 Process Development Analytical Support

Analytical support for HLW activities is provided. This will include support for tank chemistry studies and operation of the High Level Caves for small-scale testing. This support includes methods development as well as actual analyses. This activity includes several years of process support for the ITP process until the plant is able to take over this function. Analyses will also be provided to support Tank Farm operation as well as related development work at SRTC.

6.1.8 Other Technical Support

Technical (engineering) support is provided in the areas of materials consultation, system remote inspection, special sensing instrumentation, and robotic equipment development.

6.2 DWPF Programs

6.2.1 Technology Assurance and Development

Support DWPF technology by identifying operational problems and resolving technology issues. Also, support DWPF startup requirements, develop process modifications to optimize process attainment, improve product quality and enhance operational safety.

6.2.2 Waste Acceptance

Provide waste form product acceptance technology and demonstrate compliance with repository requirements. The preparation (and revisions) of the Waste Form Qualification Report (WQR) will include the following: providing the technical basis for the Glass Product Control Program, chemical compatibility, glass thermal stability, radionuclide inventory projections, and foreign materials in the

DWPF product. The canister integrity and technical liaison work will continue. Develop and demonstrate the Product Composition Control System (PCCS) for DWPF.

6.2.3 Analytical methods Development and Analytical Support

Analytical methods development and techniques are developed for use at DWPF, and analysis of Integrated Demonstration Melter System (IDMS) and Precipitate Hydrolysis Experimental Facility (PHEF) samples are performed at facilities at TNX. Additional lab facilities will be required to support DWPF and are funded under capital funding, but delays in project approval will impact when lab will be functioning.

6.2.4 DWPF Startup Support.

DWPF plant support during test planning and actual chemical runs. Activities include development of Process Requirements, specification of DWPF feed for Cold Chemical Runs(CCR) and Radioactive operation, technical support including Engineering, material Engineering, statistical and analytical support for the DWPF process and equipment. Assistance is provided to DWPF personnel in preparation and execution of presentations to oversight groups. Personnel for in-resident support are provided during key tests.

7.0 Projects

The project work required to support the DWPF operation and the waste removal operations in the HLW System Plan are listed in Appendix H. This includes a brief description of the scope as well as the driver and TEC for the project.

Due to the interdependency of the many processes involved with waste removal through glass production, the timing and sequencing of project completion is crucial . For instance, the feed to the DWPF is dependent upon the ITP and ESP operations. The ITP is further dependent upon the timely implementation of the new Late Wash project to produce acceptable feed for the DWPF. Simultaneous implementation of multiple waste removal projects is necessary to provide feed to ITP and ESP, and these projects both support and require associated evaporator system performance. The successful operation of the DWPF depends upon the evaporator systems (the RHLWE system in particular) being capable of supporting the large recycle waste water stream. Regulatory drivers also exist such as the CIF to handle the benzene from the DWPF operation and the waste removal schedule itself. It is therefore critical that adequate funding and manpower be maintained to keep the projects on schedule. This complex interdependency is further described in Appendix B with the appropriate implementation schedule shown in Appendix D.

8.0 Budgetary Support

The budget plan to support the HLW System Plan through FY98 is shown in Appendix I. The basis for these dollars is the FY93 AOP and the planning values from the FY94 FYP. The key assumption for the FY93 AOP Budget is the startup of DWPF on a radioactive sludge only feed beginning 6/94 with HLW actions to support delivery of feed on a continuous basis thereafter. The budget required for the outyears will be dependent upon the planned attainment for DWPF. As attainment is increased, waste removal projects must be expedited to support the feed requirements. Such an increase in attainment will impact the need for both Saltstone vaults as well as the authorization and construction of the Glass Waste Storage Building (GWSB)#2.

There are known issues and disconnects with the FY93 AOP with respect to the FY94 FYP. They have been summarized as follows:

- The current budget as shown on Appendix I does not contain any funding provision to support the Late Wash Facility project. The portion of this project to bypass the Auxiliary Pump Pit is needed to provide the initial radioactive sludge feed to DWPF. A reprogramming effort is underway which includes support for the Late Wash project.
- Currently projected needs of SRTC to support the HLW System Plan including Late Wash development exceed the funding projection in the FYP
- Funding for Saltstone vault capping is needed in FY93
- Implementation of DNFSB Recommendation 90-2 is funded at $400K. The actual need could be up to $4,500K to fund the WMER pilot program at DWPF.
- Configuration Management is not fully funded in FY94 (given the reduction approved in the FY93 AOP).
- A $6M WMER credit for Site overhead adjustment has been placed in DWPF Program Support pending further resolution.
- Funding for oversight programs (primarily ESH&QA and E&PD) is significantly higher in the FY93 AOP than in the FY94 FYP. The FY93 AOP is believed to be the more realistic base for future costs. This trend is expected to continue.
- Assumptions for Saltstone vault construction differ between the FYP and the AOP. The AOP assumes a need for vault #2 in 10/94 and vault #3 in FY95.
- The GWSB #2 will be required as a FY95 Line Item (8/95 authorization) for a 50% attainment rate, a FY96 Line Item (4/96 authorization) for a 35% attainment rate or as late as a FY97 Line Item (10/96 Authorization) if attainment is maintained at a 25% rate.
- Other Project Costs (OPC) funding requirements, as currently estimated by initial evaluation, are not fully funded in the FY94 FYP. The related OPC resources, in general, have not been included in the schedule.

As a result of knowledge gained in producing this HLW System Plan along with funding requirements previously identified, a change in funding strategy is needed. WMER is in the process of developing a recommendation to DOE-SR for a combination of requests for additional funding as well as reprogramming of current funds.

9.0 Resources

This HLW System Plan requires a significant operations manpower increase of 228 personnel for FY93. Success of the HLW System Plan depends upon obtaining manpower (including additional E&PD personnel as required) in a timely manner. However, this growth will be controlled, as practical, to utilize personnel as they become available from other site operations which are reducing personnel levels to minimize the potential for future personnel reductions. Availability of personnel, therefore, has the potential to limit the rate of change to the process operations and thus impact the ability to meet the schedule.

9.1 HLW

The AOP for HLW shows a planned growth of ~170 personnel in FY93. This growth is required to support the major administrative program improvements such as work control practices, training, etc., an increase in operating staff for ITP/ESP operations, and an increase in support for waste removal from Tank 25, the second feed tank for ITP. This growth includes a credit for reduction in ITP startup support personnel. Additional growth will be required in the outyears to support the ever increasing waste removal operations.

9.2 DWPF

The startup plan for DWPF is based upon the adequacy of the current work force.

10.0 Site Long Range Planning Interaction

Appropriate references have been made to the FY93 AOP and the FY94 FYP. Future updates of the plan will ensure continued interaction with Long Range Plans for the Site. The HLW System Plan is compatible with the existing plans to deinventory the canyons. For the purpose of this plan, fresh wastes receipts from the canyons include processing of driver fuel through K-14 along with the missions of the canyons to deinventory the canyon facilities. The Plan contains no provisions for generation of fresh waste from additional processing although the processing of a K-15 charge would have an insignificant impact to the waste removal program.

11.0 HLW System Plan Management

Due mainly to the lack of actual operating experience in the new processes and to the combination of interacting factors previously discussed , there is a significant degree of uncertainty with this plan and schedule.

WSRC is currently evaluating the uncertainties in the plan and prioritizing improvements that can be made to improve the confidence in the planning and scheduling program. It is the intent of WSRC to refine and update the current schedule consistent with the next update of the FYP to be submitted in the 3QFY93. This update will include improved process experience, strategy as

possible to increase the overall waste removal rate, appropriate revision to the sequence of waste removal from specific tanks, and a leveling of personnel as practical. This update will also evaluate the change in the overall site mission versus potential impacts to the waste removal operations and resolution of funding issues.

The HLW System Plan is approved by the senior level HLW System Program Board, chaired by the VP&GM of the WMER Division. The board is comprised of the level two managers of the key line programs and support divisions. A primary responsibility of this board is the oversight and approval of the HLW System Plan and the integrated schedule which form the technical schedule and cost "baseline" for the overall program. Maintenance of this "baseline", especially with regard to technology developments, and alignment with the AOP and FYP is controlled through formal change control process. Board approval is required before line programs take action which could have significant impact on the integrated schedule. This board is also responsible for ensuring corrective actions to meet program objectives are being accomplished through the responsible line management.

The HLW System Plan will be updated annually to coincide with the update of the FYP. Any revisions during the year will be per a formal change control process and should also reflect any significant formalized change in the AOP.

Appendix A

HLW/DWPF System Description

This appendix provides an overview of the processes and facilities included in the HLW/DWPF System. A figure of the system is included at the end of this appendix.

High Level Waste

High-Level Waste (HLW) is defined as the highly radioactive waste material that results from the reprocessing of spent nuclear fuel. This includes liquid waste produced directly in reprocessing and any solid waste derived from the liquid. The HLW contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

SRS liquid waste, as received in the waste tanks, is made up of many waste streams generated during the recovery and purification of transuranic products and unburned fissile material from spent reactor fuel elements. These wastes are neutralized to excess alkalinity (pH 10 to 13) before transfer to the million-gallon underground storage tanks.

HLW is separated into the F- and H-Area Canyons according to radionuclide and heat content. High-heat waste (HHW) is primarily generated during the first extraction cycle in the separations canyon and contains a major portion of the radioactivity. Low-heat waste (LHW) is primarily generated from the second and subsequent extraction cycles in the canyons. HHW is aged at least a year in receipt tanks to reduce the concentration of short-lived radionuclides before evaporation.

Waste Tanks

Waste Management operates 51 waste tanks and 4 evaporators for the purpose of safely storing and processing liquid radioactive waste. The major waste streams into the F- and H-Area tank farms include HHW, LHW, and DWPF recycle. Other major miscellaneous inputs internal to the tank farm include additions and byproducts of processes required for preparation of DWPF feed such as sludge wash water, sludge removal decant, spray washing, inhibitors, caustic used for aluminum dissolution, and recycle of wash water from the Late Wash Facility.

Of the 51 tanks, 29 are located in the H-Area tank farm and the remainder are located in F-Area tank farm. All of the tanks were built of carbon steel and reinforced concrete, but they were built with four different designs. The newest design (Type III) has a full-height secondary tank and forced (water) cooling; two designs (Types I and II) have five-foot-high secondary pans and forced cooling; the fourth design (Type IV) has a single steel wall and does not have forced cooling.

Evaporators

Each waste tank farm has two single-stage, bent-tube evaporators that are used to concentrate waste following receipt from the canyons. High-heat waste is segregated and allowed to age before evaporation. The aging allows separation of the sludge and supernate and also allows the shorter-lived radionuclides to decay to acceptable levels. Low-heat waste is sent directly to an evaporator feed tank. The sludge settles to the bottom of the feed tank, and the supernate can be processed immediately through the evaporator. Salt crystallized from high-heat waste and low-heat waste is also segregated in separate tanks because the high-heat waste must be stored for a number of years (up to 12 years) to allow decay of ^{106}Ru before DWPF processing. The low-heat waste can be processed in 0 to 3 years.

Radioactive waste, as received and stored in the tank farms, can be reduced to about 25% of its original volume and immobilized as crystallized salt by successive evaporation of the liquid supernate. Such a dewatering operation has been carried on routinely in F Area since 1960 and in H Area since 1963. Since the first evaporator facilities began operation in 1960, more than 98,489,000 gallons of space has been reclaimed. Seventy additional waste tanks valued at more than $50 million each would have been required to manage this waste had evaporation not been used.

Two evaporators currently process low-heat waste: 242-16F, and 242-16H. The 242-H evaporator processes high-heat waste and plans for the 242-16F include HHW service as well. Another evaporator, the Replacement High-Level Waste Evaporator (RHLWE), is being constructed to replace the 242-H evaporator, which cannot be reliably maintained. The new evaporator will have approximately twice the capacity of the 242-H evaporator that it replaces and will be able to accept the DWPF recycle (a low-heat waste stream of about three million gallons per year that contains very little solids) in addition to the high-heat waste. The RHLWE is currently scheduled to be on-line by August 1996. The 242-F Evaporator is not currently being utilized to process dilute wastes. For purposes of this plan, the resumption of operation for the 242-F evaporator is not considered practical and not required to meet the mission of the HLW System Plan.

Each evaporator is equipped with a zeolite Cesium Removal Column (CRC) located in a riser through the top of a waste storage tank. These columns remove cesium from the condensate produced by the concentration of waste supernates. The columns are normally maintained off-line and placed in service if a specified decontamination factor (DF) for transfer to the Effluent Treatment Facility (ETF) is not obtained. The zeolite column is capable of achieving cesium DF's of 10 to 200. When required, the spent zeolite is discharged directly to the waste tanks beneath it.

Waste Transfer System

The primary objective of the High-Level Waste Transfer and Processing Program is to remove radioactive waste from the older style tanks and to prepare the waste, including liquid, salt, and sludge, for feed to the DWPF. The waste removal program includes removal of salt and sludge by mechanical agitators, spray washing of the tank interior walls, and steam/water cleaning of the tank annuli. The waste processing program includes decontamination of the salt and liquid for incorporation into saltstone and aluminum dissolution and washing of the sludge for feed to the DWPF.

The schedules of waste transfer and waste processing are closely linked to each other and with the DWPF schedule. The scheduling objective is to remove the waste from the Types I, II, and IV tanks as rapidly as possible without exceeding the capacity of the tank farm processes or the DWPF.

Processes and equipment for waste removal and waste processing have been developed and demonstrated. Sludge removal by hydraulic slurrying and chemical cleaning with oxalic acid have been demonstrated in Tank 16H. Salt removal and sludge removal using mechanical agitation have been demonstrated. Facilities have been designed using data and experience gained from these demonstrations. To date, 3.4 million gallons of salt and 1.1 million gallons of sludge have been removed from Types I, II, and IV tanks.

New Waste Transfer Facility (NWTF)

The NWTF is currently undergoing final construction and startup testing activities. It is a series of pump tanks and a large diversion box located within an enclosed facility and is intended to enhance the High-Level Waste Transfer and Processing Program. It is currently scheduled to begin operation in late 1993. The NWTF will replace another facility (HDB2) by providing for the transfer of radioactive slurries and solutions in H Area. It will also serve as the receipt point for recycle waste transfers from the DWPF and Late Wash facilities.

Extended Sludge Processing (ESP)

Sludge that is removed from waste tanks is washed in the ESP to reduce the concentrations of soluble salts from the sludge before it is fed to the DWPF. Sludge processing includes four processes: 1) aluminum dissolution (as required for H Area HHW) with sodium hydroxide and steam heat, 2) washing with inhibited water to remove dissolved solids, 3) gravity settling, and 4) decanting the salt solutions back to the tank farm for processing. Before washing, H-Area HHW sludge is mixed with sodium hydroxide to dissolve aluminum. Quantities of aluminum in other waste tanks are not sufficient to require aluminum dissolution. After aluminum dissolution, two tanks will be used to wash sludge concurrently, with the wash water from the first tank being reused to wash the sludge in the second. When washing is complete, the sludge is transferred to one tank to be fed to the DWPF; then, processing begins again using a third tank for coprocessing. Four slurry pumps supply the agitation for washing. Wash water

that results from this process will either be transferred to an evaporator system or stored for reuse in dissolving saltcake, depending on the salt concentration. Tanks 21 and 23, Type IV tanks, will be used for staging this low activity wash water.

In-Tank Precipitation (ITP)

Salt will be removed from the waste tanks and processed via ITP. ITP extracts the majority of the radionuclides in the form of thick white precipitate; the material is then fed to the vitrification process in the DWPF. Radionuclides are removed by adding sodium tetraphenylborate (STPB) and sodium titanate (ST) to the ITP feed tank to precipitate cesium (and potassium) and adsorb strontium, respectively, from the dissolved waste salt solution. After filtration, the precipitate is washed with water, concentrated to 10 wt %, and transferred by batch to the feed tank for the vitrification facility. The wash water is collected and recycled into the next cycle of ITP. The decontaminated salt solution (filtrate) will be stored separately and fed to Saltstone.

F/H Effluent Treatment Facility (ETF)

Low-level aqueous streams currently sent to the F/H ETF from the 200 Areas consist of: segregated cooling water, contaminated surface runoff from the waste tank farms, certain evaporator overheads, cesium removal column effluent, condensate from the general purpose evaporator and acid recovery units located in Building 211, selected liquid regeneration wastes from the resin regeneration facility in H Area, and water collected in H- Area catch tank from transfer line encasements.

The F/H ETF treats the waste water that was previously sent to seepage basins. The treatment process includes filtration, organic removal, reverse osmosis, and ion exchange. The facility consists of process waste water tanks, treated water tanks, basins to collect contaminated cooling water and storm water runoff and a water treatment facility.

Facilities had not previously been available for treating all types of contaminated water releases from the canyons nor were there facilities to send contaminated water in the retention basins to the tank farms for storage and/or treatment via the tank farm evaporators. The F/H ETF corrects this by providing treatment facilities for all types of low-level waste water.

Defense Waste Processing Facility

Late Wash Facility (LW)

The Late Wash Facility (formerly the Auxiliary Pump Pit) will receive tetraphenylborate slurry material stored in ITP Tank 49 and physically remove the nitrite from the slurry by a filtration/dilution process in a stainless steel facility utilizing a cross flow filter. The nitrites are added to ITP to mitigate pitting corrosion of carbon steel waste tanks and components. Nitrites results in high

boiling organics in the DWPF process which foul heat transfer surfaces and plugs filters and instrumentation. This batch operation processes approximately 3400 gallons of slurry every 43 hours. During the process, the slurry is reprecipitated to capture cesium which has returned to solution during Tank 49 storage, re-concentrated to 10-12 wt. %, and washed to remove the nitrite from the slurry to $\leq$ 0.01M using a filtering dilution process. The washed slurry is transferred to the Low Point Pump Pit for subsequent transfer to the DWPF. The filtrate produced during the filtering process is stripped of benzene, checked for activity levels, chemically adjusted, and transferred to Tank 22.

Vitrification --S Area (DWPF)

The objectives of the DWPF S-Area Vitrification process is to take the liquid high-level radioactive waste currently stored at the SRS and permanently immobilize it as a glass solid. The vitrification operations include chemically treating two unique waste streams, mixing them with a ground borosilicate glass and then heating the mixture in an electric melter to 1130 degrees centigrade. The molten mixture is then poured into ten-feet-tall, two feet in diameter stainless-steel canisters and allowed to harden. The outer surface of the canisters is then decontaminated to DOT standards, welded closed and temporarily stored onsite for eventual transport to and disposal in a permanent federal geological repository.

Saltstone--Z Area

The DWPF Z-Area Saltstone processes low-level radioactive liquid waste salt solution from the In-Tank Precipitation Facility and the Effluent Treatment Facility. The solution is mixed with a blend of cement, flyash and blast furnace slag to form a grout. The grout is pumped in disposal vaults where it hardens into a solid non hazardous waste form for permanent disposal.

Consolidated Incineration Facility (CIF)

The CIF, while not a portion of the HLW/DWPF System, plays an important role in the success of the waste removal mission. Benzene generated from the DWPF processing of the ITP precipitate will be incinerated in the CIF.

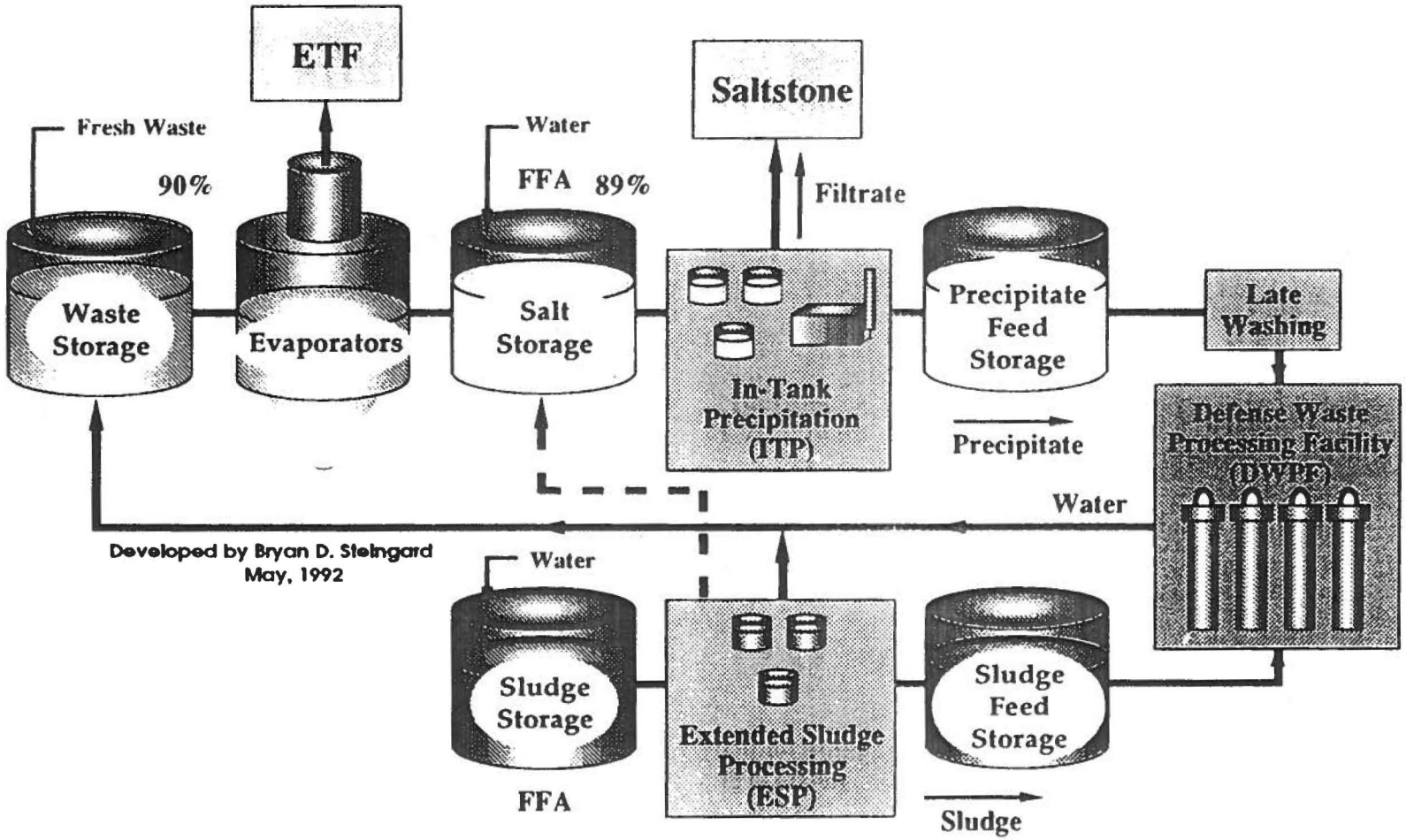
The CIF will be built to treat various site-generated combustible wastes before final disposal and to reduce the volume of the current inventory of wastes stored at SRS. The wastes to be treated will include wastes defined as hazardous by South Carolina Hazardous Waste Management Regulations and federal RCRA regulations, wastes contaminated with low levels of beta-gamma radioactivity, and mixed wastes that are both hazardous and low- level radioactive. The facility will not treat wastes containing dioxins or polychlorinated biphenyls (PCB's).

Facilities to be provided on the CIF project consist of a main process building which includes an area for boxed waste receipt, boxed waste handling, a rotary kiln incinerating system including incinerator ash removal and offgas cleaning, and the necessary control room and support facilities. The rotary kiln primary

combustion chamber will be used for the incineration of solids and various organic and aqueous liquid wastes. A secondary combustion chamber will also incinerate organic solvent wastes as well as destroy any remaining traces of hazardous constituents in the rotary kiln offgas. Offgas exiting the secondary combustion chamber will be cooled and treated by a wet offgas treatment system. Pollutants in the offgas will be removed to below regulatory limits before the offgas is discharged to the atmosphere.

Liquid waste from the offgas system will be solidified in the proposed Y-Area Saltstone Disposal Facility. An area is provided for installation of an existing solidification process for incinerator ash. Facilities included on the project but remote from the main process building include a liquid waste storage area.

Tank Farm / DWPF Operations



APPENDIX B

HLW/DWPF System Interaction

The attachments to Appendix B contain a brief description matrix of the extremely complex interaction between the various processes and facilities required to successfully support waste removal from the HLW Tanks. The fourth column is the key in that it lists the other facilities or processes which have a direct influence on that facilities operation.

A dozen Facilities have been characterized in the HLW/DWPF Interaction Matrix:

1. Sludge Waste Removal
2. Salt Waste Removal
3. Evaporation
4. Replacement High level Waste Evaporator (RHLWE)
5. In-Tank Precipitation (ITP)
6. Extended Sludge Processing (ESP)
7. Late Wash (LW)
8. Defense Waste Processing Facility (DWPF)
9. Saltstone
10. F/H Effluent Treatment Facility (ETF)
11. Transfer Facilities (In general)
12. Consolidated Incinerator Facility (CIF)

See figure at end of Appendix A for overall HLW/DWPF flowsheet. The CIF is not shown but is a direct feed from a storage tank at DWPF.

APPENDIX B

HLW/DWPF System Interaction

Process	Limiter	Solution	Dependent Upon
1. Sludge Waste Removal	1. $, time and manpower to erect steelwork, pumps, etc. 2. Manpower available/qualified 3. Chemistry Appropriate for ESP Blending 4. Transfer route available 5. ESP Processing available (Al Dissolution or not) 6. ESP rate of processing	1. Fund projects to implement in a timely manner 2. Ensure ESP space by running DWPF 3. Effective WR schedule to avoid transfer conflicts 4. Timely Analytical Results	1. Budget 2. Manpower 3. ESP Operation 4. DWPF Operation 5. Transfer Facilities Operation 6. SRTC Analytical Operations 7. Space Gain through ITP Operation
2. Salt Waste Removal	1. $, time and manpower to erect steelwork, pumps, etc. 2. Manpower available/qualified 3. Chemistry Appropriate for ITP Blending 4. Transfer route available 5. ITP Processing available 6. ITP rate of processing 7. Tank 49 not full 8. Saltstone availability	1. Fund projects to implement in a timely manner 2. Timely Analytical Results 3. Run ITP at maximum rate 4. Run LW and DWPF at a rate equal or greater than ITP 5. Run Saltstone as needed 6. Effective WR schedule to avoid transfer conflicts	1. Budget 2. Manpower 3. ITP Operation 4. LW Operation 5. DWPF Operation 6. Saltstone Operations 7. Transfer Facilities Operation 8. SRTC Analytical Operations
3. Evaporation	1. Available Concentrate Receipt (Salt Tank) Space 2. Availability of Evaporators 3. ETF capable of handling effluent	1. Run ITP to remove salt from Evaporator salt receipt tanks 2. Gain Waste Water Operating permit (for 1H Evaporator) 3. Complete construction and startup the RHLWE 4. Maintain adequate capacity in the ETF	1. Permitting Process 2. ETF Operation 3. ITP Operation
4. Replacement High Level Waste Evaporator (RHLWE)	1. $, time and manpower to complete and startup 2. Concentrate receipt space with adequate cooling 3. Tank 32 use as feed tank 4. Startup Authorization	1. Fund project to implement in a timely manner 2. Run ITP to empty Tank 29 3. Install additional cooling in Tank 29 4. Timely Readiness Reviews	1. ITP Operations 2. Authorization Process

| Process | Limiter | Solution | Dependent Upon |

Process	Limiter	Solution	Dependent Upon
5. In-Tank Precipitation (ITP)	1. $, time and manpower to complete and startup 2. Startup Authorization 3. Technical Concerns Tank 41 Criticality Tank Integrity (Deflagration) Soil Bearing Study Filter Operation 4. Successful startup testing 5. Available Feed from Salt Tanks 6. Tank 49 not full 7. Tank 50 not full 8. Saltstone operational 9. Saltstone Vaults Available	1. Fund project to implement in a timely manner 2. Timely Readiness Reviews 3. Receipt of Waste Water Operating Permit 3. Prompt resolution of process technology concerns 4. Timely availability of salt waste removal projects 5. Startup LW and DWPF before Tank 49 is full 6. Evaluate use of supernate as feed to ITP in lieu of salt waste removal operation	1. Authorization Process 2. Permitting Process 3. Saltstone Operation 4. LW Operation 5. DWPF Operation 6. Waste Removal Operations 7. Transfer Facility Operation
6. Extended Sludge Processing (ESP)	1. Manpower to support startup 2. Startup Authorization 3. Available Feed from Sludge Tanks 4. Evaporator System capacity to handle wash water transfers, evaporation and salt content 5. Tank 21 use for wash water 6. Processing space available in ESP Tanks 7. Processing cycles as required to meet DWPF feed acceptance criteria 8. DWPF capable of receiving sludge 9. Tank Integrity (Deflagration)	1. Timely Readiness Reviews 2. Timely availability of sludge waste removal projects 3. Maintain Evaporators on line 4. Complete Batch #1 and feed to DWPF 5. Prompt resolution of process technology concerns	1. Authorization process 2. Management of personnel resources 3. Waste Removal Operations 4. Evaporation Operations 5. DWPF Operations 6. Transfer Facility Operation 7. Space Gain through ITP Operation
7. Late Wash (LW)	1. Fund and implement in a timely manner 2. Startup Authorization 3. Technical Concerns Filter Operation Benzene Stripping 4. Tank 22 available for recycle of wash water 5. DWPF on line 6. Feed available from Tank 49	1. Fund projects to implement in a timely manner 2. Prompt resolution of process technology concerns 3. Timely Readiness Reviews 4. Run ITP to supply feed to Tank 49 5. Run ITP to maintain level in Tank 22 6. Run DWPF to accept Feed	1. Budget 2. Permitting Action 3. Authorization process 4. ITP Operation 5. DWPF Operation 6. Transfer Facility Operation 7. Saltstone Operation

Process	Limiter	Solution	Dependent Upon
8. Defense Waste Processing Facility (DWPF)	1. Startup Authorization 2. Successful Cold Chemical Runs 3. Technical Concerns Ammonium Nitrate Formation Organic Fouling 4. Availability of sludge feed 5. Availability of precipitate feed 6. Tank Farm capable of handling the recycle water 7. Benzene appropriately stored or incinerated	1. Timely Readiness Reviews 2. Prompt resolution of process technology concerns 3. Run ESP 4. Run LW from Tank 49 Feed 5. Run ITP 6. Maintain and increase Evaporator capacity 7. Implement CIF project	1. Budget 2. Permitting Action 3. Authorization process 4. ESP Operation 5. LW Operation 6. ITP Operation 7. Evaporator Operation including the RHLWE 8. Transfer Facility Operation 9. CIF Operation
9. Saltstone	1. Feed available from Tank 50 2. Single shift operation 3. Vaults must be available	1. Run ITP and ETF 2. Man two shift operation if required 3. Timely funding and construction of new vaults	1. Budget 2. ITP Operation 3. ETF Operation
10. F/H Effluent Treatment Facility (ETF)	1. Feeds must meet acceptance criteria 2. Operational utility 3. Tank 50 not full	1. Maintain controls on generators for feed 2. Implement utility improvements as required 3. Run Saltstone	1. Evaporator Operations 2. Canyon Evaporator Operations 3. Saltstone Operation
11. Transfer Facilities **New Waste Transfer Facility (NWTF)** **Diversion Boxes** **Inter Area Lines** **Pump Pit Facilities, etc.**	1. Jumper changes required 2. Weather can extend maintenance duration 3. Limited number of transfer routes available 4. Operational utility	1. Support projects as practical to enclose high traffic diversion boxes 2. Effective scheduling of waste transfers 3. Implement utility improvements as required	1. Weather 2. Budget
12. Consolidated Incinerator Facility (CIF)	1. $, time and manpower to complete and startup 2. Permitting Process 3. Startup Authorization 4. Provide for secondary waste treatment or disposal 5. Availability of Benzene feed	1. Fund project to implement in a timely manner 2. Timely Readiness Reviews 3. Implement CIF operation before Benzene Storage at DWPF is full	1. Budget 2. DWPF 3. Mixed Waste/ hazardous Waste Facility (Also new project)

APPENDIX C

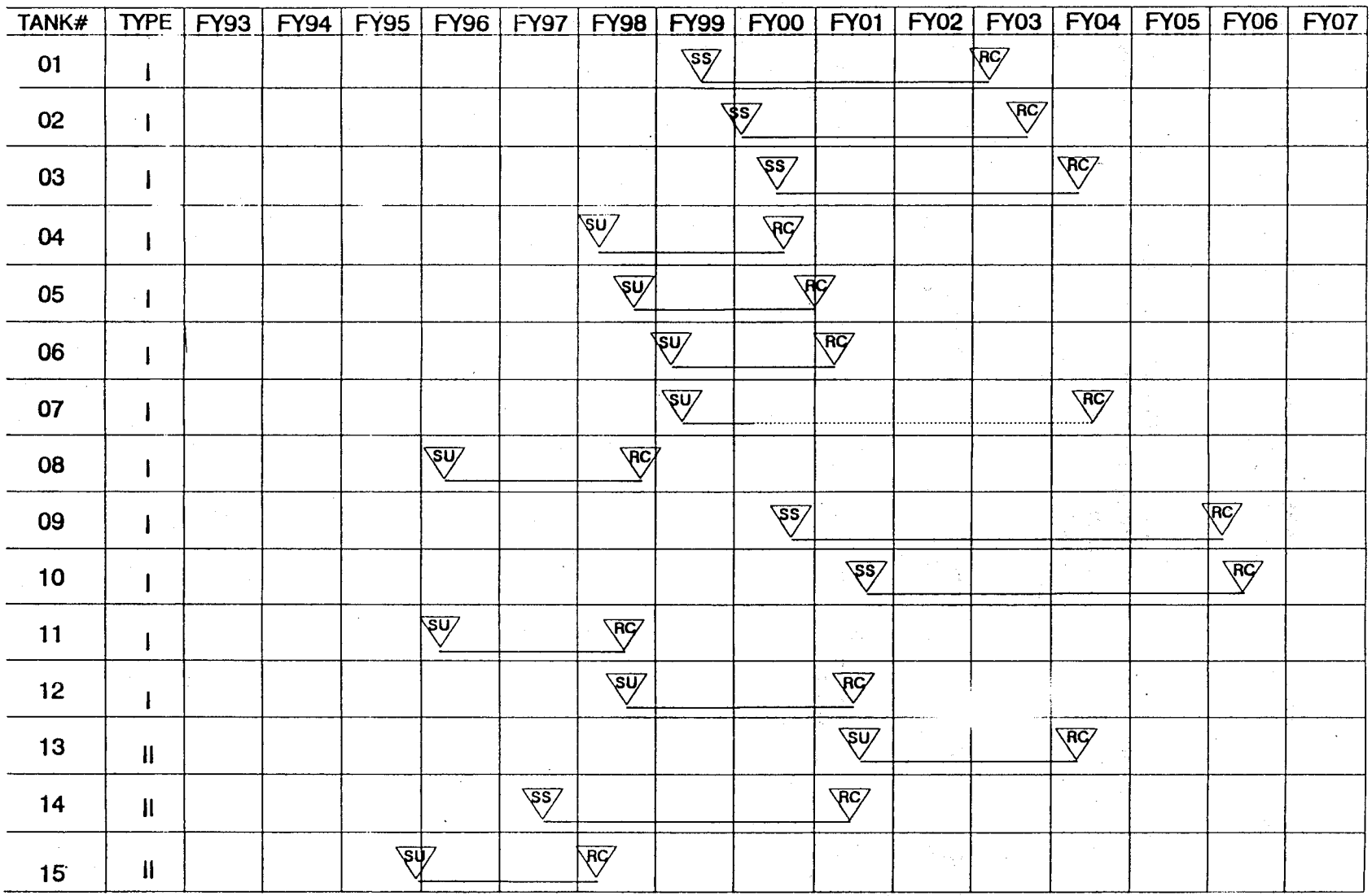
Appendix C shows the current waste removal plan for type I, II and IV tanks. These tanks do not meet the standards for secondary containment as outlined in the Federal Facilities Agreement (FFA).

The key start dates are based on a six-month planning window with the first triangle indicating the early start date for actual removal of waste from the tank. The early start date is six months before the current processing need date for ITP or ESP. (Note that the associated waste removal project action typically precedes the actual waste removal by 30-36 months.)

The solid line shows the duration for completing the waste removal, installation of water washing facilities and final rinse of the tank and annulus (if required).

The last triangle shows the late finish date for completion of waste removal. This includes six months for verification of tank status and turnover to environmental restoration.

WASTE REMOVAL PLAN FOR TYPE I, II, & IV TANKS



LEGEND	SALT STARTUP (SS)	SLUDGE STARTUP (SU)	WASTE REMOVAL OPS COMPLETE (RC)	DURATION ———	TANK USED TO TRANSFER 1, 2 & 3 .....

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WASTE REMOVAL PLAN FOR TYPE I, II, & IV TANKS

TANK#	TYPE	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07
16	II	Waste Removal Complete														
17	IV									SU		RC				
18	IV										SU		RC			
19	IV									SU		RC				
20	IV	Waste Removal Complete														
21	IV												SU		RC	
22	IV											SU		RC		
23	IV												SU		RC	
24	IV												SU		RC	

LEGEND: SALT STARTUP (SS) | SLUDGE STARTUP (SU) | WASTE REMOVAL OPS COMPLETE (RC) | DURATION ——— | TANK USED TO TRANSFER 1, 2 & 3 .....

11/03/92

APPENDIX D

HLW/DWPF Integrated Schedule

The Integrated Schedule show the major facilities, key activities and inter-relationships required to support the HLW Management Plan.

Replacement High Level Waste Evaporator - [S-4062]
Driver: Process DWPF recycle, ESP wash water and maintain space in tank farm

Key Date(s): August '96 - Begin operations

In-Tank Precipitation - [S-3781]
Driver: Provide salt receipt space in tank farm and provide feed to DWPF

Key Date(s): April '93 - Begin processing tank 41
October '95 - Provide combined precipitate and sludge feed to DWPF

Extended Sludge Processing - [S-2081]
Driver: Remove waste from old tanks and provide feed to DWPF

Key Date(s): April '93 - Resume washing of Sludge Batch 1 feed to DWPF
June '94 - Provide initial sludge only feed to DWPF

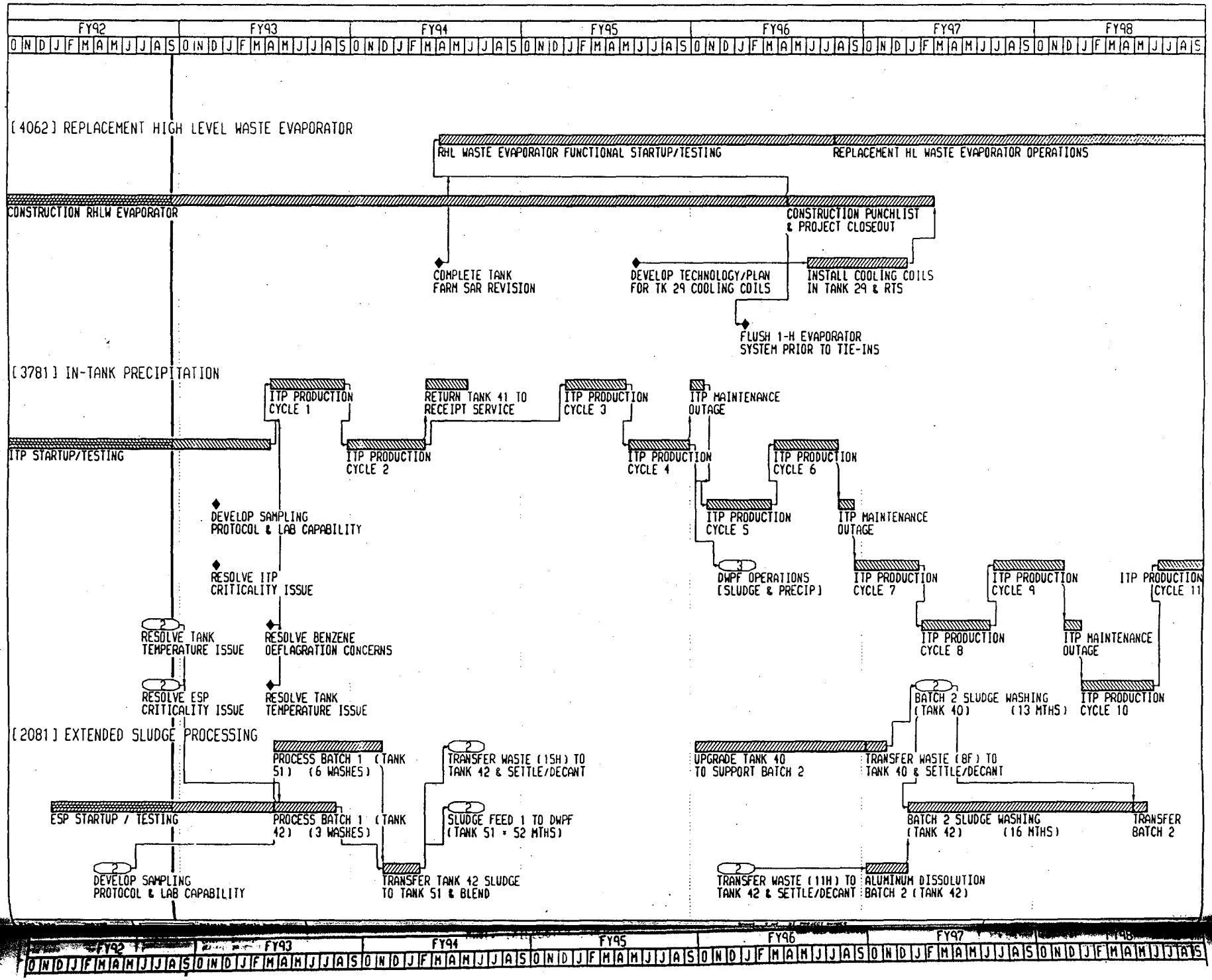
Defense Waste Processing Facility - [S-1780]
Driver: FFCA commitment to process LDR waste.

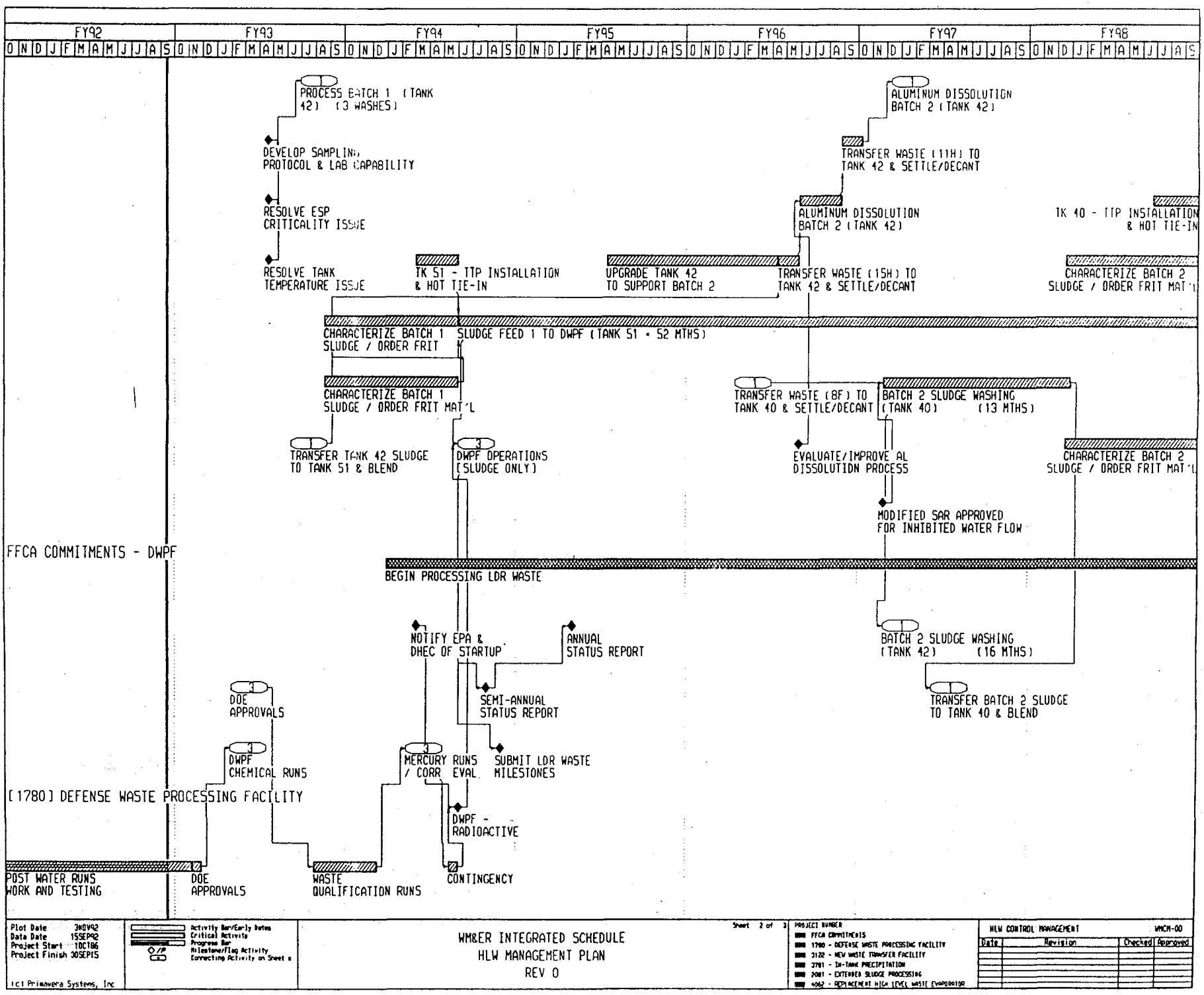
Key Date(s): December '93 - Begin mercury run and recycle stream to HLW area
December '93 - FFCA commitment to begin processing LDR waste
June ' 94 - Begin sludge only operations
October '95 - Begin combined sludge and precipitate operations

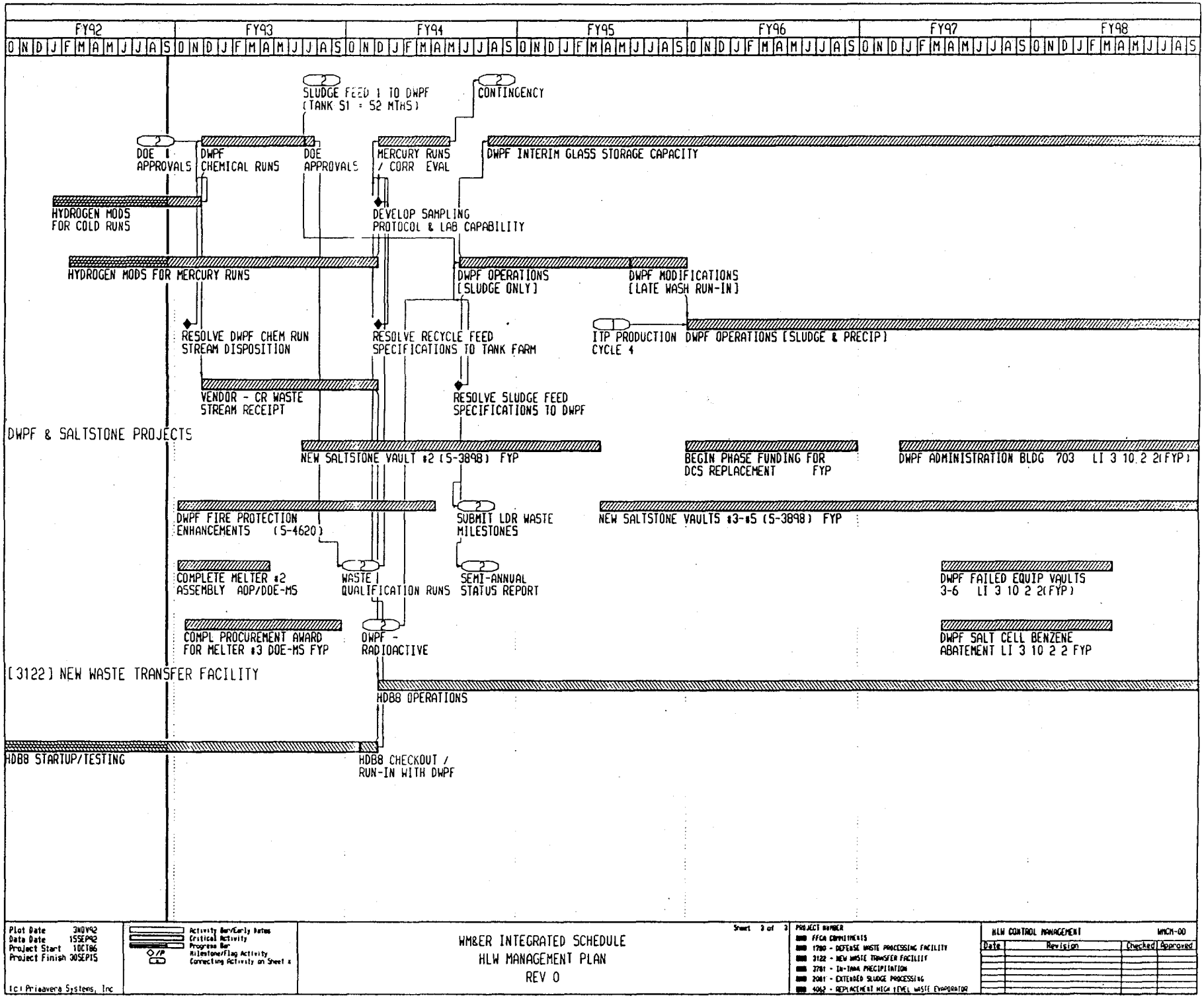
DWPF & Saltstone Projects
Driver: Construct new vaults and other key equipment needs

New Waste Transfer Facility - [S-3122]
Driver: DWPF recycle waste stream beginning with mercury runs

Key Date(s): December '93 - Begin DWPF mercury runs


FY92
FY93
FY94
FY95
FY96
FY97
FY98
O N D J F M A M J J A S
[4062] REPLACEMENT HIGH LEVEL WASTE EVAPORATOR
RHL WASTE EVAPORATOR FUNCTIONAL STARTUP/TESTING
REPLACEMENT HL WASTE EVAPORATOR OPERATIONS
CONSTRUCTION RHLW EVAPORATOR
CONSTRUCTION PUNCHLIST & PROJECT CLOSEOUT
COMPLETE TANK FARM SAR REVISION
DEVELOP TECHNOLOGY/PLAN FOR TK 29 COOLING COILS
INSTALL COOLING COILS IN TANK 29 & RTS
FLUSH 1-H EVAPORATOR SYSTEM PRIOR TO TIE-INS
[3781] IN-TANK PRECIPITATION
ITP PRODUCTION CYCLE 1
RETURN TANK 41 TO RECEIPT SERVICE
ITP PRODUCTION CYCLE 3
ITP MAINTENANCE OUTAGE
ITP STARTUP/TESTING
ITP PRODUCTION CYCLE 2
ITP PRODUCTION CYCLE 4
ITP PRODUCTION CYCLE 6
DEVELOP SAMPLING PROTOCOL & LAB CAPABILITY
ITP PRODUCTION CYCLE 5
ITP MAINTENANCE OUTAGE
RESOLVE ITP CRITICALITY ISSUE
3
DWPF OPERATIONS (SLUDGE & PRECIP)
ITP PRODUCTION CYCLE 7
ITP PRODUCTION CYCLE 9
ITP PRODUCTION CYCLE 11
2
RESOLVE TANK TEMPERATURE ISSUE
RESOLVE BENZENE DEFLAGRATION CONCERNS
ITP PRODUCTION CYCLE 8
ITP MAINTENANCE OUTAGE
2
RESOLVE ESP CRITICALITY ISSUE
RESOLVE TANK TEMPERATURE ISSUE
2
BATCH 2 SLUDGE WASHING (TANK 40) (13 MTHS)
ITP PRODUCTION CYCLE 10
[2081] EXTENDED SLUDGE PROCESSING
PROCESS BATCH 1 (TANK 51) (6 WASHES)
2
TRANSFER WASTE (15H) TO TANK 42 & SETTLE/DECANT
UPGRADE TANK 40 TO SUPPORT BATCH 2
TRANSFER WASTE (8F) TO TANK 40 & SETTLE/DECANT
ESP STARTUP / TESTING
PROCESS BATCH 1 (TANK 42) (3 WASHES)
2
SLUDGE FEED 1 TO DWPF (TANK 51 + 52 MTHS)
BATCH 2 SLUDGE WASHING (TANK 42) (16 MTHS)
TRANSFER BATCH 2
2
DEVELOP SAMPLING PROTOCOL & LAB CAPABILITY
TRANSFER TANK 42 SLUDGE TO TANK 51 & BLEND
2
TRANSFER WASTE (11H) TO TANK 42 & SETTLE/DECANT
ALUMINUM DISSOLUTION BATCH 2 (TANK 42)


FY92
FY93
FY94
FY95
FY96
FY97
FY98
PROCESS BATCH 1 (TANK 42) (3 WASHES)
DEVELOP SAMPLING PROTOCOL & LAB CAPABILITY
RESOLVE ESP CRITICALITY ISSUE
RESOLVE TANK TEMPERATURE ISSUE
TK 51 - TTP INSTALLATION & HOT TIE-IN
UPGRADE TANK 42 TO SUPPORT BATCH 2
ALUMINUM DISSOLUTION BATCH 2 (TANK 42)
TRANSFER WASTE (11H) TO TANK 42 & SETTLE/DECANT
ALUMINUM DISSOLUTION BATCH 2 (TANK 42)
TRANSFER WASTE (15H) TO TANK 42 & SETTLE/DECANT
TK 40 - TTP INSTALLATION & HOT TIE-IN
CHARACTERIZE BATCH 2 SLUDGE / ORDER FRIT MAT'L
CHARACTERIZE BATCH 1 SLUDGE / ORDER FRIT
SLUDGE FEED 1 TO DWPF (TANK 51 + 52 MTHS)
CHARACTERIZE BATCH 1 SLUDGE / ORDER FRIT MAT'L
TRANSFER WASTE (8F) TO TANK 40 & SETTLE/DECANT
BATCH 2 SLUDGE WASHING (TANK 40) (13 MTHS)
TRANSFER TANK 42 SLUDGE TO TANK 51 & BLEND
DWPF OPERATIONS (SLUDGE ONLY)
EVALUATE/IMPROVE AL DISSOLUTION PROCESS
CHARACTERIZE BATCH 2 SLUDGE / ORDER FRIT MAT'L
MODIFIED SAR APPROVED FOR INHIBITED WATER FLOW
FFCA COMMITMENTS - DWPF
BEGIN PROCESSING LDR WASTE
NOTIFY EPA & DHEC OF STARTUP
ANNUAL STATUS REPORT
BATCH 2 SLUDGE WASHING (TANK 42) (16 MTHS)
DOE APPROVALS
SEMI-ANNUAL STATUS REPORT
TRANSFER BATCH 2 SLUDGE TO TANK 40 & BLEND
DWPF CHEMICAL RUNS
MERCURY RUNS / CORR EVAL
SUBMIT LDR WASTE MILESTONES
[1780] DEFENSE WASTE PROCESSING FACILITY
DWPF - RADIOACTIVE
POST WATER RUNS WORK AND TESTING
DOE APPROVALS
WASTE QUALIFICATION RUNS
CONTINGENCY
Plot Date 3NOV92
Data Date 15SEP92
Project Start 1OCT86
Project Finish 30SEP15
(c) Primavera Systems, Inc
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
Connecting Activity on Sheet x
Sheet 2 of 3
WM&ER INTEGRATED SCHEDULE
HLW MANAGEMENT PLAN
REV 0
PROJECT NUMBER
FFCA COMMITMENTS
1780 - DEFENSE WASTE PROCESSING FACILITY
3122 - NEW WASTE TRANSFER FACILITY
3791 - IN-TANK PRECIPITATION
2081 - EXTENDED SLUDGE PROCESSING
4062 - REPLACEMENT HIGH LEVEL WASTE EVAPORATOR
HLW CONTROL MANAGEMENT
WMCM-00
Date
Revision
Checked
Approved


FY92
FY93
FY94
FY95
FY96
FY97
FY98
O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S
SLUDGE FEED 1 TO DWPF (TANK S1 = 52 MTHS)
CONTINGENCY
DOE APPROVALS
DWPF CHEMICAL RUNS
DOE APPROVALS
MERCURY RUNS / CORR EVAL
DWPF INTERIM GLASS STORAGE CAPACITY
HYDROGEN MODS FOR COLD RUNS
DEVELOP SAMPLING PROTOCOL & LAB CAPABILITY
HYDROGEN MODS FOR MERCURY RUNS
DWPF OPERATIONS [SLUDGE ONLY]
DWPF MODIFICATIONS [LATE WASH RUN-IN]
RESOLVE DWPF CHEM RUN STREAM DISPOSITION
RESOLVE RECYCLE FEED SPECIFICATIONS TO TANK FARM
ITP PRODUCTION CYCLE 4
DWPF OPERATIONS [SLUDGE & PRECIP]
VENDOR - CR WASTE STREAM RECEIPT
RESOLVE SLUDGE FEED SPECIFICATIONS TO DWPF
DWPF & SALTSTONE PROJECTS
NEW SALTSTONE VAULT #2 (S-3898) FYP
BEGIN PHASE FUNDING FOR DCS REPLACEMENT FYP
DWPF ADMINISTRATION BLDG 703 LI 3 10 2 2(FYP)
DWPF FIRE PROTECTION ENHANCEMENTS (S-4620)
SUBMIT LDR WASTE MILESTONES
NEW SALTSTONE VAULTS #3-#5 (S-3898) FYP
COMPLETE MELTER #2 ASSEMBLY AOP/DOE-MS
WASTE QUALIFICATION RUNS
SEMI-ANNUAL STATUS REPORT
DWPF FAILED EQUIP VAULTS 3-6 LI 3 10 2 2(FYP)
COMPL PROCUREMENT AWARD FOR MELTER #3 DOE-MS FYP
DWPF - RADIOACTIVE
DWPF SALT CELL BENZENE ABATEMENT LI 3 10 2 2 FYP
[3122] NEW WASTE TRANSFER FACILITY
HDB8 OPERATIONS
HDB8 STARTUP/TESTING
HDB8 CHECKOUT / RUN-IN WITH DWPF
Plot Date 3NOV92
Data Date 15SEP92
Project Start 10CT86
Project Finish 30SEP15
(c) Primavera Systems, Inc
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
Connecting Activity on Sheet #
Sheet 3 of 3
WM&ER INTEGRATED SCHEDULE
HLW MANAGEMENT PLAN
REV 0
PROJECT NUMBER
FFCA COMMITMENTS
1700 - DEFENSE WASTE PROCESSING FACILITY
3122 - NEW WASTE TRANSFER FACILITY
2701 - In-Tank PRECIPITATION
2081 - EXTENDED SLUDGE PROCESSING
4062 - REPLACEMENT HIGH LEVEL WASTE EVAPORATOR
HLW CONTROL MANAGEMENT
WMCM-00
Date
Revision
Checked
Approved

APPENDIX E

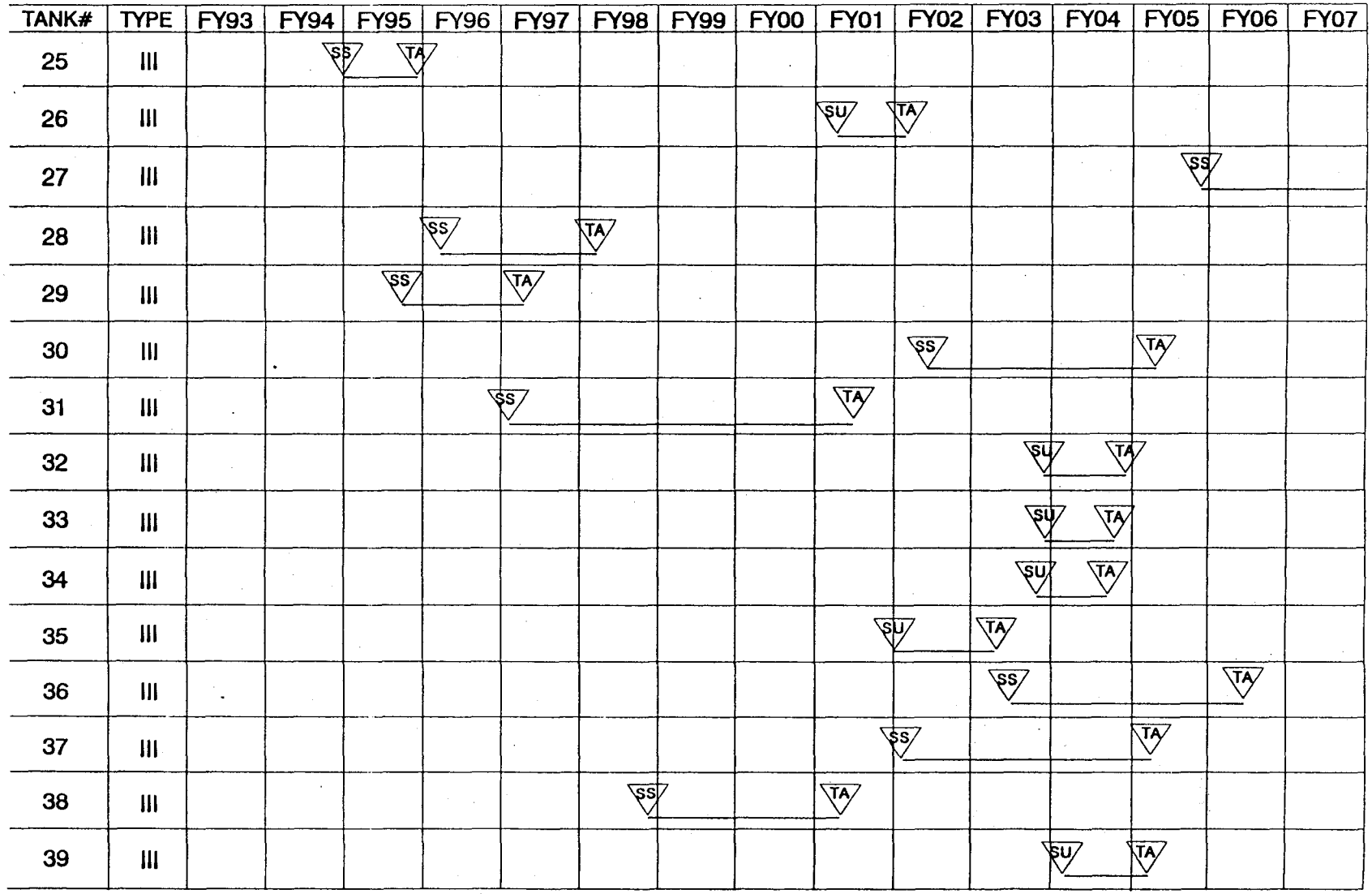
Appendix E shows the current waste removal plan for type III tanks. Waste removal from these tanks is required to maintain adequate emergency space in the tank farm, operating space for the evaporator systems, surge capacity for large transfers of ESP wash water and DWPF recycle and continuity of feed to DWPF.

The key start dates are based on a six-month planning window with the first triangle indicating the early start date for actual removal of waste from the tank. The early start date is six months before the current need date. (Note that the associated waste removal project action typically precedes the initial waste removal by 30-36 months.)

The solid line shows the duration for completing the waste removal and returning the tank to service.

The last triangle shows the early finish date for completion of waste removal and availability of the tank to be returned to service.

WASTE REMOVAL PLAN FOR TYPE III TANKS



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WASTE REMOVAL PLAN FOR TYPE III TANKS

TANK#	TYPE	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07
40	III	*														
41	III	SS ▽	TA ▽										SU ▽			TA ▽
42	III	*														
43	III											SU ▽	TA ▽			
44	III													SS ▽		
45	III														SS ▽	
46	III															SS ▽ 10/29/07
47	III					SS ▽			TA ▽							
48	III	**														
49	III	**														
50	III	**														
51	III	*														

LEGEND | SALT STARTUP ▽SS | SLUDGE STARTUP ▽SU | TANK AVAILABLE FOR SERVICE ▽RC | DURATION ——— | * ESP TANKS | ** ITP TANKS

11/03/92

Appendix F

The following attachments describe the key milestones to support the HLW Plan. The milestone date and reference documentation is also listed:

F.1 HLW

F.2 DWPF

F.3.1 SRTC - IWT

F.3.2 SRTC - DWPT

ATTACHMENT F.1

HLW WASTE REMOVAL DOE BASED MILESTONES

The HLW Waste Removal DOE based milestones relative to execution of this schedule are listed in the following table. Included are milestones from the Period 8 Award Fee document, the approved FY93 Annual Operating Plan (AOP) and from the FY94 Five Year Plan (FYP) Planning Case.

Only milestones related to the Waste Removal Program and space gain initiatives are included in this listing. For those milestones which are listed under multiple documents, the following priority exists for accuracy of dates: 1) Award Fee 2) FY93 AOP and 3) FY94 Five Year Plan.

DOCUMENT	APPROX. DATE GENERATED
1) Period 8 Award Fee Goals	10/92
2) FY93 AOP	08/92
3) FY94 FYP	*10/92

* Note: FY94 FYP Milestones revised per DOE-HQ direction to reflect new funding values. (D. Wayne Nobles to L. Watkins, October 14, 1992)

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
	• Submit revision 0 of Waste Removal schedule to DOE.	11/5/92	F.3.2.1.g	1.05.03	
	• Start waste removal from Tank 41.	12/18/92	F.3.2.3.a		
	• Restart 242-H Evaporator (Based on receipt of Waste Water Permit by 12/1/1993)*	2/1/93 *			32AA.2
	• Submit High Level Waste Removal input to Waste Removal Management Plan and track to monitor status vs. plan.	2/28/93	F.3.2.1.g		
	• Develop a schedule for Other Project Costs (OPC) activities that incorporates latest information to support RHLWE requirements.	2/28/93	5.3.2.1.c		
	• Develop a generic tank waste removal startup plan(s), and associated resource requirements, and incorporate into the High Level Liquid Waste Program.	2/28/93	F.3.2.1.h		
	• Recover 168,000 gallons of HHW space utilizing the 1H evaporator (subtract 84,000 gal/mo. for restart delay after 02/1/93).	3/31/93	F.3.2.3.a		
	• Recover 125,000 gallons of LHW space utilizing the 2H evaporator.	3/31/93	F.3.2.3.a		
	• Include authorized Line Item and cost projects summary level schedules into High Level Liquid Waste Program plan.	3/31/93	5.3.2.1.c		
	• Develop, submit, and implement a plan to ensure waste removal modifications are covered by DOE approved safety documentation.	3/31/93	5.3.2.1.g		
	• Begin radioactive operation of ITP.	4/20/93	F.3.2.3.a		

**Milestone revised to reflect current schedule information as contained in the HLW Program Plan.*

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
	• Resume Extended Sludge Processing for batch one.	4/20/93	F.3.2.3.a		
	• Initiate HHW processing through 2F Evaporator	7/1/93		1.05.03.01.01	
	• Recover 240,000 gal of space after initiation of HHW processing in the 2F Evaporator) (3 mon of ops)	9/30/93		1.05.03.01.01	
	• Reclaim 250,000 gal of LHW using 2H Evaporator	9/30/93		1.05.02.01.01	
	• Reclaim 1M gal of HHW using 1H Evaporator (reduced 83,000 gal/mon if 1H not restarted)	9/30/93		1.05.02.01.01	
	• Initiate radioactive operation of NWTF	12/9/93			32AA.3
	• Initiate Waste Removal from Tank 25	10/2/94			33AA.1
	• Initiate radioactive operation of RHLWE	3/30/95*			32AA.3
	• Initiate Waste Removal from Tank 29	8/2/95			32AA.10
	• Initiate Waste Removal from Tank 15	9/15/95			32AA.6
	• Initiate Waste Removal from Tank 11	12/29/95			32AA.6
	• Initiate Waste Removal from Tank 47	11/4/96			33AA.8
	• Initiate Waste Removal from Tank 8	12/2/96			33AA.3
	• Initiate Waste Removal from Tank 14	5/11/97			32AA.7

**Startup date assumed in HLW Program Plan was 8/96. Project currently determining startup date based upon rebaselining efforts.*

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
	• Initiate Waste Removal from Tank 31	10/19/97			32AA.17
	• Initiate Waste Removal from Tank 4	2/1/98			33AA.10
	• Initiate Waste Removal from Tank 12	5/31/98			32AA.14
	• Initiate Waste Removal from Tank 5	6/29/98			33AA.3
	• Initiate Waste Removal from Tank 14	8/30/98			32AA.14
	• Reclaim 15 M gal of tank volume (using 1H, 2H and RHWLE)	9/30/98			32AA.20
	• Initiate waste removal from Tank 6	12/26/98			33AA.3
	• Initiate Waste Removal from Tank 47	4/27/99			33AA.9
	• Initiate Waste Removal from Tank 9	7/23/99			32AA.19
	• Initiate Waste Removal from Tank 38	7/23/99			32AA.24
	• Complete Waste Removal from Tank 12	4/12/00			32AA.23
	• Complete Waste Removal from Tank 14	4/12/00			32AA.23
	• Return Tank 31 to receipt service	6/5/01			32AA.22
	• Initiate Waste Removal from Tank 21	12/19/03			32AA.16
	• Complete Waste Removal on Tank 21	5/9/05			32AA.18

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
THE FOLLOWING ARE PROJECT SPECIFIC MILESTONES					
NOTE:	*ADS milestones listed in this section were generated by Waste Management Control Management (WMCM) and Engineering & Projects Division (E&PD) during the FY94 FYP development.*				
	Waste Removal & Extended Sludge Processing (S-2081)				
	• Complete installation of slurry pump modifications (Tanks 42 & 51)	10/30/92		1.05.17.02.03.02	
	• Complete modifications to 241-74H Control Room	9/30/93		1.05.17.02.03.02	
	• Complete modifications to Tanks 21 and 22	9/30/93		1.05.17.02.03.02	
	• Tank 11H, Waste Removal Facilities-Complete Turnover to Operations	12/28/95			314-LI.11
	• Tank 8F, Waste Removal Facilities-Complete Turnover to Operations	2/11/96			314-LI.9
	• Tank 3F, Waste Removal Facilities-Complete Turnover to Operations	2/9/97			314-LI.21
	• Tank 14H, Waste Removal Facilities-Complete Turnover to Operations	5/10/97			314-LI.29
	• Tank 4F, Waste Removal Facilities-Complete Turnover to Operations	1/31/98			314-LI.44
	• Tank 5F, Waste Removal Facilities-Complete Turnover to Operations	6/28/98			314-LI.8
	• Tank 6F, Waste Removal Facilities-Complete Turnover to Operations	12/25/98			314-LI.22
	• Tank 7F, Waste Removal Facilities-Complete Turnover to Operations	2/26/99			314-LI.45
	• Tank 10H, Waste Removal Facilities-Complete Turnover to Operations	7/21/03			314-LI.25

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
	Type III Tanks Salt Removal, Phase II (S-2860)				
•	Award "Old Hill" DCS Contract	9/30/93		1.05.17.02.01.02	
•	Award Lump Sum Contract for the 241-2H Control Room	9/30/93		1.05.17.02.01.02	
•	Tank 47F, Waste Removal Facilities-Complete Turnover to Operations	11/3/96			314-LI.27
•	Tank 31H, Waste Removal Facilities-Complete Turnover to Operations	10/18/97			314-LI.39
	High Level Waste Removal from Filled Waste Tanks (S-3025)				
•	Start Title I Design	7/1/93		1.05.17	
•	Tanks 38H, Waste Removal Facilities-Complete Turnover to Operations	7/22/99			314-LI.38
•	Tanks 37H, Waste Removal Facilities-Complete Turnover to Operations	12/4/00			314-LI.43
•	Tanks 35H, Waste Removal Facilities-Complete Turnover to Operations	10/3/01			314-LI.37
•	Tank 44F, Waste Removal Facilities-Complete Turnover to Operations	10/30/01			314-LI.47
•	Tank 36H, Waste Removal Facilities-Complete Turnover to Operations	3/4/03			314-LI.49
•	Tanks 39H, Waste Removal Facilities-Complete Turnover to Operations	11/13/03			314-LI.16

HLW WASTE REMOVAL MILESTONES

HLW	DESCRIPTION	DATE	AWARD FEE	TDS	ADS
	Type III Tanks Salt Removal, Phase I (S-3291)				
	• Complete seismic study for Tanks 25, 28 and 29	3/30/93		1.05.17.02.02.02	
	• Complete TNX run-in of Tanks 25 slurry pumps	9/30/93		1.05.17.02.02.02	
	• Tank 25F, Waste Removal Facilities-Complete Turnover to Operations	10/1/94			314-LI.2
	• Tank28F, Waste Removal Facilities-Complete Turnover to Operations	11/29/94			314-LI.12
	• Tank 29H, Waste Removal Facilities-Complete Turnover to Operations	8/1/95			314-LI.15
	Replacement High Level Waste Evaporator (S-4062)				
	• Title II design complete	9/30/93		1.05.13	

ATTACHMENT F.2

DWPF DOE BASED MILESTONES

MILESTONE	DATE	AWARD FEE	TDS (AOP)	ADS(FYP)
Complete Electrical Distribution Testing	11/24/92	F.3.1.1.a		
Complete Weld Parametric Study	12/08/92	F.3.1.1.a		
Complete Emergency Diesel Generator Testing	12/03/92	F.3.1.1.a		
Complete Chemical Process O-G Mods	12/92		1.06.07-5(DOE MS)	
Complete H2 Mitigation Mods for CCR	10/92		1.06.07-4(DOE MS)	
Complete DCS Reliability Mods	10/92		1.06.07-3(DOE MS)	
Submit SAR to DOE for approval	11/92		1.06.01-2(DOE MS)	
Commence DWPF Chemical Runs	11/92		19C01 / 1.06.01-1(DOE MS)	SR-22-AA(FYP 94-98
Commence First Melter Run	01/93		19C08	
Complete Melter #2 Assembly	04/93		19C10 (New DOE MS)	
SAR, Rev 2 Update Pkgs to DOE-HQ	04/93		19H04 (New DOE MS)	
Complete Awards for Melter #3 Procurement	09/93		191C12 (New DOE MS)	
Commence Waste Qualification Runs	07/93		19C02/19C11	SR-22-AA(FYP 94-98)
Commence Radioactive Operation	05/94			SR-22-AA(FYP 94-98)
Complete the CDR for Failed Equipment Storage Vaults (3 to 6)	02/92		19C05	
Complete Failed Equipment Storage Vault	03/93		19C09	
Commence Saltstone Continuous Operation	10/92			ADSSR-23-AA
Start construction of Saltstone Vault #2	02/92			ADS SR-23-AA
Complete construction of Saltstone Vault #2	03/94			ADS SR-23-AA

ATTACHMENT F.3.1

SRTC - IWT DOE BASED MILESTONES

DESCRIPTION	COMPLETION DATE	FY93 AOP TDS#	COMMENTS
Demonstrate vertical turbine pump operation.	10/1/92	SR-46-AA	On hold per operation's request
Provide corrosion and HLW support.	On-going	SR-46-AA	
Submit Tank Farm Operational Safety Requirements for DOE Review.	12/31/92	AOP 18C05	
SRTC recommend Safety Class items to WSRC-HLW Prgm.	2/18/93	AOP 18C20	
SRTC complete (ready for WSRC review) Chapters 3,5-8,10, and 12-15 of the Tank Farm SAR.	9/30/93	AOP 18C21	
Prove mechanical integrity of backup Mott crossflow filter.	1/31/93	SR-35-AA	Facility in check-out stages
Provide Technical Manual for ITP Process.	6/30/93	SR-35-AA	Delayed due to other priorities
Install pilot scale electrochemical denitration test unit.	12/1/92	SR-50-AA	Unfunded
Demonstrate feasibility of full scale Cs ion exchange unit.	6/1/93	SR-50-AA	Unfunded

ATTACHMENT F.3.2

SRTC - DWPT DOE BASED MILESTONES

DESCRIPTION	COMPLETION DATE*	FY93 AOP TDS#	COMMENTS
IDMS VITRIFICATION:			
Initial quantification of noble metals during vitrification cycle.	09/02/93	SR-100-AA.47	
Procure stirred melter.	06/30/93	SR-100-AA.47	
PROCESS TECHNOLOGY ASSURANCE:			
Demonstrate LW PHP in 1/200th Scale SRAT Using Washed Irradiated Feed.	01/31/93	SR-100-AA.493	
Quantify degree of Entrainment to CPC Vessel Vent System.	06/30/93	SR-100-AA.493	
Demonstrate Batch 1 Target in High Level Cells.	11/03/93	SR-100-AA.497	
BENZENE ABATEMENT:			
Evaluate detoxifier performance at vendor.	07/15/93	SR-100-AA.496	
WASTE FORM QUALIFICATION - WASTE ACCEPTANCE			Provide product acceptance technology & demo.
Characterize glass samples/QR canisters.	07/31/93	SR-100-AA.42	compliance with repository requirements. This task
Revise WQR to include qualification runs data.	07/31/94	SR-100-AA.42	is funded at the Target Level. The supporting
Complete characterization of qualification runs glass.	02/28/94	SR-100-AA.42	analysis task is not full funded.
PRODUCT COMPOSITION CONTROL SYSTEM (PCCS)			
Verify & Document Solubility of Salt in DWPF Glass for Rad Ops.	09/02/93	SR-100-AA.495	
CHEMICAL RUNS SUPPORT			Funding has not yet been shifted from 4J, AJ & DA
Complete and Document MFT Homogeneity Study.	11/19/92	SR-100-AA.48	to cover in-resident support. Current schedule is 8/93, interim reports will be prepared.
ENGINEERING SUPPORT SERVICES (EES)			EES will provide technical support for DWPF
Install Cold Run Canister Penetration Taps.	01/93	SR-100-AA.41	startup requirements. Process equipment provided.
Z-AREA SALTSTONE SUPPORT			
Complete intera modeling on cracks and no slag.	06/30/93	SR-110-AA.31	

* Current FY93 AOP Milestone

Appendix G

The following attachments provide a brief description of the open technical issues with significant potential to impact the HLW Plan Schedule. In addition to the issue description is a logic tie to the HLW Plan schedule and the projected date at which time the issue must be successfully resolved.

G.1 HLW

G.2 DWPF

Attachment G.1 HLW Technical Issues:

Need Date is based on the current schedule contained in this HLW Plan Rev (0). Changes to the schedule may have a direct impact on the need date of associated issues.

1) Resolve/finalize DWPF Chemical Runs stream disposition. Where will the stream go?

Logic Ties	Need Date
a) Start of DWPF Chemical Runs	10/92
b) Start of DWPF Hg Runs	12/93

2) Develop sampling protocol for overall Waste Removal Program. Should include Lab Capability to support turnaround time, sample disposition, etc.

Logic Ties	Need Date
a) ITP - Start Salt Removal	12/92
b) ESP – Start of Processing	4/93
c) DWPF - Hg Runs	12/93

3) Resolve criticality concerns with ITP and ESP processing.

Logic Ties	Need Date
a) ITP-Start of Salt Removal	12/92
b) ESP-Resume Processing	4/93

4) Define and obtain DOE concurrence on startup review requirements for Waste Removal Projects

Logic Tie	Need Date
Develop Tank 25 waste removal startup plan	4/93

5) Resolve tank integrity (benzene deflagration) concerns

Logic Tie	Need Date
ITP - Prior to Tank 48 operation	4/93

6) Quantify or predict tank temperature during operation and determine any needed methods to control temperature

Logic Tie	Need Date
ITP - Prior to Tank 48 operation	4/93
ESP - Prior to resuming operation	4/93
ITP - Prior to Tank 49 operation	12/94

7) Resolve ITP seismic (soil bearing) concerns

Logic Tie	Need Date
ITP - Prior to Tank 48 operation	4/93

8) Finalize DWPF feed acceptance criteria

Logic Tie	Need Date
a) DWPF Recycle - Hg Runs	12/93
b) DWPF Feed - (per ESP Batch)	6/94

9) Develop plan for control room consolidation

Logic Tie	Need Date
Start of Tank 25 salt removal checkout	2/94

10) Complete Tank Farm Safety analysis Report (SAR)

Logic Tie	Need Date
RHLWE startup	4/94

11) Resolve Tank 41 Controls Issue

Logic Tie	Need Date
Return of Tank 41 to salt receipt service	6/94

12) Develop technology and plan for cooling coil replacement on Tank 29

Logic Tie	Need Date
12 months prior to scheduled coil replacement	7/95

13) Develop plan for receipt of RBOF stream to Type III tank

Logic Tie	Need Date
5 years prior to initiation of waste removal from Tank 23	2/96

14) Evaluate and improve Al Dissolution operation

Logic Tie	Need Date
Prior to Al Dissolution processing	6/96

15) Develop transition plan for turnover of "cleaned" tanks from HLW to ER

Logic Tie	Need Date
Tanks 11,15 & 8 waste removal completion	Begin 11/96

16) Define additional Waste Removal requirements for Type IV tanks (resin, sludge heel, etc.)

Logic Tie	Need Date
Waste removal from first Type IV tank (Tank 23)	3/03

Attachment G.2 - DWPF

ISSUE DESCRIPTION	NEED DATE	DRIVER/LOGIC TIE	RESOLUTION
Mitigation of H2 in the feed preparation process to minimize explosive potential of hydrogen concentrations.	11/92 12/93	Cold Chemical Runs Hg Runs	Phase I - H2 Mods for CCR Phase II - Hot H2 mods to be installed for Hg Runs
Control of the disposition of Ammonium Nitrate produced in the Precipitate Hydrolysis & feed preparation process	12/93	Need before start of Hg Runs	Ammonia Scrubber installation
Control of organic deposits in feed preparation vessels and vents. Remove ammonia and ammonia nitrate from the off-gas of process vessels to eliminate explosion potential.	10/95	Rad Ops 5/94 Full Late Wash Flow Sheet 10/95	Late Wash flow sheet reduces hi boilers and removes nitrates.

Appendix H

The following attachments list the key projects to support the overall HLW Plan. They key on the waste removal efforts in HLW and production support in the DWPF. It is not meant to be an all inclusive listing of project activities in these areas. It merely lists those with significant potential impact to the HLW Plan schedule.

The projects included are listed by title, scope and driver relative to the HLW Plan.

H.1 HLW

S-2081	Waste Removal and Extended Sludge Processing
S-2860	Type III Tanks Salt Removal, Phase II
S-3291	Type III Tanks Salt Removal, Phase I
S-3122	New Waste Transfer Facility
S-2821	Diversion Box and Pump Pit Containment Buildings
S-4062	Replacement High Level Waste Evaporator
S-3025	High Level Waste Removal from Filled Waste Tanks
S-2787	Consolidated Incinerator Facility
S-2944	Hazardous Waste/Mixed Waste Disposal Facility
S-3781	In-Tank Precipitation
S-1588	ITP Safety & Environmental Enhancements

H.2 DWPF

S-2045	Interim Glass Waste Storage Building #2
NFP	DWPF 703 Administration Building
NFP	Failed Equipment Storage Vaults #3-#6
NFP	Salt Cell Benzene Abatement
S-4620	DWPF Fire Protection Enhancements
S-3898	New Saltstone Vaults #2 - #5

ATTACHMENT H.1

Waste Removal HLW

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-2081	OE	Waste Removal and Extended Sludge Processing	Aprvd: 108,000 Pend: 328,000	1-WR 2-FFA 3-FFCA	Provide facilities to remove high level radioactive waste from 23 underground waste tanks each with a nominal capacity of a million gallons. Included are transfer pumps and transfer jets which will transfer the slurry or salt solution to the newer Type III Tanks for further processing and eventual feed to the Defense Waste Processing Facility (DWPF) or to the Saltstone Facility. Design and installation for conversion of existing instrumentation and control (I&C) for Tanks 1 through 24 and associated peripherals from the old control room to a distributed control system in the new control rooms.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-2860	OE	Type III Tanks Salt Removal, Phase II	Aprvd: 6,000 Pend: 130,000	1-WR 2-FFCA 3-OPS Support	Provide facilities to dissolve salt contained in two Type III storage tanks and to transfer the solution to the In-Tank Precipitation (ITP) facilities for processing as DWPF feed. In addition, it provides salt removal facilities on tanks 31H and 47F, control systems upgrades to 17 Type III tanks, new control room facilities 241-2H, and the Centralized Support facility 241-4H.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-3291	OE	Type III Tanks Salt Removal, Phase I	Aprvd: 26,000 Pend: 36,100	1-WR 2-FFCA	Provide facilities to dissolve high level radioactive salt contained in three interim storage tanks and transfer the solution to an ITP facility for processing as feed for the DWPF. Provides expansion to control room building 241-18F to support the process control system being provided by the Level III program.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-3122 85-D-159	LI	New Waste Transfer Facility	Aprvd: 54,871 Pend: 54,871	1-WR 2-FFCA 3-OPS Support 4-Envir.	Replace an existing obsolete diversion box/pump pit waste transfer facility with one of current design. The facility is designed to transfer waste between the Type III tanks in the east and west H Area waste tank farms and between F and H Areas. This project will include all required transfer piping and equipment, instrumentation and controls and consist of a new diversion box with jumpers and service piping that will provide ten transfer lines to existing facilities and six lines for future long-term waste programs.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-2821 87-D-181	LI	Diversion Box and Pump Pit Containment Buildings	Aprvd: 24,100 Pend: 24,100	1-Envir. Imp. 2-Imp. in OPS	Provide a metal enclosure building over H-Area diversion box no. 7 (HDB7). Consist of a remotely operated bridge crane capable of accomplishing equipment change operations in the diversion box. It will have a ventilation system to maintain a lower atmospheric pressure. HEPA filters will be used for exhaust. All the equipment required to perform remote operations in the diversion box will be provided by this project. The building and equipment allows all weather, remote, and contained work preventing 5 to 6 weeks of lost operation per year.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-4062 89-D-174	LI	Replacement High Level Waste Evaporator	Aprvd: 75,532 Pend: 109,200	1-Envir. Imp. 2-FFA (Tk 13) 3-FFCA (DWPF)	Provide a cost-effective waste concentration facility necessary to continue waste solidification and other waste management programs at the Savannah River Site (SRS). The high level waste evaporator is capable of producing 7.6 million gallons of products (overhead) each year which can be removed from the waste management complex after final processing through the existing Effluent Treatment Facility (ETF).

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-3025 93-D-187	LI	High Level Waste Removal from Filled Waste Tanks	Aprvd: 96,000 Pend: 104,000	1-WR 2-FFCA 3-OPS Support	Provides permanent and reusable facilities for Type III tanks for use in future waste removal operations which provide feed for ITP and Extended Sludge Processing (ESP) processes prior to being fed to the DWPF. Included are pump support structures, slurry pumps, slurry pump motors, and associated equipment for salt dissolution and sludge suspension; transfer jets for transfer of the dissolved salt solution, caustic system for pH adjustment on Tanks 35H, 36H, and 37H; and equipment storage facility for staging support equipment on this project as well as for use in future tank farm operations.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-2787 83-D-148	LI	Consolidated Incineration Facility	Aprvd: 99,000 Pend:	1-RCRA 2-FFCA (DWPF)	Provide a facility to incinerate hazardous, low-level radioactive, and mixed waste. The Defense Waste Processing Facility is dependent on the facility to treat its waste benzene stream.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-2944 89-D-175	LI	Hazardous Waste/Mixed Waste Disposal Facility	Aprvd: 37,500 Pend: 155,000	1-RCRA 2-FFCA	Provide 1) a Resource Conservation Recovery Act (RCRA) - permitted Treatment Building for the stabilization of hazardous and mixed waste (Phase II) and 2) two RCRA-permitted disposal vaults for the disposal of treated waste (Phase I).

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-3781	OE	In-Tank Precipitation/	Aprvd: 55,270 Pend:	1-WR 2-FFA	ITP will provide a process to decontaminate the salt solution. Sodium tetraphenylborate will be used to precipitate cesium. Sodium titanate will be used to absorb strontium and plutonium. The precipitate will be transferred to DWPF for additional processing. This project provides a filter building, a cold chemical area, a control room, and pumps.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-1588	OE	ITP Safety and Environmental Enhancements	Aprvd: 37,190 Pend: 37,190	1-WR 2-FFA	Project provides fire water suppression system, liquid nitrogen storage and unloading system, benzene stripper, laboratory, and other miscellaneous equipment necessary for the safe operation of ITP and protection of the environment.

ATTACHMENT H.2

DWPF

Project No.	Project Type ADS#	Project Title	TEC(K) *	Driver	Scope
S-2045	SR-25-LI	Interim Glass Waste Storage Building (GWSB)#2	New Facility Planning (NFP) 85,000	DOE Orders 5820.2A 6430.1A 5480.11 SCDHEC Permit # 16,783	GWSB #2 is scheduled as a FY95 line item. If deferred until FY96, the construction completion milestone will be delayed until 12/30/00. Canister production would be limited or cease until commissioning is completed in mid 2001. FYP required due date is 4/1/00.

Project No.	Project Type ADS#	Project Title	TEC(K) *	Driver	Scope
NFP 3.10.2.2 (FYP)	SR-25-LI	DWPF 703 Administration Building	NFP 6,000	DOE/IG-0279 Office trailers are not cost effective	Building 703 will provide permanent administrative office space for 250 people. Not currently supported by DOE.

Project No.	Project Type ADS#	Project Title	TEC(K) *	Driver	Scope
NFP 3.10.2.2 (FYP)	SR-25-LI	Failed Equipment Storage Vaults (FESV's) #3-#6	NFP 4,500	DOE Orders 5820.2A 5480.11	FESV's are proposed as a FY95 line item to provide four additional storage vaults to store failed melters or other failed equipment that contains high level contamination. By mid FY97, it is projected that two melters will have been used and a third vault will be needed for storage. FYP required due date is 3/30/97.

Project No.	Project Type ADS#	Project Title	TEC(K) *	Driver	Scope
NFP 3.10.2.2 (FYP)	SR-25-LI	Salt Cell Benzene Abatement	NFP 15,000	EPA NESHAP	Due to the promulgation of the new Clean Air Act regulations, 95-99% of the benzene must be removed from the Salt Cell Vent Condenser Off-Gas Stream. Not currently supported by DOE.

* Project TEC costs not validated.

Project No.	Project Type	Project Title	TEC(K)	Driver	Scope
S-4620	LI-90-D-149	Part of "Site Fire Protection Project" DWPF Fire Protection Improvements	10,564	DOE Order 5480.7	S-4620 is to correct deficiencies identified as a result of compliance assessment of S-1780 by WSRC in 1990 & DOE-HQ in 1991.

Project No.	Project Type ADS#	Project Title	TEC(K)	Driver	Scope
S-3898	SR-23-AA	New Saltstone Vaults #2-#5	#2 19,500 #3 16,500* #4 & #5 TBD	LDR-FFCA SCDHEC Permits #12,683 #IWP-217 DOE EIS-0082 Record of Decision FR23801, 6/1/82	OUTYEARS (FY95-FY98) Construction of #2 must begin no later than 3Q FY93. Construction of #3 must begin no later than 1Q FY95. Construction of #4 must begin no later than 3Q FY96. Construction of #5 must begin no later than 1Q FY98. Vaults must be funded and constructed on schedule to support full scale Saltstone operations.

* Project TEC costs not validated.

Appendix I

Appendix I is a table depicting the FY93 AOP Budget (without reprogramming) and the planning budget from the FY94 Five Year Plan. It represents that portion of the EM-30 Budget related to the HLW waste removal activities through operation of the DWPF and Saltstone.

APPENDIX I

DWPF System Budget

(Thousands of Dollars)

	DWPF	FY93 AOP	FY94 FYP Planning Case FY94	FY95	FY96	FY97	FY98	Total
21-AA	Program Mgmt	10,020	5,963	9,186	9,589	9,909	10,237	54,904
22-AA	Vitrification	167,408	174,083	177,051	172,743	182,442	180,623	1,054,350
23-AA	Saltstone	10,172	17,768	23,011	23,744	24,922	25,378	124,995
24-GP	GPP	5,950	1,961	2,000	2,000	2,000	2,000	15,911
25-LI	New Fac Plng	50	155	9,120	29,550	17,640	25,010	81,525
26-LI	81-T-105 (DWPF)	32,600	29,873					62,473
	Subtotal DWPF	**226,200**	**229,803**	**220,368**	**237,626**	**236,913**	**243,248**	**1,394,158**
	Liquid							
32-AA	H Tank Farm		599	1,268	2,274	3,374	4,040	11,555
33-AA	F Tank Farm		1,566	2,897	4,329	3,954	4,648	17,394
34-AA	ITP	58,414	44,035	47,628	50,321	56,009	58,035	314,442
39-LI	NWTF	7,228	1,961					9,189
310-LI	Repl HLW Evap	16,830	30,386	12,020	4,939	548	564	65,287
314-LI	HLW Removal	28,631	54,138	88,034	59,543	51,917	40,777	323,040
	Subtotal Liquid	**111,103**	**132,685**	**151,847**	**121,406**	**115,802**	**108,064**	**740,907**
	TOTAL	**337,303**	**362,488**	**372,215**	**359,032**	**352,715**	**351,312**	**2,135,065**

Programmatic assumptions used to develop the budget for this chart assume DWPF radioactive operations in 6/1/94. It is also assumed that the Glass Waste Storage Building #2 will be required as an FY95 Line Item (8/95 authorization) for 50% attainment, an FY96 Line Item (4/96 authorization) for 35% attainment or an FY97 Line Item (10/96 authorization) for 25% attainment. Above funding does not contain provision for Late Wash.

APPENDIX J

HLW/DWPF System Safety Documentation and Permits

Process	Safety Documents	Permits*	Comments
1. Sludge Waste Removal	Not covered by current SAR, OSR's or JCO's	1, 2, 5, 6, 7, 9, 16, 17, 21, 22, 23, 30, 31	
2. Salt Waste Removal	Covered by current (old format) Liquid Waste Handling Facilities SAR, DPSTSA-200-10-SUP-18 February, 1988	1, 2, 5, 6, 7, 9, 16, 17, 21, 22, 23, 30, 31	
3. Evaporation	Covered by current (old format) Liquid Waste Handling Facilities SAR, DPSTSA-200-10-SUP-18 February, 1988	1, 2, 5, 6, 7, 9, 16, 17, 21, 22, 23, 30, 31	
4. Replacement High Level Waste Evaporator (RHLWE)	Not covered by current SAR, OSR's or JCO's.	1, 2, 5, 6, 7, 9	Safety Analysis underway.
5. In-Tank Precipitation (ITP)	SAR Addendum 1	1, 2, 5, 6, 7, 9, 16, 21, 22, 30	In process of review for approval
6. Extended Sludge Processing (ESP)	Covered by ITP Addendum.	1, 2, 5, 6, 7, 9, 16, 21, 22, 30	
7. Late Wash (LW)	Not covered by current SAR, OSR's or JCO's.	5, 9	
8. Defense Waste Processing Facility (DWPF)	SAR, DPSTA-200-10-SUP-20, Rev 3. Cold Chemical OSR's, WSRP–RP-92-975. Other OSR's under development.	3, 4, 7, 10, 14, 19, 21, 27, 33	SAR to DOE for Approval, 8/92 Cold chemical OSR's to DOE for approval, 10/92
9. Saltstone	SAR, WSRC SA3.	3, 7, 11, 14, 20, 21, 28, 34	SAR with DOE for approval. OSR's included in the SAR.
10. F/H Effluent Treatment Facility (ETF)	Not covered by current SAR, OSR's or JCO's. SAD, DPSTSAD-200-5, 12/86	1, 2, 12, 13, 15, 21, 26, 32	

* See Pages J-3 & J-4 for listing of Applicable Permit and Environmental Documentation

Process	Safety Documents	Permits*	Comments
11. Transfer Facilities **New Waste Transfer Facility (NWTF)** **Diversion Boxes** **Inter Area Lines** **Pump Pit Facilities, etc.**	NWTF not covered by current SAR, OSR's or JCO's. Other facilities covered by Tank Farm SAR. See #3 above!	NWTF - 1, 2, 5, 6, 7, 9, 21, 24 All others - 1, 2, 5, 6, 7, 9, 16, 17, 21, 22, 23, 30, 31	NWTF Safety Analysis is underway.
12. Consolidated Incinerator Facility (CIF)	SAR submitted for WSRC Review	1, 6, 7, 8, 14, 15, 21, 29	

* See Pages J-3 & j-4 for listing of Applicable Permit and Environmental Documentation

Applicable Permit or Environmental Documents

National Environmental Policy Act:

1 ERDA-1537 "Final Environmental Impact Statement - Waste Management Operations - Savannah River Plant - Aiken, South Carolina."

2 DOE-EIS-0062 "Final Environmental Impact Statement - Supplement to ERDA-1537 - Waste Management Operations, Savannah River Plant, Aiken, South Carolina - Double Shelled Tanks for Defense High Level Radioactive Waste Storage."

3 DOE-EIS-0082 "Final Environmental Impact Statement - Defense Waste Processing Facility - Savannah River Plant, Aiken, South Carolina "

4 DOE-EA-0179 "Environmental Assessment - Waste Form Selection for SRP High-Level Waste"

Federal Facility Agreement:

5 Savannah River Site Federal Facility Agreement, Administrative Docket Number: 89-05-FF.

Land Disposal Restriction-Federal Facility Compliance Agreement:

6 Federal Facility Compliance Agreement; Savannah River Site, EPA Docket #91-01-FFR, EPA ID #SCI 890 008 989.

Resource Conservation and Recovery Act:

7 RCRA Part A Permit #SC1890008989 for Savannah River Plant.

Air Pollution Control Permit:

8 Permit #0080-0041-H-CG for the Consolidated Incinerator Facility.

South Carolina Department of Health and Environmental Control Industrial Wastewater Permit

9 Permit pending for F/H Area Tank Farms.

10 Permit #16783: Vitrification Facility

11 Permit #12683: Saltstone Facility

12 Permit #12870 and Addendums: Effluent Treatment Facility

National Emission Standard for Hazardous Air Pollutants

13 Outstanding NESHAP permit for ETF.

14 NESHAP Radionuclide Permit

15 NESHAP Benzene Permit

South Carolina Department of Health and Environmental Control Air Quality Control Permit

16 Permit to Operate Seven (7) Diesel Generators at Waste Management Facilities in H-Area - Permit #0080-0046.

17 Permit to Operate Five (5) Diesel Generators at Waste Management Facilities in F-Area - Permit #00800-0045.

18 Air Quality Control Construction Permit #0080-0046-CE for Diesel Generator at the ITP Facility (241-4H).

19 Air Quality Control Permit #0080-0066 and Addendums.

20 Air Quality Control Permit #0080-0080 and Addendums.

National Pollution Discharge and Elimination System

21 NPDES Permit for Savannah River Site; Permit # SC000175.

South Carolina Department of Health and Environmental Control Domestic Water Permit

22 Permit SC#405556: H-Area Facilities.

23 Permit SC#405566: F-Area Facilities.

24 Permit SC#401118: New Waste Transfer Facility.

25 Permit SC#LS91007: Replacement High Level Waste Evaporator.

26 Permit SC#LS-233-W: ETF.

27 Permit SC#402186 and Addendums: DWPF.

28 Permit SC#400737: Saltstone.

29 Permit Pending for CIF

South Carolina Department of Health and Environmental Control Sanitary Water Permit

30 Permit #12910 and Addendum: H-Area Facilities.

31 Permit #9326 and Addendum: F-Area Facilities.

32 Permit #9998 and Addendum: ETF.

33 Permit #9888 and Addendum: DWPF.

34 Permit #13717: Saltstone.