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LIST OF ACRONYMS

A&E	Architect and Engineer
ACTR	Acquiring Commercial Technologies for Retrieval
ADMPS	Advanced Design Mixer Pumps
ALARA	As Low as Reasonably Achievable
BSD	Baseline Systems Description
CSB	Canister Storage Building
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CENTRC	Capital Equipment/Expense Not Related to Construction
C/SCSC	Cost/Schedule Control Systems Criteria
CFR	*Code of Federal Regulations*
Cs	Cesium
CSB	Canister Storage Building
CsCl	Cesium Chloride
CST	Crystalline Silicotitanate
CW	Concentrate Waste
D&D	Decontamination and Decommissioning
DNFSB	Defense Nuclear Facilities Safety Board
DRD	Design Requirements Document
DOE	U.S. Department of Energy
DQO	Data Quality Objective
DST	Double-Shell Tank
ECN	Engineering Change Notice
EIS	Environmental Impact Statement
EM	Environmental Management
F&R	Functions and Requirements
F&OR	Functions and Operational Requirements
FM	Field Management

FTE	Full-Time Equivalents
FY	Fiscal Year
HDW	Hanford Defense Waste
HGET	Hanford General Employee Training
HLW	High-Level Waste
HQ	Headquarters
HWVP	Hanford Waste Vitrification Plant
ICD	Interface Control Document
IMUST	Inactive Miscellaneous Underground Storage Tank
IPM	Initial Pretreatment Module
ISSTRS	Initial SST Retrieval System
JCO	Justification for Continued Operation
LERF	Liquid Effluent Retention Facility
LLW	Low-Level Waste
LOW	Liquid Observation Well
M&O	Management and Operating
MOA	Memorandum of Agreement
MPC	Multi-Purpose Canister
MUST	Miscellaneous Underground Storage Tank
MYPP	Multi-Year Program Plan
MWTF	Multi-Function Waste Tank Facility
NCAW	Neutralized Current Acid Waste
NCRW	Neutralized Cladding Removal Waste
NEPA	*National Environmental Policy Act*
NRC	Nuclear Regulatory Commission
OWVP	Operational Waste Volume Projection
P&ID	Piping and Instrumentation Diagram
PBI	Performance Based Incentive
PMCS	Performance Measurement Control System
PRP	Peer Review Panel
PUREX	Plutonium-Uranium Extraction (Plant)
RAM	Responsibility Assignment Matrix
RCRA	*Resource Conservation and Recovery Act*
RFP	Request for Proposal
RL	Richland Operations Office
ROD	Record of Decision
RW	DOE Office of Civilian Radioactive Waste Management
S&D	Storage and Disposal
SEM	Scanning Electron Microscope
SEWP	*Systems Engineering Working Plan*
SRIDS	Standards/Requirements Identification Documents
SRR	Systems Requirement Review
SST	Single-Shell Tank
Sr	Strontium
SrF_2	Strontium Fluoride
TCR	Tank Characterization Report
TFA	Tank Focus Area

TMACS	Tank Monitoring and Control System
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TRS	Technical Requirements Specification
TRU	Transuranic
TSD	Treatment, Storage, or Disposal
TWRS	Tank Waste Remediation System
USQ	Unreviewed Safety Question
WBS	Work breakdown structure
WESF	Waste Encapsulation Storage Facility
WHC	Westinghouse Hanford Company

1.0 HANFORD STRATEGIC PLAN GOALS/MISSION PLAN

The Tank Waste Remediation System (TWRS) Program is driven by the *Hanford Strategic Plan*, (DOE/RL D94-048) and the fiscal year (FY) 1995 *Hanford Mission Plan, Volume 1, Site Guidance* (DOE/RL 93-102). The TWRS Program is compatible with the U.S. Department of Energy-Headquarters (DOE-HQ) Environmental Management (EM) goals. The following documents will supplement and expand upon the Hanford Strategic Plan and the Hanford Mission Plan. These documents are the Hanford Mission Direction Document (will be available in early FY 1996) and the *Tank Waste Remediation System Mission Analysis Report* (WHC-SD-WM-MAR-008 Rev. 0). A third document, the Hanford Mission Performance Plan, will follow and is a companion to the Hanford Mission Direction Document. These documents will be the basis on which TWRS Program planning will be reassessed. The Hanford Mission Direction Document will replace Volume I Site Guidance of the Hanford Mission Plan; the Hanford Mission Performance Plan will replace Volume II of the existing Hanford Mission Plan.

The Hanford Mission statement in the Hanford Strategic Plan states, "The Hanford mission is to clean up the site, provide scientific and technological excellence to meet global needs, and partner in the economic diversification of the region." The Plan's vision is that "Together we are building a clean, accessible, and healthy environment which is part of a prospering and diversified community. We are reaching beyond our past achievements to continue a tradition of excellence in scientific and technological accomplishments. We are a resource that nations turn to for solutions to future challenges."

The Hanford Strategic Plan and its supplement list nine strategic goals for the Hanford Site. It documents the results of the planning that developed strategies for accomplishing each goal and assigned an owner the goal, action dates, and performance metrics. Figure 1-1 and Table 1-1 are taken from the supplement. The strategic plan provides the essential framing for the mission analysis activity, content of the Hanford Mission Plan, and specific program plans.

The 1995 Hanford Mission Plan specifically addresses the tank waste issue and clarifies the link with other initiatives, such as improving management practices and the *Hanford Site Waste Minimization and Pollution Prevention Awareness Program Plan* (DOE/RL-91-31). This document captures the results of decision making regarding the application of systems engineering at the Hanford Site, external involvement policy, and site end-state goals. Section 3.5 of the Hanford Mission Plan on Decisions and Directives provides an integrating discussion of the actions of the National Environmental Policy Act (NEPA), and DOE policy, guidance, and decisions associated with binding agreements such as the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement). Two significant components of the Hanford Mission Plan 1994 planning basis are (1) the decisions regarding the disposition of onsite material inventory, and the key programs and interfaces to accomplish this; and (2) the Program Interface Issues section, which identified issues that stretch across program boundaries.

Site Strategic Planning is Aligned

(With the Six Grumbly Goals)

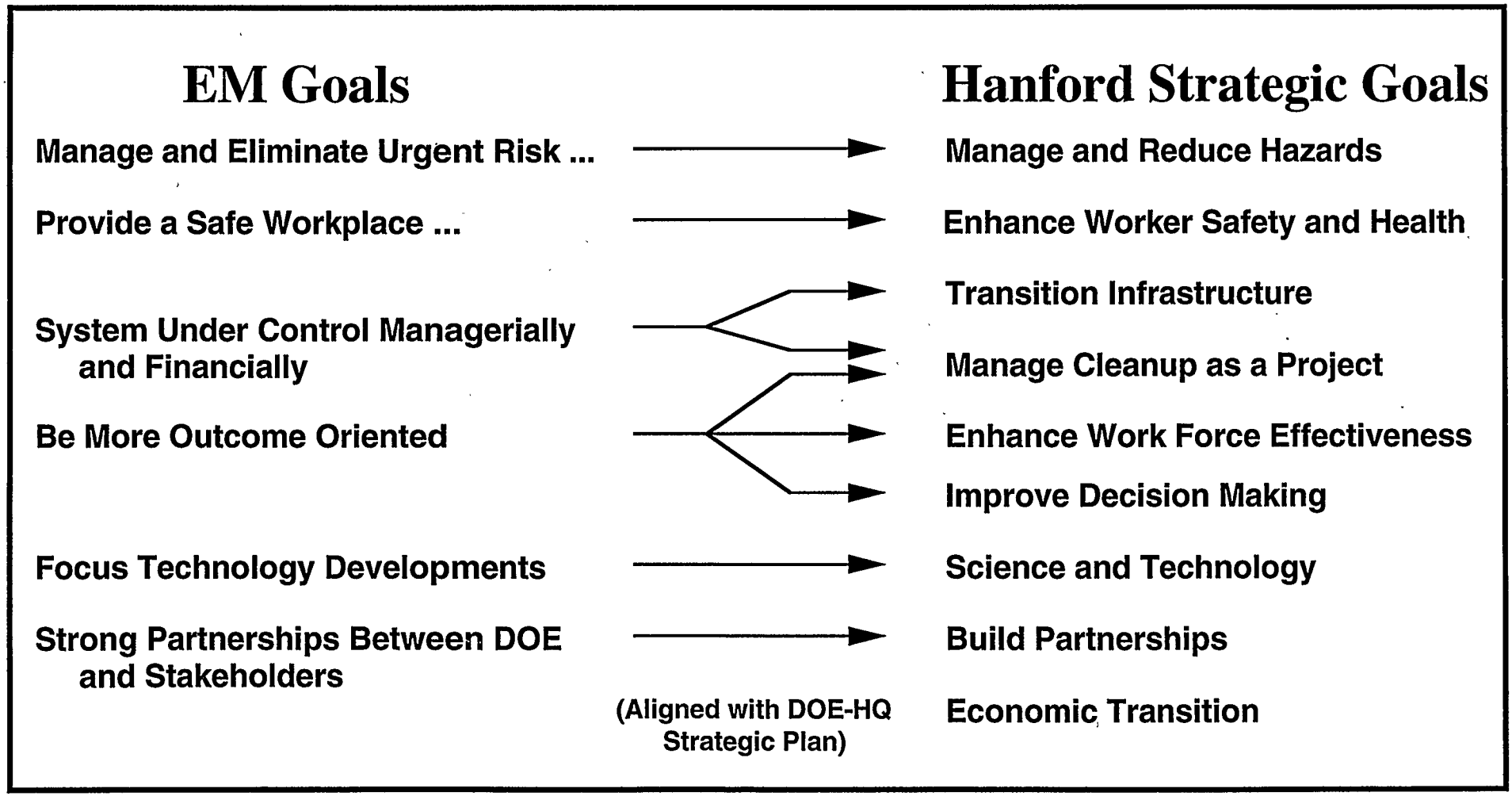


Figure 1-1. Hanford Site Strategic Planning Alignment with EM Goals.

Table 1-1. Hanford Site Strategic Goals.

1. MANAGE AND REDUCE HAZARDS. We will reduce the known hazards in our system while improving the quality of our hazards assessments to guide future decisions on risk mitigation. Goal Champion: T.R. Sheridan, Senior Management Goal Owner: J.E. Kinzer
2. ENHANCE WORKER SAFETY AND HEALTH. We will enhance the safety and health of Hanford Site workers. Goal Champion: P.W. Kruger, Senior Management Goal Owner: CA Hansen
3. TRANSITION INFRASTRUCTURE. We will provide a safe infrastructure (e.g., utilities, transportation, general purpose facilities, or sitewide services) in cost-effective ways that support the Hanford Site mission and meet or exceed appropriate standards. Goal Champion: W. A. Rutherford, Senior Management Goal Owner: *L. L. Prior*
4. MANAGE CLEANUP AS A PROJECT. We will manage Hanford Site cleanup as a project by consistently applying project management principles to reach the desired end state as quickly and cost-effectively as possible while considering the risks and benefits to the public, the workers, and the environment. Goal Champion: E. W. Higgins, Senior Management Goal Owner: R. D. Izatt
5. ENHANCE WORK FORCE EFFECTIVENESS. We will have the right number of diverse people doing the right jobs in the right way, culminating in the successful execution of the mission. Goal Champion: R. Cruz, Senior Management Goal Owner: J.D. Bauer
6. IMPROVE DECISION-MAKING PROCESS. We will have effective decision making across the Hanford Site that balances decision quality, acceptance of the decision by the public, and timeliness of the decision. Goal Champion: J.D. Goodenough, Senior Management Goal Owner: L.K. McClain
7. SCIENCE AND TECHNOLOGY. We will be leaders in providing science and technology that enhances the Hanford Site's cleanup mission, improves U. S. competitiveness, and supports the regional, national, and international need to balance economic growth and environmental responsibility. Goal Champion: DE Trader, Senior Management Goal Owner: R.M. Rosselli
8. BUILD PARTNERSHIPS. We will establish positive working relationships that will build confidence and enhance trust in the Hanford Site. Goal Champion: K.K. Randolph, Senior Management Goal Owner: S.R. Brechbill
9. ECONOMIC TRANSITION. We will use the cleanup and science and technology mission elements to help the community establish a diversified and stable economic base over the long term. This will be accomplished through private sector participation in cleanup, creation of local technology and service companies, and effective use of assets no longer required by the federal government. Goal Champion: D. L. Sours, Senior Management Goal Owner: N.M. Highland

Systems engineering activities, underway at the Hanford Site for two years, have generated a high-level comprehensive and functional architecture that ties individual program activities, needed to remedy unsafe and unacceptable conditions, to the infrastructure of system elements that support them all. These infrastructure system elements are identified in the Site systems engineering document as Manage Programs, Acquire Mission Essential Capabilities, Obtain Public Acceptance, and Transition to Beneficial Use. Programs like TWRS are supported by these elements of infrastructure.

2.0 TANK WASTE REMEDIATION SYSTEM PROGRAM OVERVIEW

2.1 PROGRAM VISION/MISSION

The TWRS Program vision represents the desired end state for the remediation of tank wastes. The vision is driven by the Hanford Strategic Plan and the Hanford Mission Plan; these plans reflect the input from all of the stakeholders. The TWRS Program vision is to clean up the Hanford Site tank wastes, close the tank farms by the year 2028, and complete shipment of waste capsules to an offsite geologic repository by 2040. The TWRS Program was recently given the responsibility for the decontaminating, decommissioning, and disposal processes. The decontaminating and decommissioning of private contractor facilities will be the responsibility of the private contractor. This vision will be achieved by the safe retrieval, treatment, and immobilization of the tank wastes, and disposal of both the low-level wastes (LLW) and the high-level wastes (HLW). Disposal of the low-level portion will occur at the Hanford Site; the high-level portion will be sent to a geologic repository. Tank structures will be stabilized in place and covered with environmental barriers which inhibit water, plant, animal, and human intrusion. Figure 2-1 shows the elements of the TWRS System.

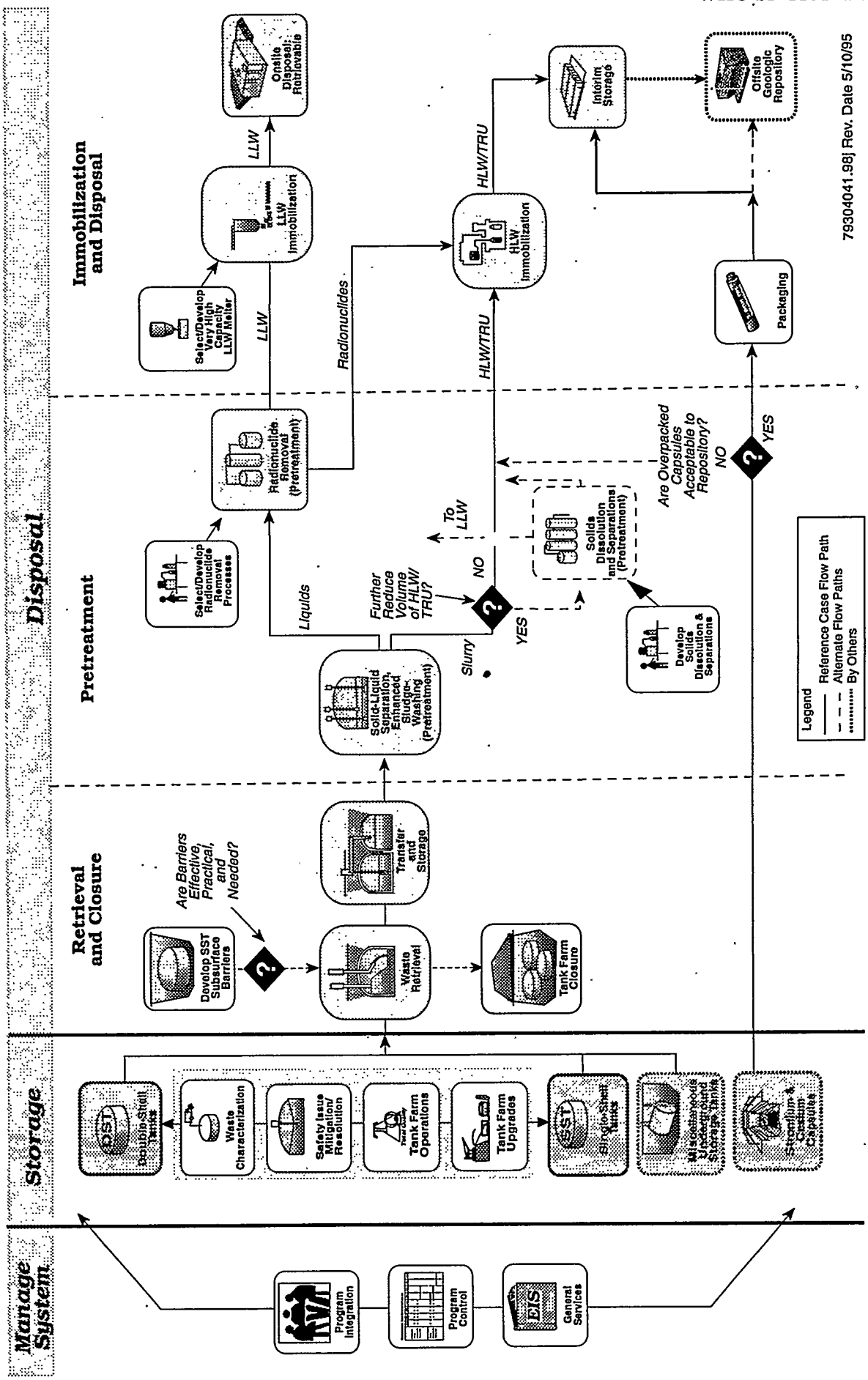
The TWRS Mission Need Justification establishes the purposes of the TWRS Program as follows.

1. Resolve the waste tank safety issues.
2. Integrate the waste disposal mission with the ongoing waste management mission.
3. Assess the technical bases for tank waste management and disposal.
4. Determine the technology available and develop any needed technologies.
5. Establish a dedicated organization and provide the resources to meet the technical challenge.

The TWRS Program mission represents the stakeholders' desire to implement the TWRS Program vision. The mission is to store, treat, and immobilize highly radioactive Hanford Site waste in a safe, environmentally sound, and cost-effective manner. (Highly radioactive Hanford Site waste is defined as current and future tank waste and the cesium/strontium capsules.) A TWRS mission analysis has been conducted; the results are documented in the *TWRS Mission Analysis Report*, WHC-SD-WM-MAR-008. To achieve this mission, the TWRS Program is dedicated to minimizing environmental, safety, and health risks associated with existing tank waste stored in the double- shell tanks (DSTs), single-shell tanks (SSTs), and inactive miscellaneous underground storage tanks *(IMUSTs)*, and the safe operation of all TWRS facilities. Reducing safety risk is the highest priority. To complete the remediation of highly radioactive Hanford Site wastes in accordance with Tri-Party Agreement commitments and Secretarial Safety Initiatives, the Program is committed to the following goals.

1. Mitigate and/or resolve safety issues and inherent risks.
2. Provide a safer work place.
3. Improve the management systems of the program and, in so doing, increase the effectiveness of the program's managerial and financial controls.
4. Become more outcome oriented.
5. Focus technology development efforts to support program objectives.
6. Develop stronger partnerships with all stakeholders.

Figure 2-1. Hanford Site Tank Waste Remediation System.



2.2 PROGRAM STRATEGY

The TWRS Program strategy is the selected path for achieving Program objectives and for converting Program functions into reality. This strategy integrates waste operations, safety issue resolution, and waste disposal (including retrieval, pretreatment, and immobilization) and is consistent with the Secretary of Energy's complex-wide strategy as well as the more focused Hanford Mission Plan. The TWRS Program strategy is incorporated in Program approaches, policies, and processes; it is reflected in the Program baseline, which is discussed at a summary level in Sections 2.2.1 and 2.3.1. Figure 2-2 provides a schematic flow that shows the relationship between this Multi-Year Program Plan (MYPP) and the other documents. This MYPP differs from the previous MYPP with respect to the work breakdown structure (WBS), which is clearly aligned with the project orientation defined by DOE-RL.

The TWRS Program strategy consists of two elements: a technical strategy and a program management strategy. The technical strategy is to integrate waste operations, safety issue resolution, retrieval, pretreatment, and disposal of tank waste. Figure 2-1 shows the relationship between these elements.

The program management strategy uses a single Major System Acquisition (MSA) management approach and is developing an alternative acquisition strategy revolving around privatization. The single MSA approach will result in integration of operations, technology development, and project activities using systems engineering as the key tool. A key element of the alternative acquisition strategy for the TWRS Program is the use of selective privatization of TWRS waste tank disposal functions to reduce life-cycle costs. Privatization will involve two phases with a minimum of two private contractors in each. Phase 1, the proof-of-concept phase, encompasses work by two (or more) contractors who will build and operate facilities and pretreat and immobilize LLW. An option is included in Phase 1 to immobilize HLW. Phase 2 will include the retrieval, pretreatment, and immobilization of LLW and HLW material.

Success depends on developing and implementing a fully integrated plan and management approach. The TWRS Program will use the systems engineering approach to ensure that work is clearly defined and sequenced so that the TWRS mission is completed successfully. Systems engineering processes result in a clear traceable path from goals and requirements to the key work and products in a way that facilitates the clear definition for discrete pieces of work. This clear definition makes it possible to essentially projectize work and is expected to result in improved cost and schedule performance. During FY 1994 and 1995, a systems requirements review (SRR) was conducted on the TWRS functions and requirements documents. The review identified a number of significant problems. The problems were analyzed to identify underlying causes. It was determined that the significant problems were derived from two imperatives: a useful systems engineering process must be institutionalized at the Hanford Site, and a risk management process supporting the systems engineering process must be agreed upon. The *TWRS Systems Requirement Review Action Plan* (Draft DOE/RL-95-74) identifies the findings and corrective actions. In the action plan, eight policy and programmatic issues were identified requiring DOE-HQ involvement. Issues requiring DOE-HQ involvement to resolve represent special effort and unique management effort. These eight issues are shown in Table 2-1.

Figure 2-2. TWRS Program Management System Document Hierarchy.

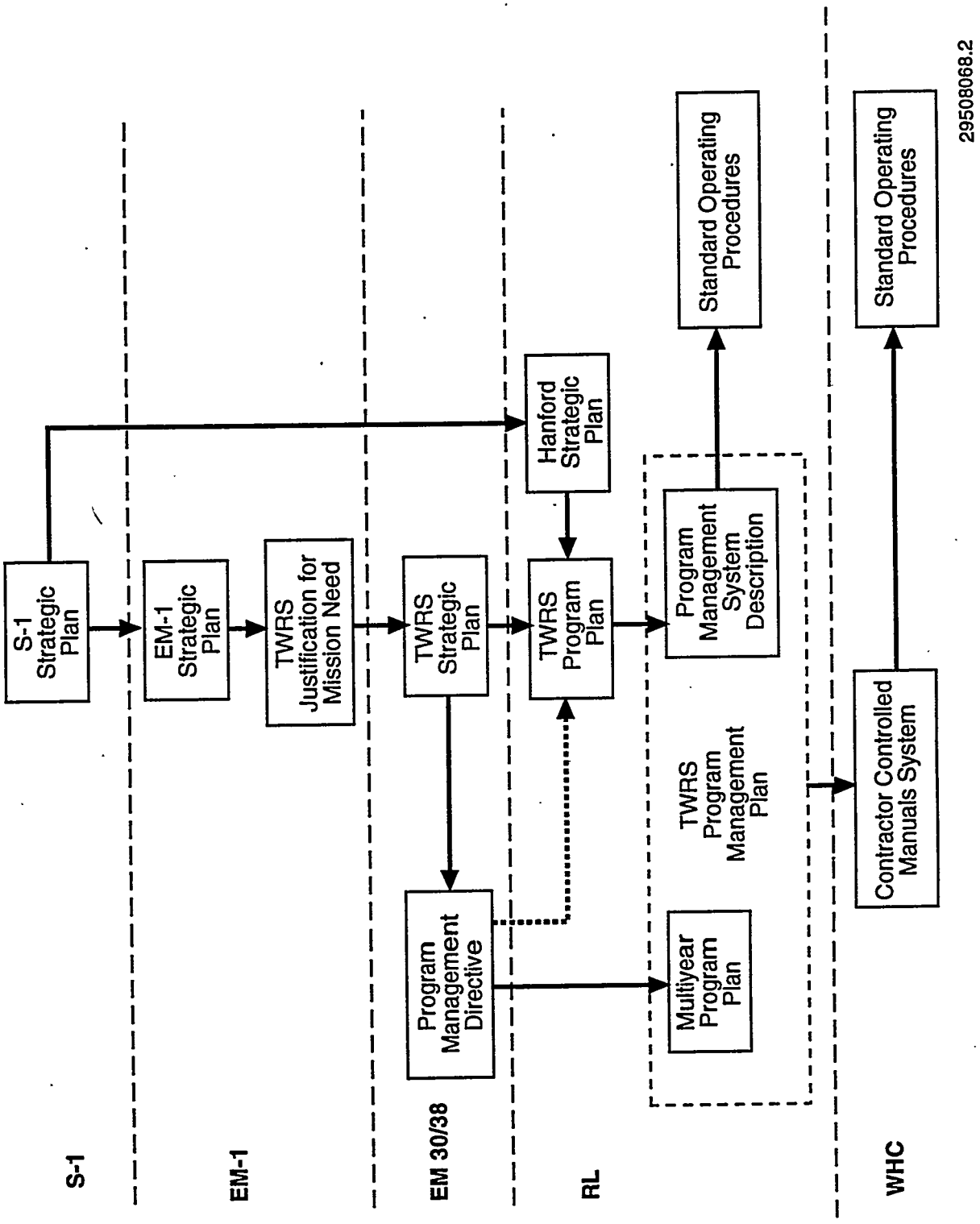


Table 2-1. Policy and Programmatic Issues for TWRS Requiring HQ Involvement.

PI-1. Does DOE-HQ consider the milestones negotiated in the fourth amendment to the Tri-Party Agreement to be constraints on the TWRS baseline program? If so, all, or just some?	Drafted, reviewed by RL
PI-2. Is there a cost profile and/or maximum total program cost requirement for the TWRS Program? If so, what is it?	Drafted, reviewed by RL
PI-3. Because the TWRS EIS is currently evaluating options that include disposing of some of the wastes in situ, should the TWRS Program consider end states different from the current planning basis to retrieve the waste from all tanks? [1]Should tank farm closure and disposal of tank low-level waste onsite be performed to the same standards as clean up of old burial grounds and liquid disposal sites? Should the standards be consistent with other DOE sites?	Drafted, reviewed by RL
PI-4. What is RW's process for evaluating and accepting high-level waste (HLW) forms and canister configurations that are different from Defense Waste Processing Facility and West Valley Demonstration Project? Are the alternative waste forms and canister configurations proposed by TWRS acceptable to the repository? What is the maximum volume of waste RW will accept from the Hanford Site? What is the methodology by which metric tons of heavy metal should be calculated for defense waste? What disposal fee(s) should be used for evaluating alternative Hanford Site waste volumes and canister configurations?	Drafted, still requires technical work
PI-5. Are the Cs and Sr halide salts acceptable waste forms for disposal in a geologic repository? If so, what is an acceptable packaging configuration for disposal?	Drafted, still requires technical work
PI-6. Is it acceptable to dispose of some tank waste, which may be classified as transuranic waste (rather than HLW), in either the Waste Isolation Pilot Project or the geologic repository, as determined by the TWRS Program based on lowest cost and other factors?	Drafted, still requires technical work
PI-7. How much waste should be removed from each tank in preparation for closure? How large of a tank leak is acceptable during the retrieval of wastes from the tanks? Do Federal and state regulations require that the residual wastes be removed for disposal elsewhere, or be subject to Nuclear Regulatory Commission (NRC) licensing authority if disposed in place?	Drafted, still requires technical work
PI-8. What is the maximum radionuclide content that can remain in the treated low-activity waste fraction from single-shell tanks disposed onsite to get NRC concurrence that it is not HLW that is subject to its regulatory jurisdiction?	Drafted, still requires technical work

Note:
[1]Not part of near-term policy issue (PI-3) submittal.

2.2.1 Technical Functions and Requirements

The technical baseline defines all functional aspects, including work to be done, requirements to be satisfied, methods to be used, and quality to be attained. The TWRS technical baseline is generated by the application of systems engineering at program and project levels. As the top-level program functions are decomposed, requirements allocated, and implementing architectures selected, the technical baseline documentation is developed.

The primary technical baselines and their contents are listed below and are shown in Figure 2-3.

- Program technical baseline:
  - Functional requirements
  - Technical requirements.

- Program (Project) element technical baseline:
  - Design requirements
  - Design configuration
  - As-built configuration
  - Operational
  - Decontamination.

The *TWRS Systems Engineering Working Plan* (SEWP), WHC-SD-WM-WP-285, contains a description of these baselines as well as general and detailed listings of documents that are generated from these baselines. The detailed listing in Appendix A of the SEWP contains, for example, the procurement and construction specifications. Figures 2-3 and 2-4 and Tables 2-2 and 2-3, taken from the SEWP, clarify the relationship between the stages of development of the technical baseline and the products and provide a summary list of the types of documents generated.

The *Tank Waste Remediation System Functions and Requirements* (DOE/RL-92-60) contains the top-level technical baseline requirements with which all lower level functions and requirements comply. This document represents the "functional requirements baseline."

2.2.2 Program Objectives

The TWRS Program must achieve the following objectives to successfully accomplish the mission.

1. Establish a comprehensive safety basis for resolving safety issues; operating facilities; maintaining, restoring, and upgrading facilities and equipment; and all other activities. This basis will ensure that all activities comply with environmental regulations and result in safe and environmentally sound operations.

2. Mitigate, resolve, or bound known tank safety issues as the first priority. Additional safety issues will be similarly managed with a priority determined by urgency. No Site worker or member of the general public will be exposed to any radiological or chemical hazard that results in exceeding radiation or industrial hygiene risk acceptance guidelines.

Figure 2-3. The TWRS Technical Baseline, Products, and Review Flow.

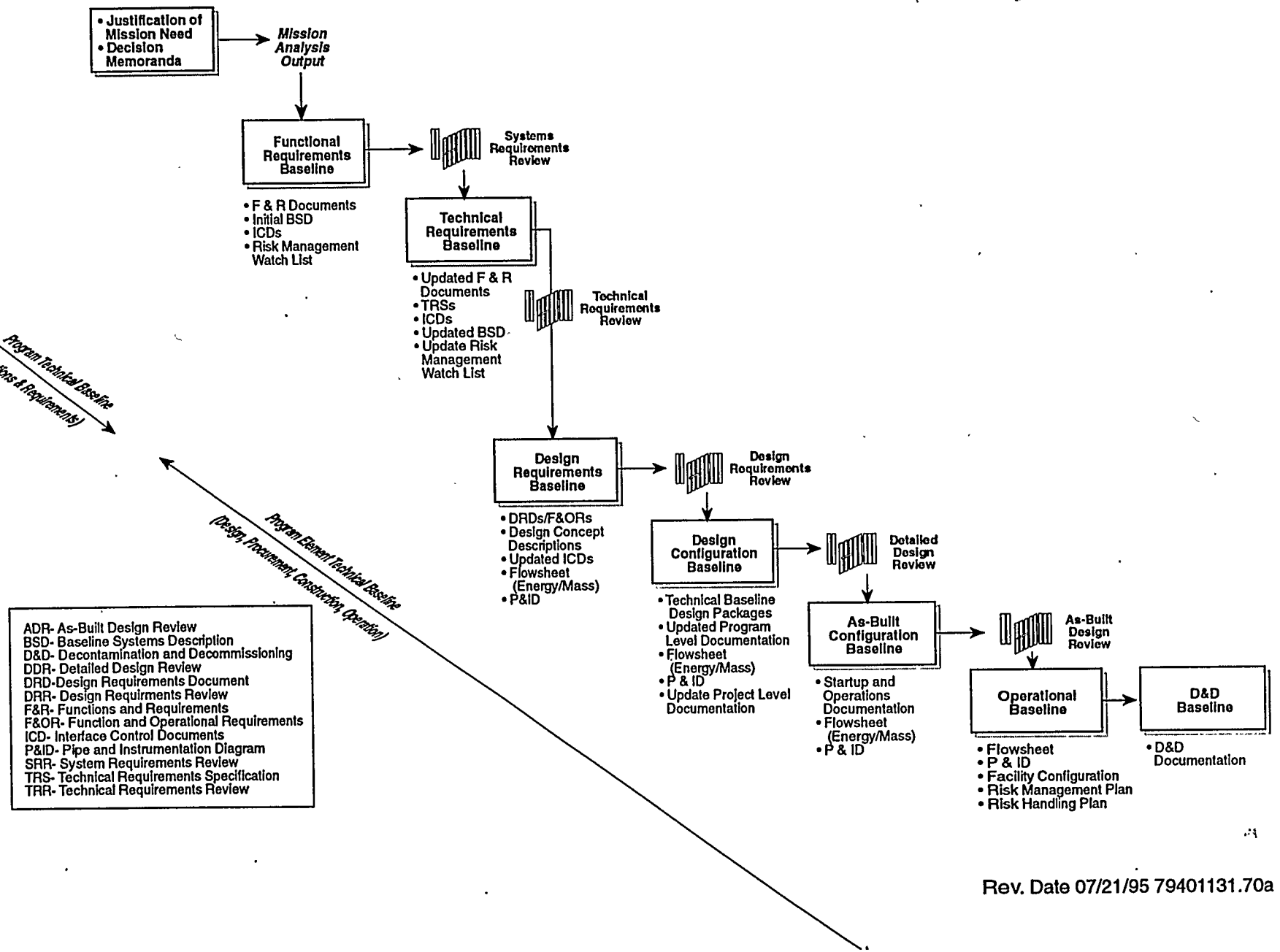


Figure 2-4. Systems Engineering Document Hierarchy.

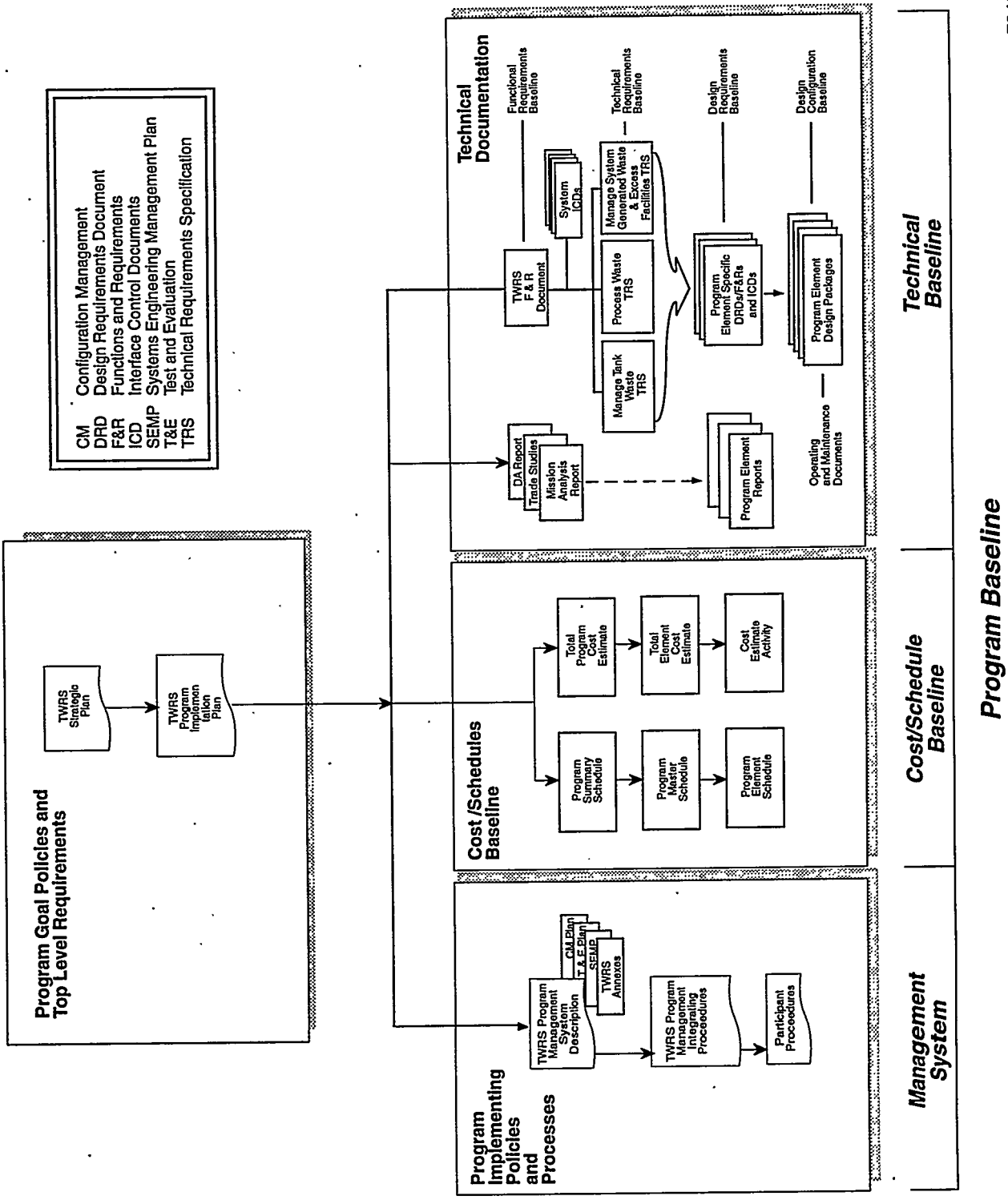


Table 2-2. Systems Engineering Technical Documents - Program Documents.

Program Document	Document Description
Mission Analysis Report	Documents the mission analysis process that translates mission needs and objectives from the mission or problem statement and other top-level documents into mission requirements.
TWRS F&R Document	Documents the results of the F&R analysis and allocation process that transforms the mission analysis results into a set of executable functions properly constrained by both derived and imposed requirements. Includes functions analysis down to level 4, preliminary alternative architecture considerations, requirements identification and assignment.
Baseline Systems Description (BSD)	Contains summary of initial state of the program and illustrations and narrative for visualizing architecture concepts. The BSD is used by all team members working on the program as a communication tool at briefings, for cost estimates and studies.
Interface Control Documents (ICD)	Depicts physical and functional interface engineering requirements between projects and programs or projects and the environment.
Technical Requirements Specification (TRS)	Contains the F&R analysis and allocation process starting at level 4 and continuing until missions of the projects and program elements are defined. Includes functions analysis, preliminary alternative architecture considerations, requirements identification and assignment.
Trade Study Reports	Documents the comparison (trades) of the strengths and weaknesses of alternative approaches or attributes.
Decision Analysis Report	Documents the decision analysis process that evaluates design solutions by determining the relative value of their cost and performance versus the selected criteria. The Decision Analysis Report explicitly justifies and documents the top level system architecture.
Design Requirements Document (DRD)	Contains information - ICDs, F&Rs, requirements allocated to specifications - pertaining to a specific project. Describes the essential technical requirements for designing, constructing, operating, and maintaining the system. Includes the verification requirements for determining if the requirements have been met. Will be used by the project as a starting point for the design process.
Program Operational Support (Logistics) Report	Describes the desired logistics program for the program-level concept architecture

Table 2-3. Systems Engineering Technical Documents - Project Documents.

Project Document	Document Description
Project Mission Analysis	Produced only when the DRD is not available to the project. Documents mission analysis for the project. Gives the project mission objective and establishes a link to the Program Mission.
Functions and Operational Requirements (F&OR) Document	Documents the F&OR analysis, the allocation process, and the concept architecture performed by the project. The F&OR analysis continues until design specification can be written for the A/E. Operational requirements are addressed. Document ensures that project scope is well understood and consistent with the DRD.
Project ICDs	Depicts physical and functional interface engineering requirements within a project.
Project Design Concept	A project level BSD. Contains summary on initial state and contains illustration and contains illustration and narrative for visualizing architecture concept.
Project Design Specification	Specification based on the F&OR and traceable to the program level specifications in the DRD.
Energy/Mass Flow Sheets	Mass and energy flow sheets describing clearly to the A/E or design group what the process must do.
Piping and Instrumentation Diagram (P&ID)	Diagram showing piping and instrumentation requirements.
Technology Development Report	Summarizes emerging or innovative technologies used in design concept. Addresses technical adequacy of the technology. Summarizes associated risk assessment and test and evaluation plan. Co-written with R&D contractor or vendor of the technology being used. (Support Document. Only written if using emerging or innovative technologies.)
Project Logistics Plan	Describes the desired logistics program for supporting the project architecture. The plan addresses system availability, maintenance planning, supply support, technical data requirements, computer resources support, manpower, training support requirements, and packaging, handling, storage, and transportation requirements.
Project Reports	Projects decides on which reports it needs. Examples of project reports are Alternative Solution Reports, Trade Study Reports, or Decision Analysis Reports. These reports document project level work related to choosing the project design solution.

3. Characterize the waste to provide the data necessary to safely store, retrieve, pretreat, immobilize, and dispose of the waste.

4. Retrieve the waste from DSTs and SSTs to the extent necessary for closure and in situ dispositioning of the tanks.

5. Separate the waste into HLW, transuranic waste, and LLW fractions, so that most radionuclides and only a small portion of other waste materials are HLW, and the remainder is LLW.

6. Remove radionuclides from the waste stream destined to become LLW to the extent needed to:

   - Meet the Nuclear Regulatory Commission "incidental waste" classification
   - Meet DOE LLW disposal requirements, which include an ALARA policy and an acceptable disposal system performance assessment
   - Be less than the comparable limits for commercial LLW (10 CFR 61 class C waste).

7. Retrieve the SST waste by 2018, close all SSTs by 2024, and complete immobilization of all waste by 2028.

8. Reduce the HLW stream volume so that the immobilized volume is acceptable to the geologic repository program and is cost effective.

9. Vitrify LLW and operate the LLW disposal facilities at an onsite, near-surface location. Waste will be disposed of in a retrievable form and in conformance to DOE disposal requirements.

10. Vitrify HLW waste and place it in canisters that meet the geologic repository program waste acceptance criteria. Store the waste canisters until they can be shipped to a geologic repository for disposal.

11. Package (or process) strontium and cesium capsules in a manner that conforms to the geologic repository program requirements.

12. Provide and operate interim storage system(s) for packaged capsules, HLW solids awaiting immobilization, and the immobilized LLW and HLW products prior to processing or disposal.

13. Disposition and close the tank farm structures by stabilizing and isolating them in place under RCRA Treatment, Storage, and Disposal criteria.

It is duly noted that a Memorandum of Agreement (MOA) has been negotiated between the Office of Environmental Restoration (EM-40) and the Office of Waste Management (EM-30) for the Single-Shell Tank Program, Hanford Site, Richland, Washington. This MOA transfers responsibility for closure of SSTs (including ancillary equipment and associated contaminated soil) from EM-40 to EM-30. Based on this MOA, for planning purposes the Waste Retrieval Project has assumed the transfer of closure responsibility from EM-40 to EM-30.

2.2.3 Program Assumptions

Assumption are necessary to bridge gaps in programmatic and technical knowledge and certainty. The TWRS Program assumptions include the following: technology availability and performance, regulatory issues, availability of required resources, and future conditions. Assumptions regarding these areas of uncertainty must be used if long-range or short-range planning is to be conducted. This section is divided into two topic areas, these are Programmatic Assumptions and Technical Assumptions.

2.2.3.1 Programmatic Assumptions

The following are the TWRS Program major programmatic assumptions.

1. The mission end state of the TWRS Program will not be appreciably changed and includes the scope of dispositioning and closing the tank farms and cleanup of ancillary equipment and contaminated soil associated with the ancillary equipment activities.

2. The funding necessary to accomplish the mission will be constrained in the near future. An expected cleanup-cost profile will be developed based on fiscal year 1996 data while work proceeds on a TWRS life-cycle cost limit.

3. The safety and health of the public and workers will continue to be the highest priority.

4. The Tri-Party Agreement and its amendments will continue to provide the basis for much of the cleanup activity at the Hanford Site. There are assumptions associated with the Tri-Party Agreement that must be considered when resolving issues, such as funding.

5. The environmental management goals established by DOE-HQ will remain valid for the foreseeable future.

6. Systems engineering principles will drive Site planning and operations.

7. The Hanford Advisory Board, current stakeholders, and the general public will continue to be involved and interested in the cleanup and associated decisions at the Hanford Site, and funding will be available to support that involvement.

8. The TWRS Program privatization effort is characterized by the following assumptions.

   A. Privatization of work scope will succeed in attracting private sector financing to do the disposal work.

   B. Private sector firms will be able to complete projectized work scopes at a lower life-cycle cost than the conventional DOE contracting mechanisms.

   C. Privatization will be accomplished in 2 phases: demonstration of performance in a privately-owned plant (Phase 1) and large-scale, production operations in a privately-owned plant (Phase 2). Phase 1 will not include retrieval.

D. Decontamination and decommissioning of the facilities is the responsibility of the private contractor.

9. Responses to the policy and programmatic issues from the System Requirements Review Action Plan (Draft DOE-RL-95-74) will be accepted. See Table 2-1 for the list of policy and programmatic issues.

10. Current planning assumes full retrieval with 99% removal of waste. The TWRS Environmental Impact Statement (in preparation) and site-wide, risk-based studies are including consideration of options for in situ disposal of some wastes.

11. Disposition and closure of all tank farm structures will be done by the M&O contractor under RCRA Treatment, Storage, and Disposal criteria rather than using RCRA past practices criteria for the SSTs.

2.2.3.2 Technical Assumptions

The following are the TWRS Program major technical assumptions.

1. The technologies necessary to achieve the program mission will be available when needed at a reasonable cost. Privatization of the Disposal Program will result in cost reductions.

2. All tank waste, including the cesium and strontium capsules, will be retrieved for treatment and disposal contingent upon the results of the completed RCRA closure plans.

3. The tank waste will be separated into high-level and low-level activity fractions.

4. Glass will be the immobilization medium for high-level and low-level waste fractions.

5. Tank safety issues will be resolved and not impede the treatment and disposal of the wastes.

6. Strontium and cesium capsules will be dispositioned offsite along with the high-level waste.

7. An overpack configuration of the existing capsule material will be acceptable for repository disposal.

8. Emptied DSTs and SSTs will be dispositioned and closed by the M&O contractor.

9. Soil that is contaminated from earlier tank leaks and is located beneath SSTs is assumed to be left in place without treatment, protected by the same barrier cover installed over the tank structures. Contaminated soil associated with cleanup/removal of ancillary equipment will be remediated.

2.2.4 Constraints

Major constraints to the TWRS Program include milestones contained in the Tri-Party Agreement, the projected availability of funding, and regulatory requirements. A detailed listing and description of program constraints is contained in *Tank Waste Remediation System Functions and Requirements* (DOE/RL-92-60) and in individual sub-project summaries found in Sections 3 through 10.

2.2.5 TWRS Risk Management

Risk management is being implemented throughout the TWRS Program as part of the implementation of systems engineering. The SRR Report criticized the TWRS Program for its lack of formalized risk management. The specific SRR Report drivers for risk management were:

- "6.3.2.13 Finding: Plans for mitigating risks and validating assumptions have insufficient detail." (p. 6-25)

- "6.3.2.14 Recommendation: Using systems engineering protocols, prepare for each WBS element a risk assessment identifying the medium to high risks to cost and schedule. Prepare formal plans to mitigate cost and schedule risks and to validate the enabling assumptions. Include action steps and milestone schedules in each plan." (p. 6-26)

Risk management in TWRS is being driven by the SRR Report (and the response defined in the SRR Action Plan) and specific interest in risk management, particularly quantification of risks, by the Defense Nuclear Facilities Safety Board (DNFSB) staff.

Current risk management activities and available products include the following.

- **TWRS Programmatic Risk Management Plan.** A draft of this plan is currently under review. This plan will be submitted as part of the October 16, 1995, functional baseline submission supporting the revised TWRS functions and requirements. It defines the risk management approach to be taken and specific activities and responsibilities throughout the Program. The plan will be updated annually in July to support multi-year program planning.

- **TWRS Strategies Quantitative Risk Assessment.** A draft report is being reviewed that provides quantitative assessments of risks associated with alternative TWRS strategies for various performance measures for cost, schedule, waste volumes produced, etc.

- **Risk Management for the Alternative Acquisition Strategy.** Risk management has been implemented as part of work to support the alternative acquisition strategy ("privatization") for TWRS. A risk watch list identifying key risks and management actions/responsibilities has been developed and is reviewed by senior management and updated on a weekly basis.

- **TWRS Functional Baseline Risk Watch List.** A risk watch list for TWRS programmatic risks is being prepared and will be submitted as part of the October 16, 1995, functional baseline submission. This risk watch list identifies specific risks to the Program cost, schedule, and technical performance; the level of risk; risk management actions being taken; and specific responsibilities. Development of the risk watch list has included interviews with both RL and WHC TWRS managers. The risk watch list will subsequently be used by management on a regular basis to monitor, track, and manage programmatic risks.

- **TWRS Directors Guidance.** Guidance provided to all WHC TWRS Directors for implementation of systems engineering included specific risk management activities. Workshops are now scheduled to assist Director's organizations in the implementation of systems engineering, including risk management.

- **Risk Management Procedure.** An interim Risk Management Procedure was written and approved for TWRS. It is now being used to guide additional risk management activities.

Key risk management activities planned for FY 1996 will produce the following products.

- **TWRS Programmatic Risk Management Plan.** This plan will be revised as needed, including particularly the identification of FY 1997 milestones and schedules; and will be used to prepare FY 1997 MYPP input.

- **Functional Baseline Risk Watch List.** This risk watch list will be revised based on review of the functional baseline and will be updated and reviewed on a regular basis by senior program management.

- **Technical Baseline Risk Watch List.** A risk watch list for the technical baseline to be developed in FY 1996 will be developed, submitted, and reviewed as part of the technical requirements review (TRR).

- **Project Risk Management Plans.** Each TWRS project (i.e., level 4 in the WBS) will prepare a risk management plan for the project by December 31, 1995. This plan will define how the project will implement risk management.

- **Project Risk Watch Lists.** Each project (level 4 WBS) and "line item" project (e.g., W-058) will prepare and use a risk watch list for the project. The initial versions of these risk watch lists will be completed by December 31, 1995. They will then be updated and used on a regular basis by project management and will feed the technical baseline risk watch list.

- **Risk Management Infrastructure Development.** TWRS will continue to improve the risk management infrastructure consistent with the enhanced emphasis on risk management in the Program. Infrastructure development will include improvements in procedures, training, and modeling to support quantitative risk analysis.

Because preparation of the FY 1996 MYPP occurred at the same time as the SRR Action Plan was initiated, all systems engineering activities (including some risk management) may not have been specifically identified in the MYPP. To ensure that these needed activities occur in FY 1996, WHC has specifically included a milestone in November 1995, to submit a change request to accomplish needed systems engineering (including risk management) activities in FY 1996 not already identified.

2.3 TANK WASTE REMEDIATION SYSTEM PROGRAM BASELINE

The TWRS Program baseline is comprised of seven elements; these elements are described in Sections 2.3.1 through 2.3.7. The baseline elements can be clustered into two groups: the technical baseline and the cost and schedule baselines.

The TWRS Program has unique features associated with implementing systems engineering in an existing system and ongoing operations. The technical baseline will eventually have all of the elements defined in the SEWP, WHC-SD-WM-WP-285 (refer to Section 2.2.1). It will be the source of information needed to generate the various types of technical baseline documents defined in Section 3 of the SEWP for the TWRS architectures chosen for the projects, and the product structures for the program and project levels respectively. Among the technical baseline documents are the Design Requirements and Project Design Specification Documents, which are the TWRS Program equivalent of the system specifications. Figure 2-3 shows the relationships in a graphical form.

The technical baseline components for TWRS are listed in Section 2.2.1. The key documents are not available at the start of FY 1996 because the information needed to generate them has not been completed. This information will be generated during the FY 1996 work activity as described in Section 3, Management Systems (WBS 1.1.1.1).

2.3.1 Systems Specification (Design Requirements and Design Specifications) Tree and Product Structure

Systems specification trees and product structures summarize and describe the physical system that has been selected to carry out the Program mission. These trees and structures are displayed graphically in Figures 2-3 and 2-4; they both represent decomposition of larger elements into their constituent parts.

Design Requirements and Design Specifications are lower-tier program documents derived from information from the work of trade studies. The trade studies use information on the technical requirements specifications and the decision process to select the system architecture and allocated requirements. This selected system architecture allocates and expands requirements for the system that are pertinent to the specific TWRS project.

The product structure represents the logical decomposition of high-level products into the lowest level of detail and is developed as part of the functions and requirements development work. The product structure is an input to the development of the WBS structure where like or related work is clustered, and the development of an organizational structure is tailored to the work.

2.3.2 Work Breakdown Structure

The structure illustrated in Attachment 2-1 shows the logical division of the work required to meet the TWRS Program mission. This structure illustrates the top-level Program functions determined through the application of systems engineering. The WBS for each project/sub-project is included in the following sections. Each of these WBS's are broken down to the level necessary to provide effective management of the work.

2.3.3 WBS Dictionary

The WBS dictionary for the TWRS Program is found in the Performance Measurement Control System (PMCS). Attachment 2-2 contains the dictionary sheets for the TWRS Program, Waste Storage, and Waste Disposal. The dictionary sheet for Management Systems is found in Attachment 3-2.

2.3.4 Level 0 Schedule

The Level 0 schedule is the logical integration of all programmatic interactions necessary to achieve the objectives of the TWRS Program. Included in this schedule are selected Tri-Party Agreement, HQ, and RL milestones. This integrated schedule provides the framework under which lower level work scope, cost estimates, and schedules are developed to establish the TWRS Program baselines. The TWRS Program Level 0 schedule is included as Attachment 2.3. Milestones on this schedule are further detailed by the information on the milestone description sheets in Appendix A.

2.3.5 Cost Baseline

The cost bases (resource requirements) provide a quantification of the resources needed to accomplish the technical bases of the baseline. The cost bases of the TWRS Program were developed using the guidelines and precepts provided in EM-30's Cost and Schedule Estimating Guide and in conjunction with the Program's scheduling efforts.

The TWRS Program's cost estimate is a compilation of the cost estimate made for each activity in the Program's schedule (i.e., activity-based cost estimating). These activities encompass the full scope of the TWRS Program. The cost estimate for each activity is, for the most part, an extension and summation of the basic resource estimates prepared for each activity. Various methodologies were used in the preparation of the estimates, but the methodology chosen was appropriate for each activity dependent on the information available. The TWRS Program cost baseline is detailed in Attachment 2-4 and will be updated annually as MYPP revisions are scheduled.

The TWRS Program Cost Estimate Baseline by Month for the execution year is detailed in Attachment 2-5.

2.3.6 Program Funding Required

A summary of the program funding requirements for the fiscal years FY 1996 through 2001 is included in Attachment 2-6. The funding amounts are furnished by ADS and funding source (i.e., operating expense, CENRTC, Line Item, GPP). Dollar amounts by funding source are time-phased by each fiscal year.

2.3.7 Planned Staffing Profiles

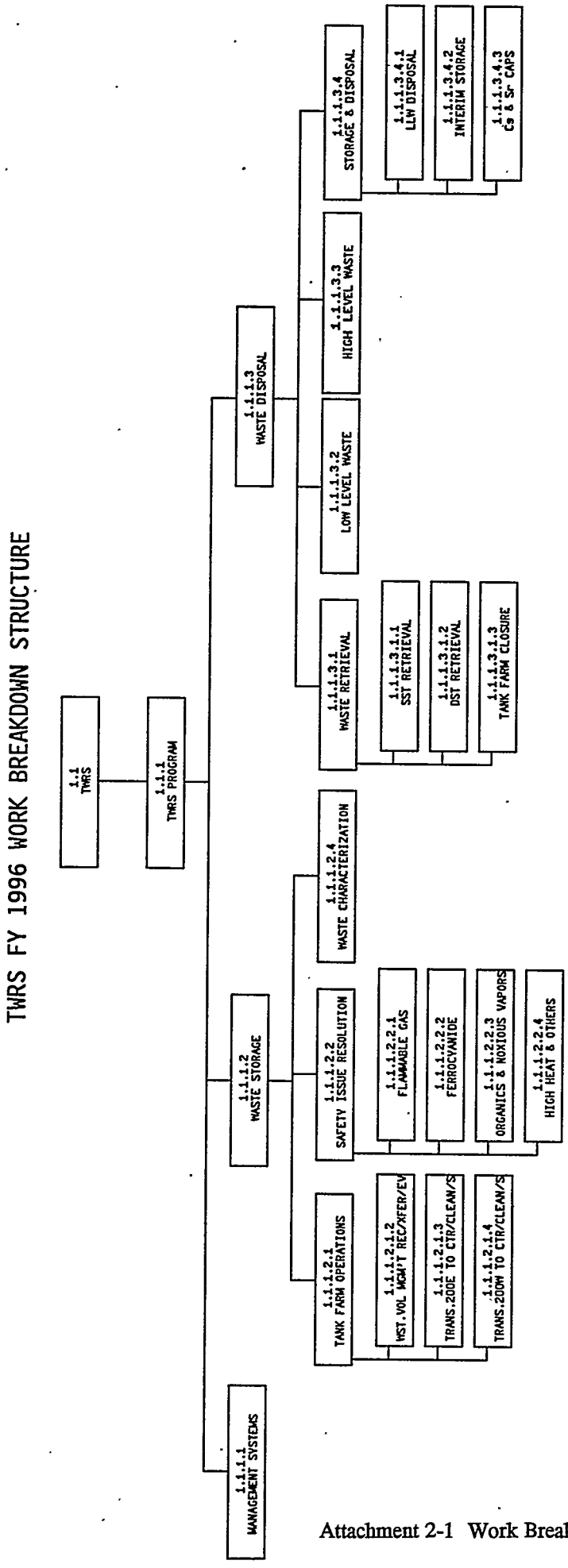
Manpower projections are determined by compiling the labor resource requirements at the lowest level of planned activities, converting the manhours into Full-Time Equivalents (FTEs), and summarizing the information at the appropriate level of the TWRS Program WBS. An FTE is equivalent to 1,812 hours in any fiscal year. The labor manhour estimates are included in the estimating work sheets supporting each activity planning form. Near-term plans divide the labor into 88 distinct categories and intermediate planning groups labor into nine categories. The planning of labor resources is reviewed and refined with each annual revision of the TWRS Multi-Year Program Plan. Attachment 2-7 contains the FTEs for the TWRS Program through the year 2002.

2.4 WASTE TYPE DATA

Data on the different waste types encountered on the TWRS Program are collected and summarized to fulfill the Hanford Site requirements for long-range strategic planning. The data include the projected quantities of different waste types (e.g., liquids, solids, and soils), which are contaminated and uncontaminated, and are categorized with regard to level of radioactivity. Categories such as high-level waste, low-level waste, transuranic waste, and others are important in determining plans for dealing with the projected volumes and/or masses. The waste type data represent projections through the end of the program. The information is categorized as follows; SSTs, DSTs, miscellaneous underground storage tanks, and solid waste. The assumptions that were used to assemble this data are available as supporting documentation. The data for the TWRS Program are in Attachment 2-8.

LISTING OF ATTACHMENTS

Attachment 2-1	Work Breakdown Structure
Attachment 2-2	WBS Dictionary Sheets
Attachment 2-3	TWRS Level 0 Schedule
Attachment 2-4	TWRS Cost Baseline
Attachment 2-5	TWRS FY 1996 Cost Estimate by Month
Attachment 2-6	FY 1996 Funding Required
Attachment 2-7	Planned Staffing Profiles
Attachment 2-8	Waste Type Data



Attachment 2-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
September 21, 1995	Tank Waste Remediation System	
3. WBS ELEMENT CODE/LEVEL 1.1.1/ 2	4. WBS ELEMENT TITLE Tank Waste Remediation System	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER 1100,1110,1120,1130,1200, 1210,1220,1230,1240,1250	9. BUDGET AND REPORTING NUMBERS Operating / CENTRC / GPP / Line Item EW3130010 / 35EW31301 / 35EW31301 / 39EW31301 EW3120071 / 35EW31207 / 35EW31207 / 39EW31207 EW3120072 EW3120074 EW3120075	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	441140	637910	831504	796162	695041	679063	726789
CENRTC	26856	22189	19150	8867	12877	3310	
GPP	4272	1998	1996	2001	2000	1500	
LINE ITEM	21746	50852	37032	92680	156311	187918	138544
TOTAL	494014	712949	889682	899710	866229	871791	865333

B. TECHNICAL BASES

See lower level WBS Dictionary.

C. STATEMENT OF WORK

Store, treat, and immobilize highly radioactive Hanford waste (existing and future tank waste and the strontium and cesium capsules) in an environmentally sound, safe, and cost effective manner.

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
September 21, 1995	Tank Waste Remediation System	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2 / 3	4. WBS ELEMENT TITLE Waste Storage	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER 1100,1110,1120,1130	9. BUDGET AND REPORTING NUMBERS Operating CENTRC GPP Line Item EW3120071 35EW31207 35EW31207 39EW31207 EW3120072 35EW31301 35EW31301 39Ew31301 EW3130010	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	256648	228549	213566	176668	155026	128071	156677
CENRTC	25478	22139	19100	8867	6871	3310	
GPP	4272	1998	1996	2001	2000	1500	
LINE ITEM	12295	35563	20163	67436	99004	136977	90001
TOTAL	298693	288249	254825	254972	262901	269858	246678

B. TECHNICAL BASES

See lower level WBS Dictionary.

C. STATEMENT OF WORK

Manage existing tank waste (e.g., waste contained in DST's, SST's, and miscellaneous tanks), and new tank waste from Site level interfaces (e.g. facility operations, D&D, ER), that is not the product of retrieval for final processing as defined by Waste Disposal. Waste Storage will be limited to the storage of waste prior to retrieval for processing; waste characterization; timely resolution of safety issues while ensuring safe and environmentally sound storage of tank wastes,optimization of tank space, volume reduction, interim stabilization, and\or emergency pumping; concentration of tank waste to support tank utilization. As tank farms are brought to a safe, clean and stable condition, they will be transitioned to the Retrieval function. This function also includes treatment/preparation of liquid, gases, and solid wastes generated during the management of tank waste. Existing contaminated tank farm facilities will be prepared for D&D and eventual turnover to ER.

This will continue until all waste is retrieved for final processing and waste is no longer reexternal sources by Systems Engineering level 2 function 4.2 - Remediate Tank Waste .

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
September 21, 1995	1.1.1 Tank Waste Remediation System	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.3/ 3	Waste Disposal	
5. CURRENT REV. NO.	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
0		
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER 1210,1220, 1230,1240,1250	9. BUDGET AND REPORTING NUMBERS Operating CENTRC GPP Line Item EW3130010 35EW31301 35EW31301 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	142552	374315	584413	588344	509289	520285	539405
CENRTC	1377	50	50		6006		
GPP							
LINE ITEM	9451	15290	16869	25244	57307	50942	48543
TOTAL	153380	389655	601332	613588	572602	571227	587948

B. TECHNICAL BASES

See lower level WBS Dictionary.

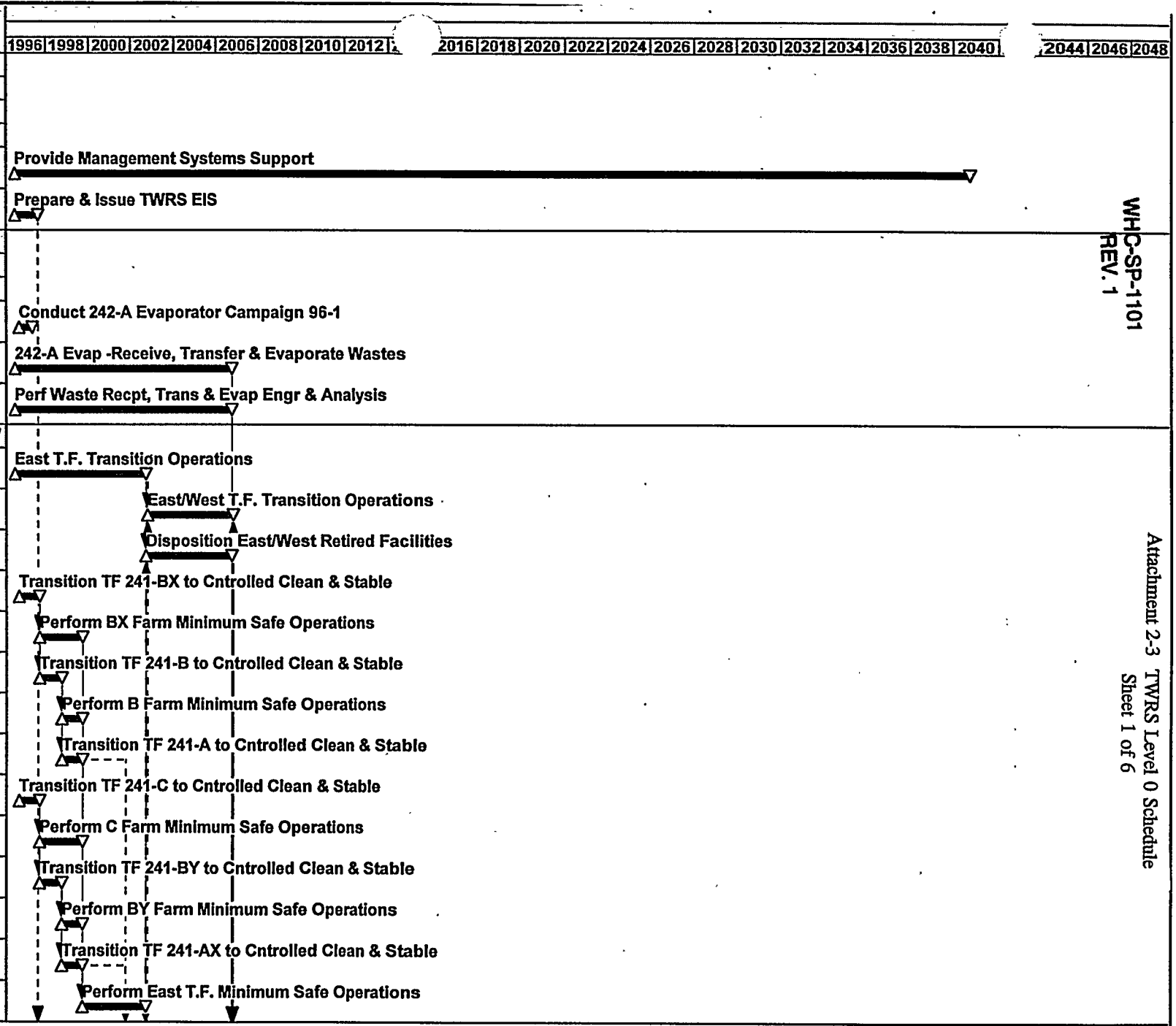
C. STATEMENT OF WORK

Process tank waste; including DST waste, SST waste, HLW contained in miscellaneous underground storage tanks, and cesium/strontium capsules (if required) for disposal. This includes retrieval of tank wastes, in-process waste transfer and storage, any pretreatment (if required), immobilization and on-site disposal of low level wastes, immobilization, interim storage, and certification of immobilized high-level wastes for acceptance into the Civilian Radioactive Waste Management System (CRWMS). Also included is the treatment/preparation of gaseous and liquid effluents and solid wastes generated during the processing of tank waste. Wastes excluded from processing by this function are the underground storage tanks and support

ponds, and ditches.

Waste disposal is initiated when waste retrieval for treatment begins and will continue until the last IHLW/ITRU package leaves the storage facility shipping dock and the treatment facilities are turned over for decontamination and decommissioning (D&D).

Activity ID	E S	Early Finish
1 Hanford Site		
1.1 TWRS Mission		
1.1.1 Tank Waste Remediation System		
1.1.1.1 Management Systems		
A100	19JUL95*	30SEP39
A150	19JUL95*	30AUG96
1.1.1.2 Waste Storage		
1.1.1.2.01 Tank Farm Operations		
1.1.1.2.01.02 Waste Vol. Mgmt Rec/Xfer/Eva		
B110	02OCT95*	31MAY96
B130	19JUL95*	30SEP05
B140	19JUL95*	30SEP05
1.1.1.2.01.03 Transition 200E to Cont./Clean/		
B201	19JUL95*	28SEP01
B203	29OCT01	28OCT05
B205	01OCT01	30SEP05
B220	02OCT95*	30SEP96
B222	01OCT96	30SEP98
B210	01OCT96	30SEP97
B212	01OCT97	30SEP98
B216	01OCT97	30SEP98
B260	02OCT95*	30SEP96
B262	01OCT96	30SEP98
B230	01OCT96	30SEP97
B232	01OCT97	30SEP98
B250	01OCT97	30SEP98
B252	01OCT98	28SEP01



Attachment 2-3 TWRS Level 0 Schedule
Sheet 1 of 6

Project Start	01JAN95
Project Finish	28SEP40
Data Date	02JAN95
Plot Date	21SEP95

Early Bar
Progress Bar

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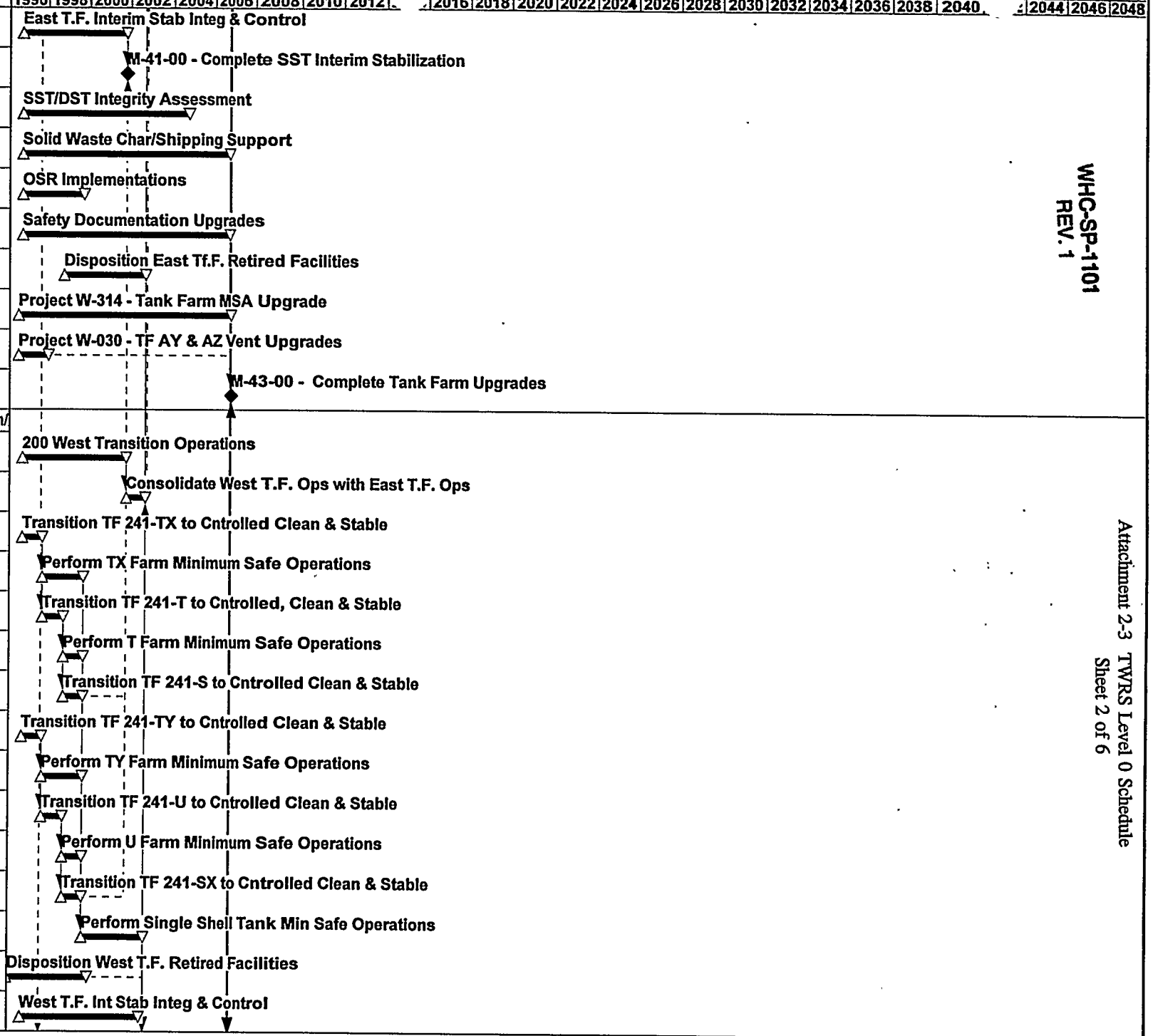
ORV5

Sheet 1 of 6

TWRS Life of Program Schedule

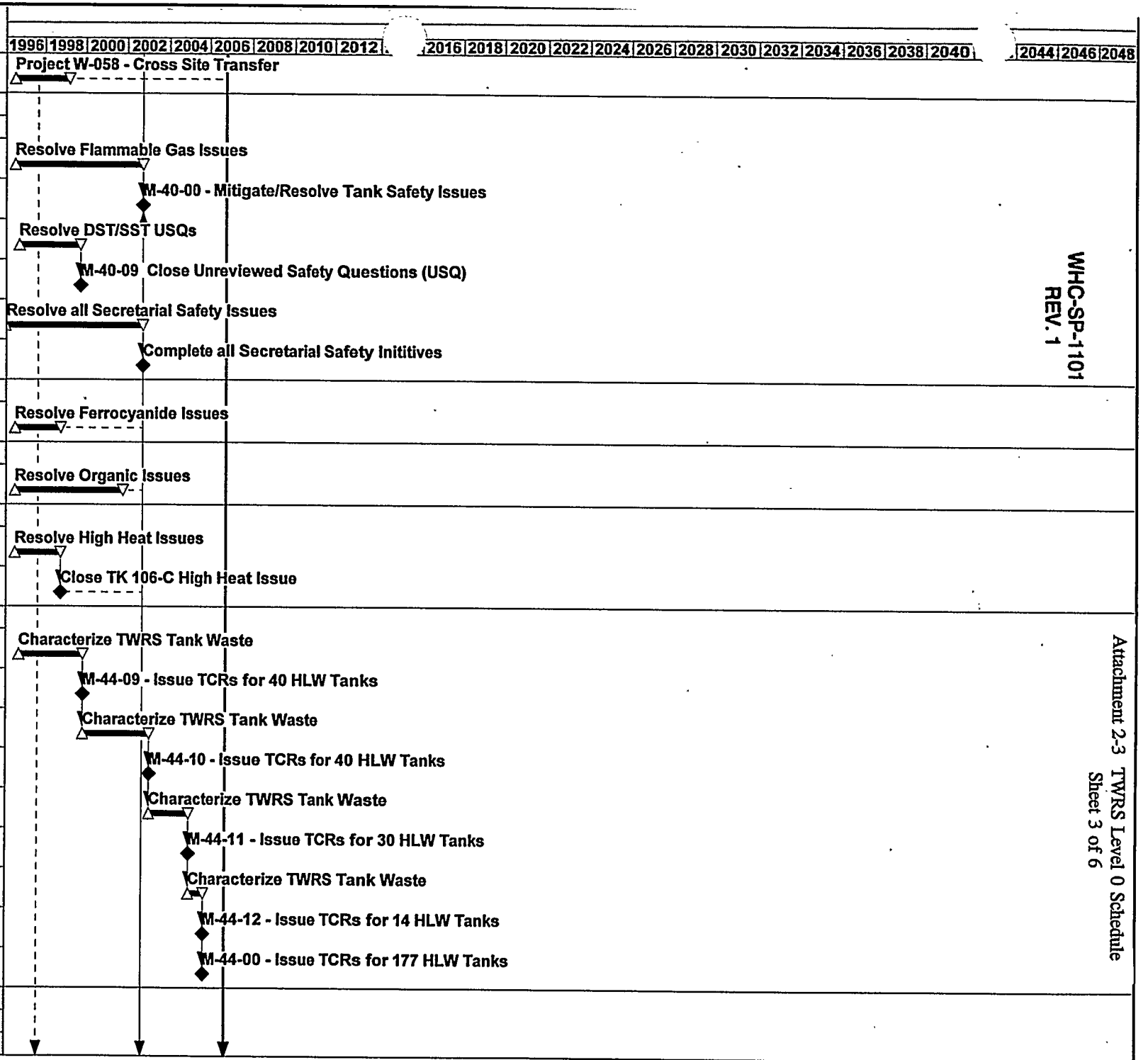
Revision 5 - 9/21/95			
Date	Revision	Checked	Approved

Activity ID		Early Finish
B256	02OCT95*	29SEP00
BMS001		29SEP00*
B272	02OCT95*	30SEP03
B274	02OCT95*	30SEP05
B276	02OCT95*	30SEP98
B278	02OCT95*	30SEP05
B279	01OCT97*	28SEP01
B280	19JUL95*	28OCT05
B290	19JUL95*	31DEC96
BMS002		28OCT05
1.1.1.2.01.04 Transition 200W to Cont./Clean/		
B302	02OCT95*	29SEP00
B304	02OCT00	28SEP01
B320	02OCT95*	30SEP96
B322	01OCT96	30SEP98
B310	01OCT96	30SEP97
B312	01OCT97	30SEP98
B350	01OCT97	30SEP98
B330	02OCT95*	30SEP96
B332	01OCT96	30SEP98
B340	01OCT96	30SEP97
B342	01OCT97	30SEP98
B360	01OCT97	30SEP98
B362	01OCT98	28SEP01
B380	02JAN95	30DEC98
B382	02OCT95*	29JUN01

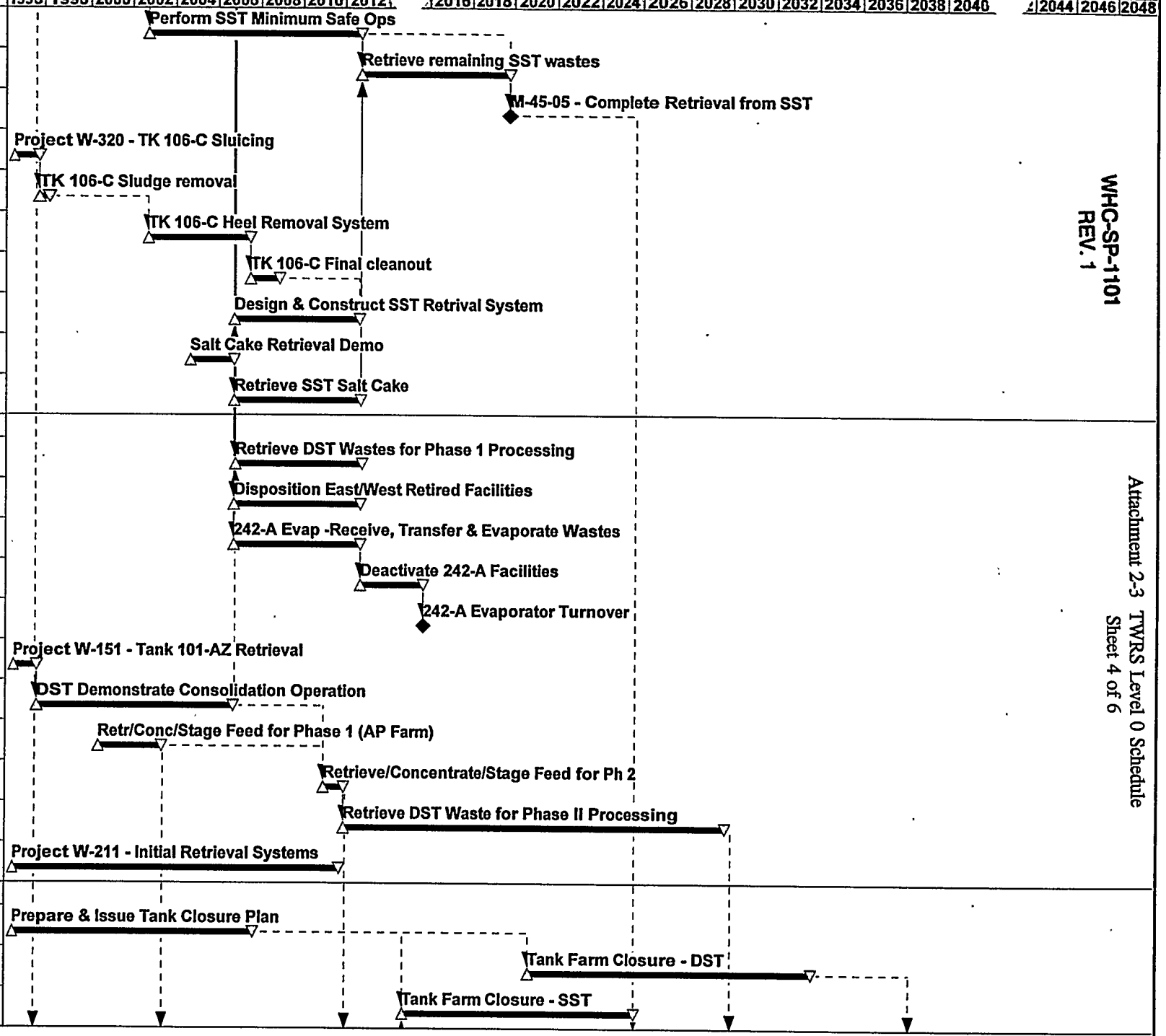


Attachment 2-3 TWRS Level 0 Schedule
Sheet 2 of 6

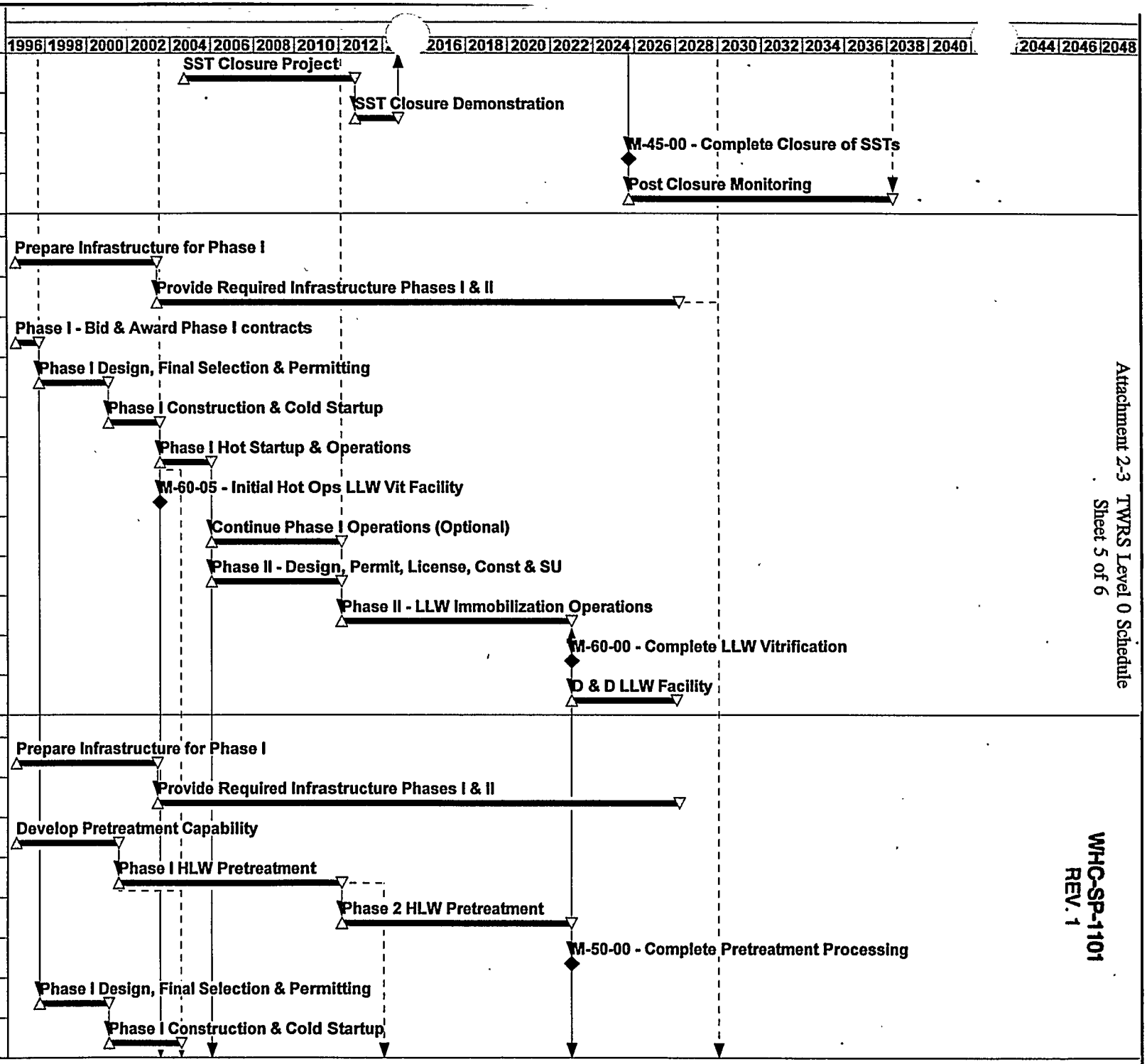
Activity ID	F	Early Finish
B270	19JUL95*	27FEB98
1.1.1.2.02 Safety Issue Resolution		
1.1.1.2.02.01 Flammable Gas		
C100	19JUL95*	28SEP01
CMS001		28SEP01
C104	02OCT95*	30SEP98
CMS002		30SEP98
C106	02JAN95	28SEP01
CMS003		28SEP01*
1.1.1.2.02.02 Ferrocyanide		
C120	19JUL95*	30SEP97
1.1.1.2.02.03 Organics & Noxious Vapors		
C140	19JUL95*	29SEP00
1.1.1.2.02.04 High Heat & Others		
C160	19JUL95*	30SEP97
CMS004		30SEP97
1.1.1.2.04 Waste Characterization		
D100	02OCT95*	05NOV98
DMS001		05NOV98
D110	06NOV98	31JAN02
DMS002		31JAN02
D120	01FEB02	31DEC03
DMS003		31DEC03
D130	01JAN04	30SEP04
DMS004		30SEP04
DMS005		30SEP04
1.1.1.3 Waste Disposal		
1.1.1.3.01 Waste Retrieval		
1.1.1.3.01.01 SST Retrieval		



Activity ID	F	Early Finish
B254	01OCT01	30SEP11
E110	03OCT11	28SEP18
EMS001		28SEP18
E150	19JUL95*	31OCT96
E100	01NOV96	31MAR97
E112	01OCT01*	30JUN06
E114	03JUL06	30NOV07
E108	03OCT05	09SEP11
E105	01OCT03*	30SEP05
E115	03OCT05*	30SEP11
1.1.1.3.01.02 DST Retrieval		
B204	31OCT05	28OCT11
B208	03OCT05	30SEP11
B142	03OCT05	30SEP11
B160	03OCT11	01OCT14
BMS003		01OCT14
E330	19JUL95*	01OCT96
E340	02OCT96	30SEP05
E305	01JUN99*	31MAY02
E310	01JAN10*	31DEC10
E300	03JAN11*	31AUG28
E360	19JUL95*	30SEP10
1.1.1.3.01.03 Tank Farm Closure		
E410	19JUL95*	29SEP06
E400	01OCT19*	30SEP32
E420	01OCT13	30SEP24



Activity ID	E S	Early Finish
E422	01OCT03*	30SEP11
E424	03OCT11	30SEP13
EMS002		30SEP24
E426	01OCT24	06APR37
1.1.1.3.02 Low Level Waste		
F050	19JUL95*	17MAY02
F075	20MAY02	26FEB27
F100	01AUG95*	30AUG96
F110	02SEP96	31DEC99
F200	03JAN00	01JUL02
F210	02JUL02	31DEC04
FMS002	02JUL02	
F220	03JAN05	03JAN11
F300	03JAN05	03JAN11
F310	04JAN11	31DEC21
FMS001		31DEC21
F320	03JAN22	30DEC26
1.1.1.3.03 High Level Waste		
G050	19JUL95*	17MAY02
G075	20MAY02	26FEB27
G080	19JUL95*	12JUL00
G090	13JUL00	03JAN11
G095	04JAN11	31DEC21
GMS002		31DEC21
G120	02SEP96	31DEC99
G130	03JAN00	01JUL03



Attachment 2-3 TWRS Level 0 Schedule
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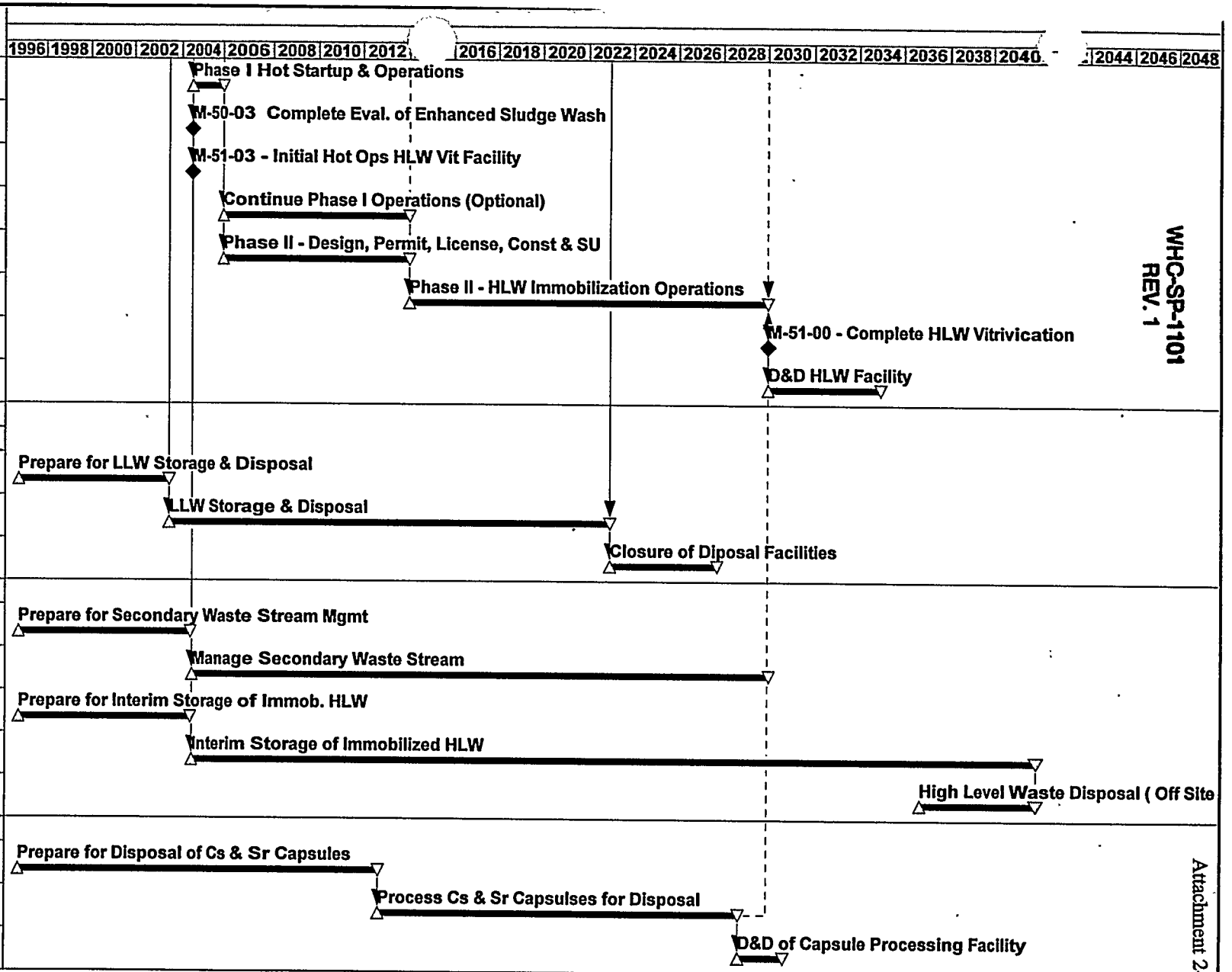
Activity ID	F	Early Finish
G140	02JUL03	31DEC04
G143		01JUL03*
G145	02JUL03	
G150	03JAN05	02JAN13
G200	03JAN05	02JAN13
G210	03JAN13	29DEC28
GMS001		29DEC28
G220	01JAN29	30DEC33
1.1.1.3.04 Storage & Disposal		
1.1.1.3.04.01 LLW Disposal		
H101	02OCT95*	28JUN02
H100	02JUL02	31DEC21
H105	03JAN22	30SEP26
1.1,1.3.04.02 Interim Storage		
H231	02OCT95*	06JUN03
H230	02JUL03	16JAN29
H206	02OCT95*	06JUN03
H200	02JUL03.	28SEP40
H205	01OCT35	28SEP40*
1.1.1.3.04.03 Cs & Sr Capsules		
H302	02OCT95*	30SEP11
H300	03OCT11*	04OCT27
H310	05OCT27	28SEP29



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REV. 1

Attachment 2-3 TWRS Level 0 Schedule
Sheet 6 of 6

TANK WASTE REMEDIATION SYSTEM

TWRSR&A: MYPP2045.WK3 09/21/95

FY 1996–2045 MYPP FUNDED/UNFUNDED COST PROFILE

WBS	TWRS PROJECTS	ALL YEARS	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05
1.1.1.1	Mgmt. Systems	957,393	41,940	35,041	33,527	31,151	30,725	30,706	30,706	30,709	31,208	30,873
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.	194,777	18,020	16,015	16,304	20,127	20,718	20,718	20,698	20,698	20,780	20,699
1.1.1.2.1.3	Transition 200E–C,C,& S*	1,356,908	94,980	86,656	89,765	131,880	160,803	192,205	150,905	150,606	149,673	149,435
1.1.1.2.1.4	Transition 200W–C,C,& S*	244,040	58,751	65,017	38,667	31,980	26,027	23,598				
1.1.1.2.2.1	Flammable Gas	129,756	32,345	28,060	32,423	15,557	13,929	7,442				
1.1.1.2.2.2	Ferrocyanide	5,019	2,692	2,327								
1.1.1.2.2.3	Organic & Noxious Vapors	48,872	13,356	17,091	15,010	3,415						
1.1.1.2.2.4	High Heat & Others	2,509	1,305	1,204								
1.1.1.2.4	Waste Characterization	556,272	77,245	71,879	62,654	52,013	41,424	25,894	75,075	75,058	75,030	
1.1.1.3.1.1	SST Retrieval	2,900,221	27,520	7,109	12,310	17,978	16,658	18,902	37,153	19,818	50,903	50,931
1.1.1.3.1.2	DST Retrieval	1,186,893	16,032	17,301	20,108	22,795	38,299	27,300	20,754	28,031	29,203	30,287
1.1.1.3.1.3	Tank Farm Closure	326,462	4,827	3,866	4,854	5,713	6,908	7,887	9,259	10,317	9,895	6,271
1.1.1.3.2	Low Level Waste	6,635,857	96,225	143,518	150,995	150,705	5,524	4,737	8,818	210,800	206,691	191,493
1.1.1.3.3	High Level Waste	9,007,864	4,195	5,204	5,696	9,545	9,582	11,455	9,576	288,778	290,124	276,210
1.1.1.3.4.1	LLW Disposal	527,233	2,793	8,091	10,803	7,193	16,506	30,052	18,775	15,730	15,129	21,143
1.1.1.3.4.2	Interim Storage	4,292,412	1,526	4,172	2,124	5,102	17,984	8,799	20,672	3,048	2,497	3,636
1.1.1.3.4.3	CS & SR Capsules	225,382	262	398	441	558	1,141	2,095	2,943	12,110	12,159	12,292
•	**TOTAL TWRS – FUNDED**	28,597,870	494,014	512,949	495,681	505,712	406,228	411,790	405,334	865,703	893,292	793,270
	UNFUNDED LLW & HLW	2,368,000	0	200,000	394,000	394,000	460,000	460,000	460,000	0	0	0
•	**TOTAL TWRS**	30,965,870	494,014	712,949	889,681	899,712	866,228	871,790	865,334	865,703	893,292	793,270

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM

TWRSR&A: MYPP2045.WK3 09/21/95

FY 1996–2045 MYPP FUNDED/UNFUNDED COST PROFILE

WBS	TWRS PROJECTS	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
1.1.1.1	Mgmt. Systems	30,833	30,828	29,855	29,726	27,585	27,585	27,661	27,585	27,585	27,585
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.										
1.1.1.2.1.3	Transition 200E–C,C,& S*										
1.1.1.2.1.4	Transition 200W–C,C,& S*										
1.1.1.2.2.1	Flammable Gas										
1.1.1.2.2.2	Ferrocyanide										
1.1.1.2.2.3	Organic & Noxious Vapors										
1.1.1.2.2.4	High Heat & Others										
1.1.1.2.4	Waste Characterization										
1.1.1.3.1.1	SST Retrieval	219,968	221,018	231,833	231,291	242,824	242,768	186,305	175,495	175,352	175,352
1.1.1.3.1.2	DST Retrieval	56,751	57,918	25,322	25,253	25,253	25,253	48,165	48,034	48,034	48,034
1.1.1.3.1.3	Tank Farm Closure	6,278	5,389	5,410	5,389	4,876	14,283	14,613	14,872	13,758	14,471
1.1.1.3.2	Low Level Waste	119,272	150,518	313,233	329,095	363,599	356,797	348,393	330,365	330,438	330,497
1.1.1.3.3	High Level Waste	169,496	218,724	465,846	490,617	541,863	532,628	520,609	490,658	489,546	489,528
1.1.1.3.4.1	LLW Disposal	71,466	20,655	5,759	3,260	7,241	6,152	19,247	56,964	19,246	6,029
1.1.1.3.4.2	Interim Storage	4,599	5,506	5,534	7,588	11,680	10,830	3,115	3,133	4,469	5,122
1.1.1.3.4.3	CS & SR Capsules	10,249	35,261	36,064	37,446	34,952	18,963	1,605	1,580	1,603	1,585
•	**TOTAL TWRS – FUNDED**	688,912	745,817	1,118,856	1,159,665	1,259,873	1,235,259	1,169,713	1,148,686	1,110,031	1,098,203
	UNFUNDED LLW & HLW	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS**	688,912	745,817	1,118,856	1,159,665	1,259,873	1,235,259	1,169,713	1,148,686	1,110,031	1,098,203

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM

TWRSR&A: MYPP2045.WK3 09/21/95

FY 1996–2045 MYPP FUNDED/UNFUNDED COST PROFILE

WBS	TWRS PROJECTS	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
1.1.1.1	Mgmt. Systems	27,525	26,599	26,593	25,574	25,278	25,066	22,419	22,211	22,834	23,700
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.										
1.1.1.2.1.3	Transition 200E–C,C,& S*										
1.1.1.2.1.4	Transition 200W–C,C,& S*										
1.1.1.2.2.1	Flammable Gas										
1.1.1.2.2.2	Ferrocyanide										
1.1.1.2.2.3	Organic & Noxious Vapors										
1.1.1.2.2.4	High Heat & Others										
1.1.1.2.4	Waste Characterization										
1.1.1.3.1.1	SST Retrieval	175,833	175,352	175,352	11,709	174	78	78	77	80	
1.1.1.3.1.2	DST Retrieval	48,165	48,034	48,034	48,034	48,165	48,034	48,034	48,034	48,165	48,034
1.1.1.3.1.3	Tank Farm Closure	14,527	14,417	14,417	14,471	14,527	14,471	13,424	13,368	13,061	7,068
1.1.1.3.2	Low Level Waste	330,508	311,424	267,371	267,385	267,324	147,479	147,989	147,844	147,915	147,957
1.1.1.3.3	High Level Waste	489,534	462,522	396,522	396,528	396,534	216,528	216,526	216,519	216,526	216,526
1.1.1.3.4.1	LLW Disposal	17,161	55,746	22,643	6,314	5,888	5,962	5,962	5,966	6,024	6,024
1.1.1.3.4.2	Interim Storage	5,143	5,102	5,102	5,122	5,143	5,122	5,226	5,304	5,208	5,152
1.1.1.3.4.3	CS & SR Capsules	876	270	442	87	0	0	0	0	0	0
•	**TOTAL TWRS – FUNDED**	1,109,272	1,099,466	956,476	775,224	763,033	462,740	459,658	459,323	459,813	454,461
	UNFUNDED LLW & HLW	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS**	1,109,272	1,099,466	956,476	775,224	763,033	462,740	459,658	459,323	459,813	454,461

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM

TWRSR&A: MYPP2045.WK3 09/21/95

FY 1996–2045 MYPP FUNDED/UNFUNDED COST PROFILE

WBS	TWRS PROJECTS	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
1.1.1.1	Mgmt. Systems	24,228	24,228	24,093	2,927	2,927	2,926	2,449	2,438	1,740	1,740
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.										
1.1.1.2.1.3	Transition 200E–C,C,& S*										
1.1.1.2.1.4	Transition 200W–C,C,& S*										
1.1.1.2.2.1	Flammable Gas										
1.1.1.2.2.2	Ferrocyanide										
1.1.1.2.2.3	Organic & Noxious Vapors										
1.1.1.2.2.4	High Heat & Others										
1.1.1.2.4	Waste Characterization										
1.1.1.3.1.1	SST Retrieval										
1.1.1.3.1.2	DST Retrieval	48,033									
1.1.1.3.1.3	Tank Farm Closure	5,903	5,903	5,903	348	349	349	351	349	348	348
1.1.1.3.2	Low Level Waste	130,914	95,939	18,837	17,258	16,000	16,000	16,000	0	0	0
1.1.1.3.3	High Level Waste	192,526	140,526	25,931	25,756	25,761	25,761	25,764	761	758	175
1.1.1.3.4.1	LLW Disposal	6,134	6,254	5,504	5,518	1,109	969	991	830		
1.1.1.3.4.2	Interim Storage	4,992	5,031	5,122	5,102	4,632	697	687	685	682	685
1.1.1.3.4.3	CS & SR Capsules	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS – FUNDED**	412,730	277,881	85,390	56,909	50,778	46,702	46,242	5,063	3,528	2,948
	UNFUNDED LLW & HLW	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS**	412,730	277,881	85,390	56,909	50,778	46,702	46,242	5,063	3,528	2,948

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM

FY 1996–2045 MYPP FUNDED/UNFUNDED COST PROFILE

TWRSR&A: MYPP2045.WK3 09/21/95

WBS	TWRS PROJECTS	FY 36	FY 37	FY 38	FY 39	FY 40	FY 41	FY 42	FY 43	FY 44	FY 45
1.1.1.1	Mgmt. Systems	1,745	1,739	1,503	1,497						
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.										
1.1.1.2.1.3	Transition 200E–C,C,& S*										
1.1.1.2.1.4	Transition 200W–C,C,& S*										
1.1.1.2.2.1	Flammable Gas										
1.1.1.2.2.2	Ferrocyanide										
1.1.1.2.2.3	Organic & Noxious Vapors										
1.1.1.2.2.4	High Heat & Others										
1.1.1.2.4	Waste Characterization										
1.1.1.3.1.1	SST Retrieval										
1.1.1.3.1.2	DST Retrieval										
1.1.1.3.1.3	Tank Farm Closure	351	349	351	348	348	358	363	363	365	228
1.1.1.3.2	Low Level Waste	0	0	0	0	0	0	0	0	0	0
1.1.1.3.3	High Level Waste	0	0	0	0	0	0	0	0	0	0
1.1.1.3.4.1	LLW Disposal										
1.1.1.3.4.2	Interim Storage	88,775	654,347	656,946	652,124	663,003	658,299	679,678	27,401	764	0
1.1.1.3.4.3	CS & SR Capsules	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS – FUNDED**	90,871	656,435	658,800	653,969	663,351	658,657	680,041	27,764	1,129	228
	UNFUNDED LLW & HLW	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS**	90,871	656,435	658,800	653,969	663,351	658,657	680,041	27,764	1,129	228

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM

TWRSR&A: MYPP2045.WK3 09/21/95

FY 1996 MYPP FUNDED/UNFUNDED COST PROFILE BY MONTH

WBS	TWRS PROJECTS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1.1.1.1	Mgmt. Systems	3,100	2,816	2,854	3,171	2,719	6,871	2,889	2,832	2,608	2,782	2,915	6,383	41,940
1.1.1.2.1.2	Wst Vol Mgt/Rec/Xfer/Evap.	1,652	1,505	1,431	1,601	1,472	1,520	1,536	1,531	1,441	1,438	1,518	1,375	18,020
1.1.1.2.1.3	Transition 200E–C,C,& S*	8,275	7,617	7,188	8,524	7,723	8,042	8,241	8,119	6,870	7,871	8,754	7,756	94,980
1.1.1.2.1.4	Transition 200W–C,C,& S*	5,432	4,916	4,605	5,038	4,805	5,078	5,082	5,065	4,596	4,803	4,990	4,341	58,751
1.1.1.2.2.1	Flammable Gas	2,701	2,383	2,361	2,785	2,705	2,890	2,777	2,652	2,454	3,064	3,160	2,413	32,345
1.1.1.2.2.2	Ferrocyanide	246	259	256	286	241	263	240	231	197	160	170	143	2,692
1.1.1.2.2.3	Organic & Noxious Vapors	584	606	778	1,191	1,328	1,843	1,670	1,552	1,166	1,016	936	686	13,356
1.1.1.2.2.4	High Heat & Others	110	100	95	105	97	115	121	121	110	122	111	98	1,305
1.1.1.2.4	Waste Characterization	7,093	6,680	6,957	8,128	7,408	6,662	7,512	6,259	6,088	5,204	4,957	4,297	77,245
1.1.1.3.1.1	SST Retrieval	3,103	2,467	2,398	2,322	1,933	2,047	2,627	1,567	1,470	1,702	2,767	3,117	27,520
1.1.1.3.1.2	DST Retrieval	1,341	1,241	1,199	1,514	1,194	1,041	1,102	1,136	1,092	1,101	1,112	2,959	16,032
1.1.1.3.1.3	Tank Farm Closure	387	351	334	399	371	370	379	377	359	377	605	518	4,827
1.1.1.3.2	Low Level Waste	8,108	8,005	7,954	8,138	8,023	8,083	8,201	8,175	8,048	8,085	8,141	7,264	96,225
1.1.1.3.3	High Level Waste	404	372	360	350	296	334	356	328	351	364	367	313	4,195
1.1.1.3.4.1	LLW Disposal	264	231	216	262	236	241	235	225	209	221	239	214	2,793
1.1.1.3.4.2	Interim Storage	185	171	160	219	179	117	123	108	94	93	39	38	1,526
1.1.1.3.4.3	CS & SR Capsules	34	30	29	37	32	31	18	10	11	7	11	12	262
•	**TOTAL TWRS – FUNDED**	43,019	39,750	39,175	44,070	40,762	45,548	43,109	40,288	37,164	38,410	40,792	41,927	494,014
	UNFUNDED LLW & HLW	0	0	0	0	0	0	0	0	0	0	0	0	0
•	**TOTAL TWRS**	43,019	39,750	39,175	44,070	40,762	45,548	43,109	40,288	37,164	38,410	40,792	41,927	494,014

* Controlled, Clean, & Stable

TANK WASTE REMEDIATION SYSTEM
FY 1996 – 2002 COST & FUNDING SUMMARY

9/27/95 UPDATE

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ADS/ DESCRIPTION	F/T	FY 1996 MYPP COST BASELN	FY 1996 MYPP FUND'G (1)	FY 1997 MYPP COST BASELN	FY 1997 MYPP FUND'G	FY 1998 MYPP COST BASELN	FY 1998 MYPP FUND'G	FY 1999 MYPP COST BASELN	FY 1999 MYPP FUND'G	FY 2000 MYPP COST BASELN	FY 2000 MYPP FUND'G	FY 2001 MYPP COST BASELN	FY 2001 MYPP FUND'G	FY 2002 MYPP COST BASELN	FY 2002 MYPP FUND'G
1200–0															
PM & A	OE	41,940	46,421	35,041	42,644	33,527	28,980	31,151	71,601	30,725	35,176	30,706	33,004	30,706	40,372
	C/E	0	1,816	0	0	0	0	0	0	0	0	0	0	0	0
	GPP	0	0	0	2	0	0	0	0	0	0	0	0	0	0
TOTAL PROG MGMT & ADMIN		**41,940**	**48,237**	**35,041**	**42,646**	**33,527**	**28,980**	**31,151**	**71,601**	**30,725**	**35,176**	**30,706**	**33,004**	**30,706**	**40,372**
1100/1120–0	OE	133,776	133,776	120,318	120,318	114,057	114,057	107,249	107,249	99,344	99,344	90,943	90,943	76,602	76,602
Oper'ns &	C/E	4,488	4,488	2,202	2,202	3,001	3,001	2,301	2,301	2,200	2,200	2,101	2,101	0	0
Maintenance	LI	0		0				0		0		0		0	
(Incl. Upgr's)	GPP	4,272	3,527	1,998	1,998	1,996	1,996	2,001	2,001	2,000	2,000	1,500	1,500	0	0
	Total	**142,536**	**141,791**	**124,518**	**124,518**	**119,054**	**119,054**	**111,551**	**111,551**	**103,544**	**103,544**	**94,544**	**94,544**	**76,602**	**76,602**
1120–0	OE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tank Farm	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upgrades	GPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100–1															
T. F. Restor'n/	OE	0	0	5,139	7,115	4,983	4,983	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Safe Ops.	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(W–314)	LI	0	0	9,560	7,584	19,800	19,800	67,436	67,436	99,004	99,004	136,977	136,977	90,001	90,001
	Total	**0**	**0**	**14,699**	**14,699**	**24,783**	**24,783**	**72,436**	**72,436**	**104,004**	**104,004**	**141,977**	**141,977**	**95,001**	**95,001**
1120–6	OE	12,576	12,576	0	0	0	0	0	0	0	0	0	0	0	0
T. F. Restor'n/	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Safe Ops.	LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(W–314)	Total	**12,576**	**12,576**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1120–2	OE	3,041	3,041	678	678	0	0	0	0	0	0	0	0	0	0
T. F. Ventil'n	C/E	200	200	0	0	0	0	0	0	0	0	0	0	0	0
Upgrades	LI	737	800	62	0	0	0	0	0	0	0	0	0	0	0
(W–030)	Total	**3,978**	**4,041**	**740**	**678**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

(1) ASSUMES NO CONGRESSIONAL BUDGET AMENDMENT

TANK WASTE REMEDIATION SYSTEM
FY 1996 – 2002 COST & FUNDING SUMMARY

9/27/95 UPDATE

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ADS/ DESCRIPTION	F/T	FY 1996 MYPP COST BASELN	FY 1996 MYPP FUND'G (1)	FY 1997 MYPP COST BASELN	FY 1997 MYPP FUND'G	FY 1998 MYPP COST BASELN	FY 1998 MYPP FUND'G	FY 1999 MYPP COST BASELN	FY 1999 MYPP FUND'G	FY 2000 MYPP COST BASELN	FY 2000 MYPP FUND'G	FY 2001 MYPP COST BASELN	FY 2001 MYPP FUND'G	FY 2002 MYPP COST BASELN	FY 2002 MYPP FUND'G
1120–4	OE	1,103	1,103	1,790	1,790	535	535	0	0	0	0	0	0	0	0
Cross Site	LI	11,558	19,795	25,941	8,100	364	364	0	0	0	0	0	0	0	0
Trsf. System (W–058)	Total	12,661	20,898	27,731	9,890	899	899	0	0	0	0	0	0	0	0
1120–7	OE	0	600	0	0	0	0	0	0	0	0	0	0	0	0
Aging Waste	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trsf Lines	LI	0	2,000	0	0	0	0	0	0	0	0	0	0	0	0
(W–028)	Total	0	2,600	0	0	0	0	0	0	0	0	0	0	0	0
1120–8															
Office Facil – 200E Area	OE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(L–091)	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100/1120	OE	150,496	151,096	127,925	129,901	119,575	119,575	112,249	112,249	104,344	104,344	95,943	95,943	81,602	81,602
Oper'ns &	C/E	4,688	4,688	2,202	2,202	3,001	3,001	2,301	2,301	2,200	2,200	2,101	2,101	0	0
Maintenance	LI	12,295	22,595	35,563	15,684	20,164	20,164	67,436	67,436	99,004	99,004	136,977	136,977	90,001	90,001
(Incl. Upgr's)	GPP	4,272	3,527	1,998	1,998	1,996	1,996	2,001	2,001	2,000	2,000	1,500	1,500	0	0
	S/T	171,751	181,906	167,688	149,785	144,736	144,736	183,987	183,987	207,548	207,548	236,521	236,521	171,603	171,603
1110–0															
Waste Tank	OE	34,021	34,021	33,745	34,799	34,834	34,834	14,355	14,355	10,720	10,720	6,233	6,233	0	0
Safety	C/E	15,677	15,677	14,937	13,883	12,599	12,599	4,617	4,617	3,209	3,209	1,209	1,209	0	0
	Total	49,698	49,698	48,682	48,682	47,433	47,433	18,972	18,972	13,929	13,929	7,442	7,442	0	0
1130–0															
Waste	OE	72,132	72,132	66,879	66,879	59,154	59,154	50,064	50,064	39,962	39,962	25,894	25,894	75,075	75,075
Charact'zation	C/E	5,113	5,113	5,000	5,000	3,500	3,500	1,949	1,949	1,462	1,462	0	0	0	0
	Total	77,245	77,245	71,879	71,879	62,654	62,654	52,013	52,013	41,424	41,424	25,894	25,894	75,075	75,075
STORAGE	OE	256,649	257,249	228,549	231,579	213,563	213,563	176,668	176,668	155,026	155,026	128,070	128,070	156,677	156,677
SUMMARY	C/E	25,478	25,478	22,139	21,085	19,100	19,100	8,867	8,867	6,871	6,871	3,310	3,310	0	0
	LI	12,295	22,595	35,563	15,684	20,164	20,164	67,436	67,436	99,004	99,004	136,977	136,977	90,001	90,001
	GPP	4,272	3,527	1,998	1,998	1,996	1,996	2,001	2,001	2,000	2,000	1,500	1,500	0	0
	TOTAL	298,694	308,849	288,249	270,346	254,823	254,823	254,972	254,972	262,901	262,901	269,857	269,857	246,678	246,678

(1) ASSUMES NO CONGRESSIONAL BUDGET AMENDMENT

Attachment 2-6 Program Funding Required
Sheet 2 of 5

WHC-SP-1101
REV. 1

TANK WASTE REMEDIATION SYSTEM
FY 1996 – 2002 COST & FUNDING SUMMARY

9/27/95 UPDATE

FILE \ 9602MYP1.WK3

09/27/95 REV 0

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ADS/ DESCRIPTION	F/T	FY 1996 MYPP COST BASELN	FY 1996 MYPP FUND'G (1)	FY 1997 MYPP COST BASELN	FY 1997 MYPP FUND'G	FY 1998 MYPP COST BASELN	FY 1998 MYPP FUND'G	FY 1999 MYPP COST BASELN	FY 1999 MYPP FUND'G	FY 2000 MYPP COST BASELN	FY 2000 MYPP FUND'G	FY 2001 MYPP COST BASELN	FY 2001 MYPP FUND'G	FY 2002 MYPP COST BASELN	FY 2002 MYPP FUND'G
1210–0	OE	14,231	14,231	11,954	11,954	18,108	18,108	23,885	23,885	23,566	23,566	26,789	26,789	46,413	46,413
Waste	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retrieval	LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	14,231	14,231	11,954	11,954	18,108	18,108	23,885	23,885	23,566	23,566	26,789	26,789	46,413	46,413
1210–2															
101–AZ Retr'vl	OE	442	442	0	0	0	0	0	0	0	0	0	0	0	0
System	C/E	1,262	1,262	0	0	0	0	0	0	0	0	0	0	0	0
(W–151)	LI	975	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	2,679	1,704	0	0	0	0	0	0	0	0	0	0	0	0
1210–3 *															
Initial Tank	OE	1,000	1,000	920	920	2,295	2,295	2,030	2,030	815	815	3,281	3,281	2,026	2,026
Retr'vl System	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(W–211)	LI	8,476	9,400	15,290	12,600	16,869	18,635	20,571	20,571	37,484	37,484	24,019	24,900	18,727	18,727
	Total	9,476	10,400	16,210	13,520	19,164	20,930	22,601	22,601	38,299	38,299	27,300	28,181	20,753	20,753
1210–4															
106–C Sluic'g	OE	21,993	16,088	112	112	0	0	0	0	0	0	0	0	0	0
(W–320)	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	21,993	16,088	112	112	0	0	0	0	0	0	0	0	0	0
1210 SUMMARY															
WASTE	OE	37,666	31,761	12,986	12,986	20,403	20,403	25,915	25,915	24,381	24,381	30,070	30,070	48,439	48,439
RETRIEVAL	C/E	1,262	1,262	0	0	0	0	0	0	0	0	0	0	0	0
	LI	9,451	9,400	15,290	12,600	16,869	18,635	20,571	20,571	37,484	37,484	24,019	24,900	18,727	18,727
SUB–TOTAL		48,379	42,423	28,276	25,586	37,272	39,038	46,486	46,486	61,865	61,865	54,089	54,970	67,166	67,166
1220–0	OE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pretreatment	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(1) ASSUMES NO CONGRESSIONAL BUDGET AMENDMENT

* ADDITIONAL FUNDING OF $ 2.6M REQUIRED TO SUPPORT CURRENT SCHEDULE

TANK WASTE REMEDIATION SYSTEM
FY 1996 – 2002 COST & FUNDING SUMMARY

9/27/95 UPDATE

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ADS/ DESCRIPTION	F/T	FY 1996 MYPP COST BASELN	FY 1996 MYPP FUND'G (1)	FY 1997 MYPP COST BASELN	FY 1997 MYPP FUND'G	FY 1998 MYPP COST BASELN	FY 1998 MYPP FUND'G	FY 1999 MYPP COST BASELN	FY 1999 MYPP FUND'G	FY 2000 MYPP COST BASELN	FY 2000 MYPP FUND'G	FY 2001 MYPP COST BASELN	FY 2001 MYPP FUND'G	FY 2002 MYPP COST BASELN	FY 2002 MYPP FUND'G
1250–0	OE	4,476	4,476	12,661	12,661	13,368	13,368	8,180	8,180	9,802	9,802	14,023	14,023	12,574	12,574
Storage &	CE	105	105	0	0	0	0	0	0	6,006	6,006	0	0	0	0
Disposal	LI	0	0	0	0	0	0	4,673	4,811	19,823	19,744	26,923	26,954	29,816	29,816
	Total	**4,581**	**4,581**	**12,661**	**12,661**	**13,368**	**13,368**	**12,853**	**12,991**	**35,631**	**35,552**	**40,946**	**40,977**	**42,390**	**42,390**
1230–01'	OE	83,000	44,950	140,000	140,000	147,000	147,000	147,000	147,000	0	0	0	0	0	0
Low Level	C/E	0	7,050	0	0	0	0	0	0	0	0	0	0	0	0
Waste Disp'l	LI	0	31,000	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**83,000**	**83,000**	**140,000**	**140,000**	**147,000**	**147,000**	**147,000**	**147,000**	**0**	**0**	**0**	**0**	**0**	**0**
1230–0	OE	13,225	13,225	3,518	3,518	3,995	3,995	3,705	3,705	5,524	5,524	4,737	4,737	8,818	8,818
Low Level	C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Disp'l															
	Total	**13,225**	**13,225**	**3,518**	**3,518**	**3,995**	**3,995**	**3,705**	**3,705**	**5,524**	**5,524**	**4,737**	**4,737**	**8,818**	**8,818**
1240–0	OE	4,185	4,185	5,154	5,154	5,646	5,646	9,545	9,545	9,582	9,582	11,455	11,455	9,576	9,576
High Level	C/E	10	0	50	50	50	50	0	0	0	0	0	0	0	0
Waste Disposal	LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**4,195**	**4,185**	**5,204**	**5,204**	**5,696**	**5,696**	**9,545**	**9,545**	**9,582**	**9,582**	**11,455**	**11,455**	**9,576**	**9,576**
DISPOSAL SUMMARY															
	OE	142,552	98,597	174,319	174,319	190,412	190,412	194,345	194,345	49,289	49,289	60,285	60,285	79,407	79,407
	C/E	1,377	8,417	50	50	50	50	0	0	6,006	6,006	0	0	0	0
	LI	9,451	40,400	15,290	12,600	16,869	18,635	25,244	25,382	57,307	57,228	50,942	51,854	48,543	48,543
	TOTAL	153,380	147,414	189,659	186,969	207,331	209,097	219,589	219,727	112,602	112,523	111,227	112,139	127,950	127,950

(1) ASSUMES NO CONGRESSIONAL BUDGET AMENDMENT

TANK WASTE REMEDIATION SYSTEM
FY 1996 – 2002 COST & FUNDING SUMMARY

9/27/95 UPDATE

FILE \ 9602MYP1.WK3

09/27/95 REV 0

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ADS/ DESCRIPTION F/T	FY 1996 MYPP COST BASELN	FY 1996 MYPP FUND'G (1)	FY 1997 MYPP COST BASELN	FY 1997 MYPP FUND'G	FY 1998 MYPP COST BASELN	FY 1998 MYPP FUND'G	FY 1999 MYPP COST BASELN	FY 1999 MYPP FUND'G	FY 2000 MYPP COST BASELN	FY 2000 MYPP FUND'G	FY 2001 MYPP COST BASELN	FY 2001 MYPP FUND'G	FY 2002 MYPP COST BASELN	FY 2002 MYPP FUND'G
TWRS SUMMARY														
OE	441,141	402,267	437,909	448,542	437,502	432,955	402,164	442,614	235,040	239,491	219,061	221,359	266,790	276,456
C/E	26,855	35,711	22,189	21,135	19,150	19,150	8,867	8,867	12,877	12,877	3,310	3,310	0	0
LI	21,746	62,995	50,853	28,284	37,033	38,799	92,680	92,818	156,311	156,232	187,919	188,831	138,544	138,544
GPP	4,272	3,527	1,998	2,000	1,996	1,996	2,001	2,001	2,000	2,000	1,500	1,500	0	0
TOTAL TWRS	494,014	504,500	512,949	499,961	495,681	492,900	505,712	546,300	406,228	410,600	411,790	415,000	405,334	415,000
UNFUNDED HLW/LLW														
OE	0	0	200,000	0	394,000	0	394,000	0	460,000	0	460,000	0	460,000	0
C/E	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	200,000	0	394,000	0	394,000	0	460,000	0	460,000	0	460,000	0
TWRS SUMMARY														
OE	441,141	402,267	637,909	448,542	831,502	432,955	796,164	442,614	695,040	239,491	679,061	221,359	726,790	276,456
C/E	26,855	35,711	22,189	21,135	19,150	19,150	8,867	8,867	12,877	12,877	3,310	3,310	0	0
LI	21,746	62,995	50,853	28,284	37,033	38,799	92,680	92,818	156,311	156,232	187,919	188,831	138,544	138,544
GPP	4,272	3,527	1,998	2,000	1,996	1,996	2,001	2,001	2,000	2,000	1,500	1,500	0	0
TOTAL TWRS	494,014	504,500	712,949	499,961	889,681	492,900	899,712	546,300	866,228	410,600	871,790	415,000	865,334	415,000

(1) ASSUMES NO CONGRESSIONAL BUDGET AMENDMENT

Attachment 2-6 Program Funding Required
Sheet 5 of 5

Planned Staffing (Full Time Equivalent)				Note: Job Family Only After 1997				
Job Family	Number							
Job Category		1996	1997	1998	1999	2000	2001	2002
MANAGERS								
First line	M010	91.8	79.6					
General/Executive	M020	146.2	123.9					
Project/Program	M030	38.9	35.2					
Other	M040	9.7	8.5					
Subtotal		286.6	247.2	215.0	177.9	166.0	154.5	190.9
ENGINEERS								
Chemical	E010	140.7	122.6					
Civil	E020	4.9	4.2					
Computer	E030	8.3	7.0					
Electrical	E040	8.2	6.9					
Environmental	E050	62.5	54.1					
Industrial	E060	0.8	0.7					
Mechanical	E070	229.2	199.6					
Nuclear	E080	21.9	19.0					
Petroleum/Mining	E090	5.1	4.3					
Plant	E100	159.0	137.9					
Quality Control	E110	24.1	20.9					
Safety	E120	26.6	23.0					
Other	E130	56.7	49.1					
Subtotal		748.0	649.3	564.7	467.4	436.1	405.9	501.4
SCIENTISTS								
Chemists	S010	52.8	58.7					
Environmental	S020	4.3	7.8					
Geologists	S030	1.1	1.6					
Life	S040	0.0	0.0					

Planned Staffing (Full Time Equivalent)				Note: Job Family Only After 1997				
Job Family	Number							
Job Category		1996	1997	1998	1999	2000	2001	2002
Material	S050	0.7	0.6					
Mathematicians	S060	0.2	0.2					
Physicists	S070	0.1	0.1					
Social	S080	0.0	0.0					
Other	S090	33.2	28.7					
Subtotal		92.4	97.7	85.0	70.3	65.6	61.1	75.4
ADMINISTRATIVE/OTHER PROFESSIONALS								
Accountant/Auditor	P010	38.7	33.6					
Architect	P020	0.0	0.0					
Buyers/Procurement	P030	0.5	0.4					
Communications	P040	2.2	1.9					
Compliance Inspectors	P050	1.6	1.4					
Computer Sys Analyst	P060	9.9	8.5					
Cost Est/Planner/Sch	P070	99.7	86.9					
Health Physics	P080	23.2	20.0					
Industrial Hygiene	P090	5.1	10.3					
Lawyers	P100	0.0	0.0					
Personnel/Labor Relations	P110	0.0	0.0					
Physicians	P130	0.0	0.0					
Physician Assistant/Nurse	P130	0.0	0.0					
Safeguard & Security	P140	4.2	3.6					
Tech Writers & Editors	P160	39.3	34.1					
Trainers	P150	31.1	27.0					
Other	P170	26.8	23.2					
Subtotal		282.3	250.9	218.2	180.6	168.5	156.8	193.8

Planned Staffing (Full Time Equivalent)				Note: Job Family Only After 1997				
Job Family	Number							
Job Category		1996	1997	1998	1999	2000	2001	2002
GENERAL ADMIN/SECRETARY/CLERK								
Admin Assistant	G010	16.1	13.9					
Office Clerk (Gen)	G020	49.6	43.0					
Office Clerk (Special)	G030	3.0	2.6					
Material Coordinator	G035	7.2	6.2					
Secretaries	G040	89.8	77.8					
Typist/Word Processor	G050	1.5	1.3					
Other	G060	0.0	0.0					
Subtotal		167.2	144.8	125.9	104.2	97.2	90.5	111.8
TECHNICIANS								
Computer Operator/Coder	T010	1.1	0.9					
Drafters	T020	3.8	3.2					
Engineers/Technicians	T030	13.2	11.4					
Environmental Science Technicians	T040	0.0	0.0					
Health Physics Technicians	T050	113.3	98.0					
Industrial Safety/Health Technicians	T060	0.0	0.0					
Instru/Control Technicians	T070	21.1	18.0					
Lab. Technicians	T080	46.3	40.0					
Media Technicians	T090	0.0	0.0					
Planning Technician	T11A	4.0	3.4					
Technician QA	T113	11.7	10.1					
Subtotal		214.5	185.0	160.9	133.2	124.2	115.7	142.8
CRAFTS								
Carpenters	C010	0.3	0.2					

Planned Staffing (Full Time Equivalent)				Note: Job Family Only After 1997				
Job Family	Number							
Job Category		1996	1997	1998	1999	2000	2001	2002
Electricians	C020	24.0	20.8					
HVAC	C030	0.0	0.3					
Machinists	C040	9.1	7.8					
Masons	C050	0.0	0.0					
Millwrights	C060	4.3	3.6					
Painters	C070	5.7	4.8					
Plmbrs/Pipefitters	C080	40.6	35.2					
Struct/Metal Workers	C090	13.7	15.0					
Vehicl/Mobile Equip. Mechanics	C100	3.8	7.5					
Welders	C110	0.5	0.4					
Other	C120	27.9	27.0					
Subtotal		129.9	122.6	106.6	88.2	82.3	76.6	94.6
OPERATORS								
Lt. Vehicle Drivers	L070	7.1	6.1					
Material Moving Equip.	R030	11.6	10.0					
Nuclear Plant	R040	84.6	73.4					
Nuclear Waste Process	R050	110:7	96.0					
Utilites Systems Oper	R070	7.4	6.4					
Other	R080	0.1	0.0					
Subtotal		221.5	191.9	166.9	138.2	128.9	119.9	148.2
LABOR & GENERAL WORKERS								
Firefighters	L010	0.0	0.0					
Food Service		0.0	0.0					
Hand/Help Lab Gen		0.0	0.0					
Material Handlers, Hlp	L050	0.2	0.0					
Janitors/Cleaners	L020	0.0	0.0					

Planned Staffing (Full Time Equivalent)

Note: Job Family Only After 1997

Job Family								
Job Category	Number	1996	1997	1998	1999	2000	2001	2002
Laundry Workers	L040	0.0	0.0					
Security Guards	L080	0.0	0.0					
Other	L090	0.6	0.0					
Subtotal		0.8	0.0	0.0	0.0	0.0	0.	0.0
TOTAL FTEs		2143.2	1889.4	1643.2	1360.0	1268.8	1181.0	1458.9

Waste Stream Information

Program:

Base Information

Completed by	L. W. Shelton
Date Completed	September 7, 1995
Data Status	0
Waste Stream ID#	
Waste Stream Name	Single Shell Tank Waste
Source Facility	200 E and 200 W SST Tank Farms
Source Program	1.1.1.3.01.01.05, TWRS Single Shell Tanks
Source Activity	
Destination Facility	200 E and 200 W DST Tank Farms
Destination Program	1.1.1.3.01.02.06 TWRS Double Shell Tanks
Funding Program	
Unit Fee	
% Defense	
Waste Type	HLW
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	1.36E+05	131688	122818	116988	114408	114196
Waste Generated		1100	2230	1460	640	53
Waste Received						
Waste Treated/Reduced						
Waste Transferred		5510	11100	7290	3220	265
Waste Disposed						
Level of Confidence						
Basis of Estimating		3	3	3	3	3

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	114196	112256	112256	112256	112256	112256
Waste Generated		9960				
Waste Received						
Waste Treated/Reduced						
Waste Transferred		11900				
Waste Disposed						
Level of Confidence						
Basis of Estimating		0				

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	112256	112256	112256	112100	108000	89500
Waste Generated				378	24600	65300
Waste Received						
Waste Treated/Reduced						
Waste Transferred				534	28700	83800
Waste Disposed						
Level of Confidence						
Basis of Estimating				0	0	0

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	78000	54300	33000	14000	0	0
Waste Generated	35900	78300	75400	64000	36000	
Waste Received						
Waste Treated/Reduced						
Waste Transferred	47400	102000	96700	83000	50000	
Waste Disposed						
Level of Confidence						
Basis of Estimating	0	0	0	0	0	

Waste Stream Desc	
Comments	

Waste Stream Information

Program:

Base Information

Completed by	L. W. Shelton
Date Completed	September 7, 1995
Data Status	0
Waste Stream ID#	
Waste Stream Name	Single Shell Tank Waste
Source Facility	200 E and 200 W SST Tank Farms
Source Program	1.1.1.3.01.01.05, TWRS Single Shell Tanks
Source Activity	
Destination Facility	200 E and 200 W DST Tank Farms
Destination Program	1.1.1.3.01.02.06 TWRS Double Shell Tanks
Funding Program	
Unit Fee	
% Defense	
Waste Type	HLW
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Waste Stream Desc	
Comments	

Waste Stream Information

Program:

Base Information

Completed by	L. W. Shelton
Date Completed	September 7, 1995
Data Status	0
Waste Stream ID#	
Waste Stream Name	Single Shell Tank Waste
Source Facility	200 E and 200 W SST Tank Farms
Source Program	1.1.1.3.01.01.05, TWRS Single Shell Tanks
Source Activity	
Destination Facility	200 E and 200 W DST Tank Farms
Destination Program	1.1.1.3.01.02.06 TWRS Double Shell Tanks
Funding Program	
Unit Fee	
% Defense	
Waste Type	HLW
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	TRU
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	TRU WASTE REPOSITORY
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	3840	3848	3856	3867	3867	3867
Waste Generated						
Waste Received		8	8	11		
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence		H	M	M	M	M
Basis of Estimating		3	3	3	3	3

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	3867	3867	3867	3867	3867	3867
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	3867	3867	3867	3867	3867	3867
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	3867	3867	3867	3867	3867	3867
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	TRU
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	TRU WASTE REPOSITORY
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	3867	3867	3867	3867	3867	3867
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	2607	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed	1260	2607				
Level of Confidence	L	L	L	L		
Basis of Estimating	3	3	3	3		

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	TRU
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	TRU WASTE REPOSITORY
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	HLW
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	LLW SURF DISP & HLW REPOSITORY & LIQUID EFFLUENT TREATMENT FSC.
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	69200	81570	86970	96790	98880	97130
Waste Generated		7270	15500	8660	8370	1630
Waste Received		14600	11300	9900	3820	1540
Waste Treated/Reduced						
Waste Transferred		9500	21400	8740	10100	4920
Waste Disposed						
Level of Confidence		H	M	M	M	M
Basis of Estimating		3	3	3	3	3

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	95293	88274	87294	87224	78604	84734
Waste Generated	1370	1370	1370	1370	1370	1370
Waste Received	1410	921	1090	4730	3790	18500
Waste Treated/Reduced						
Waste Transferred	337	2570	2080	2080	2080	2040
Waste Disposed	4280	6740	1360	4090	11700	11700
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	97404	130224	163074	182924	178174	147474
Waste Generated	1340	1340	1340	1340	1340	1340
Waste Received	24700	44500	44500	44400	44400	44400
Waste Treated/Reduced						
Waste Transferred	1670	1320	1290	1290	1290	1440
Waste Disposed	11700	11700	11700	24600	49200	75000
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	115574	82374	70964	71254	71544	71734
Waste Generated	1340	1340	1340	1340	1340	1340
Waste Received	44400	44400	44300	44200	44100	44000
Waste Treated/Reduced						
Waste Transferred	1440	1440	2350	2350	2350	2350
Waste Disposed	76200	77500	54700	42900	42800	42800
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	HLW
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	LLW SURF DISP & HLW REPOSITORY & LIQUID EFFLUENT TREATMENT FSC.
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	30185	25836	22187	18394	14488	10842
Waste Generated	757	57	57	46	46	46
Waste Received	394	394	394	261	8	8
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed	42700	4800	4100	4100	3960	3700
Level of Confidence	L	L	L	L	L	L
Basis of Estimating	3	3	3	3	3	3

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	8456	7417	3771	125	0	0
Waste Generated	46	46	46	46		
Waste Received	8	8	8	8		
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed	2440	1093	3700	3700	125	
Level of Confidence	L	L	L	L		
Basis of Estimating	3	3	3	3		

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
Waste Generated						
Waste Received						
Waste Treated/Reduced						
Waste Transferred						
Waste Disposed						
Level of Confidence						
Basis of Estimating						

Waste Stream Desc	
Comments	

Waste Stream Information

Program: TWRS - DOUBLE-SHELL TANK FARMS

Base Information

Completed by	SA BARKER
Date Completed	9/9/95
Data Status	0
Waste Stream ID#	HLW
Waste Stream Name	
Source Facility	DST FARMS
Source Program	
Source Activity	
Destination Facility	LLW SURF DISP & HLW REPOSITORY & LIQUID EFFLUENT TREATMENT FSC.
Destination Program	
Funding Program	
Unit Fee	
% Defense	
Waste Type	
Waste SubClass	
Waste Matrix	
Treatment Tech	
Waste Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
Waste Generated							
Waste Received							
Waste Treated/Reduced							
Waste Transferred							
Waste Disposed							
Level of Confidence							
Basis of Estimating							

Waste Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	GTCIII
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	0	0	0	0	0	0
W/M Generated		0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred		0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	44.7	44.7	22.3	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	44.7	44.7	22.3	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	GTCIII
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	GTCIII
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	HAZ
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

W/M = Waste/Material

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	0	0	0	0	0	0
W/M Generated		17.4	19.8	19.8	19.8	19.8
W/M Received						
W/M Treated/Reduced						
W/M Transferred		17.4	19.8	19.8	19.8	19.8
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	19.8	19.8	19.8	21.4	24.8	24.8
W/M Received						
W/M Treated/Reduced						
W/M Transferred	19.8	19.8	19.8	21.4	24.8	24.8
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	24.8	24.8	29.5	29.5	29.5	29.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	24.8	24.8	29.5	29.5	29.5	29.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	29.5	29.5	29.5	29.5	29.5	29.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	29.5	29.5	29.5	29.5	29.5	29.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	HAZ
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	29.5	29.5	29.5	29.5	29.5	29.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	29.5	29.5	29.5	29.5	29.5	29.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	29.5	7.3	4.9	2.4	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	29.5	7.3	4.9	2.4	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	HAZ
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

LLW

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	195.7	0	0	0	0	0
W/M Generated		1831.4	2288.6	1582.1	1505.7	1859.6
W/M Received						
W/M Treated/Reduced		1459.5	1647.8	1139.1	1084.1	1338.9
W/M Transferred		567.6	640.8	443.0	421.6	520.7
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	1873.9	1859.6	1859.6	2612.8	4714.5	5083.1
W/M Received						
W/M Treated/Reduced	1349.2	1338.9	1338.9	1881.2	3394.4	3659.8
W/M Transferred	524.7	520.7	520.7	731.6	1320.1	1423.3
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	4743.4	5005.2	9990.1	9831.9	9598.7	9740.1
W/M Received						
W/M Treated/Reduced	3415.2	3603.7	7192.8	7078.9	6911	7012.8
W/M Transferred	1328.2	1401.5	2797.3	2753.0	2687.7	2727.3
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	9731.5	9774.7	9818.3	9706.2	9556.5	9267.2
W/M Received						
W/M Treated/Reduced	7006.6	7037.7	7069.1	6988.4	6880.6	6672.3
W/M Transferred	2724.9	2737.0	2749.2	2717.8	2675.9	2594.9
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	9267.2	9267.2	9267.2	9267.2	9267.2	9267.2
W/M Received						
W/M Treated/Reduced	6672.3	6672.3	6672.3	6672.3	6672.3	6672.3
W/M Transferred	2594.9	2594.9	2594.9	2594.9	2594.9	2594.9
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	9267.2	6086.6	4058.1	2028.9	0	0
W/M Received						
W/M Treated/Reduced	6672.3	4382.3	2921.8	1460.8	0	0
W/M Transferred	2594.9	1704.3	1136.3	568.1	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

LLW

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLMW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	0	0	0	0	0	0
W/M Generated		298.3	829.5	504.4	736.5	940.7
W/M Received						
W/M Treated/Reduced						
W/M Transferred		298.3	829.5	504.4	736.5	940.7
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	1707.9	1769.2	1393	1767.7	1101.9	1082.9
W/M Received						
W/M Treated/Reduced						
W/M Transferred	1707.9	1769.2	1393	1767.7	1101.9	1082.9
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	1225.5	1180.6	1393.0	1487.2	1986.0	2549.1
W/M Received						
W/M Treated/Reduced						
W/M Transferred	1225.5	1180.6	1393.0	1487.2	1986.0	2549.1
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	2441.7	2803.2	3146.3	3298.4	3326.8	1240.2
W/M Received						
W/M Treated/Reduced						
W/M Transferred	2441.7	2803.2	3146.3	3298.4	3326.8	1240.2
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLMW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	1380.2	1546.2	1792.1	2021.6	2021.6	2021.6
W/M Received						
W/M Treated/Reduced						
W/M Transferred	1380.2	1546.2	1792.1	2021.6	2021.6	2021.6
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	332.0	35.2	23.5	11.7	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	332.0	35.2	23.5	11.7	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	LLMW
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRUM
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	0	0	0	0	0	0
W/M Generated		0	0	0	0	69
W/M Received						
W/M Treated/Reduced						
W/M Transferred		0	0	0	0	69
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	77.4	93	103.9	219.2	207.9	233.1
W/M Received						
W/M Treated/Reduced						
W/M Transferred	77.4	93	103.9	219.2	207.9	233.1
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	280.2	266	429.3	691.9	600.3	647.7
W/M Received						
W/M Treated/Reduced						
W/M Transferred	280.2	266	429.3	691.9	600.3	647.7
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	734.8	841.9	943.1	1020.9	1014.8	403.8
W/M Received						
W/M Treated/Reduced						
W/M Transferred	734.8	841.9	943.1	1020.9	1014.8	403.8
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRUM
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	448.4	501.2	579.5	652.5	652.5	652.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	448.4	501.2	579.5	652.5	652.5	652.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	114.7	88	57.4	28.7	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	114.7	88	57.4	28.7	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRUM
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRU
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	1995	1996	1997	1998	1999	2000
Inventory at Year End	0	0	0	0	0	0
W/M Generated		4.7	2.0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred		4.7	2.0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2001	2002	2003	2004	2005	2006
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	0	0	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	0	0	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2007	2008	2009	2010	2011	2012
Inventory at Year End	0	0	0	0	0	0
W/M Generated	0	0	108.5	108.5	108.5	108.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	0	0	108.5	108.5	108.5	108.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2013	2014	2015	2016	2017	2018
Inventory at Year End	0	0	0	0	0	0
W/M Generated	108.5	108.5	108.5	108.5	108.5	108.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	108.5	108.5	108.5	108.5	108.5	108.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M = Waste/Material

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRU
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

W/M = Waste/Material

Fiscal Year	2019	2020	2021	2022	2023	2024
Inventory at Year End	0	0	0	0	0	0
W/M Generated	108.5	108.5	108.5	108.5	108.5	108.5
W/M Received						
W/M Treated/Reduced						
W/M Transferred	108.5	108.5	108.5	108.5	108.5	108.5
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2025	2026	2027	2028	2029	2030
Inventory at Year End	0	0	0	0	0	0
W/M Generated	108.5	81.4	54.3	27.1	0	0
W/M Received						
W/M Treated/Reduced						
W/M Transferred	108.5	81.4	54.3	27.1	0	0
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2031	2032	2033	2034	2035	2036
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

Fiscal Year	2037	2038	2039	2040	2041	2042
Inventory at Year End	0	0	0	0	0	0
W/M Generated						
W/M Received						
W/M Treated/Reduced						
W/M Transferred						
W/M Disposed						
Level of Confidence						
Basis of Estimating						

W/M Stream Desc	
Comments	

Waste/Material (W/M) Stream Information

Program: TWRS - SOLID WASTE

Base Information

Completed by	FD Sargent
Date Completed	
Data Status	
W/M Stream ID#	
W/M Stream Name	TRU
Source Facility	
Source Program	
Source Activity	
Destination Facility	
Destination Program	SWD
Funding Program	
Unit Fee	
% Defense	
W/M Type	
W/M SubClass	
W/M Matrix	
Treatment Tech	
W/M Density	

Fiscal Year	2043	2044	2045	2046	2047	2048	2049
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2050	2051	2052	2053	2054	2055	2056
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2057	2058	2059	2060	2061	2062	2063
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

Fiscal Year	2064	2065	2066	2067	2068	2069	2070
Inventory at Year End	0	0	0	0	0	0	0
W/M Generated							
W/M Received							
W/M Treated/Reduced							
W/M Transferred							
W/M Disposed							
Level of Confidence							
Basis of Estimating							

W/M = Waste/Material

W/M Stream Desc	
Comments	

3.0 MANAGEMENT SYSTEMS (WBS 1.1.1.1)

3.1 STRATEGY

3.1.1 Objectives

The overall objectives of Management Systems are to continue to improve and deploy Tank Waste Remediation System (TWRS) baselining and management control capabilities and effectively manage compliance with environmental requirements and, in so doing, improve program credibility. More specific objectives are documented in the dictionary sheet in Attachment 3-2.

The above objectives will be met by using a robust systems engineering effort. Systems engineering will be coupled with an effort to develop and gain approval of the multi-year program baseline. Actions will be identified and taken to move toward more disciplined baseline management and to continually improve the data that support the multi-year baseline.

Formal change control will be used to revise the baseline and to take advantage of the improved baseline support data. The Environmental Impact Statement (EIS) process will be used to formally make and document important decisions associated with the processing and dispositioning Hanford Site tank waste.

3.1.2 Planning Assumptions

Management Systems has identified the following five summary-level assumptions specifically linked to meeting the objectives in Section 3.1.1.

1. TWRS baseline and management control documentation will be as shown in the document hierarchy in Figure 2-2.

2. Management Systems objectives will be met, and specific Management Systems deliverables will be provided as described in Milestone Description Sheets (see Appendix A).

3. The EIS schedule can be completed in 24 months (accelerated from 36 months) in accordance with direction from the Secretary of Energy to shorten Department of Energy (DOE) EIS schedules.

4. The DOE Privatization initiative will be successful.

5. No impacts to the baseline documented in the approved TWRS Multi-Year Program Plan will result from future Maintenance and Operations contract renegotiations and/or revisions.

Other more detailed assumptions are documented on TWRS activity planning forms.

3.1.3 Constraints

Management Systems has identified two summary-level constraints specifically linked to meeting the objectives in Section 3.1.1.

1. Receipt of baseline support data from each of the other projects/sub-projects that comprise the TWRS Program such that Management Systems deliverables can be produced per the schedule documented in Attachment 3-4.

2. Prevalidation reviews, validation reviews, and subsequent actions associated with the Energy Systems Acquisition Advisory Board occur as scheduled in Attachment 3-4.

3.2 TECHNICAL REQUIREMENTS BASELINE

Although Management Systems funds the upper-level systems engineering activities in TWRS, it is not a technical program and therefore is not covered in the systems engineering functions and requirements. The TWRS Program Management System Document Hierarchy is illustrated in Figure 2-2.

3.2.1 Work Breakdown Structure

Management Systems is the focal point for overall TWRS Program integration and maintains all integrated program-level products that make up the baseline. Management Systems is also structured to accommodate numerous support areas that cut across many or all of the TWRS projects/sub-projects and to provide continuity over the life of the Program.

Management Systems is further broken down into activities entitled Program Integration, Program Control, and General Services. This breakdown resulted from iterative discussions between DOE Richland Operations Office (RL) and the M&O contractor on how to best represent the repetitive program management activities, given the functional drivers such as the Congressional budget cycle and DOE requirements. A further breakdown to the levels required to manage discrete tasks is shown in Attachment 3-1.

The Program Integration activity includes completion of upper tier systems engineering architecture definition and documentation; Environmental Impact Statement development and support; and other Environmental, Safety and Health, and Quality activities that span the TWRS Program. The Program Control activity covers program management and administration activities, program strategic planning and baseline development at the total program level; program management activities at the TWRS technology development contractor; and program management and control for all TWRS projects/sub-projects. The General Services activity includes DOE support for the general support services contractor, clerical, and other special reviews deemed necessary to support the Program. This activity also supports a number of other cost accounts that provide services across the TWRS Program, such as general employee training, data/information systems support, Tri-Party Agreement administrative records, and communications support.

3.2.2 Work Breakdown Structure (WBS) Dictionary

The WBS dictionary sheet for Management Systems is in Attachment 3-2. Lower-level dictionary sheets are located in the Performance Measurement Control System (PMCS).

3.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for Management Systems is in Attachment 3-3.

3.3 SCHEDULE BASELINE

3.3.1 Summary Schedule

See Attachment 3-4 for the Management Systems summary schedule.

3.3.2 Milestone Control Log

See Attachment 3-5 for the Management Systems Milestone Control Log. Milestone description sheets are located in Appendix A.

3.4 COST BASELINE

3.4.1 Cost Baseline Summary by Year

See Attachment 3-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up.

3.4.2 Basis of Estimate

Cost estimates for the work scope represented by Management Systems are significantly improved because of increased emphasis on activity-based cost estimating with support from a team of estimating experts. The bases for cost estimates are the product definitions addressed in Section 3.1 as well as the WBS Dictionary Sheets (see Attachment 3-2) and the associated activity planning forms. The assumptions documented in Section 3.1.2 and the activity planning forms also provide a basis for estimates.

Several sources of cost data are currently available to Management Systems: industry standards (e.g., the recent Hanford Site Environmental Restoration Project baselining experience), TWRS cost history, and Hanford cost history.

3.5 PERFORMANCE MEASURES

Management Systems performance measures will be tied to the Program objectives of continuing to improve TWRS baselining and management control capabilities and effectively managing compliance with environmental requirements and, in so doing, improve Program credibility.

The major performance measures will include the following:

- Cost and schedule performance
- Cost versus budget performance
- Milestone performance
- Change control document age
- Environmental compliance performance
- Manpower
- Critical path schedule.

3.6 EXECUTION YEAR

3.6.1 Technical Objectives

The three activities that comprise the Management Systems program element will be active in fiscal year (FY) 1996. In general, systems engineering, planning, scheduling, estimating, baselining, EIS, and permit efforts will be conducted to support the objectives and strategy summarized in Section 3.1.1. Activity-level work statements are provided below. It should be noted that more detailed, cost account, task and subtask scope statements are documented in Level V WBS Dictionary Sheets and related activity planning forms.

Program Integration (WBS 1.1.1.1.1)

1. Improve technical baseline data by ensuring that the issues and enabling assumptions in the baseline and supporting documents are addressed and resolved through required associated analyses. Complete activities identified in the Systems Requirement Review (SRR) Action Plan. Obtain approval of the *Tank Waste Remediation System Functions and Requirements* document (DOE/RL-92-60). Develop other documents required by the TWRS Systems Engineering Management Plan and the TWRS Systems Engineering Working Plan. Define Systems Engineering core requirements for managing the systems engineering infrastructure when upper tier architecture is in place.

2. Prepare technical requirements specification documents. Incorporate trade studies for FY 1996 and out-year activities. Support the preparation of design requirements documents for each project as they are identified.

3. Establish a risk management approach and perform risk assessments on priority risk areas as described in Section 2, paragraph 2.2.5. Provide training and tools to implement this discipline within the TWRS Program. Assess and provide alternatives to the TWRS Program strategy with emphasis on cost-effective use of authorized budgets.

4. Perform baseline verifications, at the program level and the project level, to ensure that the products satisfy the respective functions and requirements. Perform program and project reviews to ensure that action items and open issues related to systems engineering functions and interfaces are properly dispositioned.

5. Provide overall TWRS coordination and funding for preparing the TWRS draft and final Environmental Impact Statement (EIS) document by the EIS contractor. Support public hearings and resolution of issues as appropriate to facilitate issuing the Record Of Decision (ROD) by DOE Headquarters.

6. Provide environmental permit, communications, quality assurance, safety and health, qualification and training, information management, and acquisition support to the TWRS program.

Program Control (WBS 1.1.1.1.2)

1. Provide overall guidance to the TWRS Program in the areas of planning, scheduling, cost estimating, and baselining.

2. Provide professional cost estimating and cost engineering services to the TWRS Program. Scope includes preparation for and participation in Independent Cost Estimate (ICE) reviews and ICE reconciliations, conduct of field observations, analysis of actual cost data, refinement of existing cost estimates and production of new estimates. Also included are estimate document production and submittal, as well as interface with TWRS baseline management and project management personnel on matters related to activity-based cost estimating.

3. Provide overall TWRS Program management services and operate management control and program administration systems.

4. Improve schedule baseline data by using improved planning information developed through the cost and systems engineering work summarized above.

5. Improve TWRS baseline validity and credibility by completing a TWRS RL multi-year baseline internal validation effort, completing a DOE-HQ Environmental Management (EM)-36 prevalidation review, completing a DOE-HQ Field Management (FM) validation review, and submitting an updated Multi-Year Program Plan for DOE approval.

6. Issue program analysis procedures, schedule and conduct selected program analyses, and report results to program management.

7. Collect and report data related to performance against approved baselines.

General Services (WBS 1.1.1.1.3)

1. Provide resources to support RL activities, including general support services contractor services, clerical support, special studies, and assessments.

2. Coordinate external communications and interface with the public on TWRS-related topics.

3. Process TWRS/*Resource Conservation and Recovery Act* (RCRA)/Permitting/Treatment, Storage, or Disposal (TSD) documents for inclusion into, and maintenance of, the Tri-Party Agreement required administrative record.

4. Provide internal TWRS communications support and employee documentation.

5. Provide support for cost reduction efforts in Information Management.

6. Support TWRS Hanford General Employee Training (HGET).

3.6.2 FY 1996 Performance Baseline Schedule

See Attachment 3-7 for the FY 1996 performance baseline schedule.

3.6.3 Cost Estimate Baseline by Month

See Attachment 3-8 for a month-by-month cost estimate baseline for FY 1996.

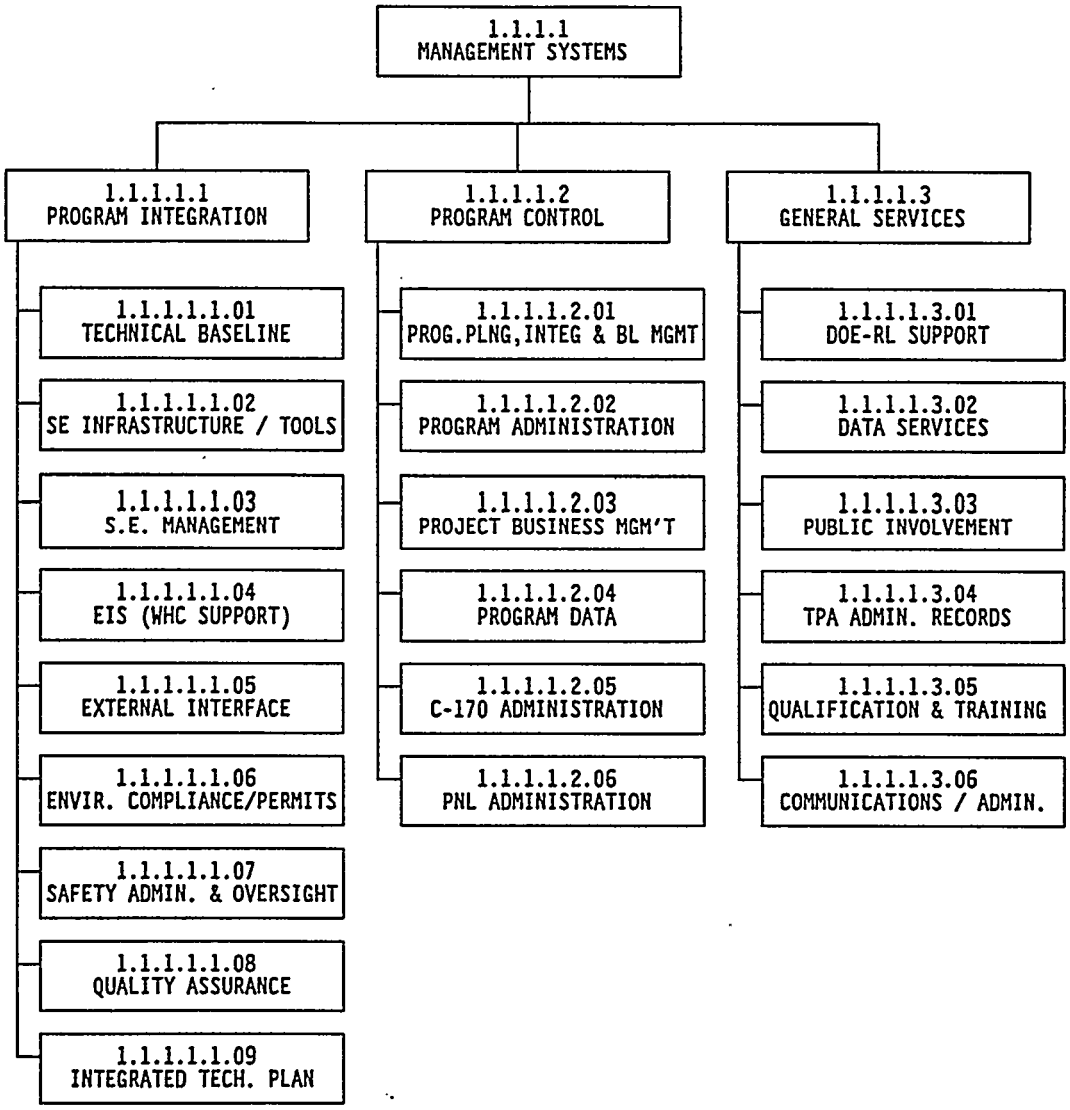
3.6.4 FY 1995 Work Scope Carryover Summary

There is no FY 1995 work scope carryover.

LISTING OF ATTACHMENTS

Attachment 3-1	Work Breakdown Structure
Attachment 3-2	WBS Dictionary Sheet
Attachment 3-3	Responsibility Assignment Matrix
Attachment 3-4	Summary Schedule
Attachment 3-5	Milestone Control Log
Attachment 3-6	Cost Baseline Summary by Year
Attachment 3-7	FY 1996 Performance Baseline Schedule
Attachment 3-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
MANAGEMENT SYSTEMS



TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
5/10/95	1.1.1 TANK WASTE REMEDIATION SYSTEM	
3. WBS ELEMENT CODE/LEVEL 1.1.1.1 Level 3	4. WBS ELEMENT TITLE MANAGEMENT SYSTEMS	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 5/10/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 12000	9. BUDGET AND REPORTING NUMBERS Operating CENTRC GPP Line Item EW3120075	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	41,940.00	35,041.00	33,527.00	31,151.00	30,725.00	30,706.00	30,706.00
CENRTC							
LINE ITEM							
GPP							
TOTAL	41,940.00	35,041.00	33,527.00	31,151.00	30,725.00	30,706.00	30,706.00

B. TECHNICAL BASES

Goals and Objectives
The Management Systems WBS element product results from a systems engineering type process to identify and define the functional, architectural, and interface requirements for the Tank Waste Remediation System (TWRS) physical system. The Functions and Requirements document (DOE/RL-92-60) and architecture are the basis for the currently established TWRS product tree. Systems engineering analysis of TWRS functions and requirements is ongoing for the life of the Program to identify emerging requirements for products other than those currently known.

In direct support of the WBS element 1.1.1, TWRS Program, Management Systems provides management structure and processes for the systematic direction and financial control of the TWRS Program. This WBS element includes specific work toward a Program Implementation Plan (PIP), intended to improve the management system that effectively comprises current Management Systems structure and processes. Significant products required of the operative management system involve discharge of fiscal responsibilities and the formalized planning, execution, and evaluation of work.
The major products provided by Management Systems for the TWRS Program include the Multi-Year Program Plan (including baseline), with annual updates. An additional management element involves supporting activities associated with the designation of the Tank Waste Remediation Program as a Major Systems Acquisition Program (MSAP). The management structures and processes developed by Management Systems are planned to support the

scheduled completion of the TWRS Program.

To ensure that the TWRS remediation activities will conform to applicable environmental, safety, and industrial health laws and regulations and to ensure that such activities will be performed in a Total Quality Management environment, a series of lower tier compliance plans will be developed. These annexes and lower tier compliance plans will be directed toward full satisfaction of the requirements of DOE Order 4700.1.

The risks associated with Management Systems are major changes in programmatic direction or necessary adjustments to established schedules. These types of changes affect products and require rework of the planning and budgeting elements of the program. Risks of this nature may develop from evolving technologies, legislative actions, or from particular situations arising from the stakeholder/public involvement processes. The Program maintains flexibility to respond and adapt to the anticipated evolution of TWRS.

Major End-Item Deliverables
Issue TWRS Interface Control Document (ICD) for Functions and Requirements (F&R) Baseline.
Issue updated Baseline System Description.
Issue draft Environmental Impact Statement (EIS).
Issue Revised TWRS Systems Engineering Management Plan (SEMP).
Issue Technical Requirements specifications (TRS) for Technical Requirements Review (TRR).
Issue Final EIS. Issue EIS Record of Decision (ROD).
Issue updated Baseline System Description.
Issue annual update to the Multi-Year Program Plan (MYPP).
Issue annual update to thre Five-Year Plan.

Acceptance Criteria
N/A

C. STATEMENT OF WORK

The work of Management Systems is accomplished through Program Integration, Program Control and General Program Services supporting the TWRS programmatic activities through a system of management structures and processes.

Integration of the TWRS Program defines the program's parameters (i.e., technical bases, resource requirements, time constraints) and provides for the definition of the program functions, requirements, and products from strategies and alternatives.

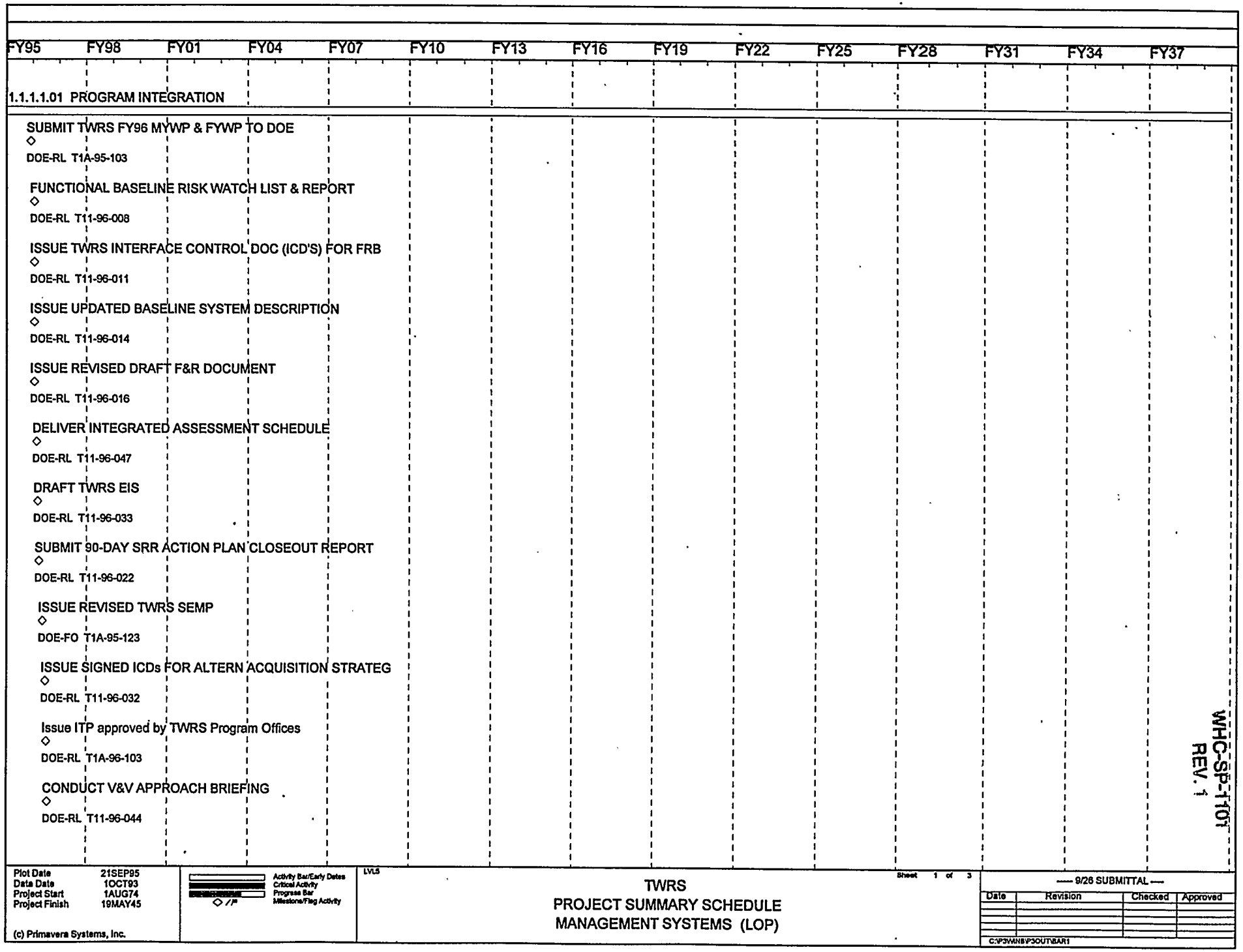
Control of the TWRS Program provides implementation of authorized baselines. Program Control also provides status periodically and acquires data pertaining to the actual progress of the programmatic work, applies that data to an analysis of the actual versus the baseline, and reports that information and the resultant baseline status. Reporting program status and trends disseminates the Program's collected progress data and identifies the potential impacts to the baseline. The Program manages impacts to the baseline through change control procedures, including changes directed by DOE.

Control of the TWRS Program also provides analysis of completed and ongoing work, recommendations for decision analysis, assessments of compliance with applicable requirements, measurements of baseline performance and resource consumption, assessments of impacts of proposed changes to program activities, and management of commitments. Full evaluation reporting is provided through the Site Management System (SMS) and the Progress Tracking System (PTS), modified to meet the needs of TWRS.

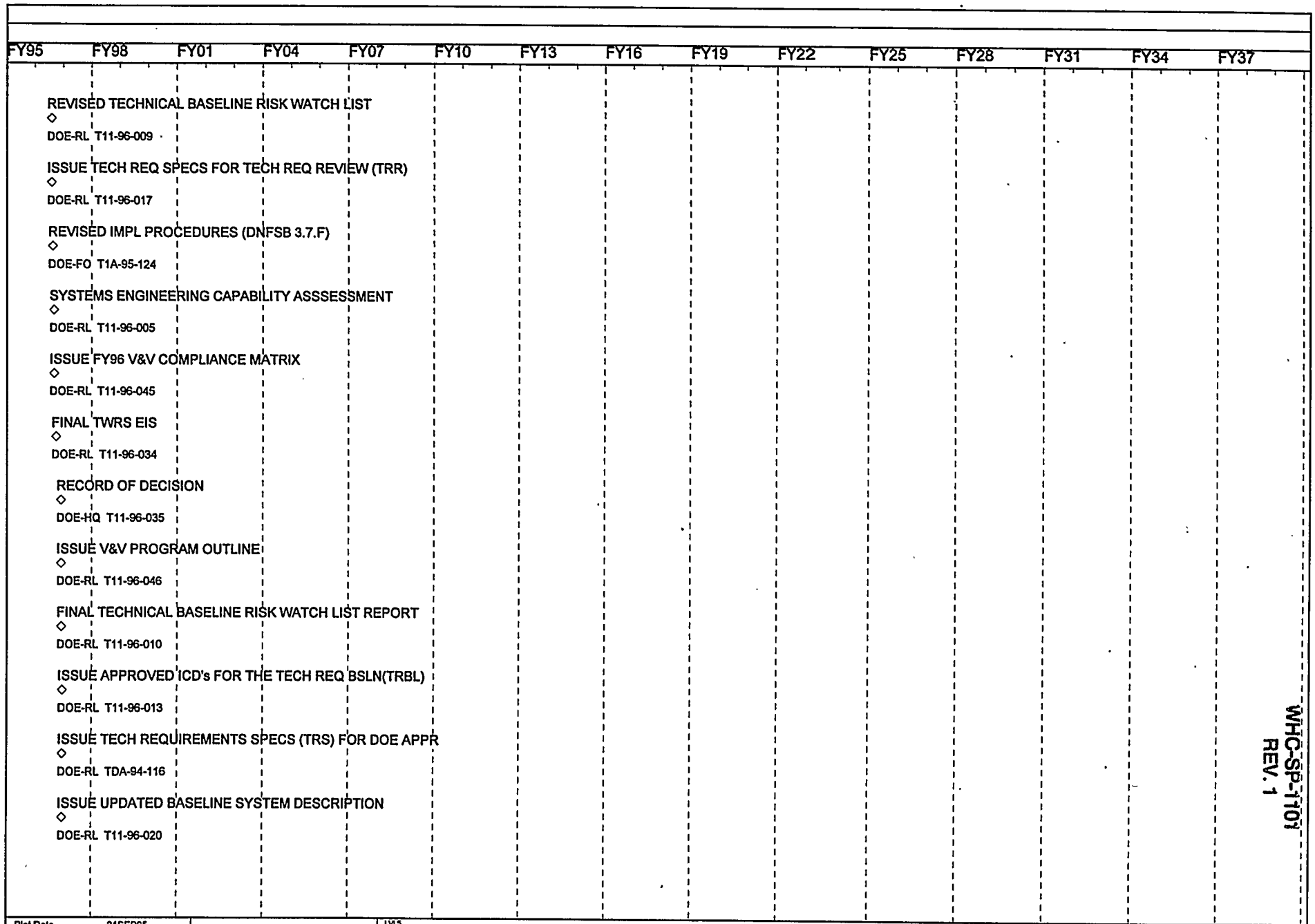
The Management Systems component provides the structure and processes needed to fulfill the requirements under the Program Integration, Program Control and General Program Services elements. Through these management systems, the programmatic work may be effectively defined, planned, scheduled, budgeted, assigned, performed, measured, and controlled. The Management Systems are described in the following hierarchical documents: Multi-Year Program Plan, and the Program Management System Description.

RESPONSIBILITY ASSIGNMENT MATRIX

WBS Number	WBS Title	Responsible Person
1.1.1.1	Management Systems	W. J. Schlauder
1.1.1.1.01	Program Integration	W. J. Schlauder
1.1.1.1.01.01	Technical Baseline	J. D. Thomson
1.1.1.1.01.02	Systems Eng Infrastructure/Tools	J. D. Thomson
1.1.1.1.01.03	Systems Eng Management	J. D. Thomson
1.1.1.1.01.04	EIS (WHC Support)	L. E. Borneman
1.1.1.1.01.05	External Interface	G. L. Dunford
1.1.1.1.01.06	Environmental Compliance/Permits	L. E. Borneman
1.1.1.1.01.07	Safety Admin and Oversight	J. M. Garcia
1.1.1.1.01.08	Quality Assurance	J. Weber
1.1.1.1.01.09	Integrated Technology Plan	G. L. Dunford
1.1.1.1.02	Program Control	W. J. Schlauder
1.1.1.1.02.01	Program Planning Integration & Baseline Management	C. E. Wilson III
1.1.1.1.02.02	Performance Measurement Control System	C. E. Wilson III
1.1.1.1.02.03	Project Business Mgmt.	J. F. Erben
1.1.1.1.02.04	Program Data	M. L. Petermann
1.1.1.1.02.05	C-170 /Performance Based Initiative Administration	C. E. Wilson III
1.1.1.1.02.06	PNL Administration	G. H. Beeman
1.1.1.1.03	General Services	W. J. Schlauder
1.1.1.1.03.01	DOE-RL Support	W. F. Edwards
1.1.1.1.03.02	Data Services	R. B. Bass
1.1.1.1.03.03	External Communications & Public Involvement	M. V. Berriochoa
1.1.1.1.03.04	TPA Administrative Records	E. J. See
1.1.1.1.03.05	Qualification & Training/HGET	M. P. Baka
1.1.1.1.03.06	Communications/Administration	M. L. Petermann



Attachment 3-4 Summary Schedule
Sheet 1 of 3



WHC-SP-1101
REV. 1

Plot Date	21SEP95
Data Date	1OCT93
Project Start	1AUG74
Project Finish	19MAY45

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LVLS

Sheet 2 of 3

TWRS
PROJECT SUMMARY SCHEDULE
MANAGEMENT SYSTEMS (LOP)

9/26 SUBMITTAL

Date	Revision	Checked	Approved

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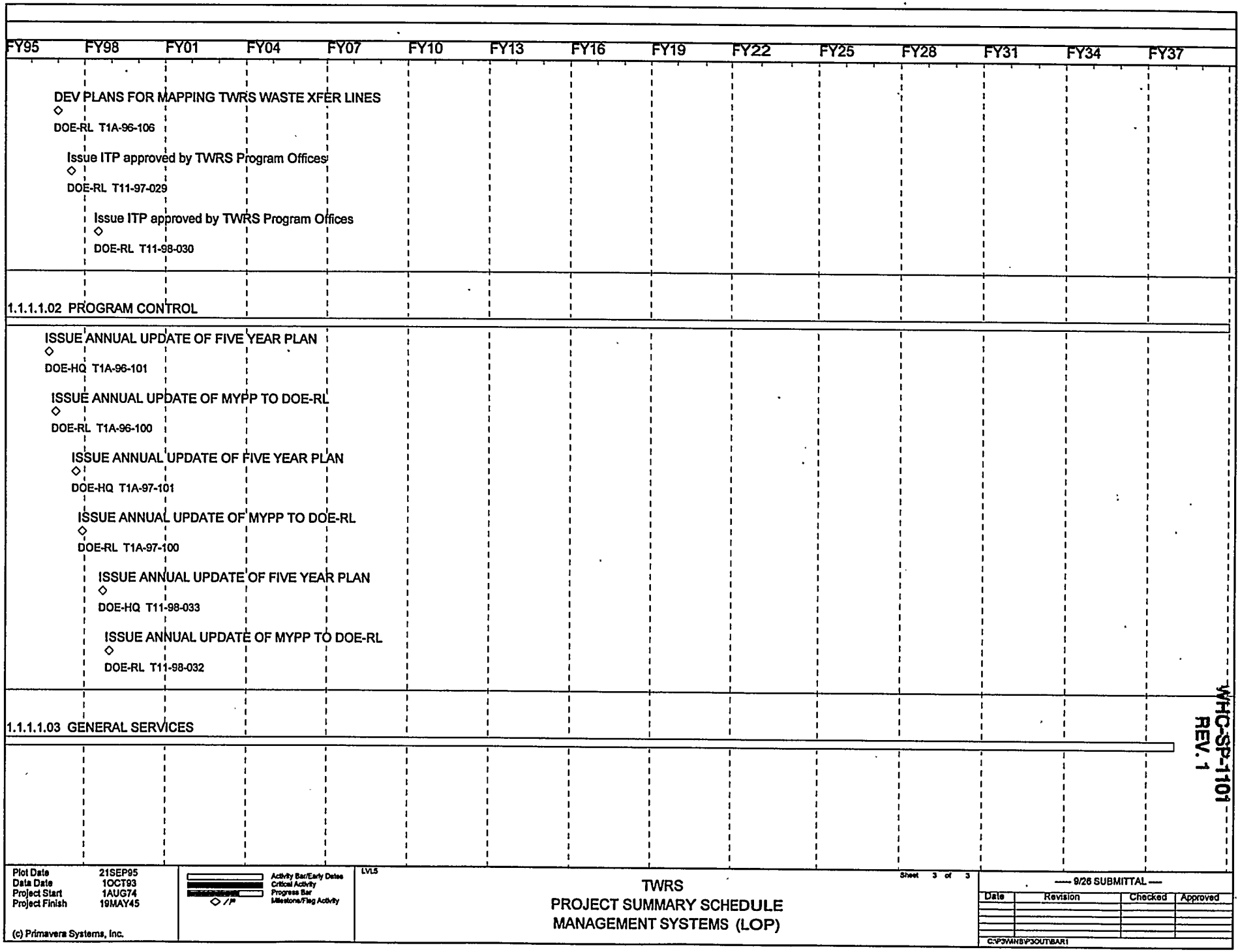
FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
FY28
FY31
FY34
FY37
DEV PLANS FOR MAPPING TWRS WASTE XFER LINES
DOE-RL T1A-96-106
Issue ITP approved by TWRS Program Offices
DOE-RL T11-97-029
Issue ITP approved by TWRS Program Offices
DOE-RL T11-98-030
1.1.1.1.02 PROGRAM CONTROL
ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN
DOE-HQ T1A-96-101
ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL
DOE-RL T1A-96-100
ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN
DOE-HQ T1A-97-101
ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL
DOE-RL T1A-97-100
ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN
DOE-HQ T11-98-033
ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL
DOE-RL T11-98-032
1.1.1.1.03 GENERAL SERVICES
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 3 of 3
TWRS
PROJECT SUMMARY SCHEDULE
MANAGEMENT SYSTEMS (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.1 Management Systems

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.1.01.02.	SYSTEMS ENGINEERING CAPABILITY ASSSESSMENT	DOE-RL T11-96-005		31MAY96
1.1.1.1.01.03.	FUNCTIONAL BASELINE RISK WATCH LIST & REPORT	DOE-RL T11-96-008		16OCT95
1.1.1.1.01.03.	REVISED TECHNICAL BASELINE RISK WATCH LIST	DOE-RL T11-96-009		01MAY96
1.1.1.1.01.03.	FINAL TECHNICAL BASELINE RISK WATCH LIST REPORT	DOE-RL T11-96-010		03SEP96
1.1.1.1.01.03.	ISSUE TWRS INTERFACE CONTROL DOC (ICD'S) FOR FRB	DOE-RL T11-96-011		16OCT95
1.1.1.1.01.03.	ISSUE APPROVED ICD's FOR THE TECH REQ BSLN(TRBL)	DOE-RL T11-96-013		16SEP96
1.1.1.1.01.01.	ISSUE UPDATED BASELINE SYSTEM DESCRIPTION	DOE-RL T11-96-014		16OCT95
1.1.1.1.01.01.	ISSUE REVISED DRAFT F&R DOCUMENT	DOE-RL T11-96-016		16OCT95
1.1.1.1.01.01.	ISSUE TECH REQ SPECS FOR TECH REQ REVIEW (TRR)	DOE-RL T11-96-017		01MAY96
1.1.1.1.01.01.	ISSUE UPDATED BASELINE SYSTEM DESCRIPTION	DOE-RL T11-96-020		16SEP96
1.1.1.1.01.01.	SUBMIT 90-DAY SRR ACTION PLAN CLOSEOUT REPORT	DOE-RL T11-96-022		18DEC95
1.1.1.1.01.03.	ISSUE SIGNED ICDs FOR ALTERN ACQUISITION STRATEG	DOE-RL T11-96-032		15MAR96
1.1.1.1.01.04.	DRAFT TWRS EIS	DOE-RL T11-96-033		30NOV95
1.1.1.1.01.04.	FINAL TWRS EIS	DOE-RL T11-96-034		28JUN96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.1 Management Systems

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.1.01.04.	RECORD OF DECISION	DOE-HQ T11-96-035		30AUG96
1.1.1.1.01.01.	CONDUCT V&V APPROACH BRIEFING	DOE-RL T11-96-044		15APR96
1.1.1.1.01.01.	ISSUE FY96 V&V COMPLIANCE MATRIX	DOE-RL T11-96-045		03JUN96
1.1.1.1.01.01.	ISSUE V&V PROGRAM OUTLINE	DOE-RL T11-96-046		30AUG96
1.1.1.1.01.08.	DELIVER INTEGRATED ASSESSMENT SCHEDULE	DOE-RL T11-96-047		15NOV95
1.1.1.1.01.09.	Issue ITP approved by TWRS Program Offices	DOE-RL T11-97-029		31MAR97
1.1.1.1.01.09.	Issue ITP approved by TWRS Program Offices	DOE-RL T11-98-030		31MAR98
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL	DOE-RL T11-98-032		31AUG98
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN	DOE-HQ T11-98-033		02JUN98
1.1.1.1.01.01.	SUBMIT TWRS FY96 MYWP & FYWP TO DOE	DOE-RL T1A-95-103		31AUG95
1.1.1.1.01.02.	ISSUE REVISED TWRS SEMP	KOE-FO T1A-95-123		05FEB96
1.1.1.1.01.02.	REVISED IMPL PROCEDURES (DNFSB 3.7.F)	DOE-FO T1A-95-124		15MAY96
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL	DOE-RL T1A-96-100		29AUG96
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN	DOE-HQ T1A-96-101		31MAY96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.1 Management Systems

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.1.01.09.	Issue ITP approved by TWRS Program Offices	DOE-RL T1A-96-103		01APR96
1.1.1.1.01.06.	DEV PLANS FOR MAPPING TWRS WASTE XFER LINES	DOE-RL T1A-96-106		30SEP96
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF MYPP TO DOE-RL	DOE-RL T1A-97-100		29AUG97
1.1.1.1.02.01.	ISSUE ANNUAL UPDATE OF FIVE YEAR PLAN	DOE-HQ T1A-97-101		02JUN97
1.1.1.1.01.01.	ISSUE TECH REQUIREMENTS SPECS (TRS) FOR DOE APPR	DOE-RL TDA-94-116		16SEP96

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.1 - Mgmt Systems - Cost By Year | TOTAL USAGE FOR YEA

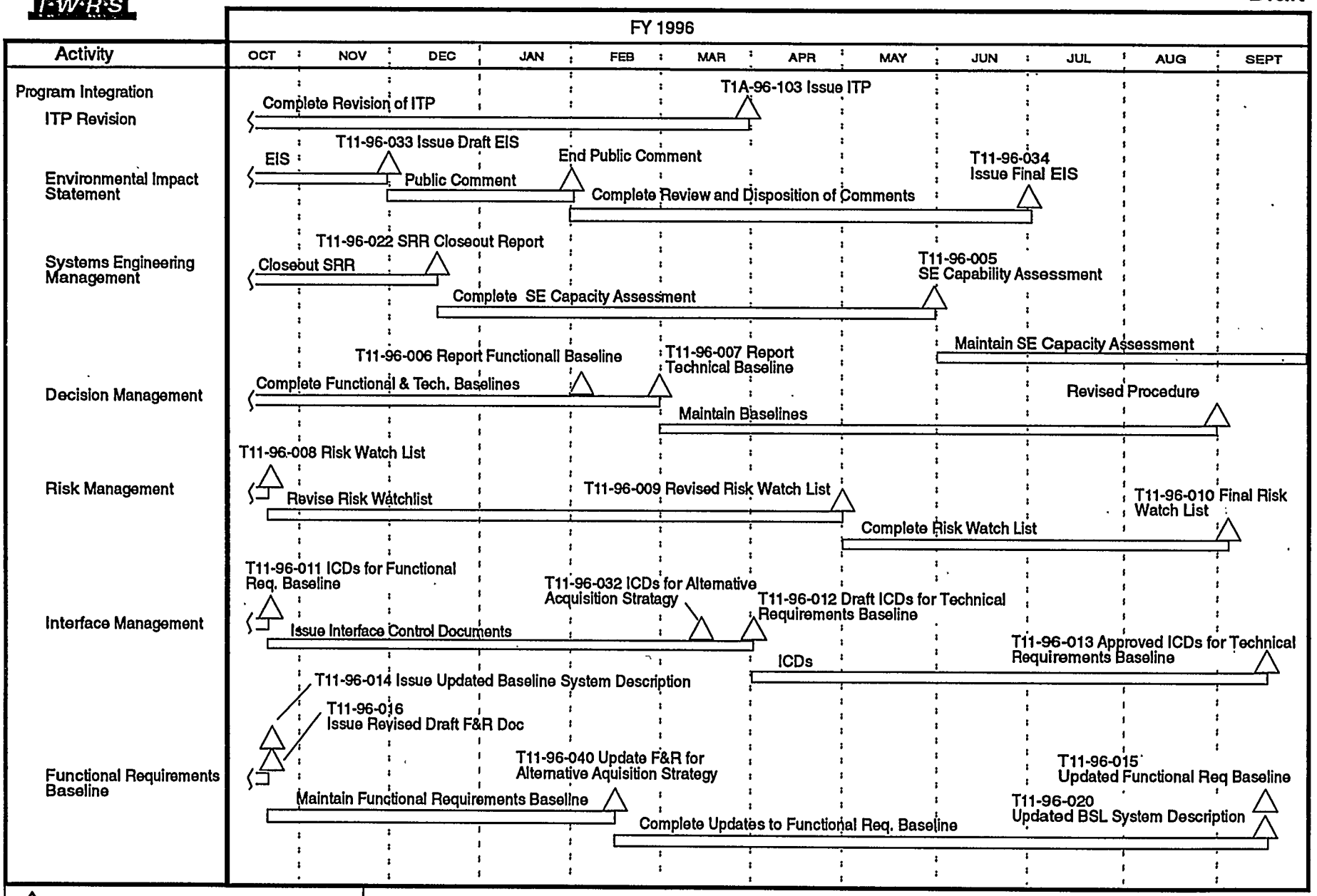
CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	957393	41940	35041	33527	31151	30725	30706	30706	30709	31208	30873
	REPORT TOTAL	957393	41940	35041	33527	31151	30725	30706	30706	30709	31208	30873

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	30833	30828	29855	29726	27585	27585	27661	27585	27585	27585	27525
	REPORT TOTAL	30833	30828	29855	29726	27585	27585	27661	27585	27585	27585	27525

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	26599	26593	25574	25278	25066	22419	22211	22834	23700	24228	24228
	REPORT TOTAL	26599	26593	25574	25278	25066	22419	22211	22834	23700	24228	24228

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038
1	EXPENSE	24093	2927	2927	2926	2449	2438	1740	1740	1745	1739	1503
	REPORT TOTAL	24093	2927	2927	2926	2449	2438	1740	1740	1745	1739	1503

CATEGORY	CATEGORY DESCRIPTION	FY 2039	FY 2040
1	EXPENSE	1496	
	REPORT TOTAL	1496	



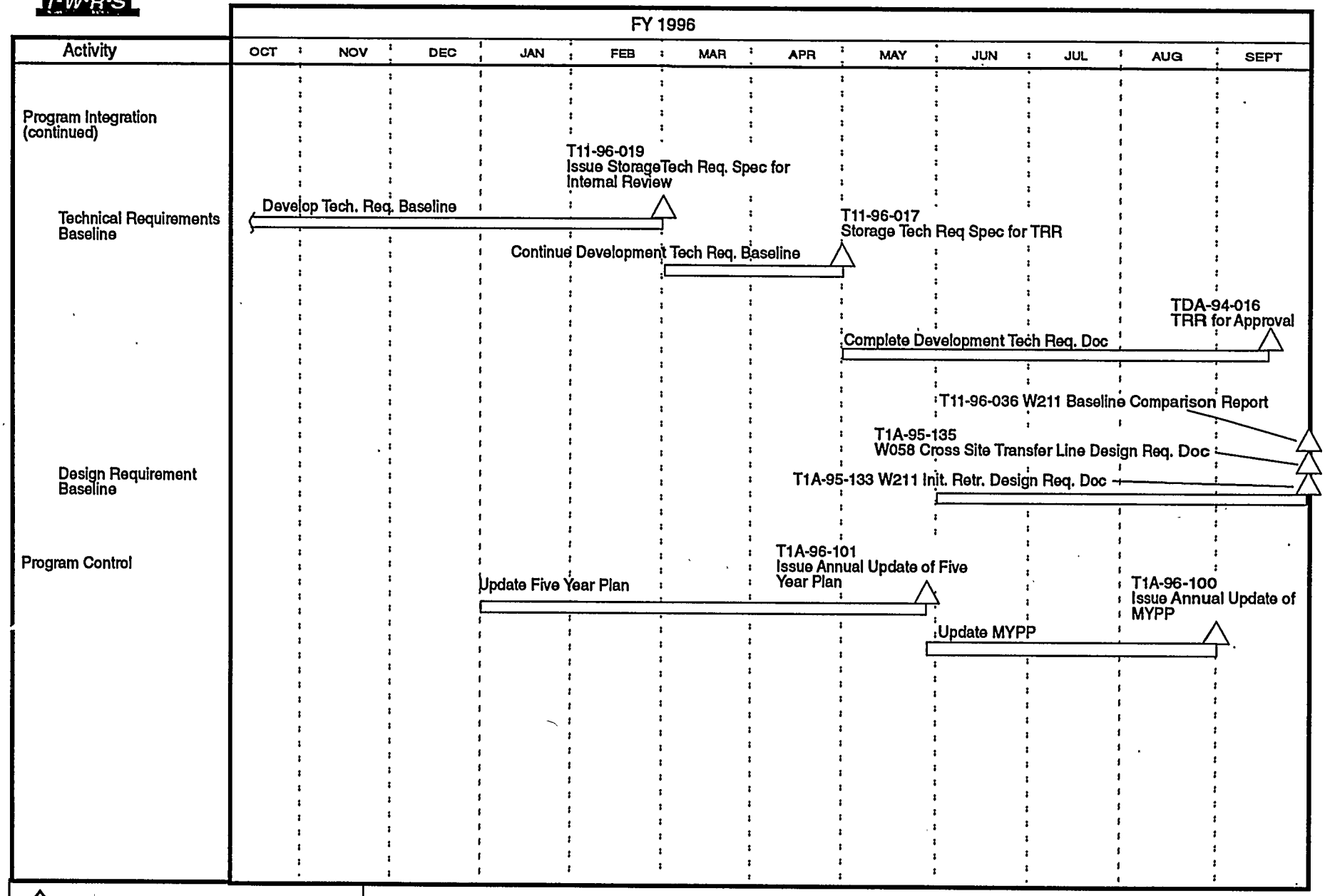
FY 1996 Performance Baseline Schedule

1.1.1.1 Management Systems

29509043.11page 1

Attachment 3-7 FY 1996 Performance Baseline Schedule
Sheet 1 of 2

WHC-SP-1101
REV. 1



FY 1996 Performance Baseline Schedule

1.1.1.1 Management Systems

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER
COST LOADING REPORT
TOTAL USAGE FOR MONTH

TWRS INTEGRATED SCHEDULE
UNITS IN K$s

1.1.1.1 - Mgmt Systems - FY 96 Cost/Month

CATEGORY	WBS ELEMENT		OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE															
	1.1.1.1.01	PROGRAM INTEGRATION	1580	1440	1547	1802	1476	1558	1521	1464	1364	1476	1546	1042	17816
	1.1.1.1.02	PROGRAM CONTROL	879	792	753	872	792	4838	871	871	792	831	871	4889	18051
	1.1.1.1.03	GENERAL SERVICES	642	583	554	497	452	475	497	497	452	475	497	452	6073
TOTAL	1		3100	2816	2854	3171	2719	6871	2889	2832	2608	2782	2915	6383	41940
	REPORT TOTAL		3100	2816	2854	3171	2719	6871	2889	2832	2608	2782	2915	6383	41940

4.0 TANK FARM OPERATIONS (WBS 1.1.1.2.1)

4.0.1 STRATEGY

The Tank Farm Operations Project covers three areas of performance within the Tank Waste Remediation Systems (TWRS): the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project; Transition 200 East to Controlled, Clean, and Stable sub-project; and Transition 200 West to Controlled, Clean, and Stable sub-project. As part of the overall strategy, the latter two activities are parallel, but they have been separated because of the geographical separation and sizes of the 200 East Area and 200 West Area tank farms' facilities, which are most effectively managed with their own organizations and sub-projects.

The mission is for safe, compliant, and cost-effective management of waste and tank farm facilities, and for continuous improvements. Two major changes have been made to support the future Tank Farm Operations Project for the future: the project has focused on a product-oriented work breakdown structure (WBS), and the former Tank Farm Upgrades project has been merged within the Tank Farm Operations Project to achieve cost reductions and efficiency. Goals will include the following:

1. Creating an interim end state that results in a controlled, clean, and stable environment leading to mortgage reduction.

2. Emphasizing sub-project management as opposed to program management.

3. Concentrating low-heat generating liquid wastes through evaporation (242-A), thus reducing volume and the number of double-shell tanks (DSTs) required to store dangerous liquid wastes and allowing Hanford facilities terminal cleanout operations.

4. Executing upgrades to improve infrastructure so that the final safety bases can be achieved.

5. Updating and maintaining a final safety basis for Tank Farm Operations Project through fiscal year (FY) 2005.

6. Managing tank volumes to meet specific capacity requirements for retrieving, removing, and remediating waste.

7. Turning over excess tank farm facilities to Environmental Restoration for final decontamination and decommission activities and closure.

The Tank Farm Operations Project is focused on integration internally with all TWRS projects and externally with other Hanford divisions and facilities (e.g., PUREX, B-Plant, Spent Fuels, Solid Waste). The Tank Farm Operations Project has instituted a philosophy that supports the deactivation of other site facilities, ensures the ability to receive and transfer waste as required, and prepares the tank farms for turnover to the Waste Disposal program.

The Tank Farms Operations Project is integrated with other TWRS projects to achieve this mission. The Waste Characterization Project will be required to support sampling of tanks for waste volume management, waste consolidation, single-shell tank (SST) interim stabilization pumping, and inactive miscellaneous underground storage tank (IMUST) issue resolution. The Safety Issue Resolution project support is necessary to resolve safety issues relating to the safe storage of waste.

These various integration points are incorporated into the project baseline schedules for the life of the Tank Farm Operations Project and are contained in this plan.

The interim end state resulting in a controlled, clean, and stable environment (item 1 above) is comprised of the following six components.

1. **Tank Farm Interim Stabilization.** Each SST in the tank farm will meet the criteria for interim stabilization specified in the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement); that is, pumping rates fall to less than 0.190 liters (0.05 gal/min), and the pumpable volume is reduced to less than 19 kiloliters (5,000 gallons) of supernate and 190 kiloliters (50,000 gallons) of pumpable interstitial liquid.

2. **Tank Farm Intrusion Prevention.** Inadvertent liquid addition into each tank will be prevented by installing barriers in pipelines leading into SSTs and sealing pump or valve pits that drain back into SSTs, as defined in the Tri-Party Agreement.

3. **Tank Farm Configuration Upgrades.** Daily routine monitoring of safety basis data will be obtained without entering the tank farm. Less frequent data collection and routine maintenance will continue to require farm entry. Essential drawings will be as-built.

4. **Operating Envelope Defined and Implemented.** Resolution of controlled, clean, and stable technical issues will be completed when all safety requirements from the authorization basis and unreviewed safety question (USQ) issues associated with the farm are resolved and justification for continued operation (JCO) and applicable environmental regulatory requirements are implemented. IMUST activities will be performed to ascertain general waste and tank conditions of tank interiors for inactive IMUSTs within the tank farm boundary. A document of the resolution of technical issues and compliance to safety and environmental requirements will be issued for each tank farm.

5. **Surface Contamination Clean Up.** A specified square footage of tank farms contaminated surface area will be stabilized, decontaminated, and/or surveyed and down-posted to a lower risk radiological posting to support the controlled, clean, and stable mission. For the purposes of this criteria, the following radiological postings will qualify as an acceptable measure of completion: High Contamination Areas, Contamination Areas, Fixed Contamination Areas, Soil Contamination Areas, and Airborne Radioactivity Areas.

6. **Abandoned Equipment Removal.** Abandoned aboveground equipment, which will no longer be used for present or future need, will be removed.

4.0.1.1 Objectives

The primary objective of the Tank Farm Operations Project is to manage tank farm waste and facilities until turnover to the Waste Disposal program. This project is currently scheduled to end in 2005. The decontamination and decommissioning (D&D) turnover deliverable standard for excess facilities will be established by the U.S. Department of Energy Office of Environmental Restoration (EM-40) in the office of ER D&D Guidance Document. Standards to which waste must be removed from waste tanks prior to final closure will be established by plans developed by the Waste Disposal program.

4.0.1.2 Planning Assumptions

A central assumption is that the existing tank farm infrastructure must be restored to meet the safe storage mission. Numerous internal and external audits have pointed out the plant physical and documentation deficiencies.

Although systems engineering within TWRS is not yet fully developed, it is assumed that once it is developed, TWRS Systems Engineering will validate the need to restore the Tank Farm Operations Project to a minimally safe condition to meet the store waste function. For example, if a tank ventilation system is operating beyond its service life, spare parts cannot be obtained, and it is non-compliant with current codes, Systems Engineering will confirm the need to upgrade the system. Therefore, the Tank Farm Operations Project is proceeding with the infrastructure upgrade process, because waiting for Systems Engineering to be fully developed will prolong both time and risk (assuming that Systems Engineering will confirm the need to do the planned work).

The Tank Farm Operations Project MYPP baseline was developed using activity-based cost estimates and resource-loaded schedules to arrive at the estimated cost of performing the technical baseline work scope. Unlike most projects which include contingency (projects of this size traditionally have estimated cost accuracy of +/- 15%), the Tank Farm Operations Project was developed using no contingency. Therefore, any contingency will be handled via the change request process during the baseline period of fiscal year 1996 to fiscal year 1998.

Within the Tank Farm Operations Project, a significant decision was made to pursue Project W-314 Tank Farm Upgrade MSA (W-314 MSA). This W-314 MSA consolidates four former sub-projects into one to provide better design integration and achieve significant efficiency gains during construction. The W-314 MSA was originally scoped in FY 1994 and FY 1995 to remove and replace components of a 40 to 50-year-old tank farm infrastructure. The project is being rescoped in FY 1996 using an integrated approach using life extension and life management applications in order to achieve significant cost reductions. The original cost estimate was done prior to the conceptual design report and is based on a rough order of magnitude which had +/- 50% accuracy and was estimated to cost in excess of $1 Billion. A revised, more accurate cost estimate will be done during FY 1996 upon completion of the conceptual design report. Other assumptions include the following:

1. Controlled, clean, and stable is achievable for SST farms by 2001. Establishing an acceptable end state on a farm-by-farm basis will significantly lower operational costs with savings being realized from the first year.

2. A systems engineering approach will be applied to all Tank Farm Operations Project activities.

3. Tank Farm Operations Project facilities and utility and transfer systems will be upgraded to current codes and standards to the extent practical.

4. Upgrades to selected facilities and systems will be performed to meet mission requirements and to achieve a cost-effective, negotiated level of compliance.

5. Equipment and facilities will be restored to satisfy interim safe tank farm operations requirements.

6. Maintain fifth shift (Training Shift). The training shift will be required to maintain the identified qualifications of operators while minimizing overtime required and maximizing training effectiveness. Failure to maintain staffing for the fifth shift will result in missed training and increased overtime costs.

7. Emergency pumping will be required as there will be one new "assumed leaking" SST annually until interim stabilization has been completed.

8. Interim stabilization of SSTs will be completed by September 2000. Failure to interim stabilize the SSTs on an aggressive schedule would increase the risk of additional leaking tanks and environmental insult. Space will be available in DSTs for SST liquids. Compatibility issues will be resolved, and cross-site transfers will be made.

9. Retrieval of SSTs will be initiated by December 2003. Failure to initiate retrieval on schedule would compromise the schedule for getting out of the SSTs and turning them over to EM-40 for D&D. Delays in the schedule would increase the cost of operating the tank farms.

10. Evaporator operations will be used to manage/optimize DST liquid volume and ensure one evaporator campaign is required per year. The evaporator is required to achieve the waste volume reduction required to avoid the need for additional DST storage tanks at a greatly increased cost.

11. Liquids from SST retrieval and new liquid waste will go to DSTs. The SSTs are beyond design life, and the risk of leaking is unacceptable. All pumpable liquid is to be removed from the SSTs by 2000, and all new liquid waste is to be added to the DSTs. Evaporation will be used to achieve the waste volume reduction needed to ensure adequate DST space for projected new waste and retrieval volumes.

12. Safety issues will be resolved to allow SST pumping in accordance with Tri-Party Agreement interim milestones. Flammable gas monitoring equipment will be installed on flammable gas Watch List SSTs before interim stabilization work is scheduled to start on these tanks. Liquid grab samples will be taken and laboratory analysis completed prior to the scheduled start of pumping.

13. The liquid observation well (LOW) installations will be completed in FY 1998. The LOW material is mild steel and installation is with current lancing procedures. There will be no major changes in safety or environmental requirements or approvals. Core sampling will be completed on schedule to support LOW installation.

14. The Transition 200 West to Controlled, Clean, and Stable sub-project will be consolidated into the Transition 200 East to Controlled, Clean, and Stable sub-project in 2001.

15. The Cross-Site Transfer System (W-058) will be completed in 1998 to provide a reliable transfer line. The existing transfer line integrity can be maintained until the completion of W-058.

16. No DST problems will occur that limit their use.

17. No Hanford facility will suffer noncompliance with storage regulations or cleanup program delays caused by the inability of tank farms to receive liquid waste.

18. The Waste Characterization Project (ADS 1130) will provide funding for sampling and analysis activities supporting evaporator feed characterization.

19. The Waste Disposal program assumes the SST Minimum Safe Operations activity from the Tank Farm Operations Project in 2001.

20. The Waste Disposal program assumes the DST Transition Operations activity, infrastructure, and personnel from the Tank Farm Operations Project in the year 2005 and/or when the W-314 MSA is complete.

21. The 242-A Evaporator and AW/AP Tank Farms' operations will be turned over to the Waste Disposal program in 2005.

22. No funding is available for additional tanks being added to the Watch List requiring implementation of Watch List controls or equipment installations affecting baseline work scope.

4.0.1.3 Constraints

Tank Farm Operations Project activities are performed within a wide variety of constraints caused by operation complexities. There are detailed requirements for radiologic and nonradiologic activities which cover Administration and Management, Environmental Protection, Materials Handling and Worker Safety in Operations. DOE Orders and Directives are also applicable.

4.0.2 TECHNICAL REQUIREMENTS BASELINE

4.0.2.1 Work Breakdown Structure

The Tank Farm Operations Project WBS Tree is found in Attachment 4.0-1.

4.0.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for Tank the Farm Operations Project is found in Attachment 4.0-2.

4.0.2.3 Technology Needs

The Tank Farm Operations Project has become "standards driven" and is committed to both continuous improvement and cost reductions. The program will pursue and assess various technologies as they become available during the project mission execution. The specific technologies to be assessed at present include the following:

- New in-tank instrumentation replacements
- Modern equipment replacements (pumps, vent systems)
- Waste minimization and pollution prevention
- ALARA practices
- New leak detection and analysis technologies
- DST qualification life extension
- Waste transfer line configuration (size, number, location, materials).

Various other technologies are being pursued within the three Tank Farm Operations sub-projects. These are discussed in more detail in the specific sub-project sections of this workplan.

4.0.3 PERFORMANCE MEASURES

The performance measures used by the Tank Farm Operations Project are tied to Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators relating to the overall conduct of operations within the project. These include the following:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product (average cost for SST stabilization)
- Overhead application rates
- Benchmarking against the private sector
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - Lost work days
  - Recordable incidents
  - First aid cases
  - Maintenance backlog
  - Unusual occurrence reports

- Off normal occurrence reports
- Log omissions
- Missed out of tolerance readings
- Corrective action management
- Solid waste generation
- Saltwell pumping

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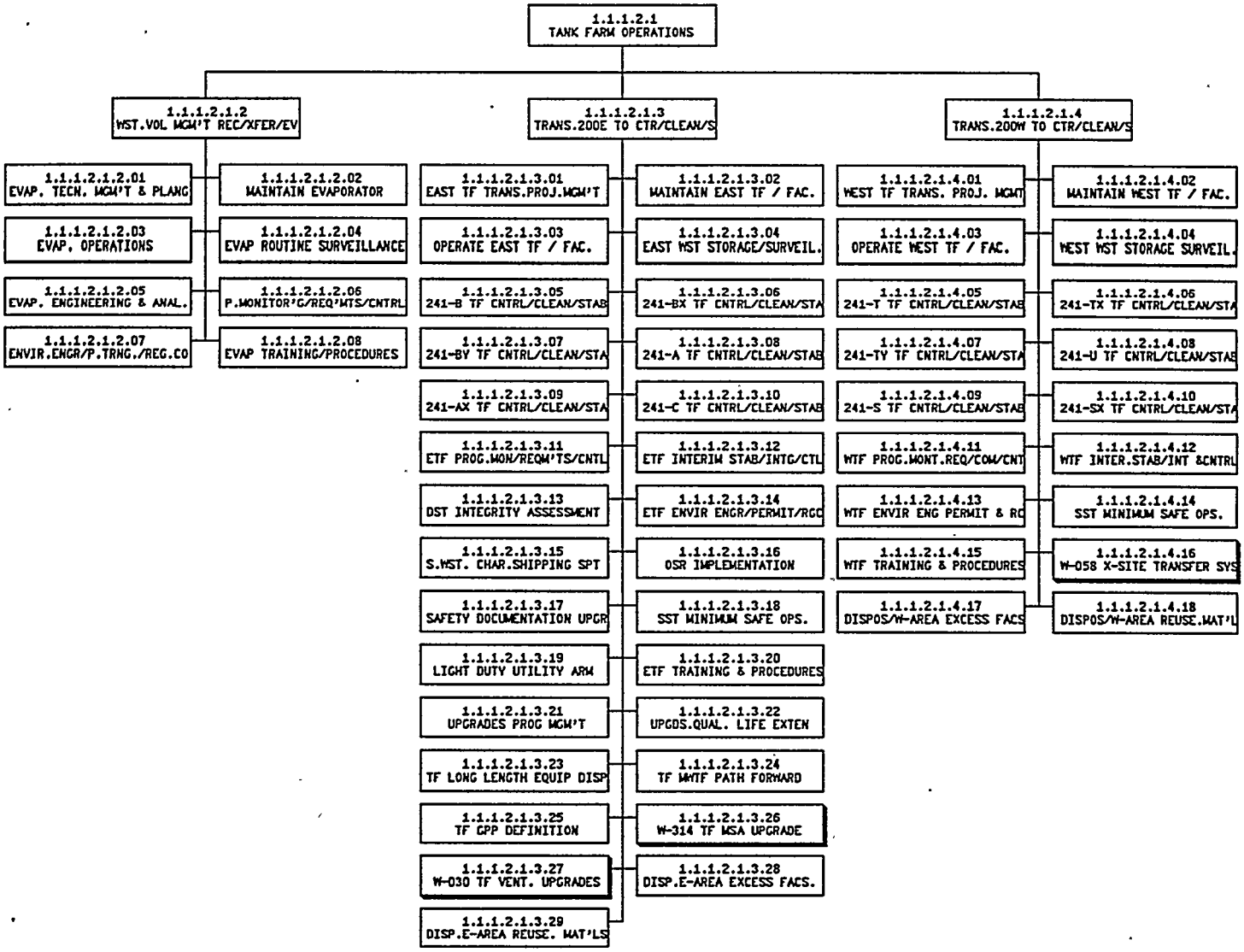
LISTING OF ATTACHMENTS

Attachment 4.0-1 Work Breakdown Structure

Attachment 4.0-2 WBS Dictionary Sheet

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
TANK FARM OPERATIONS



Attachment 4.0-1 Work Breakdown Structure

1 DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
8/ 2/95	1.1.1 TWRS 1.1.1.2 Waste Storage	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.01 Level 4	4. WBS ELEMENT TITLE Tank Farm Operations	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 5/10/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11000 11202 11204	9. BUDGET AND REPORTING NUMBERS Operating EW3130010 CENTRC 35EW31207 GPP EW3120071 Line Item 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	150,495.00	127,925.00	119,577.00	112,249.00	104,344.00	95,944.00	81,602.00
CENRTC	4,668.00	2,202.00	3,001.00	2,301.00	2,200.00	2,101.00	
LINE ITEM	12,295.00	35,563.00	20,163.00	67,436.00	99,004.00	136,977.00	90,001.00
GPP	4,272.00	1,998.00	1,996.00	2,001.00	2,000.00	1,500.00	
TOTAL	171,730.00	167,688.00	144,737.00	183,987.00	207,548.00	236,522.00	171,603.00

B. TECHNICAL BASES

Goals and Objectives

Maintaining the safe and compliant operating configuration within tank farms.

Operating the 242-A Evaporator, achieving a yearly waste volume reduction goal.

Completing M-41-00, Single-Shell Tank Interim Stabilization.

Completing M-43-00, Tank Farm Upgrades.

Completing M-46-00, Double-Shell Tank Space Evaluation.

Achieving a "Final Safe Operations Level" in tank farms (this includes completing and implementing safety documentation upgrades, resolving unreviewed safety questions, completing near-term hardware upgrades, and characterizing tank contents).

Release of waste tanks for retrieval and turnover for closure.

Major End-Item Deliverables

Maintaining the safe and compliant operating configuration within tank farms.

Operating the 242-A Evaporator, achieving a yearly waste volume reduction goal.

Completing M-41-00, Single-Shell Tank Interim Stabilization.

Completing M-43-00, Tank Farm Upgrades.

Completing M-46-00, Double-Shell Tank Space Evaluation.

Achieving a "Final Safe Operations Level" in tank farms (this includes completing and implementing safety documentation upgrades, resolving unreviewed safety questions, completing near-term hardware upgrades, and characterizing tank contents).

Release of waste tanks for retrieval and turnover for closure.

Acceptance Criteria
Achieving and maintaining regulatory and DOE Order compliance in tank farms facilities for the continued safe storage and treatment of radioactive/hazardous wastes.

Implemention and adherence to the new Operation Safety Requirements parameters.

Sufficient surveillance data and engineering analysis to demonstrate the safety, compliance, and integrity status of each high-level waste tank.

Continuous safe conditions for workers, the public, and the environment.

Completion of Acceptance Test Procedure, Operation Test Procedure, and Acceptance for Beneficial Use for all upgrades.

Restoration to operation of degraded tank farm equipment that is necessary for safe and compliant receipt, storage, and transfers of waste.

Continuous availability of sufficient tank space to accommodate contents of largest inventory of any single-shell tank and cleanup phases.

Receive on demand all high-level waste from Hanford facilities to avoid noncompliance operation interruptions of those facilities.

Acceptance of tank farm facilities by Environmental Restoration program EM-40 operations.

C. STATEMENT OF WORK

Receive, contain, and monitor radioactive liquid wastes from Hanford facilities for managing tank waste in an environmentally safe and cost effective manner. This will continue until all waste is received and processed for final disposal. This element includes performing routine surveillance, operation, maintenance, upgrade, and stabilization activities necessary for safe and compliant underground waste storage and waste concentration activities. Continued safe operation of these facilities require near and long-term upgrades in safety bases and hardware restoration. Planning anticipates achieving a final safety bases in the beginning of fiscal year 2001 following numerous upgrades, unresolved safety questions resolution, and tank characterization. This will achieve a significantly improved infrastructure allowing a mature safe operation for the planned life cycle of tank farms.

The single-shell tanks (149) have aged beyond their useful life. In addition, these underground waste storage tanks cannot be properly monitored to ensure integrity as required by the State of Washington. Pumpable liquid (interim stabilization) is being removed from these tanks with retrieval operations and final closure to follow. This project element will complete interim stabilization activities by the year 2000 allowing retrieval activities (4.2.2) to be performed. This activity is of low programmatic risk, 111 of 149 single-shell tanks have been interim stabilized and numerous safety studies have been or are nearing completion to allow pumping of Watch List single-shell tanks.

The final phase in the life cycle of the tank farms is the preparation for closure of all remaining facilities under the control of operations. Once the tank waste is processed into glass, unneeded waste tanks will be cleaned out and prepared for turnover to Environmental Restoration for Decontamination and Decommissioning. The 242-A Evaporator will be the first "major" facility

earmarked for turnover (initial work on turnover will start in the year 2007), followed by tanks in 200 West Area and finally in 200 East Area. Timely closure and turnover of unneeded facilities will reduce operating costs over the tank farm life cycle. This final phase of tank farms has the highest uncertainty from a planning standpoint. To date, a major tank farm facility has not been prepared for turnover to Environmental Restoration for Decontamination and Decommissioning activities. Planning is preliminary and will be better defined following preparation of a study and detailed cost estimate. Turnover preparations are not scheduled to begin until fiscal year 1997. On a smaller scale, the first tank farm facilities scheduled for turnover to Environmental Restoration for Decontamination and Decommissioning will be the 242-T and 242-S Evaporators.

Required activities over lifetime:

The Tank Farm Operations Project has become "standards driven" and is committed to both continuous improvement and cost reductions. The project will adopt new (modern) standards for Conduct of Operations against which performance will be continuously measured for improvements. Operating crews staff for five shifts to support training requirements for nuclear process operators. Training is comprehensive, formal, and uses auditable certification examinations. Configuration control of all Tank Farm Operations Project facilities will be maintained to modern standards through a commitment by line management to do so and formal procedures to manage updates to drawings, documents, and labels.

Technologies to be assessed:

New in-tank instrumentation replacements
Modern equipment replacements (pumps, vent systems)
Waste minimization and pollution prevention
As low as reasonably achievable practices
New leak detection and analysis technologies
Double-shell tank qualification life extension
Waste transfer line configuration (size, number, location, materials)

Options to be considered:

Specialized contractors bringing new technology improvements
Retiring facilities disposal options
Best available technology improvements
Life extension and life management of equipment and facilities

Systems Engineering Functions and Requirements:

4.2.1.1 Store Waste
4.2.1.2 Characterize Waste
4.2.1.3 Transfer Waste
4.2.1.4 Concentrate Waste
4.2.2.1 Retrieve Single-Shell Tank Waste
4.2.2.2 Retrieve Double-Shell Tank Waste
4.2.2.3 Retrieve IMUST
4.2.3.1 Store In-Process Waste
4.2.3.2 Pretreat Sludges/Solids
4.2.3.3 Pretreat Supernatants
4.2.3.4 Immobilize Low-Level Waste
4.2.3.5 Immobilize High-Level Waste
4.2.3.6 Prepare Capsules
4.2.4.1 Interim Store Immobilized High-Level Waste
4.2.4.2 Dispose of Low-Level Waste

4.1 WASTE VOLUME MANAGEMENT, RECEIPT, TRANSFER, AND EVAPORATION (WBS 1.1.1.2.1.2)

4.1.1 STRATEGY

4.1.1.1 Objectives

The primary objectives for Waste Volume Management, Receipt, Transfer, and Evaporation sub-project are:

1. Concentrate low-heat generating liquid wastes through evaporation (242-A), thereby reducing the volume and number of DSTs required to store radioactive/hazardous liquid wastes.

2. Operate the AW/AP Tank Farms in compliance with all applicable standards and requirements.

This sub-project is scheduled for turnover to the Waste Disposal program in 2005. This sub-project consists of performing all the functions required for evaporation of water from dilute waste and supporting the facilities and processes. These functions include the following:

- Performing preventive maintenance
- Performing corrective maintenance (routine and non-routine)
- Concentrating facility operations including waste transfers to feed tanks
- Performing routine surveillance monitoring
- Conducting health physics activities (radiological)
- Performing industrial hygiene and safety functions
- Performing engineering and analysis (campaign run plans, trade studies, and analysis capability upgrades)
- Managing and controlling upgrades to facilities and infrastructure
- Enhancing the safety of facility operations and preparing the facilities for eventual turnover to Waste Disposal program.

4.1.1.2 Planning Assumptions

The Waste Volume Management, Receipt, Transfer, and Evaporation sub-project baseline was developed based on the following assumptions.

1. A systems engineering approach will be applied to all Tank Farm Operations Project activities.

2. Tank Farm Operations Project facilities and utility and transfer systems shall be upgraded to current codes and standards to the extent practicable.

3. Upgrades to selected facilities and systems will be performed to meet mission requirements and achieve a cost-effective negotiated level of compliance.

4. Equipment and facilities will be restored to satisfy interim safe operations requirements.

5. The Waste Characterization Project (ADS 1130) will provide funding for sampling and analysis activities supporting evaporation feed characterization.

6. The fifth shift (training shift) will be required to maintain the identified qualifications of the operators while minimizing the overtime required and maximizing training effectiveness. Failure to maintain staffing for the fifth shift will result in missed training and increased overtime costs.

7. Evaporator operations will be used to manage/optimize DST tank liquid volume. It is assumed that one evaporator campaign is required per year. The evaporator is required to achieve waste volume reduction required to avoid the need for additional DST storage tanks at a greatly increased cost.

8. The 242-A Evaporator and AW/AP Tank Farms' operations will be turned over to the Waste Disposal program in 2005.

9. No funding is available for additional tanks being added to the Watch List requiring implementation of Watch List controls or equipment installation affecting baseline work scope.

4.1.1.3 Constraints

Administrative and Management constraints include the following:

- Funding availability
- Validity of cost estimates
- Ability of the Waste Characterization program to meet sampling schedule
- Davis-Bacon Act
- Systems Engineering definition and implementation impacts
- Procurement regulations
- Waste Volume Projection accuracy of non-TWRS generated waste
- Safety issue resolution
- Tri-Party Agreement
- DOE Approved Standards/Requirements Identification Documents (S/RIDS),
- The S/RIDS developed and approved for the Tank Farm Operations Project

Environmental Protection constraints include the following:

General:
- 42 USC 4321, et seq., *National Environmental Policy Act of 1969*
- Tri-Party Agreement

Air:
- 42 USC 7401, et seq., *Clean Air Act*
- RCW 70.94, *Washington Clean Air Act*

Water:

- 33 USC 1251, et seq., *Clean Water Act*
- 42 USC 300, et seq., *Safe Drinking Water Act*
- WAC 173-200, "Water Quality Standards for Groundwater of the State of Washington"
- 91nm-177, *Ecology Consent Order*

Materials Handling constraints include the following:

- 42 USC 6901, et seq., *Resource Conservation and Recovery Act of 1976 and Hazardous and Solid Waste Amendments of 1984*
- 42 USC 9601 et seq., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1986*
- WAC 173-303, "Dangerous Waste Requirements"
- 42 USC 2011 et seq., *Atomic Energy Act of 1954*
- 10 CFR 71, "Packaging and Transportation of Radioactive Material"
- 10 CFR 830.120, "Quality Assurance"

Worker Safety in Operations constraints include the following:

- HSRCM-1, Rev. 2, "Hanford Site Radiological Control Manual"
- 10 CFR 820, "Procedural Rules for DOE Nuclear Activities"
- 10 CFR 830, "Nuclear Safety Management"
  10 CFR 835, "Occupational Radiation Protection"
- 29 CFR 1910, "Occupational Health and Safety Standards"
- PL 101-510 Sec 3137, "Wyden Amendments"
- Defense Nuclear Facilities Safety Board Recommendations

DOE Orders including the following:

- DOE Order 1330.1D, *Software Security*
- DOE Order 2250.1, *Cost and Schedule Control System Criteria for Contract Performance*
- DOE Order 4330.4A, *Conduct of Maintenance*
- DOE Order 4700.1, *Project Management System*
- DOE Order 5000.3A, *Occurrence Reporting and Processing of Operations Information*
- DOE Order 5000.3B, *Lessons Learned*
- DOE Order 5480.1B, *Environmental, Safety and Health Program for Department of Energy*
- DOE Order 5480.19, *Conduct of operations Requirements for DOE Facilities*
- DOE Order 5480.20, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE*
- DOE Order 5480.21, *Unreviewed Safety Question*
- DOE Order 5480.22, *Technical Safety Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*
- DOE Order 5480.23, *Nuclear Safety Analysis Reports*
- DOE Order 5480.24, *Criticality Safety*
- DOE Order 5480.26, *Trending and Analysis of Operations Information Using Performance Indicators*
- DOE Order 5480.5, *Safety of Nuclear Facilities*
- DOE Order 5480.31, *Startup and Restart of Nuclear Facilities*
- DOE Order 5481.1, *Safety Analysis and Review System*
- DOE Order 5484.1, *Environmental Protection, Safety, and Health Protection Information Reporting System*

- DOE Order 5700.6C, *Quality Assurance*
- DOE Order 5820.2A, *Radioactive Waste Management*
- DOE Order 6430.1A, *General Design Criteria*

4.1.2 TECHNICAL REQUIREMENTS BASELINE

4.1.2.1 Work Breakdown Structure

The Waste Volume Management, Receipt, Transfer, and Evaporation sub-project WBS Tree is found in Attachment 4.1-1.

4.1.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project is found in Attachment 4.1-2. Lower-level dictionary sheets are available on the Performance Measurement Control System (PMCS).

4.1.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project is found in Attachment 4.1-3.

4.1.2.4 Technology Needs

The Waste Volume Management, Receipt, Transfer, and Evaporation sub-project is committed to continuous improvements and cost reductions. This sub-project will pursue and assess various technologies throughout the execution of the project mission. The technologies to be assessed include the following:

- In-tank instrumentation replacements
- Modern equipment replacements (pumps)
- Waste minimization and pollution prevention processes
- Data taking equipment (new monitor and control system)
- As low as reasonably achievable (ALARA) practices
- Utilities and service improvements (alternative energy sources)
- Tank Monitoring and Control System (TMACS) software improvements
- Data management configuration improvements
- Effluent monitoring, solid waste minimization and characterization, recycling programs, decontamination processes, and sample analysis alternatives
- Tank structural monitoring/analysis, corrosion control methods, modeling, and fissile material measurement methods
- Radiological, physical, and chemical modeling
- Operational waste volume projection (OWVP) methods
- Multi-Function Waste Tank Facility (MWTF) trade study conclusions analysis
- Remote control equipment for surveillance and D&D.

4.1.3 SCHEDULE BASELINE

4.1.3.1 Summary Schedule

See Attachment 4.1-4 for the summary schedule.

4.1.3.2 Milestone Control Log

See Attachment 4.1-5 for the Milestone Control Log. Milestone description sheets are found in Appendix A.

4.1.4 COST BASELINE

4.1.4.1 Cost Baseline Summary by Year

Attachment 4.1-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

4.1.4.2 Basis of Estimate

Cost estimates for the Tank Farms Operations Project have been developed in conjunction with an independent team of experts from an external consulting firm. The basis for estimates, WBS dictionary sheets, product definitions, and activity planning forms have been reviewed and refined and are incorporated into this Multi-Year Program Plan (MYPP). In addition, the planning assumptions in Sections 4.0.1.2, 4.1.1.2, 4.2.1.2, and 4.3.1.2 provide additional support for these estimates as well as the schedule logic and task identifications represented in Sections 4.1-4 and 4.1-7.

The detailed WBS dictionary sheets are contained in the PMCS system, while the backup cost estimating sheets are maintained in the program office.

4.1.5 PERFORMANCE MEASURES

The performance measures used by the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project are tied to C/SCSC and to various performance indicators relating to the overall conduct of operations within this sub-project. These include the following:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Overtime percentage worked
- Engineering Change Notices (ECNs)
- Age of Engineering Change Notice
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - Lost work days
  - Recordable incidents

- First aid cases
- Maintenance backlog
- Unusual occurrence reports
- Off normal occurrence reports
- Log omissions
- Missed out of tolerance readings
- Corrective action management
- Solid waste generation
- Lock and tag activities
- Temporary mods/bypasses
- Drills
- Waste volume received
- MWTF trade study analysis
- OWVP analysis and upgrades.

4.1.6 EXECUTION YEAR

4.1.6.1 Technical Objectives

The technical objectives for the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project is to complete one evaporator campaign per year for the next three years as follows:

- FY 1996: Evaporator Campaign 96-1
- FY 1997: Evaporator Campaign 97-1
- FY 1998: Evaporator Campaign 98-1

4.1.6.2 FY 1996 Performance Baseline Schedule

Attachment 4.1-7 contains the FY 1996 performance baseline schedule.

4.1.6.3 Cost Estimate Baseline by Month

Attachment 4.1-8 establishes the month-by-month cost estimate baseline for FY 1996.

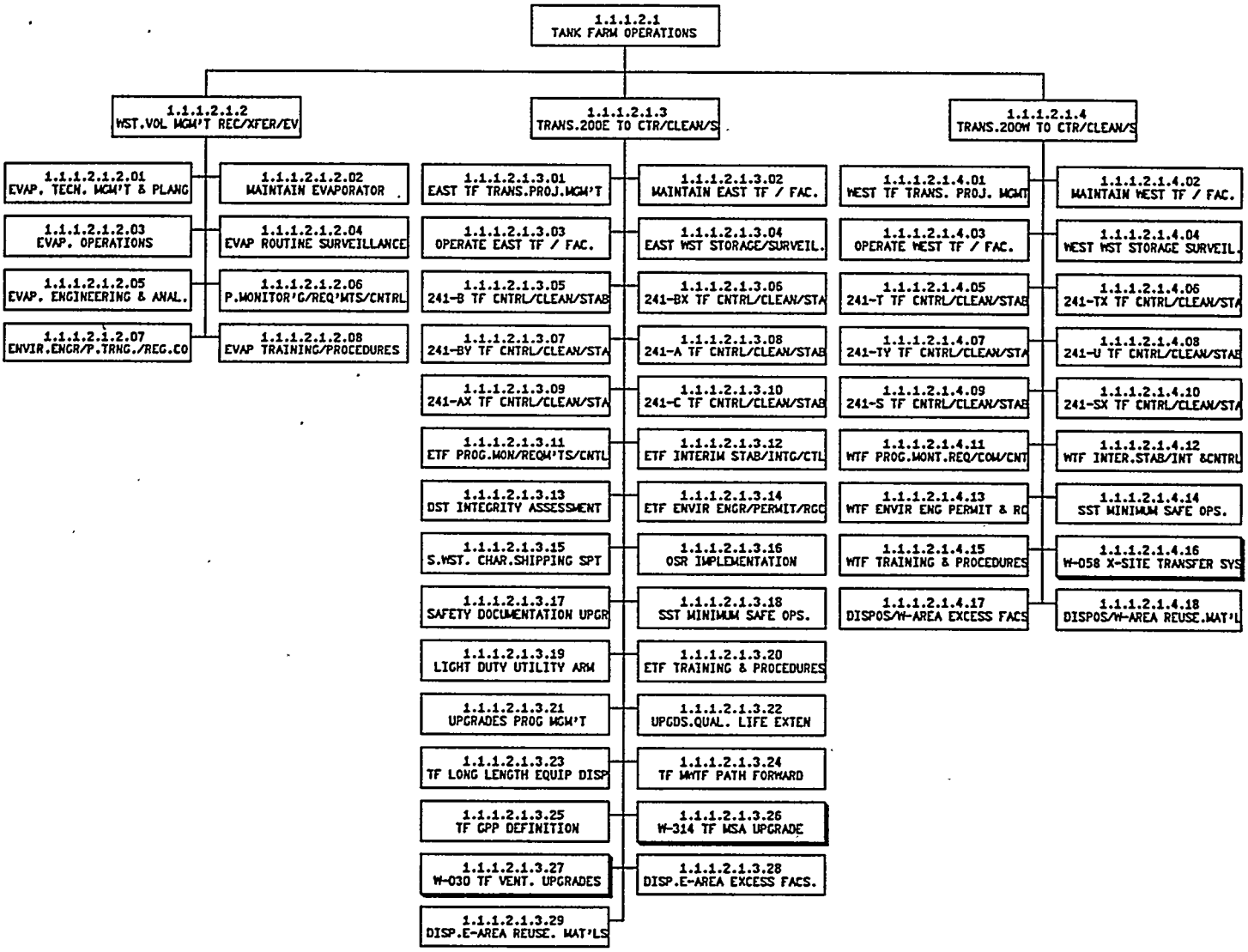
4.1.6.4 FY 1995 Work Scope Carryover Summary

Some activities which were planned in FY 1995 were not completed on schedule and will slip into FY 1996. These activities and the related milestones are reflected in the schedule and are planned for completion in FY 1996. The items that are being carried over into FY 1996 will be provided prior to completion of the MYPP.

LISTING OF ATTACHMENTS

Attachment 4.1-1	Work Breakdown Structure
Attachment 4.1-2	WBS Dictionary Sheet
Attachment 4.1-3	Responsibility Assignment Matrix
Attachment 4.1-4	Summary Schedule
Attachment 4.1-5	Milestone Control Log
Attachment 4.1-6	Cost Baseline Summary by Year
Attachment 4.1-7	FY 1996 Performance Baseline Schedule
Attachment 4.1-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
TANK FARM OPERATIONS



Attachment 4.1-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
8/3/95	1.1.1 TWRS 1.1.1.2 Waste Storage 1.1.1.2.01 Tank Farm Operations	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.01.02 Level 5	4. WBS ELEMENT TITLE Waste Volume Management, Receipt, Transfer, and Evaporation	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 9/26/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11000	9. BUDGET AND REPORTING NUMBERS Operating CENTRC GPP Line Item EW3120071	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	18,020.00	16,015.00	16,304.00	20,127.00	20,718.00	20,718.00	20,698.00
CENRTC							
LINE ITEM							
GPP							
TOTAL	18,020.00	16,015.00	16,304.00	20,127.00	20,718.00	20,718.00	20,698.00

B. TECHNICAL BASES

Goals and Objectives
The functional product of the Waste Volume Management, Receipt, Transfer, and Evaporation sub-project of Tank Farm Operations project is to concentrate waste through evaporation and to operate the adjacent tank farms.

Work scope planning and risk factors are expected to have only medium impacts to this activity. As infrastructure upgrades and restoration activities are completed and a final safety basis is achieved, it will transform into a low risk activity.

- Concentrate low-heat generating liquid wastes through evaporation (242-A), thus reducing the volume and the number of double-shell tanks required to store dangerous liquid wastes.

- Operate the AW/AP tank farms in compliance with all applicable standards and requirements.

This sub-project consists of performing all of the functions required for evaporation of water from dilute waste and support to the facilities and processes. These functions are:

- Preventive maintenance,
- Corrective maintenance (routine and non-routine),
- Facility concentration operations including waste transfers to feed tanks,

- Routine surveillance monitoring,
- Health physics activities (radiological),
- Industrial hygiene and safety functions,
- Engineering and analysis (campaign run plans, trade studies, and analysis capability upgrades),
- Manage and control upgrades to facilities and infrastructure, and
- Enhance the safety of facility operations as well as prepare the facilities for the eventual turnover to Waste Disposal program.

The Waste Volume Management, Receipt, Transfer, and Evaporation sub-project consists of performing the following major activities in support of the sub-project mission:

- Technical Management and Administration
  - -Project and baseline management
  - -Providing utilities and services
  - -Training and certification program
  - -Nuclear safety oversight
  - -Configuration management and support
  - -Providing quality assurance/quality control support
  - -Tank farm security operations and upgrades
  - -Review/revising tank farm operations and administrative procedures
  - -Tank farm surveillance database maintenance and management
  - -MWTF path forward analysis
  - -OWVP mehtod analysis and upgrade

- Tank Farm Compliance and Corrective Activities
  - -Double-shell tank integrity assessments
  - -Permitting and regulatory compliance
  - -Radioactive/hazardous solid waste management
  - -Environmental compliance, engineering, analysis, and assessments
  - -Safety envelope definition and implementation
  - -Double-shell tank emergency pumping planning/preparations
  - -Special disposal of unusable/abandoned field and in-tank equipment
  - -Compliance management and ALARA support to field activities
  - -OSR implementation including necessary upgrades
  - -Criticality engineering upgrades and safety reviews
  - -Surface contamination zone reduction

- Tank Farm Retired Facilities
  - -Transition planning for each facility or system
  - -Facility preparation for transfer to EM-40
  - -Surveillance and maintenance of retired facilities until transfer to EM-40 is accomplished
  - -Safe shutdown and transfer to EM-40

Major End-Item Deliverables

- Five-year plan input and review with RL
- Monthly baseline reviews with RL
- Maintaining the safe and compliant operating configuration within the sub-project
- Operating the 242-A Evaporator and achieving waste volume reduction goals
- Completing M-46-00, Double-Shell Tank Space Evaluation
- Release of waste tanks for Retrieval and eventual turnover to EM-40
- Turnover of all facilities to EM-40 for closure
- MWTF trade study analysis
- OWVP method analysis and upgrade
- See milestone log in Attachment 5 for level 5 milestones and deliverables

Acceptance Criteria

- Achieving and maintaining regulatory and DOE Order compliance in project facilities for the continued safe storage, analysis, and treatment of radioactive/hazardous wastes.

•□Implementation and adherence to the new Operational Safety Requirements parameters.

STATEMENT OF WORK

Required activities over FY 1996:

•□Perform scheduled component-based recall system, Preventive Maintenance, high-efficiency particulate air (filter) testing, and third party inspections

•□Corrective maintenance includes identifying deficiencies, fixing failed equipment in 242-A and AW/AP tank farms, and replacing failed pumps on feed tanks

•□Waste tank transfers, performing jumper changes and pump removals as required, rail car and tanker truck transfers

•□Radiological control performing personnel and work place surveys, monitor source checks, and PCM1B checks

•□Obtaining panel board/management control system surveillance data, condensate basin readings, vessel ventilation system readings, ion-exchange column readings, and canyon area ventilation surveillance data

•□Develop operating strategies/plans, process improvements, trending and review of operating data, monitoring process limits, ensuring technical accuracy, and process problem resolution

•□Complete the trade studies and analysis for the MWTF Path Forward

•□Upgrade the OWVP system

•□Develop Multi-Waste Tank Facility (MWTF) path forward and annual Operating Waste Volume Projections (OWVP).

•□Identify no longer needed tank farm facilities

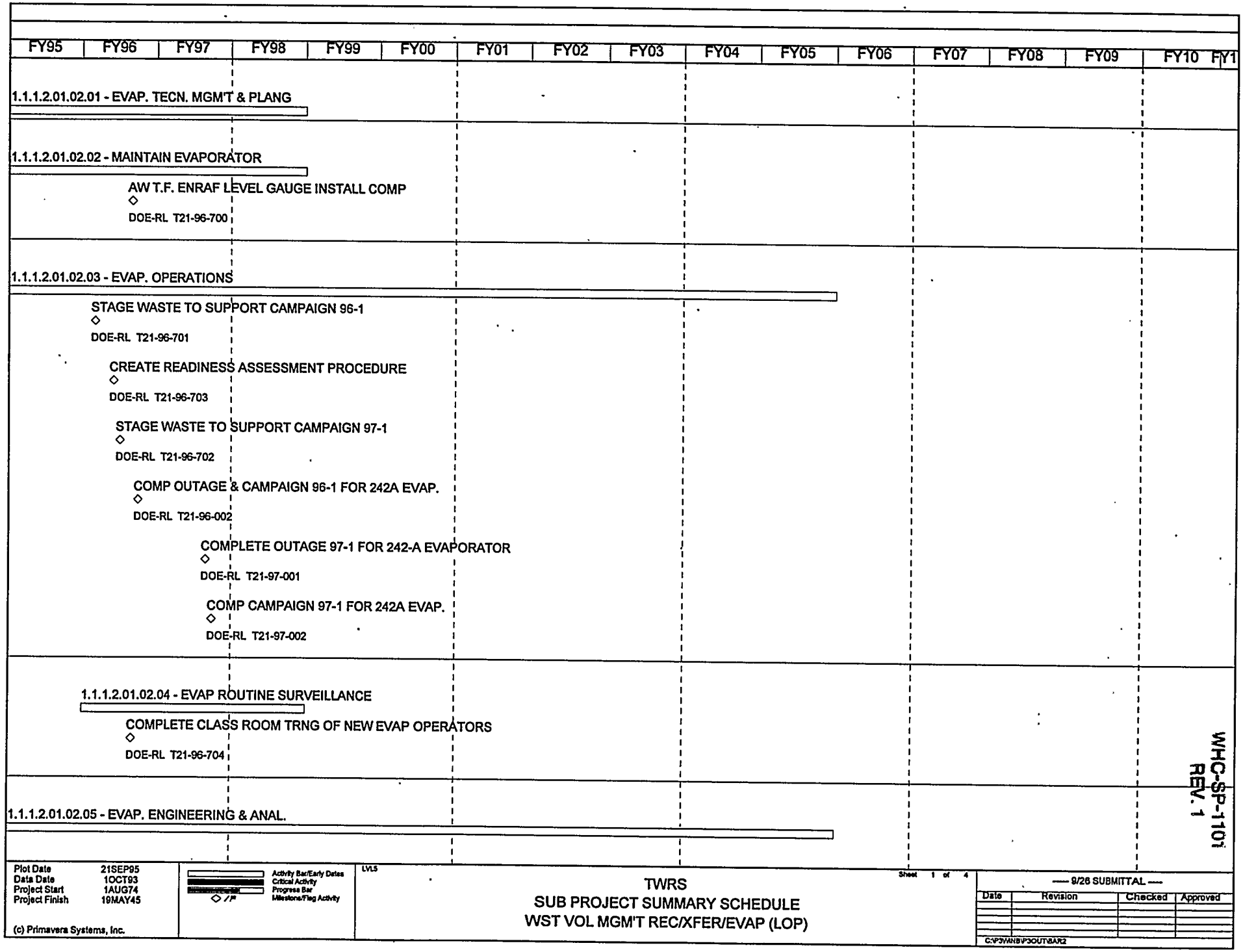
•□Perform an assessment of each facility to determine its status and readiness for turnover to ER

•□Prepare and execute required work plan to complete the facility's readiness for turnover to ER

•□Provide for all legally required surveillances of retired facilities until they have been accepted by the Environmental Restoration Program

•□Document formal turnover of retired facilities as required by the EM-40 Decontamination and Decommissioning Guidance Document

WBS	Account #	Title	Activity Manager	CAM	Program Support
1.1.1.2.1	1N1	Tank Farm Operations	J. L. Lee		D. L. Burt
1.1.1.2.1.2	1N1A	Waste Volume Management, Receipt, Transfer, and Evaporation	J. E. Geary		M. D. Stratton
1.1.1.2.1.2.1	1N1A12	Evaporator Technical Management & Planning	J. E. Geary	J. E. Geary	M. D. Stratton
1.1.1.2.1.2.2	1N1A13	Maintenance Evaporator	J. E. Geary	A. K. Yoakum	M. D. Stratton
1.1.1.2.1.2.3	1N1A14	Operate Evaporator	J. E. Geary	C. M. Winkler	M. D. Stratton
1.1.1.2.1.2.4	1N1A15	Evaporator Routine Surveillance	J. E. Geary	C. M. Winkler	M. D. Stratton
1.1.1.2.1.2.5	1N1A17	Evaporator Engineering & Analysis	J. E. Geary	R. J. Nicklas	M. D. Stratton
1.1.1.2.1.2.6	1N1A18	Evaporator Program Monitoring, Requirements, Comm & Control	J. E. Geary	D. L. Burt	M. D. Stratton
1.1.1.2.1.2.7	1N1A19	Evaporator Environmental Engineering, Permitting, & Regulatory Compliance	J. E. Geary	R. D. Gustavson	M. D. Stratton
1.1.1.2.1.2.8	1N1A1A	Evaporator Training & Procedures	J. E. Geary	T. Morton	M. D. Stratton



Attachment 4.1-4 Summary Schedule
Sheet 1 of 4

WHC-SP-1101
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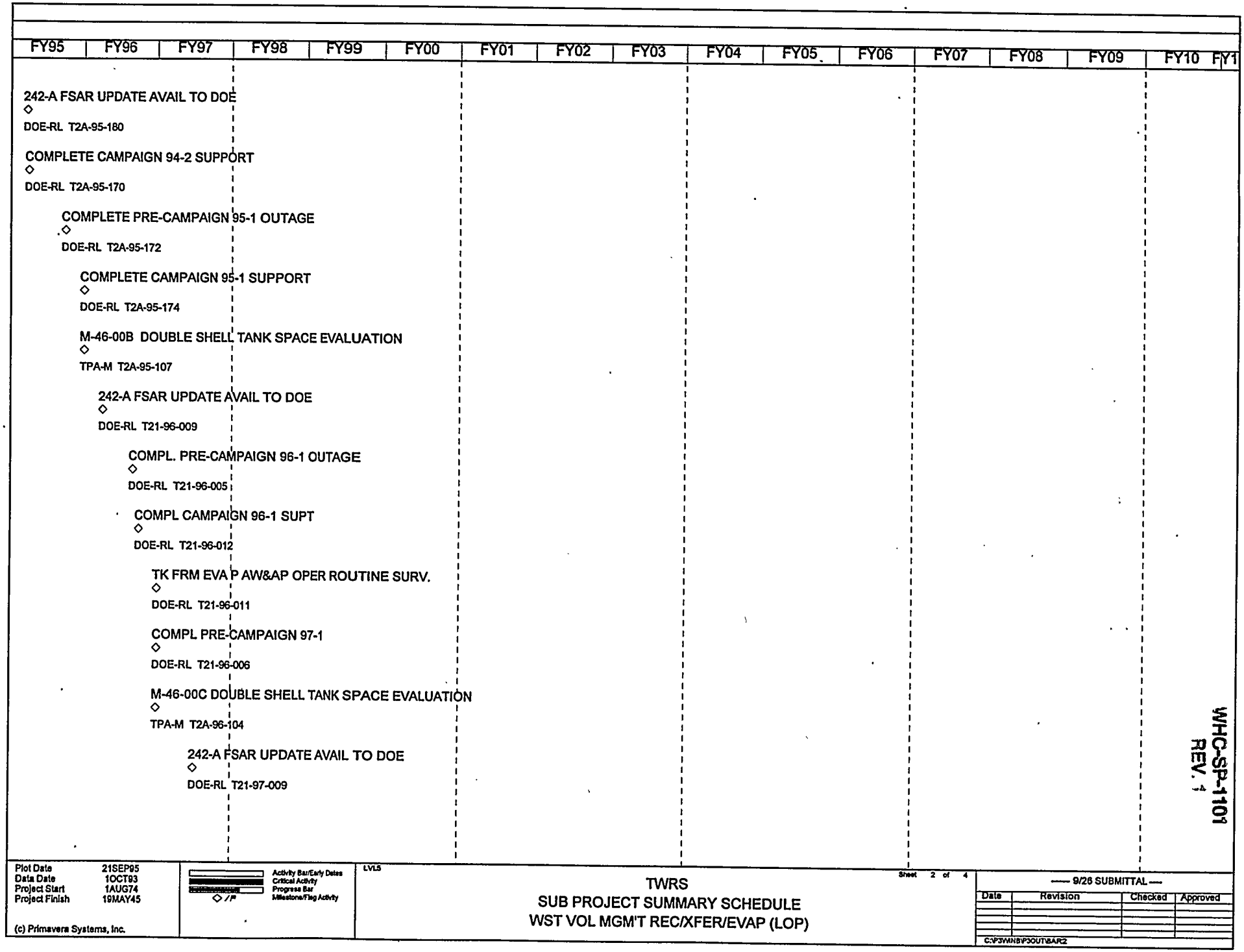
FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05
FY06
FY07
FY08
FY09
FY10
FY1
242-A FSAR UPDATE AVAIL TO DOE
DOE-RL T2A-95-180
COMPLETE CAMPAIGN 94-2 SUPPORT
DOE-RL T2A-95-170
COMPLETE PRE-CAMPAIGN 95-1 OUTAGE
DOE-RL T2A-95-172
COMPLETE CAMPAIGN 95-1 SUPPORT
DOE-RL T2A-95-174
M-46-00B DOUBLE SHELL TANK SPACE EVALUATION
TPA-M T2A-95-107
242-A FSAR UPDATE AVAIL TO DOE
DOE-RL T21-96-009
COMPL. PRE-CAMPAIGN 96-1 OUTAGE
DOE-RL T21-96-005
COMPL CAMPAIGN 96-1 SUPT
DOE-RL T21-96-012
TK FRM EVA P AW&AP OPER ROUTINE SURV.
DOE-RL T21-96-011
COMPL PRE-CAMPAIGN 97-1
DOE-RL T21-96-006
M-46-00C DOUBLE SHELL TANK SPACE EVALUATION
TPA-M T2A-96-104
242-A FSAR UPDATE AVAIL TO DOE
DOE-RL T21-97-009
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 4
TWRS
SUB PROJECT SUMMARY SCHEDULE
WST VOL MGM'T REC/XFER/EVAP (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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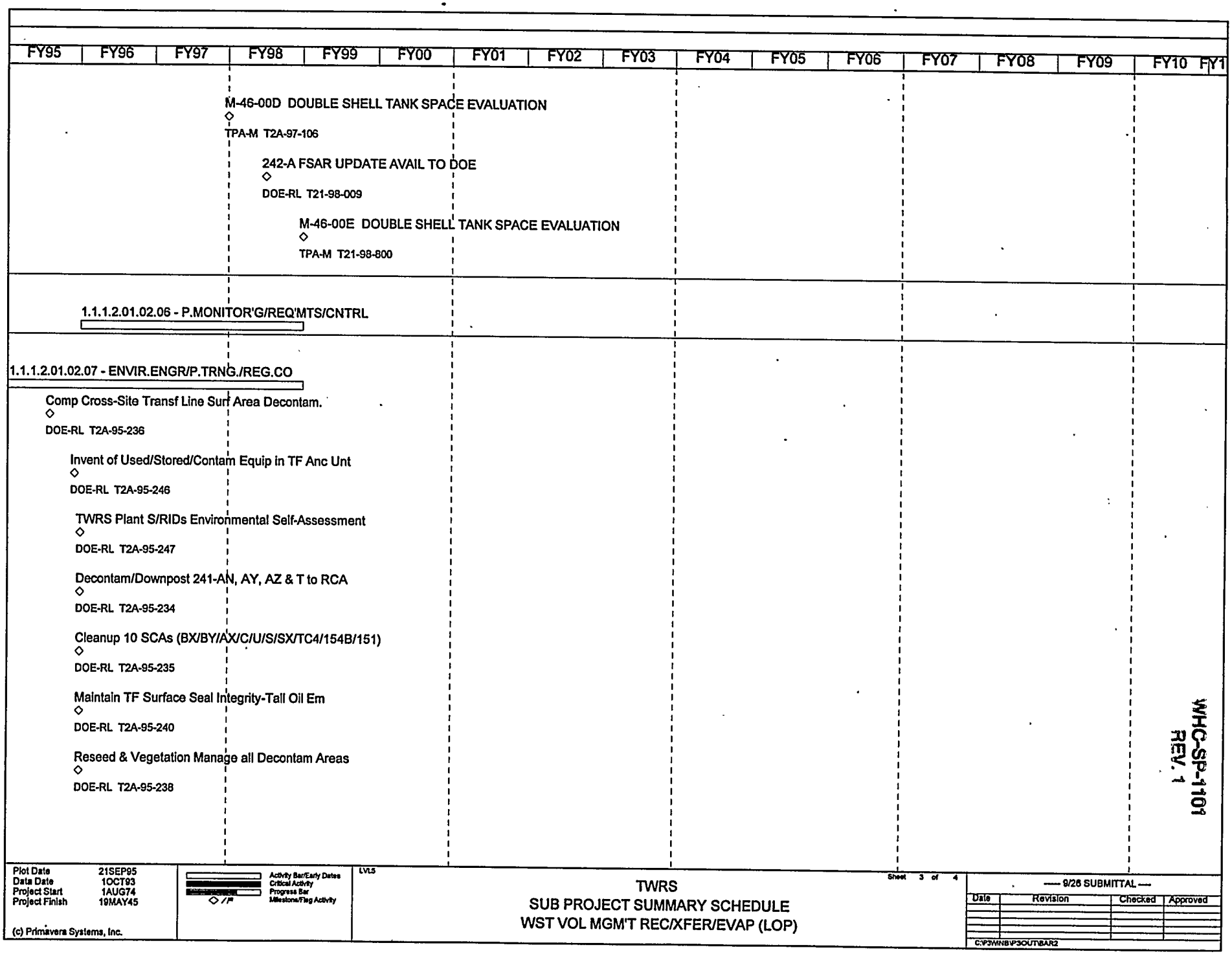
FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05
FY06
FY07
FY08
FY09
FY10
FY1
M-46-00D DOUBLE SHELL TANK SPACE EVALUATION
TPA-M T2A-97-106
242-A FSAR UPDATE AVAIL TO DOE
DOE-RL T21-98-009
M-46-00E DOUBLE SHELL TANK SPACE EVALUATION
TPA-M T21-98-800
1.1.1.2.01.02.06 - P.MONITOR'G/REQ'MTS/CNTRL
1.1.1.2.01.02.07 - ENVIR.ENGR/P.TRNG./REG.CO
Comp Cross-Site Transf Line Surf Area Decontam.
DOE-RL T2A-95-236
Invent of Used/Stored/Contam Equip in TF Anc Unt
DOE-RL T2A-95-246
TWRS Plant S/RIDs Environmental Self-Assessment
DOE-RL T2A-95-247
Decontam/Downpost 241-AN, AY, AZ & T to RCA
DOE-RL T2A-95-234
Cleanup 10 SCAs (BX/BY/AX/C/U/S/SX/TC4/154B/151)
DOE-RL T2A-95-235
Maintain TF Surface Seal Integrity-Tall Oil Em
DOE-RL T2A-95-240
Reseed & Vegetation Manage all Decontam Areas
DOE-RL T2A-95-238
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 3 of 4
TWRS
SUB PROJECT SUMMARY SCHEDULE
WST VOL MGM'T REC/XFER/EVAP (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY1

Waste Minimization: Poll Prev Opportun Assessmts
◇
DOE-RL T2A-95-244

Conduct FY95 TWRS Wst Min/Poll Prevent Actvties
◇
DOE-RL T2A-95-245

1.1.1.2.01.02.09 - TF MWTF PATH FORWARD

Issue report on NCAW consolidation
◇
DOE-RL T21-96-225

Issue report on 102-SY retrieval evaluation
◇
DOE-RL T21-96-229

Issue suppt doc cont inter stab & emerg Pump Pl
◇
DOE-RL T21-96-227

Issue TWRS report on 28 DST & wste transfer
◇
DOE-RL T21-96-231

Issue report on NCRW consolidation
◇
DOE-RL T21-96-226

WHC-SP-1101
REV. 1

Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LVL5

Sheet 4 of 4

TWRS
SUB PROJECT SUMMARY SCHEDULE
WST VOL MGM'T REC/XFER/EVAP (LOP)

9/26 SUBMITTAL

Date	Revision	Checked	Approved

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1.1.1.2.01.02 Waste Vol Mgmt Rec/Xfer/Evap

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.02.03	COMP OUTAGE & CAMPAIGN 96-1 FOR 242A EVAP.	DOE-RL T21-96-002		28JUN96
1.1.1.2.01.02.05	COMPL. PRE-CAMPAIGN 96-1 OUTAGE	DOE-RL T21-96-005		31MAY96
1.1.1.2.01.02.05	COMPL PRE-CAMPAIGN 97-1	DOE-RL T21-96-006		30SEP96
1.1.1.2.01.02.05	242-A FSAR UPDATE AVAIL TO DOE	DOE-RL T21-96-009		29DEC95
1.1.1.2.01.02.05	TK FRM EVA P AW&AP OPER ROUTINE SURV.	DOE-RL T21-96-011		30SEP96
1.1.1.2.01.02.05	COMPL CAMPAIGN 96-1 SUPT	DOE-RL T21-96-012		01JUL96
1.1.1.2.01.02.09	Issue report on NCAW consolidation	DOE-RL T21-96-225		22JAN96
1.1.1.2.01.02.09	Issue report on NCRW consolidation	DOE-RL T21-96-226		19APR96
1.1.1.2.01.02.09	Issue suppt doc cont inter stab & emerg Pump Pl	DOE-RL T21-96-227		29MAR96
1.1.1.2.01.02.09	Issue report on 102-SY retrieval evaluation	DOE-RL T21-96-229		20MAR96
1.1.1.2.01.02.09	Issue TWRS report on 28 DST & wste transfer	DOE-RL T21-96-231		29MAR96
1.1.1.2.01.02.02	AW T.F. ENRAF LEVEL GAUGE INSTALL COMP	DOE-RL T21-96-700		31MAY96
1.1.1.2.01.02.03	STAGE WASTE TO SUPPORT CAMPAIGN 96-1	DOE-RL T21-96-701		01DEC96
1.1.1.2.01.02.03	STAGE WASTE TO SUPPORT CAMPAIGN 97-1	DOE-RL T21-96-702		01APR96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.02 Waste Vol Mgmt Rec/Xfer/Evap

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.02.03	CREATE READINESS ASSESSMENT PROCEDURE	DOE-RL T21-96-703		01MAR96
1.1.1.2.01.02.04	COMPLETE CLASS ROOM TRNG OF NEW EVAP OPERATORS	DOE-RL T21-96-704		31MAY96
1.1.1.2.01.02.03	COMPLETE OUTAGE 97-1 FOR 242-A EVAPORATOR	DOE-RL T21-97-001		30MAY97
1.1.1.2.01.02.03	COMP CAMPAIGN 97-1 FOR 242A EVAP.	DOE-RL T21-97-002		30JUN97
1.1.1.2.01.02.05	242-A FSAR UPDATE AVAIL TO DOE	DOE-RL T21-97-009		28MAR97
1.1.1.2.01.02.05	242-A FSAR UPDATE AVAIL TO DOE	DOE-RL T21-98-009		30MAR98
1.1.1.2.01.02.05	M-46-00E DOUBLE SHELL TANK SPACE EVALUATION	TPA-M T21-98-800		30SEP98
1.1.1.2.01.02.05	M-46-00B DOUBLE SHELL TANK SPACE EVALUATION	TPA-M T2A-95-107		29SEP95
1.1.1.2.01.02.05	COMPLETE CAMPAIGN 94-2 SUPPORT	DOE-RL T2A-95-170		30DEC94
1.1.1.2.01.02.05	COMPLETE PRE-CAMPAIGN 95-1 OUTAGE	DOE-RL T2A-95-172		30JUN95
1.1.1.2.01.02.05	COMPLETE CAMPAIGN 95-1 SUPPORT	DOE-RL T2A-95-174		29SEP95
1.1.1.2.01.02.05	242-A FSAR UPDATE AVAIL TO DOE	DOE-RL T2A-95-180		22DEC94
1.1.1.2.01.02.07	Decontam/Downpost 241-AN, AY, AZ & T to RCA	DOE-RL T2A-95-234		29SEP95
1.1.1.2.01.02.07	Cleanup 10 SCAs (BX/BY/AX/C/U/S/SX/TC4/154B/151)	DOE-RL T2A-95-235		29SEP95

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.02 Waste Vol Mgmt Rec/Xfer/Evap

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.02.07	Comp Cross-Site Transf Line Surf Area Decontam.	DOE-RL T2A-95-236		28APR95
1.1.1.2.01.02.07	Reseed & Vegetation Manage all Decontam Areas	DOE-RL T2A-95-238		29SEP95
1.1.1.2.01.02.07	Maintain TF Surface Seal Integrity-Tall Oil Em	DOE-RL T2A-95-240		29SEP95
1.1.1.2.01.02.07	Waste Minimization: Poll Prev Opportun Assessmts	DOE-RL T2A-95-244		29SEP95
1.1.1.2.01.02.07	Conduct FY95 TWRS Wst Min/Poll Prevent Actvties	DOE-RL T2A-95-245		29SEP95
1.1.1.2.01.02.07	Invent of Used/Stored/Contam Equip in TF Anc Unt	DOE-RL T2A-95-246		31AUG95
1.1.1.2.01.02.07	TWRS Plant S/RIDs Environmental Self-Assessment	DOE-RL T2A-95-247		29SEP95
1.1.1.2.01.02.05	M-46-00C DOUBLE SHELL TANK SPACE EVALUATION	TPA-M T2A-96-104		30SEP96
1.1.1.2.01.02.05	M-46-00D DOUBLE SHELL TANK SPACE EVALUATION	TPA-M T2A-97-106		30SEP97

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.02 - Wst Vol Mgmt/Evap - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	194777	18020	16015	16304	20127	20718	20718	20698	20698	20780	20698
	REPORT TOTAL	194777	18020	16015	16304	20127	20718	20718	20698	20698	20780	20698

CATEGORY	CATEGORY DESCRIPTION	FY 2006
1	EXPENSE	
	REPORT TOTAL	

Attachment 4.1-6 Cost Baseline Summary by Year

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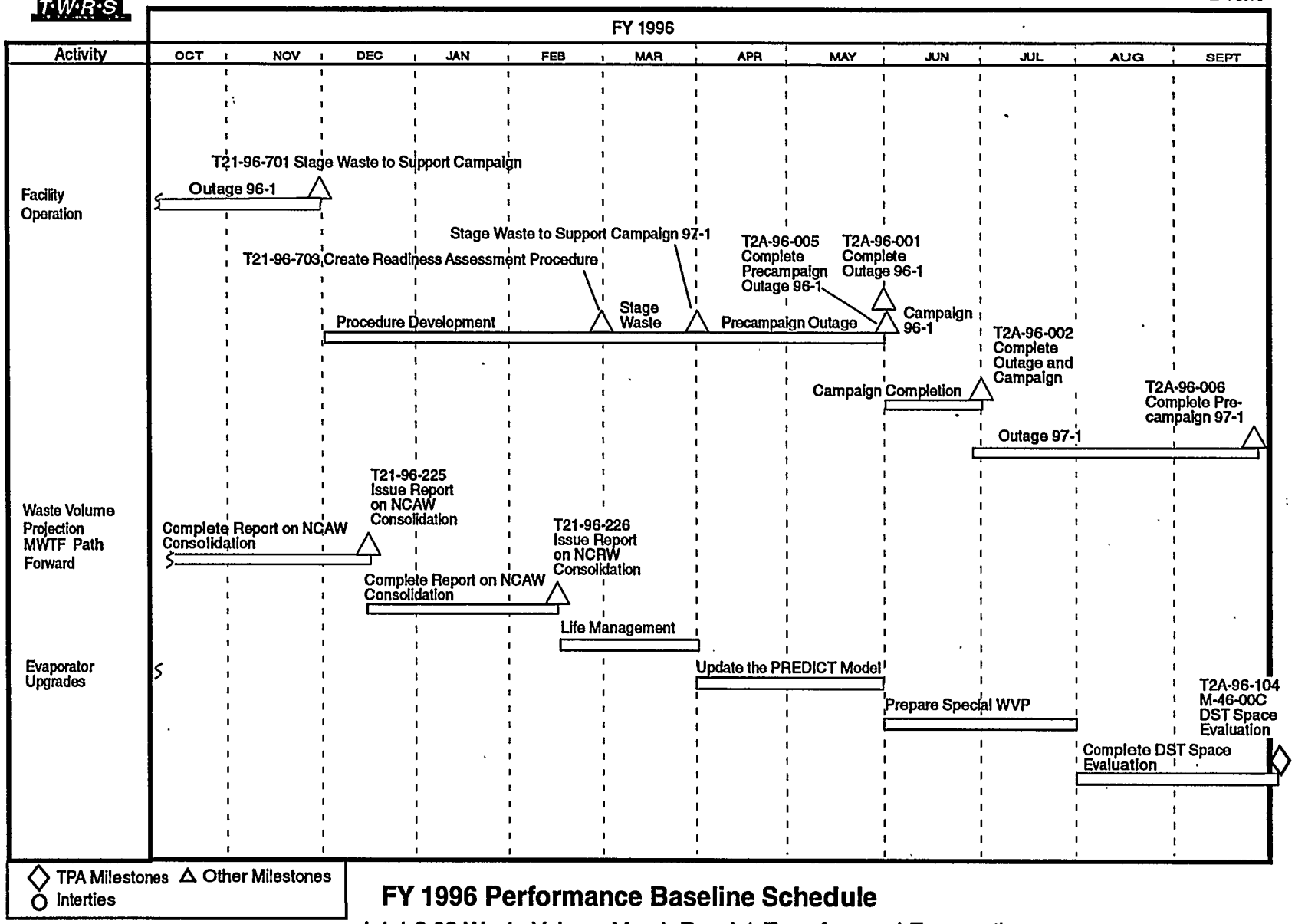

FY 1996 Performance Baseline Schedule

1.1.1.2.02 Waste Volume Mgmt, Receipt, Transfer , and Evaporation

29509043.2 rev 1

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.02 - Wst Vol/Evap - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.01.02.01 - EVAP. TECN. MGM'T & PLANG	351	319	303	351	319	335	351	351	319	335	351	319	4007
	1.1.1.2.01.02.02 - MAINTAIN EVAPORATOR	273	248	236	273	248	261	273	273	248	246	258	235	3074
	1.1.1.2.01.02.03 - EVAP. OPERATIONS	165	150	142	165	150	157	165	165	162	157	165	150	1892
	1.1.1.2.01.02.04 - EVAP ROUTINE SURVEILLANCE	163	148	141	163	148	155	163	163	148	155	163	148	1858
	1.1.1.2.01.02.05 - EVAP. ENGINEERING & ANAL.	425	386	369	377	342	359	377	377	380	351	380	345	4468
	1.1.1.2.01.02.06 - P.MONITOR'G/REQ'MTS/CNTRL	82	74	71	82	74	78	82	82	74	78	82	74	933
	1.1.1.2.01.02.07 - ENVIR.ENGR/P.TRNG./REG.CO	106	96	92	106	96	101	106	106	96	101	106	96	1211
	1.1.1.2.01.02.09 - TF MWTF PATH FORWARD	87	82	78	84	93	73	18	14	13	13	14	8	578
TOTAL	1	1652	1505	1431	1601	1472	1520	1536	1531	1441	1438	1518	1376	18020
	REPORT TOTAL	1652	1505	1431	1601	1472	1520	1536	1531	1441	1438	1518	1376	18020

Attachment 4.1-8 Cost Estimate Baseline by Month

4.2 TRANSITION 200 EAST TO CONTROLLED, CLEAN, AND STABLE (WBS 1.1.1.2.1.3)

4.2.1 STRATEGY

4.2.1.1 Objectives

The same objectives apply for the Transition 200 East to Controlled, Clean, and Stable sub-project as for the Transition 200 West to Controlled, Clean, and Stable sub-project.

The primary objective for this sub-project is to conduct all activities pertaining to the operation of a permitted treatment, storage, and disposal (TSD) facility within the boundary of the current Interim Safety Basis and in a manner that ensures compliance with all applicable federal, state, and local environmental regulations to ensure a safe work environment for all employees and support groups.

This sub-project consists of performing all the support functions required for routine surveillance, operation, and maintenance of the 200 East Area to safely monitor status and control of the underground storage of waste. These functions include the following:

- Performing preventive maintenance
- Performing corrective maintenance (routine and non-routine)
- Concentrating facility operations including waste transfers to feed tanks
- Performing routine surveillance monitoring
- Conducting health physics activities (radiological)
- Conducting industrial hygiene and safety functions
- Performing engineering and analysis (campaign run plans, trade studies, and analysis capability upgrades)
- Managing and controlling upgrades to facilities and infrastructure
- Enhancing the safety of facility operations and preparing the facilities for the eventual turnover to Waste Disposal program.

4.2.1.2 Planning Assumptions

The Transition 200 East to Controlled, Clean, and Stable sub-project baseline was based on the following assumptions:

1. Controlled, clean, and stable is achievable for SST farms in 2001. Establishing an acceptable end state on a farm-by-farm basis will significantly lower near-term operational costs with savings being realized from the first year.

2. A systems engineering approach will be applied to all Tank Farm Operations Project activities.

3. Tank Farm Operations Project facilities and utility and transfer systems shall be upgraded to current codes and standards to the extent practicable.

4. Upgrades to selected facilities and systems will be performed to meet mission requirements and achieve a cost effective, negotiated level of compliance.

5. Equipment and facilities will be restored to satisfy interim safe operations requirements.

6. Emergency pumping will be required as there will be one new "assumed leaking" SST annually until interim stabilization has been completed.

7. Interim stabilization of SSTs will be complete by September 2000. Failure to interim stabilize the SSTs on an aggressive schedule would increase the risk of additional leaking tanks and environmental insult. Space will be available in DSTs for SST liquids. Compatibility issues will be resolved, and cross-site transfers will be made.

8. Retrieval of SSTs will be initiated by December 2003. Failure to initiate retrieval on schedule would compromise the schedule for turning them over to EM-40 for D&D. Delays in the schedule would increase the cost of operating the tank farms.

9. Liquids from SST retrieval and new liquid waste will go to DSTs. The SSTs are beyond design life, and the risk of leaking is unacceptable. All pumpable liquid is to be removed from the SSTs by 2000, and all new liquid waste is to be added to the DSTs. Evaporation will be used to achieve the waste volume reduction needed to ensure adequate DST space for projected new waste and retrieval volumes.

10. Safety issues will be resolved to allow SST pumping in accordance with the Tri-Party Agreement interim milestones. Flammable gas monitoring equipment will be installed on flammable gas Watch List SSTs before Interim Stabilization work is scheduled to start on these tanks. Liquid grab samples will be taken and laboratory analysis completed prior to the scheduled start of pumping.

11. The LOW installations will be completed in FY 1998. The LOW material is mild steel and installation is performed with current lancing procedures. There will be no major changes in safety or environmental requirements or approvals. Core sampling will be completed on schedule to support LOW installation.

12. The Transition 200 West to Controlled, Clean, and Stable sub-project will be consolidated into the Transition 200 East to Controlled, Clean, and Stable sub-project in 2001.

13. No Hanford facility will suffer noncompliance with storage regulations or cleanup program delays caused by the inability of tank farms to receive liquid waste.

14. The fifth shift (training shift) will be required to maintain the identified qualifications of the operators while minimizing the overtime required and maximizing training effectiveness. Failure to maintain staffing for the fifth shift will result in missed training and increased overtime costs.

15. Evaporator operations will be used to manage/optimize DST liquid volume and assumes one evaporator campaign will be required per year. The evaporator is required to achieve the Waste Volume Reduction required to avoid the need for additional DST storage tanks at a greatly increased cost.

16. The Evaporator will transfer responsibility for the AW/AP Tank Farms in 2005 to the Transition 200 East to Controlled, Clean, and Stable sub-project.

17. The Cross-Site Transfer System (W-058) will be completed in 1998 to provide a reliable transfer line. The existing transfer line integrity can be maintained until the completion of W-058.

18. No DST problems will occur that limit their use.

19. The Waste Disposal program assumes the SST Minimum Safe Operations activity from the Tank Farm Operations Project in 2001.

20. The Waste Disposal program assumes the DST Transition Operations activity, infrastructure, and personnel from the Tank Farm Operations Project in the year 2005 and/or when the W-314 MSA is complete.

21. No funding is available for additional tanks being added to the Watch List requiring implementation of Watch List controls or equipment installations affecting baseline work scope.

4.2.1.3 Constraints

Administrative and Management constraints include the following:

- Funding availability
- Validity of cost estimates
- Ability of the Waste Characterization program to meet sampling schedule
- Davis-Bacon Act
- Systems Engineering definition and implementation impacts
- Procurement regulations
- Waste Volume Projection accuracy of non-TWRS generated waste
- Safety issue resolution
- Tri-Party Agreement
- The S/RIDs developed and approved by DOE
- The S/RIDs developed and approved for the Tank Farms Operations Project.

Environmental Protection Constraints include the following:

General:
- 42 USC 4321, et seq., *National Environmental Policy Act of 1969*

Air:
- 42 USC 7401, et seq., *Clean Air Act*
- RCW 70.94, *Washington Clean Air Act*

Water:

- 33 USC 1251, et seq., *Clean Water Act*
- 42 USC 300, et seq., *Safe Drinking Water Act*
- WAC 173-200, "Water Quality Standards for Groundwater of the State of Washington"
- 91nm-177, *Ecology Consent Order*

Materials Handling constraints include the following:

- 42 USC 6901, et seq., *Resource Conservation and Recovery Act of 1976 and Hazardous and Solid Waste Amendments of 1984*
- 42 USC 9601 et seq., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Superfund Amendments and Reauthorization Act of 1986*
- WAC 173-303, "Dangerous Waste Requirements"
- 42 USC 2011 et seq., *Atomic Energy Act of 1954*
- 10 CFR 71, "Packaging and Transportation of Radioactive Material"
- 10 CFR 830.120, "Quality Assurance"

Worker Safety in Operations include the following:

- HRSCM01, Rev. 2, "Hanford Site Radiological Control Manual"
- 10 CFR 835, "Occupational Radiation Protection"
- 29 CFR 1910, "Occupational Health and Safety Standards"
- PL 101-510 Sec 3137, "Wyden Amendments"
- Defense Nuclear Facilities Safety Board Recommendations

DOE Orders including the following:

- DOE Order 2550.1, *Cost and Schedule Control System Criteria for Contract Performance*
- DOE Order 4330.4A, *Conduct of Operations*
- DOE Order 4700.1, *Project Management System*
- DOE Order 5000.3A, *Occurrence Reporting and Processing of Operations Information*
- DOE Order 5480.1B, *Environment, Safety and Health Program for Department of Energy*
- DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*
- DOE Order 5480.20, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Facilities*
- DOE Order 5480.21, *Unreviewed Safety Question*
- DOE Order 5480.22, *Technical Safety Requirements*
- DOE Order 5480.23, *Nuclear Safety Analysis Reports*
- DOE Order 5480.24, *Criticality Safety*
- DOE Order 5480.26, *Trending and Analysis of Operations Information Using Performance Indicators*
- DOE Order 5480.31, *Startup and Restart of Nuclear Facilities*
- DOE Order 5480.5, *Safety of Nuclear Facilities*
- DOE Order 5481.1, *Safety Analysis and Review System*
- DOE Order 5484.1, *Environmental Protection, Safety, and Health Protection Information Reporting System*
- DOE Order 5700.6C, *Quality Assurance*
- DOE Order 5820.2A, *Radioactive Waste Management*
- DOE Order 6430.1A, *General Design Criteria*

4.2.2 TECHNICAL REQUIREMENTS BASELINE

4.2.2.1 Work Breakdown Structure

The Transition 200 East to Controlled, Clean, and Stable sub-project WBS Tree is found in Attachment 4.2-1.

4.2.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Transition 200 East to Controlled, Clean, and Stable sub-project is found in Attachment 4.2-2. Lower level dictionary sheets are available in PMCS.

4.2.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Transition 200 East to Controlled, Clean, and Stable sub-project is found in Attachment 4.2-3.

4.2.2.4 Technology Needs

The Transition 200 East to Controlled, Clean, and Stable sub-project is committed to both continuous improvements and cost reductions. This sub-project will pursue and assess various technologies throughout the execution of the project mission. The technologies to be assessed include the following:

- In tank instrumentation replacements
- Modern equipment replacements (pumps)
- Waste minimization processes
- Data taking equipment (spectral gamma)
- ALARA practices
- DST qualification life extension
- Utilities and service improvements (alternative energy sources)
- TMACS software improvements
- Data management configuration improvements
- Effluent monitoring, solid waste minimization and characterization, recycling programs, decontamination processes, and sample analysis alternatives
- Tank structural monitoring/analysis, corrosion control methods, modeling, and fissile material measurement methods
- Interim stabilization and emergency pumping technology improvements
- Radiological, physical, and chemical modeling
- Remotely operated equipment for surveillance and D&D.

4.2.3 SCHEDULE BASELINE

4.2.3.1 Summary Schedule

See Attachment 4.2-4 for the summary schedule.

4.2.3.2 Milestone Control Log

See Attachment 4.2-5 for the Milestone Control Log. Milestone description sheets are found in Appendix A.

4.2.4 COST BASELINE

4.2.4.1 Cost Baseline Summary by Year

Attachment 4.2-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

4.2.4.2 Basis of Estimate

Cost estimates for the Tank Farms Operations Project have been developed in conjunction with an independent team of experts from an external consulting firm. The basis for estimates, WBS dictionary sheets, product definitions, and activity planning forms have been reviewed and refined and are incorporated into this MYPP. In addition, the planning assumptions in Sections 4.0.1.2, 4.1.1.2, 4.2.1.2, and 4.3.1.2 provide additional support for these estimates as well as the schedule logic and task identifications represented in Sections 4.1-4 and 4.1-7.

The detailed WBS dictionary sheets are contained in the PMCS system, while the backup cost estimating sheets are maintained in the program office.

4.2.5 PERFORMANCE MEASURES

The performance measures utilized by the Transition 200 East to Controlled, Clean, and Stable sub-project are tied to both C/SCSC and to various performance indicators relating to the overall conduct of operations within the project. These include the following:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product (average cost for SST stabilization)
- Overtime percentage worked
- Age of Engineering Change Notice
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - -Lost work days
  - -Recordable incidents
  - -First aid cases
  - -Maintenance backlog
  - -Unusual occurrence reports
  - -Off normal occurrence reports
  - -Log omissions
  - -Missed out of tolerance readings

-Corrective action management
-Solid waste generation
-Saltwell pumping
-Lock and tag activities
-Temporary mods/bypasses
-Drills
-Nonconformance reports
-Internal/external transfers
-Waste internally transferred in gallons.

4.2.6 EXECUTION YEAR

4.2.6.1 Technical Objectives

The technical objectives for the Transition 200 East to Controlled, Clean, and Stable sub-project are to initiate the transition of SST tank farms to a Controlled, Clean, and Stable condition by 1999. The technical objectives include the following six SST tank farms:

- BX Farm and C Farm
- B Farm and BY Farm
- A Farm and AX Farm

4.2.6.2 FY 1996 Performance Baseline Schedule

Attachment 4.2-7 contains the FY 1996 performance baseline schedule.

4.2.6.3 Cost Estimate Baseline by Month

Attachment 4.2-8 establishes the month-by-month cost estimate baseline for FY 1996.

4.2.6.4 FY 1995 Work Scope Carryover Summary

Some activities which were planned in FY 1995 were not completed on schedule and will slip into FY 1996. These activities and the related milestones are reflected in the schedule and are planned for completion in FY 1996. The items that are being carried over into FY 1996 will be provided prior to completion of the MYPP.

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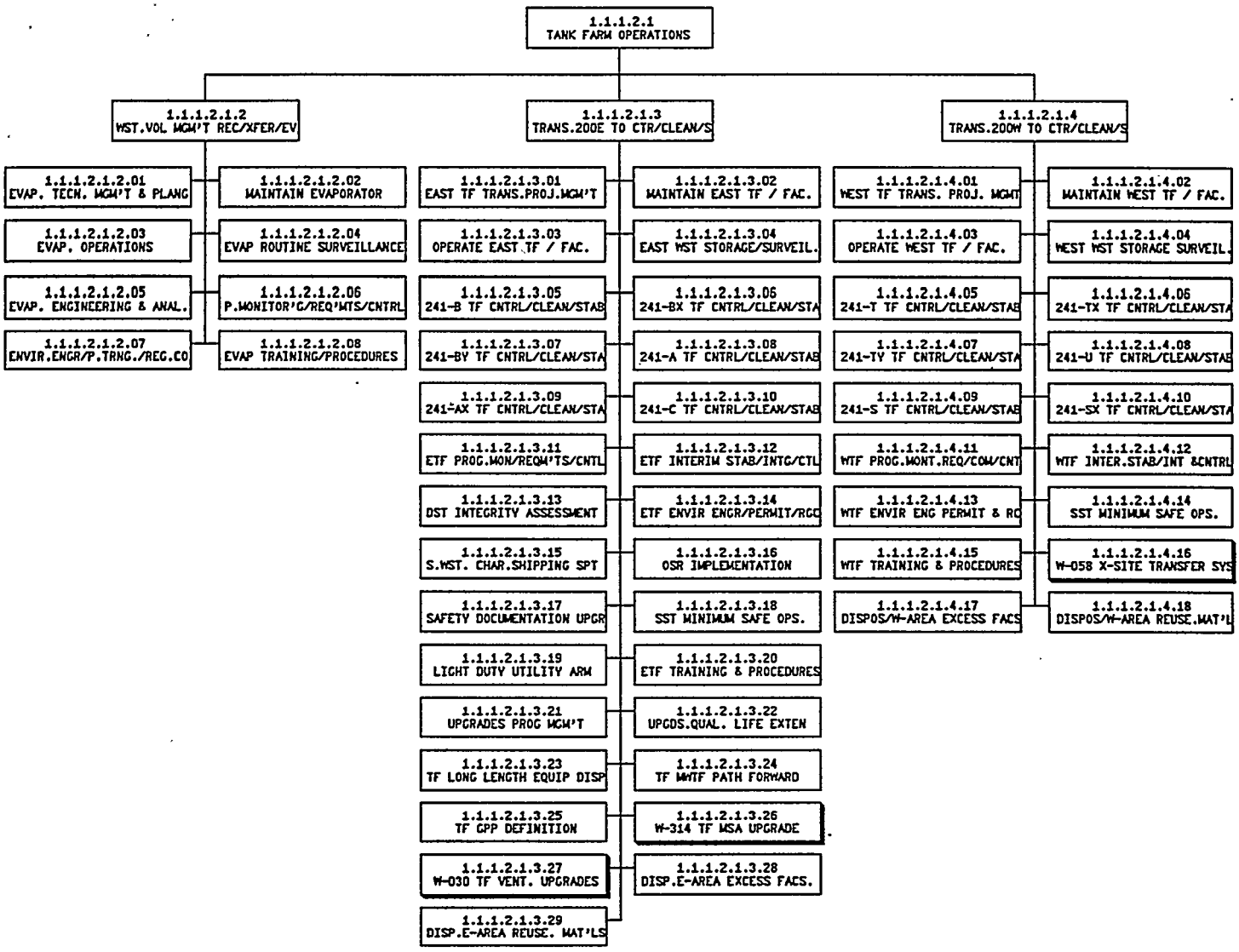
LISTING OF ATTACHMENTS

Attachment 4.2-1	Work Breakdown Structure
Attachment 4.2-2	WBS Dictionary Sheet
Attachment 4.2-3	Responsibility Assignment Matrix
Attachment 4.2-4	Summary Schedule
Attachment 4.2-5	Milestone Control Log
Attachment 4.2-6	Cost Baseline Summary by Year
Attachment 4.2-7	FY 1996 Performance Baseline Schedule
Attachment 4.2-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
TANK FARM OPERATIONS



Attachment 4.2-1 Work Breakdown Structure

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
o/ 3/95	1.1.1 TWRS 1.1.1.2 Waste Storage 1.1.1.2.01 Tank Farm Operations	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.01.03 Level 5	4. WBS ELEMENT TITLE Transition 200 East to Controlled, Clean, and Stable	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 9/26/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11000 11200 11201	9. BUDGET AND REPORTING NUMBERS Operating: EW3120071 CENTRC: 35EW31207 GPP: 39EW31301 Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	86,767.00	72,834.00	64,968.00	60,142.00	57,599.00	51,627.00	60,904.00
CENRTC	3,203.00	2,202.00	3,001.00	2,301.00	2,200.00	2,101.00	
LINE ITEM	737.00	9,622.00	19,800.00	67,436.00	99,004.00	136,977.00	90,001.00
GPP	4,272.00	1,998.00	1,996.00	2,001.00	2,000.00	1,500.00	
TOTAL	94,979.00	86,656.00	89,765.00	131,880.00	160,803.00	192,205.00	150,905.00

B. TECHNICAL BASES

Goals and Objectives

The functional product of the Transition 200 East to Controlled, Clean, and Stable sub-project is to coordinate, monitor, and control Facility Operations support to the material condition, receipt, storage, and transfer operations of 200 East Tank Farm Storage Facilities in support of Westinghouse Hanford Company and the Department of Energy's environmental management goals at Hanford.

Conduct all activities pertaining to operation of a permitted treatment, storage, and disposal facility within the boundary of current Interim Safety Basis and in a manner that ensures compliance with all applicable federal, state, and local environmental regulations to ensure a safe work environment for all employees and support groups.

This sub-project consists of performing all of the support functions required for providing the routine surveillance, operations, and maintenance of 200 East Area to safely monitor status and control the underground storage of waste. These functions are:

Preventive maintenance,
Corrective maintenance (routine and non-routine),
Routine surveillance monitoring,
Health physics activities (radiological),
Industrial hygiene and safety functions,

Engineering and analysis,
Manage and control upgrades to facilities and infrastructure, and
Enhance the safety of facility operations as well as prepare the facilities for the eventual turnover to Waste Disposal program.

The Transition 200 East to Controlled, Clean, and Stable sub-project consists of performing the following major activities in support of the sub-project mission:

Technical Management and Administration
-Project and baseline management
-Providing utilities and services
-Training and certification program
-Nuclear safety oversight
-Configuration management and support
-Providing quality assurance/quality control support
-Tank farm security operations and upgrades
-Review/revising tank farm operations and administrative procedures
-Tank farm surveillance database maintenance and management

Tank Farm Compliance and Corrective Activities
-Double-shell tank integrity assessments
-Permitting and regulatory compliance
-Radioactive/hazardous solid waste management
-Environmental compliance, engineering, analysis, and assessments
-Safety envelope definition and implementation
-Double-shell tank emergency pumping planning/preparations
-Special disposal of unusable/abandoned field and in-tank equipment
-Compliance management and ALARA support to field activities
-OSR implementation including necessary upgrades
-Criticality engineering upgrades and safety reviews
-Surface contamination zone reduction
-Vadose Zone Monitoring support

Tank Farm Single-Shell Tank Interim Stabilization

-Complete Interim Stabilization and intrusion prevention for Single-Shell Tanks with pumpable liquid (except 241-C-106)
-Prepare for emergency pumping leaking Single-Shell Tanks and pump leaking Single-Shell Tanks if required.

Install Liquid Observation Wells in all Single-Shell Tanks with sufficient material to function.

Tank Farm Retired Facilities
-Transition planning for each facility or system
-Facility preparation for transfer to EM-40
-Surveillance and maintenance of retired facilities until transfer to EM-40 is accomplished
-Safe shutdown and transfer to EM-40

Major End-Item Deliverables

Five-year plan input and review with RL
Monthly baseline reviews with RL
Maintaining the safe and compliant operating configuration within the sub-project
Completing M-41-00, Single-Shell Tank Interim Stabilization
Completing M-43-00, Tank Farm Upgrades
Release of waste tanks for Retrieval and eventual turnover to EM-40
Turnover of all facilities to EM-40 for closure
Completing M-46-00, Double-Shell Tank space evaluation
See milestone log in Attachment 5 for level 5 milestones and deliverables

Acceptance Criteria

• Achieving and maintaining regulatory and DOE Order compliance in project facilities for the continued safe storage and treatment of radioactive/hazardous waste

• Implementation and adherence to the new Operational Safety Requirements parameters

C. STATEMENT OF WORK

Required activities over lifetime:

•Perform scheduled component-based recall system, preventive maintenance, high-efficiency particulate air (filter) testing, and third party inspections

•Corrective maintenance includes identifying deficiencies, fixing and replacing failed equipment

•Waste tank transfers, performing jumper changes and pump removals as required, rail car and tanker truck transfers

•Radiological control performing personnel and work place surveys, monitor source checks, and PCM1B checks

•Obtaining panel board/management control system surveillance data, condensate basin readings, vessel ventilation system readings, ion-exchange column readings, and canyon area ventilation surveillance data

•Develop operating strategies/plans, process improvements, trending and review of operating data, monitoring process limits, ensuring technical accuracy, and process problem resolution

•Maintain the Cross-Site transfer capability to enable receipt of waste

•Provide operations support and technical support to maintain base safe operations for the sub-project

•Provide systems engineering support for oversight, evaluation and analysis capability

•Provide for emergency pumping of leaking Single-Shell Tanks and pump as required

•Project W-030, AY/AZ Farm Ventilation Upgrades

•Provide Light Duty Utility Arm (LDUA) support for prototype LDUA

•Project W-314, Tank Farm W-314 MSA Upgrade

•Identify no longer needed tank farm facilities

•Perform an assessment of each facility to determine its status and readiness for turnover to ER

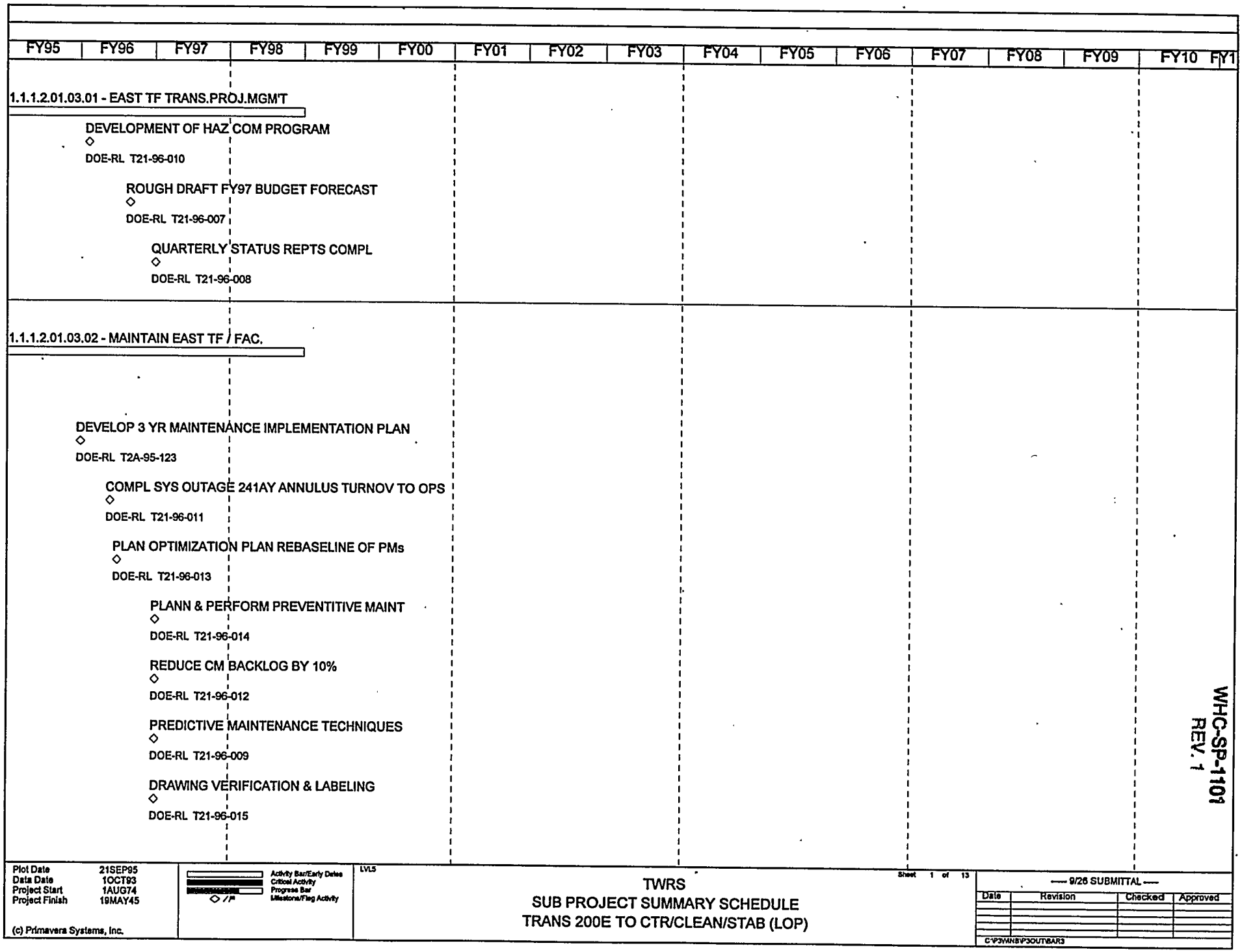
•Prepare and execute required work plan to complete the facility's readiness for turnover to ER

•Provide for all legally required surveillances of retired facilities until they have been accepted by the Environmental Restoration Program

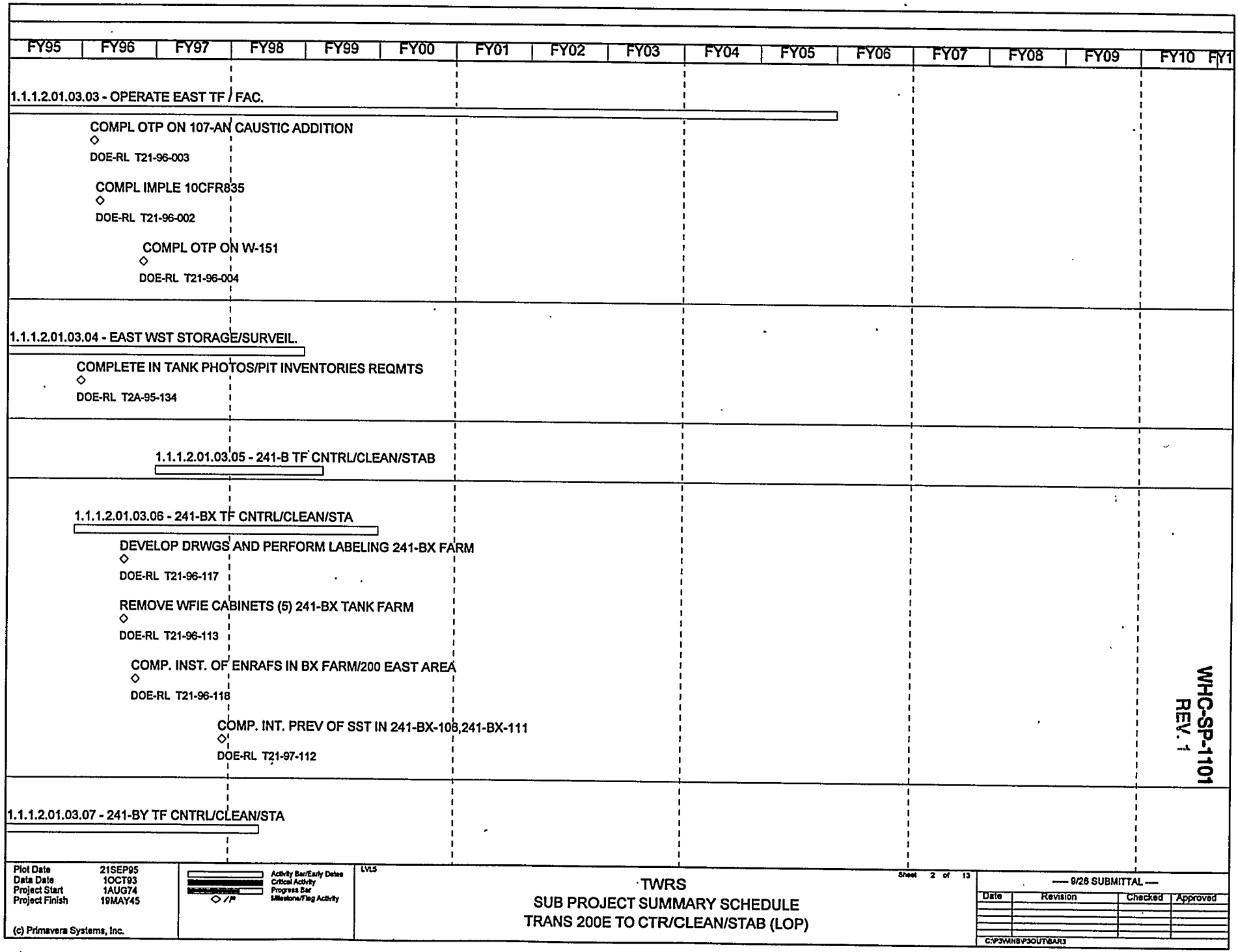
•Document formal turnover of retired facilities as required by the EM-40 Decontamination and Decommissioning Guidance Document

WBS	Account #	Title	Activity Manager	CAM	Program Support
1.1.1.2.1	1N1	Tank Farm Operations	J. L. Lee		D. L. Burt
1.1.1.2.1.3	1N1F	Transition 200 East to Controlled, Clean, and Stable	J. H. Wicks		A. R. Jaramillo
1.1.1.2.1.3.1	1N1F61	Transition East Tank Farm Project Management	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.2	1N1F62	Maintain East Tank Farms/ Facilities	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.3	1N1F63	Operate East Tank Farms/Facilities	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.4	1N1F64	East Waste Storage/ Surveillance	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.5	1N1F65	241-B Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.6	1N1F66	241-BX Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.7	1N1F67	241-BY Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.8	1N1F68	241-A Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.9	1N1F69	241-AX Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.10	1N1F6A	241-C Tank Farm Controlled, Clean, & Stable	J. H. Wicks	P. Hinojosa	A. R. Jaramillo
1.1.1.2.1.3.11	1N1F41	East Tank Farms Program Monitoring Requirements Comm & Control	J. H. Wicks	D. L. Burt	A. R. Jaramillo
1.1.1.2.1.3.12	1N1F4D	East Tank Farms Interim Stabilization Integration & Control	J. H. Wicks	T. E. Rainey	A. R. Jaramillo
1.1.1.2.1.3.13	1N1F31	SST/DST Integrity Assessment	J. H. Wicks	K.V. Scott	A. R. Jaramillo
1.1.1.2.1.3.14	1N1F32	East Tank Farms Environmental Engineering, Permitting & Regulatory Compliance	J. H. Wicks	R. D. Gustavson	A. R. Jaramillo

WBS	Account #	Title	Activity Manager	CAM	Program Support
1.1.1.2.1.3.15	1N1F34	Solid Waste Characterization Shipping Support	J. H. Wicks	P. A. Gagnon	A. R. Jaramillo
1.1.1.2.1.3.16	1N1F38	OSR Implementation	J. H. Wicks	J. G. Propson	A. R. Jaramillo
1.1.1.2.1.3.17	1N1F39	Safety Documentation Upgrades	J. H. Wicks	J. G. Propson	A. R. Jaramillo
1.1.1.2.1.3.18	Inactive	ETF SST Minimum Safe Operations	J. H. Wicks	Inactive	A. R. Jaramillo
1.1.1.2.1.3.19	1N1F3E	Light Duty Utility Arm	J. H. Wicks	T. E. Rainey	A. R. Jaramillo
1.1.1.2.1.3.20	1N1F21	East Tank Farms Training & Procedures	J. H. Wicks	T. Morton	A. R. Jaramillo
1.1.1.2.1.3.21	1N1F81	Upgrades Program Management	J. H. Wicks	J. E. Allison	A. R. Jaramillo
1.1.1.2.1.3.22	1N1F82	Upgrades Qualification Life Extension	J. H. Wicks	P. C. Ohl	A. R. Jaramillo
1.1.1.2.1.3.23	1N1F83	ETF Tank Farms Long-Length Equipment Disposal/ Prototype Transfer Pump	J. H. Wicks	S. D. Riesenweber	A. R. Jaramillo
1.1.1.2.1.3.24	1N1F86	ETF MWTF Path Forward	J. H. Wicks	C. W. Dunbar	A. R. Jaramillo
1.1.1.2.1.3.25	1N1F87	Tank Farms GPP Definition	J. H. Wicks	J. M. Light	A. R. Jaramillo
1.1.1.2.1.3.26	1N1F8B	ETF Project W-314 MSA Upgrade	J. H. Wicks	M. S. Harrington/ C. E. Shipler/ D. J. Brown	A. R. Jaramillo
1.1.1.2.1.3.27	1N1F8C	ETF Project W-030 Ventilation Upgrade	J. H. Wicks	K. A. Colosi	A. R. Jaramillo
1.1.1.2.1.3.28	Inactive	Disposition Excess Facilities	J. H. Wicks	Inactive	A. R. Jaramillo
1.1.1.2.1.3.29	Inactive	Disposition Reusable Materials	J. H. Wicks	Inactive	A. R. Jaramillo



Attachment 4.2-4 Summary Schedule
Sheet 1 of 13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1.1.1.2.01.03.03 - OPERATE EAST TF / FAC.
COMPL OTP ON 107-AN CAUSTIC ADDITION
DOE-RL T21-96-003
COMPL IMPLE 10CFR835
DOE-RL T21-96-002
COMPL OTP ON W-151
DOE-RL T21-96-004
1.1.1.2.01.03.04 - EAST WST STORAGE/SURVEIL.
COMPLETE IN TANK PHOTOS/PIT INVENTORIES REQMTS
DOE-RL T2A-95-134
1.1.1.2.01.03.05 - 241-B TF CNTRL/CLEAN/STAB
1.1.1.2.01.03.06 - 241-BX TF CNTRL/CLEAN/STA
DEVELOP DRWGS AND PERFORM LABELING 241-BX FARM
DOE-RL T21-96-117
REMOVE WFIE CABINETS (5) 241-BX TANK FARM
DOE-RL T21-96-113
COMP. INST. OF ENRAFS IN BX FARM/200 EAST AREA
DOE-RL T21-96-118
COMP. INT. PREV OF SST IN 241-BX-108,241-BX-111
DOE-RL T21-97-112
1.1.1.2.01.03.07 - 241-BY TF CNTRL/CLEAN/STA
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 2 of 13
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
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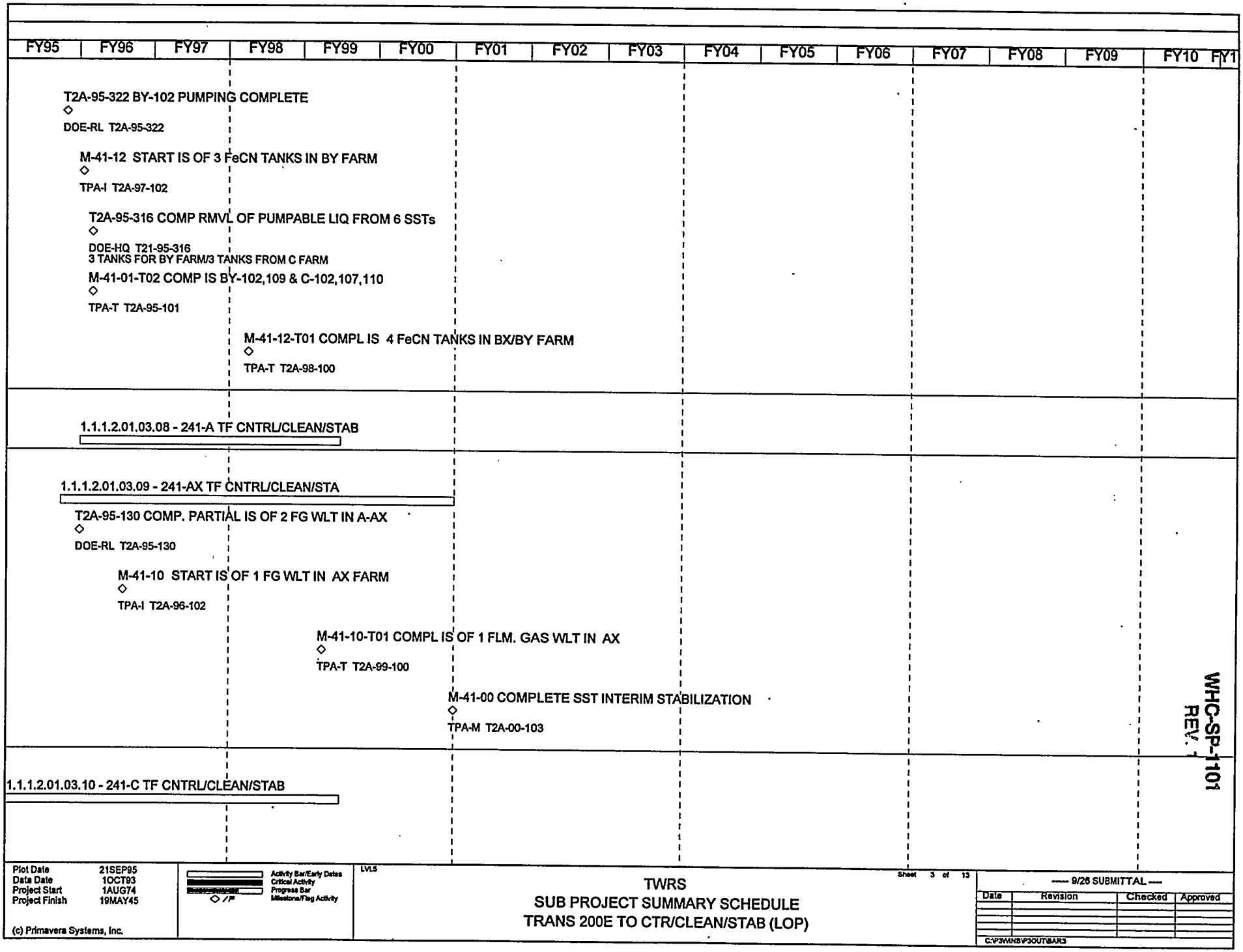
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T2A-95-322 BY-102 PUMPING COMPLETE
DOE-RL T2A-95-322
M-41-12 START IS OF 3 FeCN TANKS IN BY FARM
TPA-I T2A-97-102
T2A-95-316 COMP RMVL OF PUMPABLE LIQ FROM 6 SSTs
DOE-HQ T21-95-316
3 TANKS FOR BY FARM/3 TANKS FROM C FARM
M-41-01-T02 COMP IS BY-102,109 & C-102,107,110
TPA-T T2A-95-101
M-41-12-T01 COMPL IS 4 FeCN TANKS IN BX/BY FARM
TPA-T T2A-98-100
1.1.1.2.01.03.08 - 241-A TF CNTRL/CLEAN/STAB
1.1.1.2.01.03.09 - 241-AX TF CNTRL/CLEAN/STA
T2A-95-130 COMP. PARTIAL IS OF 2 FG WLT IN A-AX
DOE-RL T2A-95-130
M-41-10 START IS OF 1 FG WLT IN AX FARM
TPA-I T2A-96-102
M-41-10-T01 COMPL IS OF 1 FLM. GAS WLT IN AX
TPA-T T2A-99-100
M-41-00 COMPLETE SST INTERIM STABILIZATION
TPA-M T2A-00-103
1.1.1.2.01.03.10 - 241-C TF CNTRL/CLEAN/STAB
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
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Sheet 3 of 13
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
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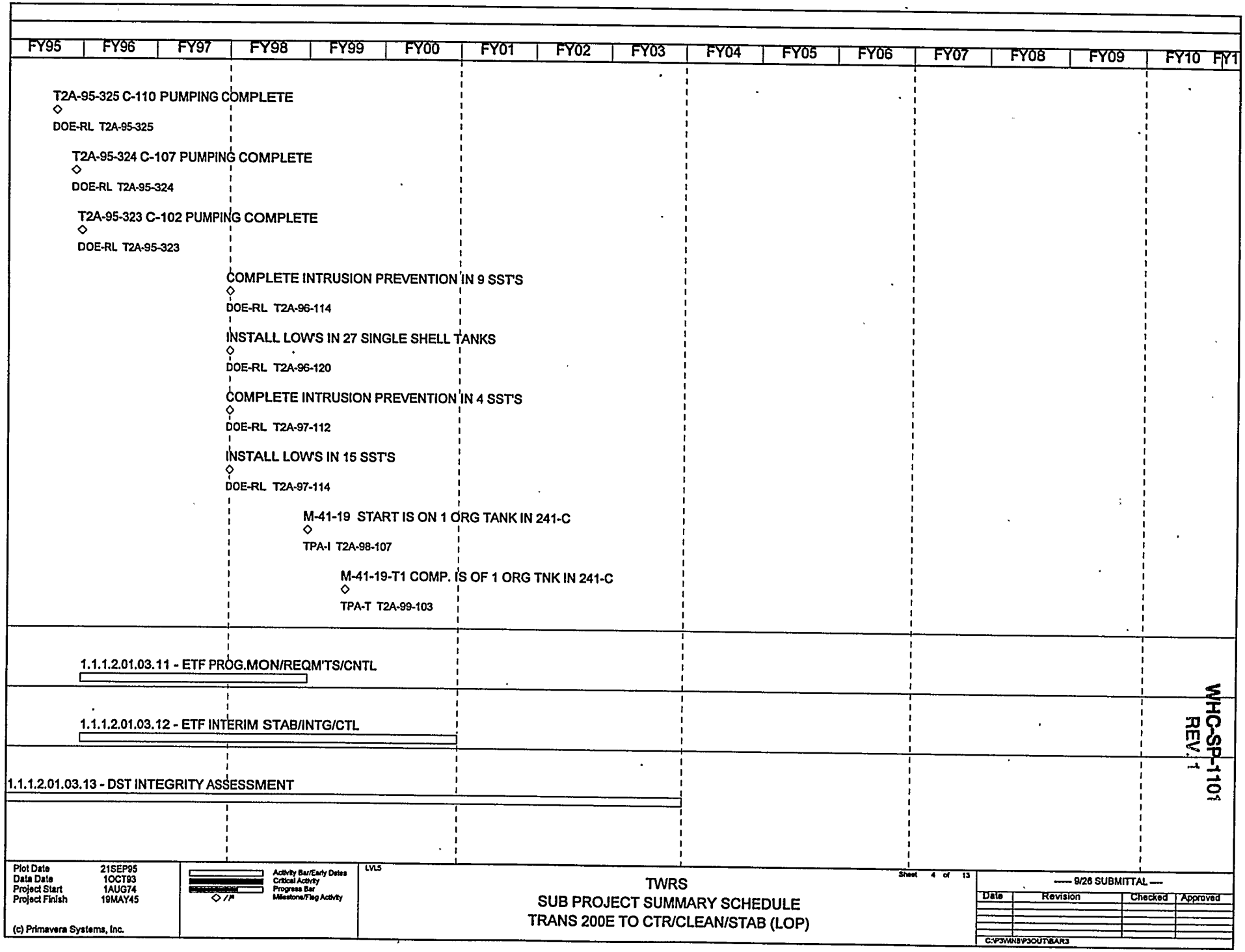
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T2A-95-325 C-110 PUMPING COMPLETE
DOE-RL T2A-95-325
T2A-95-324 C-107 PUMPING COMPLETE
DOE-RL T2A-95-324
T2A-95-323 C-102 PUMPING COMPLETE
DOE-RL T2A-95-323
COMPLETE INTRUSION PREVENTION IN 9 SST'S
DOE-RL T2A-96-114
INSTALL LOWS IN 27 SINGLE SHELL TANKS
DOE-RL T2A-96-120
COMPLETE INTRUSION PREVENTION IN 4 SST'S
DOE-RL T2A-97-112
INSTALL LOWS IN 15 SST'S
DOE-RL T2A-97-114
M-41-19 START IS ON 1 ORG TANK IN 241-C
TPA-I T2A-98-107
M-41-19-T1 COMP. IS OF 1 ORG TNK IN 241-C
TPA-T T2A-99-103
1.1.1.2.01.03.11 - ETF PROG.MON/REQM'TS/CNTL
1.1.1.2.01.03.12 - ETF INTERIM STAB/INTG/CTL
1.1.1.2.01.03.13 - DST INTEGRITY ASSESSMENT
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
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Progress Bar
Milestone/Flag Activity
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SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
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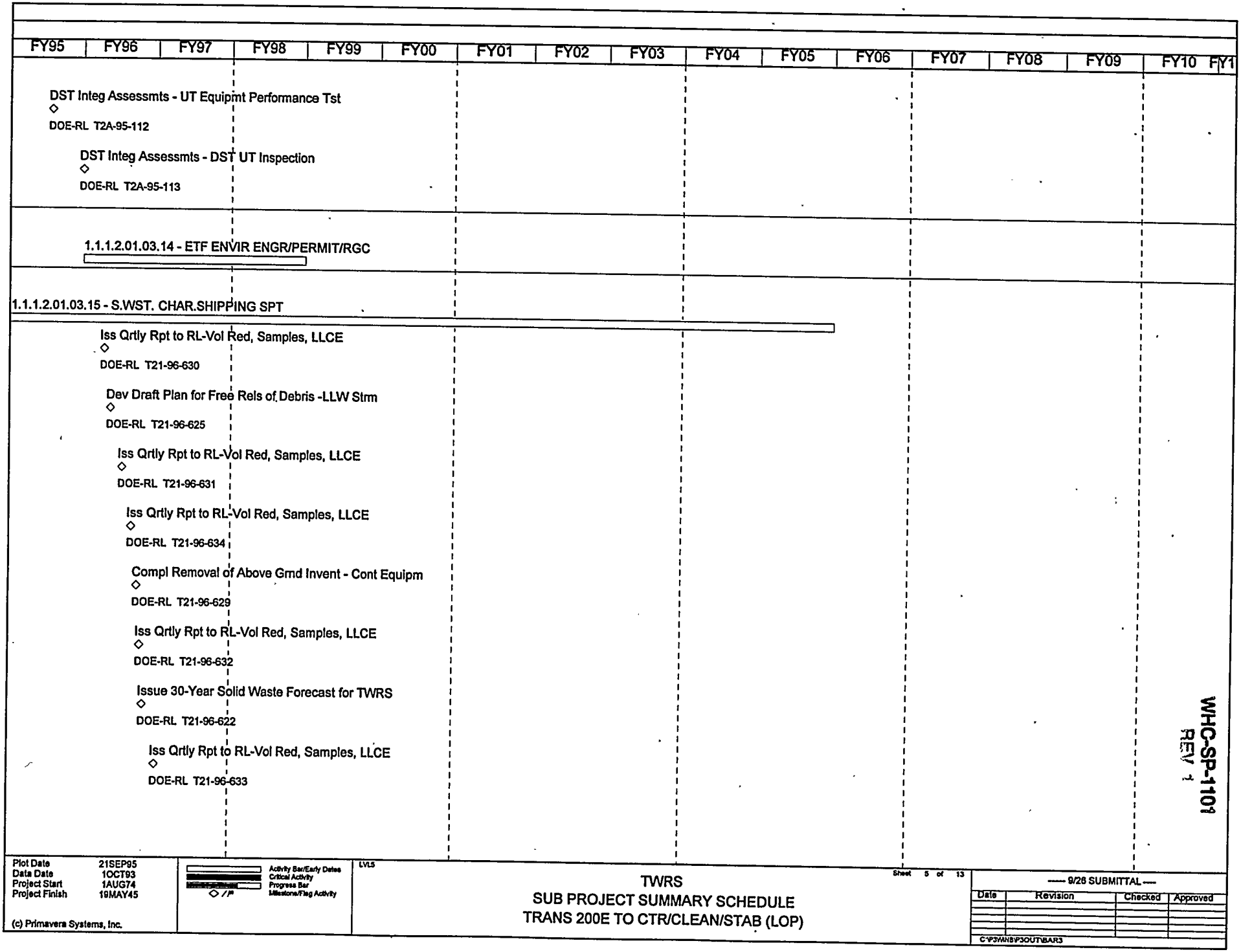

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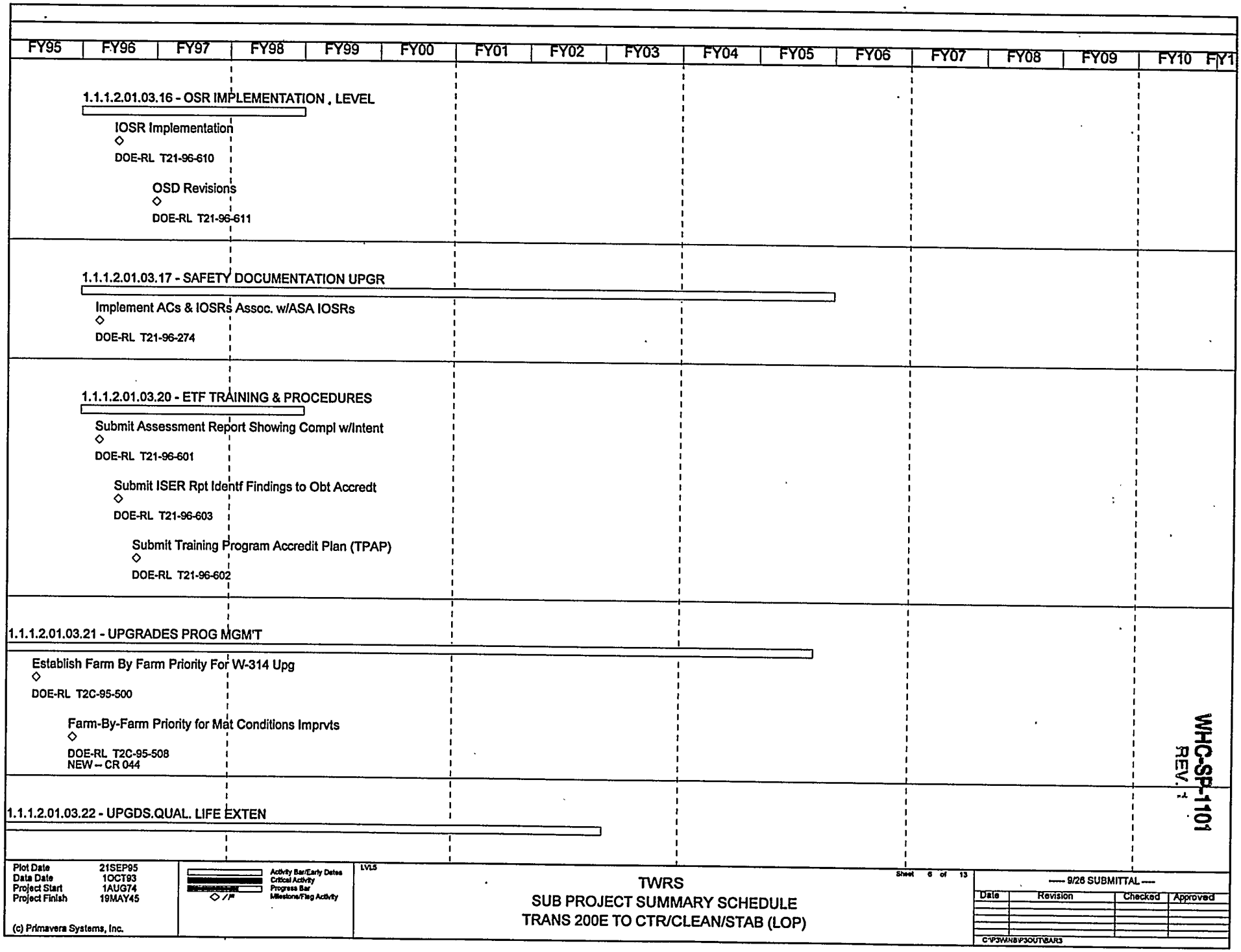

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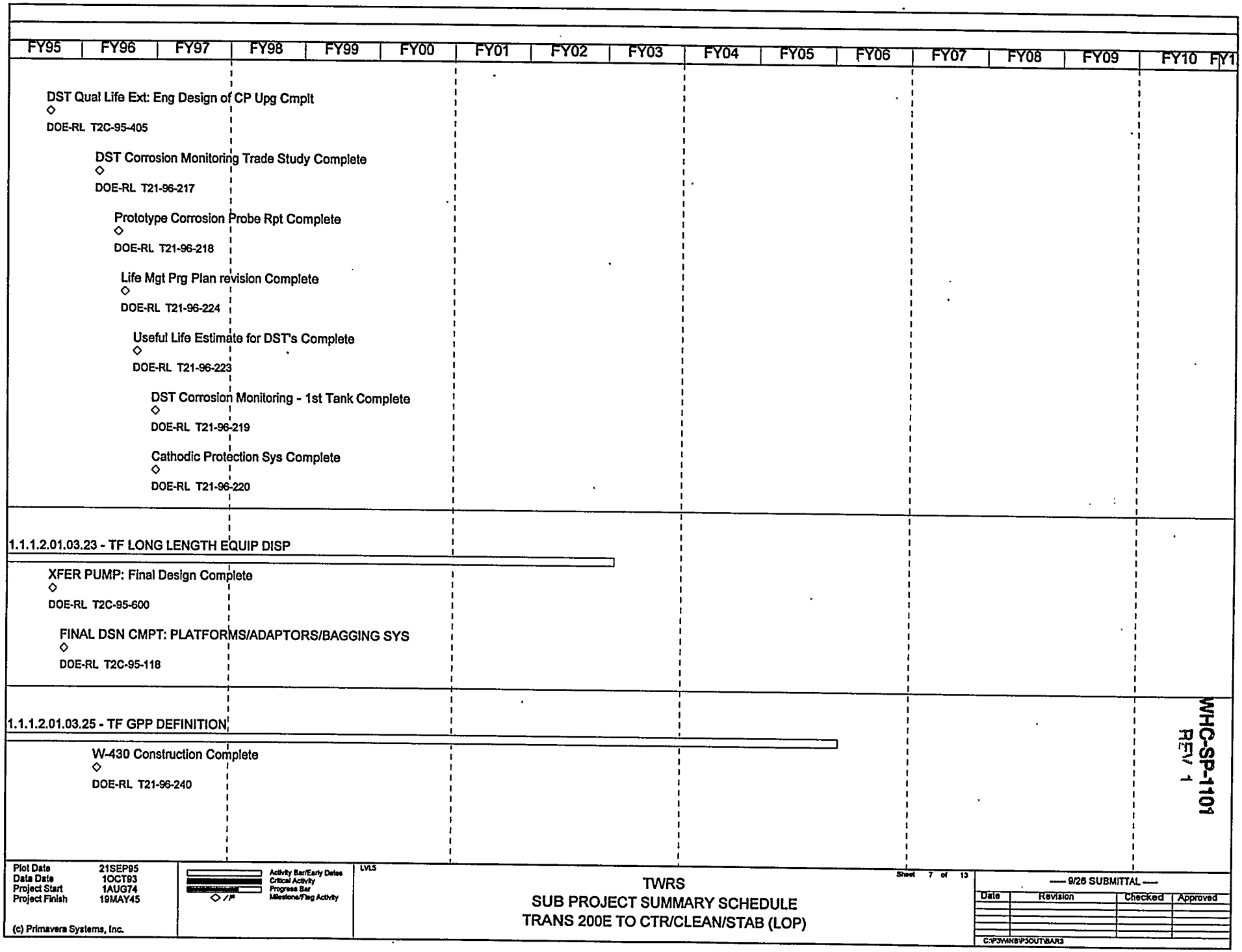
Sheet 6 of 13



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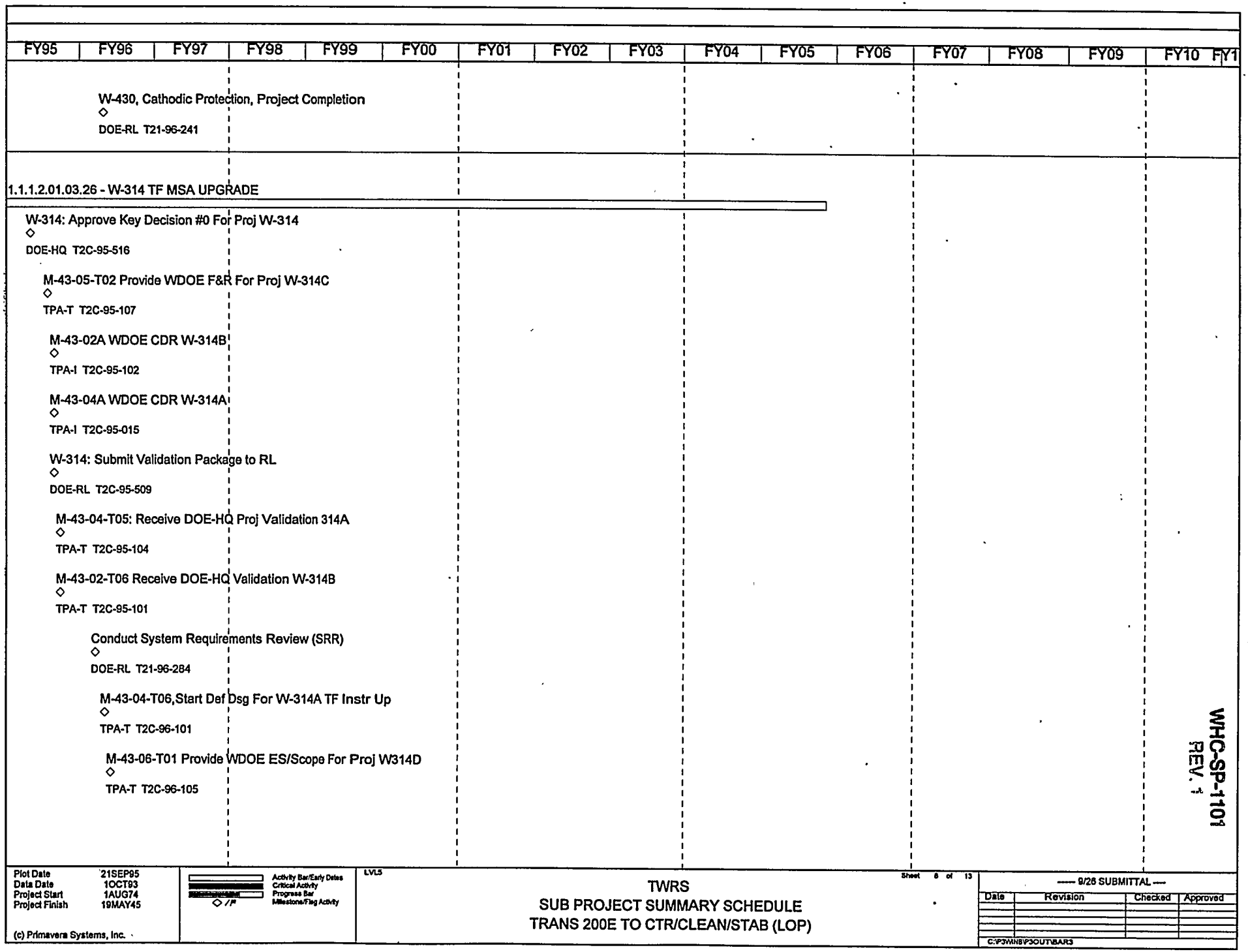
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W-430, Cathodic Protection, Project Completion
DOE-RL T21-96-241
1.1.1.2.01.03.26 - W-314 TF MSA UPGRADE
W-314: Approve Key Decision #0 For Proj W-314
DOE-HQ T2C-95-516
M-43-05-T02 Provide WDOE F&R For Proj W-314C
TPA-T T2C-95-107
M-43-02A WDOE CDR W-314B
TPA-I T2C-95-102
M-43-04A WDOE CDR W-314A
TPA-I T2C-95-015
W-314: Submit Validation Package to RL
DOE-RL T2C-95-509
M-43-04-T05: Receive DOE-HQ Proj Validation 314A
TPA-T T2C-95-104
M-43-02-T06 Receive DOE-HQ Validation W-314B
TPA-T T2C-95-101
Conduct System Requirements Review (SRR)
DOE-RL T21-96-284
M-43-04-T06,Start Def Dsg For W-314A TF Instr Up
TPA-T T2C-96-101
M-43-06-T01 Provide WDOE ES/Scope For Proj W314D
TPA-T T2C-96-105
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
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TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
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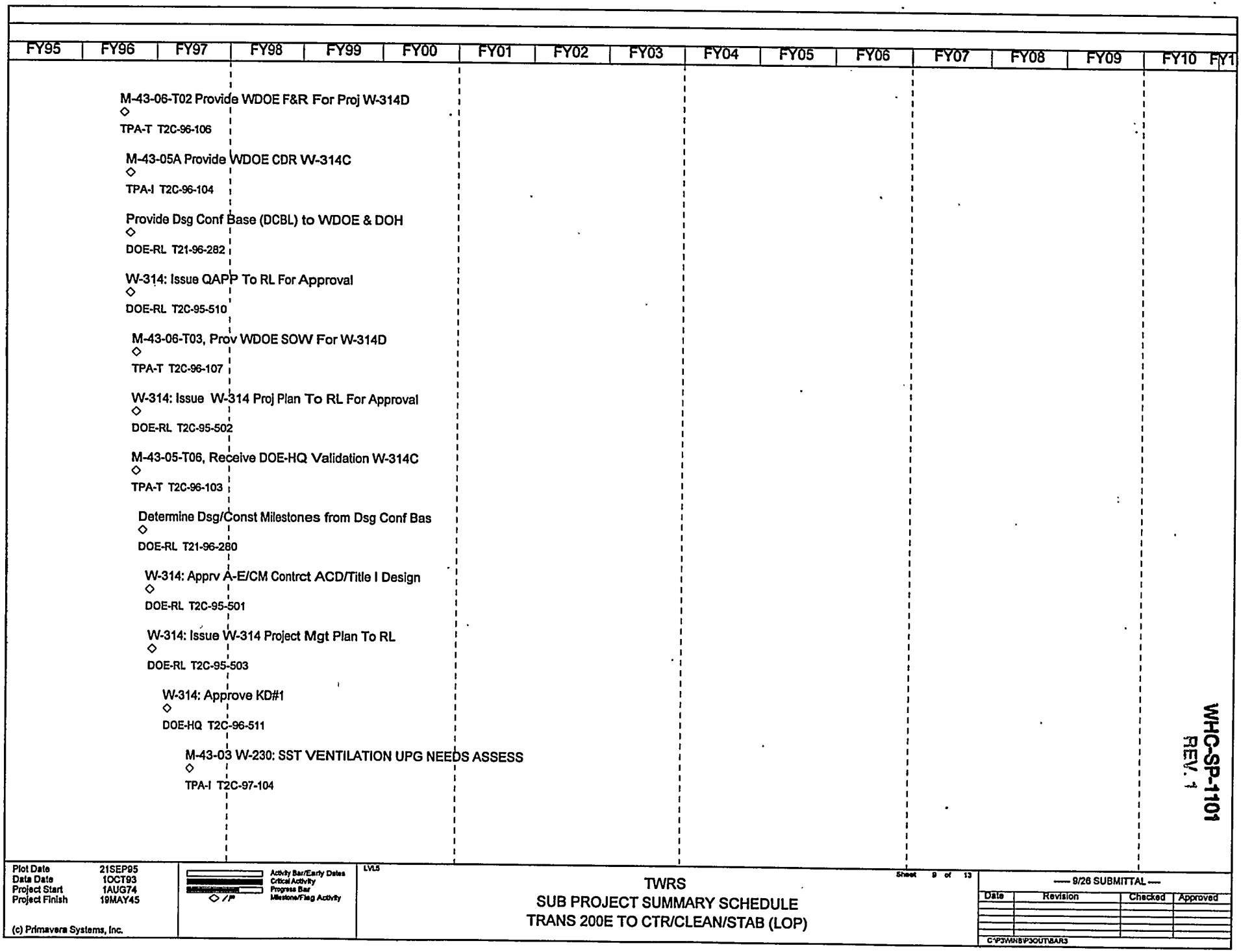
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M-43-06-T02 Provide WDOE F&R For Proj W-314D
TPA-T T2C-96-106
M-43-05A Provide WDOE CDR W-314C
TPA-I T2C-96-104
Provide Dsg Conf Base (DCBL) to WDOE & DOH
DOE-RL T21-96-282
W-314: Issue QAPP To RL For Approval
DOE-RL T2C-95-510
M-43-06-T03, Prov WDOE SOW For W-314D
TPA-T T2C-96-107
W-314: Issue W-314 Proj Plan To RL For Approval
DOE-RL T2C-95-502
M-43-05-T06, Receive DOE-HQ Validation W-314C
TPA-T T2C-96-103
Determine Dsg/Const Milestones from Dsg Conf Bas
DOE-RL T21-96-280
W-314: Apprv A-E/CM Contrct ACD/Title I Design
DOE-RL T2C-95-501
W-314: Issue W-314 Project Mgt Plan To RL
DOE-RL T2C-95-503
W-314: Approve KD#1
DOE-HQ T2C-96-511
M-43-03 W-230: SST VENTILATION UPG NEEDS ASSESS
TPA-I T2C-97-104
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
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TRANS 200E TO CTR/CLEAN/STAB (LOP)
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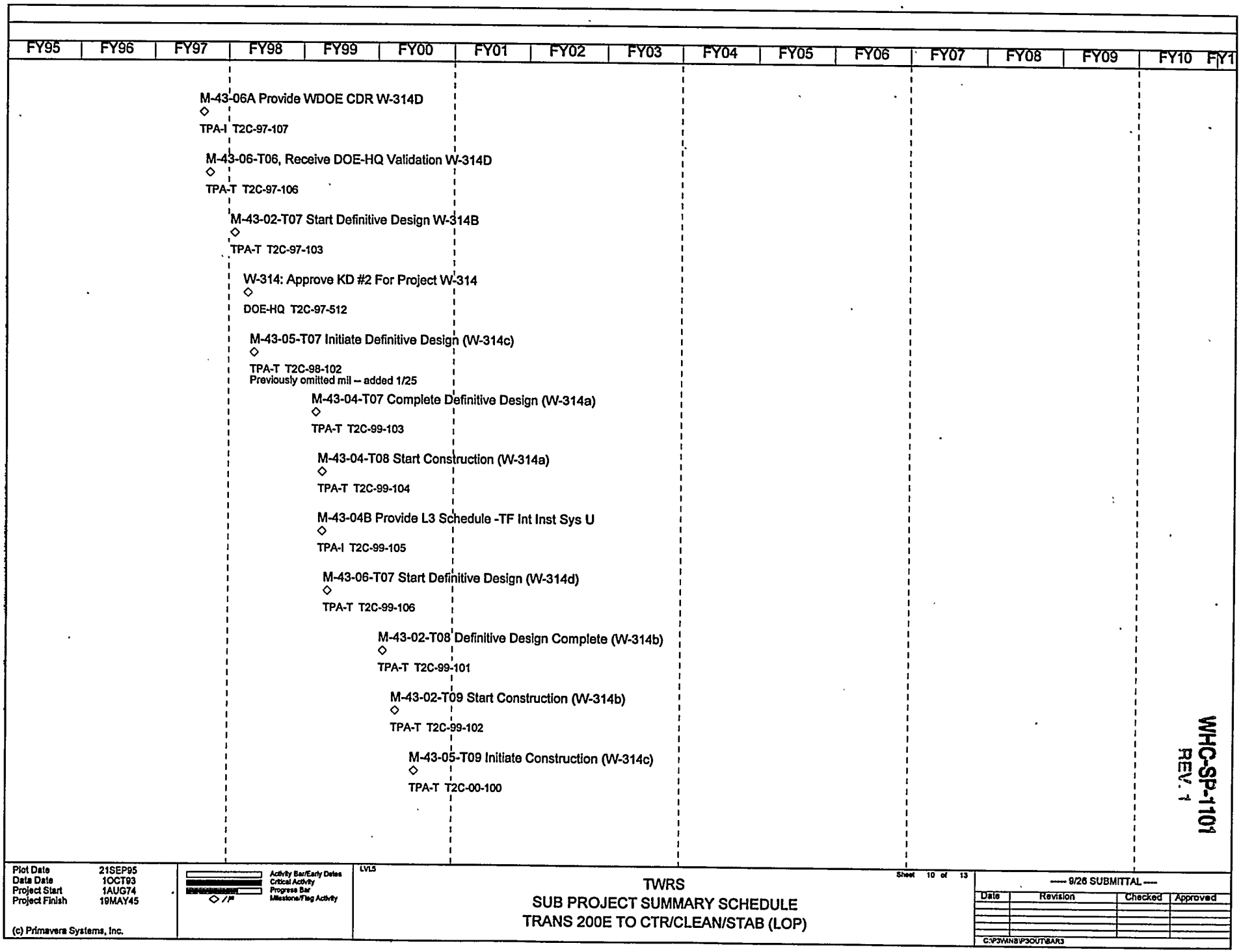
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M-43-06A Provide WDOE CDR W-314D
TPA-I T2C-97-107
M-43-06-T06, Receive DOE-HQ Validation W-314D
TPA-T T2C-97-106
M-43-02-T07 Start Definitive Design W-314B
TPA-T T2C-97-103
W-314: Approve KD #2 For Project W-314
DOE-HQ T2C-97-512
M-43-05-T07 Initiate Definitive Design (W-314c)
TPA-T T2C-98-102
Previously omitted mil -- added 1/25
M-43-04-T07 Complete Definitive Design (W-314a)
TPA-T T2C-99-103
M-43-04-T08 Start Construction (W-314a)
TPA-T T2C-99-104
M-43-04B Provide L3 Schedule -TF Int Inst Sys U
TPA-I T2C-99-105
M-43-06-T07 Start Definitive Design (W-314d)
TPA-T T2C-99-106
M-43-02-T08 Definitive Design Complete (W-314b)
TPA-T T2C-99-101
M-43-02-T09 Start Construction (W-314b)
TPA-T T2C-99-102
M-43-05-T09 Initiate Construction (W-314c)
TPA-T T2C-00-100
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
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TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
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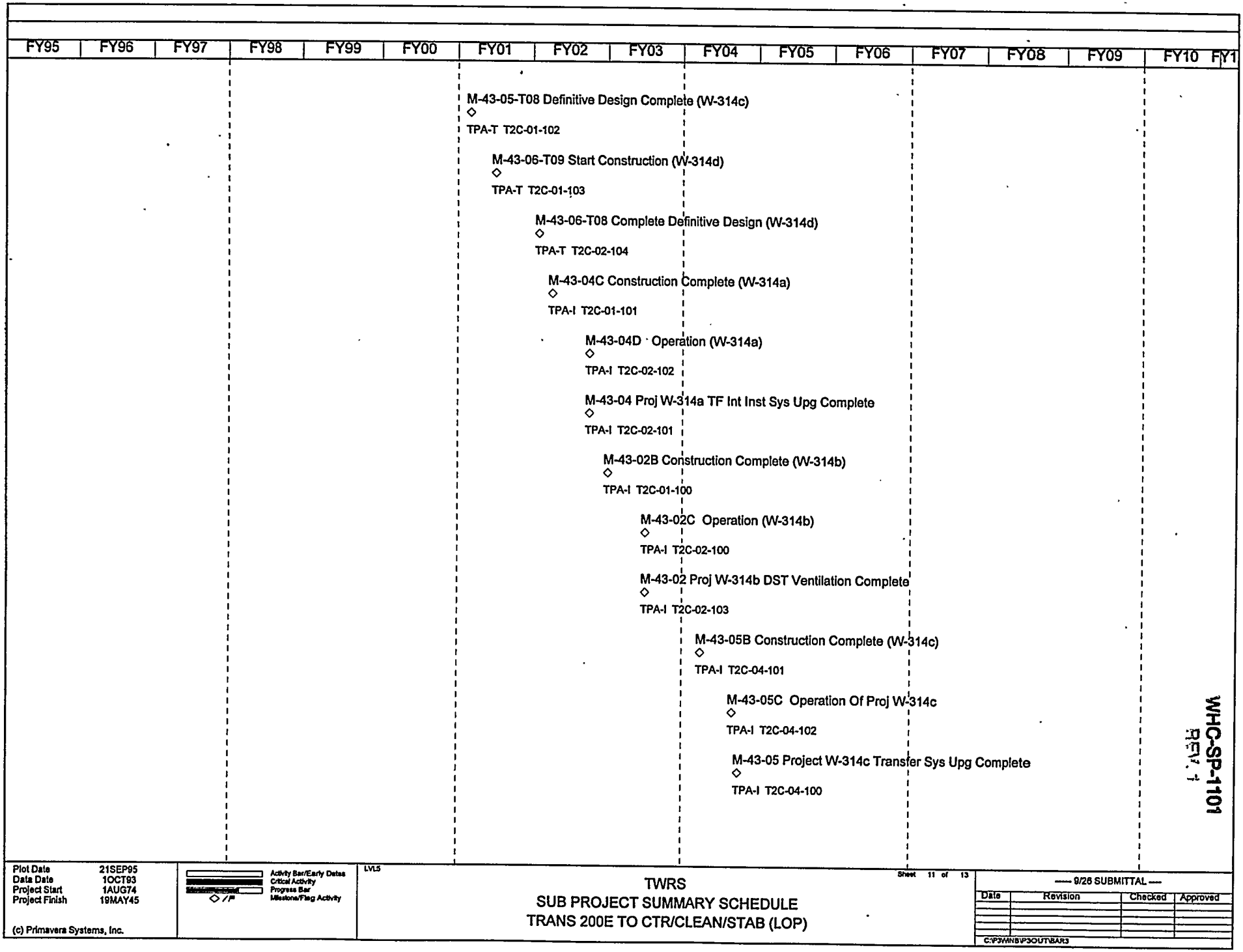

Attachment 4.2-4 Summary Schedule
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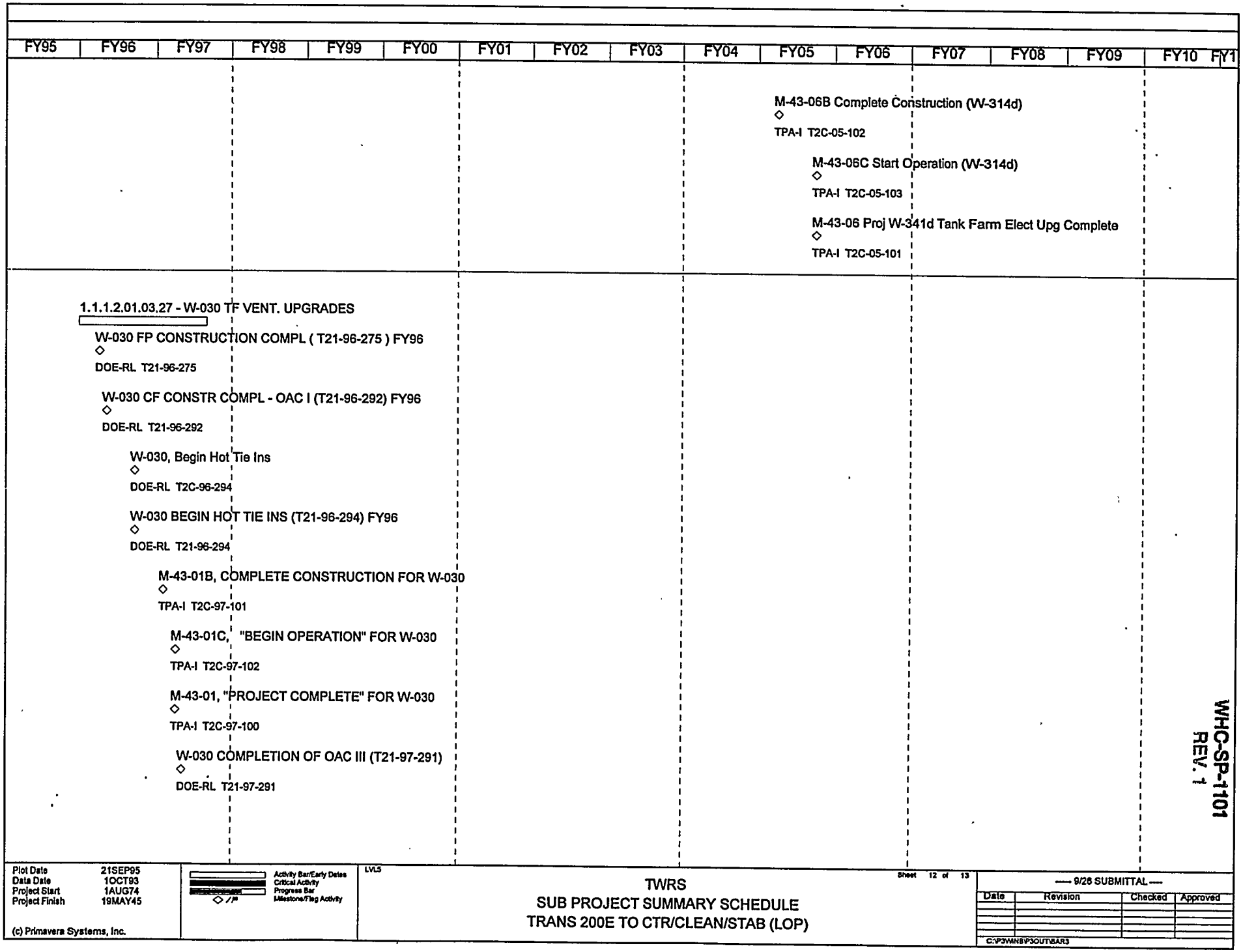
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M-43-06B Complete Construction (W-314d)
TPA-I T2C-05-102
M-43-06C Start Operation (W-314d)
TPA-I T2C-05-103
M-43-06 Proj W-341d Tank Farm Elect Upg Complete
TPA-I T2C-05-101
1.1.1.2.01.03.27 - W-030 TF VENT. UPGRADES
W-030 FP CONSTRUCTION COMPL (T21-96-275) FY96
DOE-RL T21-96-275
W-030 CF CONSTR COMPL - OAC I (T21-96-292) FY96
DOE-RL T21-96-292
W-030, Begin Hot Tie Ins
DOE-RL T2C-96-294
W-030 BEGIN HOT TIE INS (T21-96-294) FY96
DOE-RL T21-96-294
M-43-01B, COMPLETE CONSTRUCTION FOR W-030
TPA-I T2C-97-101
M-43-01C, "BEGIN OPERATION" FOR W-030
TPA-I T2C-97-102
M-43-01, "PROJECT COMPLETE" FOR W-030
TPA-I T2C-97-100
W-030 COMPLETION OF OAC III (T21-97-291)
DOE-RL T21-97-291
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
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TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200E TO CTR/CLEAN/STAB (LOP)
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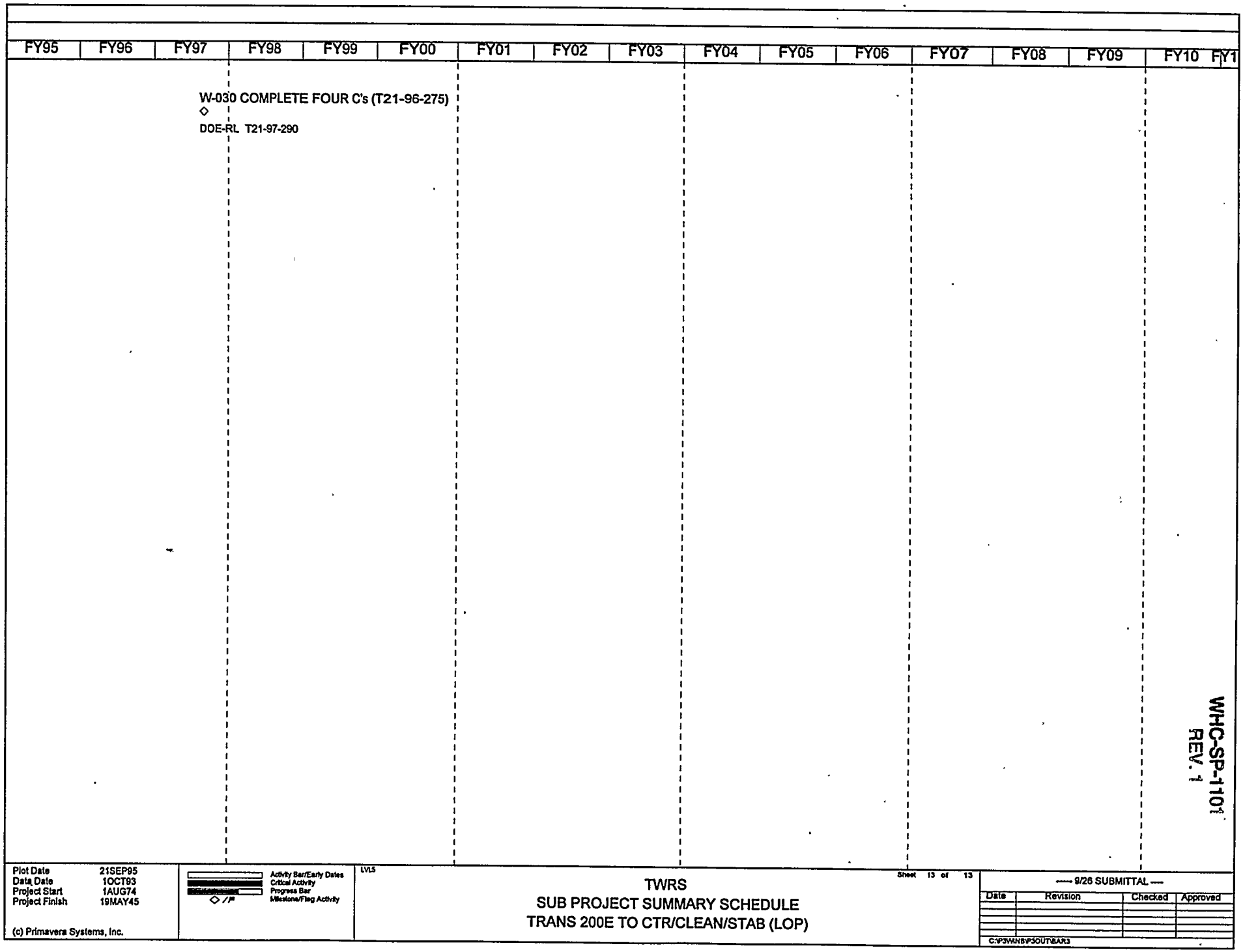
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W-030 COMPLETE FOUR C's (T21-96-275)
DOE-RL T21-97-290
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
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Milestone/Flag Activity
LVLS
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1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.07	T2A-95-316 COMP RMVL OF PUMPABLE LIQ FROM 6 SSTs	DOE-HQ T21-95-316		30NOV95
1.1.1.2.01.03.03	COMPL IMPLE 10CFR835	DOE-RL T21-96-002		29DEC95
1.1.1.2.01.03.03	COMPL OTP ON 107-AN CAUSTIC ADDITION	DOE-RL T21-96-003		01DEC95
1.1.1.2.01.03.03	COMPL OTP ON W-151	DOE-RL T21-96-004		31JUL96
1.1.1.2.01.03.01	ROUGH DRAFT FY97 BUDGET FORECAST	DOE-RL T21-96-007		31MAY96
1.1.1.2.01.03.01	QUARTERLY STATUS REPTS COMPL	DOE-RL T21-96-008		30SEP96
1.1.1.2.01.03.02	PREDICTIVE MAINTENANCE TECHNIQUES	DOE-RL T21-96-009		30SEP96
1.1.1.2.01.03.01	DEVELOPMENT OF HAZ COM PROGRAM	DOE-RL T21-96-010		10NOV95
1.1.1.2.01.03.02	COMPL SYS OUTAGE 241AY ANNULUS TURNOV TO OPS	DOE-RL T21-96-011		23FEB96
1.1.1.2.01.03.02	REDUCE CM BACKLOG BY 10%	DOE-RL T21-96-012		30SEP96
1.1.1.2.01.03.02	PLAN OPTIMIZATION PLAN REBASELINE OF PMs	DOE-RL T21-96-013		29MAR96
1.1.1.2.01.03.02	PLANN & PERFORM PREVENTITIVE MAINT	DOE-RL T21-96-014		30SEP96
1.1.1.2.01.03.02	DRAWING VERIFICATION & LABELING	DOE-RL T21-96-015		30SEP96
1.1.1.2.01.03.06	REMOVE WFIE CABINETS (5) 241-BX TANK FARM	DOE-RL T21-96-113		30APR96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.06	DEVELOP DRWGS AND PERFORM LABELING 241-BX FARM	DOE-RL T21-96-117		30APR96
1.1.1.2.01.03.06	COMP. INST. OF ENRAFS IN BX FARM/200 EAST AREA	DOE-RL T21-96-118		28JUN96
1.1.1.2.01.03.22	DST Corrosion Monitoring Trade Study Complete	DOE-RL T21-96-217		28DEC95
1.1.1.2.01.03.22	Prototype Corrosion Probe Rpt Complete	DOE-RL T21-96-218		29MAR96
1.1.1.2.01.03.22	DST Corrosion Monitoring - 1st Tank Complete	DOE-RL T21-96-219		27SEP96
1.1.1.2.01.03.22	Cathodic Protection Sys Complete	DOE-RL T21-96-220		30SEP96
1.1.1.2.01.03.22	Useful Life Estimate for DST's Complete	DOE-RL T21-96-223		28JUN96
1.1.1.2.01.03.22	Life Mgt Prg Plan revision Complete	DOE-RL T21-96-224		30APR96
1.1.1.2.01.03.25	W-430 Construction Complete	DOE-RL T21-96-240		29DEC95
1.1.1.2.01.03.25	W-430, Cathodic Protection, Project Completion	DOE-RL T21-96-241		23JAN96
1.1.1.2.01.03.17	Implement ACs & IOSRs Assoc. w/ASA IOSRs	DOE-RL T21-96-274	29DEC95	
1.1.1.2.01.03.27	W-030 FP CONSTRUCTION COMPL (T21-96-275) FY96	DOE-RL T21-96-275		29DEC95
1.1.1.2.01.03.26	Determine Dsg/Const Milestones from Dsg Conf Bas	DOE-RL T21-96-280		30JUL96
1.1.1.2.01.03.26	Provide Dsg Conf Base (DCBL) to WDOE & DOH	DOE-RL T21-96-282		29MAY96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.26	Conduct System Requirements Review (SRR)	DOE-RL T21-96-284		15DEC95
1.1.1.2.01.03.27	W-030 CF CONSTR COMPL - OAC I (T21-96-292) FY96	DOE-RL T21-96-292		31JAN96
1.1.1.2.01.03.27	W-030 BEGIN HOT TIE INS (T21-96-294) FY96	DOE-RL T21-96-294		14JUN96
1.1.1.2.01.03.20	Submit Assessment Report Showing Compl w/Intent	DOE-RL T21-96-601		29DEC95
1.1.1.2.01.03.20	Submit Training Program Accredit Plan (TPAP)	DOE-RL T21-96-602		01JUL96
1.1.1.2.01.03.20	Submit ISER Rpt Identf Findings to Obt Accredt	DOE-RL T21-96-603		01APR96
1.1.1.2.01.03.16	IOSR Implementation	DOE-RL T21-96-610		29MAR96
1.1.1.2.01.03.16	OSD Revisions	DOE-RL T21-96-611		30SEP96
1.1.1.2.01.03.15	Issue 30-Year Solid Waste Forecast for TWRS	DOE-RL T21-96-622		31JUL96
1.1.1.2.01.03.15	Dev Draft Plan for Free Rels of Debris -LLW Strm	DOE-RL T21-96-625		16FEB96
1.1.1.2.01.03.15	Compl Removal of Above Grnd Invent - Cont Equipm	DOE-RL T21-96-629		28JUN96
1.1.1.2.01.03.15	Iss Qrtly Rpt to RL-Vol Red, Samples, LLCE	DOE-RL T21-96-630		15JAN96
1.1.1.2.01.03.15	Iss Qrtly Rpt to RL-Vol Red, Samples, LLCE	DOE-RL T21-96-631		15APR96
1.1.1.2.01.03.15	Iss Qrtly Rpt to RL-Vol Red, Samples, LLCE	DOE-RL T21-96-632		15JUL96

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.15	Iss Qrtly Rpt to RL-Vol Red, Samples, LLCE	DOE-RL T21-96-633		30SEP96
1.1.1.2.01.03.15	Iss Qrtly Rpt to RL-Vol Red, Samples, LLCE	DOE-RL T21-96-634		31MAY96
1.1.1.2.01.03.06	COMP. INT. PREV OF SST IN 241-BX-106,241-BX-111	DOE-RL T21-97-112		29AUG97
1.1.1.2.01.03.27	W-030 COMPLETE FOUR C's (T21-96-275)	DOE-RL T21-97-290		30MAY97
1.1.1.2.01.03.27	W-030 COMPLETION OF OAC III (T21-97-291)	DOE-RL T21-97-291		31JAN97
1.1.1.2.01.03.09	M-41-00 COMPLETE SST INTERIM STABILIZATION	TPA-M T2A-00-103		29SEP00
1.1.1.2.01.03.07	M-41-01-T02 COMP IS BY-102,109 & C-102,107,110	TPA-T T2A-95-101		30NOV95
1.1.1.2.01.03.13	DST Integ Assessmts - UT Equipmt Performance Tst	DOE-RL T2A-95-112		28APR95
1.1.1.2.01.03.13	DST Integ Assessmts - DST UT Inspection	DOE-RL T2A-95-113		29SEP95
1.1.1.2.01.03.02	DEVELOP 3 YR MAINTENANCE IMPLEMENTATION PLAN	DOE-RL T2A-95-123		29SEP95
1.1.1.2.01.03.09	T2A-95-130 COMP. PARTIAL IS OF 2 FG WLT IN A-AX	DOE-RL T2A-95-130		29SEP95
1.1.1.2.01.03.04	COMPLETE IN TANK PHOTOS/PIT INVENTORIES REQMTS	DOE-RL T2A-95-134		29SEP95
1.1.1.2.01.03.07	T2A-95-322 BY-102 PUMPING COMPLETE	DOE-RL T2A-95-322		31JUL95
1.1.1.2.01.03.10	T2A-95-323 C-102 PUMPING COMPLETE	DOE-RL T2A-95-323		29SEP95

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.10	T2A-95-324 C-107 PUMPING COMPLETE	DOE-RL T2A-95-324		31AUG95
1.1.1.2.01.03.10	T2A-95-325 C-110 PUMPING COMPLETE	DOE-RL T2A-95-325		31MAY95
1.1.1.2.01.03.09	M-41-10 START IS OF 1 FG WLT IN AX FARM	TPA-I T2A-96-102	30APR96	
1.1.1.2.01.03.10	COMPLETE INTRUSION PREVENTION IN 9 SST'S	DOE-RL T2A-96-114		30SEP97
1.1.1.2.01.03.10	INSTALL LOW'S IN 27 SINGLE SHELL TANKS	DOE-RL T2A-96-120		30SEP97
1.1.1.2.01.03.07	M-41-12 START IS OF 3 FeCN TANKS IN BY FARM	TPA-I T2A-97-102	19OCT95	
1.1.1.2.01.03.10	COMPLETE INTRUSION PREVENTION IN 4 SST'S	DOE-RL T2A-97-112		30SEP97
1.1.1.2.01.03.10	INSTALL LOW'S IN 15 SST'S	DOE-RL T2A-97-114		30SEP97
1.1.1.2.01.03.07	M-41-12-TO1 COMPL IS 4 FeCN TANKS IN BX/BY FARM	TPA-T T2A-98-100		31DEC97
1.1.1.2.01.03.10	M-41-19 START IS ON 1 ORG TANK IN 241-C	TPA-I T2A-98-107	30SEP98	
1.1.1.2.01.03.09	M-41-10-TO1 COMPL IS OF 1 FLM. GAS WLT IN AX	TPA-T T2A-99-100		31DEC98
1.1.1.2.01.03.10	M-41-19-T1 COMP. IS OF 1 ORG TNK IN 241-C	TPA-T T2A-99-103		31MAR99
1.1.1.2.01.03.26	M-43-05-TO9 Initiate Construction (W-314c)	TPA-T T2C-00-100		31MAR00
1.1.1.2.01.03.26	M-43-02B Construction Complete (W-314b)	TPA-I T2C-01-100		01OCT01

Attachment 4.2-5 Milestone Control Log
Sheet 5 of 9

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.26	M-43-04C Construction Complete (W-314a)	TPA-I T2C-01-101		03JAN02
1.1.1.2.01.03.26	M-43-05-T08 Definitive Design Complete (W-314c)	TPA-T T2C-01-102		30NOV00
1.1.1.2.01.03.26	M-43-06-T09 Start Construction (W-314d)	TPA-T T2C-01-103	02APR01	
1.1.1.2.01.03.26	M-43-02C Operation (W-314b)	TPA-I T2C-02-100		31MAR03
1.1.1.2.01.03.26	M-43-04 Proj W-314a TF Int Inst Sys Upg Complete	TPA-I T2C-02-101		02JUL02
1.1.1.2.01.03.26	M-43-04D Operation (W-314a)	TPA-I T2C-02-102		02JUL02
1.1.1.2.01.03.26	M-43-02 Proj W-314b DST Ventilation Complete	TPA-I T2C-02-103		31MAR03
1.1.1.2.01.03.26	M-43-06-T08 Complete Definitive Design (W-314d)	TPA-T T2C-02-104		29OCT01
1.1.1.2.01.03.26	M-43-05 Project W-314c Transfer Sys Upg Complete	TPA-I T2C-04-100		30JUN04
1.1.1.2.01.03.26	M-43-05B Construction Complete (W-314c)	TPA-I T2C-04-101		31DEC03
1.1.1.2.01.03.26	M-43-05C Operation Of Proj W-314c	TPA-I T2C-04-102		01JUN04
1.1.1.2.01.03.26	M-43-06 Proj W-341d Tank Farm Elect Upg Complete	TPA-I T2C-05-101		30JUN05
1.1.1.2.01.03.26	M-43-06B Complete Construction (W-314d)	TPA-I T2C-05-102		31DEC04
1.1.1.2.01.03.26	M-43-06C Start Operation (W-314d)	TPA-I T2C-05-103		30JUN05

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.26	M-43-04A WDOE CDR W-314A	TPA-I T2C-95-015		31MAY95
1.1.1.2.01.03.26	M-43-02-T06 Receive DOE-HQ Validation W-314B	TPA-T T2C-95-101		30JUN95
1.1.1.2.01.03.26	M-43-02A WDOE CDR W-314B	TPA-I T2C-95-102		31MAY95
1.1.1.2.01.03.26	M-43-04-T05: Receive DOE-HQ Proj Validation 314A	TPA-T T2C-95-104		30JUN95
1.1.1.2.01.03.26	M-43-05-T02 Provide WDOE F&R For Proj W-314C	TPA-T T2C-95-107		28APR95
1.1.1.2.01.03.23	FINAL DSN CMPT: PLATFORMS/ADAPTORS/BAGGING SYS	DOE-RL T2C-95-118		14JUL95
1.1.1.2.01.03.22	DST Qual Life Ext: Eng Design of CP Upg Cmplt	DOE-RL T2C-95-405		28APR95
1.1.1.2.01.03.21	Establish Farm By Farm Priority For W-314 Upg	DOE-RL T2C-95-500		28FEB95
1.1.1.2.01.03.26	W-314: Apprv A-E/CM Contrct ACD/Title I Design	DOE-RL T2C-95-501		03SEP96
1.1.1.2.01.03.26	W-314: Issue W-314 Proj Plan To RL For Approval	DOE-RL T2C-95-502		28JUN96
1.1.1.2.01.03.26	W-314: Issue W-314 Project Mgt Plan To RL	DOE-RL T2C-95-503		16SEP96
1.1.1.2.01.03.21	Farm-By-Farm Priority for Mat Conditions Imprvts	DOE-RL T2C-95-508		30AUG95
1.1.1.2.01.03.26	W-314: Submit Validation Package to RL	DOE-RL T2C-95-509		31MAY96
1.1.1.2.01.03.26	W-314: Issue QAPP To RL For Approval	DOE-RL T2C-95-510	31MAY96	

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.26	W-314: Approve Key Decision #0 For Proj W-314	DOE-HQ T2C-95-516	01FEB95	
1.1.1.2.01.03.23	XFER PUMP: Final Design Complete	DOE-RL T2C-95-600		16MAY95
1.1.1.2.01.03.26	M-43-04-T06,Start Def Dsg For W-314A TF Instr Up	TPA-T T2C-96-101	31JAN96	
1.1.1.2.01.03.26	M-43-05-T06, Receive DOE-HQ Validation W-314C	TPA-T T2C-96-103		28JUN96
1.1.1.2.01.03.26	M-43-05A Provide WDOE CDR W-314C	TPA-I T2C-96-104		29MAY96
1.1.1.2.01.03.26	M-43-06-T01 Provide WDOE ES/Scope For Proj W314D	TPA-T T2C-96-105		28FEB96
1.1.1.2.01.03.26	M-43-06-T02 Provide WDOE F&R For Proj W-314D	TPA-T T2C-96-106		30APR96
1.1.1.2.01.03.26	M-43-06-T03, Prov WDOE SOW For W-314D	TPA-T T2C-96-107		28JUN96
1.1.1.2.01.03.27	W-030, Begin Hot Tie Ins	DOE-RL T2C-96-294		14JUN96
1.1.1.2.01.03.26	W-314: Approve KD#1	DOE-HQ T2C-96-511	02DEC96	
1.1.1.2.01.03.27	M-43-01, "PROJECT COMPLETE" FOR W-030	TPA-I T2C-97-100		31DEC96
1.1.1.2.01.03.27	M-43-01B, COMPLETE CONSTRUCTION FOR W-030	TPA-I T2C-97-101		31OCT96
1.1.1.2.01.03.27	M-43-01C, "BEGIN OPERATION" FOR W-030	TPA-I T2C-97-102		31DEC96
1.1.1.2.01.03.26	M-43-02-T07 Start Definitive Design W-314B	TPA-T T2C-97-103		28OCT97

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.03 Transition 200E to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.03.26	M-43-03 W-230: SST VENTILATION UPG NEEDS ASSESS	TPA-I T2C-97-104		31MAR97
1.1.1.2.01.03.26	M-43-06-T06, Receive DOE-HQ Validation W-314D	TPA-T T2C-97-106		30JUN97
1.1.1.2.01.03.26	M-43-06A Provide WDOE CDR W-314D	TPA-I T2C-97-107		30MAY97
1.1.1.2.01.03.26	W-314: Approve KD #2 For Project W-314	DOE-HQ T2C-97-512	31DEC97	
1.1.1.2.01.03.26	M-43-05-T07 Initiate Definitive Design (W-314c)	TPA-T T2C-98-102	30JAN98	
1.1.1.2.01.03.26	M-43-02-T08 Definitive Design Complete (W-314b)	TPA-T T2C-99-101		29OCT99
1.1.1.2.01.03.26	M-43-02-T09 Start Construction (W-314b)	TPA-T T2C-99-102	31DEC99	
1.1.1.2.01.03.26	M-43-04-T07 Complete Definitive Design (W-314a)	TPA-T T2C-99-103		30NOV98
1.1.1.2.01.03.26	M-43-04-T08 Start Construction (W-314a)	TPA-T T2C-99-104		31DEC98
1.1.1.2.01.03.26	M-43-04B Provide L3 Schedule -TF Int Inst Sys U	TPA-I T2C-99-105		31DEC98
1.1.1.2.01.03.26	M-43-06-T07 Start Definitive Design (W-314d)	TPA-T T2C-99-106	29JAN99	
1.1.1.2.01.03.02	REPAIR MALFUNCTIONING EXHAUSTERS	DOE-RL TW1-94-483		18APR94

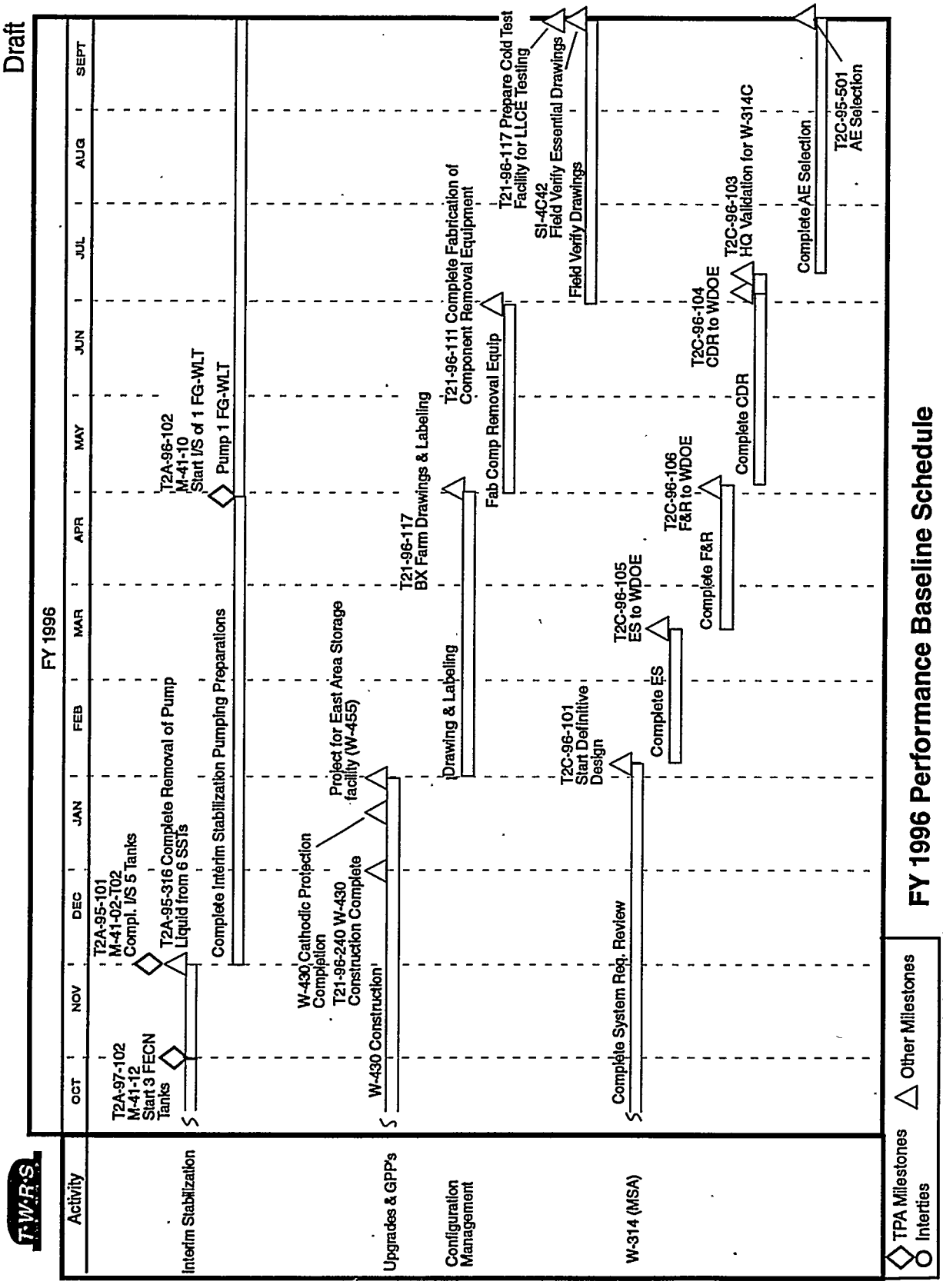
WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.03 - Trans 200E C/C/S - Cost By Year | TOTAL USAGE FOR YEAR

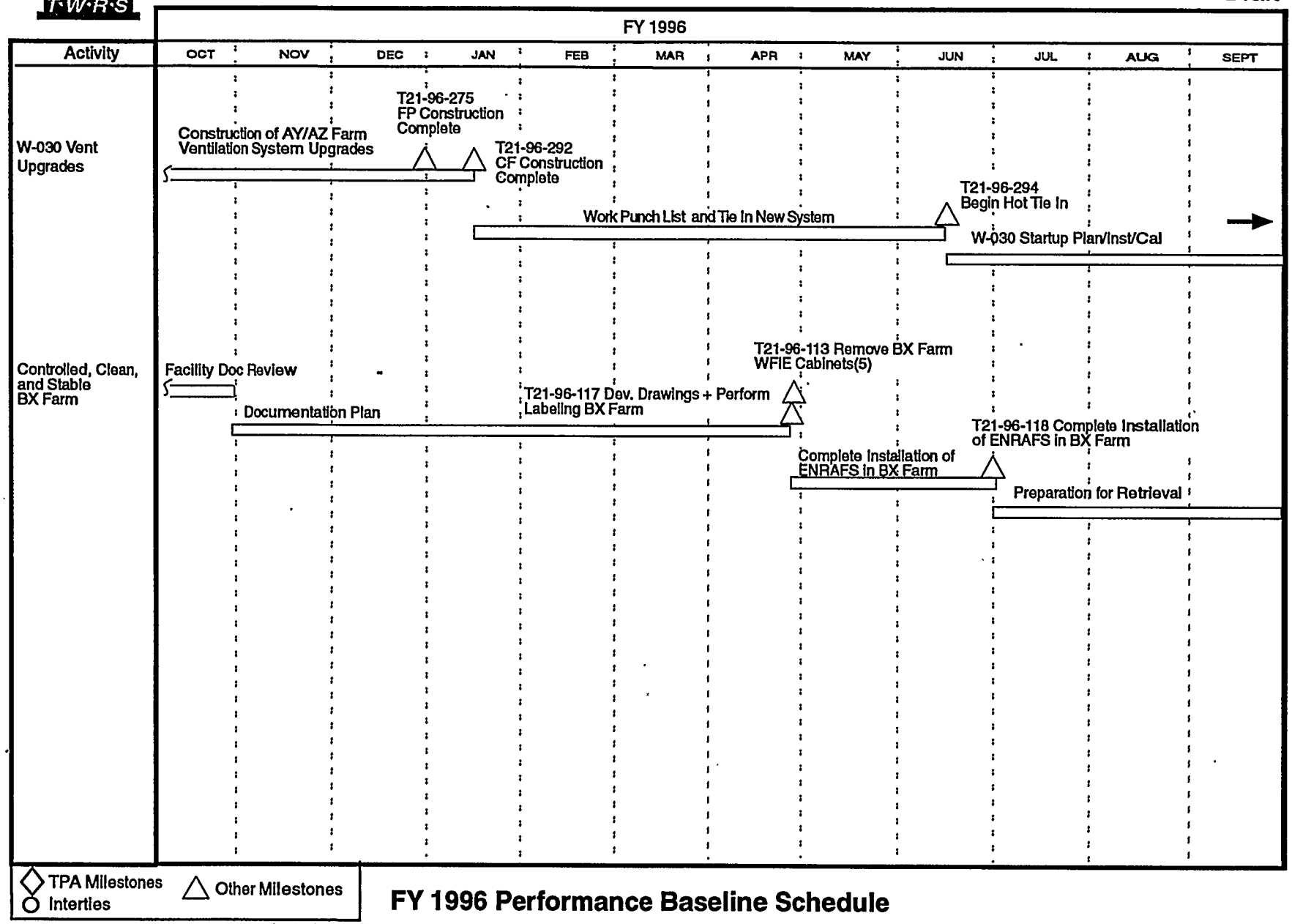
CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	634554	86767	72834	64968	60142	57599	51627	60904	60605	59672	59435
2	CENRTC	15007	3203	2202	3001	2301	2200	2101				
3	LINE ITM	693578	737	9622	19800	67436	99004	136977	90001	90001	90001	90001
4	GPP	13768	4272	1998	1996	2001	2000	1500				
	REPORT TOTAL	1356908	94980	86656	89765	131880	160803	192205	150905	150606	149673	149436

CATEGORY	CATEGORY DESCRIPTION	FY 2006
1	EXPENSE	
2	CENRTC	
3	LINE ITM	
4	GPP	
	REPORT TOTAL	



Attachment 4.2-7 FY 1996 Performance Baseline Schedule
Sheet 1 of 2

Draft



FY 1996 Performance Baseline Schedule

1.1.1.2.01.03 Tank Farm Operations - Transition 200E to Controlled, Clean and Stable

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER

TWRS INTEGRATED SCHEDULE

1.1.1.2.01.03 - Trans 200E - FY 96 Cost/Month

COST LOADING REPORT

TOTAL USAGE FOR MONTH

UNITS IN K$s

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.01.03.01 - EAST TF TRANS.PROJ.MGM'T	819	744	707	819	744	781	819	819	732	768	805	732	9288
	1.1.1.2.01.03.02 - MAINTAIN EAST TF / FAC.	1031	931	881	1020	924	960	996	996	905	951	996	905	11496
	1.1.1.2.01.03.03 - OPERATE EAST TF / FAC.	1058	959	903	998	907	952	998	1001	922	968	998	907	11569
	1.1.1.2.01.03.04 - EAST WST STORAGE/SURVEIL.	471	428	404	468	423	432	453	453	412	432	453	425	5256
	1.1.1.2.01.03.05 - 241-B TF CNTRL/CLEAN/STAB													
	1.1.1.2.01.03.06 - 241-BX TF CNTRL/CLEAN/STA	86	79	123	139	125	105	65	82	81	83	89	21	1080
	1.1.1.2.01.03.07 - 241-BY TF CNTRL/CLEAN/STA	175	159	74	86	78	82	86	86	78	82	86	78	1151
	1.1.1.2.01.03.08 - 241-A TF CNTRL/CLEAN/STAB	79	72	68	79	69	66	58	24	22	23	24	22	608
	1.1.1.2.01.03.09 - 241-AX TF CNTRL/CLEAN/STA	80	73	69	80	70	65	55	24	22	23	24	22	608
	1.1.1.2.01.03.10 - 241-C TF CNTRL/CLEAN/STAB	20	18	18	20	18								95
	1.1.1.2.01.03.11 - ETF PROG.MON/REQM'TS/CNTL	191	174	165	191	174	183	191	191	174	183	191	174	2182
	1.1.1.2.01.03.12 - ETF INTERIM STAB/INTG/CTL	55	50	48	55	50	53	55	55	50	53	55	48	626
	1.1.1.2.01.03.13 - DST INTEGRITY ASSESSMENT	92	83	79	92	83	87	92	92	83	87	92	83	1044
	1.1.1.2.01.03.14 - ETF ENVIR ENGR/PERMIT/RGC	218	198	188	218	198	208	218	218	198	208	218	198	2483
	1.1.1.2.01.03.15 - S.WST. CHAR.SHIPPING SPT	740	673	639	740	673	706	740	740	673	706	740	673	8441
	1.1.1.2.01.03.16 - OSR IMPLEMENTATION , LEVEL	129	79	75	86	79	83	86	36	33	35	36	33	791
	1.1.1.2.01.03.17 - SAFETY DOCUMENTATION UPGR	243	221	210	265	241	249	183	183	166	174	183	157	2473
	1.1.1.2.01.03.20 - ETF TRAINING & PROCEDURES	331	301	286	331	301	316	348	348	316	332	348	316	3870
	1.1.1.2.01.03.21 - UPGRADES PROG MGM'T	381	346	329	381	346	364	381	381	346	364	381	346	4346
	1.1.1.2.01.03.22 - UPGDS.QUAL. LIFE EXTEN	89	81	77	89	81	85	89	89	81	85	89	81	1018
	1.1.1.2.01.03.23 - TF LONG LENGTH EQUIP DISP	128	119	113	137	124	130	134	145	138	153	156	136	1612
	1.1.1.2.01.03.25 - TF GPP DEFINITION	83	76	56	90	80	107	112	107	98	102	107	95	1114
	1.1.1.2.01.03.26 - W-314 TF MSA UPGRADE	1076	991	945	1095	995	1045	1090	1035	412	970	1543	1380	12576
	1.1.1.2.01.03.27 - W-030 TF VENT. UPGRADES	264	241	236	282	256	265	240	262	237	253	266	239	3041
TOTAL	1	7838	7095	6692	7758	7039	7324	7488	7366	6179	7036	7879	7072	86767

Attachment 4.2-8 Cost Estimate Baseline by Month
Sheet 1 of 2

WESTINGHOUSE HANFORD COMPANY — PRIMAVERA PROJECT PLANNER — TWRS INTEGRATED SCHEDULE

1.1.1.2.01.03 - Trans 200E - FY 96 Cost/Month — COST LOADING REPORT — UNITS IN K$s

TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
2 - CENRTC														
	1.1.1.2.01.03.03 - OPERATE EAST TF / FAC.	62	56	53	62	56	59	62	62	56	59	62	56	702
	1.1.1.2.01.03.05 - 241-B TF CNTRL/CLEAN/STAB													
	1.1.1.2.01.03.07 - 241-BY TF CNTRL/CLEAN/STA													
	1.1.1.2.01.03.08 - 241-A TF CNTRL/CLEAN/STAB													
	1.1.1.2.01.03.09 - 241-AX TF CNTRL/CLEAN/STA													
	1.1.1.2.01.03.10 - 241-C TF CNTRL/CLEAN/STAB													
	1.1.1.2.01.03.23 - TF LONG LENGTH EQUIP DISP	59	179	170	197	179	188	197	197	179	290	304	164	2301
	1.1.1.2.01.03.25 - TF GPP DEFINITION													
	1.1.1.2.01.03.27 - W-030 TF VENT. UPGRADES	18	16	15	18	16	17	18	18	16	17	18	16	200
TOTAL	2	138	251	238	276	251	263	276	276	251	366	383	236	3203
3 - LINE ITM														
	1.1.1.2.01.03.03 - OPERATE EAST TF / FAC.													
	1.1.1.2.01.03.26 - W-314 TF MSA UPGRADE													
	1.1.1.2.01.03.27 - W-030 TF VENT. UPGRADES	60	55	52	60	55	58	60	60	62	72	75	68	737
TOTAL	3	60	55	52	60	55	58	60	60	62	72	75	68	737
4 - GPP														
	1.1.1.2.01.03.03 - OPERATE EAST TF / FAC.													
	1.1.1.2.01.03.25 - TF GPP DEFINITION	238	217	206	430	379	398	417	417	379	398	417	379	4272
TOTAL	4	238	217	206	430	379	398	417	417	379	398	417	379	4272
	REPORT TOTAL	8275	7617	7188	8524	7723	8042	8241	8119	6870	7871	8754	7755	94980

4.3 TRANSITION 200 WEST TO CONTROLLED, CLEAN, AND STABLE (WBS 1.1.1.2.1.4)

4.3.1 STRATEGY

4.3.1.1 Objectives

The same objectives apply for Transition 200 West to Controlled, Clean, and Stable sub-project as for the Transition 200 East to Controlled, Clean, and Stable sub-project.

The primary objective for this sub-project is to conduct all activities pertaining to operation of a permitted treatment, storage, and disposal facility within the boundary of the current Interim Safety Basis and in a manner that ensures compliance with all applicable federal, state, and local environmental regulations to ensure a safe work environment for all employees and support groups.

This sub-project consists of performing all the support functions required for providing the routine surveillance, operation, and maintenance of the 200 West Area to safely monitor status and control the underground storage of waste. These functions include the following:

- Performing preventive maintenance
- Performing corrective maintenance (routine and non-routine)
- Concentrating facility operations including waste transfers to feed tanks
- Performing routine surveillance monitoring
- Conducting health physics activities (radiological)
- Conducting industrial hygiene and safety functions
- Performing engineering and analysis (campaign run plans, trade studies, and analysis capability upgrades)
- Managing and controlling upgrades to facilities and infrastructure
- Enhancing the safety of facility operations as well as prepare the facilities for the eventual turnover to Waste Disposal program.

4.3.1.2 Planning Assumptions

The Transition 200 West to Controlled, Clean, and Stable sub-project baseline was developed based on the following assumptions:

1. Controlled, clean, and stable is achievable for SST farms in 2001. Establishing an acceptable end state on a farm-by-farm basis will significantly lower near-term operational costs with savings being realized in the first year.

2. A systems engineering approach will be applied to all Tank Farm Operations Project activities.

3. Tank Farm Operations Project facilities and utility and transfer systems shall be upgraded to current codes and standards to the extent practicable.

4. Upgrades to selected facilities and systems will be performed to meet mission requirements and achieve a cost-effective, negotiated level of compliance.

5. Equipment and facilities will be restored to satisfy interim safe operations requirements.

6. The fifth shift (training shift) will be required to maintain the identified qualifications of the operators while minimizing overtime required and maximizing training effectiveness. Failure to maintain staffing for the fifth shift will result in missed training and increased overtime costs.

7. Emergency pumping will be required as there will be one new "assumed leaking" SST annually until interim stabilization has been completed.

8. Interim stabilization of SSTs will be complete by September 2000. Failure to interim stabilize the SSTs on an aggressive schedule would increase the risk of additional leaking tanks and environmental insult. Space will be available in DSTs for SST liquids. Compatibility issues will be resolved and cross-site transfers will be made.

9. Retrieval of SSTs will be initiated by December 2003. Failure to initiate retrieval on schedule would compromise the schedule for turning them over to EM-40 for D&D. Delays in the schedule would increase the cost of operating the tank farms.

10. Evaporator operations will be used to manage/optimize DST liquid volume. It is assumed one evaporator campaign will be required per year. The evaporator is required to achieve the waste volume reduction required to avoid the need for additional DST tank storage tanks at a greatly increased cost.

11. Liquids from SST retrieval and new liquid waste will go to DSTs. The SSTs are beyond design life and the risk of leaking is unacceptable. All pumpable liquid is to be removed from the SSTs by the year 2000, and all new liquid waste is to be added to the DSTs. Evaporation will be used to achieve the waste volume reduction needed to ensure adequate DST space for projected new waste and retrieval volumes.

12. Safety issues will be resolved to allow SST pumping in accordance with the Tri-Party Agreement interim milestones. Flammable gas monitoring equipment will be installed on flammable gas Watch List SSTs before interim stabilization work is scheduled to start on these tanks. Liquid grab samples will be taken and laboratory analysis completed prior to the scheduled start of pumping.

13. The LOW installations will be completed in FY 1998. LOW material is mild steel and installation is performed with current lancing procedures. There will be no major changes in safety or environmental requirements or approvals. Core sampling will be completed on schedule to support LOW installation.

14. The Transition 200 West to Controlled, Clean, and Stable sub-project will be consolidated into the Transition 200 East to Controlled, Clean, and Stable sub-project in the year 2001.

15. The Cross-Site Transfer System (W-058) will be completed in 1998 to provide a reliable transfer line. The existing transfer line integrity can be maintained until completion of W-058.

16. No additional DSTs will be constructed for the life of the program.

17. No Hanford facility will suffer non-compliance with storage regulations or cleanup program delays because of the inability of tank farms to receive liquid waste.

18. The Waste Disposal program assumes the SST Minimum Safe Operations activity from the Tank Farm Operations Project in 2001.

19. The Waste Disposal program assumes the DST Transition Operations activity, infrastructure, and personnel from the Tank Farm Operations Project in the year 2005 and/or when the W-314 MSA is complete.

20. No funding is available for additional tanks being added to the Watch List requiring implementation of Watch List controls or equipment installations affecting baseline work scope.

4.3.1.3 Constraints

Administrative and Management constraints include the following:

- Funding availability
- Validity of cost estimates
- Ability of the Waste Characterization program to meet sampling schedule
- Davis-Bacon Act
- Systems Engineering definition and implementation impacts
- Procurement regulations
- Waste Volume Projection accuracy of non-TWRS generated waste
- Safety issue resolution
- Tri-Party Agreement
- The S/RIDS developed and approved by DOE
- The S/RIDS developed and approved for the Tank Farm Operations Project

Environmental Protection constraints include the following:

General:
- 42 USC 4321, et seq., *National Environmental Policy Act of 1969*

Air:
- 42 USC 7401, et seq., *Clean Air Act*
- RCW 70.94, *Washington Clean Air Act*

Water:

- 33 USC 1251, et seq., *Clean Water Act*
- 42 USC 300, et seq., *Safe Drinking Water Act*
- WAC 173-200, "Water Quality Standards for Groundwater of the State of Washington"
- 91nm-177, *Ecology Consent Order*

Materials Handling constraints include the following:

- 42 USC 6901, et seq., *Resource Conservation and Recovery Act of 1976 and Hazardous and Solid Waste Amendments of 1984*
- 42 USC 9601 et seq., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and Superfund Amendments and Reauthorization Act of 1986*
- WAC 173-303, "Dangerous Waste Requirements"
- 42 USC 2011 et seq., *Atomic Energy Act of 1954*
- 10 CFR 71, "Packaging and Transportation of Radioactive Material"
- 10 CFR 830.120, "Quality Assurance"

Worker Safety in Operations constraints include the following:

- HSRCM-1, Rev. 2, "Hanford Site Radiological Control Manual"
- 10 CFR 835, "Occupational Radiation Protection"
- 29 CFR 1910, "Occupational Health and Safety Standards"
- PL 101-510 Sec 3137, *Wyden Amendments*
- Defense Nuclear Facilities Safety Board Recommendations

DOE Orders including the following:

- DOE Order 2550.1, *Cost and Schedule Control System Criteria for Contract Performance*
- DOE Order 4330.4A, *Conduct of Maintenance*
- DOE Order 4700.1, *Project Management System*
- DOE Order 5000.3A, *Occurrence Reporting and Processing of Operations Information*
- DOE Order 5480.1B, *Environmental, Safety and Health Program for Department of Energy*
- DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*
- DOE Order 5480.20, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*
- DOE Order 5480.21, *Unreviewed Safety Question*
- DOE Order 5480.22, *Technical Safety Requirements*
- DOE Order 5480.23, *Nuclear Safety Analysis Reports*
- DOE Order 5480.24, *Criticality Safety*
- DOE Order 5480.26, *Trending and Analysis of Operations Information Using Performance Indicators*
- DOE Order 5480.31, *Startup and Restart of Nuclear Facilities*
- DOE Order 5480.5, *Safety of Nuclear Facilities*
- DOE Order 5481.1, *Safety Analysis and Review System*
- DOE Order 5484.1, *Environmental Protection, Safety, and Health Protection Information Reporting System*
- DOE Order 5700.6C, *Quality Assurance*
- DOE Order 5820.2A, *Radioactive Waste Management*
- DOE Order 6430.1A, *General Design Criteria*

4.3.2 TECHNICAL REQUIREMENTS BASELINE

4.3.2.1 Work Breakdown Structure

The Transition 200 West to Controlled, Clean, and Stable sub-project WBS Tree is found in Attachment 4.3-1.

4.3.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Transition 200 West to Controlled, Clean, and Stable sub-project is found in Attachment 4.3-2. Lower level dictionary sheets are available in PMCS.

4.3.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Transition 200 West to Controlled, Clean, and Stable sub-project is found in Attachment 4.3-3.

4.3.2.4 Technology Needs

The Transition 200 West to Controlled, Clean, and Stable sub-project is committed to both continuous improvements and cost reductions. This sub-project will pursue and assess various technologies through the execution of the sub-project mission. The technologies to be assessed are as follows:

- In tank instrumentation replacements
- Modern equipment replacements (pumps)
- Waste minimization processes
- Data taking equipment (spectral gamma)
- ALARA practices
- DST qualification life extension
- Utilities and service improvements (alternative energy sources)
- TMACS software improvements
- Data management configuration improvements
- Effluent monitoring, solid waste minimization and characterization, recycling programs, decontamination processes, and sample analysis alternatives
- Tank structural monitoring/analysis, corrosion control methods, modeling, and fissile material measurement methods
- Interim Stabilization and emergency pumping technology improvements
- Radiological, physical, and chemical modeling
- Remotely operated equipment for surveillance and D&D
- Waste transfer line configuration (size, number, location, materials).

4.3.3 SCHEDULE BASELINE

4.3.3.1 Summary Schedule

See Attachment 4.3-4 for the summary schedule.

4.3.3.2 Milestone Control Log

See Attachment 4.3-5 for the Milestone Control Log. Milestone description sheets are found in Appendix A.

4.3.4 COST BASELINE

4.3.4.1 Cost Baseline Summary by Year

Attachment 4.3-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

4.3.4.2 Basis of Estimate

Cost estimates for the Tank Farms Operations Project have been developed in conjunction with an independent team of experts from an external consulting firm. The basis for estimates, WBS dictionary sheets, product definitions, and activity planning forms have been reviewed and refined and are incorporated into this MYPP. In addition, the planning assumptions in Sections 4.0.1.2, 4.1.1.2, 4.2.1.2, and 4.3.1.2 provide additional support for these estimates as well as the schedule logic and task identifications represented in Sections 4.1-4 and 4.1-7.

The detailed WBS dictionary sheets are contained in the PMCS system, while the backup cost estimating sheets are maintained in the program office.

4.3.5 PERFORMANCE MEASURES

The performance measures used by the Transition 200 West to Controlled, Clean, and Stable sub-project are tied to both C/SCSC and to various performance indicators relating to the overall conduct of operations within the sub-project. These include the following:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product (average cost for SST stabilization)
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - Lost work days
  - Recordable incidents
  - First aid cases
  - Maintenance backlog

- Unusual occurrence reports
- Off normal occurrence reports
- Log omissions
- Missed out of tolerance readings
- Corrective action management
- Solid waste generation
- Saltwell pumping
- Lock and tag activities
- Temporary mods/bypasses
- Drills
- Nonconformance reports
- Number of internal/external transfers
- Waste internally transferred in gallons.

4.3.6 EXECUTION YEAR

4.3.6.1 Technical Objectives

The technical objectives for the Transition 200 West to Controlled, Clean, and Stable sub-project are to initiate the transition of SST tank farms to a Controlled, Clean, and Stable condition by 2001. The technical objectives include the following six SST tank farms:

- TX Farm and TY Farm
- T Farm and U Farm
- S Farm and SX Farm

4.3.6.2 FY 1996 Performance Baseline Schedule

Attachment 4.3-7 contains the FY 1996 performance baseline schedule.

4.3.6.3 Cost Estimate Baseline by Month

Attachment 4.3-8 establishes the month-by-month cost estimate baseline for FY 1996.

4.3.6.4 FY 1995 Work Scope Carryover Summary

Some activities which were planned in FY 1995 were not completed on schedule and will slip into FY 1996. These activities and the related milestones are reflected in the schedule and are planned for completion in FY 1996. The items that are being carried over into FY 1996 will be provided prior to completion of the MYPP.

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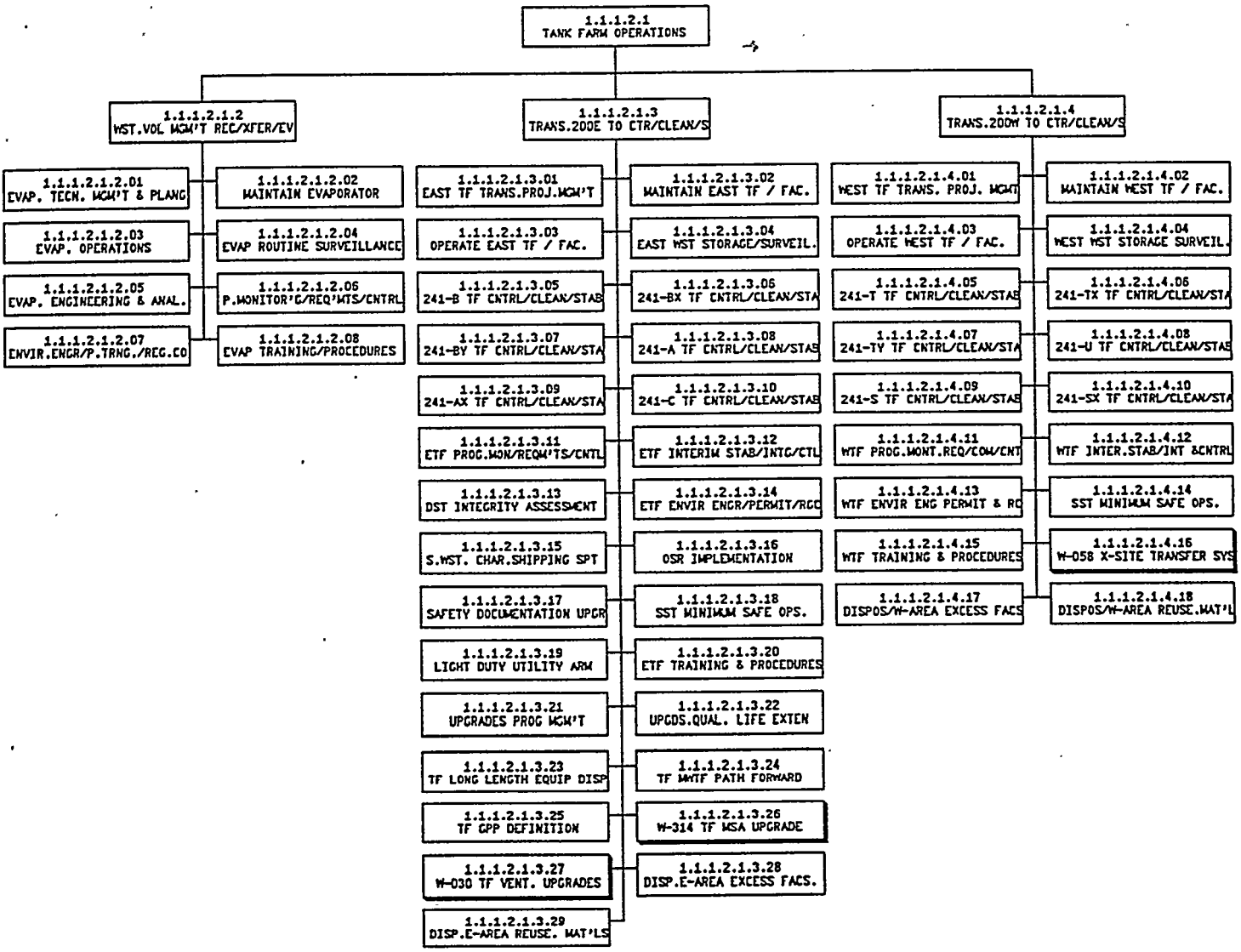
LISTING OF ATTACHMENTS

Attachment 4.3-1	Work Breakdown Structure
Attachment 4.3-2	WBS Dictionary Sheet
Attachment 4.3-3	Responsibility Assignment Matrix
Attachment 4.3-4	Summary Schedule
Attachment 4.3-5	Milestone Control Log
Attachment 4.3-6	Cost Baseline Summary by Year
Attachment 4.3-7	FY 1996 Performance Baseline Schedule
Attachment 4.3-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
TANK FARM OPERATIONS



Attachment 4.3-1 Work Breakdown Structure

1 DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
8/ 3/95	1.1.1 TWRS 1.1.1.2 Waste Storage 1.1.1.2.01 Tank Farm Operations	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.01.04 Level 5	4. WBS ELEMENT TITLE Transition 200 West to Controlled, Clean, and Stable	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 9/26/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11000 11200	9. BUDGET AND REPORTING NUMBERS Operating: EW3120071 CENTRC: 35EW31207 GPP: 39EW31301 Line Item:	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	45,708.00	39,077.00	38,304.00	31,980.00	26,027.00	23,598.00	
CENRTC	1,485.00						
LINE ITEM	11,558.00	25,941.00	364.00				
GPP							
TOTAL	58,751.00	65,018.00	38,668.00	31,980.00	26,027.00	23,598.00	

B. TECHNICAL BASES

Goals and Objectives

The functional product of the Transition 200 West to Controlled, Clean, and Stable sub-project is to coordinate, monitor, and control facility operations support to the material condition, receipt, storage, and transfer operations of 200 West Tank Farm Storage Facilities in support of Westinghouse Hanford Company and the Department of Energy's environmental management goals at Hanford.

Conduct all activities pertaining to operation of a permitted treatment, storage, and disposal facility within the boundary of current Interim Safety Basis and in a manner that ensures compliance with all applicable federal, state, and local environmental regulations to ensure a safe work environment for all employees and support groups.

□This sub-project consists of performing all of the support functions required for providing the routine surveillance, operations, and maintenance of 200 West Area to safely monitor status and control the underground storage of waste. These functions are:

- Preventive maintenance,
- Corrective maintenance (routine and non-routine),
- Routine surveillance monitoring,
- Health physics activities (radiological),
- Industrial hygiene and safety functions,

•Engineering and analysis,
•Manage and control upgrades to facilities and infrastructure, and
•Enhance the safety of facility operations as well as prepare the facilities for the eventual turnover to Waste Disposal program.

The Transition 200 West to Controlled, Clean, and Stable sub-project consists of performing the following major activities in support of the sub-project mission:

•Technical Management and Administration
-Project and baseline management
-Providing utilities and services
-Training and certification program
-Nuclear safety oversight
-Configuration management and support
-Providing quality assurance/quality control support
-Tank farm security operations and upgrades
-Review/revising tank farm operations and administrative procedures
-Tank farm surveillance database maintenance and management

•Tank Farm Compliance and Corrective Activities
-Double-shell tank integrity assessments
-Permitting and regulatory compliance
-Radioactive/hazardous solid waste management
-Environmental compliance, engineering, analysis, and assessments
-Safety envelope definition and implementation
-Double-shell tank emergency pumping planning/preparations
-Special disposal of unusable/abandoned field and in-tank equipment
-Compliance management and ALARA support to field activities
-OSR implementation including necessary upgrades
-Criticality engineering upgrades and safety reviews
-Surface contamination zone reduction
-Vadose Zone Monitoring support

•Tank Farm Single-Shell Tank Interim Stabilization
-Complete Interim Stabilization and intrusion prevention for single-shell tanks with pumpable liquid
-Prepare for emergency pumping leaking single-shell tanks and pump leaking single-shell tanks if required.

•Install Liquid Observation Wells in all single-shell tanks with sufficient material to function.

□•Tank Farm Retired Facilities
-Transition planning for each facility or system
-Surveillance and maintenance of retired facilities until transfer to EM-40 is accomplished
-Safe shutdown and transfer to EM-40

Major End-Item Deliverables

•Five-year plan input and review with RL
•Monthly baseline reviews with RL
•Maintaining the safe and compliant operating configuration within the sub-project
•Release of waste tanks for Retrieval and eventual turnover to EM-40
•Turnover of all facilities to EM-40 for closure
•See milestone log in Attachment 5 for level 5 milestones and deliverbles

Acceptance Criteria

•□Five-year plan input and review with RL

•Achieving and maintaining regulatory and DOE Order compliance in project facilities for the continued safe storage and treatment of radioactive/hazardous waste

•Implementation and adherence to the new Operational Safety Requirements parameters

STATEMENT OF WORK

Required activities over lifetime:

•Perform scheduled component-based recall system, preventive maintenance, high-efficiency particulate air (filter) testing, and third party inspections

•Corrective maintenance includes identifying deficiencies, fixing and replacing failed equipment

•Waste tank transfers, performing jumper changes and pump removals as required, rail car and tanker truck transfers

•Radiological control performing personnel and work place surveys, monitor source checks, and PCM1B checks

•Obtaining panel board/management control system surveillance data, condensate basin readings, vessel ventilation system readings, ion-exchange column readings, and canyon area ventilation surveillance data

•Develop operating strategies/plans, process improvements, trending and review of operating data, monitoring process limits, ensuring technical accuracy, and process problem resolution

•Maintain the Cross-Site transfer capability to enable receipt of waste

•Provide operations support and technical support to maintain base safe operations for the sub-project

•Provide systems engineering support for oversight, evaluation and analysis capability

•Provide for emergency pumping of leaking single-shell tanks and pump as required

•Project W-058, Cross-Site Transfer System Upgrade

•Identify no longer needed tank farm facilities

•Perform an assessment of each facility to determine its status and readiness for turnover to ER

•Provide Light Duty Utility Arm (LDUA) support for prototype LDUA

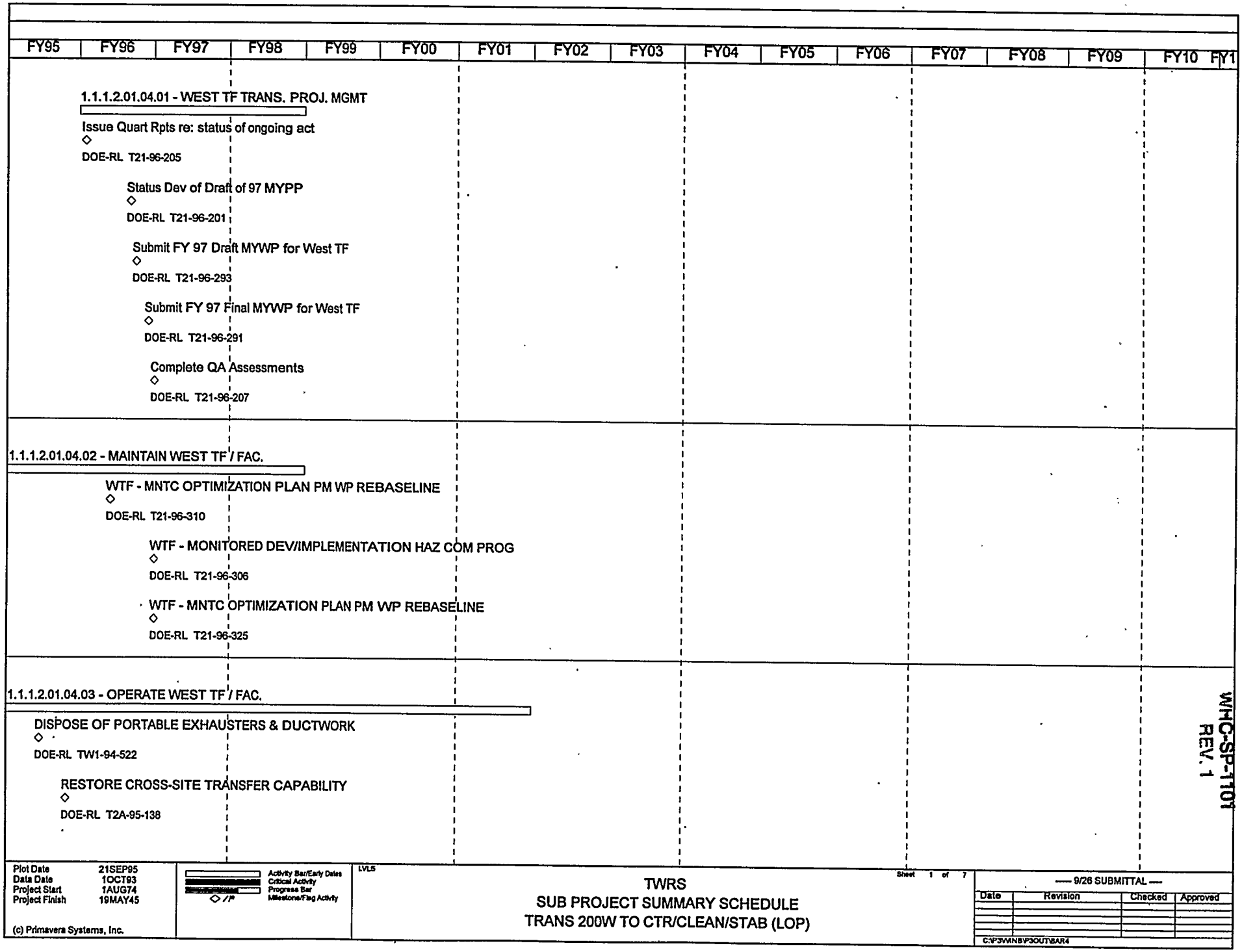
•Prepare and execute required work plan to complete the facility's readiness for turnover to ER

•Provide for all legally required surveillances of retired facilities until they have been accepted by the Environmental Restoration Program

•Document formal turnover of retired facilities as required by the EM-40 Decontamination and Decommissioning Guidance Document

WBS	Account #	Title	Activity Manager	CAM	Program Support
1.1.1.2.1	1N1	Tank Farm Operations	J. L. Lee		D. L. Burt
1.1.1.2.1.4	1N1G	Transition 200 West to Controlled, Clean, and Stable	D. P. Reber		D. L. Mensinger
1.1.1.2.1.4.1	1N1G71	Transition WTF Project Management	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.2	1N1G72	Maintain WTF/ Facilities	D. P. Reber	S. P. Youngerman	D. L. Mensinger
1.1.1.2.1.4.3	1N1G73	Operate West Tank Farms/ Facilities	D. P. Reber	P. L. Owen	D. L. Mensinger
1.1.1.2.1.4.4	1N1G74	West Waste Storage/ Surveillance	D. P. Reber	R. P. Tucker	D. L. Mensinger
1.1.1.2.1.4.5	1N1G75	241-T Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.6	1N1G76	241-TX Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.7	1N1G77	241-TY Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.8	1N1G78	241-U Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.9	1N1G79	241-S Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.10	1N1G7A	241-SX Tank Farm Controlled, Clean, & Stable	D. P. Reber	O. M. Serrano	D. L. Mensinger
1.1.1.2.1.4.11	1N1G7B	WTF Program Monitoring, Reqts, Comm & Control	D. P. Reber	D. L. Burt	D. L. Mensinger
1.1.1.2.1.4.12	1N1G7C	WTF Interim Stabilization Integration & Control	D. P. Reber	T. E. Rainey	D. L. Mensinger
1.1.1.2.1.4.13	1N1G7D	WTF Environmental Engineering, Permitting, & Regulatory Compliance	D. P. Reber	R. D. Gustavson	D. L. Mensinger
1.1.1.2.1.4.14	Inactive	WTF SST Minimum Safe Operations	D. P. Reber	Inactive	D. L. Mensinger
1.1.1.2.1.4.15	1N1G7G	WTF Training & Procedures	D. P. Reber	T. Morton	D. L. Mensinger

WBS	Account #	Title	Activity Manager	CAM	Program Support
1.1.1.2.1.4.16	1N1G7H	Project W-058 Cross-Site Transfer System Upgrade	D. P. Reber	S. D. Riesenweber	D. L. Mensinger
1.1.1.2.1.4.17	Inactive	Disposition Excess Facilities	D. P. Reber	Inactive	D. L. Mensinger
1.1.1.2.1.4.18	Inactive	Disposition Reusable Materials	D. P. Reber	Inactive	D. L. Mensinger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1.1.1.2.01.04.01 - WEST TF TRANS. PROJ. MGMT
Issue Quart Rpts re: status of ongoing act
DOE-RL T21-96-205
Status Dev of Draft of 97 MYPP
DOE-RL T21-96-201
Submit FY 97 Draft MYWP for West TF
DOE-RL T21-96-293
Submit FY 97 Final MYWP for West TF
DOE-RL T21-96-291
Complete QA Assessments
DOE-RL T21-96-207
1.1.1.2.01.04.02 - MAINTAIN WEST TF / FAC.
WTF - MNTC OPTIMIZATION PLAN PM WP REBASELINE
DOE-RL T21-96-310
WTF - MONITORED DEV/IMPLEMENTATION HAZ COM PROG
DOE-RL T21-96-306
WTF - MNTC OPTIMIZATION PLAN PM WP REBASELINE
DOE-RL T21-96-325
1.1.1.2.01.04.03 - OPERATE WEST TF / FAC.
DISPOSE OF PORTABLE EXHAUSTERS & DUCTWORK
DOE-RL TW1-94-522
RESTORE CROSS-SITE TRANSFER CAPABILITY
DOE-RL T2A-95-138
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 1 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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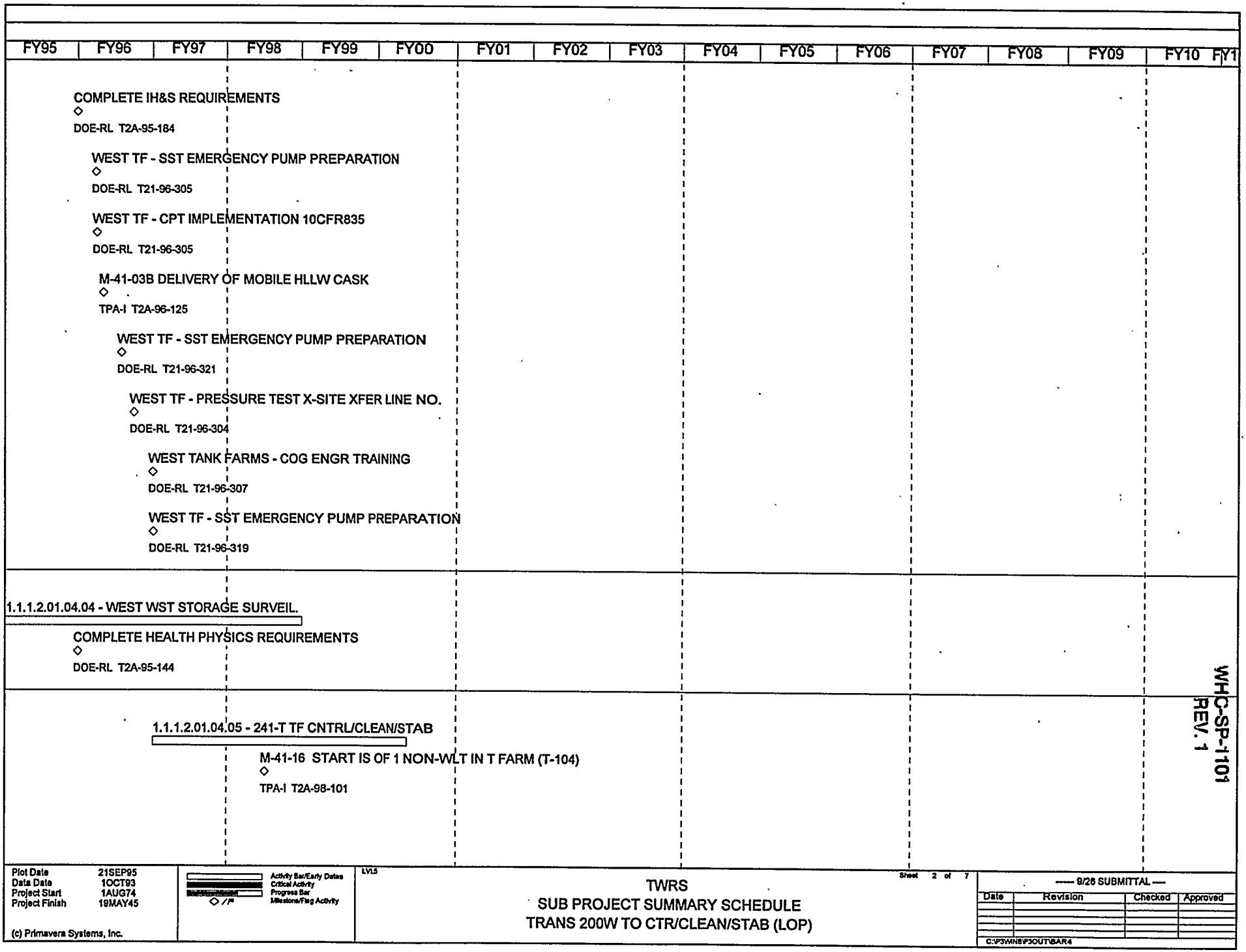
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COMPLETE IH&S REQUIREMENTS
DOE-RL T2A-95-184
WEST TF - SST EMERGENCY PUMP PREPARATION
DOE-RL T21-96-305
WEST TF - CPT IMPLEMENTATION 10CFR835
DOE-RL T21-96-305
M-41-03B DELIVERY OF MOBILE HLLW CASK
TPA-I T2A-96-125
WEST TF - SST EMERGENCY PUMP PREPARATION
DOE-RL T21-96-321
WEST TF - PRESSURE TEST X-SITE XFER LINE NO.
DOE-RL T21-96-304
WEST TANK FARMS - COG ENGR TRAINING
DOE-RL T21-96-307
WEST TF - SST EMERGENCY PUMP PREPARATION
DOE-RL T21-96-319
1.1.1.2.01.04.04 - WEST WST STORAGE SURVEIL.
COMPLETE HEALTH PHYSICS REQUIREMENTS
DOE-RL T2A-95-144
1.1.1.2.01.04.05 - 241-T TF CNTRL/CLEAN/STAB
M-41-16 START IS OF 1 NON-WLT IN T FARM (T-104)
TPA-I T2A-98-101
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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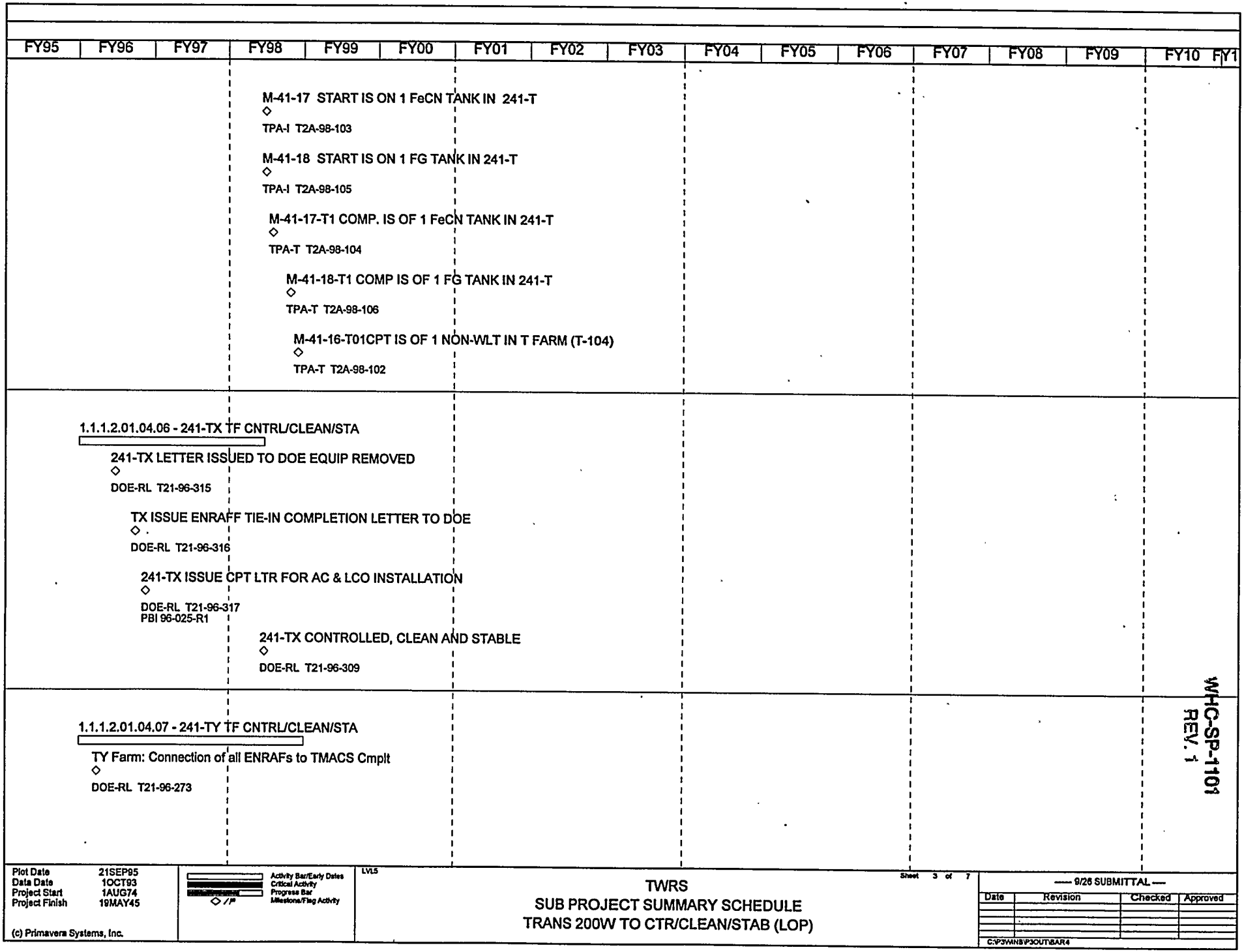
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FY1
M-41-17 START IS ON 1 FeCN TANK IN 241-T
TPA-I T2A-98-103
M-41-18 START IS ON 1 FG TANK IN 241-T
TPA-I T2A-98-105
M-41-17-T1 COMP. IS OF 1 FeCN TANK IN 241-T
TPA-T T2A-98-104
M-41-18-T1 COMP IS OF 1 FG TANK IN 241-T
TPA-T T2A-98-106
M-41-16-T01CPT IS OF 1 NON-WLT IN T FARM (T-104)
TPA-T T2A-98-102
1.1.1.2.01.04.06 - 241-TX TF CNTRL/CLEAN/STA
241-TX LETTER ISSUED TO DOE EQUIP REMOVED
DOE-RL T21-96-315
TX ISSUE ENRAFF TIE-IN COMPLETION LETTER TO DOE
DOE-RL T21-96-316
241-TX ISSUE CPT LTR FOR AC & LCO INSTALLATION
DOE-RL T21-96-317
PBI 96-025-R1
241-TX CONTROLLED, CLEAN AND STABLE
DOE-RL T21-96-309
1.1.1.2.01.04.07 - 241-TY TF CNTRL/CLEAN/STA
TY Farm: Connection of all ENRAFs to TMACS Cmplt
DOE-RL T21-96-273
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 3 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
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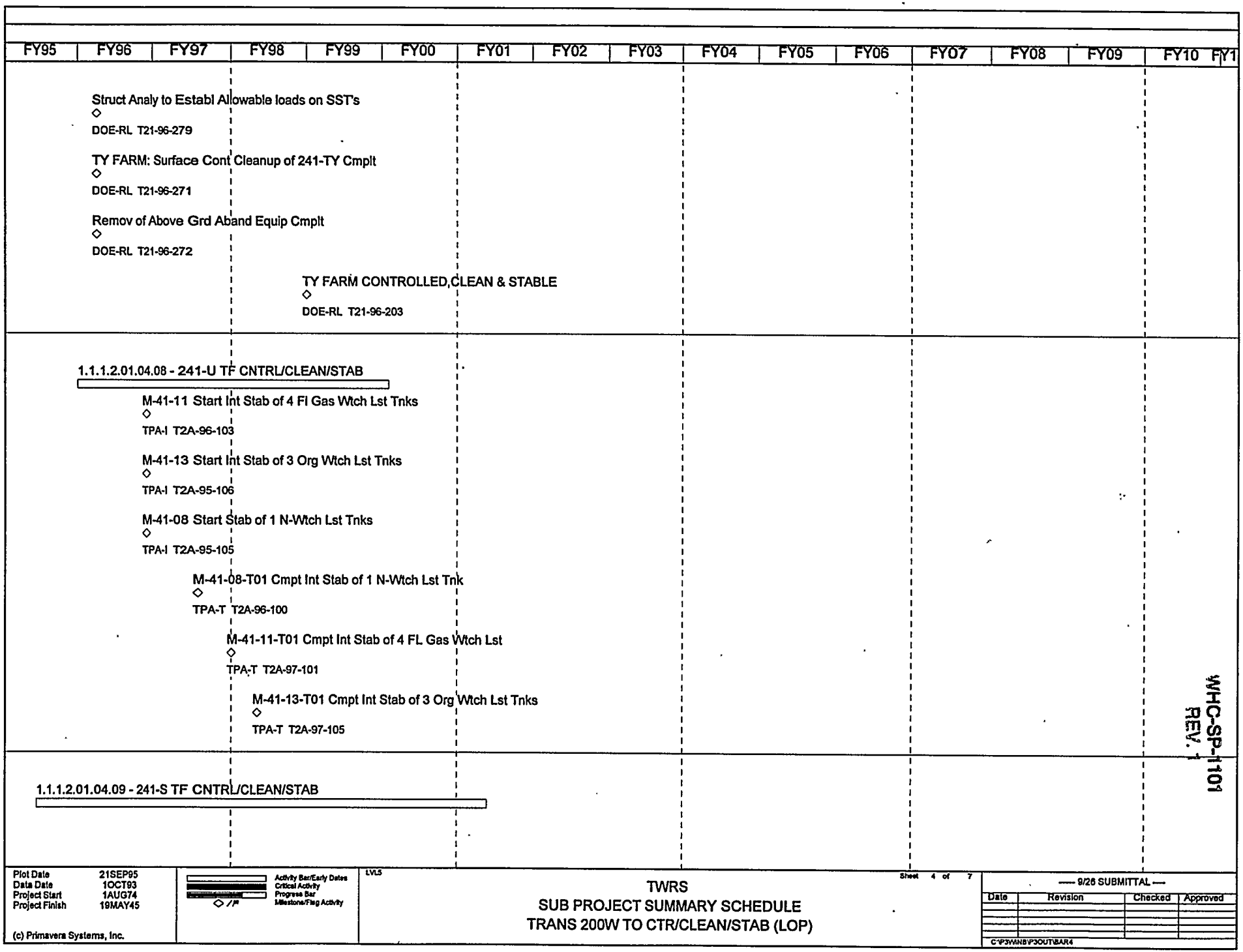
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FY1
Struct Analy to Establ Allowable loads on SST's
DOE-RL T21-96-279
TY FARM: Surface Cont Cleanup of 241-TY Cmplt
DOE-RL T21-96-271
Remov of Above Grd Aband Equip Cmplt
DOE-RL T21-96-272
TY FARM CONTROLLED,CLEAN & STABLE
DOE-RL T21-96-203
1.1.1.2.01.04.08 - 241-U TF CNTRL/CLEAN/STAB
M-41-11 Start Int Stab of 4 Fl Gas Wtch Lst Tnks
TPA-I T2A-96-103
M-41-13 Start Int Stab of 3 Org Wtch Lst Tnks
TPA-I T2A-95-106
M-41-08 Start Stab of 1 N-Wtch Lst Tnks
TPA-I T2A-95-105
M-41-08-T01 Cmpt Int Stab of 1 N-Wtch Lst Tnk
TPA-T T2A-96-100
M-41-11-T01 Cmpt Int Stab of 4 FL Gas Wtch Lst
TPA-T T2A-97-101
M-41-13-T01 Cmpt Int Stab of 3 Org Wtch Lst Tnks
TPA-T T2A-97-105
1.1.1.2.01.04.09 - 241-S TF CNTRL/CLEAN/STAB
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 4 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
Revision
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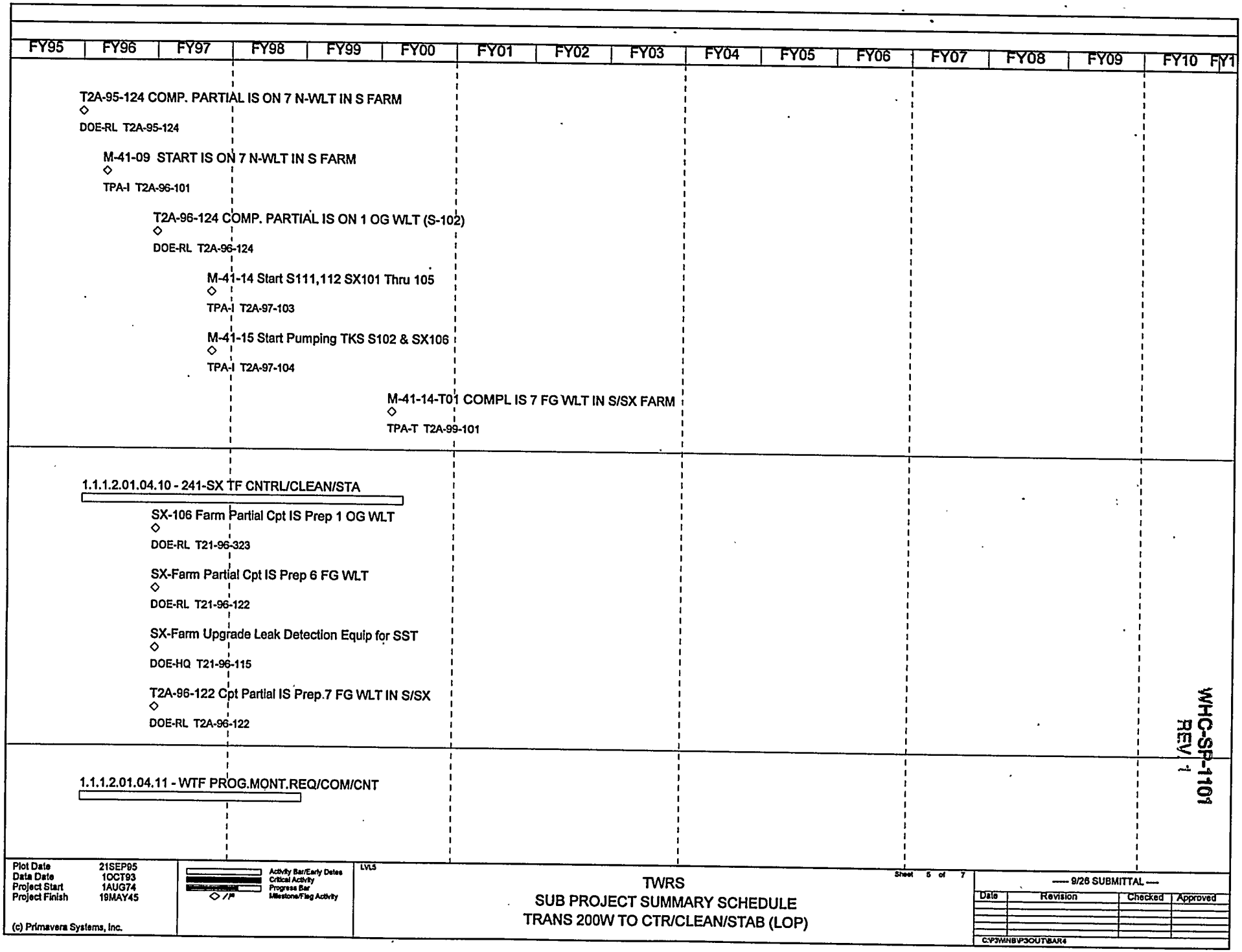
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T2A-95-124 COMP. PARTIAL IS ON 7 N-WLT IN S FARM
DOE-RL T2A-95-124
M-41-09 START IS ON 7 N-WLT IN S FARM
TPA-I T2A-96-101
T2A-96-124 COMP. PARTIAL IS ON 1 OG WLT (S-102)
DOE-RL T2A-96-124
M-41-14 Start S111,112 SX101 Thru 105
TPA-I T2A-97-103
M-41-15 Start Pumping TKS S102 & SX106
TPA-I T2A-97-104
M-41-14-T01 COMPL IS 7 FG WLT IN S/SX FARM
TPA-T T2A-99-101
1.1.1.2.01.04.10 - 241-SX TF CNTRL/CLEAN/STA
SX-106 Farm Partial Cpt IS Prep 1 OG WLT
DOE-RL T21-96-323
SX-Farm Partial Cpt IS Prep 6 FG WLT
DOE-RL T21-96-122
SX-Farm Upgrade Leak Detection Equip for SST
DOE-HQ T21-96-115
T2A-96-122 Cpt Partial IS Prep.7 FG WLT IN S/SX
DOE-RL T2A-96-122
1.1.1.2.01.04.11 - WTF PROG.MONT.REQ/COM/CNT
Plot Date 21SEP95
Data Date 10CT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 5 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
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Approved
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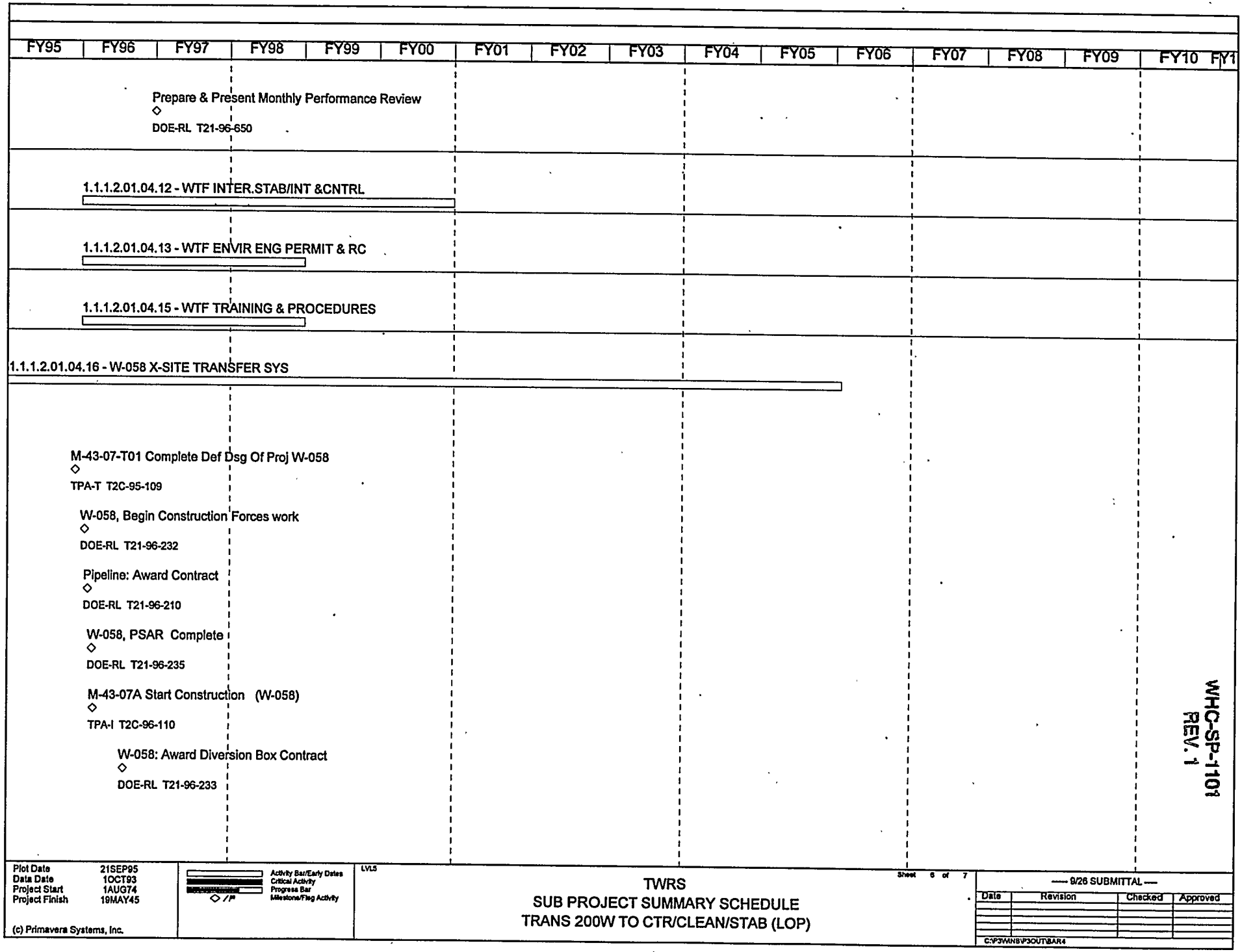
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FY1
Prepare & Present Monthly Performance Review
DOE-RL T21-96-650
1.1.1.2.01.04.12 - WTF INTER.STAB/INT &CNTRL
1.1.1.2.01.04.13 - WTF ENVIR ENG PERMIT & RC
1.1.1.2.01.04.15 - WTF TRAINING & PROCEDURES
1.1.1.2.01.04.16 - W-058 X-SITE TRANSFER SYS
M-43-07-T01 Complete Def Dsg Of Proj W-058
TPA-T T2C-95-109
W-058, Begin Construction Forces work
DOE-RL T21-96-232
Pipeline: Award Contract
DOE-RL T21-96-210
W-058, PSAR Complete
DOE-RL T21-96-235
M-43-07A Start Construction (W-058)
TPA-I T2C-96-110
W-058: Award Diversion Box Contract
DOE-RL T21-96-233
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 6 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
Revision
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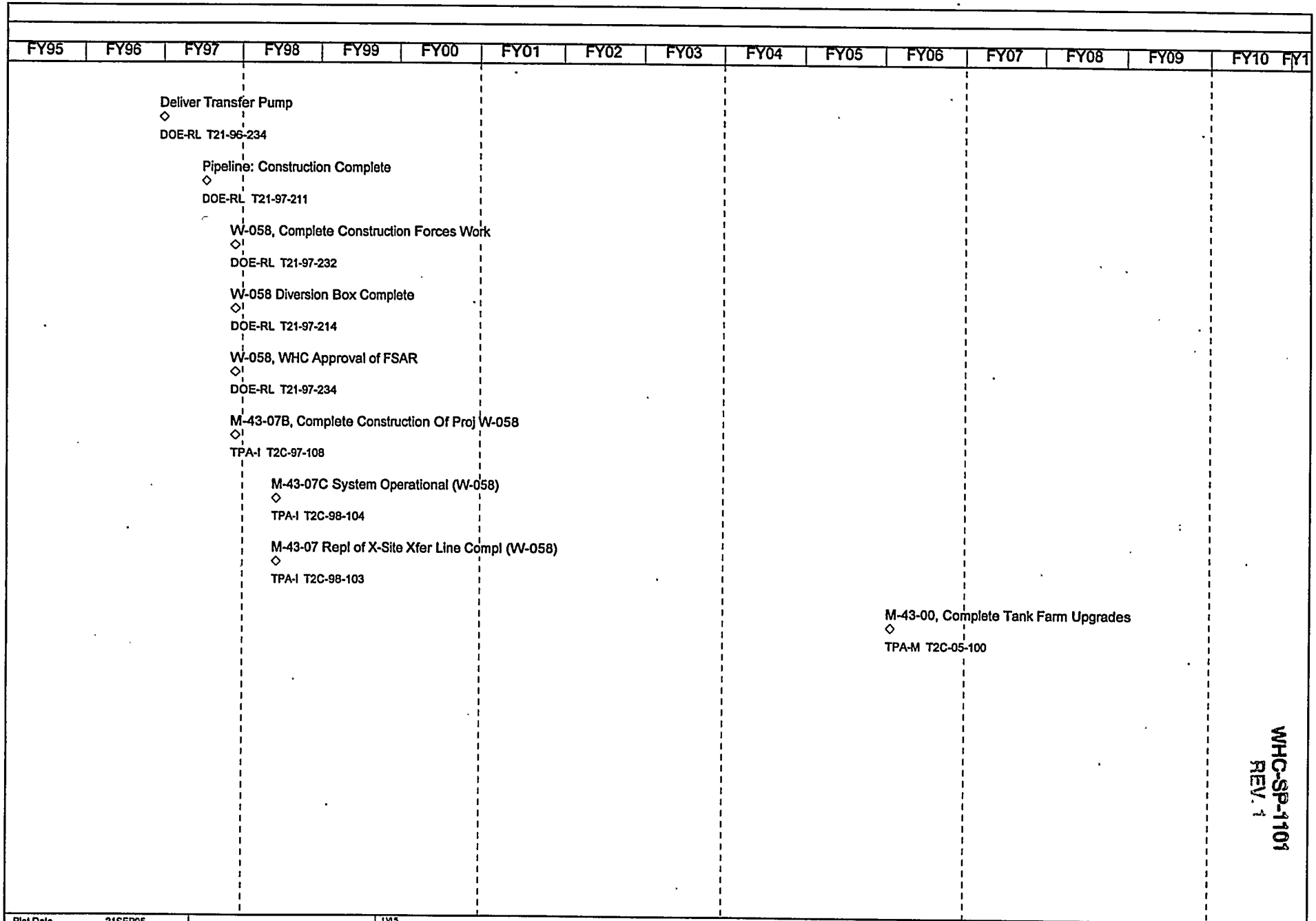
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FY1
Deliver Transfer Pump
DOE-RL T21-96-234
Pipeline: Construction Complete
DOE-RL T21-97-211
W-058, Complete Construction Forces Work
DOE-RL T21-97-232
W-058 Diversion Box Complete
DOE-RL T21-97-214
W-058, WHC Approval of FSAR
DOE-RL T21-97-234
M-43-07B, Complete Construction Of Proj W-058
TPA-I T2C-97-108
M-43-07C System Operational (W-058)
TPA-I T2C-98-104
M-43-07 Repl of X-Site Xfer Line Compl (W-058)
TPA-I T2C-98-103
M-43-00, Complete Tank Farm Upgrades
TPA-M T2C-05-100
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 7 of 7
TWRS
SUB PROJECT SUMMARY SCHEDULE
TRANS 200W TO CTR/CLEAN/STAB (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.04 Transition 200W to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.04.10	SX-Farm Upgrade Leak Detection Equip for SST	DOE-HQ T21-96-115		30SEP96
1.1.1.2.01.04.10	SX-Farm Partial Cpt IS Prep 6 FG WLT	DOE-RL T21-96-122		30SEP96
1.1.1.2.01.04.01	Status Dev of Draft of 97 MYPP	DOE-RL T21-96-201		31MAY96
1.1.1.2.01.04.07	TY FARM CONTROLLED,CLEAN & STABLE	DOE-RL T21-96-203		30SEP98
1.1.1.2.01.04.01	Issue Quart Rpts re: status of ongoing act	DOE-RL T21-96-205		31OCT95
1.1.1.2.01.04.01	Complete QA Assessments	DOE-RL T21-96-207		30SEP96
1.1.1.2.01.04.16	Pipeline: Award Contract	DOE-RL T21-96-210		31OCT95
1.1.1.2.01.04.16	W-058, Begin Construction Forces work	DOE-RL T21-96-232	16OCT95	
1.1.1.2.01.04.16	W-058: Award Diversion Box Contract	DOE-RL T21-96-233		01MAY96
1.1.1.2.01.04.16	Deliver Transfer Pump	DOE-RL T21-96-234		30SEP96
1.1.1.2.01.04.16	W-058, PSAR Complete	DOE-RL T21-96-235		21NOV95
1.1.1.2.01.04.07	TY FARM: Surface Cont Cleanup of 241-TY Cmplt	DOE-RL T21-96-271		29DEC95
1.1.1.2.01.04.07	Remov of Above Grd Aband Equip Cmplt	DOE-RL T21-96-272		29DEC95
1.1.1.2.01.04.07	TY Farm: Connection of all ENRAFs to TMACS Cmplt	DOE-RL T21-96-273		29DEC95

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.04 Transition 200W to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.04.07	Struct Analy to Establ Allowable loads on SST's	DOE-RL T21-96-279		29DEC95
1.1.1.2.01.04.01	Submit FY 97 Final MYWP for West TF	DOE-RL T21-96-291		30AUG96
1.1.1.2.01.04.01	Submit FY 97 Draft MYWP for West TF	DOE-RL T21-96-293		28JUN96
1.1.1.2.01.04.03	WEST TF - PRESSURE TEST X-SITE XFER LINE NO.	DOE-RL T21-96-304		28JUN96
1.1.1.2.01.04.03	WEST TF - SST EMERGENCY PUMP PREPARATION	DOE-RL T21-96-305	29DEC95	
1.1.1.2.01.04.03	WEST TF - CPT IMPLEMENTATION 10CFR835	DOE-RL T21-96-305	02JAN96	
1.1.1.2.01.04.02	WTF - MONITORED DEV/IMPLEMENTATION HAZ COM PROG	DOE-RL T21-96-306		30SEP96
1.1.1.2.01.04.03	WEST TANK FARMS - COG ENGR TRAINING	DOE-RL T21-96-307		27SEP96
1.1.1.2.01.04.06	241-TX CONTROLLED, CLEAN AND STABLE	DOE-RL T21-96-309		23MAR98
1.1.1.2.01.04.02	WTF - MNTC OPTIMIZATION PLAN PM WP REBASELINE	DOE-RL T21-96-310		26FEB96
1.1.1.2.01.04.06	241-TX LETTER ISSUED TO DOE EQUIP REMOVED	DOE-RL T21-96-315		25MAR96
1.1.1.2.01.04.06	TX ISSUE ENRAFF TIE-IN COMPLETION LETTER TO DOE	DOE-RL T21-96-316		27JUN96
1.1.1.2.01.04.06	241-TX ISSUE CPT LTR FOR AC & LCO INSTALLATION	DOE-RL T21-96-317		15AUG96
1.1.1.2.01.04.03	WEST TF - SST EMERGENCY PUMP PREPARATION	DOE-RL T21-96-319		30SEP96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.04 Transition 200W to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.04.03	WEST TF - SST EMERGENCY PUMP PREPARATION	DOE-RL T21-96-321	30APR96	
1.1.1.2.01.04.10	SX-106 Farm Partial Cpt IS Prep 1 OG WLT	DOE-RL T21-96-323		30SEP96
1.1.1.2.01.04.02	WTF - MNTC OPTIMIZATION PLAN PM WP REBASELINE	DOE-RL T21-96-325		30SEP96
1.1.1.2.01.04.11	Prepare & Present Monthly Performance Review	DOE-RL T21-96-650		30SEP96
1.1.1.2.01.04.16	Pipeline: Construction Complete	DOE-RL T21-97-211		18APR97
1.1.1.2.01.04.16	W-058 Diversion Box Complete	DOE-RL T21-97-214		29AUG97
1.1.1.2.01.04.16	W-058, Complete Construction Forces Work	DOE-RL T21-97-232		28AUG97
1.1.1.2.01.04.16	W-058, WHC Approval of FSAR	DOE-RL T21-97-234		29AUG97
1.1.1.2.01.04.08	M-41-08 Start Stab of 1 N-Wtch Lst Tnks	TPA-I T2A-95-105		30AUG96
1.1.1.2.01.04.08	M-41-13 Start Int Stab of 3 Org Wtch Lst Tnks	TPA-I T2A-95-106		30AUG96
1.1.1.2.01.04.09	T2A-95-124 COMP. PARTIAL IS ON 7 N-WLT IN S FARM	DOE-RL T2A-95-124		29SEP95
1.1.1.2.01.04.03	RESTORE CROSS-SITE TRANSFER CAPABILITY	DOE-RL T2A-95-138		01AUG95
1.1.1.2.01.04.04	COMPLETE HEALTH PHYSICS REQUIREMENTS	DOE-RL T2A-95-144		29SEP95
1.1.1.2.01.04.03	COMPLETE IH&S REQUIREMENTS	DOE-RL T2A-95-184		29SEP95

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.01.04 Transition 200W to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.04.08	M-41-08-T01 Cmpt Int Stab of 1 N-Wtch Lst Tnk	TPA-T T2A-96-100		30APR97
1.1.1.2.01.04.09	M-41-09 START IS ON 7 N-WLT IN S FARM	TPA-I T2A-96-101	31JAN96	
1.1.1.2.01.04.08	M-41-11 Start Int Stab of 4 Fl Gas Wtch Lst Tnks	TPA-I T2A-96-103		30AUG96
1.1.1.2.01.04.10	T2A-96-122 Cpt Partial IS Prep 7 FG WLT IN S/SX	DOE-RL T2A-96-122		30SEP96
1.1.1.2.01.04.09	T2A-96-124 COMP. PARTIAL IS ON 1 OG WLT (S-102)	DOE-RL T2A-96-124		30SEP96
1.1.1.2.01.04.03	M-41-03B DELIVERY OF MOBILE HLLW CASK	TPA-I T2A-96-125		31JAN96
1.1.1.2.01.04.08	M-41-11-T01 Cmpt Int Stab of 4 FL Gas Wtch Lst	TPA-T T2A-97-101		30SEP97
1.1.1.2.01.04.09	M-41-14 Start S111,112 SX101 Thru 105	TPA-I T2A-97-103	27JUN97	
1.1.1.2.01.04.09	M-41-15 Start Pumping TKS S102 & SX106	TPA-I T2A-97-104	30JUN97	
1.1.1.2.01.04.08	M-41-13-T01 Cmpt Int Stab of 3 Org Wtch Lst Tnks	TPA-T T2A-97-105		02FEB98
1.1.1.2.01.04.05	M-41-16 START IS OF 1 NON-WLT IN T FARM (T-104)	TPA-I T2A-98-101	31MAR98	
1.1.1.2.01.04.05	M-41-16-T01CPT IS OF 1 NON-WLT IN T FARM (T-104)	TPA-T T2A-98-102		31AUG98
1.1.1.2.01.04.05	M-41-17 START IS ON 1 FeCN TANK IN 241-T	TPA-I T2A-98-103	02APR98	
1.1.1.2.01.04.05	M-41-17-T1 COMP. IS OF 1 FeCN TANK IN 241-T	TPA-T T2A-98-104		04MAY98

1.1.1.2.01.04 Transition 200W to Ctrd/Clean/Stab

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.01.04.05	M-41-18 START IS ON 1 FG TANK IN 241-T	TPA-I T2A-98-105	02APR98	
1.1.1.2.01.04.05	M-41-18-T1 COMP IS OF 1 FG TANK IN 241-T	TPA-T T2A-98-106		27JUL98
1.1.1.2.01.04.09	M-41-14-T01 COMPL IS 7 FG WLT IN S/SX FARM	TPA-T T2A-99-101		30NOV99
1.1.1.2.01.04.16	M-43-00, Complete Tank Farm Upgrades	TPA-M T2C-05-100		28OCT05
1.1.1.2.01.04.16	M-43-07-T01 Complete Def Dsg Of Proj W-058	TPA-T T2C-95-109		30AUG95
1.1.1.2.01.04.16	M-43-07A Start Construction (W-058)	TPA-I T2C-96-110	29NOV95	
1.1.1.2.01.04.16	M-43-07B, Complete Construction Of Proj W-058	TPA-I T2C-97-108		29AUG97
1.1.1.2.01.04.16	M-43-07 Repl of X-Site Xfer Line Compl (W-058)	TPA-I T2C-98-103		26FEB98
1.1.1.2.01.04.16	M-43-07C System Operational (W-058)	TPA-I T2C-98-104		26FEB98
1.1.1.2.01.04.03	DISPOSE OF PORTABLE EXHAUSTERS & DUCTWORK	DOE-RL TW1-94-522		16MAR95
1.1.1.2.01.04.16	W-058: Issue NOC To DOH	DOE-RL TW3-94-418		30SEP94

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.04 - Trans 200W C/C/S - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
1	EXPENSE	204693	45708	39077	38304	31980	26027	23598	
2	CENRTC	1485	1485						
3	LINE ITM	37862	11558	25941	364				
	REPORT TOTAL	244040	58751	65017	38667	31980	26027	23598	

Attachment 4.3-6 Cost Baseline Summary by Year

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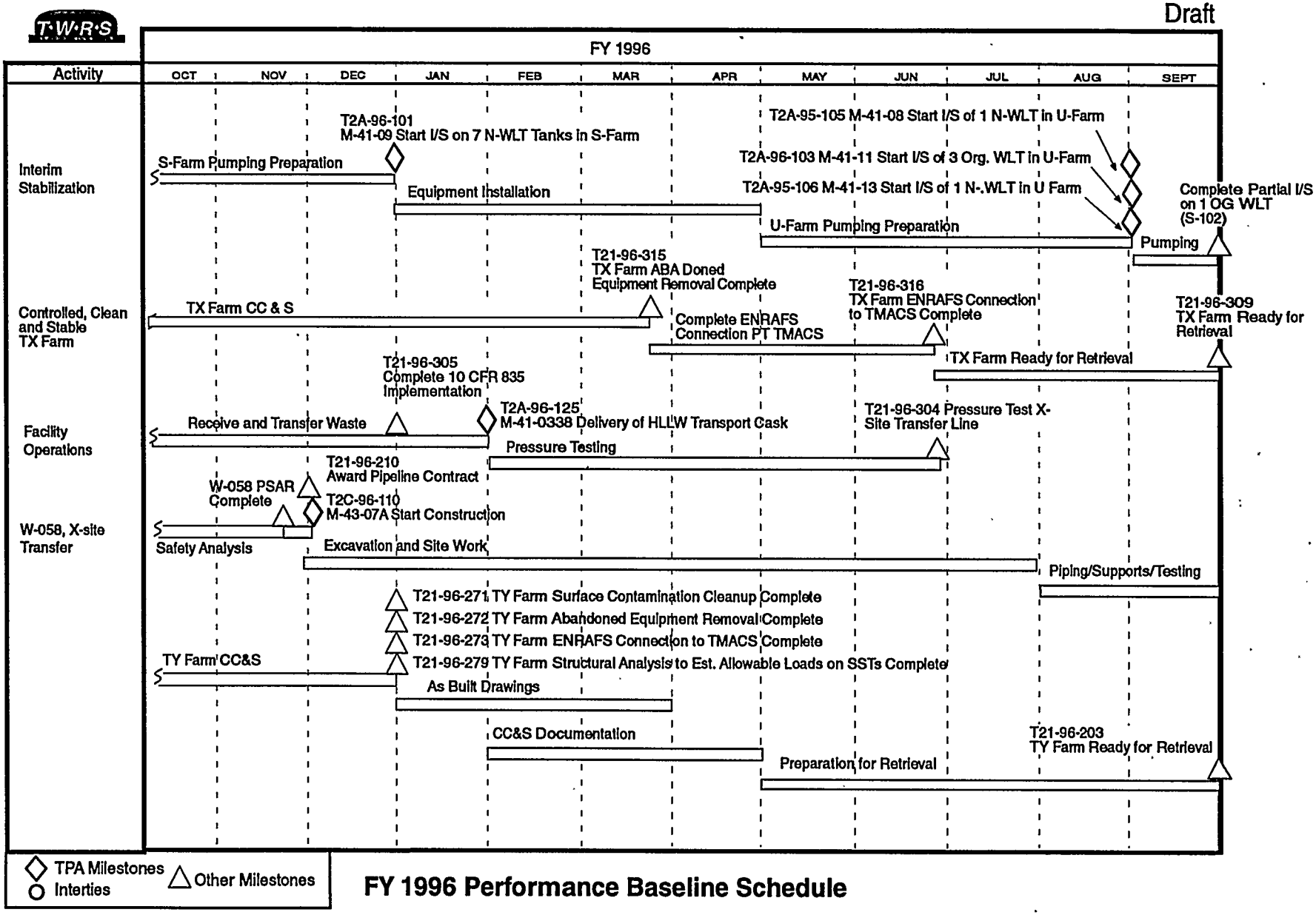

FY 1996 Performance Baseline Schedule

1.1.1.2.01.04 Tank Farm Operations - Transition 200W to Controlled, Clean and Stable 29509043.3 rev 1

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.04 - Trans 200W - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.01.04.01 - WEST TF TRANS. PROJ. MGMT	540	491	467	540	491	516	540	540	491	516	540	491	6166
	1.1.1.2.01.04.02 - MAINTAIN WEST TF / FAC.	846	769	731	846	769	808	846	846	769	808	846	769	9656
	1.1.1.2.01.04.03 - OPERATE WEST TF / FAC.	544	495	470	544	495	519	544	544	494	502	526	467	6145
	1.1.1.2.01.04.04 - WEST WST STORAGE SURVEIL.	291	265	252	291	265	278	291	291	265	278	291	265	3323
	1.1.1.2.01.04.05 - 241-T TF CNTRL/CLEAN/STAB													
	1.1.1.2.01.04.06 - 241-TX TF CNTRL/CLEAN/STA	139	91	63	134	122	112	10	10	10	33	35	25	785
	1.1.1.2.01.04.07 - 241-TY TF CNTRL/CLEAN/STA	155	148	141	36	23	24	17						544
	1.1.1.2.01.04.08 - 241-U TF CNTRL/CLEAN/STAB	383	348	331	383	348	365	383	383	348	365	383	176	4195
	1.1.1.2.01.04.09 - 241-S TF CNTRL/CLEAN/STAB	264	240	228	266	478	558	605	605	541	539	523	471	5317
	1.1.1.2.01.04.10 - 241-SX TF CNTRL/CLEAN/STA	90	82	77	90	82	86	90	90	82	86	90	82	1023
	1.1.1.2.01.04.11 - WTF PROG.MONT.REQ/COM/CNT	172	156	148	172	156	164	172	172	156	164	172	156	1959
	1.1.1.2.01.04.12 - WTF INTER.STAB/INT &CNTRL	169	153	147	195	177	176	140	140	127	134	140	127	1827
	1.1.1.2.01.04.13 - WTF ENVIR ENG PERMIT & RC	197	179	170	197	179	188	197	197	179	188	197	179	2242
	1.1.1.2.01.04.15 - WTF TRAINING & PROCEDURES	125	113	108	125	113	119	125	125	113	119	125	113	1422
	1.1.1.2.01.04.16 - W-058 X-SITE TRANSFER SYS	97	88	83	97	88	92	97	97	88	92	97	88	1103
TOTAL	1	4010	3617	3415	3916	3785	4006	4057	4040	3664	3824	3965	3409	45708
2 - CENRTC														
	1.1.1.2.01.04.02 - MAINTAIN WEST TF / FAC.	30	27	26	30	27	28	30	30	27	28	30	27	339
	1.1.1.2.01.04.03 - OPERATE WEST TF / FAC.	71	65	61	5	5	5	5	5	5	5	5	5	241
	1.1.1.2.01.04.06 - 241-TX TF CNTRL/CLEAN/STA	211	192	182	73	67	70							795
	1.1.1.2.01.04.07 - 241-TY TF CNTRL/CLEAN/STA		22	21	24	22	23							110
TOTAL	2	312	305	290	132	120	126	35	35	32	33	35	32	1485

Attachment 4.3-8 Cost Estimate Baseline by Month
Sheet 1 of 2

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.01.04 - Trans 200W - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
3 - LINE ITM														
	1.1.1.2.01.04.16 - W-058 X-SITE TRANSFER SYS	1110	994	900	990	900	945	990	990	900	945	990	900	11558
TOTAL	3	1110	994	900	990	900	945	990	990	900	945	990	900	11558
	REPORT TOTAL	5432	4916	4605	5038	4805	5078	5082	5065	4596	4803	4990	4341	58751

5.0 SAFETY ISSUE RESOLUTION (WBS 1.1.1.2.2)

The Safety Issue Resolution Project (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell tanks (DSTs) and single-shell tanks (SSTs) at the Hanford Site.

The Safety Issue Resolution Project will meet the applicable functions and requirements and will deliver the products and end items necessary to achieve the Tank Waste Remediation System (TWRS) Program mission. The purpose of the Safety Issue Resolution Project is to mitigate and/or resolve waste tank safety issues at the Hanford Site. The project's objectives are to:

1. Serve as a focal point to identify and resolve high-priority waste tank safety issues.

2. Ensure safe storage of waste during the interim period until retrieval or disposal operations begin.

The Safety Issue Resolution Project consists of the following sub-projects:

Flammable Gas (1.1.1.2.2.1)
Ferrocyanide (1.1.1.2.2.2)
Organics and Noxious Vapors (1.1.1.2.2.3)
High Heat and Others (1.1.1.2.2.4)

Sections 5.1, 5.2, 5.3, and 5.4 contain specific information about each of the above sub-projects.

The work breakdown structure (WBS) tree for the Safety Issue Resolution Project is found in Attachment 5.0-1.

The WBS dictionary sheet for the Safety Issue Resolution Project is found in Attachment 5.0-2.

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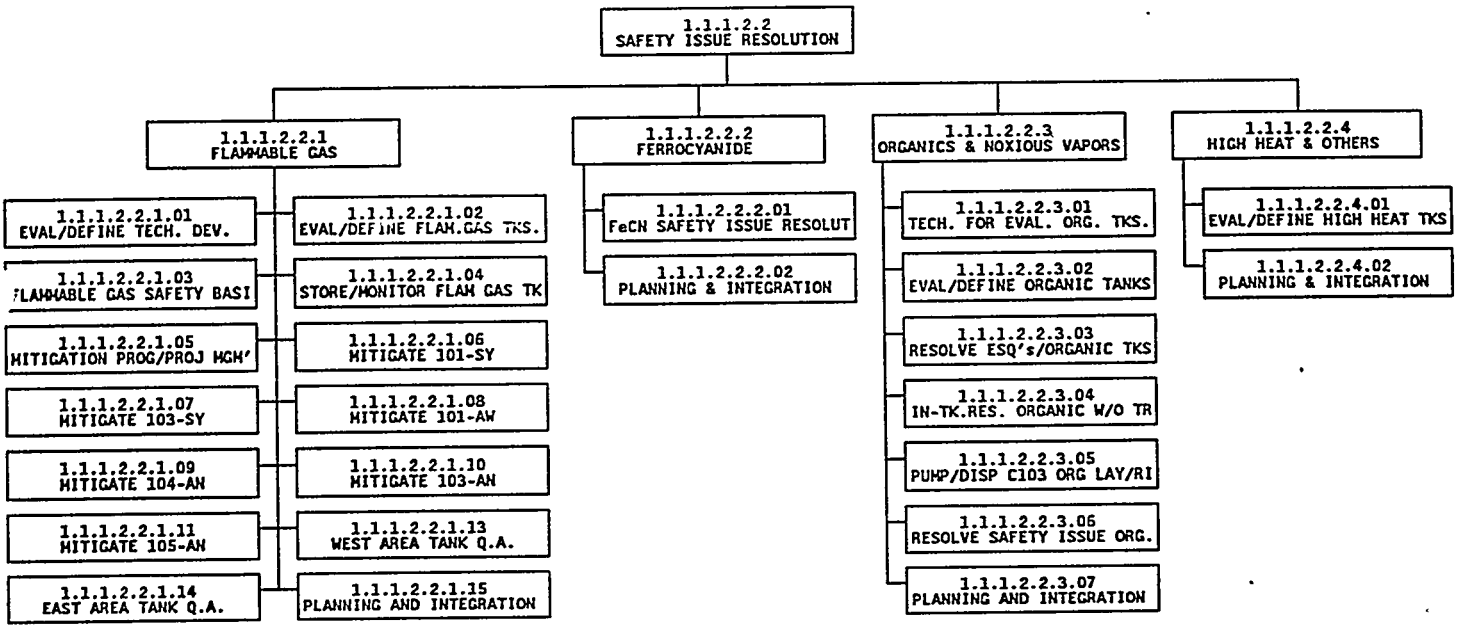
LISTING OF ATTACHMENTS

Attachment 5.0-1 Work Breakdown Structure

Attachment 5.0-2 WBS Dictionary Sheet

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
SAFETY ISSUE RESOLUTION



Attachment 5.0-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1 DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/19/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.2 WASTE STORAGE	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.2.02 Level 4	SAFETY ISSUE RESOLUTION	
5. CURRENT REV. NO.	6. EFFECTIVE REV. DATE	7. APPROVED CHANGES
0	5/10/95	
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO	9. BUDGET AND REPORTING NUMBERS	
11100	Operating EW3120072 / CENTRC 35EW31207 / GPP / Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	34,021.00	33,745.00	34,834.00	14,355.00	10,720.00	6,233.00	
CENRTC	15,677.00	14,937.00	12,599.00	4,617.00	3,209.00	1,209.00	
LINE ITEM							
GPP							
TOTAL	49,698.00	48,682.00	47,433.00	18,972.00	13,929.00	7,442.00	

B. TECHNICAL BASES

Goals and Objectives
The goal is to mitigate and/or resolve high priority waste tank safety issues to the fullest extent practicable. The objective is timely resolution of safety issues while ensuring safe storage of tank waste with minimum impact to the environment during the interim period until retrieval for treatment and/or disposal operations begin. The scope includes conducting safety evaluations and proposing corrective action strategies for mitigating and/or resolving the hazards.

□The Safety Issue Resolution Program consists of the following Level V sub-projects:
□□
□□1.1.1.2.02.01, Flammable Gas
□□1.1.1.2.02.02, Ferrocyanide
□□1.1.1.2.02.03, Organics & Noxious Vapors
□□1.1.1.2.02.04, High Heat & Others

TECHNICAL BASES

The safety Issue Resolution Program (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell and single-shell tanks at the Hanford Site. This program serves as the focal point for identification and resolution of high priority waste

tank safety issues. Several safety issues and deficiencies have been identified, and four issues have been declared unreviewed safety questions (USQ) because they represent conditions potentially outside the existing safety envelopes. Twenty-five (six double-shell and nineteen single-shell) tanks have a significant potential to generate and release flammable gases (primarily hydrogen and ammonia) mixed with an oxidizer (nitrous oxide); eighteen single-shell tanks contain greater than 1,000 g-moles of ferrocyanide; and eighteen single-shell tanks contain organic chemicals (exceeding 3 weight percent total organic carbon) mixed with sodium nitrate/nitrite. These tanks all have the potential for runaway reactions which could result in the release of high-level waste. Two single- shell tanks either have, or have had, a floating layer of organic solvent. One single-shell tank with a heat generation rate greater than 100,000 Btu/hr requires periodic water additions to prevent waste temperatures from exceeding the 300 F operating limit; in the event of a tank leak, if cooling water additions were discontinued, then the tank could fail due to high temperature, and result in the release of high-level waste. These fifty-four tanks (ten organic tanks are also listed as flammable gas or Ferrocyanide tanks) comprise the Watch List and are subject to operating restrictions in and around them to minimize the possibility of an unsafe event occurring.

Major End-Item Deliverables

The end-item deliverable that will complete this WBS Element is the following Tri-Party Agreement Major Milestone:

M-40-00 (T2B-01-100) Transmit letter to DOE-RL indicating that all high priority Watch List tanks have been mitigated and/or that their safety issues have been resolved.

Supporting deliverables include the following Tri-Party Areement Interim Milestone:

M-40-01 (TW2-94-462) Transmit report documenting results of the Tank 241-SY-101 low speed mixer pump test to RL. (Complete)

M-40-02 (T2B-95-100) Provide letter to RL documenting completion of upgrading temperature monitoring capabilities in ferrocyanide tanks. (Complete)

M-40-02A (TW2-94-435) Provide letter to RL transmitting a final cleared summary report on the criteria for upgraded temperature monitoring capabilities in ferrocyanide tanks. (Complete)

M-40-02B (TW2-94-490) Issue status report to RL documenting completion of installing two of seven new thermocouples and continuous temperature monitoring systems in ferrocyanide tanks. (Complete)

M-40-03 (T2B-96-100) Transmit a cleared report to RL summarizing the results of vapor characterization of all ferrocyanide Watch List tanks.

M-40-04-T01 (T2B-95-101) Reach a decision to interim stabilize tank 241-C-103 with floating organic layer in place or proceed with removal of floating organic layer. (Complete)

M-40-05 (T2B-95-102) Transmit cleared report to RL on the minimum liquid level and amount of water additions recommended for high-heat tank 241-C-106 as determined by a safety alternative test. (Complete)

M-40-06 (TW2-95-322) Transmit to RL the formal quantitative analysis (surrogate validated) report on vapor sampling characterization of Tank 241-C-103. (Complete)

M-40-07 (T2B-95-103) Transmit letter to RL announcing commencement of operation of a vapor treatment system for tank 241-C-103. (Complete)

M-40-08 (T2B-96-101) Transmit a cleared report to RL summarizing the results of vapor characterization of all organic Watch List tanks.

M-40-09 (T2B-98-100) Transmit letter to RL recommending closure of the USQ for the single-shell flammable gas tanks. RL approval will close the last of the unreviewed safety questions for double-shell and single-shell tanks that had been identified as of September 30, 1993.

M-40-10 (T2B-97-100) Transmit cleared report to RL on the results of vapor space monitoring in all flammable gas generating tanks.

M-40-11 (TW2-94-445) Issue an approved criticality safety analysis and, if needed, a control plan; and support approval by

DOE of criticality unreviewed safety question closure documentation by providing input as necessary. (Complete)

M-40-12 (T2B-99-100) Transmit letter to RL documenting resolution of the nuclear criticality safety issue.

M-40-13 (TW2-94-467) Transmit letter to RL documenting design and fabrication of a spare mixer pump for tank 241-SY-101. (Complete)

M-40-14 (TW2-94-493) Support approval by DOE of ferrocyanide USQ closure documentation by providing input as necessary. (Complete)

M-40-15 (TW2-94-417) Transmit letter to RL documenting installation of standard hydrogen monitoring systems in the remaining five potentially flammable double-shell tanks. (Complete)

M-40-16 (TW2-94-492) Submit Draft Interim Safety Basis Level 1 topical report for RL review two months after receipt of tank 241-C-103 dip sample draft analytical report from PNL. (Complete)

M-40-17 (TW2-94-491) Support approval by DOE of Tank 241-C-103 USQ closure documentation by providing input as necessary. (Complete)

Acceptance Criteria
This program element will be complete if:

All work described in this WBS Element is accomplished within its cost, schedule and technical baseline; and performance measurement of work actually achieved is accurately reported.

All 4 of the unreviewed safety questions (identified as of September 30, 1993) are closed per DOE Order 5480.21.

All 6 parts of the DNFSB 90-7 are closed as described in the "Implementation Plan for the Defense Nuclear Facilities Safety Board Recommendation 90-7," DOE/RL-110.

Approval is received from DOE for removal of approximately 55 tanks (as of September 30, 1995) from the Watch List.

An adequate safety basis is established to bound the known hazards associated with the safety issues and deficiencies (identified as of April 15, 1995). Redefining the safe operating conditions may result in either the removal and/or addition of interim operational restrictions for waste tanks.

Approval is received from DOE to resolve the safety issues and deficiencies (identified as of April 15, 1995) after either controlling or eliminating the hazards.

C. STATEMENT OF WORK

Required Activities over Lifetime:

Tanks with the higher risk will be evaluated and mitigated first. The logic involves a problem definition phase followed by three optional paths leading to resolution of the safety issue for a tank or group of tanks by either controlling or eliminating the hazard. The logic elements are: (1) evaluate and define the problem; (2) in-tank resolution without treatment; (3) in-tank resolution with treatment; and (4) resolution out-of-tank with or without treatment. The path followed is ultimately a function of whether the waste requires treatment and where the waste treatment takes place. The logic sequence for performing work is the same for all tanks. Much of the work within this program element is "first-of-a-kind" in nature; and all information gained and decisions made for one tank are shared with the remaining tanks. Work on many tanks and safety issues is being conducted in parallel to resolve the issues as expeditiously as possible.

The problem definition phase consists of reviewing historical records; procuring laboratory and waste monitoring equipment; developing analytical methods; conducting simulant waste studies; obtaining and analyzing waste samples; interpreting characterization and monitoring data; developing predictive models; and performing safety and environmental analyses. Recommendations for closure of the USQs will be made based on updated analyses or mitigation of the hazard. In-tank resolution without treatment consists of developing, procuring, and installing additional equipment to continuously monitor tank parameters (temperature, pressure, gas concentration, surface level), which is necessary for most tanks to complete problem definition; and for some tanks, may also be adequate to resolve the safety issue. If not, corrective action plans will be prepared and implemented to

control the hazard. Some of the in-tank resolution with treatment (mitigation) options being considered are moisture control; mixer pumps; sonic or perhaps ultrasonic agitation; heating and dilution; closed-loop cooling; and vapor treatment. Scope consists of concept development, design, fabrication, installation, testing, and demonstration of the equipment. The safety envelope will be redefined, operating procedures modified, control limits established, and documentation completed for recommendation of safety issue resolution. Also included in this programs scope is data analysis and interpretation, field surveillance, and statistical evaluations. Operation of mitigation and/or monitoring equipment beyond testing, operational verification and turnover to tank farm operations is not within the scope of this Program Element, nor is resolution out-of-tank with or without treatment (remediation), if required.

The program element is scheduled to be complete by 2001 with the following exception: (1) flammable gas double-shell tanks may require waste retrieval (remediation) which may delay safety issue resolution until 2005. The "Cost Content" section reflects planning through Fiscal Year 2001.

Several sources of risk and/or uncertainty exist for this program element. One is the tank structures (i.e., whether there are adequate risers to support characterization and enhanced monitoring; whether the tanks can support additional loads from monitoring and mitigation equipment; and whether any tanks will fail and require accelerated retrieval); there is moderate risk in this area. Another is the approval process for USQ closure and removal of tanks from the Watch List; until the approval is delegated from HQ to RL there is moderate risk in this area as well. Another is whether all hazards and issues have been identified. And another is whether existing methods will be successful in controlling the hazards. Since the mixer pump in tank 241-SY-101 is considered a success in controlling the flammable gas releases and plans are in place for controlling most of the other hazards, this is considered low risk.

Interfaces:

Item Provided From This WBS (1.1.1.2.02) to:

1.1.1.2.01 Tank Farm Operations: Mitigation/resolution of tank safety issues and/or closure of unreviewed safety questions to achieve a new safe operating condition envelope; removal of tanks from the Watch List; removal of operational restrictions; operation/maintenance of installed systems.

1.1.1.2.04 Waste Characterization: Data requirements and Data Quality Objective documents; Data (on tank waste behavior); Reuseable Materials for Characterization (developmental instruments for testing of tank waste properties).

1.1.1.3.01 Waste Retrieval: Data for Retrieve Waste (results of technical investigations of waste properties); mitigation of tank safety issues and/or closure of unreviewed safety questions to allow remediation through retrieval of tank waste.

Solid Waste Disposal: Manage Tank Waste (MTW) System Generated (SG) solid waste (contaminated equipment removed from tanks).

Item Provided To This WBS (1.1.1.2.02) from:

1.1.1.2.01 Tank Farm Operations: Operation and maintenance of waste tank plant systems. Upgrade of waste tank facilities and systems.

1.1.1.2.04 Waste Characterization: Tank Waste Analysis Plans (TWAP)/Tank Characterization Plans and Tank Characterization Reports (TCR).

1.1.1.3.01 Waste Retrieval: Retrieved tank waste as part of the actions necessary for safety issue resolution.

Characterization must provide representative samples per the appropriate DQO and the necessary chemical, thermodynamic, and physical property data to permit completion of laboratory testing and documentation for safety issue resolution. Resolution of safety issues must not alter the waste in a manner that will adversely affect tank farm operations, retrieval operations, or treatment operations. The high-level waste and low-level waste programs will be notified of potential chemical additions that may be used for safety issue resolution; and will be notified when mitigation measures for resolving waste tank safety issues have been validated.

5.1 FLAMMABLE GAS (WBS 1.1.1.2.2.1)

5.1.1 STRATEGY

5.1.1.1 Objectives

The Safety Issue Resolution Project (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell tanks (DST) and single-shell tanks (SST) at the Hanford Site.

The Safety Issue Resolution Project will meet the applicable functions and requirements and will deliver the products and end items necessary to achieve the Tank Waste Remediation System (TWRS) Program mission. The purpose of the Safety Issue Resolution Project is to mitigate and/or resolve the waste tank safety issues at the Hanford Site and the objectives are:

1. Serve as a focal point to identify and resolve high-priority waste tank safety issues.

2. Ensure safe storage of waste during the interim period until retrieval or disposal operations begin.

The Safety Issue Resolution Project consists of the following sub-projects:

Flammable Gas (1.1.1.2.2.1)
Ferrocyanide (1.1.1.2.2.2)
Organics (1.1.1.2.2.3)
High Heat and Others (1.1.1.2.2.4)

A description of the flammable gas safety issues can be found in the Level 5 Work Breakdown Structure Dictionary, Attachment 5.1-2.

The potential to generate and release flammable gases mixed with an oxidizer has been identified as a high-priority safety issue. The objective is to develop tank safety criteria and to apply the criteria on a tank-by-tank basis. The safety issue will be resolved for all tanks by either: (1) demonstrating that a hazard does not exist and no action other than surveillance of important tank parameters is required; (2) controlling the hazard (mitigation); or (3) eliminating the hazard (removing the waste from the tanks by Waste Retrieval [WBS 1.1.1.3.1], and treating in a future facility).

5.1.1.2 Planning Assumptions

1. All six flammable gas DSTs on the Watch List (241-SY-101, 241-SY-103, 241-AW-101, 241-AN-103, 241-AN-104, and 241-AN-105) will be retrieved to enable the safety issue to be resolved.

2. No single-shell flammable gas tank will be retrieved to enable the flammable gas safety issue to be resolved for those tanks.

3. The mixer pump installed in tank 241-SY-101 to mitigate the waste hazard will be turned over to TWRS Transition Projects and operated until the waste has been retrieved. A spare pump(s) will be provided to meet risk guidelines for pump failure.

4. Safety issues will be mitigated and/or resolved. Resolution of safety issues for some tanks may be delayed if out-of-tank treatment is required.

5. Activities to resolve waste tank safety issues shall be based on continued in situ safe storage of the waste until the waste is retrieved for treatment and/or disposal.

6. Safe interim storage of waste shall support continued operations, characterization, retrieval, treatment, and other cleanup activities.

7. Equipment, including cameras, multi-function instrument trees, void meter, viscometer, gas characterization systems, ammonia stack monitors, and ventilation flow control and monitoring equipment, will be installed and operated in the six flammable gas DSTs to complete characterization of their contents and behavior.

8. Portable exhausters will be provided to ventilate flammable gas SSTs in case the tanks are determined to require mitigation.

9. This sub-project funds developmental instrumentation, ventilation upgrades, mitigation upgrades, and operation/maintenance of installed equipment, until turnover to Tank Farm Operations (1.1.1.2.1), for all flammable gas Watch List tanks.

10. SSTs and DSTs requiring characterization to address the flammable gas safety issue will be sampled by Waste Characterization (1.1.1.2.4) in a timely manner. This sub-project will fund specific analyses to interpret the characterization data as they relate to resolution of the issues.

11. Sixteen more Watch List tanks will be identified as a result of characterization and historical review. The potential increased costs have been factored into the current planning cycle.

12. Funds are not budgeted for tank 241-SY-101 mixer pump replacement in FY 1996-98, even though the two year design life of the pump was exceeded in FY 1995.

5.1.1.3 Constraints

1. The extent that mixing and/or dilution will be required to successfully mitigate the five double-shell, flammable-gas-containing Watch List tanks (besides tank 241-SY-101) has not yet been determined.

2. Uncertainty surrounds quantitative values used in analyses and models, as well as depth, breadth, and completeness of analyses used to support the technical bases.

3. The regulatory acceptability of mitigation strategies is not certain, especially if more stringent environmental and safety regulations are implemented in the future. Thus, the impact of increased safety and hazardous waste requirements on the time and cost to mitigate the tanks is uncertain (e.g., disposal costs for pumps and equipment).

4. Although integration of field work activities is in progress, the availability of tank risers may impact installation of mitigating equipment and tank monitoring instrumentation.

5. The methods required to mitigate or resolve flammable gas tank safety issues have not yet been fully developed. For example, if mitigation by dilution is necessary, additional DST space for the removal and treatment of waste from some tanks may be required.

6. The process and procedure for removing tanks from the Watch List has not been fully established.

7. Unscheduled events may impact scheduled work.

5.1.2 TECHNICAL REQUIREMENTS BASELINE

5.1.2.1 Work Breakdown Structure

The WBS tree for the Flammable Gas sub-project can be found in Attachment 5.1-1.

5.1.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Flammable Gas sub-project can be found in Attachment 5.1-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

5.1.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Flammable Gas sub-project can be found in Attachment 5.1-3.

5.1.2.4 Technology Needs

In general, no new breakthroughs in technology are considered to be a prerequisite to flammable gas safety issue resolution; however, lab research may be necessary to resolve the issue.

Technology applications shall be identified, and research, development, demonstration, test and evaluation funds shall be available as needs are identified.

5.1.3 SCHEDULE BASELINE

5.1.3.1 Summary Schedule

See Attachment 5.1-4 for the summary schedule.

5.1.3.2 Milestone Control Log

See Attachment 5.1-5 for the milestone control log. Milestone description sheets are located in Appendix A.

5.1.4 COST BASELINE

5.1.4.1 Cost Baseline Summary by Year

Attachment 5.1-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

5.1.4.2 Basis of Estimate

The basis of estimates is: (1) historical costs since 1990; and (2) independent cost estimates developed jointly by Project Time and Cost, Inc. and Los Alamos Technical Associates.

5.1.5 PERFORMANCE MEASURES

The performance measures utilized by the Safety Issue Resolution Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators. These are:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product
- Overhead application rates
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - milestone completions
  - recordable incidents
  - corrective action management.

5.1.6 EXECUTION YEAR

5.1.6.1 Technical Objectives

This section provides a summary of the technical objectives and specific FY 1996 work scope planned to support resolution of the flammable gas safety issue.

1. **Evaluate and Define Safety Issue.** Establish the work to be done based on historical data, sampling and analysis, simulant waste studies, laboratory tests, monitoring data, mathematical modeling, and sensitivity analysis. It defines safe conditions for operation and decides on the appropriate path to resolve the safety issue. In addition, it includes the choice of the "no-action" option if it is determined no safety issue exists for a single waste type or a group of similar wastes or tanks. Specific FY 1996 work scope includes deployment of a retained gas sampler, reports on gas generation and gas retention, ammonia studies, vapor space monitoring, and data analysis and interpretation.

2. **Close Unreviewed Safety Question (USQ).** Establish the technical bases for closure of the USQ. The safety envelope will be redefined, operating procedures modified, control limits established, and documentation completed for recommendation of USQ closure. Specific FY 1996 work scope includes approval of SARR-002 and SARR-004 as the safety basis for performing activities in DSTs and SSTs, and submitting documentation to close the USQ for 241-AW farm.

3. **Mitigate Condition.** Develop corrective actions for safety issues that address possible treatment to reduce the severity of the safety issues. Work includes development, design, fabrication, installation, testing, and demonstration of the equipment for mixing wastes, and possibly heating and diluting wastes. Specific FY 1996 work scope includes turnover of the 241-SY-101 mixer pump to operations.

4. **Store and Monitor.** Provide monitoring systems to ensure safe storage until the safety issue is resolved. Work includes developing, procuring, and installing additional equipment to improve ventilation flow control and to continuously monitor tank parameters for temperature, pressure, gas concentration, and surface level. Specific FY 1996 work scope includes installation of video cameras in three 241-AN farm tanks, multi-function instrument trees in three 241-AN tanks, ammonia monitors in 241-AW and 241-AN farms, and inlet filters and flow control devices for 241-AW farm.

5. **Resolve Safety Issue.** Implement corrective actions to eliminate the hazard and resolve the safety issue. No specific work scope planned in FY 1996.

5.1.6.2 FY 1996 Performance Baseline Schedule

Attachment 5.1-7 contains the FY 1996 performance baseline schedule.

5.1.6.3 Cost Estimate Baseline by Month

Attachment 5.1-8 establishes the month-by-month cost estimate baseline for FY 1996.

5.1.6.4 FY 1995 Work Scope Carryover Summary

Work scope carryover includes gas generation studies, deployment of the retained gas sampler for use in tank 241-AW-101, USQ closure documentation for 241-AW-101, ventilation upgrades for 241-AW farm, ammonia monitors for 241-AW and 241-AN farms, and final follow-up support of 241-SY-101 pump turnover to Operations.

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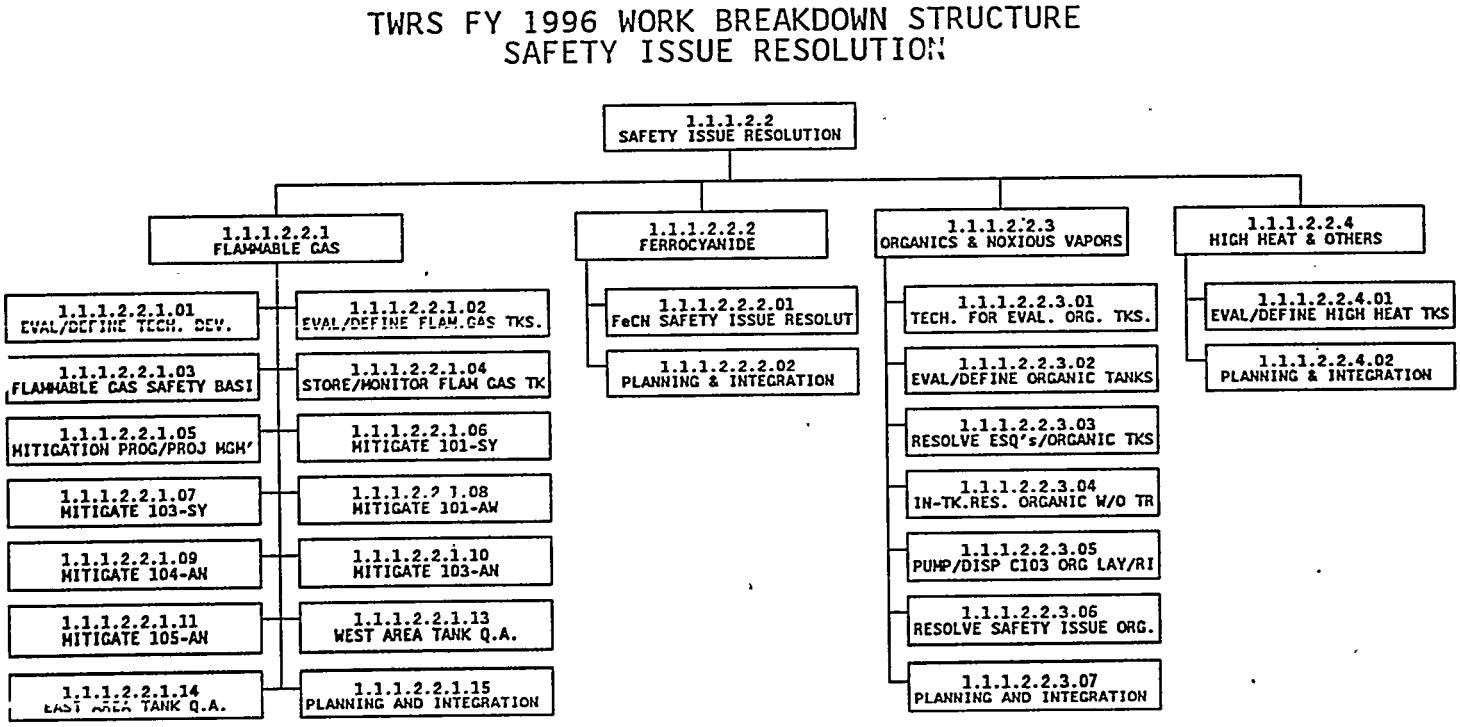
LISTING OF ATTACHMENTS

Attachment 5.1-1	Work Breakdown Structure
Attachment 5.1-2	WBS Dictionary Sheet
Attachment 5.1-3	Responsibility Assignment Matrix
Attachment 5.1-4	Summary Schedule
Attachment 5.1-5	Milestone Control Log
Attachment 5.1-6	Cost Baseline Summary by Year
Attachment 5.1-7	FY 1996 Performance Baseline Schedule
Attachment 5.1-8	Cost Estimate Baseline by Month



Attachment 5.1-1 Work Breakdown Structure

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/19/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.2 WASTE STORAGE 1.1.1.2.02 SAFETY ISSUE RESOLUTION	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.02.01 Level 5	4. WBS ELEMENT TITLE FLAMMABLE GAS	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 5/10/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11100	9. BUDGET AND REPORTING NUMBERS Operating EW3120072 CENTRC 35EW31207 GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	22,364.00	24,099.00	23,881.00	10,948.00	10,720.00	6,233.00	
CENRTC	9,981.00	3,961.00	8,542.00	4,608.00	3,209.00	1,209.00	
LINE ITEM							
GPP							
TOTAL	32,345.00	28,060.00	32,423.00	15,556.00	13,929.00	7,442.00	

B. TECHNICAL BASES

Goals and Objectives

In 1990, five double-shell tanks (DST), 241-AN-103, 241-AN-104, 241-AN-105, 241-SY-101 and 241-SY-103, and eighteen single shell tanks (SST), 241-A-101, 241-AX-101, 241-AX-103, 241-S-102, 241-S-111, 241-S-112, 241-SX-101, 241-SX-102, 241-SX-103, 241-SX-104, 241-SX-105, 241-SX-106, 241-SX-109, 241-T-110, 241-U-103, 241-U-105, 241-U-108, and 241-U-109, were identified as having a significant potential to generate and release flammable gases (primarily hydrogen and ammonia) mixed with an oxidizer (nitrous oxide). This safety issue was declared an Unreviewed Safety Question (USQ) because it represents conditions outside the envelope addressed by the Safety Analysis Report (SAR). Operational restrictions were imposed to reduce the potential for ignition sources. In 1992, one additional DST, 241-AW-101, was added to the Watch List; and in 1993, one additional SST, 241-U-107, was added. The presence of a flammable gas mixture, along with an ignition source, could provide the potential for a deflagration, leading to an increased risk of the release of radioactive waste. The double shell tanks (DSTs), tanks 241-SY-101, 241-SY-103, 241-AW-101, 241-AN-103, 241-AN-104, and 241-AN-105, entrap gas within the waste and periodically or sporadically release it in a gas release event (GRE). As a result, these tanks also pose a potential risk of an unfiltered release of radioactivity to the environment from over pressurizing the ventilation system.

Tank 241-SY-101 exhibits the largest risk and, during several GREs, released concentrations of hydrogen that exceeded the lower flammability limit. The venting of gases is expected to continue until some form of in-tank treatment (mitigation) is taken. During these releases, over-pressurizations were measured without resulting in any contamination spread. Mitigation of tank 241-SY-101 has been accomplished by the installation and operation of a mixer pump. Mitigation will be required only if the tank dome space

exceeds 25% of the lower flammability limit. Removal of pumpable liquid from single-shell tanks (SSTs) for interim stabilization as stipulated in the Tri-Party Agreement will be conducted by Tank Farm Operations (1.1.1.2.01). Final resolution of the safety issue may require retrieval of the DST waste by Waste Retrieval (1.1.1.3.01) and treatment in a future low-level waste (1.1.1.3.02) or high-level waste (1.1.1.3.03) facility . Seven of the tanks 241-A-101, 241-S-102, 241-S-111, 241-SX-103, 241-SX-106, 241-U-103, and 241-U-105, are listed on the Organic Tank Watch List and tasks involving those tanks will be coordinated with Sub-Project 1.1.1.2.02.03..

Major End-Item Deliverables

M-40-00 Mitigate/Resolve Tank Safety Issues for High Priority Watch List Tanks
M-40-09 Close All Unreviewed Safety Questions for Double-Shell and Single-Shell Tanks
M-40-10 Complete Vapor Space Monitoring for All Flammable Gas Generating Tanks
SI 2f Expedite Design and Construction of a Backup Portable Exhauster for Tank 241-SY-101
SI 2l Close SY Tank Farm Flammable Gas USQ

Acceptance Criteria

Maintain vapor spaces of Flammable Gas Watch List Tanks below 25 % of the lower flammability limit
Complete work scope within cost, schedule and technical baseline
Resolve Flammable Gas Safety Issue
Close Flammable Gas USQ
Remove Flammable Gas Tanks from Watch List

C. STATEMENT OF WORK

Required Activities:

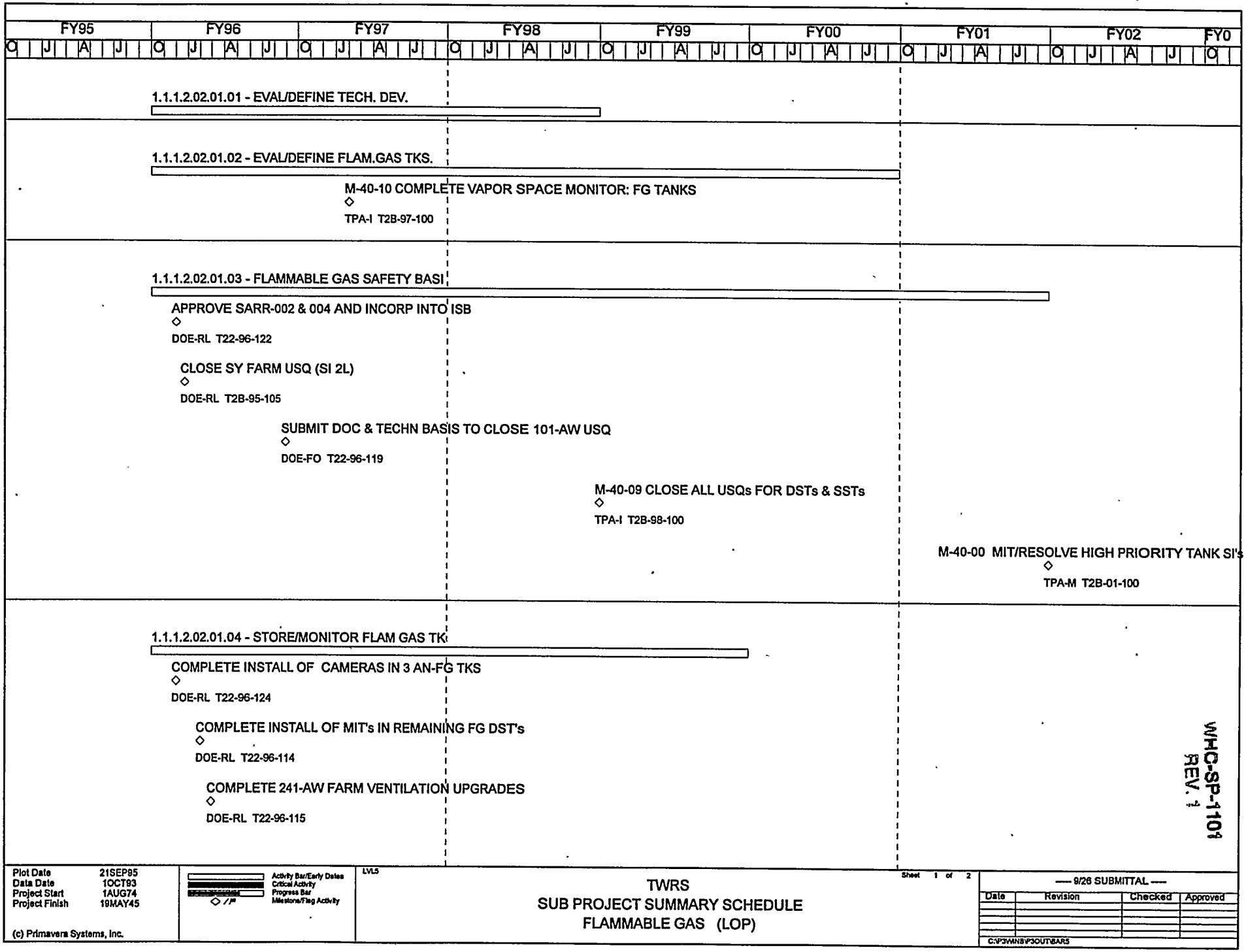
The scope of this activity includes defining the hazard of flammable gases through waste characterization, eliminate gas releases that result in a flammable gas concentration in the tank dome (vapor space) that is higher than 25% of the lower flammability limit, mechanistic studies and tank data evaluation, and identifying ways to mitigate the hazard. The objective is to develop tank safety criteria and to apply the criteria on a tank-by-tank basis to remove all of the tanks from the Flammable Gas Watch List by either controlling or eliminating the hazard. The work will be conducted in the following sequence: (1) tank 241-SY-101; (2) remaining DSTs; and (3) SSTs.

Specific tasks include a multi-laboratory study using synthetic waste to determine the chemical and physical mechanisms of gas generation, developing physical and numerical models to simulate gas release phenomenon and to evaluate strategies for mitigation of flammable gas releases, developing analytical techniques for characterization of chelators in tank waste, flammability monitoring, obtaining and analyzing dome space grab samples and auger surface samples, core sampling and analysis (provided by Waste Characterization 1.1.1.2.03), evaluating and interpreting data, performance analysis of each tank, testing and repairing thermocouple trees, installing multi-functional (temperature, pressure, gas concentration) instrument trees (MIT), gas monitoring cabinets, surface level detectors, closed-circuit TV cameras, and ventilation system upgrades, hooking up instruments to the tank monitor and control system (TMACS), preparing safety assessments (SA) and environmental assessments (EA) to allow tank-intrusive activities and to support the Interim Safety Basis (ISB), defining the process for removal of tanks from the Watch List, establishing the technical basis for the USQ, preparing hazard assessments and probabilistic risk assessments, redefining tank safety envelopes, and preparing documentation for closure of the USQ. Obtaining tank farm readings as required for the final safety basis will be conducted by Tank Farm Operations, 1.1.1.2.01. Also included is the completion of fabrication of a second spare mitigation pump, fabrication of Gas Characterization Systems, and Void Fraction Meter and Viscometer measurements of DST contents.

OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

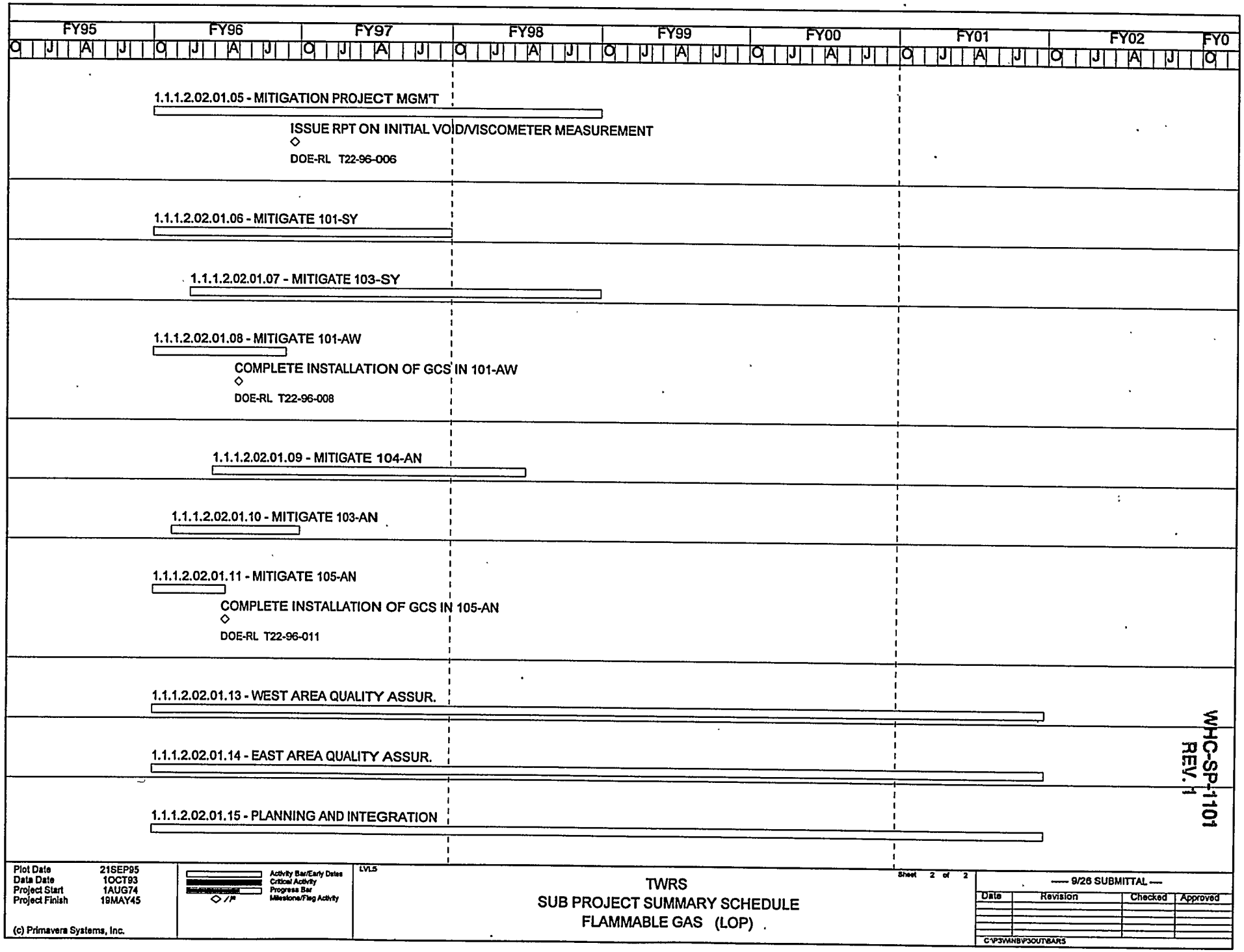
Public Law 101-510
Tri-Party Agreement M-40
DOE Orders 5480.21 and 5820.2A

WBS Number	WBS Title	Responsible Person
1.1.1.2.02	Safety Issue Resolution	E. J. Lipke
1.1.1.2.02.01	Flammable Gas	G. D. Johnson
1.1.1.2.02.01.01	Evaluate & Define Technology Development for Flammable Gas	G. D. Johnson
1.1.1.2.02.01.02	Evaluate & Define Flammable Gas Tanks	W. B. Barton
1.1.1.2.02.01.03	Flammable Gas Safety Basis	R. J. VanVleet
1.1.1.2.02.01.04	Store & Monitor Flammable Gas Tanks	J. W. Lentsch
1.1.1.2.02.01.05	Mitigation Program/Project Management	J. W. Lentsch
1.1.1.2.02.01.06	101-SY Mitigation	T. R. Benegas
1.1.1.2.02.01.07	103-SY Mitigation	R. E. Bauer
1.1.1.2.02.01.08	101-AW Mitigation	R. E. Bauer
1.1.1.2.02.01.09	104-AN Mitigation	R. W. Reed
1.1.1.2.02.01.10	103-AN Mitigation	R. W. Reed
1.1.1.2.02.01.11	105-AN Mitigation	R. W. Reed
1.1.1.2.02.01.13	West Area Waste Tank Quality Assurance	J. Weber
1.1.1.2.02.01.14	East Area Waste Tank Quality Assurance	J. Weber
1.1.1.2.02.01.15	Planning & Integration	T. L. Denton



WHC-SP-1101
REV. 1

Attachment 5.1-4 Summary Schedule
Sheet 1 of 2



WHC-SP-1101
REV. 1

1.1.1.2.02.01 Flammable Gas

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.02.01.05	ISSUE RPT ON INITIAL VOID/VISCOMETER MEASUREMENT	DOE-RL T22-96-006		16SEP96
1.1.1.2.02.01.08	COMPLETE INSTALLATION OF GCS IN 101-AW	DOE-RL T22-96-008		30APR96
1.1.1.2.02.01.11	COMPLETE INSTALLATION OF GCS IN 105-AN	DOE-RL T22-96-011		29MAR96
1.1.1.2.02.01.04	COMPLETE INSTALL OF MIT's IN REMAINING FG DST's	DOE-RL T22-96-114		31JAN96
1.1.1.2.02.01.04	COMPLETE 241-AW FARM VENTILATION UPGRADES	DOE-RL T22-96-115		28FEB96
1.1.1.2.02.01.03	SUBMIT DOC & TECHN BASIS TO CLOSE 101-AW USQ	DOE-FO T22-96-119		28AUG96
1.1.1.2.02.01.03	APPROVE SARR-002 & 004 AND INCORP INTO ISB	DOE-RL T22-96-122		30NOV95
1.1.1.2.02.01.04	COMPLETE INSTALL OF CAMERAS IN 3 AN-FG TKS	DOE-RL T22-96-124		30NOV95
1.1.1.2.02.01.03	M-40-00 MIT/RESOLVE HIGH PRIORITY TANK SI's	TPA-M T2B-01-100		28SEP01
1.1.1.2.02.01.03	CLOSE SY FARM USQ (SI 2L)	DOE-RL T2B-95-105		21DEC95
1.1.1.2.02.01.02	M-40-10 COMPLETE VAPOR SPACE MONITOR: FG TANKS	TPA-I T2B-97-100		31JAN97
1.1.1.2.02.01.03	M-40-09 CLOSE ALL USQs FOR DSTs & SSTs	TPA-I T2B-98-100		30SEP98

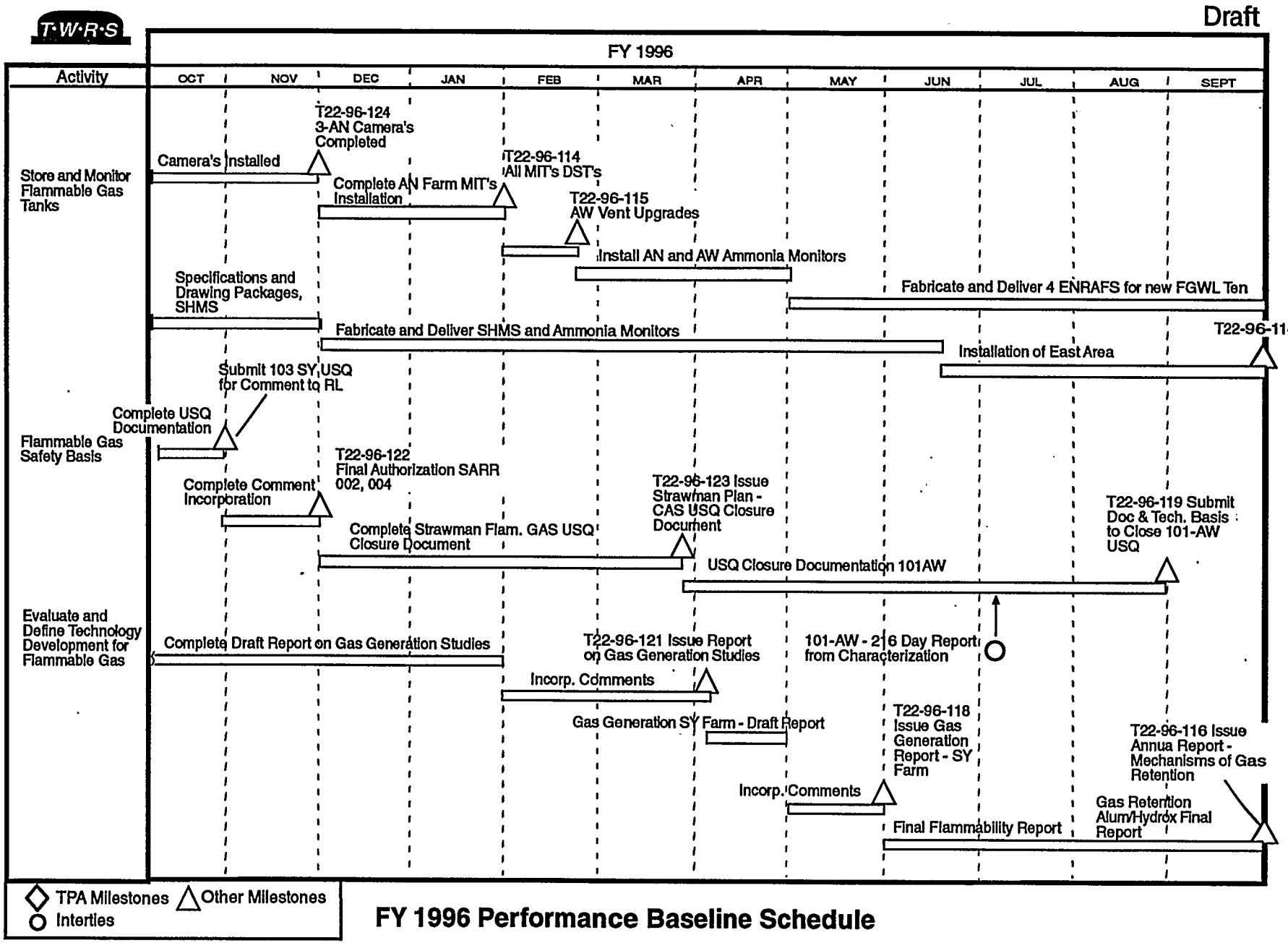
WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.01 - Flammable Gas - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
1	EXPENSE	98245	22364	24099	23881	10948	10720	6233	
2	CENRTC	31510	9981	3961	8542	4608	3209	1209	
	REPORT TOTAL	129756	32345	28060	32423	15557	13929	7442	

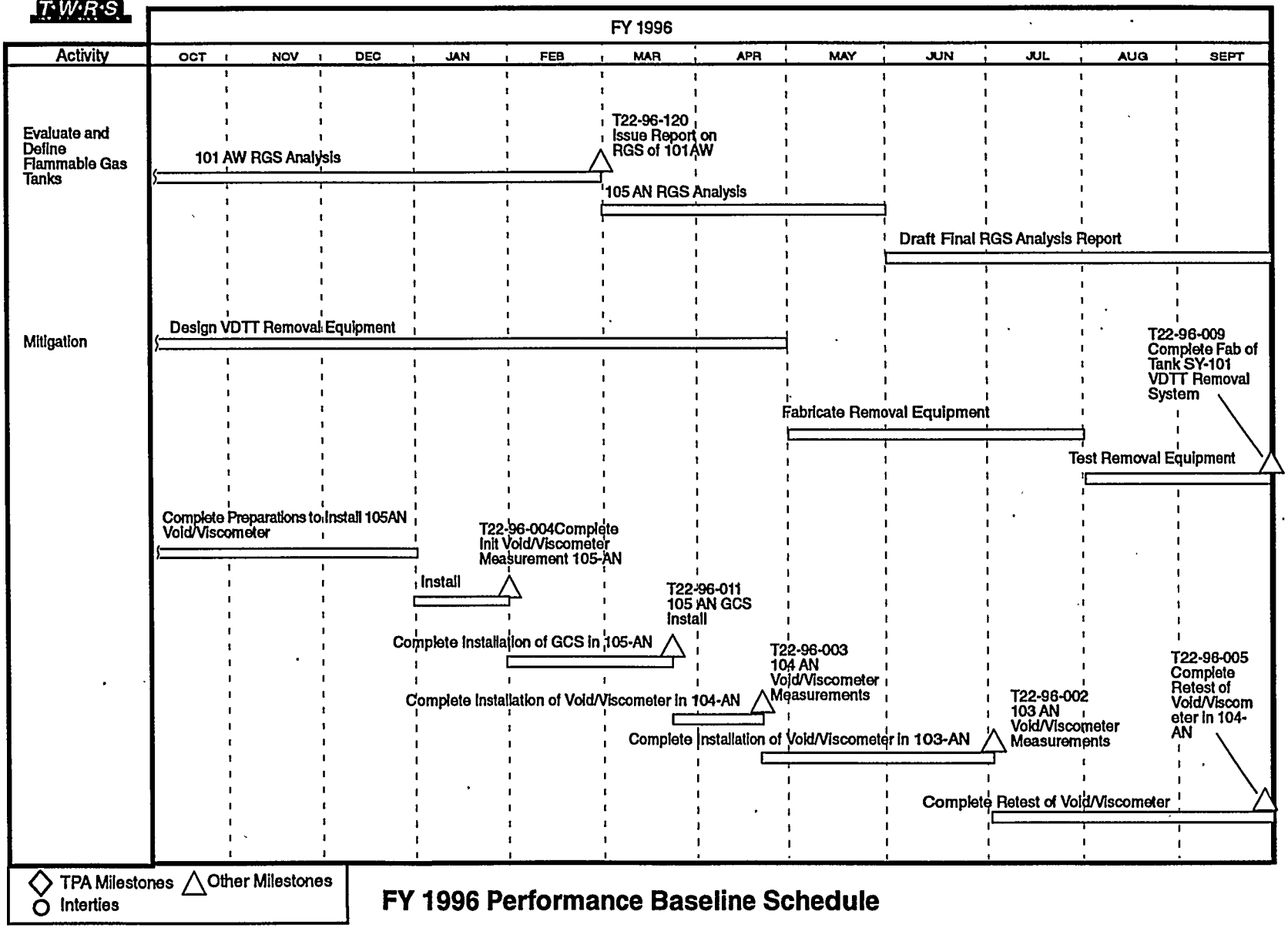
Attachment 5.1-6 Cost Baseline Summary by Year



FY 1996 Performance Baseline Schedule

1.1.1.2.02.01 Safety Issue Resolution - Flammable Gas

Draft



FY 1996 Performance Baseline Schedule

1.1.1.2.02.01 Safety Issue Resolution - Flammable Gas

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.01 - Flammable Gas - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.02.01.01 - EVAL/DEFINE TECH. DEV.	335	316	299	352	339	335	331	307	258	271	202	168	3511
	1.1.1.2.02.01.02 - EVAL/DEFINE FLAM.GAS TKS.	259	246	270	316	290	303	222	217	215	228	219	163	2949
	1.1.1.2.02.01.03 - FLAMMABLE GAS SAFETY BASI	96	122	103	142	105	112	116	116	106	135	162	128	1442
	1.1.1.2.02.01.04 - STORE/MONITOR FLAM GAS TK	420	422	355	339	278	250	233	213	501	912	721	269	4914
	1.1.1.2.02.01.05 - MITIGATION PROJECT MGM'T	462	417	389	451	386	392	410	410	373	392	410	373	4865
	1.1.1.2.02.01.06 - MITIGATE 101-SY							20	62	56	59	119	108	425
	1.1.1.2.02.01.07 - MITIGATE 103-SY				23	23	24	25	25	23	24	25	23	215
	1.1.1.2.02.01.08 - MITIGATE 101-AW								22	20	21	64		128
	1.1.1.2.02.01.09 - MITIGATE 104-AN							58	132	122				312
	1.1.1.2.02.01.10 - MITIGATE 103-AN				54	69	124	67	3		37	90	81	524
	1.1.1.2.02.01.11 - MITIGATE 105-AN		30	85	221	8								344
	1.1.1.2.02.01.13 - WEST AREA QUALITY ASSUR.	61	56	53	61	55	58	61	61	55	58	61	55	694
	1.1.1.2.02.01.14 - EAST AREA QUALITY ASSUR.	61	56	53	61	55	58	61	61	55	58	61	55	694
	1.1.1.2.02.01.15 - PLANNING AND INTEGRATION	118	107	102	118	107	113	118	118	107	113	118	107	1347
TOTAL	1	1813	1772	1709	2137	1715	1768	1721	1746	1891	2308	2253	1532	22364

Attachment 5.1-8 Cost Estimate Baseline by Month
Sheet 1 of 2

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER
COST LOADING REPORT
TOTAL USAGE FOR MONTH

TWRS INTEGRATED SCHEDULE
UNITS IN K$s

1.1.1.2.02.01 - Flammable Gas - FY 96 Cost/Month

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
2 - CENRTC														
	1.1.1.2.02.01.01 - EVAL/DEFINE TECH. DEV.	16	15	15	17	18	17	18	16	12	11	10	8	173
	1.1.1.2.02.01.02 - EVAL/DEFINE FLAM.GAS TKS.	21	16	15	18	16	17	18	18	16	17	13	10	195
	1.1.1.2.02.01.04 - STORE/MONITOR FLAM GAS TK	455	220	279	251	562	634	674	687	365	550	730	818	6225
	1.1.1.2.02.01.06 - MITIGATE 101-SY	332	301	286	332	301	316	292	184	167	175	154	44	2885
	1.1.1.2.02.01.07 - MITIGATE 103-SY													
	1.1.1.2.02.01.08 - MITIGATE 101-AW	30	27	26	26	39	50	52						249
	1.1.1.2.02.01.09 - MITIGATE 104-AN					1	5	1						7
	1.1.1.2.02.01.10 - MITIGATE 103-AN		2	4	1				0	3	2			12
	1.1.1.2.02.01.11 - MITIGATE 105-AN	34	30	26	3	51	82							225
	1.1.1.2.02.01.15 - PLANNING AND INTEGRATION	1	1	1	1	1	1	1	1	1	1	1	1	9
TOTAL	2	888	612	652	648	989	1122	1056	906	563	756	908	880	9981
	REPORT TOTAL	2701	2383	2361	2785	2705	2890	2777	2652	2454	3064	3160	2413	32345

Attachment 5.1-8 Cost Estimate Baseline by Month
Sheet 2 of 2

5.2 FERROCYANIDE (WBS 1.1.1.2.2.2)

5.2.1 STRATEGY

5.2.1.1 Objectives

The Safety Issue Resolution Project (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell tanks (DST) and single-shell tanks (SST) at the Hanford Site.

The Safety Issue Resolution Project will meet the applicable functions and requirements and will deliver the products and end items necessary to achieve the Tank Waste Remediation System (TWRS) Program mission. The purpose of the Safety Issue Resolution Project is to mitigate and/or resolve the waste tank safety issues at the Hanford Site and the objectives are:

1. Serve as a focal point to identify and resolve high-priority waste tank safety issues.

2. Ensure safe storage of waste during the interim period until retrieval or disposal operations begin.

The Safety Issue Resolution Project consists of the following sub-projects:

Flammable Gas (1.1.1.2.2.1)
Ferrocyanide (1.1.1.2.2.2)
Organics and Noxious Vapors (1.1.1.2.2.3)
High Heat and Others (1.1.1.2.2.4)

A description of the ferrocyanide safety issues can be found in the Level 5 Work Breakdown Structure Dictionary, Attachment 5.2-2.

The potential for ferrocyanide compounds to react and propagate under certain conditions, including dryness, proper chemical concentration, and elevated temperatures has been identified as a high-priority safety issue. Three options are being considered to resolve the safety issue: (1) demonstrate that the probability and consequences of a runaway chemical reaction is acceptably small; (2) monitor and maintain moisture content of the waste to ensure the probability of a propagating ferrocyanide reaction does not exist; and (3) remove the waste from the tanks by Waste Retrieval (1.1.1.3.1) and treat in a future facility.

5.2.1.2 Planning Assumptions

1. Activities to resolve the ferrocyanide waste tank safety issue shall be based on continued in situ safe storage of the waste until the waste is retrieved for treatment and/or disposal.

2. Safe interim storage of waste shall support continued operations, characterization, retrieval, treatment, and other cleanup activities.

3. SSTs requiring characterization to resolve the ferrocyanide safety issue will be sampled by the Waste Characterization Project (1.1.1.2.4) in a timely manner. This sub-project will fund specific analyses to interpret the characterization data as the data relate to resolution of the ferrocyanide issue. Not all ferrocyanide Watch List tanks need to be sampled to resolve the safety issue.

4. The remaining 18 tanks on the ferrocyanide Watch List will not require retrieval or treatment of the waste to enable the ferrocyanide safety issue to be resolved.

5. If needed to resolve the safety issue for any of the ferrocyanide tanks, moisture monitoring and control equipment will be installed.

5.2.1.3 Constraints

1. A certain level of moisture may need to be assured during storage, retrieval, and treatment of ferrocyanide-containing waste to prevent the possibility of exothermic reactions.

2. If aging of the waste is proven as the solution to ferrocyanide-containing tanks through studies conducted by this sub-project, the uncertainty will be reduced.

5.2.2 TECHNICAL REQUIREMENTS BASELINE

5.2.2.1 Work Breakdown Structure

The WBS tree for the Ferrocyanide sub-project can be found in Attachment 5.2-1.

5.2.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Ferrocyanide sub-project can be found in Attachment 5.2-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

5.2.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Ferrocyanide sub-project can be found in Attachment 5.2-3.

5.2.2.4 Technology Needs

In general, no new breakthroughs in technology are considered to be a prerequisite to ferrocyanide safety issue resolution; however, lab research may be necessary to resolve the issue.

5.2.3 SCHEDULE BASELINE

5.2.3.1 Summary Schedule

See Attachment 5.2-4 for the summary schedule.

5.2.3.2 Milestone Control Log

See Attachment 5.2-5 for the milestone control log. Milestone description sheets are located in Appendix A.

5.2.4 COST BASELINE

5.2.4.1 Cost Baseline Summary by Year

Attachment 5.2-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

5.2.4.2 Basis of Estimate

The basis of estimates is: (1) historical costs since 1990; and (2) independent cost estimates developed jointly by Project Time and Cost, Inc. and Los Alamos Technical Associates.

5.2.5 PERFORMANCE MEASURES

The performance measures utilized by the Safety Issue Resolution Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators. These are:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product
- Overhead application rates
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - milestone completions
  - recordable incidents
  - corrective action management.

5.2.6 EXECUTION YEAR

5.2.6.1 Technical Objectives

This section provides a summary of the technical objectives and specific FY 1996 work scope planned to support resolution of the ferrocyanide safety issue.

1. **Evaluate and Define Safety Issue.** Establish the work to be done based on historical data, sampling and analysis, simulant waste studies, laboratory tests, monitoring data, mathematical modeling, and sensitivity analysis. It defines safe conditions for operation and decides on the appropriate path to resolve the safety issue. In addition, it includes the choice of the "no-action" option if it is determined no safety issue exists for a single waste type or a group of similar wastes or tanks. Specific FY 1996 work scope includes final aging studies, propagation tests with simulated and actual waste, and core sample data analysis and interpretation.

2. **Close Unreviewed Safety Question (USQ).** Establish the technical bases for closure of the USQ. The safety envelope will be redefined, operating procedures modified, control limits established, and documentation completed for recommendation of USQ closure. The ferrocyanide USQ is closed.

3. **Mitigate Condition.** Develop corrective actions for safety issues that address possible treatment to reduce the severity of the safety issues. Work includes development, design, fabrication, installation, testing, and demonstration of the equipment for moisture control. There is no specific work scope needed in FY 1996.

4. **Store and Monitor.** Provide monitoring systems to ensure safe storage until the safety issue is resolved. Work includes developing, procuring, and installing additional equipment to improve ventilation flow control and to continuously monitor tank parameters for neutron flux. Specific FY 1996 work scope includes scanning electron microscope scans of actual samples and Mossbauer spectroscopy scans in selected tanks.

5. **Resolve Safety Issue.** Implement corrective actions to eliminate the hazard and resolve the safety issue. Specific FY 1996 work scope includes transmitting documentation to resolve the ferrocyanide safety issue for four 241-C farm tanks, and then for all tanks.

5.2.6.2 FY 1996 Performance Baseline Schedule

Attachment 5.2-7 contains the FY 1996 performance baseline schedule.

5.2.6.3 Cost Estimate Baseline by Month

Attachment 5.2-8 establishes the month-by-month cost estimate baseline for FY 1996.

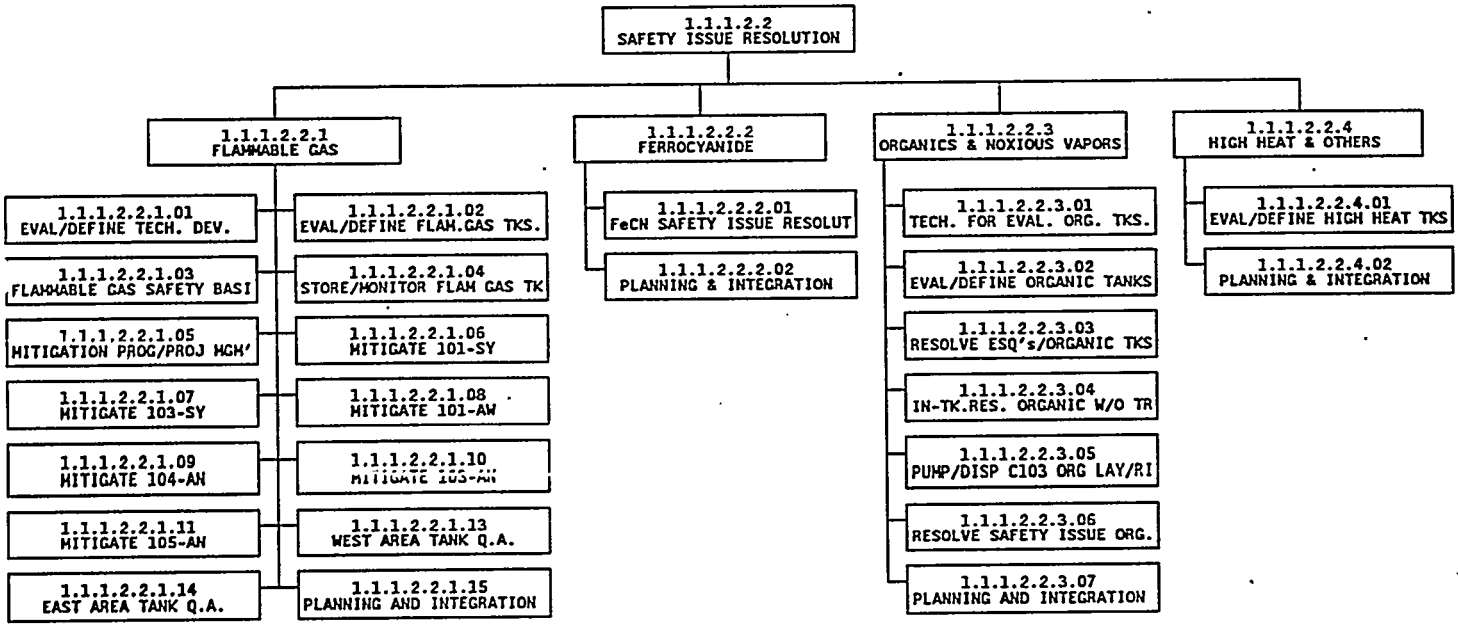
5.2.6.4 FY 1995 Work Scope Carryover Summary

Work scope carryover includes scanning electron microscope (SEM) scans of actual waste samples, Mossbauer spectroscopy scans in selected tanks using Liquid Observation Wells (LOW), and support for safety issue resolution.

LISTING OF ATTACHMENTS

Attachment 5.2-1	Work Breakdown Structure
Attachment 5.2-2	WBS Dictionary Sheet
Attachment 5.2-3	Responsibility Assignment Matrix
Attachment 5.2-4	Summary Schedule
Attachment 5.2-5	Milestone Control Log
Attachment 5.2-6	Cost Baseline Summary by Year
Attachment 5.2-7	Program Performance Baseline Schedule
Attachment 5.2-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
SAFETY ISSUE RESOLUTION



Attachment 5.2-1 Work Breakdown Structure

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/19/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.2 WASTE STORAGE 1.1.1.2.02 SAFETY ISSUE RESOLUTION	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.02.02 Level 5	4. WBS ELEMENT TITLE FERROCYANIDE	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 9/26/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11100	9. BUDGET AND REPORTING NUMBERS Operating EW3120072 CENTRC 35EW31207 GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	2,683.00	2,317.00					
CENRTC	9.00	9.00					
LINE ITEM							
GPP							
TOTAL	2,692.00	2,326.00					

B. TECHNICAL BASES

Goals and Objectives

In 1989, twenty-two single-shell tanks (SST), 241-BX-102, BX-106, BX-110, BX-111, BY-101, BY-103, BY-104, BY-105, BY-106, BY-107, BY-108, BY-110, BY-111, BY-112, C-108, C-109, C-111, C-112, T-101, TX-118, TY-101, and TY-103, were identified as potentially containing greater than 1,000 g-moles (465 pounds) of ferrocyanide precipitates resulting from three radiocesium scavenging processes ("U-Plant," "T-Plant," and "In-Farm) in the 1950's. In 1990, two additional SSTs, 241-T-107 and TY-104, were also identified as originally having greater than 1,000 g-moles; however, six of the original 22 tanks, 241-BX-102, BX-106, BX-110, BX-111, BY-101, and T-101, were identified as containing less than that amount and have been removed from the Ferrocyanide Tanks Watch List. Ferrocyanide compounds can react and propagate under certain conditions, including dryness, proper chemical concentration, and elevated temperatures (250 degrees C). A GAO study postulated dose consequences two orders of magnitude greater than those stated in the DOE 1987 Environmental Impact Statement (EIS) for a worst-case accident. In 1990, the ferrocyanide issue was declared an Unreviewed Safety Question (USQ) because the safety envelope for these tanks at the time may not have been bounded by the then existing safety analysis report (SAR).

Three options are being considered to resolve the safety issue: 1) demonstrate that the probability and consequences of a runaway chemical reaction is acceptably small, and therefore no action other than surveillance of important tank parameters is required; 2) monitor and maintain moisture content of the waste to ensure the probability of a propagating ferrocyanide reaction does not exist, and therefore no further action is required; and 3) remove the waste from the tanks by Waste Retrieval (1.1.1.3.01) and treat in a future low level waste (1.1.1.3.02) or high level waste (1.1.1.3.03) facility as required for disposal. Removal of pumpable liquid

from SSTs for interim stabilization as stipulated in the Tri-Party Agreement will be conducted by Tank Farm Operations (1.1.1.2.01). Two of the tanks, 241-TX-118 and 241-TY-104, are also listed on the Organic Tank Watch List, and tasks involving those tanks will be coordinated with Sub-Project 1.1.1.2.02.03, Organics and Noxious Vapors.

Major End-Item Deliverables

T22-96-023 Transmit Safety Documentation for Four 241-C Farm Tanks
T22-96-025 Issue Final Report on Aging Studies (PNL)
T22-96-022 Transmit Documentation to Resolve Ferrocyanide Safety Issue for All Tanks
T22-97-007 Resolve All Concerns and Close Out Ferrocyanide Safety Issue

Acceptance Criteria
Complete work scope within cost, schedule, and technical baseline
Resolve Ferrocyanide Safety Issue

C. STATEMENT OF WORK

Required Activities:

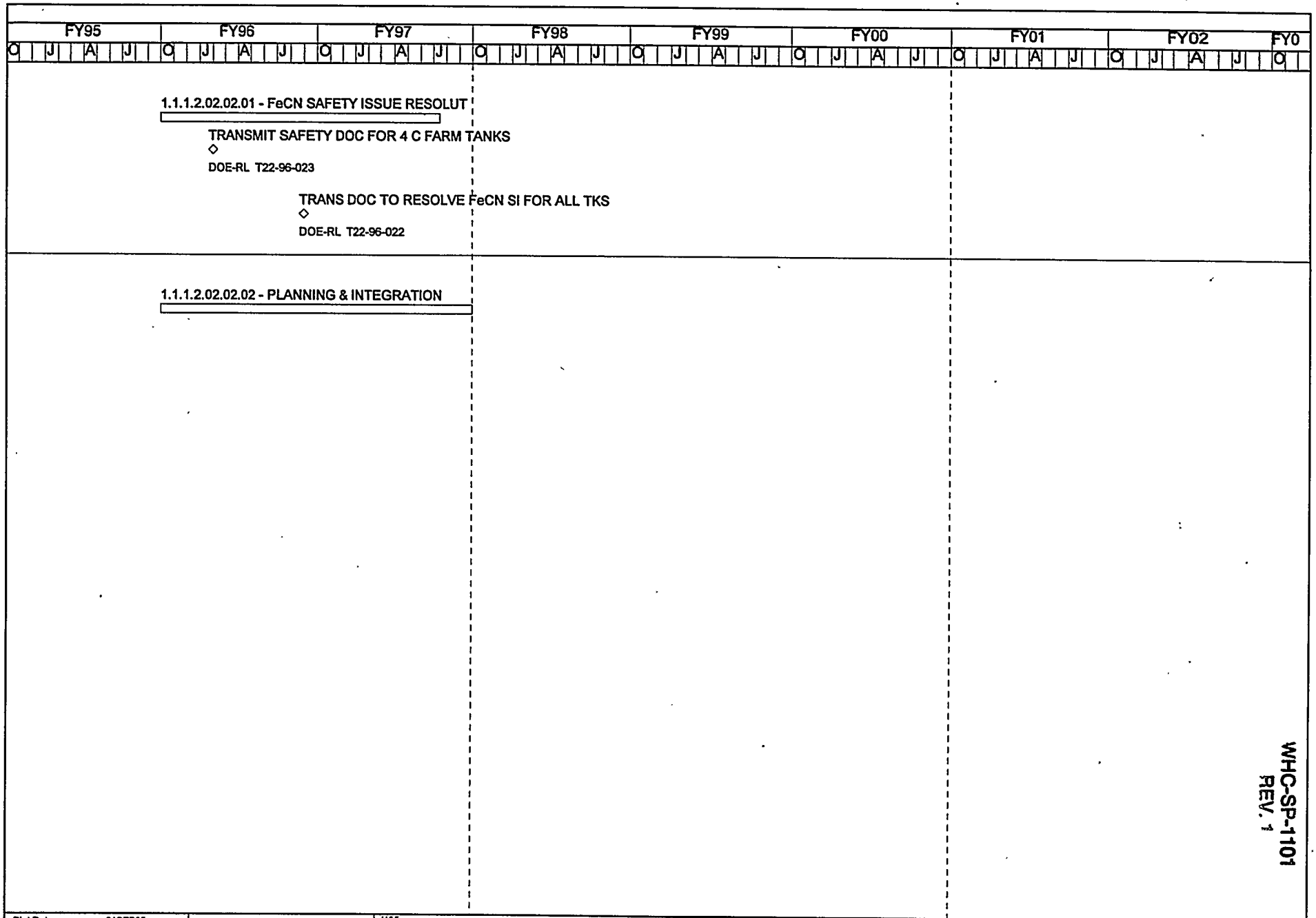
The scope of this Activity includes defining the hazard of ferrocyanide waste through historical records review, simulant waste studies, tank waste monitoring, modeling and actual waste characterization, and validating the safe storage of the waste in the tanks, or to mitigate the hazard, if necessary. The objective is to apply the safety criteria developed to close the USQ on a tank-by-tank (or group of tanks) basis to resolve the Ferrocyanide Safety Issue, and thus remove all of the tanks from the Ferrocyanide Watch List (by either controlling the hazard or showing that no hazard exists). Six tanks found historically to have received less than 1,000 g-moles were taken off the Ferrocyanide Watch List. For the remaining 18 tanks, the logical sequence will be to complete safety documentation that provides an adequate safety envelope, close the USQ (closed 3/1/94), validate via core sampling and waste characterization that the tanks are safe, and implement corrective actions, if required, to resolve the safety issue.

Specific tasks include thermal and airflow modeling; safety analysis for pumping ferrocyanide tanks; flammability monitoring; obtaining and analyzing dome space gas samples and auger surface samples (provided by Waste Characterization 1.1.1.2.03); core sampling and analysis (provided by Waste Characterization 1.1.1.2.03); evaluating and interpreting data; development and deployment of ferrocyanide Fourier Transform infrared (FTIR) speciation methods (development of laser Raman spectroscopy for in-situ characterization of tank waste will be provided by 1.1.1.2.03); studies to determine the effects of aging on ferrocyanide waste; determining the reactivity and reaction kinetics of simulants and actual tank waste; installation of additional instrument trees; installation of tank monitor and control system (TMACS) upgrades; development and implementation of moisture monitoring and control if required; safety and environmental assessments to allow tank-intrusive activities; removal of tanks from the Ferrocyanide Watch List; hazards assessments; consequence calculations; redefining tank safety envelopes; and resolution of the Ferrocyanide Safety Issue. Tank instrument readings as required for the final safety basis will be conducted by Tank Farm Operations, 1.1.1.2.01. Many of these tasks were completed in FY 1995 or before. Final tasks remaining include completion of aging studies, core sampling and analysis (provided by Waste Characterization 1.1.1.2.03), data interpretation, removal of tanks from the Ferrocyanide Watch List, and resolution of the Ferrocyanide Safety Issue.

OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Public Law 101-510
DNFSB 90-7
Tri-Party Agreement M-40
DOE Orders 5480.21 and 5820.23
GAO Audit RCED 91-34

WBS Number	WBS Title	Responsible Person
1.1.1.2.01	Safety Issue Resolution	E. J. Lipke
1.1.1.2.02.02	Ferrocyanide	R. J. Cash
1.1.1.2.02.02.01	Ferrocyanide Safety Issue Resolution	R. J. Cash
1.1.1.2.02.02.02	Planning & Integration	T. L. Denton



Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LVL5

Sheet 1 of 1

TWRS
SUB PROJECT SUMMARY SCHEDULE
FERROCYANIDE (LOP)

— 9/26 SUBMITTAL —

Date	Revision	Checked	Approved

C:\P3\WIN95\P3OUT\BAR6

WHC-SP-1101
REV. 1

Attachment 5.2-4 Summary Schedule

1.1.1.2.02.02 Ferrocyanide

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.02.02.01	TRANS DOC TO RESOLVE FeCN SI FOR ALL TKS	DOE-RL T22-96-022		30AUG96
1.1.1.2.02.02.01	TRANSMIT SAFETY DOC FOR 4 C FARM TANKS	DOE-RL T22-96-023		31JAN96

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

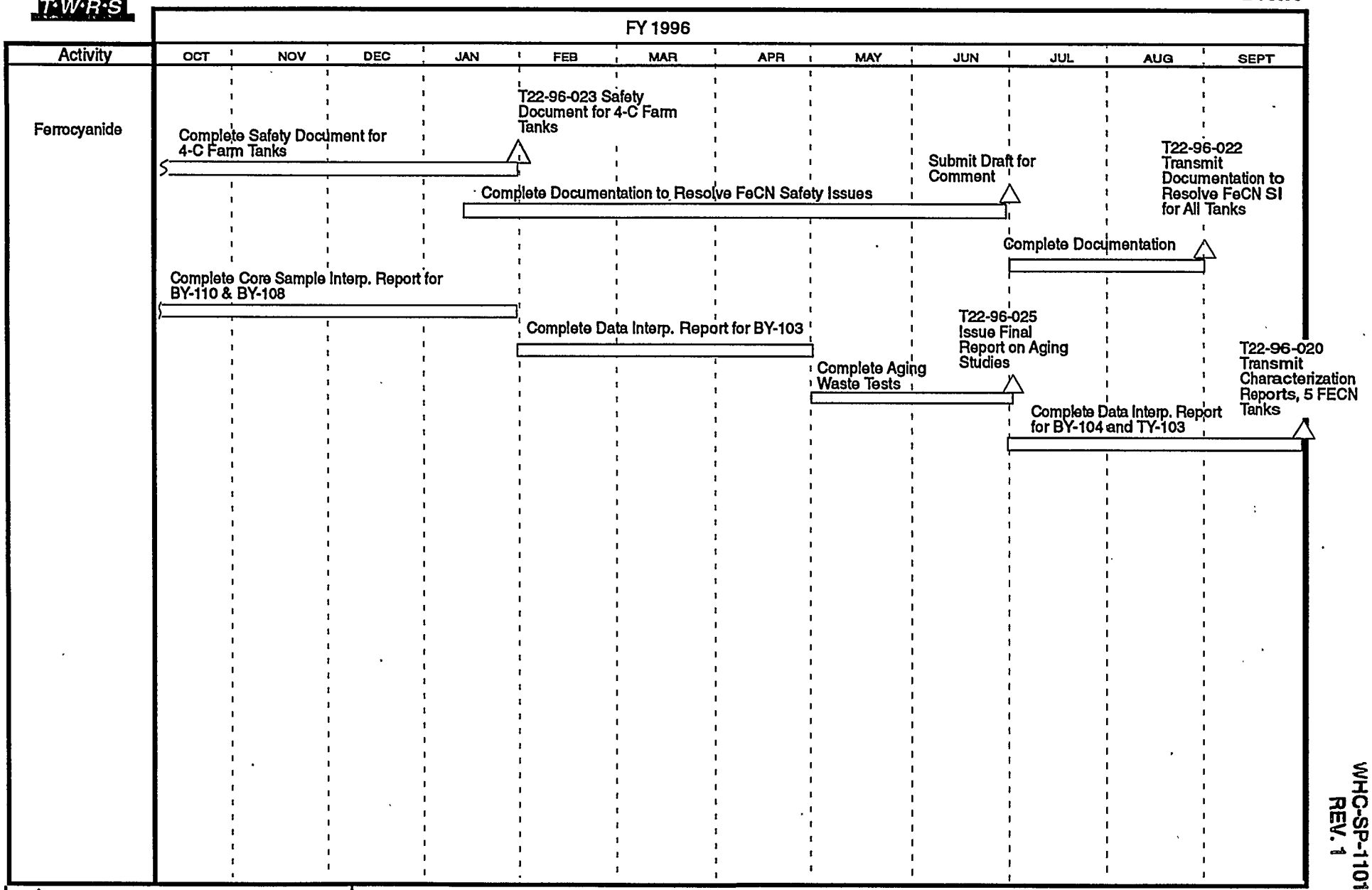
COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.02 - Ferrocyanide - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998
1	EXPENSE	5001	2683	2317	
2	CENRTC	18	9	9	
	REPORT TOTAL	5019	2692	2326	

Attachment 5.2-6 Cost Baseline Summary by Year

Draft



FY 1996 Performance Baseline Schedule

1.1.1.2.02.02 Safety Issue Resolution - Ferrocyanide

29509043.8 rev 1

Attachment 5.2-7

WHC-SP-1101 REV. 1

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.02 - Ferrocyanide - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.02.02.01 - FeCN SAFETY ISSUE RESOLUT	166	186	187	206	168	187	161	151	124	84	90	71	1782
	1.1.1.2.02.02.02 - PLANNING & INTEGRATION	79	72	68	79	72	75	79	79	72	75	79	72	901
TOTAL	1	245	258	256	285	240	262	240	230	196	159	169	142	2683
2 - CENRTC														
	1.1.1.2.02.02.02 - PLANNING & INTEGRATION	1	1	1	1	1	1	1	1	1	1	1	1	9
TOTAL	2	1	1	1	1	1	1	1	1	1	1	1	1	9
	REPORT TOTAL	246	259	256	286	241	263	240	231	197	160	170	143	2692

5.3 ORGANIC AND NOXIOUS VAPORS (WBS 1.1.1.2.2.3)

5.3.1 STRATEGY

5.3.1.1 Objectives

The Safety Issue Resolution Project (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell tanks (DST) and single-shell tanks (SST) at the Hanford Site.

The Safety Issue Resolution Project will meet the applicable functions and requirements and will deliver the products and end items necessary to achieve the Tank Waste Remediation System (TWRS) Program mission. The purpose of the Safety Issue Resolution Project is to mitigate and/or resolve the waste tank safety issues at the Hanford Site and the objectives are:

1. Serve as a focal point to identify and resolve high-priority waste tank safety issues.

2. Ensure safe storage of waste during the interim period until retrieval or disposal operations begin.

The Safety Issue Resolution Project consists of the following sub-projects:

Flammable Gas (1.1.1.2.2.1)
Ferrocyanide (1.1.1.2.2.2)
Organics and Noxious Vapors (1.1.1.2.2.3)
High Heat and Others (1.1.1.2.2.4)

Two organic safety issues are being addressed:

1. Condensed-phase propagating chemical reactions due to the presence of nonvolatile organics mixed with nitrate/nitrite salts

2. Vapor phase combustion of semi-volatile process solvents present as a separable phase in the waste.

The presence of a suitable initiator could possibly initiate a reaction or combustion event. The heat and pressure associated with this event could compromise tank integrity and release radioactive material to the environment.

These safety issues will be resolved either by demonstrating that the probability of a reaction or combustion event is acceptably small, or by taking appropriate mitigation actions.

It is expected that mitigation actions, if required, will ensure continued safe interim storage. If mitigation actions cannot ensure continued safe interim storage, remediation actions (waste retrieval/pretreatment) will be required.

A description of the organics safety issue can be found in the WBS Dictionary, Attachment 5.3-2.

5.3.1.2 Planning Assumptions

1. The organic tanks safety issues can be resolved without retrieval/pretreatment of the waste.

2. Moisture monitoring and control will be the mitigation method employed to prevent condensed-phase propagating chemical reactions.

3. Safety hazards related to the presence of a separable organic solvent phase in the waste will not require mitigation to ensure continued safe interim storage.

5.3.1.3 Constraints

1. The extent that moisture monitoring and control will be required to mitigate condensed-phase propagating chemical reactions has not yet been determined.

2. The ability to resolve the condensed-phase propagating chemical reaction hazard via waste sampling and analysis is uncertain.

3. Declaration of an unreviewed safety question relative to the condensed-phase propagating chemical reaction hazard will impact the schedule for resolution of the safety issue by one to two years.

5.3.2 TECHNICAL REQUIREMENTS BASELINE

5.3.2.1 Work Breakdown Structure

The WBS tree for the Organic and Noxious Vapors sub-project can be found in Attachment 5.3-1.

5.3.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Organic and Noxious Vapors sub-project can be found in Attachment 5.3-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

5.3.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Organic and Noxious Vapors sub-project can be found in Attachment 5.3-3.

5.3.2.4 Technology Needs

Technology to resolve the organic tanks safety issues is presently available with the following exceptions:

1. The ability to reliably and accurately monitor waste moisture content in the top 14 centimeters (5.5 inches) of the waste needs to be developed.

2. Laboratory testing with simulated tank waste is required to confirm safety criteria for condensed-phase propagating chemical reactions.

3. Hot cell capability to measure the following waste characteristics needs to be developed:

   - Ability of actual waste samples to sustain a condensed-phase propagating chemical reaction (tube propagation tests)

   - Equilibrium moisture content as a function of relative humidity.

5.3.3 SCHEDULE BASELINE

5.3.3.1 Summary Schedule

See Attachment 5.3-4 for the summary schedule.

5.3.3.2 Milestone Control Log

See Attachment 5.3-5 for the milestone control log. Milestone description sheets are located in Appendix A.

5.3.4 COST BASELINE

5.3.4.1 Cost Baseline Summary by Year

Attachment 5.3-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

5.3.4.2 Basis of Estimate

The basis of estimates is: (1) historical costs since 1990; and (2) independent cost estimates developed jointly by Project time and Cost, Inc. and Los Alamos Technical Associates.

5.3.5 PERFORMANCE MEASURES

The performance measures utilized by the Safety Issue Resolution Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators. within the project. These are:

- Actual cost vs schedule,
- Estimates at completion,
- Cost of significant activities,
- Cost of delivered product
- Overhead application rates,
- Customer satisfaction, measured by feedback from the customer, and
- Performance indicators
  - milestone completions
  - recordable incident
  - corrective action management

5.3.6 EXECUTION YEAR

5.3.6.1 Technical Objectives

Determine if tanks contain unacceptable concentrations of organic chemical.
Evaluate conditions necessary for a condensed-phase propagating chemical reaction.
Identify requirements for continued safe interim storage.
Develop models for each tank to bound it's safety.

5.3.6.2 FY 1996 Performance Baseline Schedule

Attachment 5.3-7 contains the FY 1996 performance baseline schedule.

5.3.6.3 Cost Estimate Baseline by Month

Attachment 5.3-8 establishes the month-by-month cost estimate baseline for FY 1996.

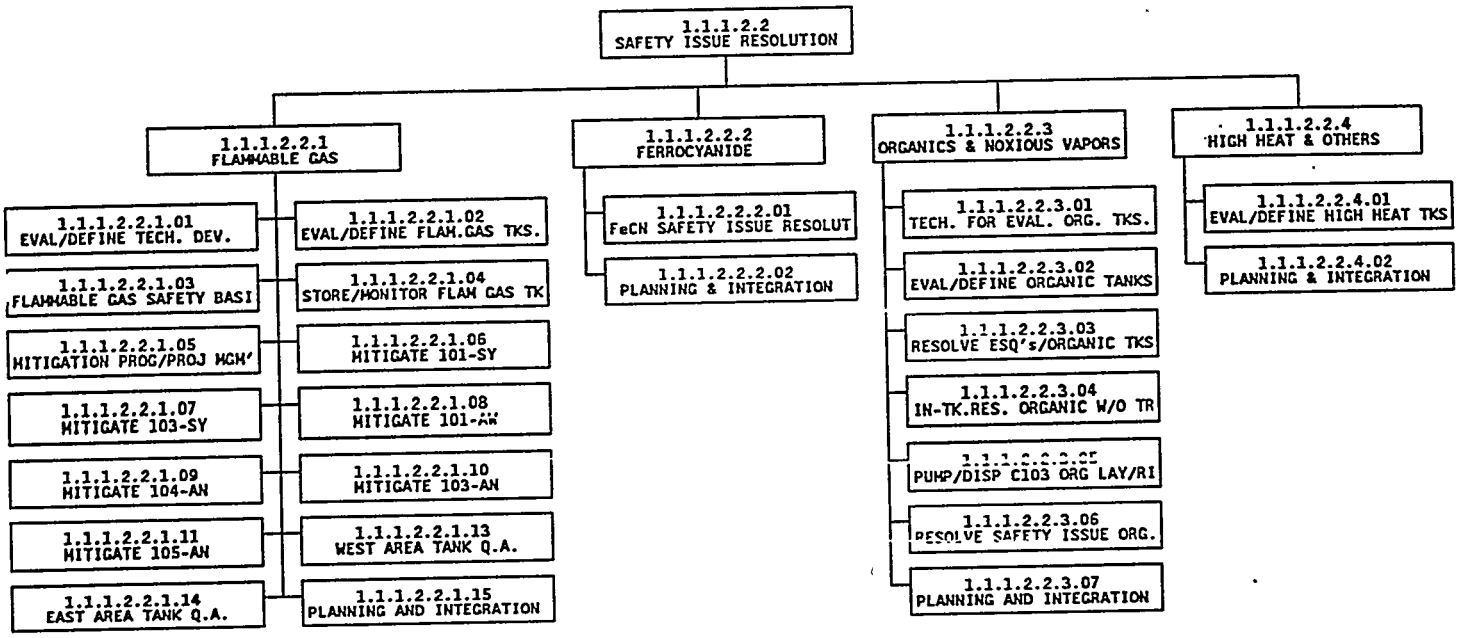
5.3.6.4 FY 1995 Work Scope Carryover Summary

None.

LISTING OF ATTACHMENTS

Attachment 5.3-1	Work Breakdown Structure
Attachment 5.3-2	WBS Dictionary Sheet
Attachment 5.3-3	Responsibility Assignment Matrix
Attachment 5.3-4	Summary Schedule
Attachment 5.3-5	Milestone Control Log
Attachment 5.3-6	Cost Baseline Summary by Year
Attachment 5.3-7	FY 1996 Performance Baseline Schedule
Attachment 5.3-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
SAFETY ISSUE RESOLUTION



Attachment 5.3-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
5/19/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.2 WASTE STORAGE 1.1.1.2.02 SAFETY ISSUE RESOLUTION	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.02.03 Level 5	4. WBS ELEMENT TITLE ORGANICS & NOXIOUS VAPORS	
5. CURRENT REV, NO. 0	6. EFFECTIVE REV. DATE 5/10/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11100	9. BUDGET AND REPORTING NUMBERS Operating EW3120072 CENTRC 35EW31207 GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	7,678.00	6,133.00	10,952.00	3,407.00			
CENRTC	5,678.00	10,958.00	4,057.00	9.00			
LINE ITEM							
GPP							
TOTAL	13,356.00	17,091.00	15,009.00	3,416.00			

B. TECHNICAL BASES

Goals and Objectives
A study in 1990 defined an upper limit of "10 weight percent organic equivalent to sodium acetate" which correesponds to 3 weight percent total organic carbon (TOC) as an acceptable concentration of TOC in Tank waste. At present , there are twenty organic tanks on the Watch List. Eighteen of the twenty are single-shell tanks (SSTs), 241-A-101, AX-102, B-103, S-102, S-111, SX-103, SX-106, T-111, TX-105, and TX-118, TY-104, U-103, U-105, U-106, U-107, U-111, U-203 AND U-204, have been identified as possibly exceeding this criterion and are, therefore, included on the organic tanks Watch List. Under a scenario involving significant bulk overheating of the waste (180 degree C to 250 degree C), it may be postulated that a mixture of organic-nitrate/nitrite solids might react rapidly, possibly damaging the tank and leading to releases of radioactive materials to the environment. This is believed to have a very low probability of occurrence, because the margin between the minimum ignition temperature and the measured tank temperatures is large also, tank 241-C-103 is included on the organic tanks Watch List because of the presence of a floating of organic solvent and tank 241-C-102 is also included on the organic tanks Watch List because it formerly contained a floating layer of organic solvent.

Two options are possible for resolving the organic safety issue: 1) demonstrate through waste characterization and laboratory testing that the probability of a condensed-phase propagating chemical is acceptably small and that no further action is required; or 2) mitigation/remediation of the waste. Due to the length of time before the retrieval and treatment technology is available, option 2 will require implementation of monitoring upgrades and in-tank treatment to ensure safe interim storage. Two of the eighteen tanks, 241-TX-118 and 241-TY-104, are also on the ferrocyanide tank Watch List and eight of the tanks, 241-A-101, S-102, S-111,

SX-103, SX-106, U-103, U-105, AND U-107, are listed on the flammable gas tank Watch list, and tasks involving those tanks will be coordinated with these activities. Removal of pumpable liquid from SSTs for interim stabilization as stipulated in the Tri-Party Agreement will be conducted by Tank Farm Operations and Maintenance (1.1.1.2.01).

Procurement/Fabrication and deployment of a Surface Moisture Monitoring System, Organic Sensors, and EMI Moisture Probe Moisture concentrations of the waste surface (down to 14 centimeters) are needed to assist in the determination of safe storage of the organic-bearing waste. The moisture is required to be determined off-riser due to suspected higher concentrations of moisture directly underneath the riser. There have been significant questions by oversight groups on this issue. The system being developed will be able to measure moisture up to 6 feet away from the riser and the neutron detector system being used is being modified based on work done for the Ferrocyanide Program in FY 1994 and FY 1995 and 3) Fabrication/Deployment of a Light Duty Utility Arm (LDUA). The LDUA system is being modified and support end effectors are being provided to specifically assist in the determination of safe storage of the organic-bearing waste. The primary need is to verify organic concentrations, and possibly moisture, are the same as that measured by samples taken directly beneath the riser. There have been significant questions by oversight groups on this issue. The LDUA has the capability to obtain this information off-riser. The end effectors will include, 1) a sampling device to obtain a surface sample specifically for organic concentrations, 2) a total organic detector, probably based on an infrared technology using fiber optic systems, 3) a moisture sensor to be deployed on the surface greater than 6 feet off riser, if the measurements made by other systems do not show consistent moisture concentrations inside 6 feet, and 4) any other sensors determined to be needed for the safe storage of the organic waste.

Major End-Item Deliverables
Major RL Revise Organic Nitrate Safety Report; SARR-033
Major RL Develop and Deploy Waste Surface Moisture Monitoring System

Acceptance Criteria
Complete work scope within cost, schedule, and technical baseline
Resolve Organic Tanks Safety Issues

C. STATEMENT OF WORK

Efforts will focus on activities to determine if the tanks contain unacceptable concentrations of organic chemical and to evaluate conditions necessary for a condensed-phase propagating chemical reaction. The waste will be characterized and models developed for each tank to bound its safety. The organic Watch List criteria will be applied to each tank, and requirements for continued safe interim storage identified. Specific tasks include, core sampling and analysis, interpreting data, developing methods for characterizing organic functional groups and species, developing models, testing of waste surrogates, simulants, and actual waste to establish the safety boundaries for each tank, installing instrument trees, hooking up of instruments to the tank monitor and control system (TMACS), procuring and installing gas monitoring and ventilation system upgrades, installing moisture measurement and control systems, removal and disposal of any inoperable or interfering equipment from the waste tanks, evaluating alternative mitigation concepts, testing of the preferred mitigation alternative(s), and selection of a viable mitigation concepts(s). Design, procurement, installation, and demonstration of mitigation will proceed on a tank-by-tank basis. Development of instruments to evaluate the performance of the in-tank mitigation is also included.

Technologies to be Assessed:

Waste Aging Studies (PNL)
SST Organic Carbon/Waste Moisture Study (PNL)
Waste Energetics w/Simulants (FAI)
Organic Safety Technical Stategy Study
Interstitial Liquid/Salt Cake Modeling
Large Scale Propagation Tests (U of AZ)
Organic Tanks Safety Criteria
Organics Solubility Study
Hot Cell Tube Propagation Tests (PNL)
Equilibrium Waste Moisture Tests (PNL)
Consequence Analyses

Options to be Considered:

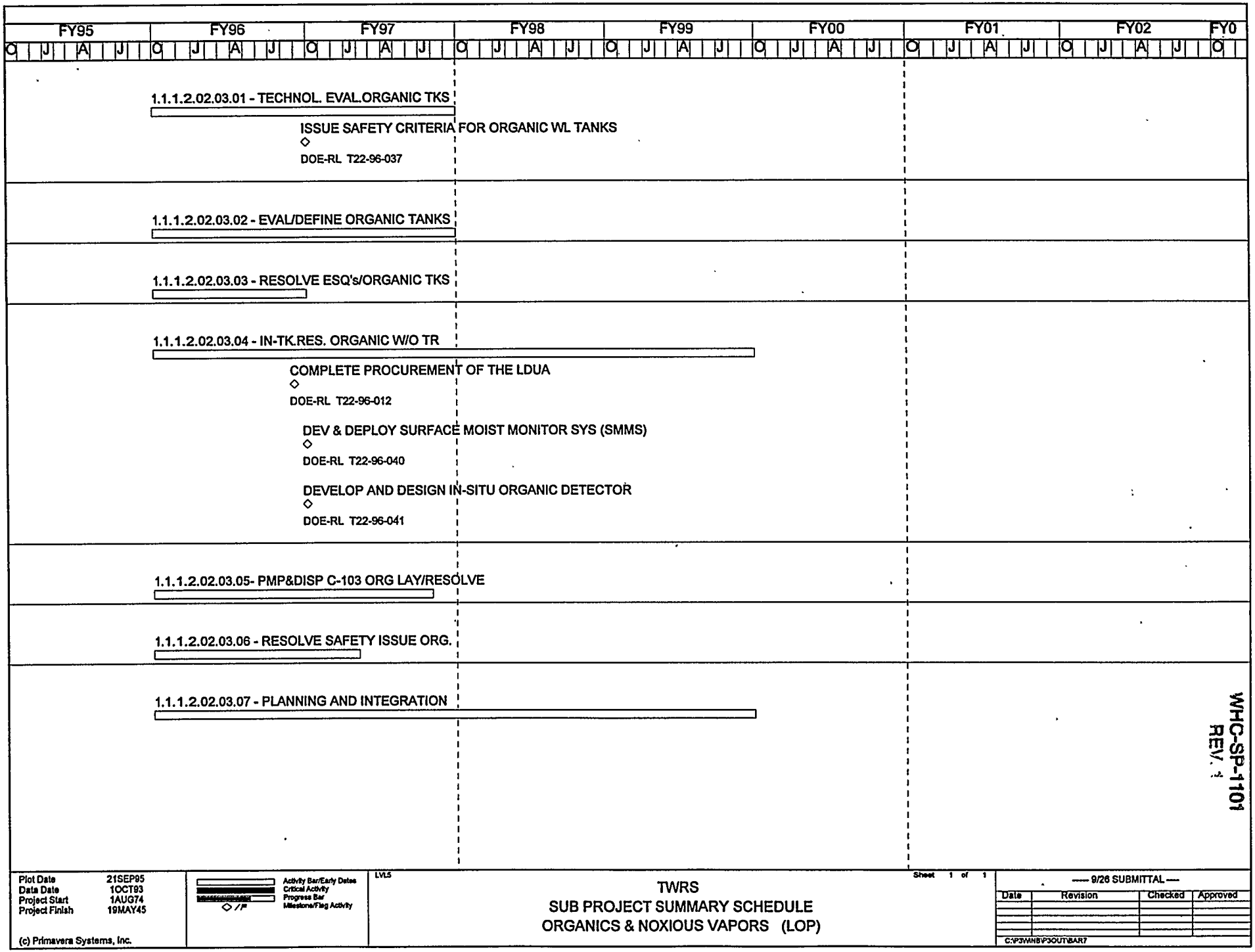
Demonstrate that the probability of a condensed-phase propagating chemical reaction is acceptably small, or mitigate/remediate the

waste
Demonstrate that the probability of an organic solvent combustion event is acceptably small, or mitigate/remediate the waste

OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Public Law 101-510
DOE Orders 5480.21 and 5820.2A

WBS Number	WBS Title	Responsible Person
1.1.1.2.02	Safety Issue Resolution	E. J. Lipke
1.1.1.2.02.03	Organics & Noxious Vapors	D. A. Turner
1.1.1.2.02.03.01	Technology for Evaluating Organic Tanks	D. A. Turner
1.1.1.2.02.03.02	Evaluate & Define Organic Tanks	D. A. Turner
1.1.1.2.02.03.03	Resolve USQs for Organic Tanks	D. A. Turner
1.1.1.2.02.03.04	In-Tank Resolution of Organic Tanks w/o Treatment/LDUA	G. T. Dukelow
1.1.1.2.02.03.05	Pump and Dispose C-103 Organic Lay/Resolve Issue	D. A. Turner
1.1.1.2.02.03.06	Resolve Safety Issue Organic Tanks	D. A. Turner
1.1.1.2.02.03.07	Planning and Integration	T. L. Denton



Attachment 5.3-4 Summary Schedule

1.1.1.2.02.03 Organics & Noxious Vapors

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.02.03.04	COMPLETE PROCUREMENT OF THE LDUA	DOE-RL T22-96-012		30AUG96
1.1.1.2.02.03.01	ISSUE SAFETY CRITERIA FOR ORGANIC WL TANKS	DOE-RL T22-96-037		30SEP96
1.1.1.2.02.03.04	DEV & DEPLOY SURFACE MOIST MONITOR SYS (SMMS)	DOE-RL T22-96-040		30SEP96
1.1.1.2.02.03.04	DEVELOP AND DESIGN IN-SITU ORGANIC DETECTOR	DOE-RL T22-96-041		30SEP96

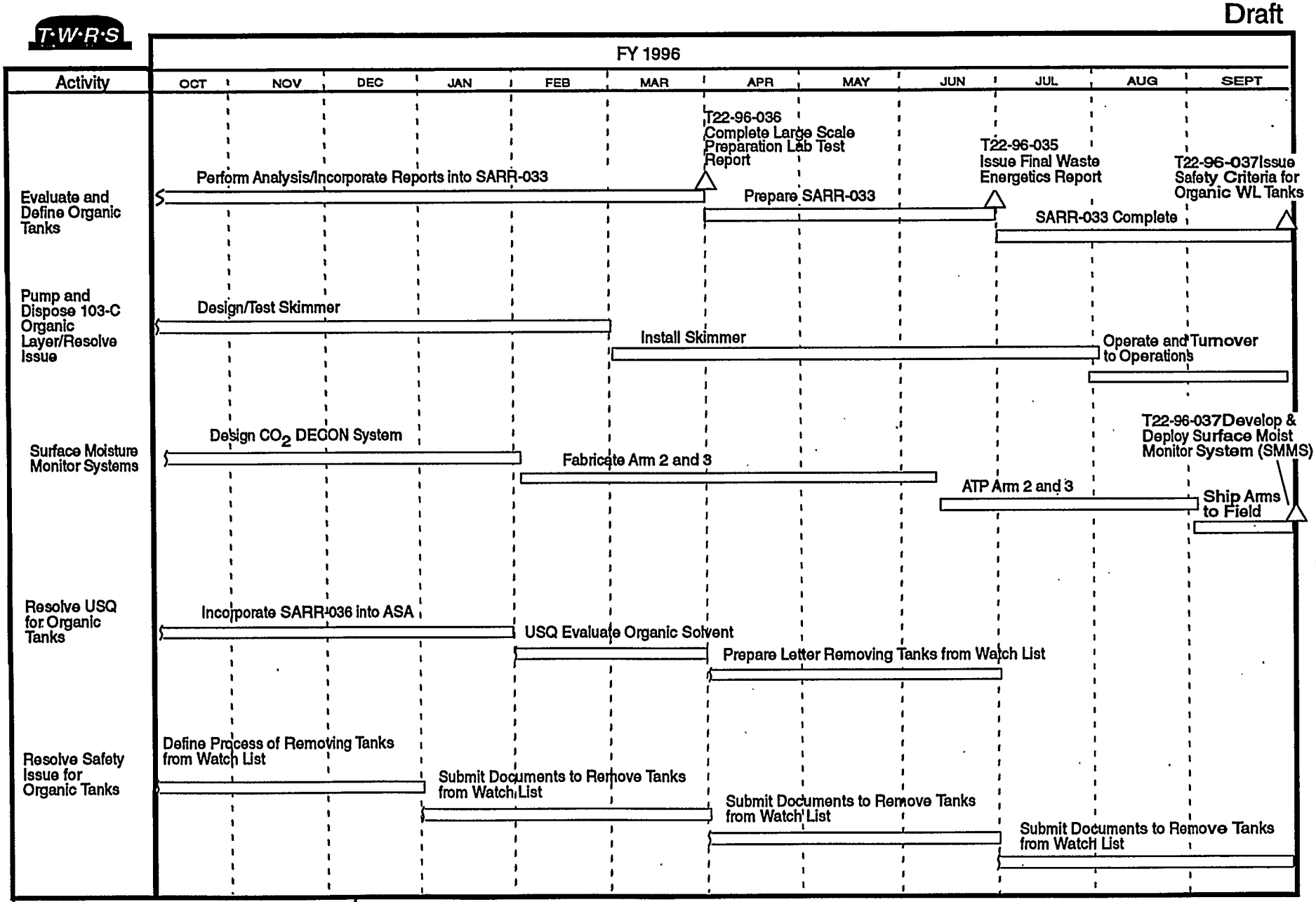
WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.03 - Organics & Nox. V.- Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
1	EXPENSE	28170	7678	6133	10952	3407	
2	CENRTC	20703	5678	10958	4057	9	
	REPORT TOTAL	48872	13356	17091	15010	3416	

Attachment 5.3-6 Cost Baseline Summary by Year



FY 1996 Performance Baseline Schedule

1.1.1.2.02.03 Safety Issue Resolution - Organic and Nox Vapors

29509043.7

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.03 - Organics/Nox - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.02.03.01 - TECHNOL. EVAL.ORGANIC TKS	180	204	273	452	520	448	322	300	236	195	156	153	3440
	1.1.1.2.02.03.02 - EVAL/DEFINE ORGANIC TANKS	17	16	15	13	12	42	54	53	41	38	40	35	378
	1.1.1.2.02.03.03 - RESOLVE ESQ's/ORGANIC TKS	8	22	21	24	7	7	62	64	59	57	59	36	425
	1.1.1.2.02.03.04 - IN-TK.RES. ORGANIC W/O TR	16	18	40	99	88	299	312	318	303	318	317	194	2322
	1.1.1.2.02.03.05 - PUMP & DISP C-103 ORGN LAYER	5	5	5	7	36	38	20	19	12				147
	1.1.1.2.02.03.06 - RESOLVE SAFETY ISSUE ORG.	3	2	2	7	7	7	7	4	7	7	8	3	65
	1.1.1.2.02.03.07 - PLANNING AND INTEGRATION	79	72	68	79	72	75	79	79	72	75	79	72	901
TOTAL	1	308	339	425	682	742	916	857	837	729	690	659	493	7678
2 - CENRTC														
	1.1.1.2.02.03.03 - RESOLVE ESQ's/ORGANIC TKS	45	40	38	45	126	137	39	34	31	2			536
	1.1.1.2.02.03.04 - IN-TK.RES. ORGANIC W/O TR	231	225	315	463	459	790	774	679	405	323	276	193	5133
	1.1.1.2.02.03.07 - PLANNING AND INTEGRATION	1	1	1	1	1	1	1	1	1	1	1	1	9
TOTAL	2	276	267	354	509	585	927	814	714	437	326	276	194	5678
	REPORT TOTAL	584	606	778	1191	1328	1843	1670	1552	1166	1016	936	687	13356

5.4 HIGH HEAT AND OTHERS
(WBS 1.1.1.2.2.4)

5.4.1 STRATEGY

5.4.1.1 Objectives

The Safety Issue Resolution Project (formerly called Waste Tank Safety Program) was established in mid-1990 to address the hazards associated with storage of radioactive mixed waste in the large underground radioactive waste storage double-shell tanks (DST) and single-shell tanks (SST) at the Hanford Site.

The Safety Issue Resolution Project will meet the applicable functions and requirements and will deliver the products and end items necessary to achieve the Tank Waste Remediation System (TWRS) Program mission. The purpose of the Safety Issue Resolution Project is to mitigate and/or resolve the waste tank safety issues at the Hanford Site and the objectives are:

1. Serve as a focal point to identify and resolve high-priority waste tank safety issues.

2. Ensure safe storage of waste during the interim period until retrieval or disposal operations begin.

The Safety Issue Resolution Project consists of the following sub-projects:

Flammable Gas (1.1.1.2.2.1)
Ferrocyanide (1.1.1.2.2.2)
Organics and Noxious Vapors (1.1.1.2.2.3)
High Heat and Others (1.1.1.2.2.4)

Cooling water additions to tank 241-C-106 to prevent waste temperatures in excess of the 149 °C (300 °F) operating limit has been identified as a high-priority safety issue. At this time, the only identified method to resolve the safety issue is retrieval of the waste. Although the existing cooling method is effective, an action response plan was developed to deal with a leaking tank situation during the interim period until retrieval operations begin.

A description of the high heat and others safety issues can be found in the WBS Dictionary, Attachment 5.4-2.

5.4.1.2 Planning Assumptions

1. The high-heat safety issue for tank 241-C-106 will be resolved by transferring the waste to a double-shell tank that has better leak resistance and heat dissipation capacity.

2. The Waste Retrieval Project (1.1.1.3.1) shall fund development of the technical basis necessary to support the safety considerations of the waste under conditions other than storage (e.g., retrieval sluicing and transfer operations), as such development relates to the high-heat safety issue.

5.4.1.3 Constraints

1. Uncertainties in the characteristics and composition (thermal hydraulics and chemistry) of stored waste in tank 241-C-106.

2. Uncertainty as to the structural integrity of tank 241-C-106; ability of the tank to withstand dome loading and hydraulic forces during retrieval operations necessary to resolve the safety issue.

5.4.2 TECHNICAL REQUIREMENTS BASELINE

5.4.2.1 Work Breakdown Structure

The WBS tree for the High Heat and Others sub-project can be found in Attachment 5.4-1.

5.4.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the High Heat and Others sub-project can be found in Attachment 5.4-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

5.4.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the High Heat and Others sub-project can be found in Attachment 5.4-3.

5.4.2.4 Technology Needs

An in-tank chiller was designed as a contingency action in case of a tank leak prior to waste retrieval. The chiller would be used to cool the dome space which in turn provides cooling for the waste matrix in the tank.

Retrieval of the waste will be by others (Waste Retrieval 1.1.1.3.1) using existing sluicing technology.

5.4.3 SCHEDULE BASELINE

5.4.3.1 Summary Schedule

See Attachment 5.4-4 for the summary schedule.

5.4.3.2 Milestone Control Log

See Attachment 5.4-5 for the milestone control log. Milestone description sheets are located in Appendix A.

5.4.4 COST BASELINE

5.4.4.1 Cost Baseline Summary by Year

Attachment 5.4-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

5.4.4.2 Basis of Estimate

The basis of estimates is: (1) historical costs since 1990; and (2) independent cost estimates developed jointly by Project Time and Cost, Inc. and Los Alamos Technical Associates.

5.4.5 PERFORMANCE MEASURES

The performance measures utilized by the Safety Issue Resolution Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators. These are:

- Actual cost vs schedule
- Estimates at completion
- Cost of significant activities
- Cost of delivered product
- Overhead application rates
- Customer satisfaction, measured by feedback from the customer
- Performance indicators
  - milestone completions
  - recordable incidents
  - corrective action management

5.4.6 EXECUTION YEAR

5.4.6.1 Technical Objectives

This section provides a summary of the technical objectives and specific FY 1996 work scope planned to support resolution of the high heat safety issue.

1. **Evaluate and Define Safety Issue.** Establish the work to be done based on historical data, sampling and analysis, laboratory tests, monitoring data, and mathematical modeling. It defines safe conditions for operation and decides on the appropriate path to resolve the safety issue. In addition, it includes the choice of the "no-action" option if it is determined no safety issue exists for tank 241-C-106. For high heat, specific FY 1996 work scope includes thermal modeling, monitoring tank performance and analyzing surveillance data.

2. **Close Unreviewed Safety Question (USQ).** Establish the technical bases for closure of the USQ. The safety envelope will be redefined, operating procedures modified, control limits established, and documentation completed for recommendation of USQ closure. There is no USQ associated with high heat.

3. **Mitigate Condition.** Develop corrective actions for safety issues that address possible treatment to reduce the severity of the safety issues. Work includes development, design, fabrication, installation, testing, and demonstration of the equipment for moisture control and heat removal, and to assure continued subcriticality. For high heat, specific FY 1996 work scope includes updating an action response plan in case of a tank leak.

4. **Store and Monitor.** Provide monitoring systems to ensure safe storage until the safety issue is resolved. Work includes developing, procuring, and installing additional equipment to improve ventilation, to continuously monitor tank parameters for temperature, and for neutron detection. For high heat, no specific FY 1996 work scope is needed.

5. **Resolve Safety Issue.** Implement corrective actions to eliminate the hazard and resolve the safety issue. For high heat, specific FY 1996 work scope includes supporting tank 241-C-106 pre-retrieval and waste retrieval activities being conducted by the Waste Retrieval Project under Project W-320.

5.4.6.2 FY 1996 Performance Baseline Schedule

Attachment 5.4-7 contains the FY 1996 performance baseline schedule.

5.4.6.3 Cost Estimate Baseline by Month

Attachment 5.4-8 establishes the month-by-month cost estimate baseline for FY 1996.

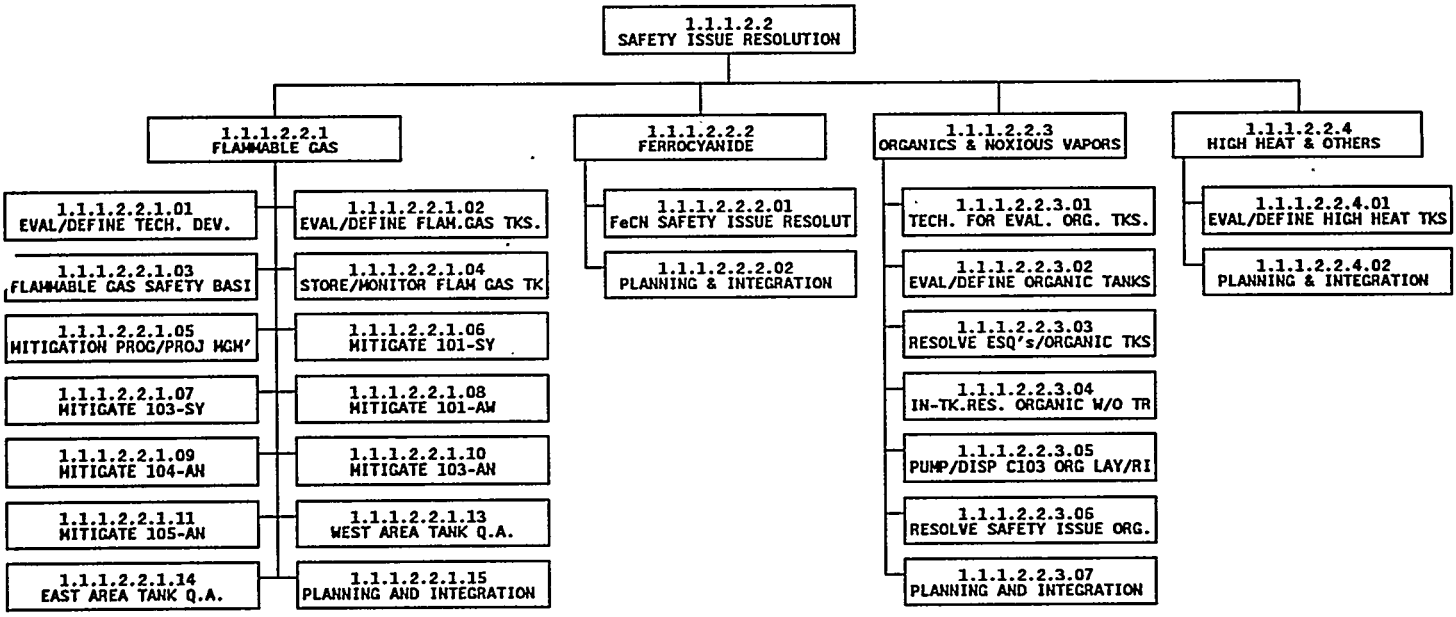
5.4.6.4 FY 1995 Work Scope Carryover Summary

None.

LISTING OF ATTACHMENTS

Attachment 5.4-1	Work Breakdown Structure
Attachment 5.4-2	WBS Dictionary Sheet
Attachment 5.4-3	Responsibility Assignment Matrix
Attachment 5.4-4	Summary Schedule
Attachment 5.4-5	Milestone Control Log
Attachment 5.4-6	Cost Baseline Summary by Year
Attachment 5.4-7	FY 1996 Performance Baseline Schedule
Attachment 5.4-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
SAFETY ISSUE RESOLUTION



Attachment 5.4-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/19/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.2 WASTE STORAGE 1.1.1.2.02 SAFETY ISSUE RESOLUTION	
3. WBS ELEMENT CODE/LEVEL 1.1.1.2.02.04 Level 5	4. WBS ELEMENT TITLE HIGH HEAT & OTHERS	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 9/26/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 11100	9. BUDGET AND REPORTING NUMBERS Operating EW3120072 CENTRC 35EW31207 GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	1,296.00	1,195.00					
CENRTC	9.00	9.00					
LINE ITEM							
GPP							
TOTAL	1,305.00	1,204.00					

B. TECHNICAL BASES

Goals and Objectives

HIGH HEAT PROGRAM GOALS AND OBJECTIVES:

Tank 241-C-106, a 530,000 gallon capacity single-shell tank (SST), has been used for high-level radioactive waste storage since mid 1947 and currently is approximately half-full. Heat-generating sludge was inadvertently transferred into the tank in the late 1960's. The high heat generation (over 100,00 Btu/h in 1995) resulted in a safety issue that, if left alone, the structure might fail from high temperature, allowing high-level radioactive waste to be released to the environment. Since mid-1971, water has been added periodically to the tank to prevent waste temperatures in excess of the 300 degrees F operating limit by keeping a liquid cover over the sludge and promoting heat removal by evaporative cooling through active filtered ventilation. Although the cooling method is effective, it poses a potential hazard should a leak develop. In the event of a tank leak, the liquid would drain into the ground and further cooling water additions might add to the environmental impact. The fraction of cooling water that exceeds the interstitial holdup liquid capacity of the sludge is defined as drainable liquid. If cooling water additions are stopped, the sludge would heat to temperatures greater than established safety limits and may cause tank structural damage and an unacceptable radioactive release to the environment. A high-heat tank is defined as a SST with a heat generation rate of 11.8 kw (40,000 Btu/h) or greater. Of the ten tanks on the high-heat list, only tank 241-C-106 has been placed on the safety Watch List because of the need for cooling water additions and the potential for structural damage if temperatures are not controlled.

The logic for resolution of this high-heat tank safety issue uses a graded approach considering alternative cooling methods. Although the existing cooling method (water additions with forced ventilation) is effective, an action response plan has been implemented to deal with a leaking tank situation. A chiller will be added in FY 1996 to provide a constant dome space temperature of 40 degrees F. It has been concluded that a small quantity of drainable liquid on the waste surface is required for cooling even with the chiller.

Tri-Party Agreement (TPA) Milestone M-40-05, Complete Safety Alternative Test in High-Heat Tank 241-C-106 (completed in September 1995), was established to determine the minimum liquid inventory if the tank remains sound. At this time, the only identified remediation method is retrieval of the waste. Tank 241-C-106 has been selected by Waste Retrieval (1.1.1.3.01) to satisfy Tri-Party Agreement Milestone M-45-03A, Initiate Sluicing Retrieval of 241-C-106, in FY 1997 (Project W-320, Tank 241-C-106 Sluicing).

Major End-Item Deliverables

T22-96-030 06/30/96 Complete a Waste Removal Thermal Hydraulics Report for Tank 241-C-106
T22-96-032 08/01/96 Update Tank 241-C-106 Action Response Plan
T22-97-011 09/30/97 Resolve High-Heat Safety Issue after Retrieval of Waste in Tank 241-C-106

Acceptance Criteria

Complete work scope within cost, schedule and technical baseline
Resolve High-Heat Safety Issue for Tank 241-C-106

C. STATEMENT OF WORK

The focus of activities for resolution of the high-heat tank safety issue consists of using the GOTH thermal model for predicting the thermal behavior of tank 241-C-106 and predicting water evaporation rates required to maintain waste temperatures within safety criteria for the tank, both with and without a chiller for the air in the dome space. A safety alternative process (SAP) test was conducted in tank 241-C-106 in FY 1994 to determine minimium liquid inventories (water additions) required for cooling and define lower liquid operating levels, in case of a tank leak and still provide sufficient waste evaporative cooling with the forced ventilation system. In-tank video was used to monitor the liquid-waste interface during the SAP. New minimum operating liquid levels and water additions were defined for the tank in FY 1995 as part of TPA Milestone M-40-05.

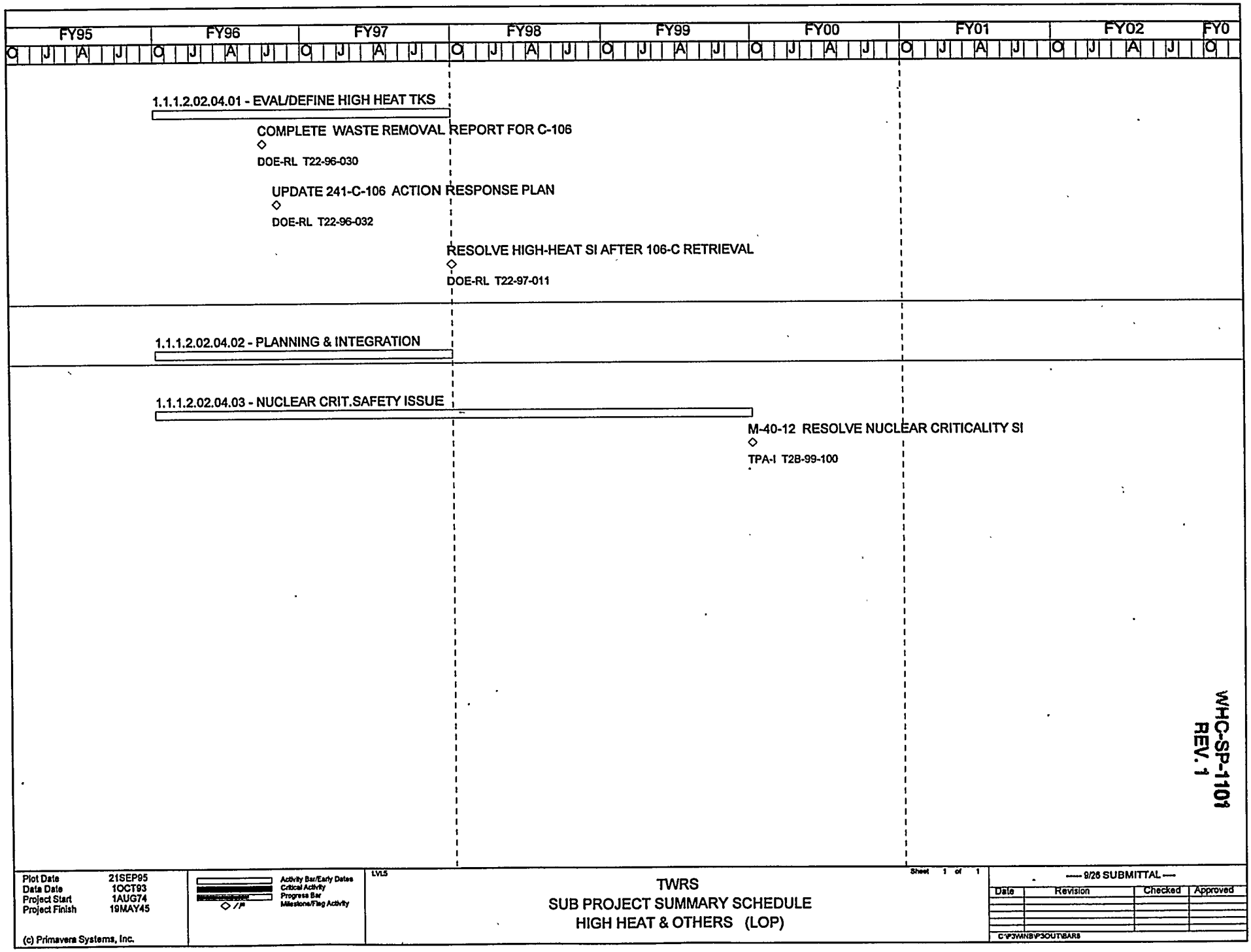
A chiller will be installed by Project W-320 in FY 1996. After the chiller becomes operational, tank temperatures and conditions will be monitored and compared with the tank performance predicted by modeling. A detailed thermal hydraulic analyses will be completed to ensure the saturation zone has dissipated and that the tank is performing as expected.

All work will be coordinated with the pre-retrieval activities and during retrieval being conducted by Waste Retrieval, 1.1.1.3.01, in order to ensure tank safety at all times. Thermal hydraulic analyses will be conducted during the course of waste retrieval to assess temperature behavior and determine how much waste must be removed to lower the tank heat load to less than 11.8 kw. A corrosion control program has been implemented to minimize tank wall corrosion. The purpose of the corrosion control is to prevent tank leaks before and during retrieval . A safety assessment has been prepared by Project W-320 (09/29/95) and forwarded to RL for approval. The High-Heat Safety Program will assist Waste Retrieval with resolution of any comments or concerns in securing approval of the Safety Assessment. An updated action response plan for abnormal conditions that might occur in tank 241-C-106 before, during, and after retrieval will also be prepared.

OTHER LEGAL DRIVERS AND ORDER REQUIREMENTS

Public Law 101-510
Tri-Party Agreement M-40
DOE Order 5820.2A

WBS Number	WBS Title	Responsible Person
1.1.1.2.02	Safety Issue Resolution	E. J. Lipke
1.1.1.2.02.04	High Heat & Others	R. J. Cash
1.1.1.2.02.04.01	Evaluate & Define High Heat Tanks	R. J. Cash
1.1.1.2.02.04.02	Planning & Integration	T. L. Denton



Attachment 5.4-4 Summary Schedule

WHC-SP-1101
REV. 1

1.1.1.2.02.04 High Heat and Others

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.02.04.01	COMPLETE WASTE REMOVAL REPORT FOR C-106	DOE-RL T22-96-030		28JUN96
1.1.1.2.02.04.01	UPDATE 241-C-106 ACTION RESPONSE PLAN	DOE-RL T22-96-032		02AUG96
1.1.1.2.02.04.01	RESOLVE HIGH-HEAT SI AFTER 106-C RETRIEVAL	DOE-RL T22-97-011		30SEP97
1.1.1.2.02.04.03	M-40-12 RESOLVE NUCLEAR CRITICALITY SI	TPA-I T2B-99-100		30SEP99

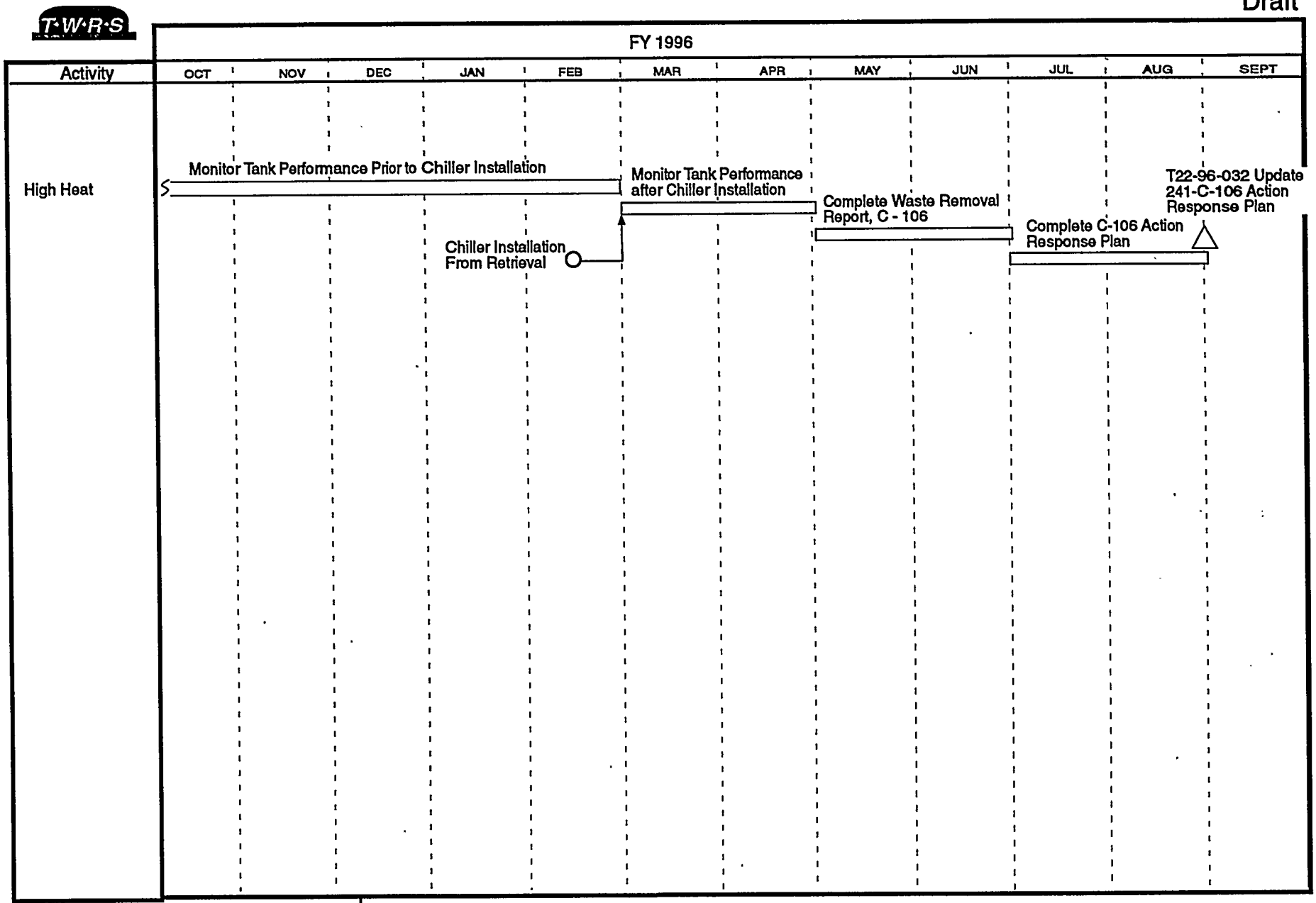
WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.04 - High Heat & Others- Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998
1	EXPENSE	2491	1296	1195	
2	CENRTC	18	9	9	
	REPORT TOTAL	2509	1305	1204	

Attachment 5.4-6 Cost Baseline Summary by Year



FY 1996 Performance Baseline Schedule

1.1.1.2.02.04 Safety Issue Resolution - High Heat and Others

29509043.6

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.02.04 - High Heat - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.2.02.04.01 - EVAL/DEFINE HIGH HEAT TKS	30	27	26	25	24	39	41	41	38	46	32	27	395
	1.1.1.2.02.04.02 - PLANNING & INTEGRATION	79	72	68	79	72	75	79	79	72	75	79	72	901
TOTAL	1	109	99	94	104	96	114	120	120	109	121	111	99	1296
2 - CENRTC														
	1.1.1.2.02.04.02 - PLANNING & INTEGRATION	1	1	1	1	1	1	1	1	1	1	1	1	9
TOTAL	2	1	1	1	1	1	1	1	1	1	1	1	1	9
	REPORT TOTAL	110	100	95	105	97	115	121	121	110	122	111	100	1305

Attachment 5.4-8 Cost Estimate Baseline by Month

6.0 WASTE CHARACTERIZATION (WBS 1.1.1.2.4)

6.1 STRATEGY

The Characterization Project was established to characterize the Hanford Site high-level radioactive waste and to ensure safe storage and disposal associated with storage of radioactive mixed waste in large, underground, radioactive waste storage double-shell tanks (DSTs) and single-shell tanks (SSTs).

Tank waste contents will be characterized to ensure an acceptable level of public and worker health and safety in conjunction with safe storage of waste, and safe and cost-effective waste disposal. A sound characterization basis will determine the number and types of samples to be analyzed.

6.1.1 Objectives

The objective of the Characterization Project is to provide tank waste characterization information for the Hanford Site DSTs and SSTs. This objective is implemented through program management, technical basis development and reporting, managing and developing sampling equipment, acquiring samples and measurements, and sample analyses.

The effort to characterize the high-level radioactive waste and to ensure safe storage and disposal involves:

1. Preparation and issue of a safety analysis report
2. Development and implementation of an integrated technical basis for characterizing the waste
3. Development and execution of the capability to sample and analyze tank waste.

Each of these activities will facilitate formation of the production sampling plan. As appropriate, changes to the DOE/RL-0001, Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan, and the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) will be made to support production field sampling, sample analyses, and report writing.

6.1.2 Planning Assumptions

The key assumptions listed below are for the current planning cycle and are based on current knowledge. Assumptions will be revised as necessary for future planning cycles as new information becomes available.

1. No additional tanks will be added to the Watch List. If additions are made, a cost and schedule impact may be created. Appropriate impacts will be documented.
2. DNFSB Recommendation 93-5 Implementation Plan (sample Watch List tanks by 09/95 and all tanks by 09/96) will not be met.

3. The milestones listed below are Tri-Party Agreement commitments that will require renegotiation. Change Request action will be initiated to negotiate revised completion dates. The forecast dates are projections based on current strategies and analysis of waste on a tank-by-tank basis.

		Original Date	Forecast Date
T2D-96-102	Issue 40 tank characterization reports in accordance with the approved tank characterization plans. Complete input of characterization information for 40 high-level waste (HLW) tanks to electronic database(s) (M-44-09)	9/30/96	4/30/98
T2D-97-102	Issue 40 tank characterization reports in accordance with the approved tank characterization plans. Complete input of characterization information for 40 HLW tanks to electronic database(s) (M-44-10)	9/30/97	1/31/02
T2D-98-102	Issue 30 tank characterization reports in accordance with the approved tank characterization plans. Complete input of characterization information for 30 HLW tanks to electronic database(s) (M-44-11)	9/30/98	12/31/03
T2D-99-101	Issue 14 tank characterization reports in accordance with the approved tank characterization plans. Complete input of characterization information for 14 HLW tanks to electronic database(s) (M-44-12)	9/30/99	9/30/04
T2D-99-103	Issue tank characterization reports based on process knowledge, prior characterization data, and validated empirical data acquired after May 1989 for 177 Hanford HLW tanks (M-44-00)	9/30/99	9/30/04

4. Waste sampling to confirm the characterization technical basis will receive priority.

5. No reductions of sampling operators are planned; however, no additional funding is planned to maintain sampling capability. If a reduction of operators were to occur, a reduction in the number of qualified sampling operators would probably result. Consequently, an appropriate reduction in field samples would be required.

6. Three truck sampling crews will work in shift rotations. These three crews will only take rotary core samples; they will not move or set up trucks. A setup crew will set up the trucks, and a field sampling crew will take auger, grab, and vapor samples.

7. Rotary core samples will begin at the rate of 4 cores per month and will increase to 5 cores per month by the end of FY 1996, resulting in an average of 4.5 rotary cores per month. This rate will be reduced in the months that push samples are taken.

8. No new laboratory chemical technicians will be hired. Sample analyses throughput will be 5 analytical equivalents per month, maximum, or 60 analytical equivalent units per year.

9. To maintain a two laboratory capability, the 325 Building Analytical Chemistry Laboratory (ACL) and the 222-S Laboratory will be used. The 325 Building ACL will perform 10 AEUs of work. This work will be coordinated with DOE-RL. In addition, methods development, special analyses, technical expertise, transition to 222-S Laboratory, reference laboratory, and surge capacity, will be performed.

10. New equipment development will be limited to a cone penetrometer, a near-surface moisture monitoring system, X-ray imaging systems, a half-liter large-volume supernate sampler, a simulated riser installation, and a CO_2 decontamination system.

11. Three core samples will be taken for each rotary sampling event, three core samples will be taken for each auger sampling event, two core samples will be taken for each push sampling event, and three risers will be inspected on each tank sampled. In addition, auger sampling events will be taken from tanks that will have rotary and/or push sampling events.

6.1.3 Constraints

The following constraints are recognized and accommodated in planning documents.

1. The scope of the Characterization Project is limited to sampling and characterizing wastes stored in underground storage tanks under control of the Tank Waste Remediation System (TWRS).

2. Certain physical properties of the waste change during the sampling process. If these properties need to be measured as they currently exist in the tanks, in situ measurement methods must be developed.

3. Tank sampling is currently restricted to locations directly beneath risers, and the number of risers that can be used is very limited in most SSTs. Access to additional sampling locations will require development of new sampling technology or addition of new risers.

4. Sample size is currently limited, which may restrict analytical protocols.

5. Technical and programmatic risks impact work requirements.

   a. Technical risks are caused by uncertainties in the characteristics and composition of tank waste. These uncertainties are:

      - Assumptions that underlie technical analyses
      - Degree to which selected technologies are mature for a given application
      - Range of uncertainty surrounding quantitative values used in analyses and models
      - Depth, breadth, and completeness of analyses used to support the technical bases
      - Misunderstood chemistry and thermal hydraulics of waste contents in several tanks, thus raising uncertainty for acquiring samples.

b. Programmatic risks involve achieving the required level of technical excellence within available funding and schedule constraints; managing the Characterization Project to properly consider the values of public interest groups, Native American tribes, local and regional governments, and Washington State agencies; institutional influences; and the merging of new facilities with existing operations and facilities, both within TWRS and sitewide. Factors contributing to the programmatic risks are:

- Incomplete operational records, which make data analysis and data interpretation difficult
- Uncertainties about the impact of increased safety and hazardous waste requirements on the time and cost to sample the waste (e.g., disposal costs for sampling equipment)
- Reliability of sampling equipment, which may impact sampling activities even though integration of field work activities is in progress
- Unscheduled events that may impact scheduled work
- Availability of an adequate number of qualified resources in the time frame required
- Depth of planning, including maturity of cost estimates and funding stability
- Perceptions of stakeholder and institutional oversight agencies regarding progress and the effective use of available resources.

6.2 TECHNICAL REQUIREMENTS BASELINE

The Tri-Party Agreement Fourth Amendment (January 1994) milestone, "Issue tank characterization reports (TCRs) based on process knowledge, prior characterization data, and validated empirical data acquired after May 1989 for 177 Hanford high-level waste tanks," endorses tank characterization work. The technical basis is developed from evaluation of mission strategy, functions and requirements, assumptions, and constraints.

Technical functions and requirements have been established for the Characterization Project. The functions and requirements lie within Level 4 of the functional hierarchy of the TWRS.

1. Level 0, Clean Up Hanford (0)
2. Level 1, Remedy Unsafe and Unacceptable Conditions (4.0)
3. Level 2, Remediate Tank Waste (4.2)
4. Level 3, Manage Tank Waste (4.2.1)
5. Level 4, Characterize Waste (4.2.1.2).

This Project supports the 4.2.1.1, "Store Managed Tank Waste," function by sampling and analyzing tank waste. Tank characterization reports necessary to evaluate and resolve safety issues are provided.

This Project provides waste data and tank characterization information to support the 4.2.2.1, "Retrieve Tank Waste," function; and the 4.2.2.1 function retrieves tank waste as part of the actions necessary to resolve safety issues and for disposal.

This Project shares waste data and tank characterization information with the 4.2.2.3, " Pretreat Waste," function; and 4.2.2.3 pretreats tank waste as part of the actions necessary for disposal.

6.2.1 Work Breakdown Structure

The Characterization Project consists of the following work breakdown structure (WBS) elements.

1. Program Management. Management activities for the continued safe operations, storage, and disposal of tank wastes are supplied. Work scope includes: programmatic guidance; coordination and interface with oversight organizations; and development and implementation of work plans, schedules, budgets, procurement actions, reports, and reviews.

2. Technical Basis and Reports. Technical bases are developed and information management is supplied. Technical oversight and guidance, process engineering documentation, technical review, and data evaluation services are provided. Work scope includes technical review of data quality objectives (DQOs), developing and maintaining tank characterization plans and reports, validating tank layer models, managing tank waste characterization database information, obtaining historical documentation, and providing technical basis documents.

3. Sampling Equipment. Equipment and operational techniques are analyzed and improvements are implemented to optimize sampling efficiency. Work scope includes managing sampling equipment, improving equipment availability and effectiveness, and deploying new equipment.

4. Acquire Samples and Measurements. Specific sampling methodologies are performed for sampling tank contents and for sampling vapor in tank domespaces. Work scope includes managing samples and measurements and obtaining physical samples by using rotary mode sampling, push mode sampling, grab sampling, auger sampling, and vapor sampling. Samples are transported to an onsite laboratory for analysis. The information obtained will be used for monthly activity reports and TCRs. Equipment will be maintained and decontaminated as necessary.

5. Sample Analyses. Timely sample analysis is performed to support safe storage and disposal of tank wastes. Samples will be received and analyzed, and a report will be issued to document results. Work scope includes managing sample analyses, rotary sample analyses, push sample analyses, grab sample analyses, auger sample analyses, vapor sample analyses, laboratory upgrades and technology applications.

The WBS tree for the Characterization Project can be found in Attachment 6-1.

6.2.2 WBS Dictionary Sheets

The Characterization Project WBS dictionary sheet is found in Attachment 6-2.

6.2.3 Responsibility Assignment Matrix

Responsibilities are defined for the Characterization Project, interfacing organizations, and external advisory groups.

1. Project Responsibilities. The Characterization Project is responsible for managing the tank waste characterization efforts necessary to support safe storage and disposal of tank wastes. The Characterization Project will provide leadership to implement the TWRS Program mission by establishing the technical bases for characterizing tank waste, performing field sampling of tanks, evaluating data, recommending actions, providing laboratory analyses, and managing technical activities associated with tank waste characterization. Specifically, the Characterization Project will:

   a. Ensure the capture, integration, and reporting of known tank waste information, including process history (e.g., transfer records, historical assays), field data taken specifically for characterization, and sampling and analysis data and information

   b. Ensure that waste characterization requirements for the TWRS Project are formally specified through the DQO process

   c. Identify, integrate, prioritize, and gather additional sampling and analyses for TWRS project elements

   d. Develop technologies required to satisfy the tank waste sampling and analysis needs of the TWRS project elements

   e. Conduct tank waste historical data review, sampling, analyses, and data reporting responsive to:

      - Specifications in the DNFSB recommendations
      - Prompt resolution of the waste tank safety issues
      - The schedule and performance needs for selection, design, and development of processes for waste retrieval, waste classification, and waste pretreatment and vitrification.

   f. Issue tank characterization reports based on process knowledge, prior characterization data, and recent laboratory data as defined in Tri-Party Agreement Milestone M-44-00.

2. Interfacing Organizations Responsibilities. The Characterization Project has both internal and external customers.

   a. The internal customers, identified as Westinghouse Hanford Company organizations and other Hanford Site contractors, need tank characterization data to manage tank waste operations.

b. The external customers are comprised mostly of agencies and oversight groups. These groups sometimes focus on the Characterization Project; but, in general, they view characterization as key input to facilitate evaluation of other TWRS activities (e.g., retrieval, pretreatment, or disposal).

Characterization Project management supplies interface and liaison support to the operations, laboratory, DNFSB, vapor sampling, and technical programs.

a. The operations interface provides guidance and coordination for execution of field sampling operations.

b. The laboratory interface ensures that samples are analyzed in accordance with DQOs.

c. The DNFSB interface ensures that tracking, scheduling, and reporting of recommendations and Tri-Party Agreement milestones are completed.

d. The vapor sampling interface coordinates the efforts of Westinghouse Hanford Company and Pacific Northwest Laboratory to resolve safety issues within the vapor sampling program and integrates vapor-related field sampling, laboratory analyses, and data reporting activities.

e. The technical interface manages the definition and integration of characterization DQOs, tank waste analysis plans, and tank characterization plans; evaluates and reports historical, sampling, and analytical data through tank characterization reports; and maintains a database for characterization information to meet end-user needs.

3. External Advisory Group Responsibilities. Four external advisory groups perform technical overview of characterization strategy, activities, and requirements associated with characterization of tank wastes. These groups provide extensive engineering, scientific, and laboratory experience.

a. Tank Characterization Advisory Panel

b. Characterization Technical Advisory Group

c. Chemical Reactions Sub-Tank Advisory Panel

d. Tank Sampling Assistance Panel.

The Responsibility Assignment Matrix for the Characterization Project can be found in Attachment 6-3.

6.2.4 Technology Needs

Some outstanding major decisions need to be made.

1. Funding Shortfall. A funding shortfall exists in the Characterization Project. This shortfall will drive revisions to Tri-Party Agreement Milestones M-44-09, M-44-10, M-44-11, M-44-12, and M-44-00. These milestones pertain to delivery of Tank Characterization Reports for FY 1996 through FY 1999.

2. DQO Process. Each entity or activity already has defined issues and associated information needs. The DQO process was used that defines the type, time-line, and quality (precision, accuracy, etc.) of the information needed to make specific decisions.

   As sample results are received, they will be compared to the related safety analysis assumptions to ensure that the safety conclusions remain valid and to identify any needed changes to the characterization basis, including changed information requirements to be satisfied by tank samples.

3. Tank Priority List. Best available data, criteria, and weighting will be used to rank individual tanks. The most important tanks will be identified.

   Placing the tanks in a priority order is a consensus process that cuts across the programmatic activities requesting the information. Tanks that rank high for more than one need will be ranked higher overall because they provide the greatest information return for invested resources. Once a priority list of tanks is generated, this list is then subjected to known technical constraints, followed by known operational constraints. A sampling plan with a schedule for obtaining and analyzing waste samples can then be developed.

   A preliminary priority list is contained in WHC-SD-WM-TA-164, *Tank Waste Characterization Basis*.

4. Sampling Equipment. Field experience with sampling equipment and completed engineering improvements of the sampling tools are expected to resolve many of the past problems that prevented effective sampling and led to the inability to achieve the DNFSB Recommendation 93-5 Implementation Plan schedule.

   Known and potential problems will be analyzed, and solutions will be implemented.

6.3 SCHEDULE BASELINE

The schedule baseline is established based on funding guidance. Work encompasses Program Management, Technical Basis and Reports, Sampling Equipment, Acquire Samples and Measurements, and Sample Analyses.

6.3.1 Summary Schedule

See Attachment 6-4 for the Characterization Project summary schedule.

6.3.2 Milestone Control Log

See Attachment 6-5 for the milestone control log. Milestone description sheets are located in Appendix A.

6.4 COST BASELINE

The cost baseline is established from the past history of costs required to effectively manage this project. Empirical cost data exist for field work support, technical studies, and construction activities. In addition, construction estimates exist for major capital activities. All cost estimates have been validated by the performing organization and by the respective management function responsible for the work activity.

6.4.1 Cost Baseline Summary by Year

Attachment 6-6 contains the cost baseline summary by year.

6.4.2 Basis of Estimate

The cost estimates are based in part on historical data for those activities that are similar in scope and resources. This historical information, coupled with an independently-generated, activity-based cost estimate, results in this cumulative resource-loaded estimate and schedule.

6.5 PERFORMANCE MEASURES

Performance measures will be established and tracked monthly. Measures will include budgeted cost of work scheduled, budgeted cost of work performed, actual cost of work performed, schedule variance, and cost variance. In addition, the following will be tracked:

1. Reliability, availability, and maintainability of equipment
2. Incidents and occurrences
3. Milestone completion
4. Sampling productivity (weighted sampling factor)
5. Laboratory productivity (analytical equivalency units)
6. Overall performance measure on basis of the number of TCRs.

6.6 EXECUTION YEAR

6.6.1 Technical Objectives

Refer to Section 6.1.1, Objectives.

6.6.2 FY 1996 Performance Baseline Schedule

Attachment 6-7 contains the FY 1996 Performance Baseline Schedule.

6.6.3 Cost Estimate Baseline by Month

The FY 1996 cost estimate baseline by month for the Characterization Project is in Attachment 6-8.

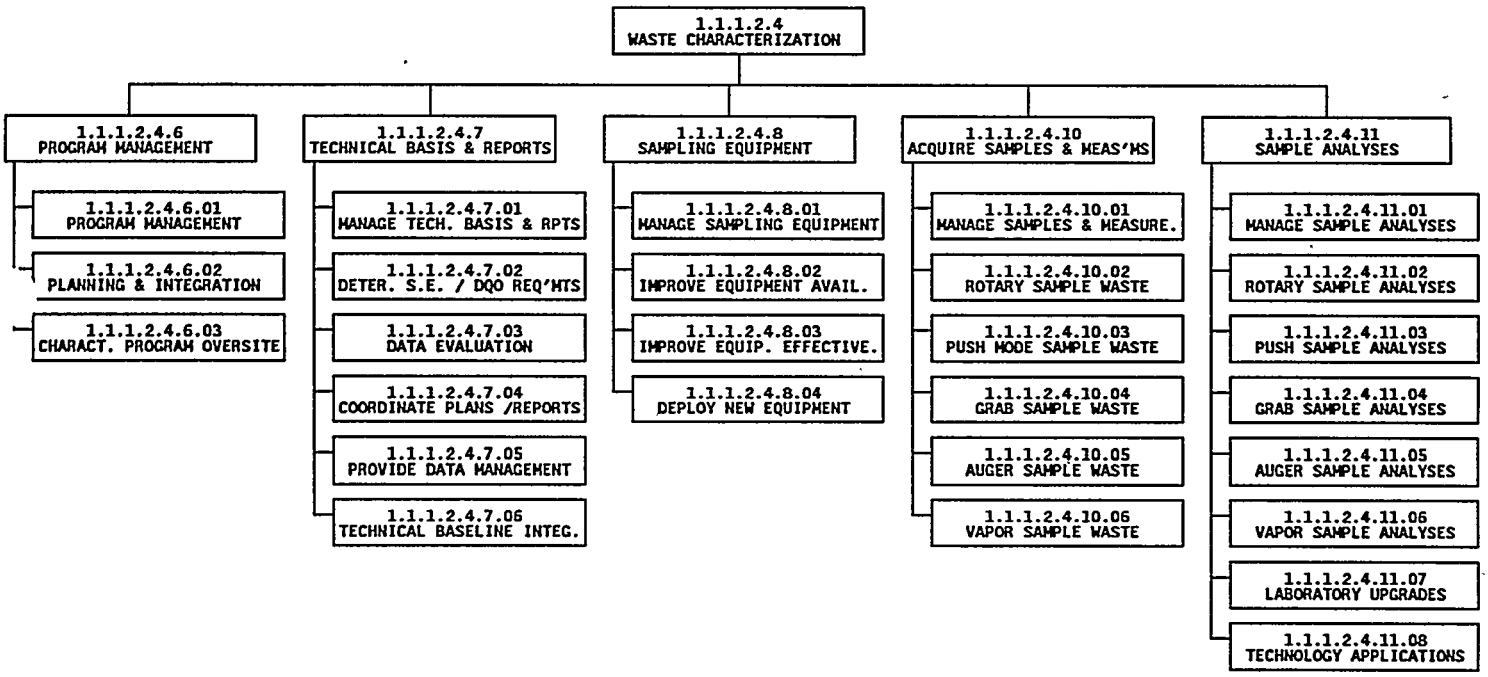
6.6.4 FY 1995 Work Scope Carryover Summary

There is no FY 1995 work scope carryover.

LISTING OF ATTACHMENTS

Attachment 6-1	Work Breakdown Structure
Attachment 6-2	WBS Dictionary Sheet
Attachment 6-3	Responsibility Assignment Matrix
Attachment 6-4	Summary Schedule
Attachment 6-5	Milestone Control Log
Attachment 6-6	Cost Baseline Summary by Year
Attachment 6-7	FY 1996 Performance Baseline Schedule
Attachment 6-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
WASTE CHARACTERIZATION



Attachment 6-1 Work Breakdown Structure

Tank Waste Remediation System
Work Breakdown Structure Dictionary

1. PROGRAM TITLE/PARTICIPANT	2. DATE PREPARED	3. IDENTIFICATION NUMBER
1.1.1 Tank Waste Remediation System 1.1.1.02 Waste Storage 1.1.1.02.04 Waste Characterization	September 15, 1995	DE-AC06-87RL10930
4. WBS ELEMENT CODE/LEVEL	5. WBS ELEMENT TITLE	
1.1.1.02.04/IV	Waste Characterization	
6. WBS INDEX LINE NO.	7. CURRENT REV NO.	8. EFFECTIVE REVISION DATE
Not used	0	October 1, 1995
9. APPROVED CHANGES	10. ADS ID - ADS SUFFIX - SUBACTIVITY NUMBER	
N/A	1130-0	
11. SYSTEM ENGINEERING ARCHITECTURE REFERENCE NUMBER/TITLE FROM TWRS FUNCTIONS AND REQUIREMENTS DOCUMENT (DOE/RL-92-60 REV.1) 4.2.1.2 Waste Characterization	12. BUDGET AND REPORTING NUMBER(S) Expense: EW3120074 Capital: 35EW31207 Line Item:	

13. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY 1996 $(000)	FY 1997 $(000)	FY 1998 $(000)	FY 1999 $(000)	FY 2000 $(000)	FY 2001 $(000)
OPERATING	72132	66879	59155	50064	39962	25894
CENRTC	5113	5,000	3,500	1949	1462	0
GPP	0	0	0	0	0	0
LINE ITEM	0	0	0	0	0	0
TOTAL	77,245.0	71,879.0	62,655.0	52,013.0	41,424.0	25,894.0

B. TECHNICAL BASES

Goals & objectives:

Waste Characterization provides tank waste characterization information for Hanford Site double-shell and single-shell tanks. This work is comprised of program management, technical basis and reports, sampling equipment, acquire samples and measurements, and sample analyses.

1. Provide Program Management. Within this task, management activities necessary to support Waste Characterization for the continued safe storage and disposal of tank wastes are supplied. Work scope includes program management, planning and integration, and characterization program oversight.

2. Provide Technical Basis and Reports. Within this task, technical bases are developed, and information management in support of Waste Characterization is supplied. Work scope includes management of technical basis and reports, determination of systems engineering and data quality objective (DQO) requirements, data evaluation, coordination of plans and reports, provide data management, and complete technical baseline integration.

3. Provide Sampling Equipment. Within this task, equipment and operational techniques are analyzed and improvements are implemented. Work scope includes managing sampling equipment, improving equipment availability, improving equipment effectiveness, and deploying new equipment.

4. Acquire Samples and Measurements. Within this task, specific sampling methodologies are performed. Work scope includes managing samples and measurements and obtaining physical samples by using rotary-mode sampling, push-mode sampling, grab sampling, auger sampling, and vapor sampling.

5. Perform Samples Analyses. Within this task, sample analyses are performed. Work scope includes management of sample analyses, rotary sample analyses, push sample analyses, grab sample analyses, auger sample analyses, vapor sample analyses, laboratory upgrades, and technology applications.

Status of design documentation:

Sampling analyses will be done in accordance with the appropriate DQO, TCP, sampling analysis plans (SAP), and Hanford Analytical Services Quality Assurance Plan (HASQAP), Rev. 2.

Major end-item deliverables (related to milestones and interfaces appropriate to this level of the WBS):

Issue Tank Characterization Reports based on process knowledge, prior characterization data, and validated empirical data acquired after May 1989 for 177 Hanford high-level waste tanks (TPA M-44-00).

See milestone control log.

C. STATEMENT OF WORK

Required activities:

Waste Characterization consists of the following activities:

1. Program Management. Management activities for the continued safe storage and disposal of tank wastes are supplied. Work scope includes programmatic guidance; coordination and interface with oversight organizations; development and implementation of work plans, schedules, procurement actions, reporting, and reviews.

2. Technical Basis and Reports. Technical bases are developed and implementation plans are supplied. Technical oversight, process engineering documentation, technical review, and data evaluation services are provided. Work scope includes performing technical review of DQOs, developing and maintaining tank characterization plans (TCPs) and tank characterization reports (TCRs), validation of tank layer models, managing tank waste characterization database information, obtaining historical documentation, and providing technical basis documents.

3. Sampling Equipment. Equipment and operational techniques are analyzed and improvements are implemented to optimize sampling efficiency. Work scope includes managing sampling equipment, improving equipment availability and effectiveness, and deploying new equipment.

4. Acquire Samples and Measurements. Specific sampling methodologies are performed for sampling tank contents and sampling vapor in tank domespaces. Work scope includes managing samples and measurements and obtaining physical samples by using rotary-mode sampling, push-mode sampling, grab sampling, auger sampling, and vapor sampling. Samples are transported to an onsite laboratory for analyses. The information obtained will be used for monthly activity and tank characterization reports. Equipment will be maintained and decontaminated as necessary.

5. Sample Analyses. Timely sample analyses to support safe storage and disposal of tank wastes are performed. Work scope includes receipt and analysis of samples, generation of reports to document analyses results, performance of laboratory upgrades, and direct technology applications.

Technologies to be assessed:

Evaluate the Internet as a publishing media for disseminating TCRs, TCPs, tank waste analysis plans (TWAPs), etc. Assess Standard Generalized Markup Language (SGML) as a potential improvement for maintaining document integrity, configuration control, standard access and data reuse for TCRs and similar documents.

Analytical needs, with near-term/extended-lead times, as identified through the DQO process, will be developed.

Options to be considered:

In-situ characterization of waste within the tank without obtaining physical samples and delivering them to a laboratory will be evaluated.

1.1.1.2.04 (1N4)
WASTE CHARACTERIZATION
RESPONSIBILITY ASSIGNMENT MATRIX
DIRECTOR: L. F. ERMOLD
DEPUTY: M. A. PAYNE

1.1.1.2.04.06 (1N4F)
PROGRAM MANAGEMENT
MGR: T. J. KELLEY
ORG: CHAR PRGM MGMT
Planner: E. L. Renner
Analyst: S. D. Carr
Scheduler: L. A. Yeater

- 1.1.1.2.04.06.01 (1N4FF1) Program Management — CAM: T. J. Kelley
- 1.1.1.2.04.06.02 (1N4FF2) Planning and Integration — CAM: G. A. Hanson
- 1.1.1.2.04.06.03 (1N4FF3) Characterization Program Oversight — CAM: T. J. Kelley

1.1.1.2.04.07 (1N4G)
TECHNICAL BASIS & REPORTS
MGR: R. S. POPIELARCZYK
ORG: CHAR TECH BASIS
Planner: E. L. Renner/G. T. Frater
Analyst: S. D. Carr
Scheduler: J. R. Burgess

- 1.1.1.2.04.07.01 (1N4GG1) Manage Technical Basis & Reports — CAM: R. S. Popielarczyk
- 1.1.1.2.04.07.02 (1N4GG2) Determination of Sys Eng/DQO Reqs — CAM: D. G. Baide
- 1.1.1.2.04.07.03 (1N4GG3) Data Evaluation — CAM: S. J. Eberlein
- 1.1.1.2.04.07.04 (1N4GG4) Coordinate Plans / Reports — CAM: J. G. Kristofzski
- 1.1.1.2.04.07.05 (1N4GG5) Provide Data Management — CAM: J. G. Kristofzski
- 1.1.1.2.04.07.06 (1N4GG6) Technical Baseline Integration — CAM: S. J. Eberlein

1.1.1.2.04.08 (1N4H)
SAMPLING EQUIPMENT
MGR: R. E. RAYMOND
ORG: CHAR EQUIP ENGINEER
Planner: P. A. Young
Analyst: D. J. Ratcliffe
Scheduler: L. A. Yeater

- 1.1.1.2.04.08.01 (1N4HH1) Manage Sampling Equipment — CAM: R. E. Raymond
- 1.1.1.2.04.08.02 (1N4HH2) Improve Equipment Availability — CAM: D. W. Hamilton
- 1.1.1.2.04.08.03 (1N4HH3) Improve Equipment Effectiveness — CAM: C. E. Hanson
- 1.1.1.2.04.08.04 (1N4HH4) Deploy New Equipment — CAM: C. E. Hanson

1.1.1.2.04.10 (1N4J)
ACQUIRE SAMPLES & MEASUREMENTS
MGR: R. NI
ORG: CHAR OPERATIONS
Planner: P. A. Young
Analyst: R. S. Schubert
Scheduler: L. J. Saldana

- 1.1.1.2.04.10.01 (1N4JJ1) Manage Samples & Measurements — CAM: R. NI
- 1.1.1.2.04.10.02 (1N4JJ2) Rotary Sample Waste — CAM: J. L. Lee
- 1.1.1.2.04.10.03 (1N4JJ3) Push Mode Sample Waste — CAM: J. L. Lee
- 1.1.1.2.04.10.04 (1N4JJ4) Grab Sample Waste — CAM: W. J. Kennedy
- 1.1.1.2.04.10.05 (1N4JJ5) Auger Sample Waste — CAM: W. J. Kennedy
- 1.1.1.2.04.10.06 (1N4JJ6) Vapor Sample Tank — CAM: W. J. Kennedy

1.1.1.2.04.11 (1N4K)
SAMPLE ANALYSES
MGR: A. G. KING
ORG: ANALYTICAL SERVICES
Planner: M. J. Sinclair
Analyst: M. J. Sinclair
Scheduler: P. R. Seipt

- 1.1.1.2.04.11.01 (1N4KK1) Manage Sample Analyses — CAM: V. W. Hall
- 1.1.1.2.04.11.02 (1N4KK2) Rotary Sample Analyses — CAM: C. T. Narquis
- 1.1.1.2.04.11.03 (1N4KK3) Push Sample Analyses — CAM: C. T. Narquis
- 1.1.1.2.04.11.04 (1N4KK4) Grab Sample Analyses — CAM: C. T. Narquis
- 1.1.1.2.04.11.05 (1N4KK5) Auger Sample Analyses — CAM: C. T. Narquis
- 1.1.1.2.04.11.06 (1N4KK6) Vapor Sample Analyses — CAM: D. R. Bratzel
- 1.1.1.2.04.11.07 (1N4KK7) Laboratory Upgrades — CAM: R. P. Marshall
- 1.1.1.2.04.11.08 (1N4KK8) Technology Applications — CAM: D. A. Dodd

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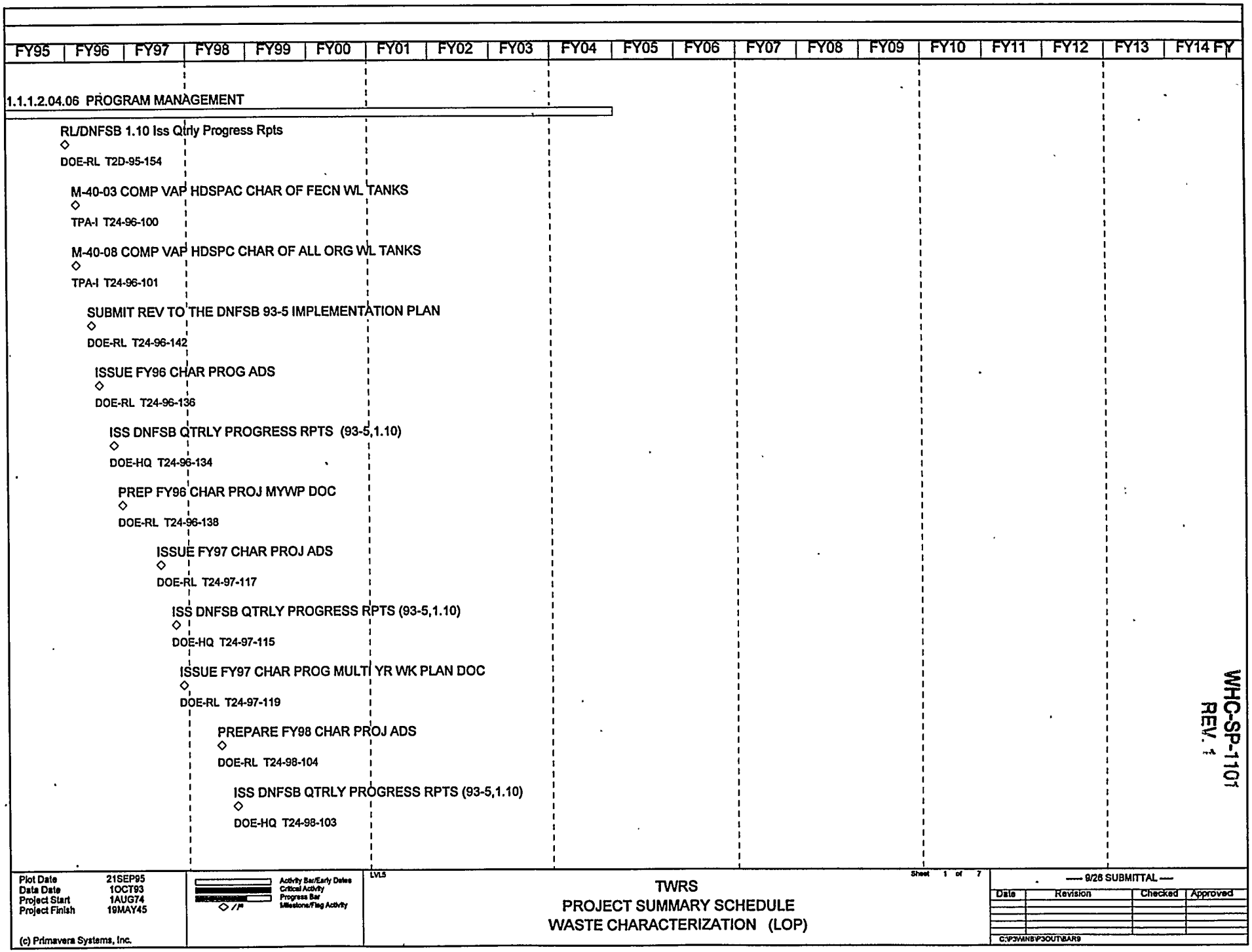

Attachment 6-4 Summary Schedule
Sheet 1 of 7

WHC-SP-1101
REV. 1

FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14 FY

PREP FY97 CHAR PMULTI YR WK PLAN DOC
◇
DOE-RL T24-98-106

1.1.1.2.04.07 TECHNICAL BASIS & REPORTS

RL(DNFSB 1.23) ID "Bounding Tanks"(11/30/94)
◇
DOE-RL T2D-95-106

WHC PNL Tank Grouping Analysis
◇
DOE-RL T2D-95-118

WHC White Paper on Hist Data Methods
◇
DOE-RL T2D-95-119

M-44-08 TPA Issue 30 TCRs/TCD INPUT
◇
TPA-I T2D-95-102

M-44-02B Prepare Fnl TWAP FY96 Update
◇
TPA-I T2D-95-101

ISS ORGANIC SOURCE TERMS REP-LANL-(T24-96-151)
◇
DOE-RL T24-96-151

M-44-01C-SUBMIT DRAFT TWAP UPDATE TO EPA/ECOL
◇
TPA-I T2D-96-100

M-44-02C SUBMIT TWAP UPDATE TO EPA/ECOL APPR
◇
TPA-I T2D-96-101

ISS 21 TANK CHAR REPORTS TCD/INPUT-(T24-96-144)
◇
DOE-RL T24-96-144

UPDATE TANK CHARACTERIZATION BASIS(T24-96-146)
◇
DOE-RL T24-96-146

Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45

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Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LVL5

Sheet 2 of 7

TWRS
PROJECT SUMMARY SCHEDULE
WASTE CHARACTERIZATION (LOP)

9/26 SUBMITTAL

Date	Revision	Checked	Approved

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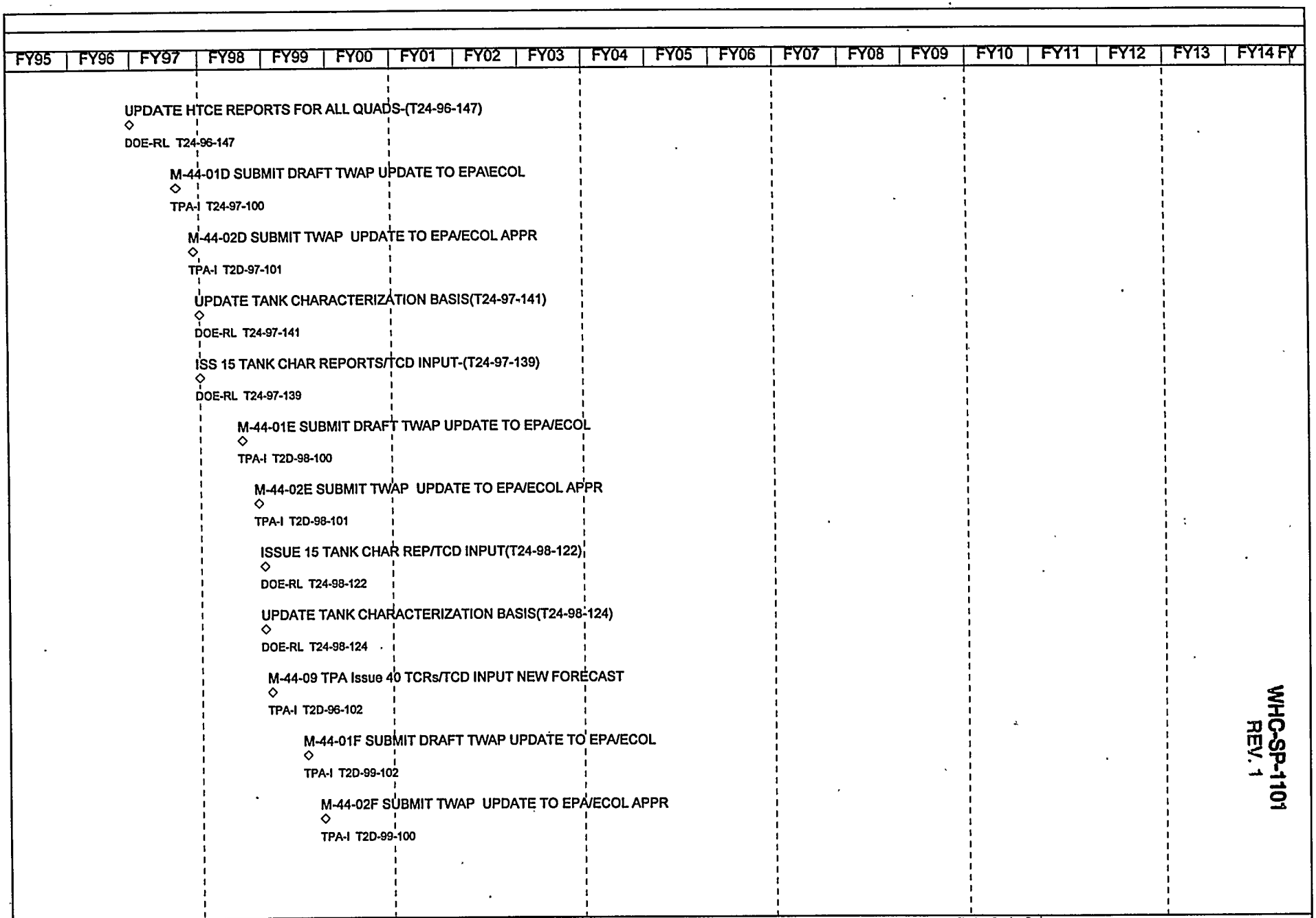
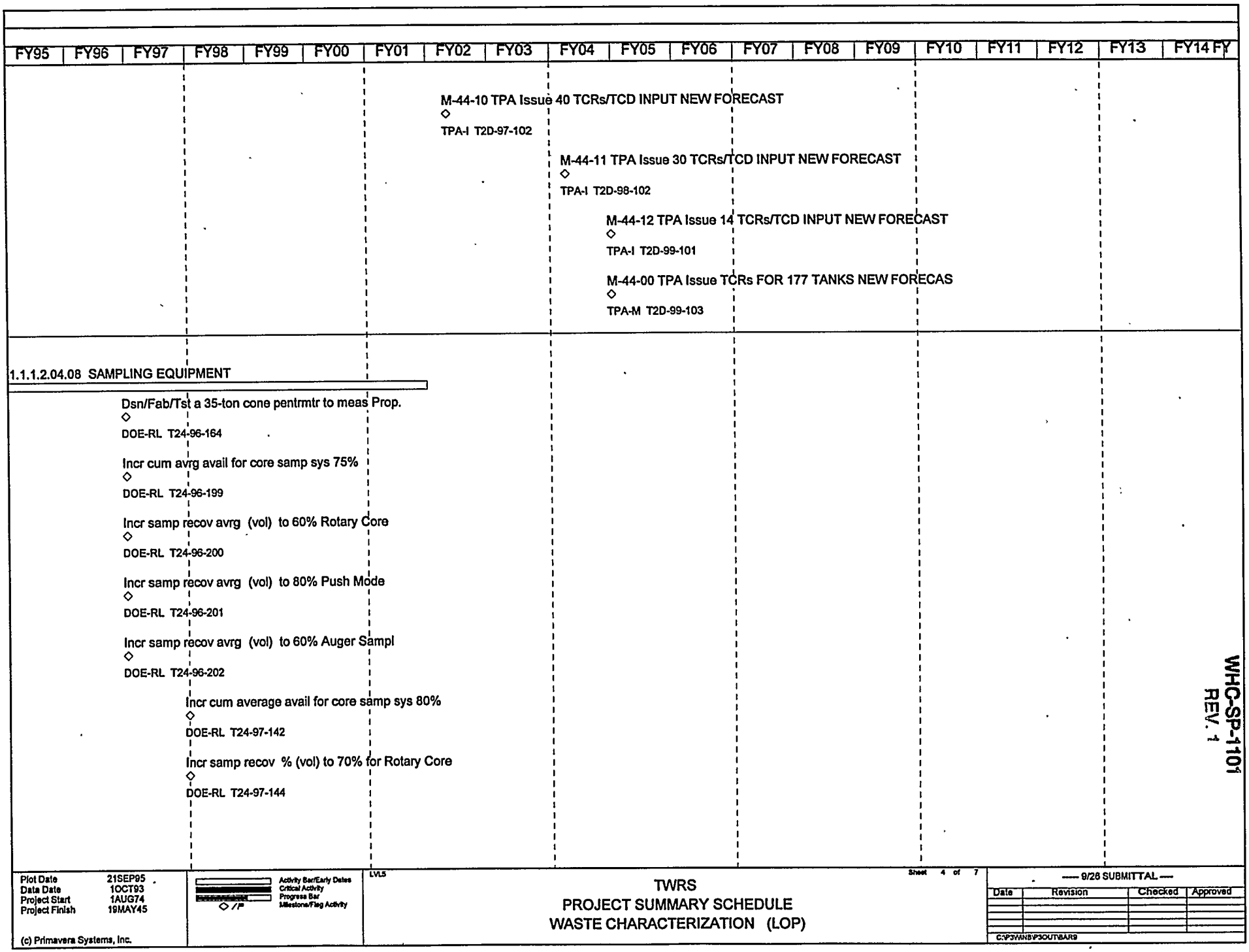


Attachment 6-4 Summary Schedule
Sheet 3 of 7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M-44-10 TPA Issue 40 TCRs/TCD INPUT NEW FORECAST
TPA-I T2D-97-102
M-44-11 TPA Issue 30 TCRs/TCD INPUT NEW FORECAST
TPA-I T2D-98-102
M-44-12 TPA Issue 14 TCRs/TCD INPUT NEW FORECAST
TPA-I T2D-99-101
M-44-00 TPA Issue TCRs FOR 177 TANKS NEW FORECAS
TPA-M T2D-99-103
1.1.1.2.04.08 SAMPLING EQUIPMENT
Dsn/Fab/Tst a 35-ton cone pentrmtr to meas Prop.
DOE-RL T24-96-164
Incr cum avrg avail for core samp sys 75%
DOE-RL T24-96-199
Incr samp recov avrg (vol) to 60% Rotary Core
DOE-RL T24-96-200
Incr samp recov avrg (vol) to 80% Push Mode
DOE-RL T24-96-201
Incr samp recov avrg (vol) to 60% Auger Sampl
DOE-RL T24-96-202
Incr cum average avail for core samp sys 80%
DOE-RL T24-97-142
Incr samp recov % (vol) to 70% for Rotary Core
DOE-RL T24-97-144
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
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Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
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TWRS
PROJECT SUMMARY SCHEDULE
WASTE CHARACTERIZATION (LOP)
9/26 SUBMITTAL
Date
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Incr samp recov % (vol) to 70% for Auger Sampl
◇
DOE-RL T24-97-143

Incr samp recov % (vol) to 90% for Push Mode
◇
DOE-RL T24-97-145

1.1.1.2.04.10 ACQUIRE SAMPLES & MEASUREMENTS

COLLECT 7 ROTARY AND 30 PUSH MODE CORE SAMPLES
◇
DOE-RL T2D-95-135

COLLECT 46 AUGER SAMP FROM Hi LVL WASTE TANK
◇
DOE-RL T2D-95-136

COL VAPOR SAMP FROM 40 HIGH LEVEL WASTE TANK
◇
DOE-RL T2D-95-137

COLLECT 37 GRAB SUPERNATE AND SLUDGE SAMPLES FRO
◇
DOE-RL T2D-95-138

Complete 45 Rotary mode core samples
◇
DOE-RL T24-96-166

Complete 12 Push mode core samples
◇
DOE-RL T24-96-167

Complete 30 Grab samples
◇
DOE-RL T24-96-169

Complete 16 Auger samples
◇
DOE-RL T24-96-170

Complete 48 Vapor samples
◇
DOE-RL T24-96-168

Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45

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Activity Bar/Early Dates
Critical Activity
Progress Bar
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Sheet 5 of 7

TWRS
PROJECT SUMMARY SCHEDULE
WASTE CHARACTERIZATION (LOP)

9/26 SUBMITTAL

Date	Revision	Checked	Approved

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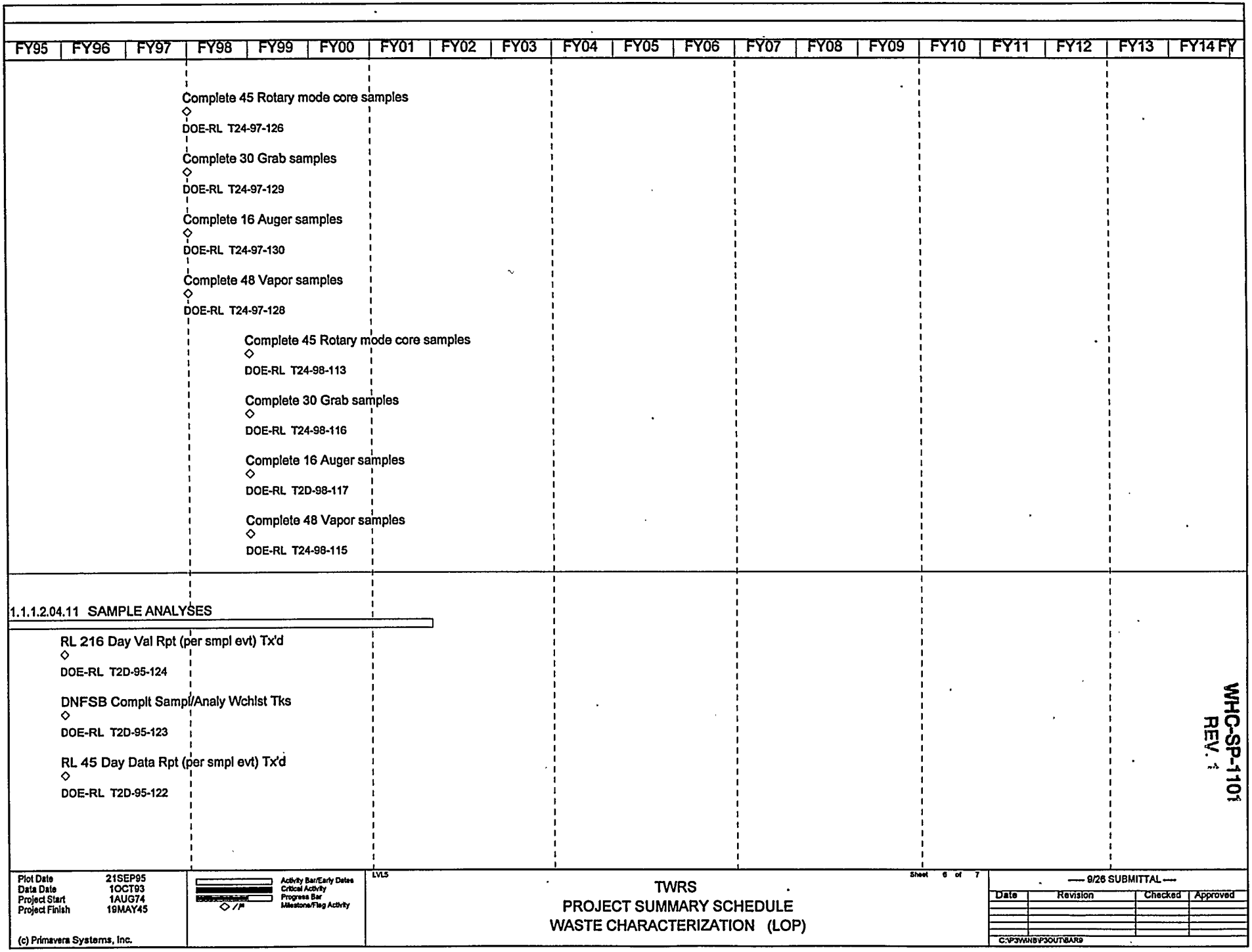
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Complete 45 Rotary mode core samples
DOE-RL T24-97-126
Complete 30 Grab samples
DOE-RL T24-97-129
Complete 16 Auger samples
DOE-RL T24-97-130
Complete 48 Vapor samples
DOE-RL T24-97-128
Complete 45 Rotary mode core samples
DOE-RL T24-98-113
Complete 30 Grab samples
DOE-RL T24-98-116
Complete 16 Auger samples
DOE-RL T2D-98-117
Complete 48 Vapor samples
DOE-RL T24-98-115
1.1.1.2.04.11 SAMPLE ANALYSES
RL 216 Day Val Rpt (per smpl evt) Tx'd
DOE-RL T2D-95-124
DNFSB Complt Sampl/Analy Wchlst Tks
DOE-RL T2D-95-123
RL 45 Day Data Rpt (per smpl evt) Tx'd
DOE-RL T2D-95-122
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
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Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
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TWRS
PROJECT SUMMARY SCHEDULE
WASTE CHARACTERIZATION (LOP)
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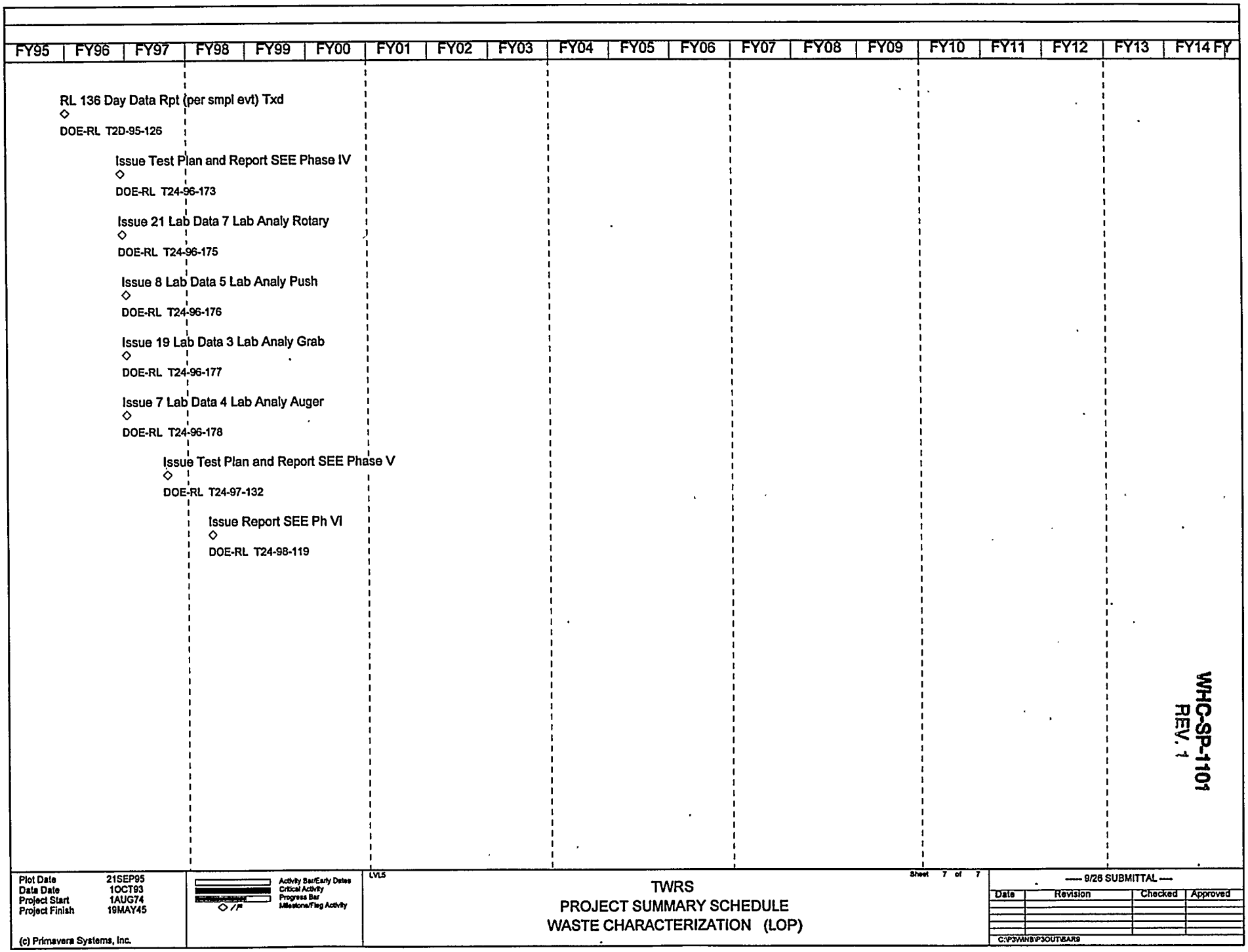
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FY14
FY
RL 136 Day Data Rpt (per smpl evt) Txd
DOE-RL T2D-95-126
Issue Test Plan and Report SEE Phase IV
DOE-RL T24-96-173
Issue 21 Lab Data 7 Lab Analy Rotary
DOE-RL T24-96-175
Issue 8 Lab Data 5 Lab Analy Push
DOE-RL T24-96-176
Issue 19 Lab Data 3 Lab Analy Grab
DOE-RL T24-96-177
Issue 7 Lab Data 4 Lab Analy Auger
DOE-RL T24-96-178
Issue Test Plan and Report SEE Phase V
DOE-RL T24-97-132
Issue Report SEE Ph VI
DOE-RL T24-98-119
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
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PROJECT SUMMARY SCHEDULE
WASTE CHARACTERIZATION (LOP)
9/26 SUBMITTAL
Date
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WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.06.	M-40-03 COMP VAP HDSPAC CHAR OF FECN WL TANKS	TPA-I T24-96-100		30NOV95
1.1.1.2.04.06.	M-40-08 COMP VAP HDSPC CHAR OF ALL ORG WL TANKS	TPA-I T24-96-101		30NOV95
1.1.1.2.04.06.	ISS DNFSB QTRLY PROGRESS RPTS (93-5,1.10)	DOE-HQ T24-96-134		12JUL96
1.1.1.2.04.06.	ISSUE FY96 CHAR PROG ADS	DOE-RL T24-96-136		15APR96
1.1.1.2.04.06.	PREP FY96 CHAR PROJ MYWP DOC	DOE-RL T24-96-138		30AUG96
1.1.1.2.04.06.	SUBMIT REV TO THE DNFSB 93-5 IMPLEMENTATION PLAN	DOE-RL T24-96-142		29FEB96
1.1.1.2.04.07.	ISS 21 TANK CHAR REPORTS TCD/INPUT-(T24-96-144)	DOE-RL T24-96-144		30SEP96
1.1.1.2.04.07.	UPDATE TANK CHARACTERIZATION BASIS(T24-96-146)	DOE-RL T24-96-146		30SEP96
1.1.1.2.04.07.	UPDATE HTCE REPORTS FOR ALL QUADS-(T24-96-147)	DOE-RL T24-96-147		30SEP96
1.1.1.2.04.07.	ISS ORGANIC SOURCE TERMS REP-LANL-(T24-96-151)	DOE-RL T24-96-151		29MAR96
1.1.1.2.04.08.	Dsn/Fab/Tst a 35-ton cone pentrmtr to meas Prop.	DOE-RL T24-96-164		26SEP96
1.1.1.2.04.10.	Complete 45 Rotary mode core samples	DOE-RL T24-96-166		30SEP96
1.1.1.2.04.10.	Complete 12 Push mode core samples	DOE-RL T24-96-167		30SEP96
1.1.1.2.04.10.	Complete 48 Vapor samples	DOE-RL T24-96-168		30SEP96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.10.	Complete 30 Grab samples	DOE-RL T24-96-169		30SEP96
1.1.1.2.04.10.	Complete 16 Auger samples	DOE-RL T24-96-170		30SEP96
1.1.1.2.04.11.01	Issue Test Plan and Report SEE Phase IV	DOE-RL T24-96-173		30AUG96
1.1.1.2.04.11.02	Issue 21 Lab Data 7 Lab Analy Rotary	DOE-RL T24-96-175		09SEP96
1.1.1.2.04.11.03	Issue 8 Lab Data 5 Lab Analy Push	DOE-RL T24-96-176		30SEP96
1.1.1.2.04.11.04	Issue 19 Lab Data 3 Lab Analy Grab	DOE-RL T24-96-177		30SEP96
1.1.1.2.04.11.05	Issue 7 Lab Data 4 Lab Analy Auger	DOE-RL T24-96-178		30SEP96
1.1.1.2.04.08.	Incr cum avrg avail for core samp sys 75%	DOE-RL T24-96-199		30SEP96
1.1.1.2.04.08.	Incr samp recov avrg (vol) to 60% Rotary Core	DOE-RL T24-96-200		30SEP96
1.1.1.2.04.08.	Incr samp recov avrg (vol) to 80% Push Mode	DOE-RL T24-96-201		30SEP96
1.1.1.2.04.08.	Incr samp recov avrg (vol) to 60% Auger Sampl	DOE-RL T24-96-202		30SEP96
1.1.1.2.04.07.	M-44-01D SUBMIT DRAFT TWAP UPDATE TO EPA\ECOL	TPA-I T24-97-100		29MAY97
1.1.1.2.04.06.	ISS DNFSB QTRLY PROGRESS RPTS (93-5,1.10)	DOE-HQ T24-97-115		14JUL97
1.1.1.2.04.06.	ISSUE FY97 CHAR PROJ ADS	DOE-RL T24-97-117		15APR97

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.06.	ISSUE FY97 CHAR PROG MULTI YR WK PLAN DOC	DOE-RL T24-97-119		29AUG97
1.1.1.2.04.10.	Complete 45 Rotary mode core samples	DOE-RL T24-97-126		30SEP97
1.1.1.2.04.10.	Complete 48 Vapor samples	DOE-RL T24-97-128		30SEP97
1.1.1.2.04.10.	Complete 30 Grab samples	DOE-RL T24-97-129		30SEP97
1.1.1.2.04.10.	Complete 16 Auger samples	DOE-RL T24-97-130		30SEP97
1.1.1.2.04.11.01	Issue Test Plan and Report SEE Phase V	DOE-RL T24-97-132		30MAY97
1.1.1.2.04.07.	ISS 15 TANK CHAR REPORTS/TCD INPUT-(T24-97-139)	DOE-RL T24-97-139		30SEP97
1.1.1.2.04.07.	UPDATE TANK CHARACTERIZATION BASIS(T24-97-141)	DOE-RL T24-97-141		29SEP97
1.1.1.2.04.08.	Incr cum average avail for core samp sys 80%	DOE-RL T24-97-142		30SEP97
1.1.1.2.04.08.	Incr samp recov % (vol) to 70% for Auger Sampl	DOE-RL T24-97-143		30SEP97
1.1.1.2.04.08.	Incr samp recov % (vol) to 70% for Rotary Core	DOE-RL T24-97-144		30SEP97
1.1.1.2.04.08.	Incr samp recov % (vol) to 90% for Push Mode	DOE-RL T24-97-145		30SEP97
1.1.1.2.04.06.	ISS DNFSB QTRLY PROGRESS RPTS (93-5,1.10)	DOE-HQ T24-98-103		21JUL98
1.1.1.2.04.06.	PREPARE FY98 CHAR PROJ ADS	DOE-RL T24-98-104		15APR98

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.06.	PREP FY97 CHAR PMULTI YR WK PLAN DOC	DOE-RL T24-98-106		31AUG98
1.1.1.2.04.10.	Complete 45 Rotary mode core samples	DOE-RL T24-98-113		29SEP98
1.1.1.2.04.10.	Complete 48 Vapor samples	DOE-RL T24-98-115		30SEP98
1.1.1.2.04.10.	Complete 30 Grab samples	DOE-RL T24-98-116		30SEP98
1.1.1.2.04.11.01	Issue Report SEE Ph VI	DOE-RL T24-98-119		27FEB98
1.1.1.2.04.07.	ISSUE 15 TANK CHAR REP/TCD INPUT(T24-98-122)	DOE-RL T24-98-122		29SEP98
1.1.1.2.04.07.	UPDATE TANK CHARACTERIZATION BASIS(T24-98-124)	DOE-RL T24-98-124		30SEP98
1.1.1.2.04.07.	M-44-02B Prepare Fnl TWAP FY96 Update	TPA-I T2D-95-101		29SEP95
1.1.1.2.04.07.	M-44-08 TPA Issue 30 TCRs/TCD INPUT	TPA-I T2D-95-102		29SEP95
1.1.1.2.04.07.	RL(DNFSB 1.23) ID "Bounding Tanks"(11/30/94)	DOE-RL T2D-95-106		30NOV94
1.1.1.2.04.07.	WHC PNL Tank Grouping Analysis	DOE-RL T2D-95-118		31AUG95
1.1.1.2.04.07.	WHC White Paper on Hist Data Methods	DOE-RL T2D-95-119		28SEP95
1.1.1.2.04.11.01	RL 45 Day Data Rpt (per smpl evt) Tx'd	DOE-RL T2D-95-122		02OCT95
1.1.1.2.04.11.01	DNFSB Complt Sampl/Analy Wchlst Tks	DOE-RL T2D-95-123		02OCT95

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.11.01	RL 216 Day Val Rpt (per smpl evt) Tx'd	DOE-RL T2D-95-124		29SEP95
1.1.1.2.04.11.01	RL 136 Day Data Rpt (per smpl evt) Txd	DOE-RL T2D-95-126		02OCT95
1.1.1.2.04.10.	COLLECT 7 ROTARY AND 30 PUSH MODE CORE SAMPLES	DOE-RL T2D-95-135		29SEP95
1.1.1.2.04.10.	COLLECT 46 AUGER SAMP FROM Hi LVL WASTE TANK	DOE-RL T2D-95-136		29SEP95
1.1.1.2.04.10.	COL VAPOR SAMP FROM 40 HIGH LEVEL WASTE TANK	DOE-RL T2D-95-137		29SEP95
1.1.1.2.04.10.	COLLECT 37 GRAB SUPERNATE AND SLUDGE SAMPLES FRO	DOE-RL T2D-95-138		29SEP95
1.1.1.2.04.06.	RL/DNFSB 1.10 Iss Qtrly Progress Rpts	DOE-RL T2D-95-154		29SEP95
1.1.1.2.04.07.	M-44-01C-SUBMIT DRAFT TWAP UPDATE TO EPA/ECOL	TPA-I T2D-96-100		31MAY96
1.1.1.2.04.07.	M-44-02C SUBMIT TWAP UPDATE TO EPA/ECOL APPR	TPA-I T2D-96-101		30AUG96
1.1.1.2.04.07.	M-44-09 TPA Issue 40 TCRs/TCD INPUT NEW FORECAST	TPA-I T2D-96-102		05NOV98
1.1.1.2.04.07.	M-44-02D SUBMIT TWAP UPDATE TO EPA/ECOL APPR	TPA-I T2D-97-101		28AUG97
1.1.1.2.04.07.	M-44-10 TPA Issue 40 TCRs/TCD INPUT NEW FORECAST	TPA-I T2D-97-102		31JAN02
1.1.1.2.04.07.	M-44-01E SUBMIT DRAFT TWAP UPDATE TO EPA/ECOL	TPA-I T2D-98-100		28MAY98
1.1.1.2.04.07.	M-44-02E SUBMIT TWAP UPDATE TO EPA/ECOL APPR	TPA-I T2D-98-101		28AUG98

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.2.04 Waste Characterization

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.2.04.07.	M-44-11 TPA Issue 30 TCRs/TCD INPUT NEW FORECAST	TPA-I T2D-98-102		31DEC03
1.1.1.2.04.10.	Complete 16 Auger samples	DOE-RL T2D-98-117		30SEP98
1.1.1.2.04.07.	M-44-02F SUBMIT TWAP UPDATE TO EPA/ECOL APPR	TPA-I T2D-99-100		30AUG99
1.1.1.2.04.07.	M-44-12 TPA Issue 14 TCRs/TCD INPUT NEW FORECAST	TPA-I T2D-99-101		30SEP04
1.1.1.2.04.07.	M-44-01F SUBMIT DRAFT TWAP UPDATE TO EPA/ECOL	TPA-I T2D-99-102		27MAY99
1.1.1.2.04.07.	M-44-00 TPA Issue TCRs FOR 177 TANKS NEW FORECAS	TPA-M T2D-99-103		30SEP04

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

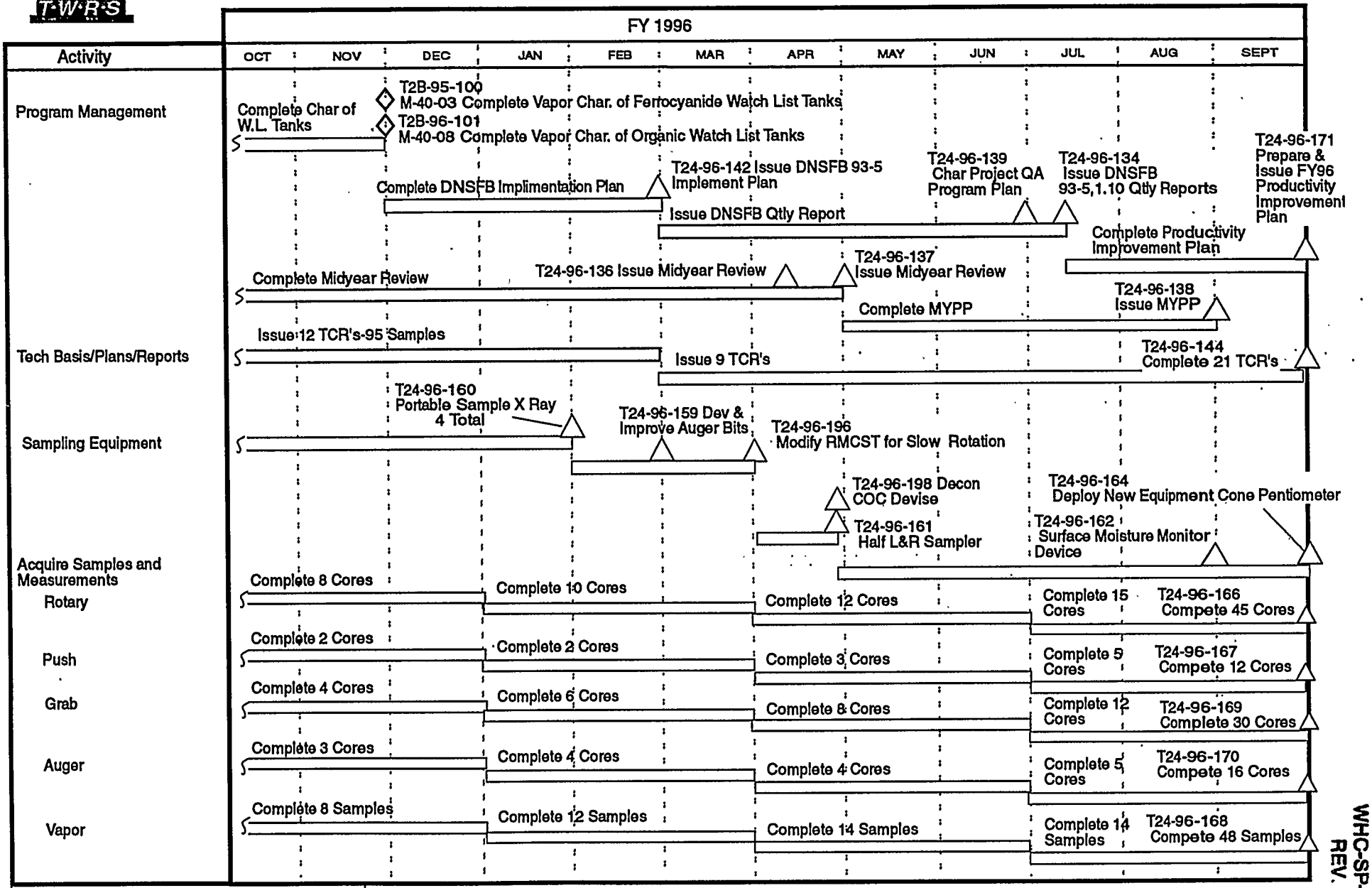
1.1.1.2.04 - Wst Characterization - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	539249	72132	66879	59155	50064	39962	25894	75075	75058	75029	
2	CENRTC	17024	5113	5000	3500	1949	1462					
	REPORT TOTAL	556272	77245	71879	62654	52013	41424	25894	75075	75058	75029	

Attachment 6-6 Cost Baseline Summary by Year

Draft

T·W·R·S



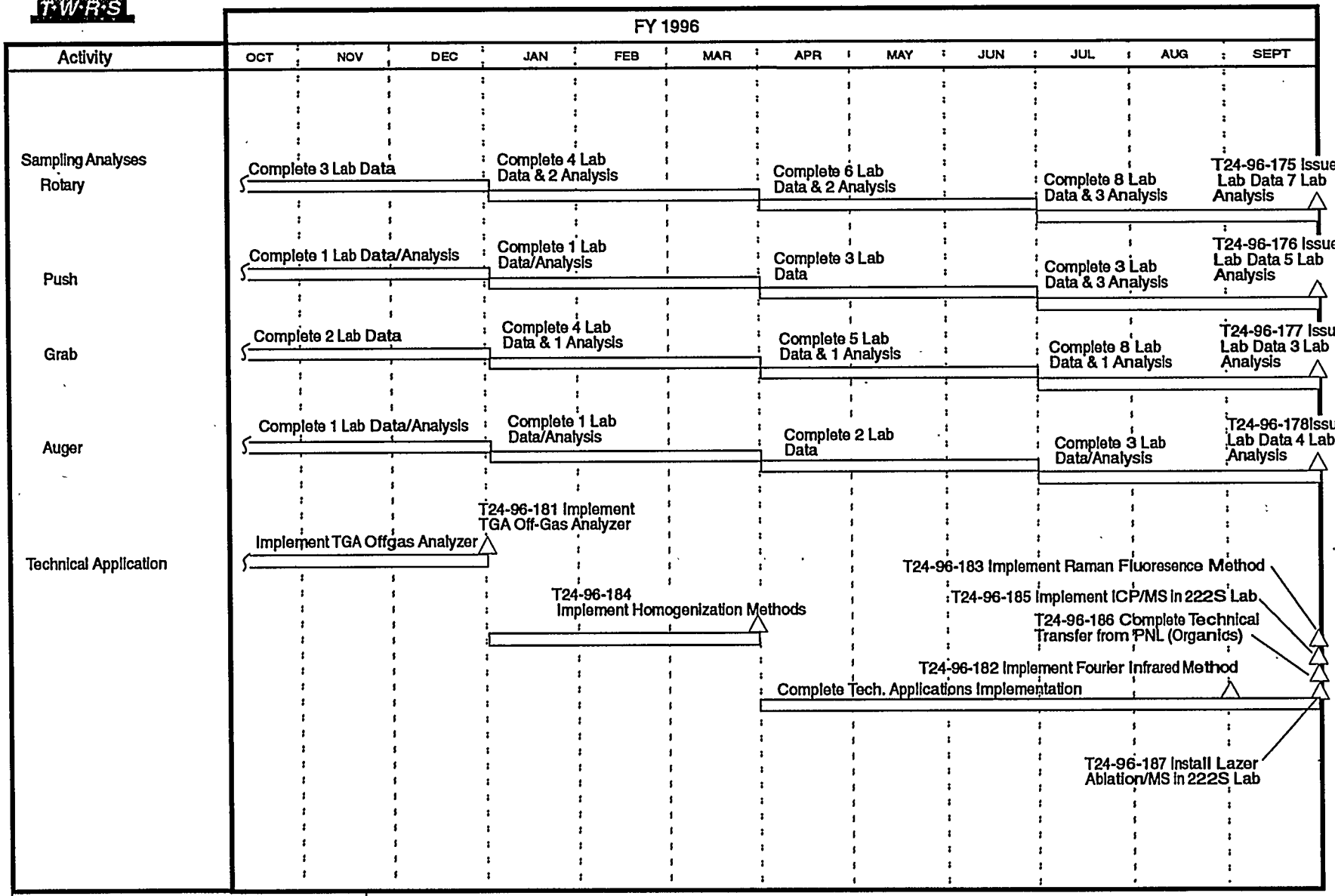
◇ TPA Milestones
△ Other Milestones
○ Interties

FY 1996 Performance Baseline Schedule

1.1.1.2.04 Waste Characterization

WHC-SP-1101
REV. 1

Draft



FY 1996 Performance Baseline Schedule

1.1.1.2.04 Waste Characterization

WHC-SP-1101
REV. 1

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.2.04 - Wste Character. - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT		OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE															
	1.1.1.2.04.06	PROGRAM MANAGEMENT	608	562	610	729	611	663	951	660	600	577	599	496	7665
	1.1.1.2.04.07	TECHNICAL BASIS & REPORTS	807	825	810	910	869	933	1060	881	828	956	1127	790	10795
	1.1.1.2.04.08	SAMPLING EQUIPMENT	906	937	624	774	667	480	248	245	188	331	346	278	6024
	1.1.1.2.04.10	ACQUIRE SAMPLES & MEASUREMENTS	2485	2136	2480	2774	2410	2302	2934	2171	2250	1510	1469	1451	26372
	1.1.1.2.04.11	SAMPLE ANALYSES	1561	1628	1672	2175	2107	1942	2039	2022	1968	1702	1283	1177	21276
TOTAL	1		6367	6088	6195	7362	6664	6320	7232	5979	5834	5076	4824	4193	72132
2 - CENRTC															
	1.1.1.2.04.08	SAMPLING EQUIPMENT	609	487	661	650	639	231	164	164	149	16	17		3786
	1.1.1.2.04.10	ACQUIRE SAMPLES & MEASUREMENTS	104	95	90	104	95	100	104	104	95	100	104	95	1191
	1.1.1.2.04.11	SAMPLE ANALYSES	12	11	10	12	11	11	12	12	11	11	12	11	136
TOTAL	2		726	593	762	766	744	342	280	280	254	127	133	106	5113
	REPORT TOTAL		7093	6680	6957	8128	7408	6662	7512	6259	6088	5204	4957	4298	77245

Attachment 6-8 Cost Estimate Baseline by Month

7.0 WASTE RETRIEVAL (WBS 1.1.1.3.1)

7.0.1 STRATEGY

The Waste Retrieval project has as its primary objective the removal of wastes from, and closure of, the Double Shell Tanks (DSTs), Single Shell Tanks (SSTs), and Miscellaneous Underground Storage Tanks (MUSTs) in a safe, cost effective, regulatory compliant, and environmentally sound manner.

The TWRS strategy for accomplishing this objective is to retrieve all DST and SST waste to provide feed for pretreatment and immobilization activities. MUSTs will be evaluated for appropriate retrieval and immobilization action. Waste from MUSTs is currently being addressed under the actions for SST wastes.

Initially waste will be retrieved from DSTs for waste volume reduction through blending and consolidation and to make storage space for retrieved SST waste. Designated DSTs will be used for staging retrieved waste prior to transfer to immobilization facilities.

The TWRS alternate acquisition strategy will be implemented in two phases using private sector contractor(s). The first phase will demonstrate, on a small scale, the contractor(s)' ability to immobilize various waste types. The second phase will involve full-scale operations to immobilize the remaining wastes from all DSTs and SSTs.

Waste retrieved to support the first phase will come primarily from the DSTs. The M&O contractor will be responsible for retrieving the waste for first phase feed and continue to support a schedule that complies with Tri-Party Agreement (TPA) milestones, Secretarial Safety Initiatives, and Defense Nuclear Facility Safety Board (DNFSB) commitments through the year 2010. The M&O contractor will be responsible for developing sludge washing capability and for providing washed sludge to Phase I immobilization, as required. The private sector contractor will perform retrieval activities for Phase II. However, the M&O contractor may be required to retrieve additional wastes during the transition of responsibilities from the M&O contractor to the private sector contractor.

Mixer pumps are the reference technology for DST waste mobilization for retrieval. Mixer pumps have proven effective in retrieving waste at Savannah River and West Valley. Mixer pumps are being applied to the AZ-101 Process Test and the Initial Tank Retrieval System as provided by Project W-151 and W-211, respectively. Enhancements to the mixer pump to increase reliability and service life are being pursued under the Advanced Design Mixer Pump tasks.

Past-practice sluicing is the reference technology for SST mobilization for retrieval. Sluicing will be demonstrated in Watch List Tank C-106 to meet TPA milestone M-45-03A and Secretarial Safety Initiative 6d43. The Tank C-106 sluicing system is being provided by Project W-320. Sluicing will also be applied to the Initial SST Retrieval System (ISSTRS) as required for TPA M-45-04. Parallel to the design of the ISSTRS is the development of leak monitoring and mitigation as required by TPA milestones M-45-08 and M-45-09. Improvements to SST retrieval are needed for difficult-to-retrieve waste including Tank C-106 Heel removal required by TPA milestone M-45-03-T01. These improvements are being provided under the Acquire Commercial Technology for Retrieval (ACTR) tasks.

The Waste Retrieval project provides for closure of the SSTs. Sufficient waste must be removed as technically and cost feasible to permit closure by the M&O contractor. The strategy and activities needed to plan and implement closure are defined in the SST Closure Work Plan.

The technical basis for the Waste Retrieval project will be developed through the use of systems engineering. The draft RL TWRS Systems Engineering Standard describes an acceptable approach to systems engineering and will be used as a guide.

7.0.1.1 Objectives

The principal objectives of the Waste Retrieval project are to support resolution of waste tank safety issues; remove waste from all aging SSTs and transfer to DSTs for safe interim storage; retrieve waste from MUSTs; mobilize sludge in DSTs for in-tank treatment or transfer; and consolidate wastes in DSTs to optimize the use of available tank space. This project will also provide the infrastructure necessary to retrieve and transfer waste from SSTs, DSTs, and MUSTs to the interim storage or treatment and immobilization facilities and for closure of the farms.

The Waste Retrieval project will meet the major milestones established in the Tri-Party Agreement. Target milestones will be met when consistent with the acquisition strategy for low-level waste (LLW) and high-level waste (HLW) treatment and immobilization alternatives.

Specific objectives are defined in Sections 7.1, 7.2, and 7.3.

7.0.1.2 Planning Assumptions

1. Two mixer pumps will successfully mobilize sufficient sludge in each DST to allow reuse.

2. Sluicing is the reference SST retrieval technology. Alternate technologies will be required to achieve the Tri-Party Agreement objective of retrieving 99% of tank wastes.

3. The Hanford Defense Waste Environmental Impact Statement (HDW-EIS) and Record of Decision (ROD) provide sufficient National Environmental Policy Act (NEPA) documentation for the retrieval of DST waste.

4. A ROD on the Tank Waste Remediation System (TWRS) EIS is a prerequisite to the retrieval of the remaining SSTs.

5. Waste Retrieval will perform all activities necessary to close DSTs, SSTs, and MUSTs, including the preparation of a closure plan and EIS.

6. There is no requirement to provide tank waste samples for large-scale pretreatment and immobilization development. System(s) to provide small volumes of retrieved saltcake and sludges are not included in the Waste Retrieval baseline.

7.0.1.3 Constraints

The Waste Retrieval Project is required to meet specific SST retrieval and closure milestones established by the Tri-Party Agreement. Safety issues limit access to, and impose process restrictions on, retrieval from SSTs and DSTs. DST tank space imposes constraints on the time-sequencing and rate of retrieval from SSTs and MUSTs. Tank farm infrastructure and DST waste management operations impose constraints on transfer capabilities and, ultimately, process production rates.

The lack of definition as to what constitutes closure imposes a constraint on finalizing retrieval system requirements.

7.0.2 TECHNICAL REQUIREMENTS BASELINE

7.0.2.1 Work Breakdown Structure

The Waste Retrieval project is one of the four disposal projects contained within the TWRS Program structure. This project is organized into three projects, SSTs, DSTs, and Tank Farm Closure. These three projects are further broken down into four major functions: Project Administration, Systems Definition, Projects, and Operations. Systems Engineering at the functional and technical requirements levels has been consolidated in the Tank Farm Closure project.

Attachment 7.0-1 shows the WBS tree for the Waste Retrieval project.

7.0.2.2 WBS Dictionary

The dictionary sheet for the Waste Retrieval project is in Attachment 7.0-2.

7.0.2.3 Responsibility Assignment Matrix

Responsibilities are assigned to various organizational elements, internal and external to TWRS, for discrete activities identified in the WBS. A responsibility assignment matrix (RAM) is developed to assist in the management and control of the work assigned to the Waste Retrieval project.

The Retrieval Program Office provides direction to the performing organizations in the form of a WBS and a schedule. Each performing organization or project is responsible for developing the lower level WBS, schedules, and estimates for the work to be performed. Constraints are applied to the proposed schedules and estimates and the plans are established.

Technology development for the Waste Retrieval project is supported by EM-50 working through the Tank Focus Area (TFA). The Waste Retrieval project identifies the needs and establishes the technical requirements. EM-50 monitors the performance of TFA against those requirements.

The Responsibility Assignment Matrix (RAM) for the Waste Retrieval project is included in Attachment 7.0-3.

7.0.2.4 Technology Needs

The program technical bases are derived from the TWRS Mission Analysis and the Functions and Requirements (F&Rs) allocated to function 4.2.2.1, Retrieve Tank Waste. Data and information necessary to perform requirement analyses and trade studies are part of the architecture selections process used to formulate the technology needs provided to EM-50 and TFA as a planning base.

7.0.3 SCHEDULE BASELINE

The schedules for each of the projects appear in the respective attachments.

7.0.4 COST BASELINE

Cost baselines for the Waste Retrieval project are compiled from a full spectrum of bases. Projects that have been validated have cost estimates commensurate with the design level of the project. Management and engineering tasks, other than projects, are estimated at various levels of confidence ranging from detailed bottoms up estimates to planning feasibility estimates.

7.0.5 PERFORMANCE MEASURES

Performance measures will be tied to the development and establishment of a tank waste retrieval project configuration specifically dealing with performance elements that ensure success of the objectives. These measures include cost and schedule compliance and milestone completions. The systems engineering approach utilized by TWRS provides requirements to the project. As these requirements are developed, quantifiable measures will be identified and used to track performance.

7.0.6 EXECUTION YEAR

7.0.6.1 Technical Objectives

Technical objectives of the Waste Retrieval project are to conduct all activities necessary to develop and demonstrate methodologies to retrieve the waste contained in DSTs, SSTs, and the designated MUSTs in compliance with tank closure requirements. The focus of the efforts will be on implementing into design of retrieval equipment/process the fundamental relations between waste properties and physical performance parameters. A systems engineering approach will provide integrated cost-effective systems.

The objectives for DST waste retrieval technologies are to test and demonstrate mixer pump performance, including the ability to mobilize waste in DSTs and to maintain a uniform waste slurry mixture after the waste is mobilized. This includes implementing improved mixer pump designs to maximize performance and operational efficiencies over the existing mixer pump designs.

The SST technology objective is to employ industry to identify, develop, and evaluate enhancements to the reference SST retrieval systems. The need for sluicing enhancements will be evaluated to improve sluicing retrieval performance, reduce cost, and reduce tank leakage potential during sluicing operations. Alternative retrieval technologies will be assessed by establishing a competitive development of systems concepts and developed through demonstrations.

Technical objectives for leak detection and monitoring during sluicing operations will focus on establishing the requirements, evaluating the available technologies, and selecting the most promising technologies for engineering development/testing, as appropriate. Leak detection issues facing SST waste retrieval are closely related to the closure decision, and detection of a leak during retrieval operations will influence retrieval systems design and closure configuration.

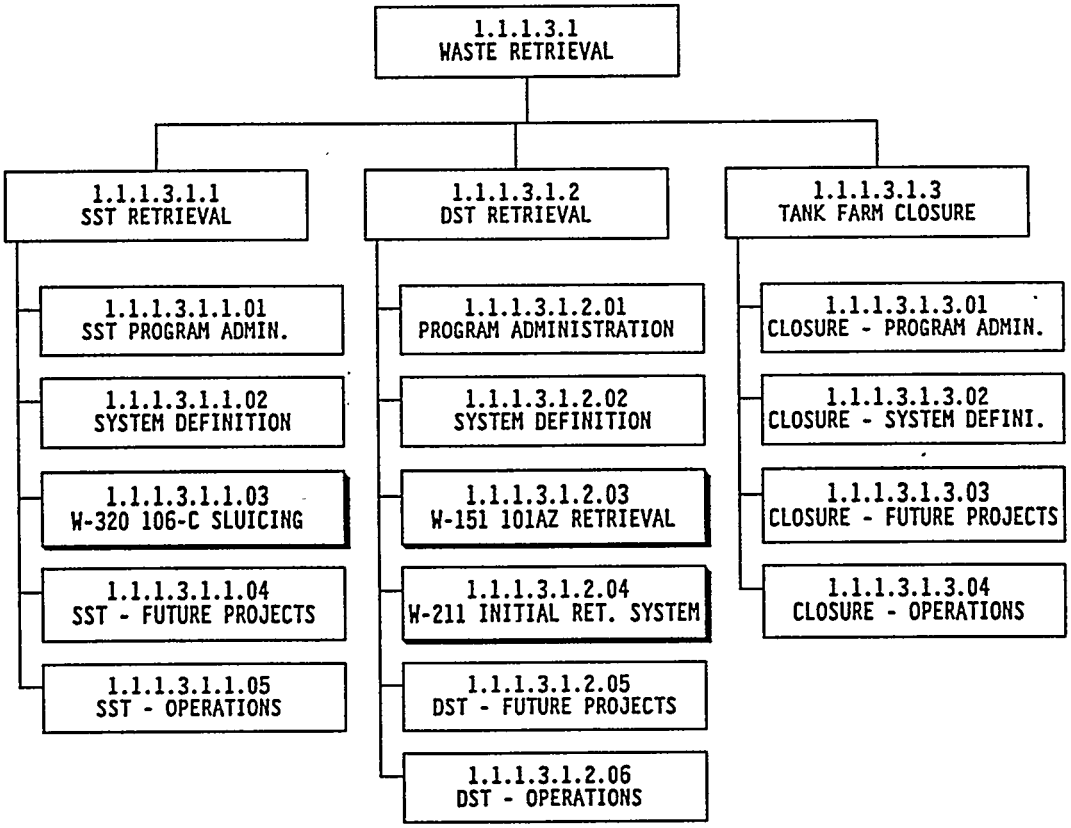
Closure planning developments and issues resolution will be identified in regular updates of the Closure Work Plan.

LISTING OF ATTACHMENTS

Attachment 7.0-1 Work Breakdown Structure

Attachment 7.0-2 WBS Dictionary Sheet

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
WASTE RETRIEVAL



Attachment 7.0-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
August 31, 1995	1.1.1 TWRS Project 1.1.1.3 Disposal	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.3.1/IIII	Waste Retrieval Project	
5. CURRENT REV. NO.	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
0		N/A
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER	9. BUDGET AND REPORTING NUMBERS	
1210	Operating EW3130010 / CENRTC 35EW31301 / GPP/Line Item 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	37666	12986	20403	25915	24381	30071	48438
CENRTC	1262		0	0	0	0	0
GPP							
LINE ITEM	9451	15290	16869	20571	37484	24019	18727
TOTAL	48379	28276	37272	46486	61865	54090	67165

B. TECHNICAL BASES

This work element is part of the Level II WBS element, Disposal, and is comprised of the following Level IV WBS elements:

- WBS 1.1.1.3.1.1, Single Shell Tanks (SST) Retrieval
- WBS 1.1.1.3.1.2, Double Shell Tanks (DST) Retrieval
- WBS 1.1.1.3.1.3, Closure

The Waste Retrieval Project is responsible for retrieving waste from Underground Storage Tanks (USTs) to the degree required for tank closure and closing the respective Tank Farm Operable Units. The technical basis is derived from the TWRS Functions and Requirements Document under the function 4.2.2.1, 'Retrieve Tank Waste'. To this end, the Waste Retrieval Project will develop and demonstrate technologies to mobilize and transfer waste; design, construct, and operate retrieval equipment; demonstrate technologies for in-tank treatment of waste; provide systems to consolidate wastes to effectively use available tank space; provide infrastructure necessary for waste retrieval and transfer; and develop and implement the plans for tank farm closure.

The strategy for UST waste retrieval is to implement the best demonstrated available technology in a time frame that

supports the overall TWRS mission objectives, and eliminates additional waste retrieval operations during the closure process. The retrieval operations will be initiated with known, proven technologies to support rapid resolution of tank safety issues and statutory commitments. Additional technology will be developed in parallel and deployed as available to meet the TWRS mission requirements.

The risks associated with Waste Retrieval are: 1) availability of adequate tank space to support negotiated Tri-Party Agreement retrieval schedule; 2) acceptable leakage during retrieval/performance assessment or TWRS EIS; 3) capability to provide infrastructure and resources for simultaneous retrieval from multiple tank farms; 4) sluicing capability to provide for adequate waste retrieval; 5) tank farm closure; and 6) identification of commercial technology to meet enhancement needs.

Goals and objectives:

The principal goal of the Waste Retrieval Project is the closure of all SSTs, DSTs, and MUSTs in accordance with regulatory requirements. In achieving this goal the project will:

1. Mobilize and transfer waste from the USTs for transport to various facilities for storage, treatment, or disposal. Included are:
   - The design, installation, and operation of retrieval systems and equipment.
   - Upgrades to, and/or replacement of, the tank farm infrastructure and local transfer lines required to support retrieval for DSTs which are not provided by other disposal projects.
   - Tank farm infrastructure and transfer mechanisms appropriate for SST and MUST waste retrieval.
2. Develop and demonstrate technologies for waste retrieval and in-tank processes.
3. Transfer and consolidate DST wastes to optimize tank space utilization.
4. Retrieve the waste contained in USTs for feed to treatment and immobilization facilities.
5. Establish and implement tank closure requirements.

Major end-item deliverables:

The end-item deliverable for this WBS Element is the following Tri-Party Agreement Major Milestone:

M-45-00	9/30/2024	Complete Closure of all SST Farms

Supporting deliverables include the following Tri-Party Agreement Interim Milestones:

M-45-01	09/30/1994	Develop SST Retrieval Technology
M-45-02A	09/30/1996	Submit Initial SST Retrieval Sequence Document
M-45-02	09/30/2017	Submit Annual Updates to SST Retrieval Sequence Document
M-45-03A	10/31/1997	Initiate Sluicing Retrieval of C-106
M-45-03	06/30/2002	Initiate Final Retrieval Demonstration of C-106
M-45-04A	04/30/1997	Complete Conceptual Design for the Initial SST Retrieval System
M-45-04	11/30/2003	Provide Initial SST Retrieval Systems
M-45-05	09/30/2018	Retrieve Waste from all Remaining SSTs
M-45-06	09/30/2024	Complete Closure of all SST Farms
M-45-08A	12/31/2000	Complete system Design and Operating Strategy for Tank Leak Monitoring and Mitigation for SSTs
M-45-08B	06/30/2003	Complete Demonstration and Installation of Leak Monitoring and Mitigation Systems for Initial SST Retrieval
M-45-08	06/30/2003	Establish Full Scale Capability for Mitigation of Waste Tank Leakage During Retrieval Sluicing Operations

M-45-09A	09/30/1996	Submit Annual Progress Reports on the Development of Waste Tank Leak Monitoring/Detection and Mitigation Activities in Support of M-45-08

Additional supporting deliverables include the following HQ Safety Initiative:

SI 6	10/31/1996	Accelerate Retrieval of High Heat Tank 106-C

Acceptance criteria:

Must meet requirements established by DOE, Regulatory agencies, and local/programmatic authorities as approved baseline documents, including TPA milestones identified in the schedule baseline.

C. STATEMENT OF WORK

Required activities over lifetime:

The Waste Retrieval Project will develop and demonstrate retrieval technology; provide engineering for the tank waste retrieval program; perform process tests; and design, procure, construct, install, startup, and operate tank equipment and facilities during waste retrieval operations; and develop, finalize, and implement a plan for closure of the Tank Farm Operable Units. The work will be done in accordance with systems engineering principles as discussed in WBS 1.1.1.3.01.03.

The Waste Retrieval Project is broken down into the following three (3) projects to encompass the work activities to be performed:

1.1.1.3.1.1 SST

1.1.1.3.1.1.1 SST Project Administration

- Provide SST Engineering Management of the SST Retrieval element activities which includes provisions for technical direction, planning, management of SST operations after 2001, and performance reporting of SST Retrieval workscope.

1.1.1.3.1.1.2 SST System Definition

- Provide project definition tasks for SST/MUST, Retrieval projects, process tests, and demonstration to include the following:

  - Establish project baseline consistent with the systems engineering approach that has been adopted by TWRS.

  - Prepare project Conceptual Design Reports (CDRs) and Functional and Operational Requirements (F&ORs), as required.

  - Perform trade studies as required to evaluate and optimize alternative project architectures to select the architecture that provides improved safety, minimizes the environmental impact, and maximizes cost effectiveness.

- Interchange concepts and information with the EM-50 and other TWRS program elements to support closure of safety issues, obtain necessary waste characterization data, and define upgrades necessary for retrieval activities.

- Through an activity identified as Acquire Commercial Technologies for Retrieval (ACTR), determine from industry the best approaches to retrieve 99% of the waste from underground storage tanks, using performance based criteria. The ACTR effort is to recommend retrieval solutions for final 106-C waste retrieval demonstration, and the ISSTRS and follow-on tank waste retrieval projects. Technology development will be performed to assist the immobilization contractor in identifying

candidate technologies for carrying out the retrieval responsibilities. Development will be continued as necessary to support the acquisition strategy.

1.1.1.3.1.1.3 W-320 106-C Sluicing

- Design, procure, install, test, and prepare for operation the sluicing system to retrieve waste from Tank 241-C-106 employing sluicing for resolution of the SST high-heat safety issue and to demonstrate sluicing technology.

1.1.1.3.1.1.4 SST Future Projects

- Provide facilities and equipment to retrieve waste from SSTs and MUSTs, e.g., First Farm (ISSTRS). Future work may require additional breakdown depending upon the project definition and acquisition strategies employed.

1.1.1.3.1.1.5 SST Operations

- Provide for safe operations through testing, qualification of procedures and equipment, and training of personnel.

- Operate the SST and MUST retrieval systems, e.g., 106-C heel removal and the ISSTRS to demonstrate proof-of-concept.

1.1.1.3.1.2 DST

1.1.1.3.1.2.1 DST Project Administration

- Provide DST Engineering Management of DST Retrieval Project activities including technical direction, planning, and performance reporting of DST Retrieval workscope.

1.1.1.3.1.2.2 DST Systems Definition

- Define DST mixer pump process test requirements and mixer pump performance measurements.

- Provide project definition tasks for DSTs, including the following:

  - Establish project baseline by producing the Design Requirement Documentation and project definition package (e.g. decision analysis, justification of mission need, EA (SA documentation, validation information, project cost estimate and schedule, etc.)

  - Prepare NEPA and safety documentation

  - Prepare project CDRs and F&ORs as required.

- Perform the DST system approach plan to include technology demonstrations; consolidation actions; feed preparation and staging for processing; and operability evaluations.

- Evaluate and optimize through the competitive design, procure, and testing of an Advanced Design mixer pump.

1.1.1.3.1.2.3 W-151 101-AZ Retrieval

- Install mixer pump system in tank 241-AZ-101.

- Demonstrate mixer pump operation and sludge mobilization of neutralized current acid waste in Tank 241-AZ-101.

- Design, construct, and install pumps and ancillary equipment

- Design, demonstrate, and qualify equipment and procedures for removal of tank internal components.

1.1.1.3.1.2.4 W-211 Initial DST Retrieval System

- Design, procure, install, test, and prepare for operation the first 10 DSTs after Tank 241-AZ-101 in order to:

  - Plan and coordinate the consolidation of waste to optimize tank space utilization.

  - Mitigate watch list tank safety issues.

  - Supply waste as feed to treatment and immobilization facilities.

1.1.1.3.1.2.5 DST Future Projects (W-343)

- Design, procure, install, test, and prepare for retrieval systems for the seventeen (17) DSTs remaining after project W-211, as necessary.

1.1.1.3.1.2.6 DST Operations

- Operate to design specifications/procedures to obtain required performance.

- Operate the 241-AZ-101 mixer pumps to demonstrate sludge mobilization and sludge washing.

- Provide for safe operations through testing, qualification of procedures and equipment, and training of personnel.

- Operate the retrieval systems to transfer waste, optimize tank space utilization, and to supply waste to treatment and immobilization facilities.

1.1.1.3.1.3 Tank Closure

1.1.1.3.1.3.1 Closure Project Administration

- Provide Project Management and coordination of all Waste Retrieval Project activities through the end of the project (Tank Closure). This includes planning and performance reporting, integration of all Waste Retrieval activities, maintaining a project baseline, and interfaces with other TWRS Projects.

- Provide for and implement the policies and process of TWRS system engineering. Fundamental elements to be attained are the Waste Retrieval Project function decomposition through the technical requirements specification, the respective definition of missions needs, requirement and decision analyses as part of the functional decomposition to the project level, identify and maintain interface control, and maintain a risk baseline.

1.1.1.3.1.3.2 Closure System Definition

- Implementation and definition of closure work plans that define pathways toward closure configurations (further decomposition of decision logic to implement Tank Farm Closures). Interface with the Washington Department of Ecology through the approval of closure plans.

- Define closure performance requirements and criteria.

- Perform requirement analyses and risk assessments to establish closure configurations, i.e., allowable residuals, surface barrier requirement, etc.

- Provide project definition tasks for closure actions to include the following:
  - establishing a project baseline,
  - test and demonstrate applied technologies and architectures,
  - prepare project documentation in accordance with system engineering protocol, and
  - perform trade studies as required to evaluate and optimize closure architecture.

1.1.1.3.1.3.3 Future Projects

- Design, procure, and construct configurations for tank farm closure.

1.1.1.3.1.3.4 Closure Operations

- Provide for the safe implementation and monitoring of post-closure activities.

Interfaces:

Waste Retrieval Project must meet the requirements and feed/transfer specifications for storage and ultimately treatment of the retrieved waste stream; the tank retrieval sequence predicted on the TWRS flow sheet and treatment scenarios.

From The Waste Retrieval WBS To:		Item Provided:
1.1.1.1.1	Management Systems	Business Documentation/Reporting
1.1.1.2.1	Tank Farm Operations	Retrieval systems to mitigate/resolve tank safety issues and retrieve tank waste Upgrade requirements to achieve retrieval of DST tank waste and transfer of wastes for consolidation and processing
1.1.1.2.4	Waste Characterization	Data Quality Objective documents; Data (on tank waste behavior); Reusable Materials for Characterization (developmental instruments for testing of tank waste properties).
1.1.1.3.2	Low-Level Waste	Water recycle needs
1.1.2.1.1	Solid Waste Disposal	Manage Tank Waste (MTW) System Generated (SG) solid waste (contaminated equipment removed from tanks).
1.2.0.5.1	Environmental Restoration	D&D transfer facilities

To The Waste Retrieval WBS From:		Item Provided:
1.1.1.1.1	Management Systems	Business Document Guidance & Permit approvals; Approve TWRS EIS DOE-HQ Key Decision process; Project documentation approval and performance assessments. Input to SST Closure Plan relative to alternatives for tank closure, ancillary, equipment disposal, contaminated soil cleanup. Definition of waste retrieval criteria support closure,

based on performance assessment of closed tank farms.

1.1.1.2.1	Tank Farm Operations	Operation and maintenance of waste retrieval systems.
1.1.1.2.2	Safety Issue Resolution	Resolving tank safety issues to perform demonstration of achieving remediation through retrieval.
1.1.1.2.4	Waste Characterization	Characterization of all DSTs, SSTs, and MUSTs for waste retrieval operations.
1.1.1.3.2	Low Level Waste	Low Level Waste (LLW) feed specification.
1.1.1.3.3	High Level Waste	High Level Waste (HLW) feed specification.

Technologies to be assessed:

- Develop and test enhanced and alternate waste retrieval systems

  - Retrieval System (through the Acquire Commercial Technologies for Retrieval, ACTR, effort)

  - DST mixer pump performance reliability, availability, and maintainability.

- Evaluate and test SST leak mitigation and detection methods deployed during retrieval operations; closure.

Options to be considered:

- Teaming with EM-50, industry, and other agencies will identify future options.

7.1 SST RETRIEVAL (WBS 1.1.1.3.1.1)

7.1.1 STRATEGY

The objective of the SST Retrieval project is the retrieval of waste from Single Shell Tanks (SSTs) and Miscellaneous Underground Storage Tanks (MUSTs) to permit closure of these tanks in accordance with regulatory requirements. The regulatory requirement for SSTs is retrieval of 99% of the waste volume. The regulatory requirement for retrieval from MUSTs will be determined upon completion of the identification of tanks and characterization of tank contents.

The strategy for accomplishing this objective is to demonstrate the applicability of current technology, develop enhancements, and develop new technologies with the goal of improving worker safety, environmental safeguards, and cost effectiveness. The reference technology for SST retrieval is the sluicing process that was successfully demonstrated at the Hanford Site in the 1950's through the 1970's. Upon completion of Project W-320, 106-C Sluicing, sluicing will be demonstrated in the retrieval of sludge from tank 241-C-106 and resolution of the high-heat safety issue. Performance data acquired in sluicing C-106 will be applied to the system definition, design, and construction of the Initial Single Shell Retrieval System (ISSTRS), the objective of which is to demonstrate retrieval of a broader range of tank wastes including saltcake.

Sluicing alone will not accomplish the objective to retrieve 99% of SST waste. Enhancements to sluicing and alternate retrieval technologies will be identified and developed in partnership with industry through Acquire Commercial Technology for Retrieval (ACTR). A full-scale demonstration of SST retrieval technology, with the goal of retrieving 99% of the waste from a tank, is to be complete by September 30, 2003.

The M&O contractor is to be responsible for the demonstration of SST retrieval technology. Subsequent to the successful demonstration of SST retrieval technology, retrieval must continue through the year 2010 to meet the Tri-Party Agreement milestone to retrieve all SST wastes by 2018 (M-45-05). In 2011, the responsibility for SST and MUST retrieval will be transitioned to a private sector contractor. Upon completion of retrieval, the tanks will be returned to the M&O contractor for closure (WBS 1.1.1.3.1.3).

7.1.1.1 Objectives

The primary objectives of the SST Retrieval project of the Waste Retrieval project WBS are to support resolution of waste tank safety issues and remove and transfer waste from aging SSTs to DSTs for safe interim storage.

Specific objectives include the following:

1. Retrieval of waste in tank 241-C-106 to resolve a tank safety issue
2. Project coordination with EM-50 to the fullest extent possible
3. Acquiring Commercial Technologies for Retrieval (ACTR)

4. Developing partnerships with industry beginning with the cleanout of the tank 241-C-106 heel project

5. Designing, constructing, and operating the initial SST retrieval system to demonstrate saltcake retrieval

6. Evaluating the demonstration project tank leak detection retrieval requirements and concepts

7. Providing interface coordination with the selected treatment and immobilization facilities

8. The Waste Retrieval project will meet the major milestones established in the Tri-Party Agreement. Target milestones will be met when they are consistent with the acquisition strategy for LLW and HLW treatment and immobilization alternatives.

7.1.1.2 Planning Assumptions

1. Sluicing is the reference SST retrieval method; additional methods will be required to achieve Tri-Party Agreement objectives.

2. An environmental assessment is sufficient NEPA documentation for retrieving the first SST (tank 241-C-106). A Record of Decision (ROD) on the TWRS Environmental Impact Statement (EIS) is a prerequisite for retrieving the remaining SSTs.

3. Waste Retrieval will perform all activities necessary to close SSTs and MUSTs, including the preparation of a closure plan and environmental impact statement.

4. Waste Retrieval will assume responsibility for SST minimum safe operations in 2001, with the tanks in a controlled, clean, and stable condition. Responsibility for minimum safe operations and retrieval will be transferred in accordance with the acquisition strategies in 2005.

5. The Waste Retrieval project will provide the infrastructure necessary for waste retrieval and transfers from SSTs and MUSTs.

Additional details may be found in the activity planning forms.

7.1.1.3 Constraints

The SST Retrieval project is required to meet specific milestones established by the Tri-Party Agreement. Safety issues limit access to, and impose process restrictions on, retrieval of waste from SSTs. The availability of DST tank space imposes constraints on the time-sequencing and rate of retrieval from SSTs.

7.1.2 TECHNICAL REQUIREMENTS BASELINE

The SST Retrieval project baseline is described in the strategy, the work breakdown structure, the schedule and milestones to be achieved, and the resources required to perform the work.

7.1.2.1 Work Breakdown Structure

The WBS tree for the SST and MUST Retrieval project is in Attachment 7.1-1.

7.1.2.2 WBS Dictionary Sheets

The WBS dictionary sheet for the SST Retrieval project is found in Attachment 7.1-2. Lower-level dictionary sheets are available on the Performance Measurement Control System (PMCS).

7.1.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the SST Retrieval project is found in Attachment 7.1-3.

7.1.2.4 Technology Needs

The development and demonstration of methodologies to retrieve the waste stored in SSTs and designated MUSTs, in compliance with tank closure requirements, continue to be a need. With the formulation of fundamental relationships between waste properties and physical performance parameters of waste retrieval equipment and processes, selection of equipment and processes will be finalized.

Leak detection and monitoring evaluations are needed to establish requirements and identify the appropriate and available technologies. Tests may be conducted to confirm a method's ability to meet specific requirements and to provide data needed to evaluate and select a technology.

7.1.3 SCHEDULE BASELINE

7.1.3.1 Summary Schedule

See Attachment 7.1-4 for the summary schedule.

7.1.3.2 Milestone Control Log

See Attachment 7.1-5 for the Milestone Control Log. Milestone description sheets are located in Appendix A.

7.1.4 COST BASELINE

7.1.4.1 Cost Baseline Summary by Year

See Attachment 7.1-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up to the project.

7.1.4.2 Basis of Estimate

Tasks are estimated at various levels of confidence ranging from detailed bottoms-up estimates to planning feasibility estimates.

7.1.5 PERFORMANCE MEASURES

Performance measures will be tied to the development and establishment of an SST retrieval configuration specifically dealing with performance elements that ensure success of the objectives. These measures include cost and schedule compliance, milestone completion, and finalization of the closure strategy.

7.1.6 EXECUTION YEAR

7.1.6.1 Technical Objectives

The SST Retrieval technical objectives are to identify, develop, evaluate, and demonstrate enhanced and alternate retrieval technologies through partnership with industry, such as with ACTR project. As part of this, fostering technical exchanges with representatives from other DOE sites as part of the EM-50 and tank focus area will augment SST and MUST waste retrieval technology development requirements.

7.1.6.2 FY 1996 Performance Baseline Schedule

See Attachment 7.1-7 for the FY 1996 performance baseline schedule.

7.1.6.3 Cost Estimate Baseline by Month

See Attachment 7.1-8 for the month-by-month cost estimate baseline for FY 1996.

7.1.6.4 FY 1995 Work Scope Carryover Summary

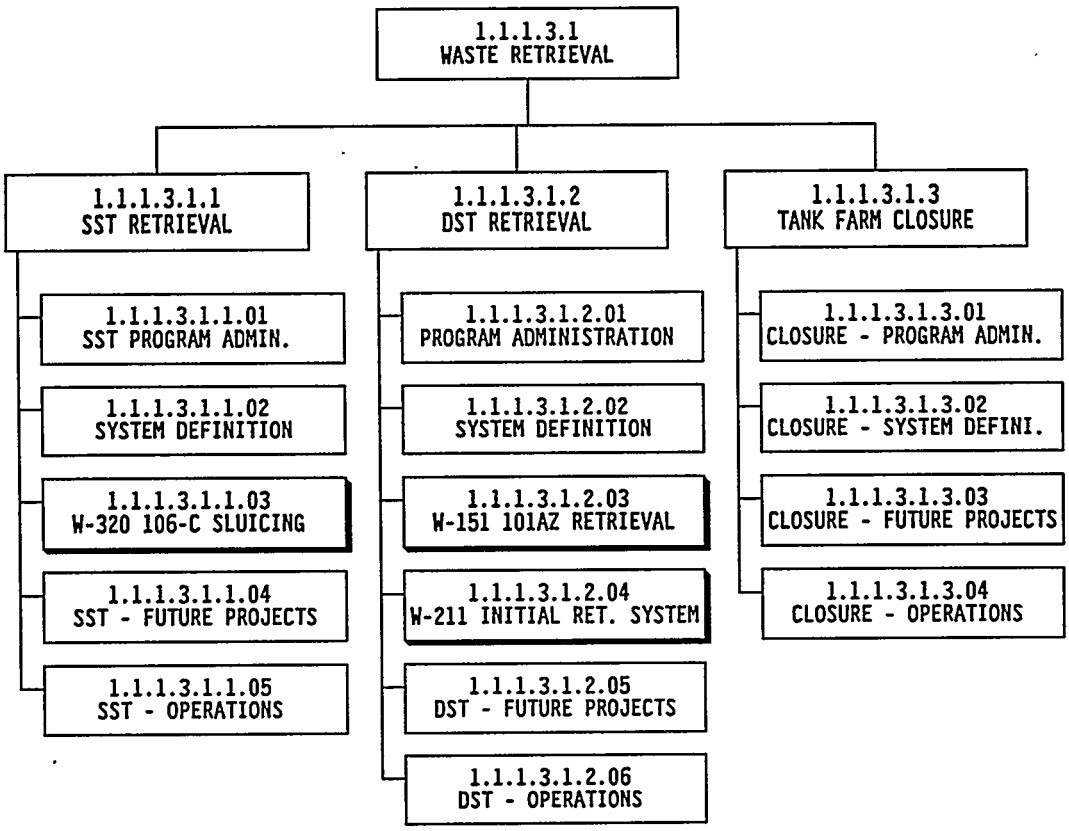
FY 1995 carryover work is associated with Project W-320, 241-C-106 Sluicing:

- WHC Support to Construction
- C-Farm Electrical Modifications
- AY-Farm Electrical Modifications
- Pit Decontamination
- Construction Services/Equipment
- Expense Procurements
- Readiness Reviews.

LISTING OF ATTACHMENTS

Attachment 7.1-1	Work Breakdown Structure
Attachment 7.1-2	WBS Dictionary Sheet
Attachment 7.1-3	Responsibility Assignment Matrix
Attachment 7.1-4	Summary Schedule
Attachment 7.1-5	Milestone Control Log
Attachment 7.1-6	Cost Baseline Summary by Year
Attachment 7.1-7	FY 1996 Performance Baseline Schedule
Attachment 7.1-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
WASTE RETRIEVAL



Attachment 7.1-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
August 31, 1995	1.1.1 TWRS Project 1.1.1.3 Disposal 1.1.1.3.1 Waste Retrieval Project	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.3.1.1/IV	Single-Shell Tanks	
5. CURRENT REV. NO.	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
0		N/A
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER	9. BUDGET AND REPORTING NUMBERS	
1210-0 1210-4	Operating: EW3130010 CENTRC: 35EW31301 GPP/Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	27520	7109	12310	17978	16658	18902	37153
CENRTC							
GPP							
LINE ITEM							
TOTAL	27520	7109	12310	17978	16658	18902	37153

B. TECHNICAL BASES

Goals and Objectives

This work element is part of the Waste Retrieval Project Level III WBS element and is comprised of the following Level V WBS elements:

- 1.1.1.3.1.1.1, SST Project Administration
- 1.1.1.3.1.1.2, SST System Definition
- 1.1.1.3.1.1.3, W-320 C-106 Sluicing
- 1.1.1.3.1.1.4, SST Future Projects
- 1.1.1.3.1.1.5, SST Operations

The goal is to provide management and planning bases for the Single Shell Tank (SST) Project administration which includes: the tracking of schedules and budgets, coordination and overseeing the development and integration of SST Waste Retrieval Project activities within TWRS; complete the activities necessary to define and establish the initial SST Retrieval Systems (ISSTRS); the 106-C Heel Clean out; future SST Retrieval projects, and MUST Retrievals projects;

implementation of activities to acquire from industry the best technical and contracting approaches to retrieval of wastes from underground storage; establish functional requirements and available technologies to mitigate tank leakage during retrieval; complete design, construction, and operation of the 106-C sluicing demonstration; and operate retrieval systems to remove waste from SSTs and miscellaneous underground storage tanks (MUSTs).

Major End-Item Deliverables

- Identify requirements for EM-50 efforts
- Establish RFQ for industry fly-off concept/development, procurement
- Issue Project Plan, FORD, Design Description, and Hazard Classification for the Initial SST Retrieval System (ISSTRS)
- Issue strategy for retrieval systems leak mitigation
- Complete construction, operational readiness review (ORR), operating procedures, and initiate sluicing retrieval of tank 241-C-106
- Prepare project documentation to formulate the basis for the 106-C Heel Removal Project
- Complete construction, operational readiness review (ORR), and operating procedures for the first farm and 106-C heel removal
- Prepare project documentation, requirements, for remaining SST retrieval
- Transition SST Farms for closure

Acceptance Criteria

- Tri-Party Agreement (TPA) milestones establish the acceptance criteria for SST retrieval (M-45 series)
- SST Retrieval systems designs, procurement, construction and operations will be done in accordance with the appropriate DOE Orders and regulations

C. STATEMENT OF WORK

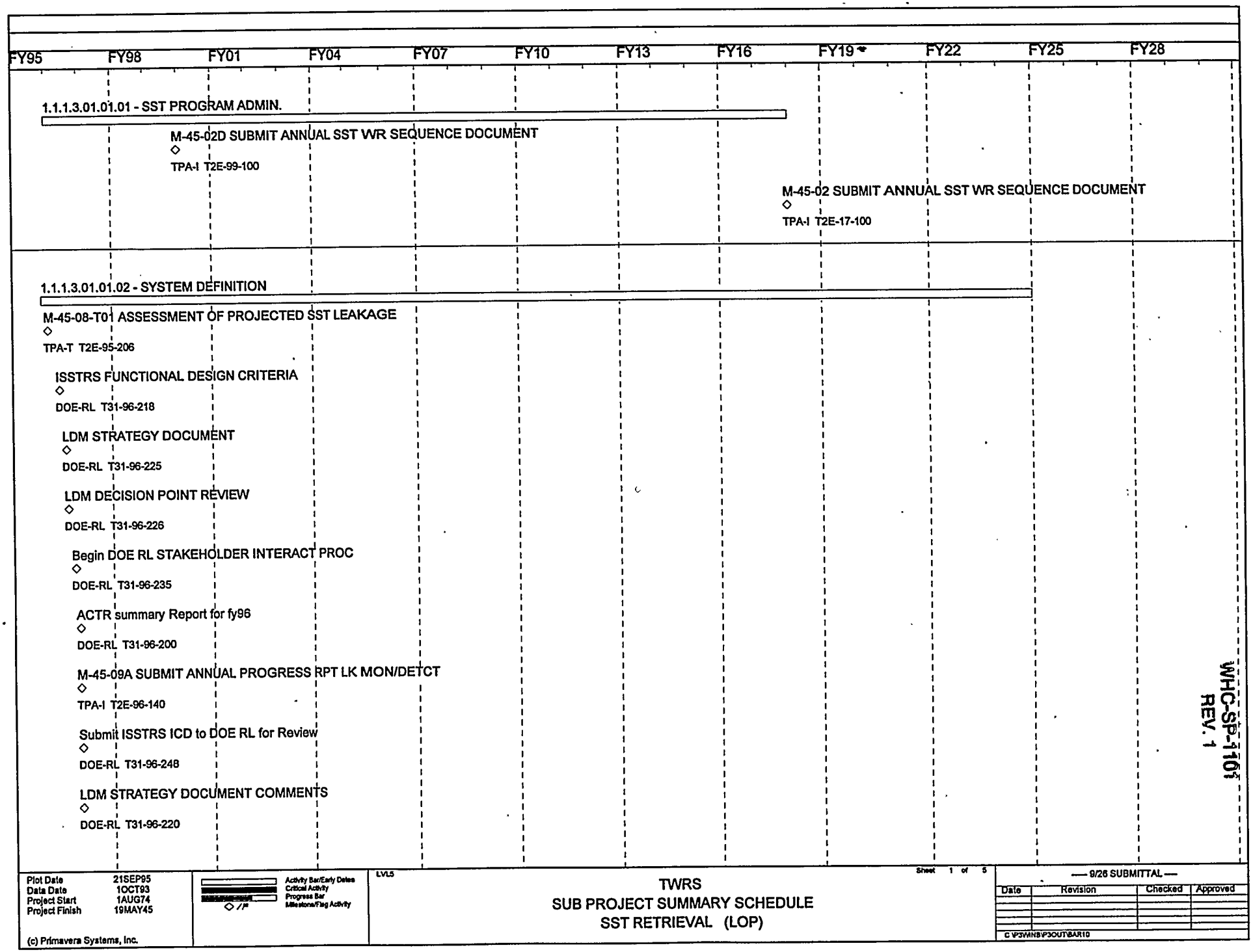
The work elements that comprise this WBS are:

- SST Engineering Management
  - Coordinate EM-50 Interface
- Acquire Commercial Technology for Retrieval (ACTR)
- Initial SST Retrieval System (ISSTRS) Definition
- Leak Detection
- 106-C Heel Clean out Project Definition
- SST Future Projects Definition
- MUST Future Projects Definition
- Tank 241-C-106 Sluicing Project (Project W-320)

- SST Future Projects
  - First Farm (ISSTRS)
  - Remaining Farms
  - MUST Projects

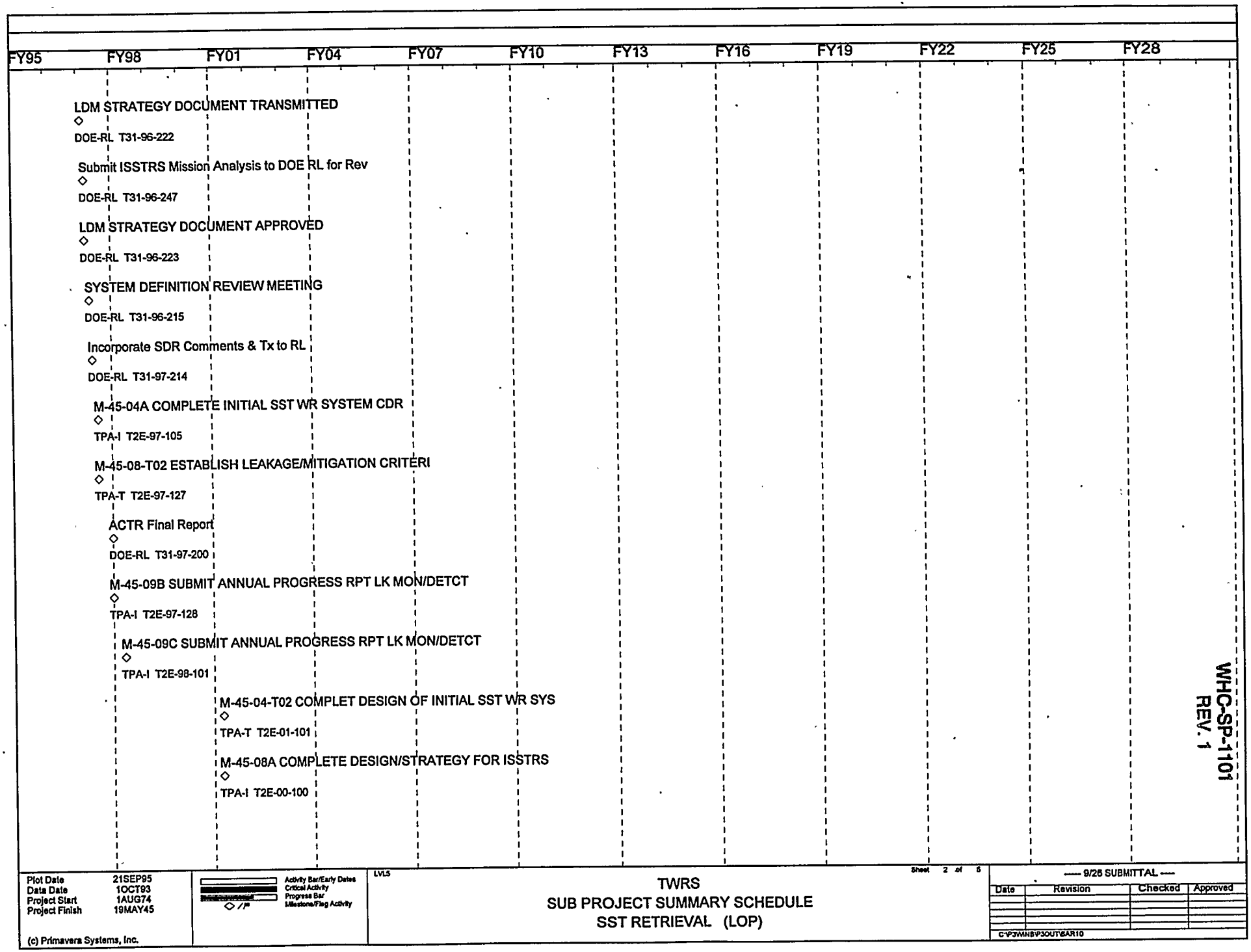
- Operations
  - 106-C Sluicing operations
  - 106-C Heel Removal operations
  - First Farm waste retrieval operations (SST)
  - Remaining SST waste retrieval operations
  - MUST waste retrieval operations

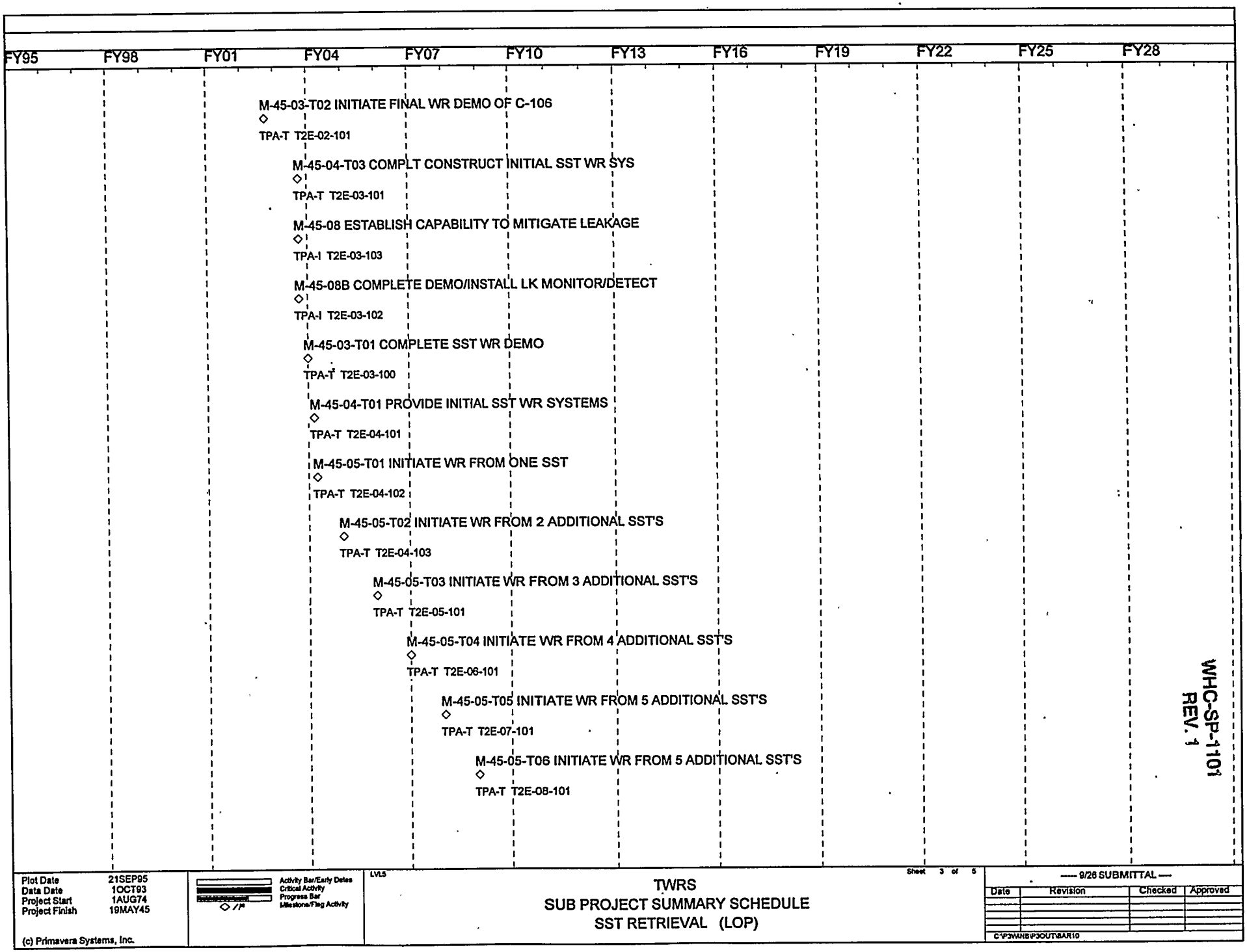
SMS WBS Code	Title	Responsible Manager:
1.1.1.3.01	**Waste Retrieval Project**	**GA Meyer**
1.1.1.3.01.01	Single Shell Tank Retrieval (SST)	LA Fort
1.1.1.3.01.01.01	SST - Program Administration	GL Crawford
1.1.1.3.01.01.02	SST - System Definition	GL Crawford
1.1.1.3.01.01.03	W-320, 241-C-106 Sluicing	KW Leliefeld
1.1.1.3.01.01.04	SST - Future Projects	GL Crawford
1.1.1.3.01.01.05	SST - Operations	TBD



Attachment 7.1-4 Summary Schedule
Sheet 1 of 5

WHC-SP-1101
REV. 1


FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
FY28
LDM STRATEGY DOCUMENT TRANSMITTED
DOE-RL T31-96-222
Submit ISSTRS Mission Analysis to DOE RL for Rev
DOE-RL T31-96-247
LDM STRATEGY DOCUMENT APPROVED
DOE-RL T31-96-223
SYSTEM DEFINITION REVIEW MEETING
DOE-RL T31-96-215
Incorporate SDR Comments & Tx to RL
DOE-RL T31-97-214
M-45-04A COMPLETE INITIAL SST WR SYSTEM CDR
TPA-I T2E-97-105
M-45-08-T02 ESTABLISH LEAKAGE/MITIGATION CRITERI
TPA-T T2E-97-127
ACTR Final Report
DOE-RL T31-97-200
M-45-09B SUBMIT ANNUAL PROGRESS RPT LK MON/DETCT
TPA-I T2E-97-128
M-45-09C SUBMIT ANNUAL PROGRESS RPT LK MON/DETCT
TPA-I T2E-98-101
M-45-04-T02 COMPLET DESIGN OF INITIAL SST WR SYS
TPA-T T2E-01-101
M-45-08A COMPLETE DESIGN/STRATEGY FOR ISSTRS
TPA-I T2E-00-100
WHC-SP-1101
REV. 1
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 2 of 5
TWRS
SUB PROJECT SUMMARY SCHEDULE
SST RETRIEVAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
C:\P3\WNBP3OUT\BAR10


FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
FY28
M-45-03-T02 INITIATE FINAL WR DEMO OF C-106
TPA-T T2E-02-101
M-45-04-T03 COMPLT CONSTRUCT INITIAL SST WR SYS
TPA-T T2E-03-101
M-45-08 ESTABLISH CAPABILITY TO MITIGATE LEAKAGE
TPA-I T2E-03-103
M-45-08B COMPLETE DEMO/INSTALL LK MONITOR/DETECT
TPA-I T2E-03-102
M-45-03-T01 COMPLETE SST WR DEMO
TPA-T T2E-03-100
M-45-04-T01 PROVIDE INITIAL SST WR SYSTEMS
TPA-T T2E-04-101
M-45-05-T01 INITIATE WR FROM ONE SST
TPA-T T2E-04-102
M-45-05-T02 INITIATE WR FROM 2 ADDITIONAL SST'S
TPA-T T2E-04-103
M-45-05-T03 INITIATE WR FROM 3 ADDITIONAL SST'S
TPA-T T2E-05-101
M-45-05-T04 INITIATE WR FROM 4 ADDITIONAL SST'S
TPA-T T2E-06-101
M-45-05-T05 INITIATE WR FROM 5 ADDITIONAL SST'S
TPA-T T2E-07-101
M-45-05-T06 INITIATE WR FROM 5 ADDITIONAL SST'S
TPA-T T2E-08-101
WHC-SP-1101
REV. 1
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 3 of 5
TWRS
SUB PROJECT SUMMARY SCHEDULE
SST RETRIEVAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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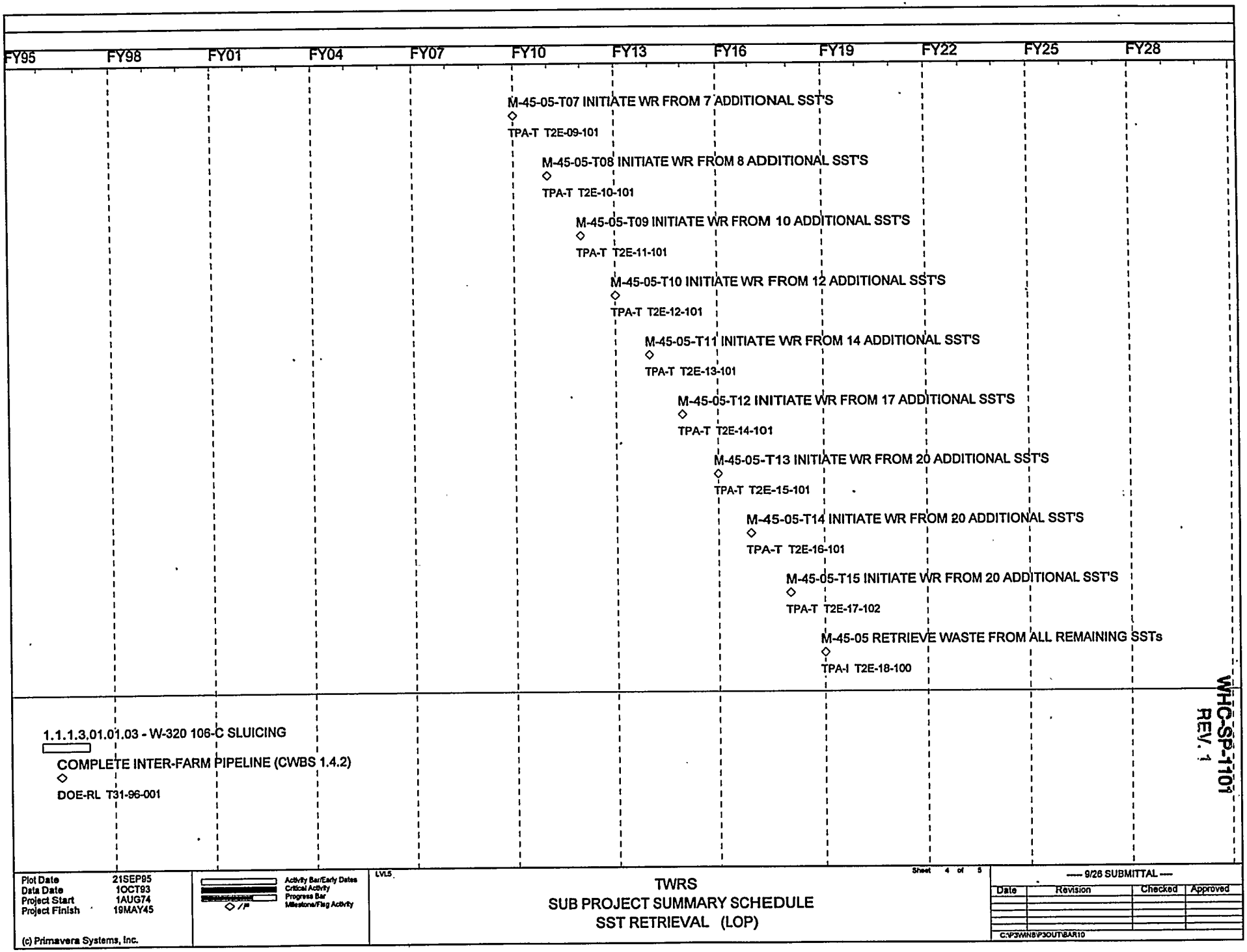
FY95
FY98
FY01
FY04
FY07
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FY13
FY16
FY19
FY22
FY25
FY28
M-45-05-T07 INITIATE WR FROM 7 ADDITIONAL SST'S
TPA-T T2E-09-101
M-45-05-T08 INITIATE WR FROM 8 ADDITIONAL SST'S
TPA-T T2E-10-101
M-45-05-T09 INITIATE WR FROM 10 ADDITIONAL SST'S
TPA-T T2E-11-101
M-45-05-T10 INITIATE WR FROM 12 ADDITIONAL SST'S
TPA-T T2E-12-101
M-45-05-T11 INITIATE WR FROM 14 ADDITIONAL SST'S
TPA-T T2E-13-101
M-45-05-T12 INITIATE WR FROM 17 ADDITIONAL SST'S
TPA-T T2E-14-101
M-45-05-T13 INITIATE WR FROM 20 ADDITIONAL SST'S
TPA-T T2E-15-101
M-45-05-T14 INITIATE WR FROM 20 ADDITIONAL SST'S
TPA-T T2E-16-101
M-45-05-T15 INITIATE WR FROM 20 ADDITIONAL SST'S
TPA-T T2E-17-102
M-45-05 RETRIEVE WASTE FROM ALL REMAINING SSTs
TPA-I T2E-18-100
1.1.1.3.01.01.03 - W-320 106-C SLUICING
COMPLETE INTER-FARM PIPELINE (CWBS 1.4.2)
DOE-RL T31-96-001
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 4 of 5
TWRS
SUB PROJECT SUMMARY SCHEDULE
SST RETRIEVAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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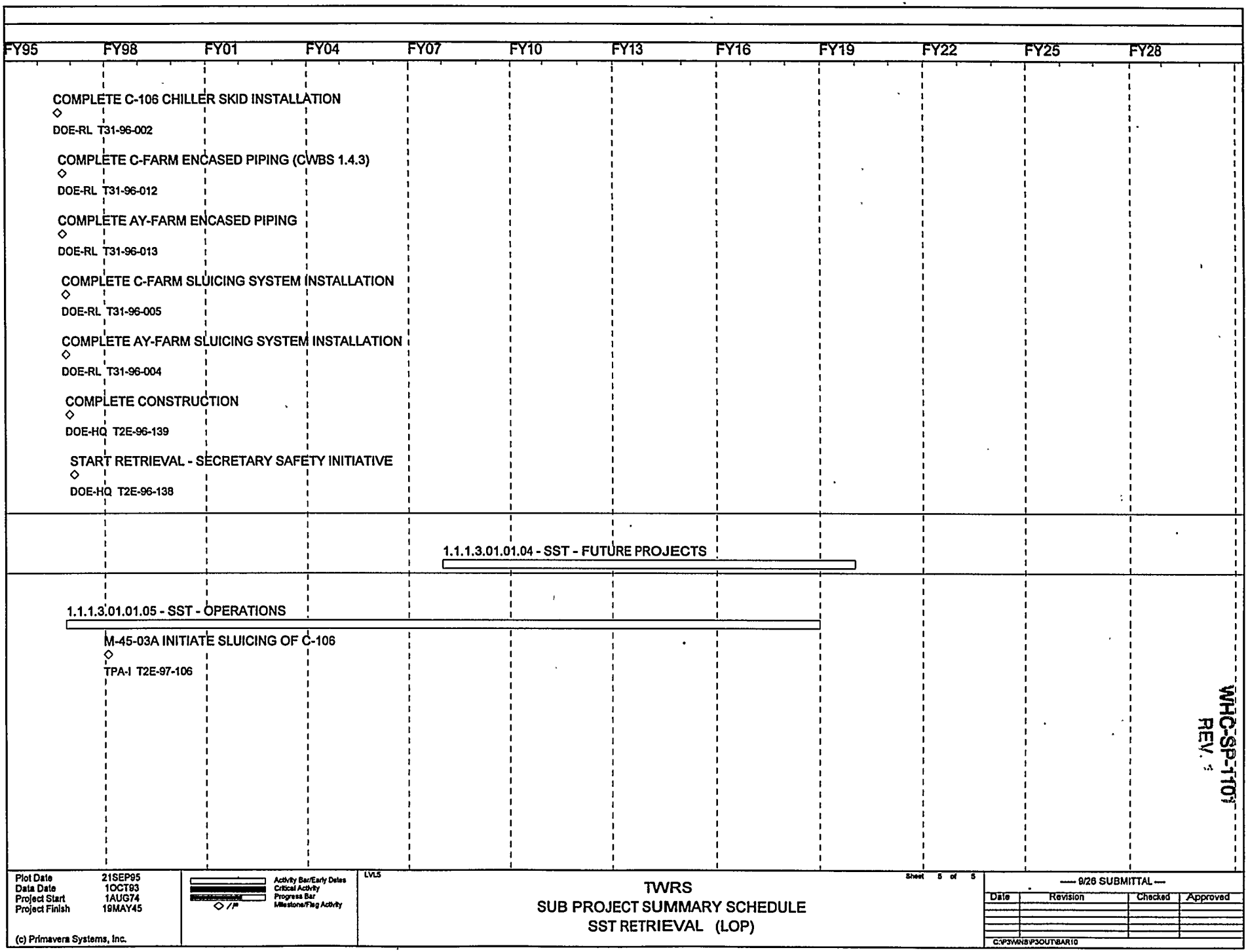

Attachment 7.1-4 Summary Schedule
Sheet 5 of 5

1.1.1.3.01.01 SST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.01.02	M-45-08A COMPLETE DESIGN/STRATEGY FOR ISSTRS	TPA-I T2E-00-100		02JAN01
1.1.1.3.01.01.02	M-45-04-TO2 COMPLET DESIGN OF INITIAL SST WR SYS	TPA-T T2E-01-101		02JAN01
1.1.1.3.01.01.02	M-45-03-TO2 INITIATE FINAL WR DEMO OF C-106	TPA-T T2E-02-101		28JUN02
1.1.1.3.01.01.02	M-45-03-TO1 COMPLETE SST WR DEMO	TPA-T T2E-03-100		30SEP03
1.1.1.3.01.01.02	M-45-04-TO3 COMPLT CONSTRUCT INITIAL SST WR SYS	TPA-T T2E-03-101		30JUN03
1.1.1.3.01.01.02	M-45-08B COMPLETE DEMO/INSTALL LK MONITOR/DETECT	TPA-I T2E-03-102		30JUN03
1.1.1.3.01.01.02	M-45-08 ESTABLISH CAPABILITY TO MITIGATE LEAKAGE	TPA-I T2E-03-103		30JUN03
1.1.1.3.01.01.02	M-45-04-TO1 PROVIDE INITIAL SST WR SYSTEMS	TPA-T T2E-04-101		01DEC03
1.1.1.3.01.01.02	M-45-05-TO1 INITIATE WR FROM ONE SST	TPA-T T2E-04-102	31DEC03	
1.1.1.3.01.01.02	M-45-05-TO2 INITIATE WR FROM 2 ADDITIONAL SST'S	TPA-T T2E-04-103	30SEP04	
1.1.1.3.01.01.02	M-45-05-TO3 INITIATE WR FROM 3 ADDITIONAL SST'S	TPA-T T2E-05-101	30SEP05	
1.1.1.3.01.01.02	M-45-05-TO4 INITIATE WR FROM 4 ADDITIONAL SST'S	TPA-T T2E-06-101	02OCT06	
1.1.1.3.01.01.02	M-45-05-TO5 INITIATE WR FROM 5 ADDITIONAL SST'S	TPA-T T2E-07-101	01OCT07	
1.1.1.3.01.01.02	M-45-05-TO6 INITIATE WR FROM 5 ADDITIONAL SST'S	TPA-T T2E-08-101	30SEP08	

1.1.1.3.01.01 SST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.01.02	M-45-05-T07 INITIATE WR FROM 7 ADDITIONAL SST'S	TPA-T T2E-09-101	30SEP09	
1.1.1.3.01.01.02	M-45-05-T08 INITIATE WR FROM 8 ADDITIONAL SST'S	TPA-T T2E-10-101	30SEP10	
1.1.1.3.01.01.02	M-45-05-T09 INITIATE WR FROM 10 ADDITIONAL SST'S	TPA-T T2E-11-101	30SEP11	
1.1.1.3.01.01.02	M-45-05-T10 INITIATE WR FROM 12 ADDITIONAL SST'S	TPA-T T2E-12-101	01OCT12	
1.1.1.3.01.01.02	M-45-05-T11 INITIATE WR FROM 14 ADDITIONAL SST'S	TPA-T T2E-13-101	30SEP13	
1.1.1.3.01.01.02	M-45-05-T12 INITIATE WR FROM 17 ADDITIONAL SST'S	TPA-T T2E-14-101	30SEP14	
1.1.1.3.01.01.02	M-45-05-T13 INITIATE WR FROM 20 ADDITIONAL SST'S	TPA-T T2E-15-101	30SEP15	
1.1.1.3.01.01.02	M-45-05-T14 INITIATE WR FROM 20 ADDITIONAL SST'S	TPA-T T2E-16-101	30SEP16	
1.1.1.3.01.01.01	M-45-02 SUBMIT ANNUAL SST WR SEQUENCE DOCUMENT	TPA-I T2E-17-100		29SEP17
1.1.1.3.01.01.02	M-45-05-T15 INITIATE WR FROM 20 ADDITIONAL SST'S	TPA-T T2E-17-102	02OCT17	
1.1.1.3.01.01.02	M-45-05 RETRIEVE WASTE FROM ALL REMAINING SSTs	TPA-I T2E-18-100		01OCT18
1.1.1.3.01.01.02	M-45-08-T01 ASSESSMENT OF PROJECTED SST LEAKAGE	TPA-T T2E-95-206		31OCT95
1.1.1.3.01.01.03	START RETRIEVAL - SECRETARY SAFETY INITIATIVE	DOE-HQ T2E-96-138	01NOV96	
1.1.1.3.01.01.03	COMPLETE CONSTRUCTION	DOE-HQ T2E-96-139		10SEP96

1.1.1.3.01.01 SST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.01.02	M-45-09A SUBMIT ANNUAL PROGRESS RPT LK MON/DETCT	TPA-I T2E-96-140	-	30SEP96
1.1.1.3.01.01.02	M-45-04A COMPLETE INITIAL SST WR SYSTEM CDR	TPA-I T2E-97-105		30APR97
1.1.1.3.01.01.05	M-45-03A INITIATE SLUICING OF C-106	TPA-I T2E-97-106	31OCT97	
1.1.1.3.01.01.02	M-45-08-T02 ESTABLISH LEAKAGE/MITIGATION CRITERI	TPA-T T2E-97-127		30APR97
1.1.1.3.01.01.02	M-45-09B SUBMIT ANNUAL PROGRESS RPT LK MON/DETCT	TPA-I T2E-97-128		30SEP97
1.1.1.3.01.01.02	M-45-09C SUBMIT ANNUAL PROGRESS RPT LK MON/DETCT	TPA-I T2E-98-101		02FEB98
1.1.1.3.01.01.01	M-45-02D SUBMIT ANNUAL SST WR SEQUENCE DOCUMENT	TPA-I T2E-99-100		29SEP99
1.1.1.3.01.01.03	COMPLETE INTER-FARM PIPELINE (CWBS 1.4.2)	DOE-RL T31-96-001		29MAR96
1.1.1.3.01.01.03	COMPLETE C-106 CHILLER SKID INSTALLATION	DOE-RL T31-96-002		10MAY96
1.1.1.3.01.01.03	COMPLETE AY-FARM SLUICING SYSTEM INSTALLATION	DOE-RL T31-96-004		02AUG96
1.1.1.3.01.01.03	COMPLETE C-FARM SLUICING SYSTEM INSTALLATION	DOE-RL T31-96-005		02AUG96
1.1.1.3.01.01.03	COMPLETE C-FARM ENCASED PIPING (CWBS 1.4.3)	DOE-RL T31-96-012		28JUN96
1.1.1.3.01.01.03	COMPLETE AY-FARM ENCASED PIPING	DOE-RL T31-96-013		28JUN96
1.1.1.3.01.01.02	ACTR summary Report for fy96	DOE-RL T31-96-200		30SEP96

1.1.1.3.01.01 SST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.01.02	SYSTEM DEFINITION REVIEW MEETING	DOE-RL T31-96-215		03FEB97
1.1.1.3.01.01.02	ISSTRS FUNCTIONAL DESIGN CRITERIA	DOE-RL T31-96-218		08MAR96
1.1.1.3.01.01.02	LDM STRATEGY DOCUMENT COMMENTS	DOE-RL T31-96-220	15OCT96	
1.1.1.3.01.01.02	LDM STRATEGY DOCUMENT TRANSMITTED	DOE-RL T31-96-222		11NOV96
1.1.1.3.01.01.02	LDM STRATEGY DOCUMENT APPROVED	DOE-RL T31-96-223		18DEC96
1.1.1.3.01.01.02	LDM STRATEGY DOCUMENT	DOE-RL T31-96-225		15MAY96
1.1.1.3.01.01.02	LDM DECISION POINT REVIEW	DOE-RL T31-96-226		03JUN96
1.1.1.3.01.01.02	Begin DOE RL STAKEHOLDER INTERACT PROC	DOE-RL T31-96-235		15AUG96
1.1.1.3.01.01.02	Submit ISSTRS Mission Analysis to DOE RL for Rev	DOE-RL T31-96-247		16DEC96
1.1.1.3.01.01.02	Submit ISSTRS ICD to DOE RL for Review	DOE-RL T31-96-248		15OCT96
1.1.1.3.01.01.02	ACTR Final Report	DOE-RL T31-97-200		30SEP97
1.1.1.3.01.01.02	Incorporate SDR Comments & Tx to RL	DOE-RL T31-97-214		03MAR97

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.01.01 - SST Retrieval - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	2900221	27520	7109	12310	17978	16658	18902	37153	19818	50903	50931
	REPORT TOTAL	2900221	27520	7109	12310	17978	16658	18902	37153	19818	50903	50931

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	219968	221018	231833	231291	242827	242768	186305	175495	175352	175352	175833
	REPORT TOTAL	219968	221018	231833	231291	242827	242768	186305	175495	175352	175352	175833

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1	EXPENSE	175352	175352	11709	174	78	78	77	78	
	REPORT TOTAL	175352	175352	11709	174	78	78	77	78	

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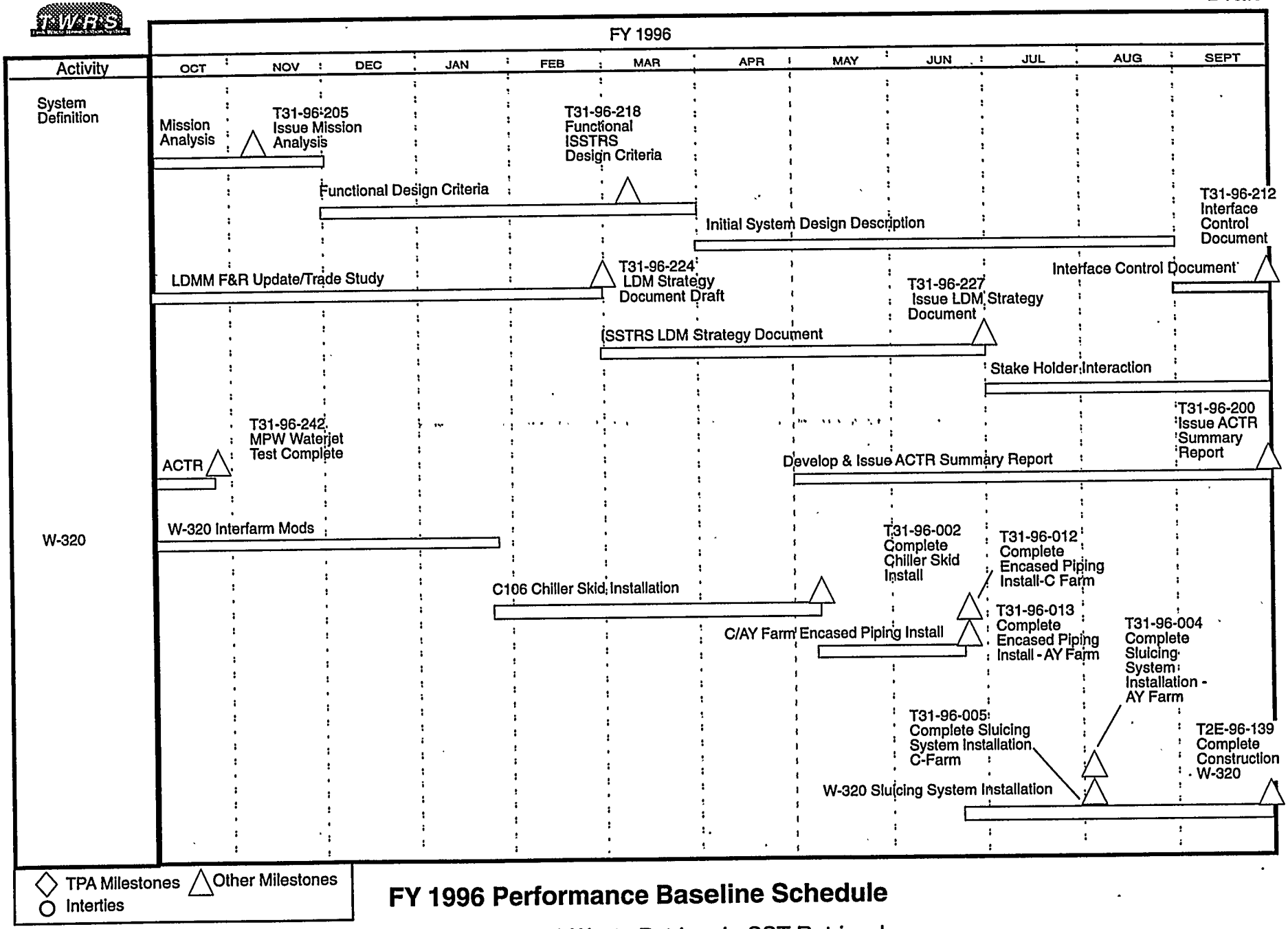


FY 1996 Performance Baseline Schedule

1.1.1.3.01.01 Waste Retrieval - SST Retrieval

29509043.14

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER
COST LOADING REPORT
TOTAL USAGE FOR MONTH

TWRS INTEGRATED SCHEDULE
UNITS IN K$s

1.1.1.3.01.01 - SST Retrieval - FY 96 Cost/Month

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.01.01.01 - SST PROGRAM ADMIN.	23	21	20	23	21	22	23	23	21	22	23	21	259
	1.1.1.3.01.01.02 - SYSTEM DEFINITION	201	183	228	299	327	361	336	325	341	352	369	1439	4764
	1.1.1.3.01.01.03 - W-320 106-C SLUICING	2879	2263	2150	2000	1585	1664	2268	1219	1108	1328	2112	1417	21993
	1.1.3.01.01.04 - SST - FUTURE PROJECTS													
	1.1.1.3.01.01.05 - SST - OPERATIONS											264	240	504
TOTAL	1	3103	2467	2398	2322	1933	2047	2627	1567	1470	1702	2767	3117	27520
	REPORT TOTAL	3103	2467	2398	2322	1933	2047	2627	1567	1470	1702	2767	3117	27520

7.2 DST RETRIEVAL (WBS 1.1.1.3.1.2)

7.2.1 STRATEGY

The objective of the Double Shell Tank (DST) Retrieval project is the retrieval of DST waste to permit closure of the tanks in accordance with regulatory requirements. In addition to accomplishing this objective, the DSTs will function to receive waste retrieved from SSTs and MUSTs for staging feed to the pretreatment and immobilization activities.

The strategy for accomplishing this objective is to apply known technical solutions such as the use of mixer pumps, which have proven effective in retrieving tank wastes at the West Valley and Savannah River sites. Upon completion of Project W-151, 101-AZ Retrieval, a process test will be performed in tank 241-AZ-101 to demonstrate the capability of mixer pumps to mobilize neutralized current acid waste sludge. Concurrent with this activity, advanced design mixer pumps (ADMPs) will be procured and tested with the goal of enhanced mobilization capability, improved reliability, and reduced life-cycle costs. Performance data obtained in ADMP testing will be applied to the specification for equipment to be procured and installed by Project W-211, Initial DST Retrieval System, which will provide mixer pump based retrieval systems for ten (10) DSTs. Project W-211 will initiate Title II design on the first retrieval system in January 1996.

The M&O contractor is to be responsible for demonstrating DST retrieval technology, consolidating wastes to fully utilize tank space, and staging feed for the Phase I pretreatment and immobilization activities. The DST retrieval project will assume responsibility for operation of the DST tank farms in the year 2005, with the principal functions being the receipt and safe storage of waste retrieved from SSTs and MUSTs and staging feed for continued operation of Phase I facilities. In 2010, responsibility for some or all of the DSTs will be transitioned to a private sector contractor. Upon completion of pretreatment and immobilization activities, the DSTs will be returned to the M&O contractor for closure (WBS 1.1.1.3.1.3).

7.2.1.1 Objectives

The objectives of the DST Retrieval project are to provide retrieval systems to resolve tank waste safety issues, demonstrate the mobilization of sludge to facilitate in-tank treatment or transfer, consolidate waste to optimize tank space utilization, and transfer the wastes as feed for pretreatment and immobilization activities.

Specific objectives include the following:

1. Resolve tank safety issues as required
2. Establish waste consolidation requirements
3. Procure advanced design mixer pumps and demonstrate and verify mixer pump performance
4. Demonstrate in-tank sludge washing and caustic leaching

5. Provide retrieval systems to consolidate wastes and supply feed to the immobilization facilities

6. Maintain safe operation of the DST farms and receive and store waste from other Hanford operations commencing in 2005; continue operation pending implementation of an alternate acquisition strategy

7. Support waste blending operations.

7.2.1.2 Planning Assumptions

1. Two mixer pumps will successfully mobilize all sludge in each DST.

2. The Hanford Defense Waste Environmental Impact Statement (HDW-EIS) and Record of Decision (ROD) provides sufficient National Environmental Policy Act (NEPA) documentation for the retrieval of DST waste.

3. The Waste Retrieval Project will assume responsibility for DST minimum safe operation in 2005 and will transfer that responsibility in accordance with the acquisition strategies for treatment and immobilization in 2010.

4. The Waste Retrieval Project will perform all activities to close DSTs including the preparation of a closure plan and environmental impact statement.

4. The 242-A Evaporator will be available for reducing waste volume until the Phase II Low Level-Waste (LLW) immobilization facility is in operation.

7.2.1.3 Constraints

Safety issues limit access to, and impose process restrictions on, waste retrieval from DSTs. The need to consolidate waste to optimize tank space utilization imposes constraints on the retrieval system installation sequence. Tank farm infrastructure imposes limits on retrieval rates, transfer system capabilities, and transfer rates. The lack of characterization data on the contents of each tank imposes limitations on the consolidation of wastes.

7.2.2 TECHNICAL REQUIREMENTS BASELINE

7.2.2.1 Work Breakdown Structure

This project is one of three projects in the Waste Retrieval project WBS. The WBS tree for the DST Retrieval project is found in Attachment 7.2-1.

7.2.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the DST Retrieval project is found in Attachment 7.2-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

7.2.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the DST Retrieval project is found in Attachment 7.2-3.

7.2.2.4 Technology Needs

There is a need to provide a balance between technology development and application of DST retrieval systems. The application of decision-making tools such as the program decision logic, functional flow diagrams, and interface control documents will address this need. Emphasis is placed on establishing and maintaining justification for new and continuing development activities such as the advance design mixer pump and sonic mobilization probe.

7.2.3 SCHEDULE BASELINE

7.2.3.1 Summary Schedule

See Attachment 7.2-4 for the summary schedule.

7.2.3.2 Milestone Control Log

See Attachment 7.2-5 for the Milestone Control Log. Milestone description sheets are located in Appendix A.

7.2.4 COST BASELINE

7.2.4.1 Cost Baseline Summary by Year

See Attachment 7.2-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up to the project.

7.2.4.2 Basis of Estimate

Tasks are estimated at various levels of confidence ranging from detailed bottoms-up estimates for validated projects to planning feasibility estimates.

7.2.5 PERFORMANCE MEASURES

Performance measures will be tied to the development and establishment of a DST retrieval configuration specifically dealing with performance elements that ensure success of the objectives. These measures include cost and schedule compliance, milestone completion, and maintaining the DST retrieval strategy current with TWRS mission objectives.

7.2.6 EXECUTION YEAR

7.2.6.1 Technical Objectives

The DST Retrieval project objectives are to identify, develop, and evaluate enhanced and alternate retrieval technologies. An approach plan will be developed for implementation of activities required to demonstrate retrieval technology, consolidate waste, and stage and supply feed to the pretreatment and immobilization facilities. Specific objectives include:

1. Installation and operation of the 241-AZ-101 mixer pumps

2. Procurement of prototype advanced design mixer pumps

3. Initiation of Title II design for the first retrieval system to be provided by Project W-211.

7.2.6.2 FY 1996 Performance Baseline Schedule

See Attachment 7.2-7 for the FY 1996 performance baseline schedule.

7.2.6.3 Cost Estimate Baseline by Month

See Attachment 7.2-8 for the month-by-month cost estimate baseline for FY 1996.

7.2.6.5 FY 1995 Work Scope Carryover Summary

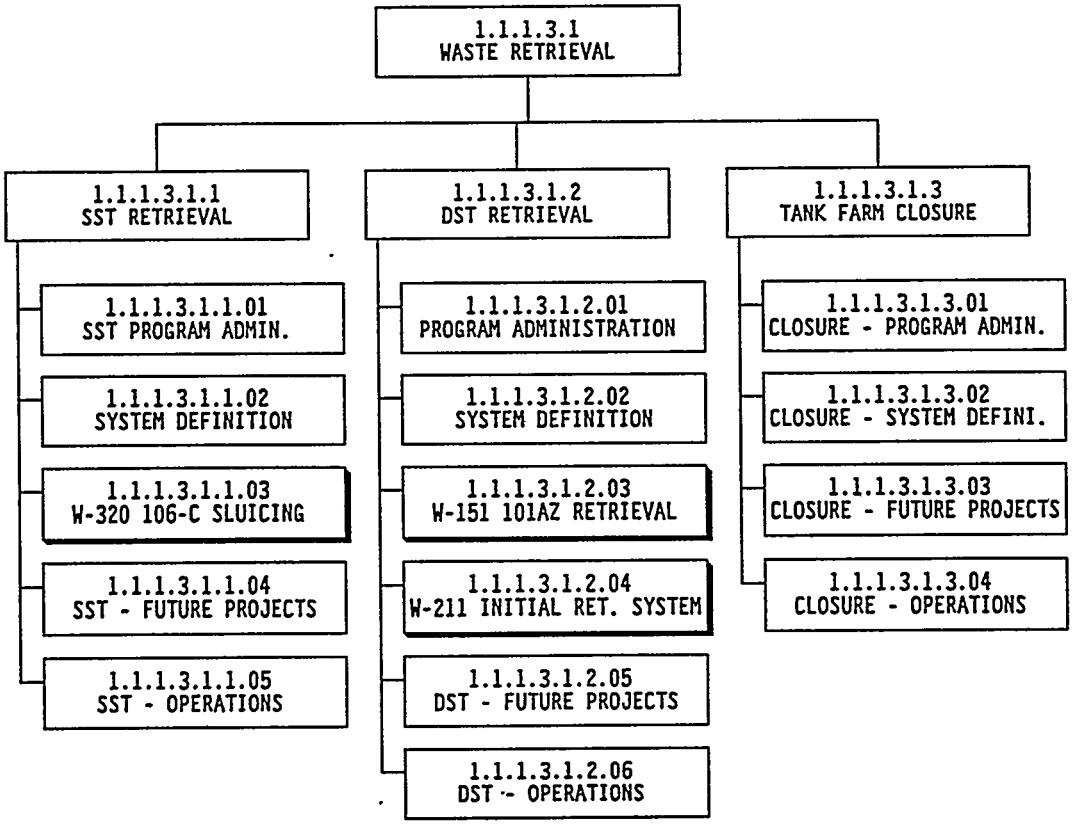
Delays experienced by Project W-151, Tank 101-AZ Waste Retrieval System, on authorized work scope, resulted in a forecasted completion in the first quarter of FY 1996 instead of the fourth quarter of FY 1995. Carryover work scope is described as follows:

- Bearing cooling water pipeline installation
- Electrical cable installation
- Thermocouple assembly installation, as well as the existing thermocouple removal
- Mixer pump installation
- Electrical connections to equipment
- VFD installation
- Transfer pump removal
- Testing.

LISTING OF ATTACHMENTS

Attachment 7.2-1	Work Breakdown Structure
Attachment 7.2-2	WBS Dictionary Sheet
Attachment 7.2-3	Responsibility Assignment Matrix
Attachment 7.2-4	Summary Schedule
Attachment 7.2-5	Milestone Control Log
Attachment 7.2-6	Cost Baseline Summary by Year
Attachment 7.2-7	FY 1996 Performance Baseline Schedule
Attachment 7.2-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
WASTE RETRIEVAL



Attachment 7.2-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
August 31, 1995	1.1.1 TWRS Project 1.1.1.3 Disposal 1.1.1.3.1 Waste Retrieval Project	
3. WBS ELEMENT CODE/LEVEL 1.1.1.3.1.2/IV	4. WBS ELEMENT TITLE Double-Shell Tanks	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV DATE	7. APPROVED CHANGES N/A
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER 1210-0 1210-2 1210-3	9. BUDGET AND REPORTING NUMBERS Operating: EW3130010 CENTRC: 35EW31301 GPP/Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	5319	2011	3240	2224	815	3281	2026
CENRTC	1262	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0
LINE ITEM	9451	15290	16869	20571	37484	24019	18727
TOTAL	16032	17301	20109	22795	38299	27300	20753

B. TECHNICAL BASES

Goals and Objectives

This work element is part of the Waste Retrieval Project Level III WBS element and is comprised of the following Level V WBS elements:

- 1.1.1.3.1.2.1, DST Project Administration
- 1.1.1.3.1.2.2, DST System Definition
- 1.1.1.3.1.2.3, W-151 101-AZ Retrieval
- 1.1.1.3.1.2.4, W-211 Initial DST Retrieval System
- 1.1.1.3.1.2.5, DST Future Projects
- 1.1.1.3.1.2.6, DST Operations

The goal is to provide management and planning bases for/to Double Shell Tank (DST) Project Administration which includes: tracking of schedules and budgets; coordination and overseeing development; complete the activities to demonstrate the activities to demonstrate DST mixer pump performance; establish requirements for consolidation of

DST waste for storage and feed to treatment facilities; design, process, and test advance design mixer pumps; and complete design, construction, and operation of DST waste retrieval systems.

Major End-Item Deliverables

- Prepare approach plan for demonstrations, waste consolidation, and feed to pretreatment and immobilization.
- Issue mixer pump performance test plan identifying testing requirements
- Identify DST waste consolidation requirements
- Issue Advanced Design Mixer pump performance testing results
- Provide Design Requirements Documents (DRDs) for DST retrieval systems projects
- Complete construction and installation of the first DST mixer pump retrieval system (Project W-151, 101-AZ)
- Provide DST waste retrieval systems as required
- Prepare project documentation, requirements, for remaining DST retrieval
- Consolidate DST waste per operational requirements
- Complete retrieval from all DSTs and transition to the Tank Closure project.

Acceptance Criteria

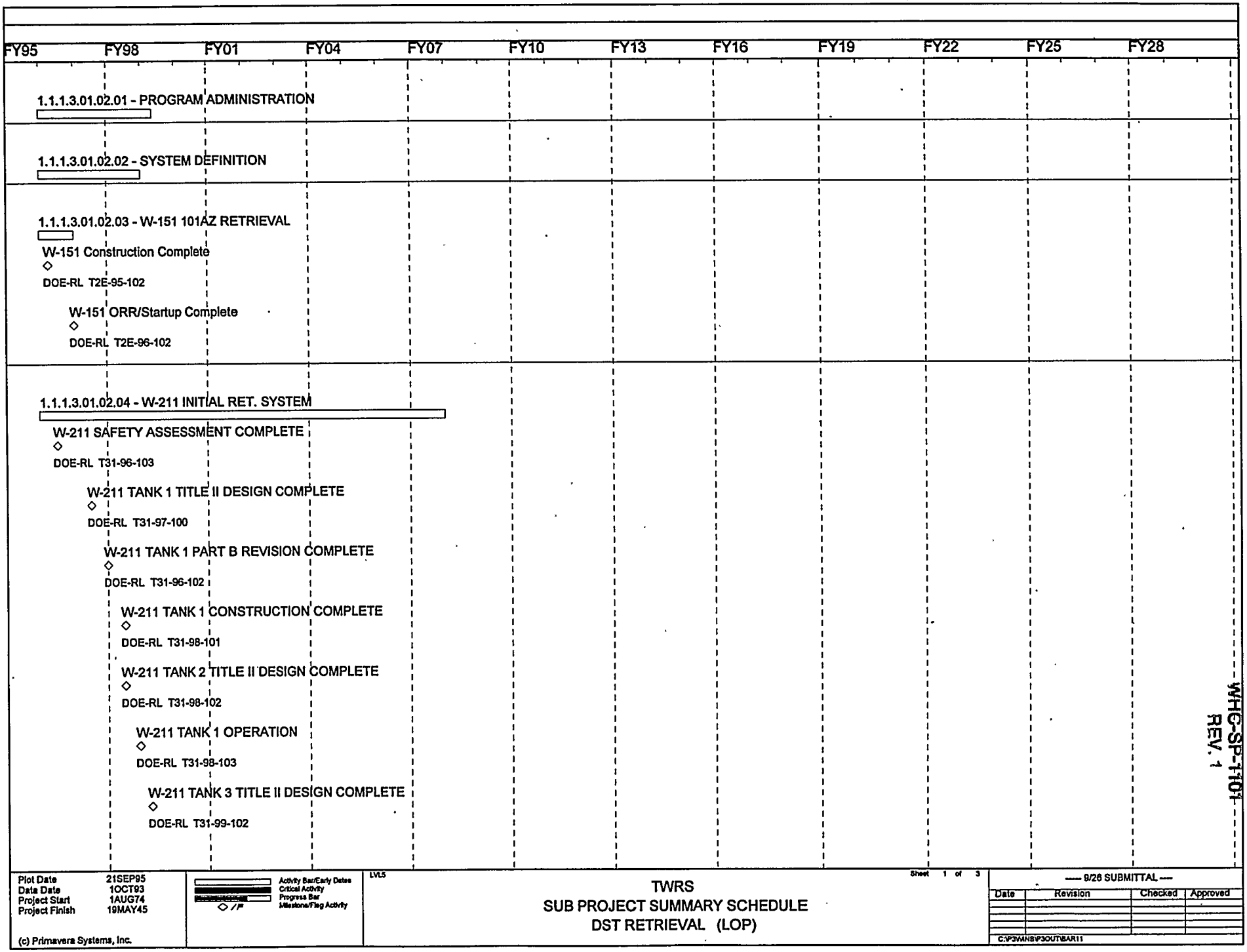
- Tri-Party Agreement (TPA) milestones establish the acceptance criteria for final disposition of tank wastes
- DST retrieval systems will be done in accordance with the appropriate DOE Orders and regulations

C. STATEMENT OF WORK

The work elements that comprise this WBS are:

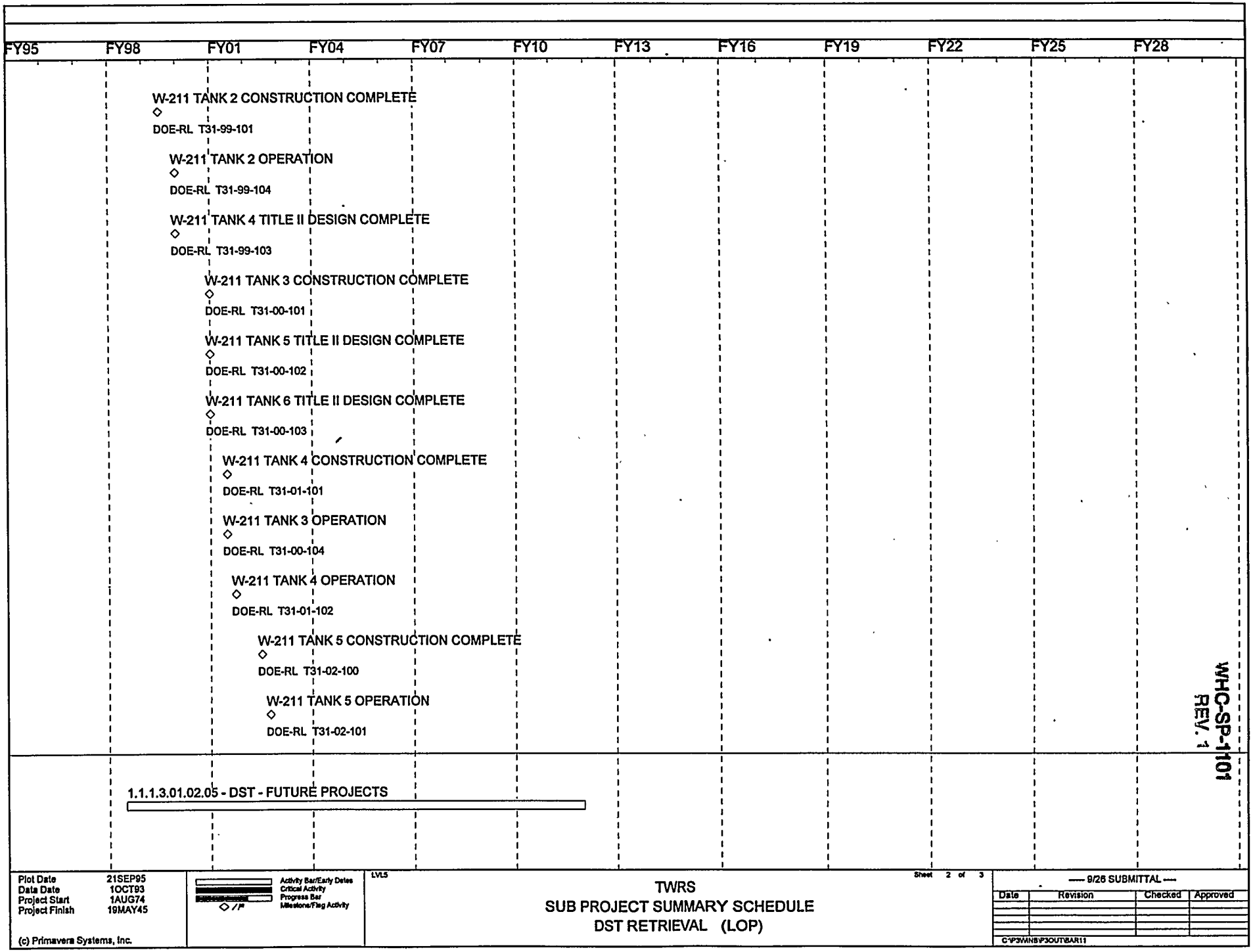
- DST Engineering Management
- 101-AZ Process Test Definitions
- DST Waste Consolidation Definition
- Advance Design Mixer Pump design, procurement, and testing
- Project W-151, 101-AZ Retrieval
- Project W-211, Initial Double Shell Tank Retrieval Systems
- Future DST Project (W-343)
- Operations
  - 101-AZ process test
  - Sludge washing/caustic leach process test
  - Waste consolidation
  - Phase I and Phase II Retrieval Operations

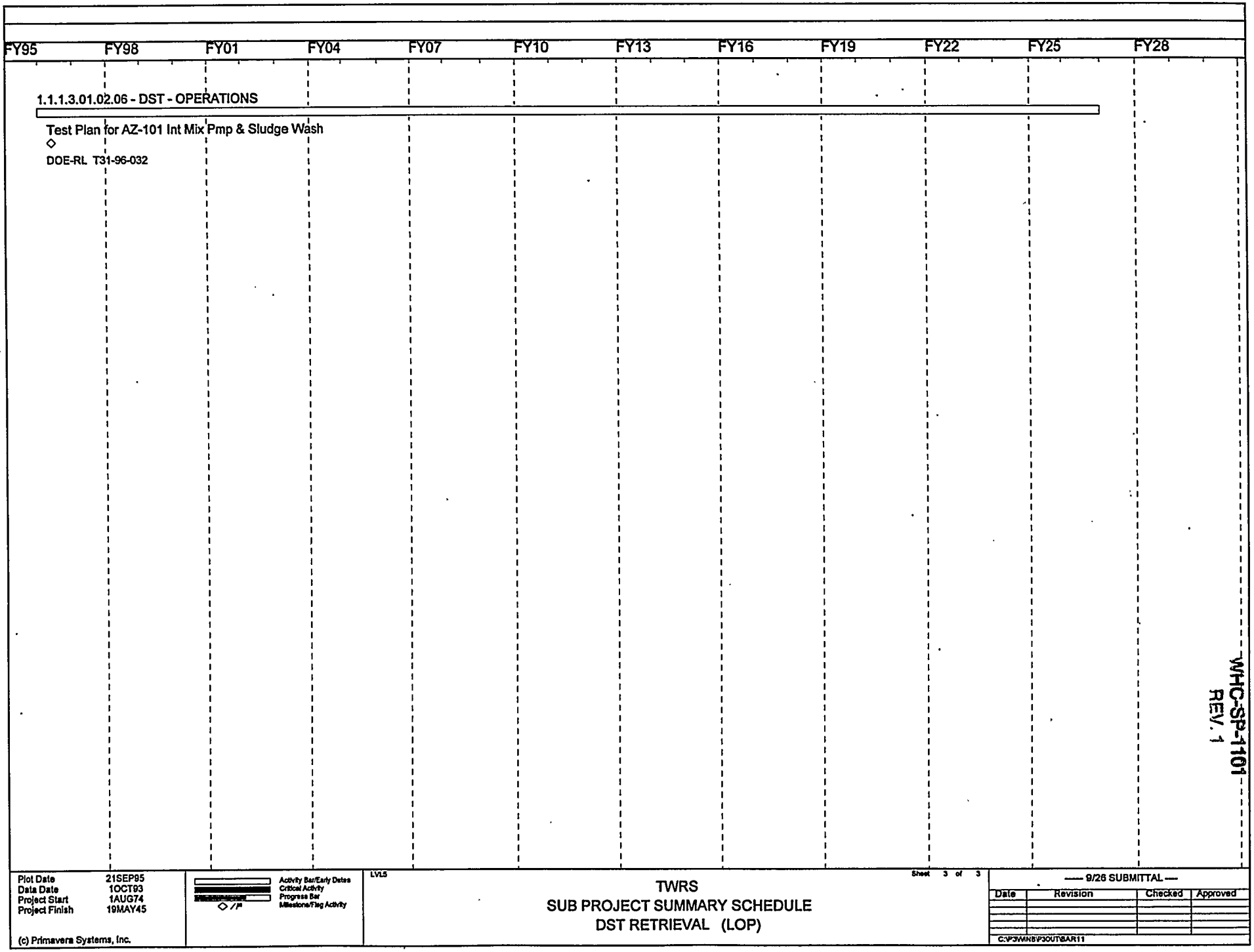
SMS WBS Code	Title	Responsible Manager:
1.1.1.3.01	**Waste Retrieval Project**	**GA Meyer**
1.1.1.3.01.02	Double Shell Tank Retrieval (DST)	CA Augustine
1.1.1.3.01.02.01	DST - Program Administration	DL Lamberd
1.1.1.3.01.02.02	DST - System Definition	DL Lamberd
1.1.1.3.01.02.03	W-151, 101-AZ Waste Retrieval System	EM Nordquist
1.1.1.3.01.02.04	W-211, Initial Tank Retrieval Systems (DST)	JE Van Beek
1.1.1.3.01.02.05	DST - Future Projects	DL Lamberd
1.1.1.3.01.02.06	DST - Operations	TBD



Attachment 7.2-4 Summary Schedule
Sheet 1 of 3

WHC-SP-1101
REV. 1


FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
FY28
W-211 TANK 2 CONSTRUCTION COMPLETE
DOE-RL T31-99-101
W-211 TANK 2 OPERATION
DOE-RL T31-99-104
W-211 TANK 4 TITLE II DESIGN COMPLETE
DOE-RL T31-99-103
W-211 TANK 3 CONSTRUCTION COMPLETE
DOE-RL T31-00-101
W-211 TANK 5 TITLE II DESIGN COMPLETE
DOE-RL T31-00-102
W-211 TANK 6 TITLE II DESIGN COMPLETE
DOE-RL T31-00-103
W-211 TANK 4 CONSTRUCTION COMPLETE
DOE-RL T31-01-101
W-211 TANK 3 OPERATION
DOE-RL T31-00-104
W-211 TANK 4 OPERATION
DOE-RL T31-01-102
W-211 TANK 5 CONSTRUCTION COMPLETE
DOE-RL T31-02-100
W-211 TANK 5 OPERATION
DOE-RL T31-02-101
1.1.1.3.01.02.05 - DST - FUTURE PROJECTS
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 3
TWRS
SUB PROJECT SUMMARY SCHEDULE
DST RETRIEVAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
C:\P3\WNBP3OUT\BAR11



Attachment 7.2-4 Summary Schedule
Sheet 3 of 3

1.1.1.3.01.02 DST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.02.03	W-151 Construction Complete	DOE-RL T2E-95-102		29DEC95
1.1.1.3.01.02.03	W-151 ORR/Startup Complete	DOE-RL T2E-96-102		30SEP96
1.1.1.3.01.02.04	W-211 TANK 3 CONSTRUCTION COMPLETE	DOE-RL T31-00-101		29SEP00
1.1.1.3.01.02.04	W-211 TANK 5 TITLE II DESIGN COMPLETE	DOE-RL T31-00-102		30SEP00
1.1.1.3.01.02.04	W-211 TANK 6 TITLE II DESIGN COMPLETE	DOE-RL T31-00-103		30SEP00
1.1.1.3.01.02.04	W-211 TANK 3 OPERATION	DOE-RL T31-00-104		31MAR01
1.1.1.3.01.02.04	W-211 TANK 4 CONSTRUCTION COMPLETE	DOE-RL T31-01-101		31MAR01
1.1.1.3.01.02.04	W-211 TANK 4 OPERATION	DOE-RL T31-01-102		30JUN01
1.1.1.3.01.02.04	W-211 TANK 5 CONSTRUCTION COMPLETE	DOE-RL T31-02-100		01APR02
1.1.1.3.01.02.04	W-211 TANK 5 OPERATION	DOE-RL T31-02-101		01JUL02
1.1.1.3.01.02.06	Test Plan for AZ-101 Int Mix Pmp & Sludge Wash	DOE-RL T31-96-032		01MAR96
1.1.1.3.01.02.04	W-211 TANK 1 PART B REVISION COMPLETE	DOE-RL T31-96-102		29SEP97
1.1.1.3.01.02.04	W-211 SAFETY ASSESSMENT COMPLETE	DOE-RL T31-96-103		31MAR96
1.1.1.3.01.02.04	W-211 TANK 1 TITLE II DESIGN COMPLETE	DOE-RL T31-97-100		31MAR97

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.01.02 DST Retrieval

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.02.04	W-211 TANK 1 CONSTRUCTION COMPLETE	DOE-RL T31-98-101		31MAR98
1.1.1.3.01.02.04	W-211 TANK 2 TITLE II DESIGN COMPLETE	DOE-RL T31-98-102		31MAR98
1.1.1.3.01.02.04	W-211 TANK 1 OPERATION	DOE-RL T31-98-103		31AUG98
1.1.1.3.01.02.04	W-211 TANK 2 CONSTRUCTION COMPLETE	DOE-RL T31-99-101		31MAR99
1.1.1.3.01.02.04	W-211 TANK 3 TITLE II DESIGN COMPLETE	DOE-RL T31-99-102		31DEC98
1.1.1.3.01.02.04	W-211 TANK 4 TITLE II DESIGN COMPLETE	DOE-RL T31-99-103		30SEP99
1.1.1.3.01.02.04	W-211 TANK 2 OPERATION	DOE-RL T31-99-104		28SEP99

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

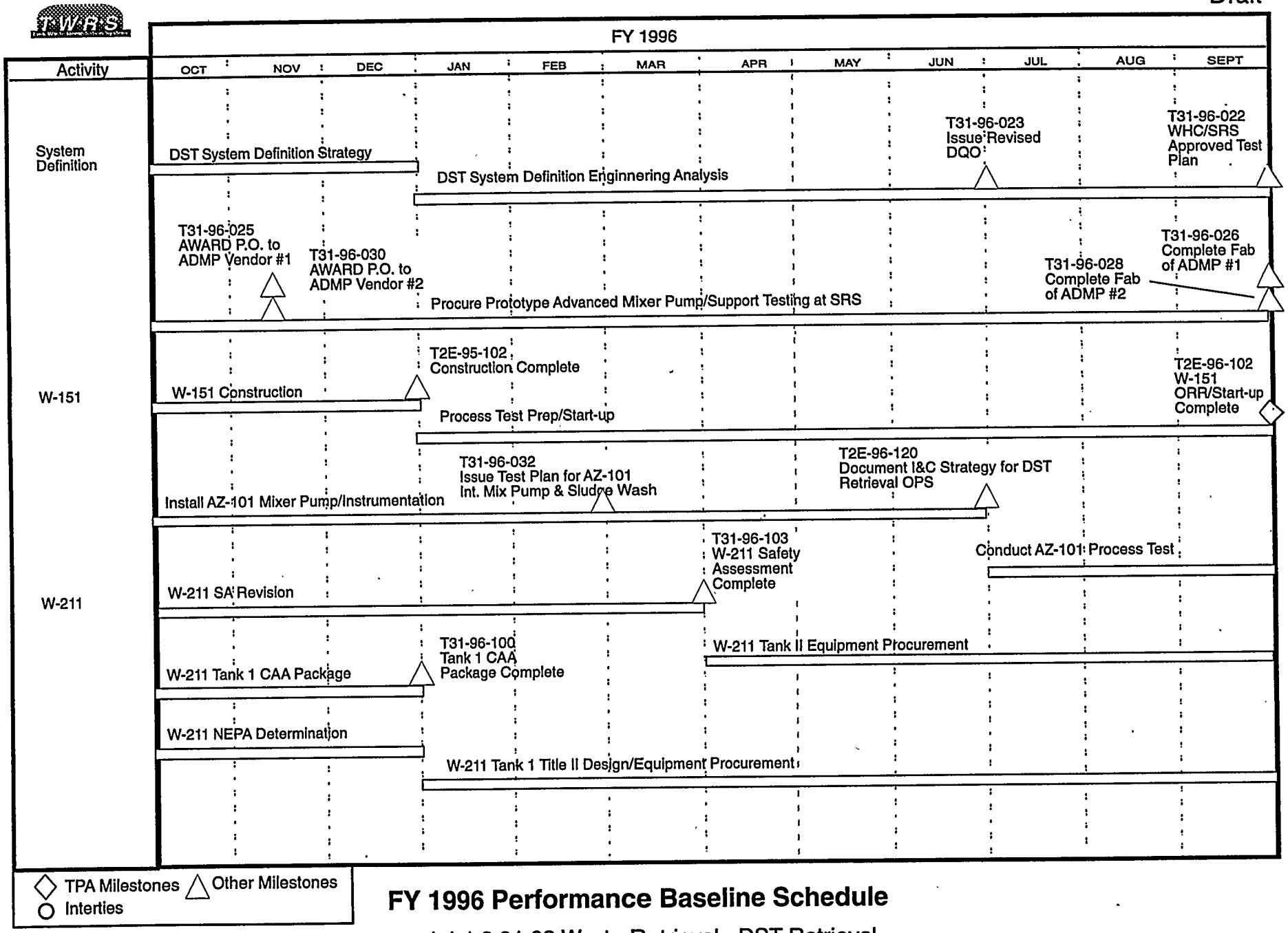
COST LOADING REPORT | UNITS IN K$s

1.1.1.3.01.02 - DST Retrieval - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	907784	5319	2011	3240	2224	815	3281	2026	2999	3129	3245
2	CENRTC	1262	1262									
3	LINE ITM	277847	9451	15290	16869	20571	37484	24019	18727	25032	26074	27042
	REPORT TOTAL	1186893	16032	17301	20108	22795	38299	27300	20754	28031	29203	30287

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	28627	28752	25322	25253	25253	25253	48165	48034	48034	48034	48165
2	CENRTC											
3	LINE ITM	28124	29166									
	REPORT TOTAL	56751	57918	25322	25253	25253	25253	48165	48034	48034	48034	48165

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	48034	48034	48034	48165	48034	48034	48034	48165	48034	48034	
2	CENRTC											
3	LINE ITM											
	REPORT TOTAL	48034	48034	48034	48165	48034	48034	48034	48165	48034	48034	



FY 1996 Performance Baseline Schedule

1.1.1.3.01.02 Waste Retrieval - DST Retrieval

29509043.13

WESTINGHOUSE HANFORD COMPANY — PRIMAVERA PROJECT PLANNER — TWRS INTEGRATED SCHEDULE

COST LOADING REPORT — UNITS IN K$s

1.1.1.3.01.02 - DST Retrieval - FY 96 Cost/Month — TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.01.02.01 - PROGRAM ADMINISTRATION	30	27	26	30	27	29	30	30	27	29	30	27	344
	1.1.1.3.01.02.02 - SYSTEM DEFINITION	497	452	429	505	245	33	48	48	43	45	48	43	2435
	1.1.1.3.01.02.03 - W-151 101AZ RETRIEVAL	91	83	78	36	33	34	15	15	14	14	15	14	442
	1.1.1.3.01.02.04 - W-211 INITIAL RET. SYSTEM	107	107	111	93	86	92	81	84	92	51	48	46	1000
	1.1.1.3.01.02.05 - DST - FUTURE PROJECTS													
	1.1.1.3.01.02.06 - DST - OPERATIONS	96	88	83	96	88	92	96	96	88	92	96	88	1098
TOTAL	1	822	757	728	760	479	280	270	273	264	231	237	218	5319
2 - CENRTC														
	1.1.1.3.01.02.03 - W-151 101AZ RETRIEVAL	111	101	96	111	101	106	111	111	101	106	111	101	1262
TOTAL	2	111	101	96	111	101	106	111	111	101	106	111	101	1262
3 - LINE ITM														
	1.1.1.3.01.02.03 - W-151 101AZ RETRIEVAL	280	254	242	70	63	66							975
	1.1.1.3.01.02.04 - W-211 INITIAL RET. SYSTEM	129	129	134	574	551	589	721	752	728	764	764	2640	8476
TOTAL	3	409	384	375	644	614	655	721	752	728	764	764	2640	9451
	REPORT TOTAL	1341	1241	1199	1514	1194	1041	1102	1136	1092	1101	1112	2959	16032

7.3 TANK FARM CLOSURE (WBS 1.1.1.3.1.3)

7.3.1 STRATEGY

The strategy for Tank Farm Closure project is removal of adequate waste from the tanks so that the tank farm ancillary equipment, contaminated soil, and the tanks themselves will be considered by the U.S. Nuclear Regulatory Commission to be non HLW and may be disposed of in place in accordance with applicable regulations and agreements. This necessitates an early focus on engineering studies, sampling and characterization, contaminant transport modeling, and development of risk analysis methodology as a basis for evaluation of closure alternatives. Cost benefit analysis will be used as an input to the selection of preferred alternatives. Once quantifiable information is obtained, decisions affecting closure can and will be made that determine the configuration and condition of the respective operable units at closure. Final decisions on closure configurations will be made and approval will be obtained through a supplement to the TWRS EIS.

The overall management of the Waste Retrieval projects will be performed from the Tank Farm Closure project since it attains the end point of all the Waste Retrieval projects. TWRS program integration, the Waste Retrieval project planning, performance reporting, and programmatic systems engineering aspects consisting of the functional and technical requirements decomposition will be administered as well. This includes implementation of the TWRS Program systems engineering iterative structured process as it pertains to the policies and framework for managing TWRS systems engineering as well as all activities necessary to provide interface control. The administration of systems engineering work will consist of the planning, monitoring, and controlling of work performed within the proper organizational framework, properly integrated with other site work, within the confines of the Waste Retrieval projects.

7.3.1.1 Objectives

The objective of this project is to define and implement closure configurations. These will be integrated with planning and budgeting, systems engineering, safety analysis, environmental permitting, National Environmental Policy Act, waste characterization, and technology development for the Waste Retrieval project. The approach will be to establish a basis and methodology for tank operable unit closure that includes tanks, residual waste in tanks following retrieval, materials added to tanks to immobilize residual wastes and/or prevent subsidence, surface barriers, and contaminated soil and tank farm ancillary equipment within the boundaries of the tank operable unit.

7.3.1.2 Planning Assumptions

1. The disposal alternatives ultimately selected will involve retrieving as much waste as practicable. Residual waste will be accepted as incidental waste. Waste retrieval will remove sufficient radioactivity, using processes that are economically and technically practical, that the radioactive component of the residual waste in tanks, contaminated soil, and ancillary equipment will be classified by the Nuclear Regulatory Commission as non HLW.

2. No additional waste (residual) will be removed once retrieval has been completed. Tanks with residual wastes will be closed as a landfill.

7.3.1.3 Constraints

The Tri-Party Agreement constrains the tank closure effort by requiring that certain milestones be met pending completion of the closure decision process. The project baseline provides for closure as a landfill. The imposition of more stringent regulatory constraints would adversely impact cost and schedule. Classification of the residual waste as HLW by the NRC would also have significant impacts upon the accomplishment of the TPA milestones. Detailed functional decompositions, requirement allocations, and architectures have not been developed to a level that adequately define a closure basis.

7.3.2 TECHNICAL REQUIREMENTS BASELINE

7.3.2.1 Work Breakdown Structure

The WBS for the Tank Farm Closure project is found in Attachment 7.3-1.

7.3.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Tank Farm Closure project is found in Attachment 7.3-2. Lower level dictionary sheets are available on the Performance Measurement Control System (PMCS).

7.3.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Tank Farm Closure project is found in Attachment 7.3-3.

7.3.2.4 Technology Needs

Technology development activities will be coordinated through various focus areas serving the entire DOE Complex. Of these areas, the tank focus area specific to closure is most applicable for technology development activities. An effort will be made to keep abreast of available technology (through the TFA), to use existing technologies where applicable, and to allocate research dollars in the most cost-effective manner.

7.3.3 SCHEDULE BASELINE

7.3.3.1 Summary Schedule

See Attachment 7.3-4 for the summary schedule.

7.3.3.2 Milestone Control Log

See Attachment 7.3-5 for the milestone control log. Milestone description sheets are located in Appendix A.

7.3.4 COST BASELINE

7.3.4.1 Cost Baseline Summary by Year

See Attachment 7.3-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up to the project.

7.3.4.2 Basis of Estimate

Tasks are estimated at various levels of confidence ranging from detailed bottoms-up estimates to planning feasibility estimates.

7.3.5 PERFORMANCE MEASURES

Performance measures will be tied to the development and establishment of a tank closure configuration and will deal specifically with performance elements that ensure success of the objectives. These measures include cost and schedule compliance, milestone completion, and finalization of the closure strategy.

7.3.6 EXECUTION YEAR

7.3.6.1 Technical Objectives

The technical objectives are to address and resolve the issues affecting hydrogeology, tank farm interim operations, waste retrieval, waste characterization, technology development, and regulatory compliance. Because of uncertainties surrounding the closure process, the strategy is to resolve such issues by thorough demonstrations of technical feasibility. Tri-Party Agreement Milestone M-45-06 is to provide a closure work plan with the intent to provide a road map for closure of SSTs.

Four activities are planned relative to tank farm closure within this project. The first is to incorporate regulator comments and issue the SST Closure Work Plan. This activity includes identifying regulatory criteria for comparison of closure alternatives. The second activity is to conduct engineering trade studies to evaluate closure alternatives, establish performance requirements, and assess performance and compliance with regulatory criteria. The third activity is to develop performance assessment (PA) models and develop an approach for allocation of closure system performance requirements to closure systems elements. The final activity is to interpret data obtained from monitoring and testing of the prototype Hanford Surface Barrier for inclusion in the Performance Assessment (PA) work scope.

Five prominent areas are planned relative to systems engineering. The first is the TWRS Decision Trades consisting of a determination of waste transfer concepts, a determination of excess facilities, and a determination of TWRS recycle/reuse concepts. The second is to identify the Waste Retrieval project risks in accordance with TWRS systems engineering protocol. The third is to establish the Waste Retrieval Function decision logic, documenting the strategy and approach for accomplishing the waste retrieval function (4.2.2.1). The fourth activity is to implement the four remaining issues as identified in the SRR Action Plan, which includes developing the technical requirement specifications

for waste retrieval. The fifth and final activity consists of two requirement analyses. One is to assess the plausibility of criticality during retrieval and transfer actions. The other is to assess the flammability and emissions of noxious gases during waste retrieval and transfer actions.

7.3.6.2 FY 1996 Performance Baseline Schedule

See Attachment 7.3-7 for the FY 1996 performance baseline schedule.

7.3.6.3 Cost Estimate Baseline by Month

See Attachment 7.3-8 for the month-by-month cost estimate baseline for FY 1996.

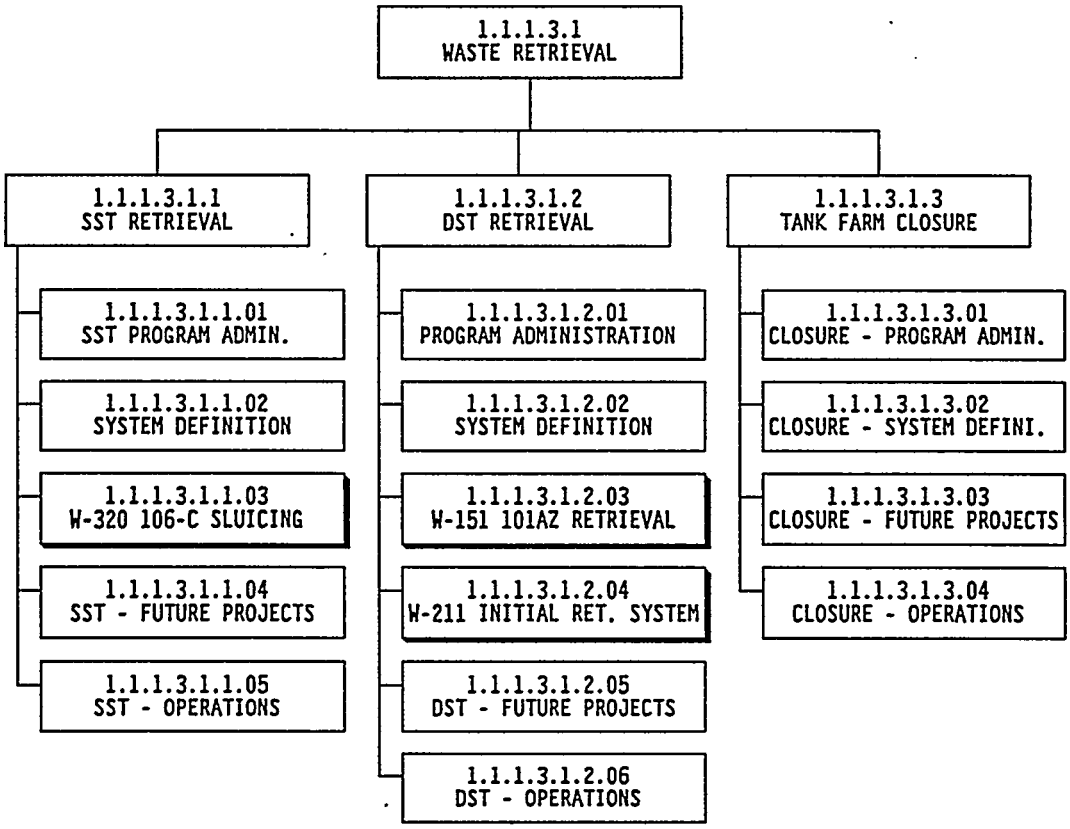
7.3.6.4 FY 1995 Work Scope Carryover Summary

None.

LISTING OF ATTACHMENTS

Attachment 7.3-1	Work Breakdown Structure
Attachment 7.3-2	WBS Dictionary Sheet
Attachment 7.3-3	Responsibility Assignment Matrix
Attachment 7.3-4	Summary Schedule
Attachment 7.3-5	Milestone Control Log
Attachment 7.3-6	Cost Baseline Summary by Year
Attachment 7.3-7	FY 1996 Performance Baseline Schedule
Attachment 7.3-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
WASTE RETRIEVAL



Attachment 7.3-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM/TITLE/PARTICIPANT	
August 31, 1995	1.1.1 TWRS Project 1.1.1.3 Disposal 1.1.1.3.1 Waste Retrieval Project	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.3.1.3/IV	Tank Farm Closure	
5. CURRENT REV. NO.	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
0		N/A
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER	9. BUDGET AND REPORTING NUMBERS	
1210-0	Operating: EW3130010 CENTRC: 35EW31301 GPP/Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars) ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	4827	3866	4854	5713	6908	7887	9259
CENRTC							
GPP							
LINE ITEM							
TOTAL	4827	3866	4854	5713	6908	7887	9259

B. TECHNICAL BASES

Goals and Objectives

This project element is part of the Waste Retrieval Project Level III WBS element and is comprised of the following Level V WBS elements:

- 1.1.1.3.1.3.1, Closure Project Administration
- 1.1.1.3.1.3.2, Closure System Definition
- 1.1.1.3.1.3.3, Closure Future Projects
- 1.1.1.3.1.3.4, Closure Operations

The ultimate goal of the Waste Retrieval Project is to close all the tank farms once waste has been removed from the tanks. The objective is to establish the bases, requirements for the Tank Operable Unit closure, and thus implement the closure configuration. Part of this effort includes management and planning for the Waste Retrieval Project, which encompasses baseline planning, monitoring and control of the baseline plans, tracking of schedules and budgets, integration of waste retrieval activities within TWRS, and Quality Assurance for the Program element. Also included

are: the Waste Retrieval Project application of TWRS System Engineering elements; Technical Requirement Specifications, Trade Studies and required analyses; decision logic definitions; and programmatic risk determinations. Tank closure definition requires an analysis to establish applicability of federal and state regulations and to reduce uncertainty and programmatic risk through identification and resolution of regulatory issues. Included in the category of regulatory issues are classification of the radioactive component of residual wastes in tanks, contaminated soil, and ancillary equipment, definition of jurisdictional authority of federal and state agencies, resolution of potential conflicts between regulations, and establishing or clarify regulatory requirements for different categories of wastes.

Major End-Item Deliverables

The end-item deliverables for this WBS element is the following Tri-Party Agreement Major Milestone:

M-45-00	09/30/2024	Complete Closure of all SST Farms

Supporting deliverables include the following Tri-Party Agreement Interim Milestones:

M-45-02A	09/30/1996	Submit Initial SST Retrieval Sequence Document
M-45-02	09/30/2017	Submit Annual Updates to SST Retrieval Sequence Document
M-45-06	09/30/2024	Complete Closure of all SST Farms

Other deliverables are:

- Issue annual budget request (ADS/MYPP)
- Issue and maintain Waste Retrieval Technical Requirements baseline document
- Issue retrieval trade/decision analyses and risk determinations

Acceptance Criteria

The Tri-Party Agreement (TPA) milestones, specifically M-45-00, establish the acceptance criteria for Tank Farm Closure.

C. STATEMENT OF WORK

The work elements that are included in this WBS are:

- Closure Project Administration

  - Provide Project Management and coordination of all Waste Retrieval Project activities through the end of the project (Tank Closure). This includes planning and performance reporting, integration of all Waste Retrieval activities, maintaining a project baseline, and interfaces with other TWRS Projects.

  - Provide for and implement the policies and process of TWRS system engineering. Fundamental elements to be attained are the Waste Retrieval Project function decomposition through the technical requirements specification, the respective definition of missions needs, requirement and decision analyses as part of the functional decomposition to the project level, identify and maintain interface control, and maintain a risk baseline.

- Closure System Definition

  - Implementation and definition of closure work plans that define pathways toward closure configurations (further decomposition of decision logic to implement Tank Farm Closures). Interface with the Washington Department of Ecology through the approval of closure plans.

- Define closure performance requirements and criteria.

- Perform requirement analyses and risk assessments to establish closure configurations, i.e., allowable residuals, surface barrier requirement, etc.

- Provide project definition tasks for closure actions to include the following:
  - establishing a project baseline,
  - test and demonstrate applied technologies and architectures,
  - prepare project documentation in accordance with system engineering protocol, and
  - perform trade studies as required to evaluate and optimize closure architecture.

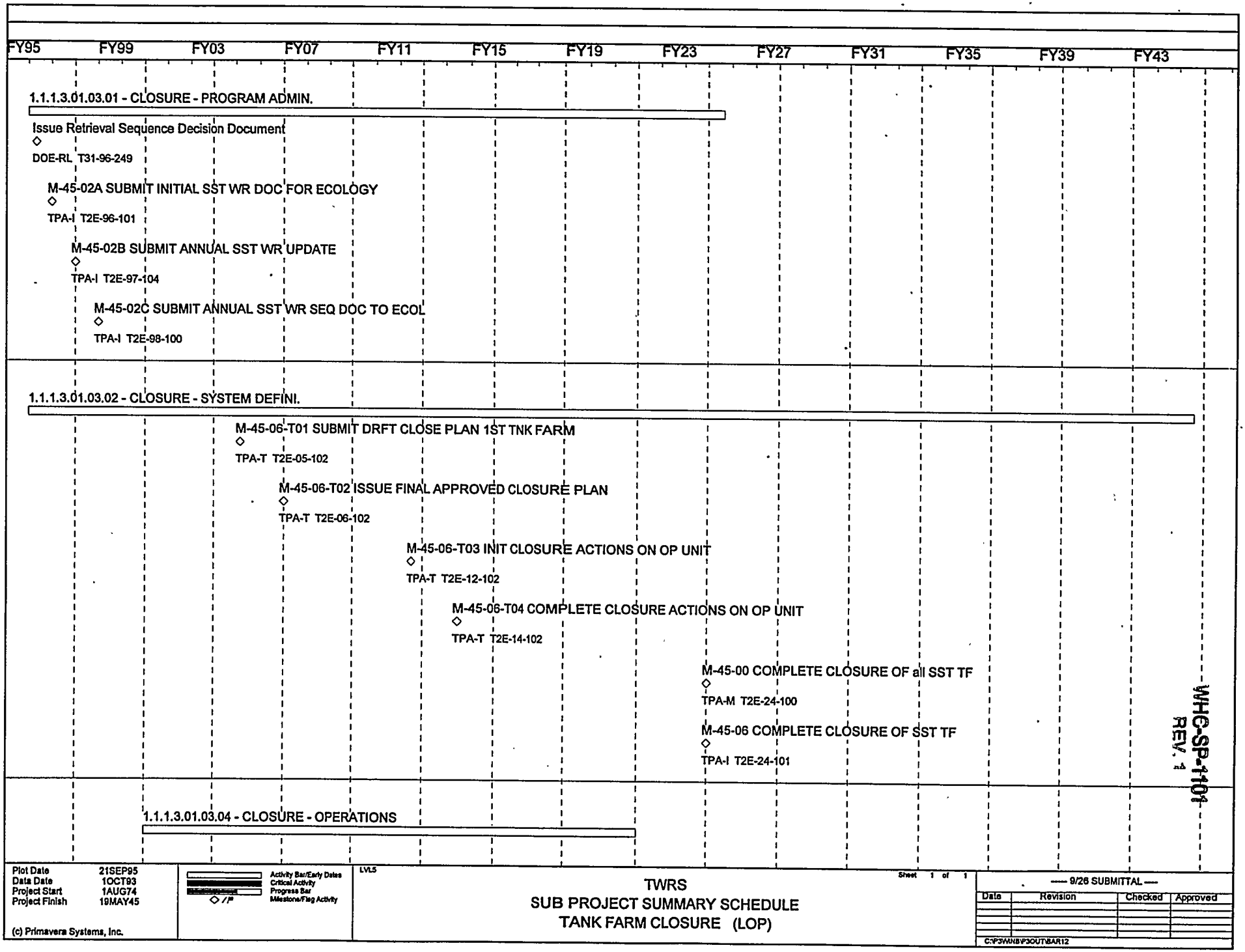
- Future Projects

  - Design, procure, and construct configurations for tank farm closure.

- Closure Operations

  - Provide for the safe implementation and monitoring of post-closure activities.

SMS WBS Code	Title	Responsible Manager:
1.1.1.3.01	**Waste Retrieval Project**	**GA Meyer**
1.1.1.3.01.03	Tank Farm Closure	LA Fort
1.1.1.3.01.03.01	Closure - Program Administration	LA Fort
1.1.1.3.01.03.02	Closure - System Definition)	EA Fredenburg
1.1.1.3.01.03.03	Closure - Future Projects	EA Fredenburg
1.1.1.3.01.03.04	Closure - Operations	EA Fredenburg



Attachment 7.3-4 Summary Schedule

1.1.1.3.01.03 Tank Farm Closure

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.01.03.02	M-45-06-T01 SUBMIT DRFT CLOSE PLAN 1ST TNK FARM	TPA-T T2E-05-102		30NOV04
1.1.1.3.01.03.02	M-45-06-T02 ISSUE FINAL APPROVED CLOSURE PLAN	TPA-T T2E-06-102		29SEP06
1.1.1.3.01.03.02	M-45-06-T03 INIT CLOSURE ACTIONS ON OP UNIT	TPA-T T2E-12-102	02APR12	
1.1.1.3.01.03.02	M-45-06-T04 COMPLETE CLOSURE ACTIONS ON OP UNIT	TPA-T T2E-14-102		31MAR14
1.1.1.3.01.03.02	M-45-00 COMPLETE CLOSURE OF all SST TF	TPA-M T2E-24-100		30SEP24
1.1.1.3.01.03.02	M-45-06 COMPLETE CLOSURE OF SST TF	TPA-I T2E-24-101		30SEP24
1.1.1.3.01.03.01	M-45-02A SUBMIT INITIAL SST WR DOC FOR ECOLOGY	TPA-I T2E-96-101		30SEP96
1.1.1.3.01.03.01	M-45-02B SUBMIT ANNUAL SST WR UPDATE	TPA-I T2E-97-104		30SEP97
1.1.1.3.01.03.01	M-45-02C SUBMIT ANNUAL SST WR SEQ DOC TO ECOL	TPA-I T2E-98-100		30SEP98
1.1.1.3.01.03.01	Issue Retrieval Sequence Decision Document	DOE-RL T31-96-249		31JAN96

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.01.03 - Tank Farm Closure - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	176741	4827	3866	4854	5713	6908	7887	9259	10317	9895	6271
2	CENRTC	149721										
	REPORT TOTAL	326462	4827	3866	4854	5713	6908	7887	9259	10317	9895	6271

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	6278	5389	5410	5389	4876	3587	3681	3753	3704	3740	3754
2	CENRTC						10696	10932	11119	10055	10730	10773
	REPORT TOTAL	6278	5389	5410	5389	4876	14283	14613	14872	13758	14471	14527

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	3729	3729	3740	3754	3740	2694	2680	2672	7068	5903	5903
2	CENRTC	10688	10688	10730	10773	10730	10730	10688	10388			
	REPORT TOTAL	14417	14417	14471	14527	14471	13424	13368	13061	7068	5903	5903

Attachment 7.3-6 Cost Baseline Summary by Year
Sheet 1 of 2

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

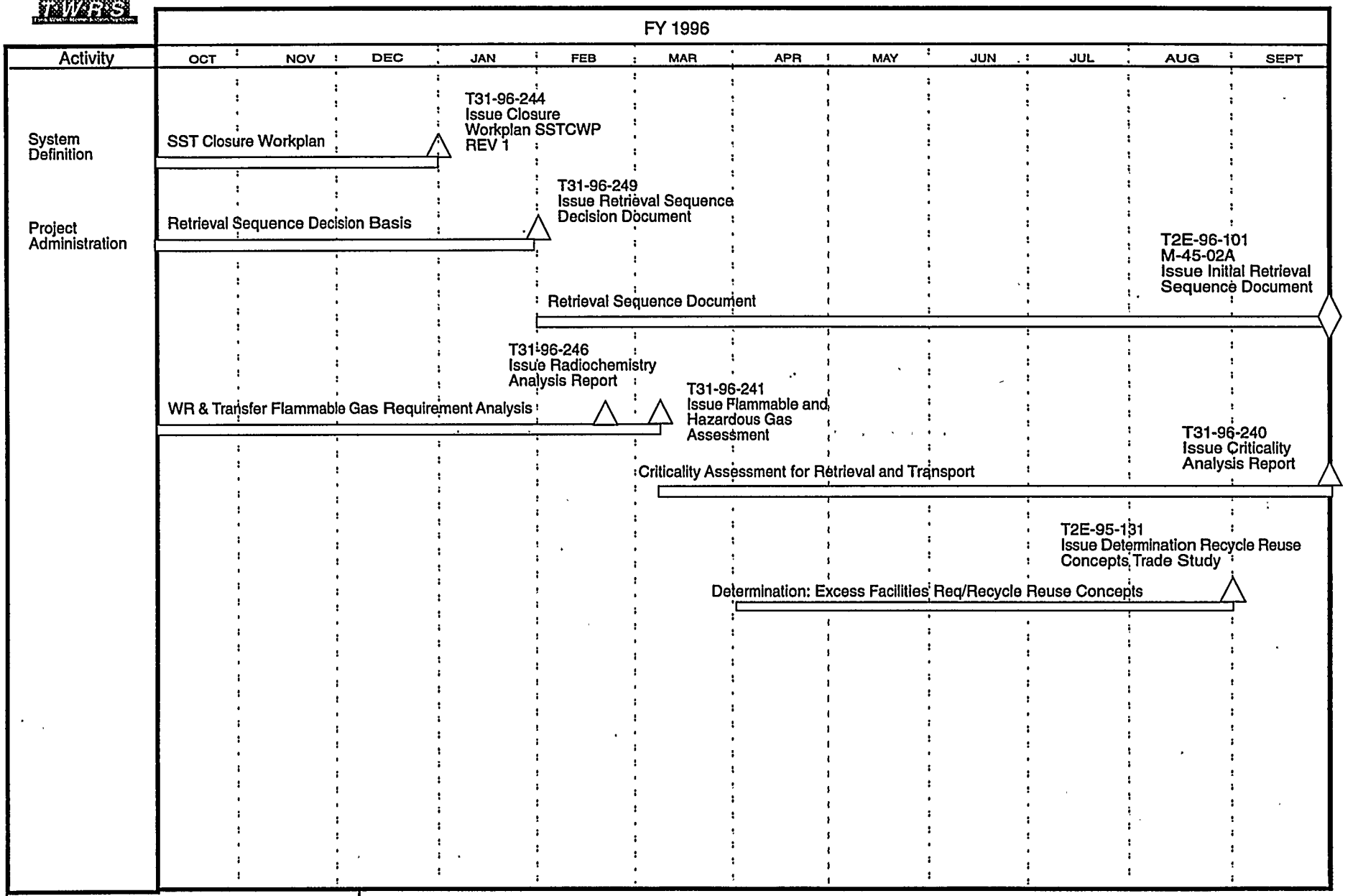
1.1.1.3.01.03 - Tank Farm Closure - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038
1	EXPENSE	5903	348	349	349	351	349	348	348	351	349	351
2	CENRTC											
	REPORT TOTAL	5903	348	349	349	351	349	348	348	351	349	351

CATEGORY	CATEGORY DESCRIPTION	FY 2039	FY 2040	FY 2041	FY 2042	FY 2043	FY 2044	FY 2045	FY 2046
1	EXPENSE	348	348	358	363	363	365	230	
2	CENRTC								
	REPORT TOTAL	348	348	358	363	363	365	230	

Attachment 7.3-6 Cost Baseline Summary by Year
Sheet 2 of 2

Draft



FY 1996 Performance Baseline Schedule

1.1.1.3.01.03 Waste Retrieval - Tank Farm Closure

29509043.12

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.01.03 -Tk Farm Closure- FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.01.03.01 - CLOSURE - PROGRAM ADMIN.	313	284	270	326	304	300	305	303	292	307	326	264	3593
	1.1.1.3.01.03.02 - CLOSURE - SYSTEM DEFINI.	74	67	64	74	67	70	74	74	67	70	279	253	1233
	1.1.1.3.01.03.04 - CLOSURE - OPERATIONS													
TOTAL	1	387	351	334	399	371	370	379	377	359	377	605	517	4827
2 - CENRTC														
	1.1.1.3.01.03.02 - CLOSURE - SYSTEM DEFINI.													
TOTAL	2													
	REPORT TOTAL	387	351	334	399	371	370	379	377	359	377	605	517	4827

Attachment 7.3-8 Cost Estimate Baseline by Month

8.0 LOW-LEVEL WASTE (WBS 1.1.1.3.2)

The major efforts in the Waste Disposal program are grouped into four areas: retrieval, low-level waste (LLW) immobilization, high-level waste (HLW) immobilization, and storage and disposal. The LLW Immobilization Project is responsible for the separation of the low-activity and high-activity fractions of tank waste and the immobilization of the low-activity fraction.

8.1 STRATEGY

8.1.1 Objectives

The major objective is to treat and immobilize tank waste. This will be done with a privatization contractual arrangement. Privatization is defined as vendors, under contract with the Department of Energy (DOE), using private funding to design, permit, construct, operate, decontaminate, and decommission their own equipment and facilities to treat tank waste.

Payment for these services will take the form of fixed price per unit of product meeting DOE specifications. Vendors would be selected from a fixed price competitive process.

Privatization will be divided into two phases:

Phase 1. The "proof of concept phase" will be initiated by contract award in August 1996, will operate through at least 2005, and treat approximately 2 to 3 percent of the tank waste. The goal is to establish and demonstrate the technical, commercial, and procurement capabilities necessary for the privatization of the remaining tank disposal mission.

Phase 2. This phase is expected to begin with contract award in 2005 and conclude shortly after 2028 with the completion of processing operations to dispose of the remaining tank waste.

To establish the technical, commercial, and procurement capabilities necessary for privatization of the tank disposal mission, the following general objectives have been established for Phase 1:

- Meet benchmark Tri-Party Agreement milestones
- Realize the efficiencies of the commercial sector to reduce program costs
- Demonstrate the ability to sustain program continuity to support a viable market for services
- Transition DOE out of regulatory oversight to the extent possible.
  - Occupational Safety and Health will regulate industrial safety.
  - In Phase 2, the Nuclear Regulatory Commission will oversee nuclear safety rather than DOE.
  - Minimize DOE participation in the environmental permitting process.

Consistent with the Phase 1 general objectives, the LLW Project includes the following objectives for Phase 1:

Technical Objectives:

- Settle bulk solids from liquid via settle decant
- Separate solids in supernatant from liquid
- Separate fission products from liquid (for example, cesium and technetium, etc.)
- Remove transuranics (TRU) and strontium complexed with organics
- Remove soluble TRU
- Demonstrate melter feed capabilities
- Operate melter at 15 to 20 metric tons per day glass equivalent
- Demonstrate offgas treatment capabilities
- Demonstrate projected waste loading in glass.

Commercial Objectives:

- Establish a commercially viable market
- Establish the principal of paying for product
- Establish an experience base for pricing deliverables in Phase 2
- Develop and maintain cost competitive situation.

Procurement Objectives:

- Purchase services to process high- and low-activity radioactive waste
- Develop performance and acceptance specifications for products
- Establish a sufficient understanding of operations to write and award contract and execute Phase 2.

General Schedule for Phase 1:

Contract award	August 30, 1996
Complete environmental permitting	January 2000
Initiate construction	January 2000
Complete radiological safety analysis review	January 2002
Complete construction	January 2002
Operations	
Cold startup	January 2002
Hot startup	July 2002
Proof-of-concept operations	July 2002 to January 2005
Additional operations start (optional)	January 2005
Decontamination and decommissioning and RCRA closure of Phase 1 facility	Within 2 years of completing Phase 1 activities (including optional additional operations)

General Schedule for Phase 2:

Contract award	2005
Design, permitting, licensing, construction and startup - Low-activity waste	2005 to 2011
Operations - Low-activity waste	2011 to 2021
Decontamination and Decommissioning -Low-activity waste	2021 to 2026

8.1.2 Planning Assumptions

1. DOE will continue to own and administer the Hanford Site.

2. The Tri-Party Agreement and its amendments will continue to provide the basis for much of the cleanup activity at the Hanford Site, and funding will be available to carry out that activity.

3. Current stakeholders and the public will continue to be involved in and interested in the cleanup and associated decisions at the Hanford Site, and funding will be available to support that involvement.

4. The management and operating (M&O) contractor will remain the integrating contractor responsible for maintaining the technical and programmatic baseline, which includes but is not limited to the following: performing system engineering (trade studies), identifying interfaces (interface control documents), defining requirements (updated mission analysis and functions and requirements document), establishing the repository interface (waste acceptance documents), and providing the required infrastructure (utilities and tank farm-specific).

5. The M&O contractor will not act as the integrating contractor for vendor payments. Although the work described in item 4 is performed by Westinghouse Hanford Company (WHC) for the Hanford Site, DOE will be the integrator for vendor payment.

8.1.2.1 1996 Planning Basis

1. The Tank Waste Remediation System Environmental Impact Statement (TWRS EIS) will be available in 1996. The Record of Decision will provide updated guidance for disposal of all double-shell tank and single-shell tank waste, replacing the guidance of the *Environmental Impact Statement for Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes* and the associated *Record of Decision for Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes*, which was issued on April 14, 1988.

2. All tank waste from SSTs and DSTs will be retrieved for immobilization and stable disposal.

3. Tank waste will be separated into low-activity and high-activity fractions.

4. The low-activity fraction of tank waste will be immobilized for storage and eventual onsite disposal.

5. Privatization will occur in two phases: a proof-of-concept phase (1) and phase 2, which will dispose of the remaining tank waste.

6. Immobilization of HLW and LLW will be performed in Phase 1 and Phase 2.

7. The HLW and LLW Projects (RL/WHC/PNL) will prepare the Requests for Proposal to obtain the private vendors, evaluate proposals, and evaluate Phase 1 results in anticipation of preparing Phase 2 Request for Proposal.

8. Costs for vendor facility acquisitions and product payments are consolidated in the LLW and HLW Projects. DOE will not pay for vendor design.

9. The Storage and Disposal Project will assure that the vendor meets product acceptance requirements.

10. Of the actions identified in the System Requirements Review (SRR) Action Plan, which pertain to the disposal mission, only those required to support the privatization acquisition strategy will be implemented by the M&O contractor; the remaining actions will be included in the vendor scope as appropriate.

11. The LLW Project will be affected by the resolution of the System Requirements Review Action Plan, issue PI-1 (Tri-Party Agreement milestones as programmatic constraints), which is assigned to be dispositioned by the TWRS Program integration.

12. The LLW Project of the M&O contractor is assigned to disposition the following System Requirements Review Action Plan issues:

    - CW-1 (Concentrate Waste Performance Requirements) for Phase 1 tank waste
    - CW-2 (Concentrate Waste Architecture Evaluation and Selection) for the Phase 1 period through 2011
    - LLW-6 (Immobilize and Dispose LLW: Identification of Constraints and Development of Performance Requirements/Alternative Analysis for Treatment/Disposition of Gaseous Effluent) for Phase 1 tank waste.

    The LLW Project of the M&O Contractor also provides input to the LLW Phase II Vendor(s) for CW-1 (Concentrate Waste Performance Requirements).

13. The Phase 1 Privatization vendors will perform work in accordance with their contracts that address and satisfy the following SRR Action Plan issues. Action to track these issues in the context of the SRR Action Plan will be discontinued.
    - LLW-2 (Immobilize and Dispose LLW: Develop Alternatives for Low-Level Waste Form) except for findings related to performance assessment and storage and disposal compositional criteria which are assigned to the S&D Project.
    - LLW-3 (Immobilize and Dispose LLW: Output Requirements for Pretreatment)
    - LLW-4 (Immobilize and Dispose LLW: Provide Technical Basis for Glass Rework Assumption for Hanford Vitrification Facilities).

14. The Phase 2 privatization vendors are assigned to disposition the following tasks:
    - CW-1 (Concentrate Waste Performance Requirements)
    - CW-2 (Concentrate Waste Architecture Evaluation and Selection) for the Phase 2 period beginning 2011

    The Phase 2 vendor will also participate in LLW-2 and LLW-3 for Phase 2 tank waste.

15. The Storage and Disposal Project of the M&O contractor is assigned to disposition the following System Requirements Review Action Plan tasks:

    - PI-8 (Radionuclide Removal from Tank Waste Supernatant), which needs resolution to support Phase 1 and Phase 2
    - LLW-1 (Immobilize and Dispose LLW: Quantitative Performance Requirements for LLW Form)

    The Storage and Disposal Project will also integrate the disposition of LLW-2 and LLW-3 for Phase 2 tank waste because each Phase 2 vendor may have different process requirements and/or different waste forms.

16. Solid waste containing nonradioactive hazardous constituents will be treated and disposed of onsite or shipped offsite for disposal.

17. Liquid effluents will be treated to reduce the level of hazardous components and will be controlled through release permits.

18. Radioactive liquid effluents from LLW vendors will be returned to tank farms for storage, treatment, and disposal or sent directly to the Liquid Effluent Retention Facility, if appropriate.

19. DOE policy and commitments to the public and stakeholders constrain siting new tank waste processing facilities in the existing 200 Areas.

20. The sodium stored at the Fast Flux Test Facility will be converted into sodium hydroxide by the facility transition program and supplied to the disposal program for processing tank waste.

21. The 242-A Evaporator will continue to support the Waste Storage program and Waste Disposal program through the year 2011 when Phase II of privatization, full-scale production, begins.

22. Funding for the 242-A Evaporator operation will be in the Waste Storage program until it is transferred to the Waste Retrieval Project, where it will remain until Phase 2 privatization LLW operations begin in 2011.

23. The 242-A Evaporator shall be maintained to provide waste concentration capability to the Phase 1 privatization LLW and HLW decontamination and decommission operations whether these operations are completed in January 2005 or continued until Phase 2 operations begin in the year 2011.

24. The M&O contractor will not continue the solicitation process for an A&E to design the LLW Vitrification Facility.

25. The M&O contractor will not resume activities to continue the conceptual design of the Initial Pretreatment Module.

8.1.2.2 Assumptions for Phase 1. Phase I includes proof-of-concept (2002 to 2005) and extended operations (optional) (2005 to 2013) with decontamination and decommissioning and RCRA closure of the Phase 1 facility.

1. The LLW immobilization for Phase 1 will be performed by two vendors in facilities; each will have a nominal capacity of processing waste of 15 to 20 liters per minute (22,000 to 29,000 liters per day), or 100 moles of sodium per minute.

2. The LLW immobilization for Phase 1 will result in approximately 20 metric tons per day of containers of immobilized product being provided to the Storage and Disposal Project for interim storage.

3. Solid Waste containing radioactive constituents, both radioactive mixed waste and low-level radioactive waste, will be transferred to the Storage and Disposal Project.

4. All vendor, M&O, and other contractor funding for Phase 1 shall be expense funding.

5. Budget validation for the privatization activity and related support will be achieved in time to support the Phase I schedule.

6. The assumed designated site for Phase 1 LLW and HLW project facilities is the grout site, which is near the AP tank farm. This site was chosen to minimize infrastructure costs such as transfer lines.

7. To meet tank farm operations storage criteria, the supernatant from sludge washing will be interim stored by the M&O contractor in existing storage space without prior chemical separation of the radionuclides.

8. No technology development is required by the M&O contractor, research and development contractor, or other national laboratories in support of Phase 1 LLW procurement support for privatization.

9. For program planning purposes, it is assumed that the option to extend operations will be exercised, and the Phase 1 disposal facilities will be operated until Phase 2 facilities are operational. At that time, the Phase 1 facilities will be decontaminated and decommissioned. However, DOE will retain the option to continue operating these facilities in support of Phase 2.

10. If the option to extend Phase 1 operations is exercised, additional tanks serving as sources of waste tanks will be identified to the affected Phase 1 vendor(s). There are significant quantities of feed in tanks 241-AZ-101 and 241-AZ-102 to serve as feed for HLW immobilization for several years.

11. DOE does not want to preclude the potential for overlap between Phase 1 and Phase 2 operations.

12. Interim onsite storage of the Phase 1 immobilized LLW product containers as well as transportation to this storage facility will be the responsibility of the M&O contractor (Storage and Disposal Project).

13. The M&O contractor will receive the LLW immobilized product, perform acceptance testing, and maintain the product in safe, clean, and stable interim storage.

14. Each Phase 1 vendor will be assigned a feed tank for the tank waste that is to be supplied to each of them.

15. All tank farm piping, valving and related infrastructure support leading to the feed tanks (that is, upstream from the tanks) will be provided by the M&O contractor through the disposal program (not the landlord or other programs).

16. All vendor site infrastructure support (for example, instrumentation) in the feed tanks or downstream from the tanks to vendor facilities shall be provided by the vendors.

17. The LLW interim storage provided by the M&O contractor (Storage and Disposal Project) will accept only LLW immobilized product.

18. Solid waste, mixed waste liquids, and failed equipment from Phase 1 privatization vendors will go to the proper storage and/or disposal. The M&O contractor (Storage and Disposal Project) will be responsible for the infrastructure to receive these secondary streams in support of the DOE-RL infrastructure sub-project.

19. The following Tri-Party Agreement milestones will be achieved on or ahead of schedule as a result of Phase 1 privatization:

    M-50-02-T01 Complete construction of LLW pretreatment facility (January 2002 rather than December 2003 for Phase 1)

    M-50-02 Start hot operations of LLW pretreatment facility (July 2002 rather than December 2004 for Phase 1)

    M-60-05 Initiate hot operations of LLW immobilization facility (July 2002 rather than June 2005 for Phase 1)

20. The M&O will store separated Tc, Cs and Sr/TRU products provided by the vendor.

21. The following Tri-Party Agreement milestones will be achieved with a delayed schedule as a result of Phase 1 privatization:

    M-50-01-T02 Submit conceptual design and initiate definitive design for a LLW pretreatment facility (December 1996 delayed to TBD. This work will be done by the privatization vendors for Phase 1)

    M-50-01 Start construction of LLW pretreatment facility (November 1998 delayed to January 2000 for Phase 1)

22. The draft Phase 1 RFP will be completed with enough detail to require a minimal amount of rework to finalize. RFP rework will have a minimal cost and a minimal impact on vendor proposals.

23. During the design/permitting stage of Phase 1, three contractors will be awarded fixed price contracts from competitive proposals. Later, only two of these contractors will be awarded contracts to proceed.

24. Site characterization work for Phase I vendor facilities is assumed to be in the grout area near the AP tank farm; it includes such activities as ground penetrating radar, soil samples, radiation survey, etc. in the past FY 1996 time frame.

25. Phase 1 vendors will identify to the M&O contractor tank waste sample needs and will provide funds to acquire samples and conduct laboratory analyses. If new equipment is required, such payment will include reimbursement for hardware and support capability .

26. Results from new Hanford Site utility and other site infrastructure-related engineering studies will not be required by Phase 1 vendors prior to April 1997.

27. TWRS infrastructure upgrades needed to support privatization can be achieved without schedule impact to vendor plans.

28. Vendor(s) will provide funding for design & construction of any utilities/infrastructure required to support the vendor(s) plant(s).

8.1.2.3 Assumptions for Phase 2. Full-scale low-activity waste operations (2011 to 2021) and decontamination and decommissioning (2021 to 2026) will take place.

1. The LLW immobilization for Phase 2 will be performed by two vendors in facilities, each with a nominal combined capacity for processing all SST and DST waste by 2028.

2. Infrastructure cost estimates assume all vendor Phase 2 LLW and HLW immobilization facilities are in the same general area.

3. Any technology development required by the M&O contractor to support issuing the RFP for Phase 2 privatization or the evaluation of proposals will be funded by the EM-50 Office of Technology Development through the Tank Focus Area.

4. Any technology development required by DOE to support technical or programmatic risk reduction associated with privatization or to maintain a core competency to pursue an alternate approach will be funded by the EM-50 Office of Technology Development through the Tank Focus Area.

5. The following Tri-Party Agreement milestones will be achieved on or ahead of schedule as a result of Phase 2 privatization:

   M-50-00 Complete pretreatment processing of Hanford tank waste (2021 rather than December 2028)

   M-60-00 Complete LLW immobilization (2021 rather than December 2028)

6. The following Tri-Party Agreement milestones will be achieved with a delayed schedule as a result of Phase 2 privatization:

   M-50-01-T02 Submit conceptual design and initiate definitive design of LLW pretreatment facility (December 1996 to TBD. This work will be done by the privatization vendors for Phase 2)

   M-50-01 Start construction of LLW pretreatment facility (November 1998 delayed to 2005 to 2011 for Phase 2)

   M-50-02-T01 Complete construction of LLW pretreatment facility (February 2003 delayed to 2005 to 2011 for Phase 2)

   M-50-02 Start hot operations of LLW pretreatment facility (December 2004 delayed to 2011 for Phase 2)

   M-60-02 Complete melter feasibility and system operability tests, select reference melter(s), and establish reference LLW glass formulation which meets complete system requirements (November 1996 to TBD. This work will be done by the privatization vendors in Phase I).

   M-60-03 Submit conceptual design and initiate definitive design of the LLW vitrification facility (November 1996 to TBD. This work will be done by the privatization vendor for Phase II).

   M-60-04 Initiate construction of the LLW vitrification facility (delayed from December 1997 to 2005 for Phase II).

   M-60-05 Initiate hot operations of the LLW vitrification facility (delayed from June 2005 to 2011 for Phase II).

   M-60-05-T01 Complete construction of the LLW vitrification facility (delayed from December 2003 to 2011 for Phase II).

7. The vendors for Phase 2 LLW immobilization will provide LLW product directly to the disposal facility. It is assumed that there is no interim storage required for the Phase 2 LLW product.

8. The Phase 2 site characterization work will be completed between 2002 to 2005 time frame rather than the currently planned period defined in WHC-SD-WM-PLN-19, *Characterization Plan for the Proposed TWRS Treatment Complex.*

9. LLW infrastructure needs were based upon planning done for the draft RFP for Phase 1 privatization; these will be updated with vendor input following initial design.

10. The draft Phase 2 RFP will be completed with sufficient detail to require a minimal amount of rework to finalize; RFP rework will have a minimal cost and a minimal impact on vendor proposals.

11. Radioactive liquid effluents from the Phase 2 LLW vendors will be returned to the tank farms, which are operated by the retrieval vendor for storage, treatment, and disposal, or will be sent directly to the Liquid Effluent Retention Facility (LERF), if appropriate.

12. The retrieval vendor(s), Phase 2 LLW and HLW vendors may be different from each other and from Phase 1 vendors.

13. Cesium, strontium, and technetium, after separation by the Phase 2 vendors, will be stored by HLW Phase 2 vendors in containers, not in large underground storage tanks.

14. If the Waste Characterization Project no longer exists at the time of Phase 2, then the Waste Retrieval Project will become the repository for all tank waste characterization data.

8.1.3 Constraints

The key items that limit achievement of the LLW immobilization project mission or provide current obstacles to the project objectives include the following.

8.1.3.1 Technology Development/Applied Engineering

The two assumptions, that no Phase I technology development is required and that any Phase 2 technology development required will be funded by EM-50, are risky. Technology development for removal of technetium from Hanford wastes is in its early stages. No effective alkaline solution approach has yet been demonstrated, although one has been postulated and still needs laboratory evaluation. Strontium removal from Hanford complexed waste has been demonstrated in FY 1995 laboratory studies. Removing these elements will require bench-scale testing to generate information supporting the design of production scale processes. Both these radioactive elements are planned to be removed from the waste in Phase 1. The EM-50 program, which has a national focus, has only a limited budget to apply to Hanford Site-specific problems. Generally, many of the LLW Project technology issues are waste-specific in nature and therefore require site-specific work not directly transferable to other sites.

8.1.3.2 TWRS Functions and Requirements

The TWRS functions and requirements (F&Rs) includes the identification of inputs, outputs, and constraints for each function identified by the TWRS systems engineering architecture. The architecture associated with the LLW Project consists of the pretreat supernatants and immobilize LLW functions. For each function the technical requirements will be defined in technical requirements specification (TRS), which provides constraints, performance specifications, interface definitions, interface diagrams, and architecture tables. The interface control document (ICD) identifies interfaces, the physical transfer of feeds and products, and acceptance requirement between the M&O contractor and the private vendor. Issues identified in the SRR Action Plan assigned to the LLW Project will be resolved and incorporated in the TWRS system engineering documentation.

8.1.3.3 Tank Waste Characterization Information

A key shortcoming to moving forward with confidence in developing a capability to treat and dispose of all tank waste at the Hanford Site is the limited knowledge of the characteristics and composition of waste in each tank or group of tanks. It is essential that sufficient knowledge be gained from characterization data and information to ensure that all requirements are met for providing suitable feed streams for separating the low-activity and high-activity fractions and to perform the necessary pretreatment and immobilization processes for all Hanford tank waste. At this time, information is limited, requirements are being established through the data quality objectives process (previously developed by the Environmental Protection Agency), and samples are being gathered and analyzed by the Waste Characterization Project. The constraint is the ability of the Waste Characterization Project to meet the needs for data and information to support Phase 1 and Phase 2 vendor design needs and to meet the safe storage information needs of the M&O contractor, given limited resource availability.

8.1.3.4 Availability of Tank Waste Samples and Capability for Taking Samples

Currently the Waste Characterization Project has a limited capability to obtain, transport, and unload radioactive tank samples for testing. The Waste Characterization Project can take either 100 milliliter liquid dip samples or approximately 250-milliliter liquid segment samples using its sludge core sampling equipment. Estimates of several liters to many tens of liters of liquid waste have been identified to conduct single pass ion exchange tests for cesium removal with even the smallest possible column size of approximately 10 milliliters.

The time to design, procure, and assemble a system to significantly increase sample capacity to a nominal value of 3 liters is approximately 21 months. If a system is not funded relatively soon, there would not be time to support tests for data generation required early in the vendor process design. It is currently assumed that the vendor will identify the need for samples and provide the capability to obtain the samples after the vendor contracts have been awarded and the vendor has initiated his design. It is necessary that the sampling hardware capability proceeds on a tight schedule without difficulty and that the Waste Characterization Project of the M&O contractor is able to take the required samples on an expedited basis. To date the Waste Characterization Project has not demonstrated this capability. This is a very risky assumption given the time required to establish the sampling capability, obtain the samples, and conduct tests to support an aggressive Phase 1 hot startup schedule.

8.1.3.5 Project Funding and Validation Schedules

The LLW Project has assumed that all engineering, design, and construction of Phase I infrastructure facilities and systems can be expense funded. This allows the infrastructure acquisition schedule and the privatization schedule to be compatible. The assumption is based on the intended use of the facilities and systems. Phase I is a proof-of-concept activity resulting in a LLW processing facility that will complete its mission in approximately three years. Guidelines that separate expense-funded projects from capital-funded projects suggest two basic criteria: if facility life is not expected to exceed two years, or if the facility is considered to be a prototype, it can be built and constructed using expense funding. The basis of the assumption is that the infrastructure required for Phase I qualifies as a prototype.

If the strategy and designation are not accepted, the infrastructure sub-project must be capital funded, and the schedule would not be compatible with the privatization schedule. Whether expense or capital, the sub-project must go through validation and approval steps. It is suggested that validation and approval be a local DOE-RL responsibility because of the nature and importance of the infrastructure to privatization. This approach will ensure that critical schedules will be met.

8.1.3.6 Availability of Specification for LLW Immobilization Product

Complete quantitative specifications for the LLW immobilization product do not currently exist. No quantitative requirements based on an accepted LLW performance assessment have been established. The quantitative performance requirements for the LLW form depend on the performance of the entire waste disposal system, of which waste form is but one part. (The disposal system consists of engineered barriers, man-made structures such as a vaults, the waste form, and the vadose zone.) Models are being developed to assess the disposal system, and data are being collected to improve and verify the models. Data are needed for all aspects of the disposal system including site- and waste form-specific data. The collection of data, development of defensible models and achieving both regulatory and public acceptance of the models is a lengthy process. This process will not be completed for several years after the Phase 1 privatization contract is awarded; therefore, there is significant risk that the acceptability of the vendor-produced Phase 1 product will be impacted. This could cause the product to have to be reworked at considerable cost to DOE.

8.1.3.7 Facility Sites for Different Vendors for Phase 1 and Phase 2

It is assumed that all vendor facility sites for each phase are close enough together that only one infrastructure and one set of utility supply systems will be needed for each phase. For example, it is assumed that one electrical supply system would service LLW and HLW vendor sites for Phase I. If one phase had multiple sites, multiple electrical supply systems would be required; such additional costs are not currently a part of the Multi-Year Program Plan.

Another assumption is that the Phase I site will not be the same as the Phase II site. Therefore, a different set of utility supply and infrastructure support systems is planned. Funding based upon this assumption may be conservatively high if the same site is chosen for Phase II as Phase I.

8.1.3.8 Infrastructure availability for different vendors for both phases

It is assumed that no engineering studies for infrastructure or utilities will be started until the award of the Phase I contract. The scheduled need to supply infrastructure and utilities may be sooner than DOE can supply them. If funding were provided earlier to support this project definition work, vendor requirements would have to be anticipated. If requirements were anticipated correctly, there would be a greater possibility of meeting requirements in a timely manner.

8.2 TECHNICAL REQUIREMENTS BASELINE

LLW Project Technical Documents Tree & Product Structure

The systems engineering process is being used within the TWRS Program to develop and maintain a technical baseline. The technical basis for the LLW Project is derived from the systems engineering functions and requirements work and the technical documents tree and the product structure that support the TWRS cleanup mission. For the TWRS Program Technical Baseline, the TWRS Safety and Technical Integration group is providing the integrating function, funded by Management Systems (ADS 1200). TWRS Disposal Engineering is providing the integrating support for all projects, including the LLW Project, within the Disposal program.

For the Functional Requirements Baseline these documents include the TWRS Functions and Requirements (F&R) documents and the Initial Baseline Systems Description. In FY 1996 the LLW Project will provide input to support the TWRS F&R update to be issued in September 1996. Support for resolution of the Systems Requirements Review issues will also be provided by the LLW Project as indicated in the Planning Basis section of this narrative. These will be done in accordance with the TWRS System Requirements Review Action Plan, DOE/RL-95-74.

For the Technical Requirements Baseline, these documents include updated F&R documents, Technical Requirements Specifications (TRSs), Interface Control Documents, and an updated Baseline Systems Description. In FY 1996, the LLW Project will provide input to support the TWRS TRS internal review, which is scheduled to begin in March 1996.

Within the LLW Project a Design Requirements Baseline will be established. Design Requirements Documents (DRDs) will be issued consistent with the TRSs. In FY 1995, draft DRDs were prepared for LLW Pretreatment and LLW Immobilization. These will serve as a starting point. Other documents that must be prepared are Functions and Operational Requirements (F&ORs), Design Concept Descriptions, Updated Interface Control Documents, Flowsheets (Energy/Mass), Pipe and Instrumentation Diagrams, and Updated Project Level Documentation. These will extend through the design portion of Phase 1 privatization. Preliminary drafts of several of these documents have been prepared as input to the Phase 1 Request for Proposal (RFP), which is due for release in FY 1996 (draft RFP in November 1996 and final at the end of March 1996).

Privatization Phase 1 and Phase 2 activities will involve extensive integration involving the M&O contractor with the different vendors. These documents will serve a vital function in establishing and maintaining an integrated approach to meeting Disposal program goals and objectives.

An As-Built Configuration Baseline will be generated before startup and operations in FY 2002 for Phase 1. It will include startup and operations documentation, updated flowsheets, and pipe and instrumentation diagrams.

Subsequently, an Operational Baseline will be prepared to support the operations period, which begins in FY 2002 for Phase 1.

Finally a Decontamination and Decommissioning (D&D) baseline will be prepared to support the D&D of the facilities, which will be performed at the end of Phase 1 operations.

8.2.1 Work Breakdown Structure

The WBS tree for the LLW Project is in Attachment 8-1.

8.2.2 WBS Dictionary Sheets

The WBS dictionary sheet for the LLW Project is in Attachment 8-2. Lower level dictionary sheets are available on the Performance Measurement Control System (PMCS).

8.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the LLW Project is in Attachment 8-3.

8.2.4 Technology Needs

8.2.4.1 Establish a Three-Liter Sample Acquisition Capability

This activity includes the design, procurement, assembly, testing and completion of a readiness review of a three-liter sampling capability. This capability will facilitate ion exchange testing of multiple cycles of nominal 10-milliliter columns for low-capacity resins such as CS-100 and non-regenerable material testing for high capacity materials such as crystalline silicotitanate (CST). It will also facilitate laboratory-scale filter tests for sludges to support the adaptation of solids and liquids separations technology to meet Hanford Site waste-specific requirements.

This work reduces the risk of Phase 1 by providing a sampling capability that allows pretreatment process performance to be tested on a small scale with actual waste. Testing is necessary because the lack of knowledge of chemical speciation in the tanks prevents process performance prediction by the vendor. Testing with actual waste will provide a basis for proposed LLW pretreatment requirements and LLW feed and product specifications. Testing will also identify process chemistry issues associated with waste retrieval, dilution, and transport to the pretreatment processes. Waste volumes up to hundreds of liters may be needed. The current method for taking tank waste samples is limited to a 120-milliliter bottle on a wire. This is inadequate for obtaining many sample volumes required because of cost and ALARA considerations.

8.2.4.2 Conduct Column Tests for Technetium Removal Using Synthetic and Actual Waste.

Column tests will be conducted by the Argonne National Laboratory using a proprietary ion exchange resin on one synthetic waste type that is planned to be used in Phase 1 privatization. Elution of the technetium using either dilute acid or water will also be tested. Scale column tests, using one ion exchange resin for technetium removal, will be conducted on two actual waste types after the cesium has been removed upstream by three different ion exchange materials using nominally 10 milliliter columns. Technetium break-through curves will be measured in the synthetic and actual waste cases. The synthetic waste work reduces the risk of LLW Phase 1 by ensuring that information on a process to remove technetium (if the LLW specification requires technetium removal) is available to the vendor. The work with actual waste also reduces risk by ensuring that information on the process performance of technetium removal is available. This information is valuable because lack of knowledge of chemical speciation of the waste after cesium removal prevents performance prediction by the vendor.

8.2.4.3 Conduct Technetium Stability Tests Using Synthetic Waste\.

Cycling tests will be performed on a selected ion exchange material for technetium removal. Up to 25 cycles of loading and elution will be tested. Technetium break-through curves will be measured. This work reduces risk in Phase 1 by ensuring that the resin used for technetium removal is chemically stable (if technetium removal is required).

8.2.4.4 Conduct Transuranic and Strontium Precipitation Tests Using Actual Waste.

Small scale batch precipitation tests need to be conducted on actual complexed concentrate waste or other waste types if required to remove transuranics (including neptunium for performance assessment purposes) and strontium. Cations will be added to waste to co-precipitate the radionuclides of interest or substitute for the radionuclides in complexed species. This work continues a screening effort begun in fiscal year 1995. Attempts will be made to minimize the addition of cations so that the impact on glass will be minimized. This work reduces risk in Phase 1 by providing information on precipitation process performance for transuranic and strontium removal. This is necessary because lack of knowledge of chemical speciation of the waste prevents performance prediction by the vendor.

8.2.4.5 Adapt High Capacity Melters for Immobilization of Hanford Low-Level Waste

The adaptation of commercial high-volume technology for immobilization of low-level waste is one of the key challenges of the TWRS Program. In FY 1995, TWRS conducted a series of private-sector testing activities. A group of industrial experts evaluated the results of testing and identified additional test work that is necessary to ensure that private sector technologies can be successfully applied. Efforts are needed to continue developing high priority information necessary to adapt the commercial immobilization technology to Hanford radioactive waste service.

8.3 SCHEDULE BASELINE

8.3.1 Summary Schedule

The summary schedule is located in Attachment 8-4. Tables are also provided that show internal and external interfaces for Phase I and Phase II.

8.3.2 Milestone Control Log

See Attachment 8-5 for the milestone control log. Milestone description sheets are located in Appendix A.

8.4 COST BASELINE

8.4.1 Cost Baseline Summary by Year

Attachment 8-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the Project.

8.4.2 Basis of Estimate

Refer to the Activity Planning Forms and Estimating Work Sheets - Summary of the schedule activities for the basis of estimate.

8.5 PERFORMANCE MEASURES

The performance measures utilized by the LLW Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators relating to the overall conduct of operations within the project.

For the Privatization support activities (those not provided by the vendors)

- Actual versus planned/committed delivery schedule of products and services
- Estimates at completion
- Cost of significant activities
- Cost of delivered product (average cost)
- Overhead application rates
- Bench marking against the private sector
- Customer satisfaction, measured by feedback from the DOE customer and the vendor(s) being provided services
- Performance indicators
  -Lost work days
  -Recordable incidents
  -First aid cases
  -Unusual occurrence reports
  -Off normal occurrence reports.

For the Privatization activities [those provided by the vendor(s)], the performance measures are defined by the terms and conditions of the respective contracts. Typical examples are:

- Cost of delivered product (average cost of LLW immobilized waste)
- Adherence to schedule for acceptance of feed for Tank Farms
- Operation of the facilities in accordance with regulatory permits (e.g. emissions and effluents)
- Operation of the facilities within forecast site services (e.g. utilities) requirements
- Conformance of LLW immobilized product to acceptance criteria
- Conformance of HLW separated solids to acceptance criteria
- Secondary waste minimization.

8.6 EXECUTION YEAR

8.6.1 Technical Objectives

The technical objectives for the LLW Immobilization Project in the execution year are to issue the privatization RFP and to award the contract.

8.6.2 FY 1996 Performance Baseline Schedule

Attachment 8-7 contains the FY 1996 performance baseline schedule.

8.6.3 Cost Estimate Baseline by Month

Attachment 8-8 establishes the month-by-month cost estimate baseline for fiscal year 1996.

8.6.4 FY 1995 Work Scope Carryover Summary

FY 1995 carryover includes the outstanding commitment associated with the termination of the architect/engineer (Raytheon/BNFL) contract for design of the LLW Pretreatment Facility, Project W-236B (IPM). The amount of the contract termination liability is yet to be determined. Estimates range from $900,000 to $2,500,000 depending on whether the liability for breaking the facility lease is included. Currently an uncosted balance of $700,000 is identified for carryover to fund a portion of this commitment and offset additional project closeout activities.

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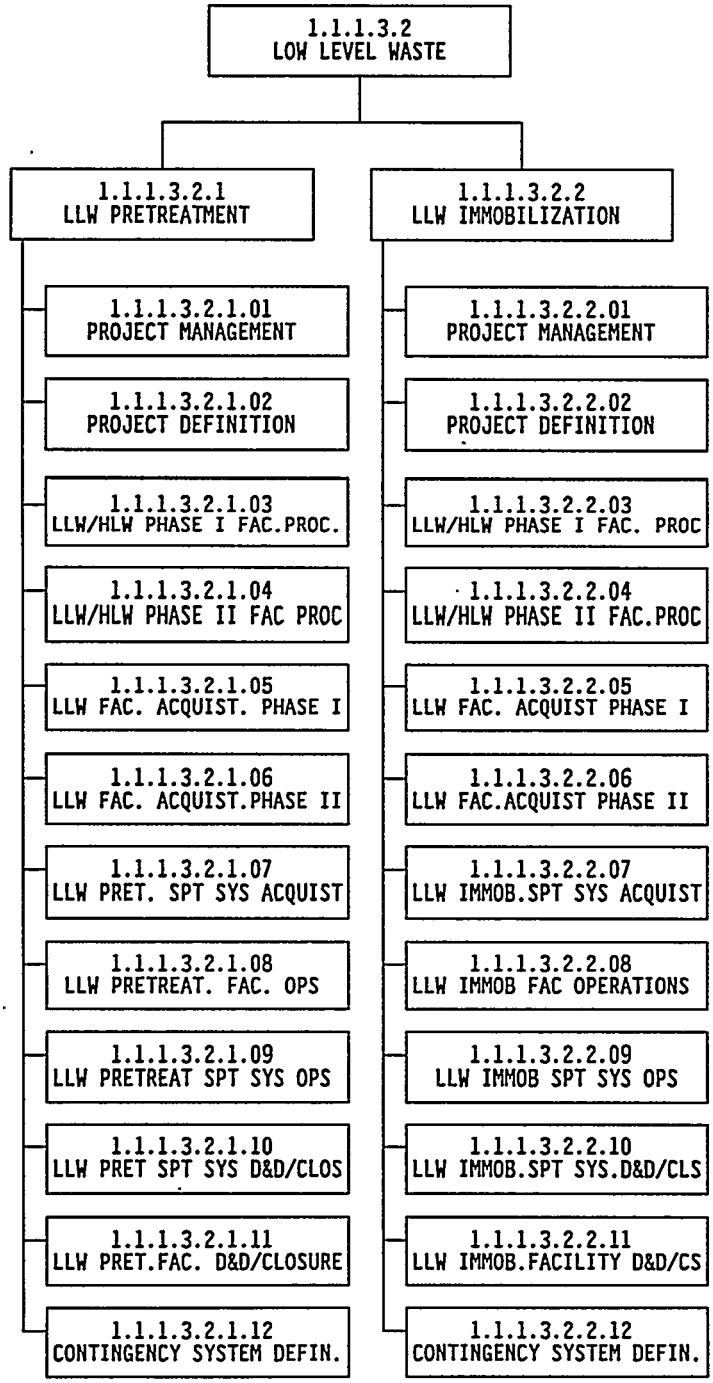
LISTING OF ATTACHMENTS

Attachment 8-1	Work Breakdown Structure
Attachment 8-2	WBS Dictionary Sheet
Attachment 8-3	Responsibility Assignment Matrix
Attachment 8-4	Summary Schedule
Attachment 8-5	Milestone Control Log
Attachment 8-6	Cost Baseline Summary by Year
Attachment 8-7	FY 1996 Performance Baseline Schedule
Attachment 8-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
LOW LEVEL WASTE



Attachment 8-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED 9/17/95	2. PROGRAM/TITLE/PARTICIPANT 1.1.1 Tank Waste Remediation System 1.1.1.3 Waste Disposal	
3. WBS ELEMENT CODE/LEVEL 1.1.1.3.02	4. WBS ELEMENT TITLE Low-Level Waste	
5. CURRENT REV. NO.	6. EFFECTIVE REV DATE	7. APPROVED CHANGES
8. ADS-ADS-SUFFIX-SUBACTIVITY NUMBER	9. BUDGET AND REPORTING NUMBERS Operating CENRTC GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated dollars)

THE COST CONTENT IS PROCUREMENT SENSITIVE ($000)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
OPERATING	96225	143518	219995	219705	189524	188737	192818
CENRTC							
GPP							
LINE ITEM							
TOTAL	96225	143518	219995	219705	189524	188737	192818

B. TECHNICAL BASES

Goals and Objectives

The goal of the Low Level Waste Project is to immobilize the low activity waste fraction of the waste in the 177 double and single shell tanks. To this end, the project is responsible for separating radionuclides from the supernate current contained in the tanks and separating radionuclides from the sludge wash solutions and the alkaline leach solutions generated in the HLW Project. After separation of the radionuclides, the remaining salt solutions will be immobilized.

To accomplish this overall goal the LLW Project will use a Privatization Scenario that is divided into two

vendors will finance the design, construction and operation of the facilities and will be paid upon delivery of the immobilized LLW to the Storage and Disposal Project. The goal of this phase is to demonstrate the feasibility of the privatization approach and to gather data which leads to a cost-effective tank waste remediation in the Full-Scale Production Phase (Phase II). Approximately three percent of the waste will be processed in Phase I. Wastes will be selected in such a manner to encompass the range of technical obstacles which are expected to be encountered in Phase II.

The second phase will be a Full-Scale Production Phase. The goal of this phase is to pretreat and immobilize the remaining 97 percent of the waste. Multiple vendors may be used to accomplish this goal.

In general, the privatization approach is expected to build upon the strengths of our nation's free enterprise system:

- Cost competitive, cost effective, employment of multiple vendors
- Leading edge technology developed by industry for a wide range of applications
- Capital financing arrangements which smooth the life cycle funding requirements, reducing the need for high initial appropriation of government funds.

Major End-Item Deliverables

A. Long-term Deliverables

- Design, construction and operation of LLW pretreatment and immobilization facilities (Phase 1 and Phase 2) and pretreatment of all supernate, water wash, and alkaline leach solutions and subsequent immobilization of all low activity waste generated from pretreatment separations.

- Complete LLW pretreatment and immobilization processing of Hanford tank waste, clean out and shut down LLW pretreatment and immobilization facilities, decontaminate and decommission the LLW facilities and close all sites which were used by the LLW project .

B. Near-term Deliverables

- Issuance of an RFP for Phase 1 by 3/15/96

- Award of the Phase 1 contract by 8/30/96

Acceptance Criteria

A. Long-term Acceptance Criteria

- Immobilized waste must meet the product specifications provided by the Storage and Disposal Project.

- Site Closure consistent with criteria generated using the NEPA process and in compliance with all applicable regulations.

B. Near-term Acceptance Criteria

- Adequate technical and commercialization information is provided to DOE to allow DOE to issue the Phase 1 RFP.

- Adequate technical and commercialization information is provided to DOE to Award the Phase 1 Contract.

Statement of Work

The LLW Project is part of the Level III WBS element, Dispose of Tank Waste and is comprised of two Level V activities: LLW Pretreatment and LLW Immobilization.

Each of these Level V activities are comprised of 12 identical Level VI activities. The following is a brief description of the work scope contained in each of these Level VI activities.

1. Project Management

This activity provides for the development of program plans and strategy documents that define the scope of the project as well as aid in the management and integration of the program element. Work scope that supports this activity is as follows:

Baseline Management:

- Prepare monthly reporting documentation and submit to TWRS Program Integration, to include Site Management System data, Critical Issues, Monthly Performance Review, and various technical, financial, and schedule data for special presentations.

- Participate in various external reviews, e.g., safety reviews, regulators and oversight groups such as the Pretreatment Sub-TAP and DNFSB, to include development of required information, coordinating and conducting meetings.

- Develop and maintain cost account plans and schedules, status the LLW Program integrated schedule and provide schedule and financial baseline status to WHC reporting systems, e.g., SMS, PTS, and MPR.

- Review and comment on program deliverables, i.e., reports, engineering studies, and other milestone media.

Plan Preparation:

- Provide guidance to Cost Account Managers (CAMs) in the preparation of the LLW Program's business documentation (i.e., MYPP and ADS).

- Provide schedule and financial resources to prepare schedules and financial information supporting the CAMs in plan preparation.

- Provide the LLW Program integration prior to submittal of business plans to include reviews and incorporation of comments.

- Submit business plans to the TWRS Program Integration for submittal to RL and other customers.

Milestones:

- Prepare and submit the Draft MYPP for FY 1997. (T32-96-011)
- Prepare and submit the MYPP for FY , 1997, 1998, and 1999. (T32-96-002, T32-97-002, T32-98-002)
- Prepare and submit the FY 1998, 1999, and 2000 ADSs. (T32-96-001, T32-97-001, T32-98-001)

Closeout:

- Perform contract closeout activities to shut down FY 1995 Pretreatment work at the Architect/Engineer (Raytheon). Carryover funding of $700K, identified as a legal

commitment for closeout of the Raytheon contract, is included in this WBS.

2. **Project Definition**

This activity will consist of performing systems engineering analysis of LLW Project. The results of the analysis will be issued in the form of Functions and Requirements (F&R) documents, Technical Requirements Specifications (TRSs) and Interface Control Documents (ICDs), and Design Requirements Documents (DRD). The documents will be updated as needed to keep them current. In FY 1996, inputs will be provided to support the TWRS TRS Review and the update of the TWRS F&R baseline. The documents will be prepared as needed to support preparation of the RFPs and awarding the privatization Phase I and Phase II contracts. Trade Studies will be performed as needed to support the Systems Engineering analysis systems requirements review, the technical requirements review, and LLW Project specific reviews.

This activity also includes planning the feed staging for Phase 1 to ensure that the Retrieval Project is able to deliver the appropriate amount and composition of the feed to the LLW Vendor(s) on the appropriate schedule.

Milestones:

- Issue Feed Staging Feasibility Study (T32-96-020).
- Issue Preliminary Feed Staging Plan (T32-96-022).
- Confirmation of Preliminary Feed Staging Plan (T32-96-023).
- Issue LLW Gaseous Effluents Performance Requirements (T32-96-025).
- Issue 242-A Evaporator Life Extension Study (T32-96-026).

3. **Phase I Facility Procurement Support**

The scope of the of this WBS element is to provide the DOE with the necessary technical support to carry out the TWRS Privatization activities through the award of contract and to provide contract management support through the life of the contract. These activities can be broken down into four major tasks:

Direct support to the issuance of the Phase I Request for Proposal (RFP) and the evaluation of vendor responses, leading to the award of contract(s). This will include a collation and review of the vendor comments received from the Draft RFP, a final revision to the RFP, and a support to vendor meetings and questions.

Development and analysis of information to support DOE policy decision relating to privatization to support the Source Evaluation Board (SEB). This will include conducting a financial market analysis to ensure that the phase I contract is financially feasible, conducting risk management activities on the project, support to the renegotiation of the Tri-Party Agreement, and support to the SEB in awarding the Phase I contract.

Definition of scope and requirements for the M&O contractor, as modified to accommodate and appropriately interface with privatized activities. This will include developing Phase I and life-cycle cost estimates for privatization, developing site and infrastructure support information, and support of a TWRS/Privatization transition and interface team.

Management and coordination to support privatization activities and interface with the DOE. This will project management and oversight of the contractor team supporting privatization, project control, document control, and quality assurance activities, as well as coordination with various technical organizations (i.e., regulatory, finance, technical, and procurement). Privatization Phase I close-out and transition activities are also planned under this task.

Milestones:

- Issuance of One Draft Request for Proposal of Privatization for Phase I (T32-96-004).
- Issuance of Final Request for Proposal (RFP) for Phase I (T32-96-005).
- Contract Award Phase I (T32-96-006).

4. Phase II Facility Procurement Support

The scope of this WBS element is to provide the DOE with the necessary technical support to carry out the TWRS Privatization activities through the award of contract and provide the contract management support throughout the life of the contract. These activities can be broken down into four major tasks:

Direct support to the development of the Phase II Request for Proposal (RFP) and the evaluation of vendor responses, leading to the award of contract(s). This will include development of a draft RFP based on lessons learned from Phase II, a collation and review of the vendor comments received from the Draft RFP, a final revision to the RFP, and a support to vendor meetings and questions.

Development and analysis of information to support DOE policy decisions relating to privatization to support the Source Evaluation Board (SEB). This will include conducting a financial market analysis to ensure that the Phase II contract in financially feasible, conducting risk management activities on the project, support to the renegotiation of the Tri-Party Agreement, and support to the SEB in awarding the Phase II contract.

Definition of scope and requirements for the M&O contractor, as modified to accommodate and appropriately interface with privatized activities. This will include developing Phase II and life-cycle cost estimates for privatization, developing site and infrastructure support information, and support of a TWRS/Privatization transition and interface team.

Management and coordination to support privatization activities and interface with the DOE. This will include project management and oversight of the contractor team supporting privatization, project control, document control, and quality assurance activities, as well as coordination with various technical organizations (i.e., regulatory, finance, technical, and procurement). Privatization Phase II close-out and transition activities are also planned under this task.

Milestones:
- Issuance of Final Request for Proposal (RFP) Phase II (T32-04-001).
- Phase II Contract Award (T32-05-003).

5. Phase I Facility Acquisition

Under the Phase 1 Proof-Of-Concept privatization of Tank Waste Remediation System (TWRS), The Department of Energy (DOE) will procure from two private sector vendors, two Low Level Waste (LLW) pretreatment and immobilization facilities and (at DOE's discretion) an optional High Level Waste facility.

DOE will also procure the services of the two aforementioned private vendors to process some or all of the waste from specifically selected Hanford waste tanks. The selected vendors will then demonstrate their respective technologies, and process actual Hanford tank waste (approx 3% of the total waste) in increasingly more complex segments. The vendors will specifically demonstrate efficiency of ion exchange, effectiveness of solid/liquid separation, organic removal and removal of constituents that effect the HLW volume. The vendors will treat and immobilize a sufficient quantity starting in FY 2002 with start-up of the facilities, and ending with the decontamination and decommissioning of the vendors' facilities.

The vendors' facilities will use two double-shell feed tanks (DSTs), 241-AP-102 and 241-AP-104, and interface with the existing tank farm system. The vendors' treatment facilities will remove fission products and solids from the waste, solidifying the remaining liquid fraction. The fission products that are removed from the waste will be transferred to the High Level Waste Project for further treatment by the Storage and Disposal Project. Condensates that are contaminated from the treatment processes will be treated by the

vendor to meet acceptance criteria for the Effluent Treatment Facility (ETF), and transferred to the ETF for further treatment and disposal.

If any support to the vendors is needed for secondary wastes, it is provided by the Storage and Disposal Project.

The specific work scope of this activity includes the design, construction and cold startup of the vendor facilities for LLW pretreatment and immobilization and the design and construction of the associated utility infrastructure.

The two selected Phase 1 vendors will be responsible for meeting applicable environmental, safety, and health requirements established by federal, state and local statutes; and the associated risk that accompanies these areas.

Milestones:

- Initiate Cold Operations of the LLW Pretreatment/Immobilization Facilities (T32-02-005).
- Finish Construction of Phase I Facilities (M-50-02-T01) (T3A-04-100).
- Start Hot Operations of LLW Pretreatment Facility to Remove Cesium and Strontium (M-50-02) (T3A-05-100).
- Start Construction of LLW Pretreatment Facility (M-50-01) (T3A-99-101).
- Initiate Hot Operations of the LLW Vitrification Facility (M-60-05) (T3B-05-100).

6. Phase II Facility Acquisition

In Phase II, the private contractors will construct facilities and retrieve the waste from the remaining underground storage tanks (USTs), transfer the waste to processing facilities, extract fission products from the waste, solidify Low Activity Waste (LAW), transfer the solidified LAW to DOE, solidify the High level Waste (HLW), and provide interim storage for the HLW.

The private companies will be able to process increasingly more complex wastes, with facilities that will accommodate the transformation. The Phase II facilities will be designed, built, operated, decontaminated and decommissioned by Private sector companies using private funding. DOE will purchase their waste products for storage and disposal.

This particular scope of work includes the preparation of a Phase 2 RFP for the LLW pretreatment and immobilization facilities, an evaluation of the proposals and award of the contract(s) and contract management support for DOE during the life of the contract.

7. Support Systems Acquisition

This scope of work includes conduction engineering studies, identifying design requirements, completing conceptual and definitive designs, procurement of equipment, construction of facilities, and turnover to support systems operations for cold start-up of support systems. These support systems are primarily utilities including such items as water, electricity, and telecommunications, but also include infrastructure support such as siting studies for vendors facilities, establishing road access to vendors facilities, and providing any upgrades to emergency services to support the vendors facilities.

Milestones:

- Issue Approved Site Evaluation Report, Phase I LLW Pretreatment Support Systems Acquisition (T32-96-010).
- Issue Approved Site Evaluation Report, Phase I LLW Immobilization Support Systems Acquisition (T32-96-009).
- Review Vendor PSAR, Phase I LLW Immobilization Support Systems Acquisition (T32-98-005).
- Review Vendor PSAR, Phase I LLW Pretreatment Support Systems Acquisition (T32-98-

009).
- Review Vendor FSAR, Phase I LLW Pretreatment Support Systems Acquisition (T32-00-004).
- Initiate Review Vendor PSAR, Phase II LLW Pretreatment Support Systems Acquisition (T32-06-002).
- Review Vendor FSAR, Phase II LLW Pretreatment Support Systems Acquisition (T32-10-003).
- Design, Construct, Start-up Utilities/Support Systems LLW Pretreatment Support Systems Acquisition, Phase II (T32-10-004).
- Complete Conceptual Design of the LLW Infrastructure Project, Phase II (T32-06-003).
- Key Decision 3 and 4, Approval to Commence Construction/Operation of the LLW Infrastructure Project, Phase II (T32-09-001).
- Review Vendor FSAR, Phase I LLW Immobilization Support Systems Acquisition (T32-00-002).
- Review Vendor PSAR, Phase II LLW Immobilization Support Systems Acquisition (T32-06-001).
- Review Vendor FSAR, Phase II LLW Immobilization Support Systems Acquisition (T32-10-001).
- Design, Construct, Startup Utilities/Support Systems LLW Immobilization Support Systems Acquisition, Phase II (T32-10-002).

8. Facilities Operations

This work scope includes activities required for successful operation of the vendor processing facilities used to pretreat and immobilize the waste. These activities which will be managed and funded by the private vendor(s) include the following:

a. Production operations of the processing facilities
b. Preventative and corrective maintenance of the processing facilities
c. Quality assurance support for the processing facilities
d. Safety assurance support for the processing facilities
e. Engineering support for the processing facilities

Milestones:
- Complete Initial Phase I Operations of LLW Pretreatment Facility (T32-05-001).
- Complete Continuing Phase I Operations of the LLW Pretreatment Facility (T32-11-001).
- Complete Vitrification of Hanford LLW (M-60-00) (T3B-28-100).
- Complete Initial Phase I Operations of the LLW Immobilization Facility (T32-05-004).
- Complete Continuing Phase I Operations of the LLW Immobilization Facility (T32-11-002).

9. Support Systems Operations

This work scope includes activities required for successful hot start-up and operation of the systems which support the operation of the vendors processing facilities (primarily available utilities). These activities include the following:

a. Systems definition support during engineering studies/conceptual design of these support systems

b. Planning and integration of preparation activities

c. Preparation of required documentation (e.g., operating procedures)

these technologies but by preserving a core competency of experts in supernate chemistry and LLW melter technology.

- Conduct Column Tests for Technetium Removal Using Synthetic and Actual Waste. Column tests will be conducted by Argonne National Lab using a proprietary ion exchange resin on one synthetic waste type planned to be used in Phase 1 Privatization. Elution of the technetium using either dilute acid or water will also be tested. Scale Column Tests using one ion exchange resin for technetium removal will be conducted on two different actual waste types after the cesium has been removed upstream by three different ion exchange materials using nominally 10 ml columns. Technetium break-through curves will be measured in both the synthetic and actual waste cases. The synthetic waste work reduces risk of Phase 1 by ensuring that information is available to the vendor on a process to remove technetium should the LLW specification require removal of technetium as expected. The work with actual waste also reduces risk by ensuring that information on the process performance of technetium removal is available . This information is valuable because lack of knowledge of chemical speciation of the waste after cesium removal prevents performance prediction by the vendor.

- Conduct Technetium Stability Tests Using Synthetic Waste. Cycling tests will be performed on a selected ion exchange material for technetium removal. Up to 25 cycles of loading and elution will be tested. Technetium break-through curves will be measured. This work reduces risk of Phase 1 by ensuring that the resin used for technetium removal is chemically stable should technetium removal be required as expected.

- Conduct TRU/Strontium Precipitation Tests Using Actual Waste. Small scale batch precipitation tests need to be conducted on actual complexed concentrate waste or other waste types if required to remove TRU (including Neptunium for performance assessment purposes) and Strontium. Cations will be added to the waste to either co-precipitate the radionuclides of interest or substitute for the radionuclides in the complexed species. This work continues a screening effort begun in FY 1995. Attempts will be made to minimize the addition of cations so that the impact on glass will be minimized. This work reduces risk of Phase 1 by providing information on a precipitation process performance for TRU and Sr Removal which is necessary because lack of knowledge of chemical speciation of the waste prevents performance prediction by the vendor.

- Adapt High Capacity Melters for Immobilization of Hanford LLW. The adaptation of commercial high-volume technology for immobilization of low level waste is one of the key challenges of the TWRS program. In FY 1995, TWRS conducted a series of private-sector testing activities. A group of industrial experts evaluated the results of the testing and identified additional test work that will be necessary to assure that the private sector technologies can be successfully applied. Efforts need to continue to develop the high priority information necessary to adapt the commercial immobilization technology to Hanford radioactive waste service.

b. Establish a 3 Liter Sample Acquisition Capability. This activity includes the design, procurement, assembly, testing and completion of a readiness review of a 3 liter sampling capability. This capability will facilitate ion exchange testing of multiple cycles of nominal 10ml columns for low capacity resins such as CS-100 and non-regenerable material testing for high capacity materials such as CST. It will also facilitate lab scale filter tests for sludges to support the adaptation of solids/liquids separations technology to meet Hanford waste specific requirements.

This work reduces the risk of Phase 1 by providing a sampling capability to allow pretreatment process performance to be tested on a small scale with actual waste. The testing is necessary since the lack of knowledge of chemical speciation in the tanks prevents process performance prediction by the vendor. Testing with actual waste will provide a basis for proposed LLW pretreatment

requirements, and LLW feed and product specifications. This testing will also identify process chemistry issues associated with the retrieval, dilution and transport of the waste to the pretreatment processes. Waste volumes up to hundreds of liters may be needed. The current method for taking tank waste samples is limited to a 120ml bottle on a wire. This is inadequate for obtaining many of the sample volumes required because of cost and ALARA considerations.

c. Development of Strategic Alternatives to the Privatization Approach

This activity would include the development of an alternative contracting scenario in which DOE would finance the design, construction and operation of the LLW processing facilities using the technology available within the DOE complex. Risk based retrieval scenarios as well as total retrieval scenarios would be explored. This scope of work includes the development of flowsheets for pretreatment and immobilization of waste using laboratory data generated either from past program activities or future activities funded by the Tank Focus Area. This activity reduces the risk to DOE in the event that the privatization approach is not successful by preserving a core competency of engineering personnel as well as developing a back-up strategy.

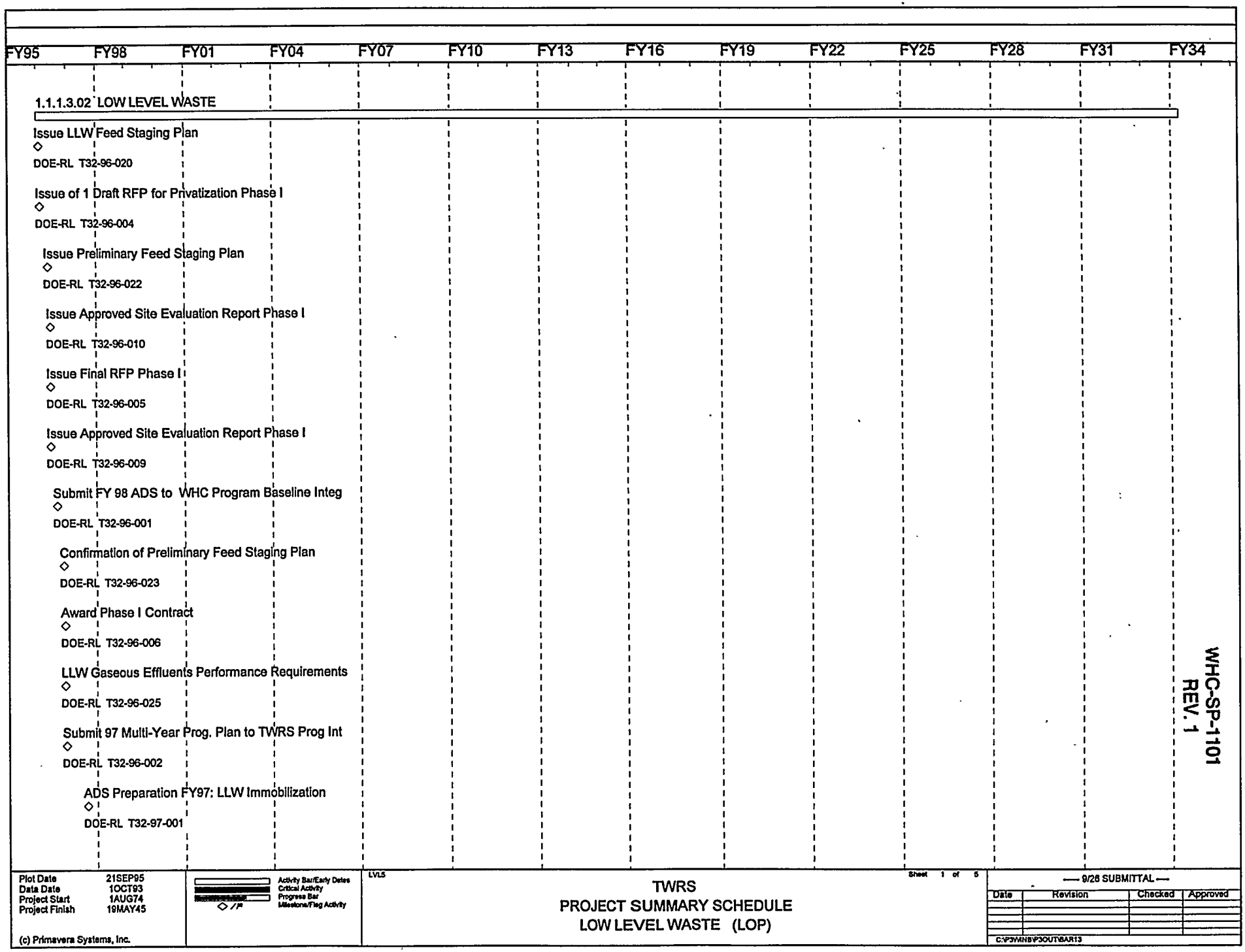
Responsibility Assignment Matrix
LLW Project (1.1.1.3.02)

WBS Number	WBS Title	Responsibility
1.1.1.3.02	LLW Project	K. A. Gasper
1.1.1.3.02.01	LLW Pretreatment	J. N. Appel
1.1.1.3.02.01.01	Project Management	I. E. Reep
1.1.1.3.02.01.02	Project Definition	J. A. Swenson
1.1.1.3.02.01.03	LLW/HLW Phase I Facilities Procurement Support	N/A (refer to LLW Immobilization: LLW/HLW Phase I Facilities Procurement Support 1.1.1.3.02.02.03)
1.1.1.3.02.01.04	LLW/HLW Phase II Facilities Procurement Support	N/A (refer to LLW Immobilization: LLW/HLW Phase II Facilities Procurement Support 1.1.1.3.02.02.04)
1.1.1.3.02.01.05	LLW Facility Acquisition Phase I	N/A (refer to LLW Immobilization: LLW Facility Acquisition Phase I 1.1.1.3.02.02.05)
1.1.1.3.02.01.06	LLW Facility Acquisition Phase II	N/A (refer to LLW Immobilization: LLW Facility Acquisition Phase II 1.1.1.3.02.02.06)
1.1.1.3.02.01.07	LLW Pretreatment Support Systems Acquisition	P. Felise
1.1.1.3.02.01.08	LLW Pretreatment Facility Operations	R. U. Elwell
1.1.1.3.02.01.09	LLW Pretreatment Support Systems Operations	R. U. Elwell
1.1.1.3.02.01.10	LLW Pretreatment Support Systems D&D/Closure	I. E. Reep (inactive in FY 96-98)
1.1.1.3.02.01.11	LLW Pretreatment Facility D&D/Closure	I. E. Reep (inactive in FY 96-98)
1.1.1.3.02.01.12	Contingency System Definition	J. N. Appel
1.1.1.3.02.02	LLW Immobilization	I. E. Reep
1.1.1.3.02.02.01	Project Management	I. E. Reep

Responsibility Assignment Matrix

LLW Project (1.1.1.3.02)

WBS Number	WBS Title	Responsibility
1.1.1.3.02.02.02	Project Definition	J. Swenson
1.1.1.3.02.02.03	LLW/HLW Phase I Facilities Procurement Support	S. E. Wagner
1.1.1.3.02.02.04	LLW/HLW Phase II Facilities Procurement Support	S. E. Wagner
1.1.1.3.02.02.05	LLW Facility Acquisition-Phase I	S. E. Wagner
1.1.1.3.02.02.06	LLW Facility Acquisition - Phase II	S. E. Wagner
1.1.1.3.02.02.07	LLW Immobilization Support Systems Acquisition	P. Felise
1.1.1.3.02.02.08	LLW Immobilization Facilities Operations	R. U. Elwell
1.1.1.3.02.02.09	LLW Immobilization Support Systems Operations	R. U. Elwell
1.1.1.3.02.02.10	LLW Immobilization Support Systems D&D/Closure	I. E. Reep (inactive in FY 96-98)
1.1.1.3.02.02.11	LLW Immobilization Facility D&D/Closure	I. E. Reep (inactive in FY 96-98)
1.1.1.3.02.02.12	Contingency System Definition	J. N. Appel



Attachment 8-4 Summary Schedule Sheet 1 of 18

WHC-SP-1101
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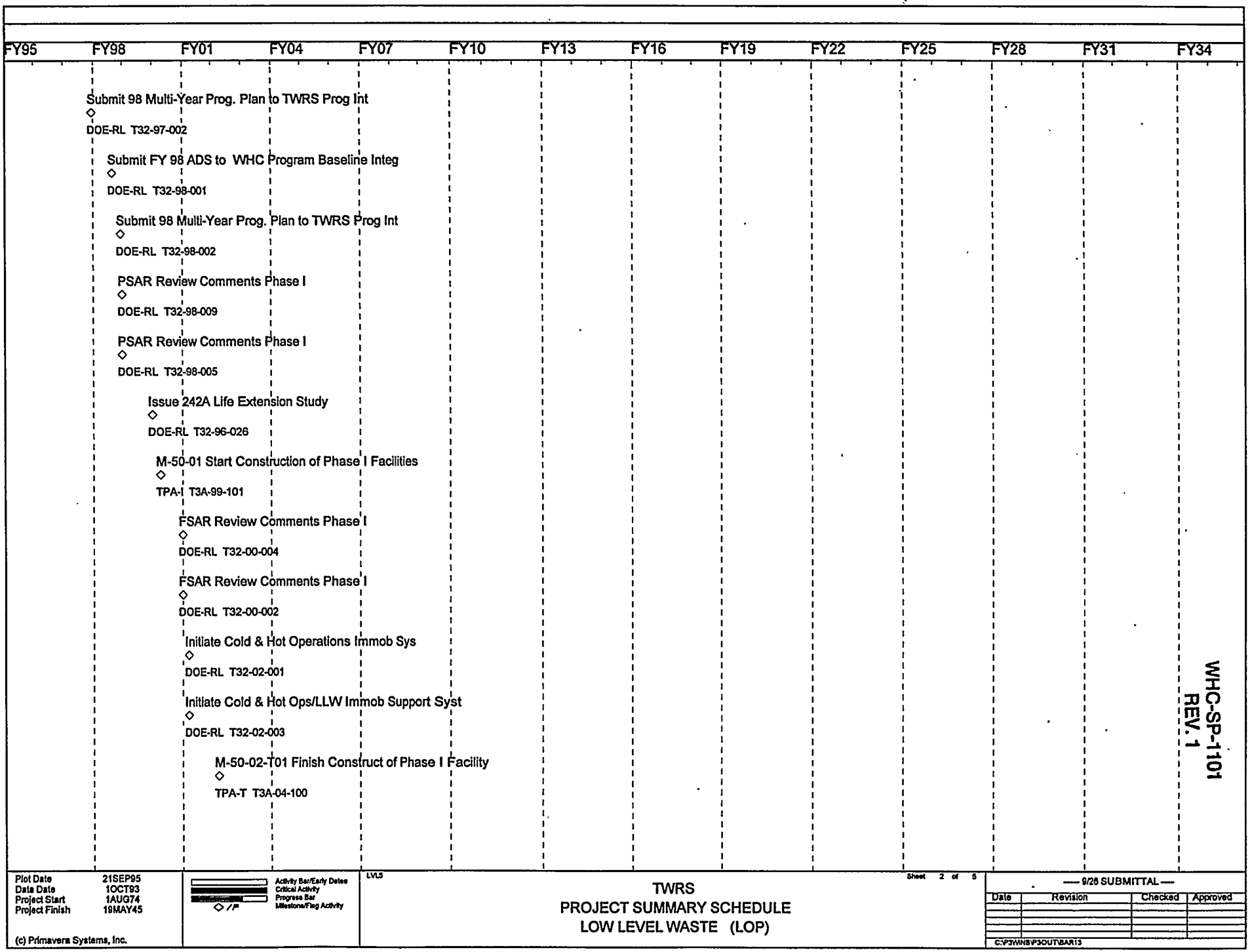
FY95
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FY13
FY16
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FY28
FY31
FY34
Submit 98 Multi-Year Prog. Plan to TWRS Prog Int
DOE-RL T32-97-002
Submit FY 98 ADS to WHC Program Baseline Integ
DOE-RL T32-98-001
Submit 98 Multi-Year Prog. Plan to TWRS Prog Int
DOE-RL T32-98-002
PSAR Review Comments Phase I
DOE-RL T32-98-009
PSAR Review Comments Phase I
DOE-RL T32-98-005
Issue 242A Life Extension Study
DOE-RL T32-96-026
M-50-01 Start Construction of Phase I Facilities
TPA-I T3A-99-101
FSAR Review Comments Phase I
DOE-RL T32-00-004
FSAR Review Comments Phase I
DOE-RL T32-00-002
Initiate Cold & Hot Operations Immob Sys
DOE-RL T32-02-001
Initiate Cold & Hot Ops/LLW Immob Support Syst
DOE-RL T32-02-003
M-50-02-T01 Finish Construct of Phase I Facility
TPA-T T3A-04-100
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 5
TWRS
PROJECT SUMMARY SCHEDULE
LOW LEVEL WASTE (LOP)
----- 9/26 SUBMITTAL -----
Date
Revision
Checked
Approved
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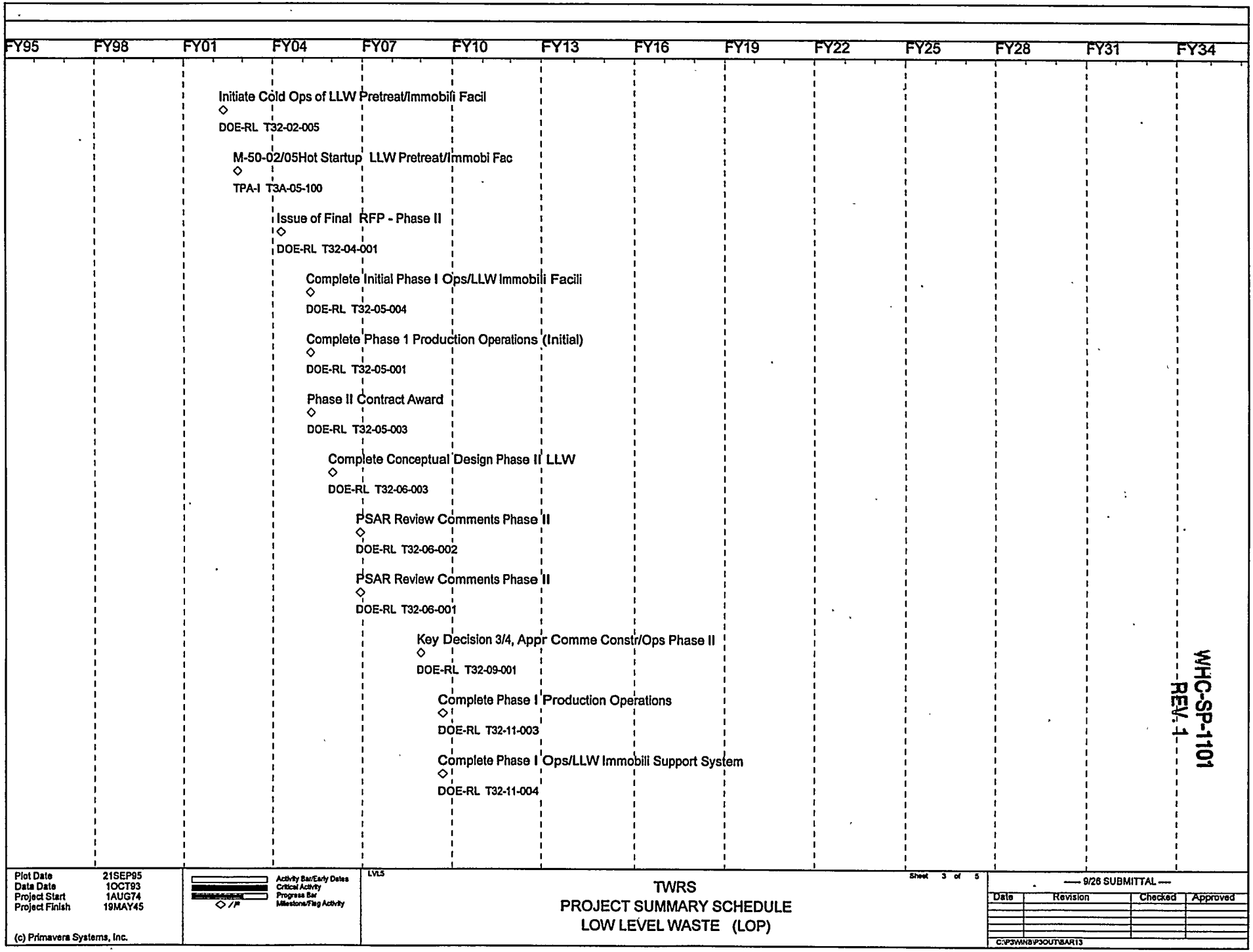
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Initiate Cold Ops of LLW Pretreat/Immobili Facil
DOE-RL T32-02-005
M-50-02/05Hot Startup LLW Pretreat/Immobi Fac
TPA-I T3A-05-100
Issue of Final RFP - Phase II
DOE-RL T32-04-001
Complete Initial Phase I Ops/LLW Immobili Facili
DOE-RL T32-05-004
Complete Phase 1 Production Operations (Initial)
DOE-RL T32-05-001
Phase II Contract Award
DOE-RL T32-05-003
Complete Conceptual Design Phase II LLW
DOE-RL T32-06-003
PSAR Review Comments Phase II
DOE-RL T32-06-002
PSAR Review Comments Phase II
DOE-RL T32-06-001
Key Decision 3/4, Appr Comme Constr/Ops Phase II
DOE-RL T32-09-001
Complete Phase I Production Operations
DOE-RL T32-11-003
Complete Phase I Ops/LLW Immobili Support System
DOE-RL T32-11-004
WHC-SP-1101
REV. 1
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 3 of 5
TWRS
PROJECT SUMMARY SCHEDULE
LOW LEVEL WASTE (LOP)
9/26 SUBMITTAL
Date
Revision
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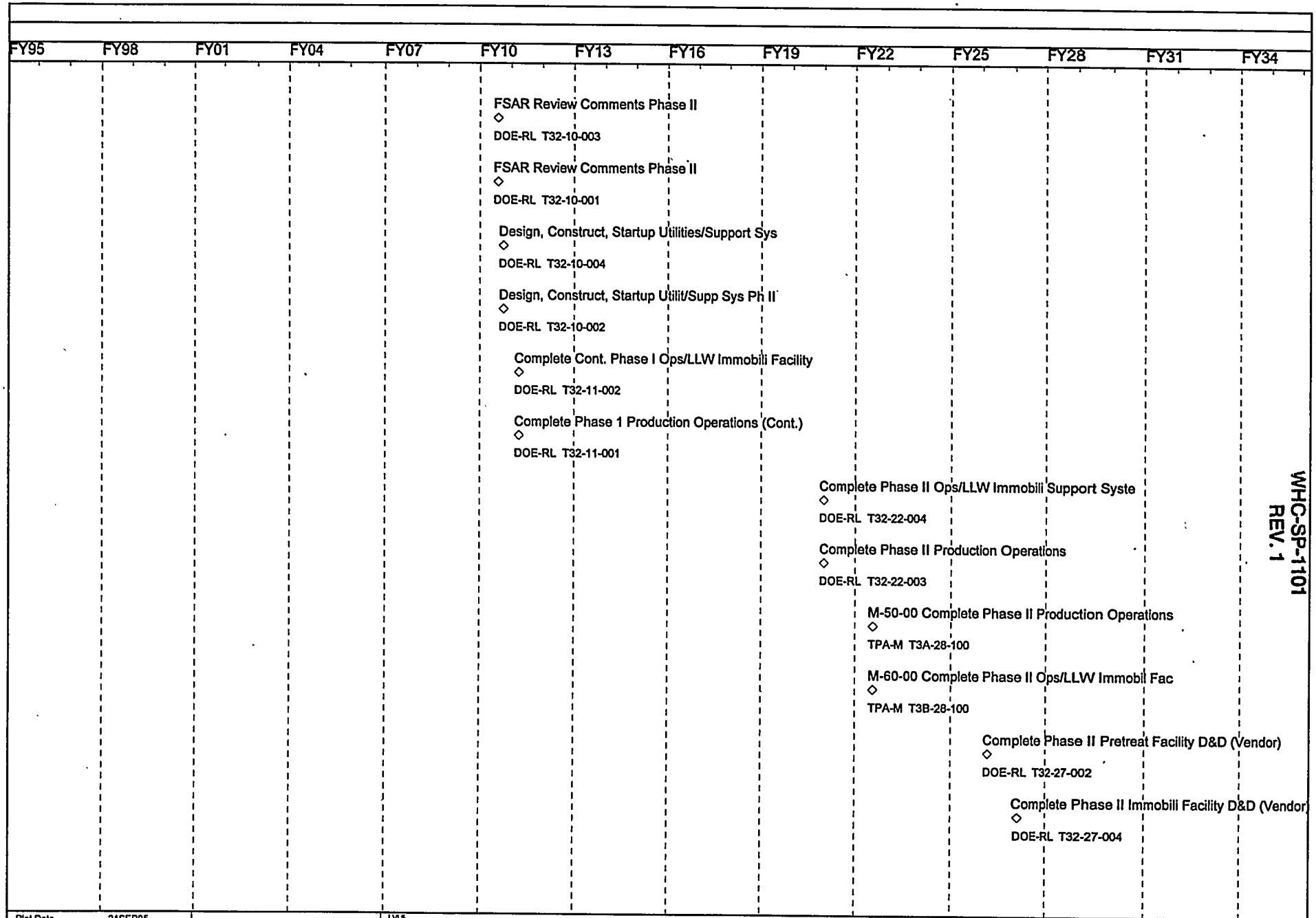

Plot Date	21SEP95
Data Date	1OCT93
Project Start	1AUG74
Project Finish	19MAY45

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Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LVL5

Sheet 4 of 5

TWRS
PROJECT SUMMARY SCHEDULE
LOW LEVEL WASTE (LOP)

9/26 SUBMITTAL

Date	Revision	Checked	Approved

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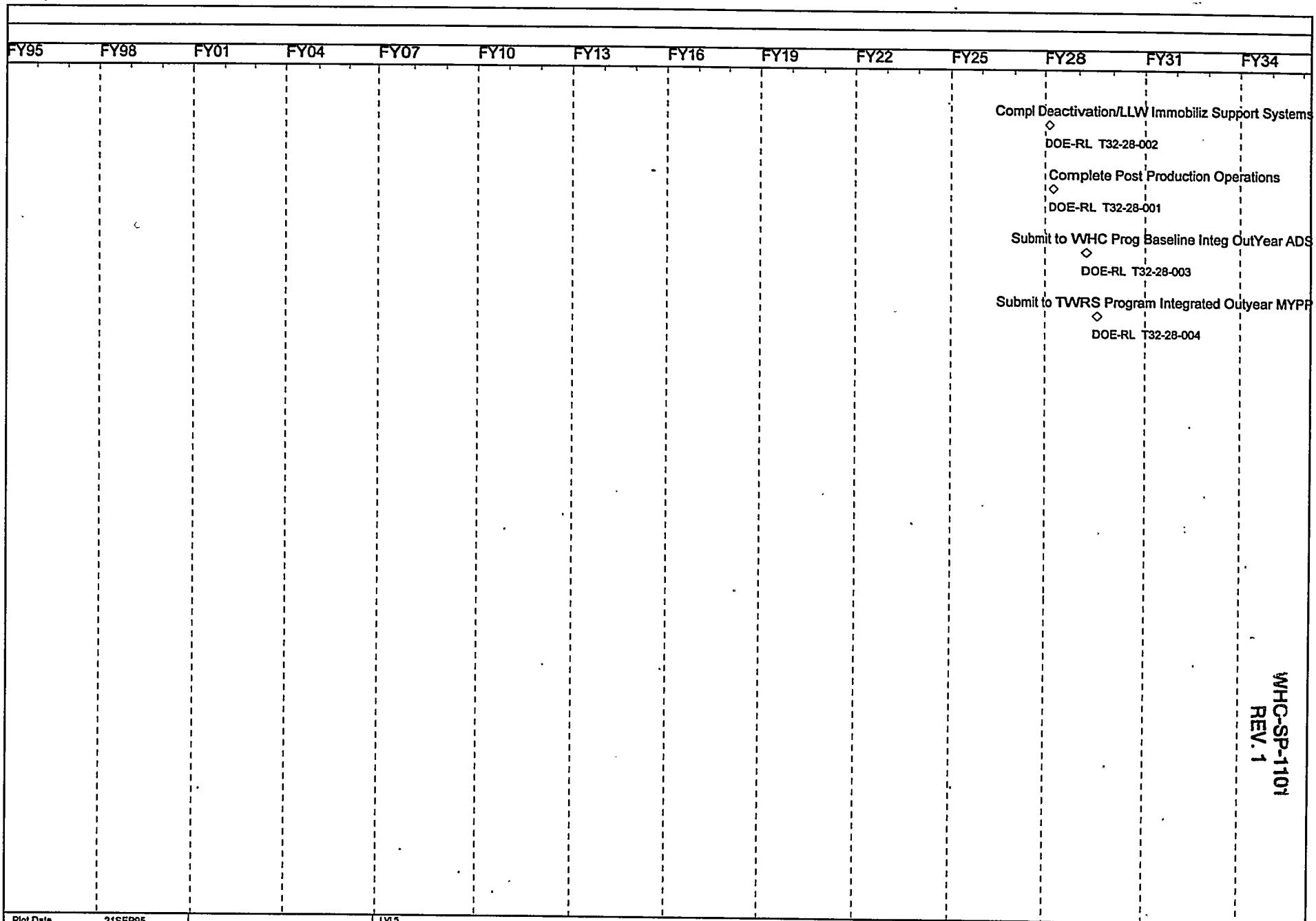
FY95
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FY22
FY25
FY28
FY31
FY34
Compl Deactivation/LLW Immobiliz Support Systems
DOE-RL T32-28-002
Complete Post Production Operations
DOE-RL T32-28-001
Submit to WHC Prog Baseline Integ OutYear ADS
DOE-RL T32-28-003
Submit to TWRS Program Integrated Outyear MYPP
DOE-RL T32-28-004
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 5 of 5
TWRS
PROJECT SUMMARY SCHEDULE
LOW LEVEL WASTE (LOP)
9/26 SUBMITTAL
Date
Revision
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LLW PROJECT PHASE 1 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
1	LLW	L1W05100	RETR		Requirements for Supernate - Composition, amount, and schedules	
2	RETR		LLW/Vendor(s)	L1W08010, L1W08020	Supernate - Composition, amount, and schedules	
3	LLW/Vendor(s)	L1W08010, L1W08020	TFO		Separated solids from the LLW vendor(s) plant	
4	LLW/Vendor(s)	L1W08010, L1W08020	S&D		Cesium waste removed by the LLW vendor(s)	
5	LLW/Vendor(s)	L1W08010, L1W08020	S&D		Strontium waste removed by the LLW Vendor(s)	
6	LLW/Vendor(s)	L1W08010, L1W08020	S&D		Technetium waste removed by the LLW vendor(s)	
7	LLW/Vendor(s)	L1W08010, L1W08020	S&D		Immobilized LLW	
8	HLW XHLLLS201	H22A5	LLW/Vendor(s)	L1W05100	Acceptance criteria of separated solids from the LLW vendor(s) plant	
9	TFO		LLW/Vendor(s)	L1W05100	Acceptance criteria of separated solids from the LLW vendor(s) plant	

LLW PROJECT PHASE 1 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
10	LLW	L2D03020A	S&D		Contract award information to S&D	
11	S&D		LLW/Vendor(s)	L1W05100	Acceptance criteria of separated cesium waste specs.	
12	S&D		LLW/Vendor(s)	L1W05100	Acceptance criteria of separated strontium waste specs.	
13	S&D		LLW/Vendor(s)	L1W05100	Acceptance criteria of separated technetium waste specs.	
14	S&D		LLW/Vendor(s)	L1W05100	Acceptance criteria of immobilized low level waste	
15	S&D/LLW/Vendor(s)		LLW/Vendor(s)/S&D	L1W08010, L1W08020 L2W08010 L2W08020	Agreement that transfer of vendor(s) liquid and solid waste meets acceptance criteria	
16	Vendor(s)	L1W08010, L1W08020 L2W08010, L2W08020	LLW or WDOE		Vendor(s) gaseous emissions report	
17	TFO		LLW/Vendor(s)	L1W05100 L1W05200	Liquid effluent acceptance criteria	

LLW PROJECT PHASE 1 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
18	CHAR		LLW/Vendor(s)	L1W05100 L2W05100	Supernate samples for vendor(s) tests	
19	TWRS		LLW	L1W05100 L2W05100	Approved TWRS EIS	
20	S&D		LLW/Vendor(s)	L2W08010	Complete construction of LLW Phase I Storage Facility	
21	LLW/Vendor(s)	L1W08010 L1W08020 L2W08010 L2W08020	RETR		Liquid effluent from the vendor(s) after turnover of DST tanks and evaporator to Retrieval Project	
22	LLW/Vendor(s)	L1W08010 L1W08020 L2W08010 L2W08020	TFO		Liquid effluent from the vendor(s) prior to turnover of DST tanks and evaporator to Retrieval Project	
23	LLW/Vendor(s)	L1W08010 L1W08020 L2W08010 L2W08020	SW		Other solid waste from vendor(s) plants (equipment, etc)	
24	CHAR		Vendor(s)	L1W05100 L2W05100	Vendor(s) site soil characterization information for NEPA baseline for ultimate closure	
25	RETR/Vendor(s) XROLL0205		LLW and TFO	L1W08010	Characteristics of LLW stream from Phase I sludge wash	

LLW PROJECT PHASE 1 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
26	SW		LLW/Vendor(s)	L1W05100 L2W05200	Other solid waste (equipment, etc) acceptance criteria	
27	LLW	L1W02720 L2W02010	PM		LLW Input to Technical Requirements Specification	
28	LLW	L1W02720 L2W02020	PM		LLW Input to Functions & Requirements Update	
29	LLW	L1W02720 L2W02020	PM		LLW Input to Interface Control Documents	
30	LLW	L1W05100 L2W05100	CHAR		List of Samples Need by LLW Project	
31	LLW/Vendor(s)	L1W05100 L2W05100	HLW XLLHL50203	H12A3212	Acceptance Criteria for LLW Stream from Phase I Sludge Washing	
32	LLW/Vendor(s)	L1W05100	HLW XLLHLP0202	H22B3 H12B312	Characteristics of separated Cs.	
33	LLW/Vendor(s)	L1W05100	HLW XLLHLP0202	H22B3 H12B312	Characteristics of separated Sr.	
34	LLW/Vendor(s)	L1W05100	HLW XLLHP0202	H22B3 H12B312	Characteristics of separated Tc.	
35	LLW/Vendor(s)	L1W05100	HLW XLLHP0202	H22B3 H12B312	Characteristics of separated solids.	

LLW PROJECT PHASE 1 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
36	HLW XHLLLS0204	H12A4212	LLW/Vendor(s)	L1W05100 L2W05100	Characteristics for LLW Stream from Phase II Sludge Washing	
37						
38						

LLW PROJECT PHASE 1 INTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
1	LLW/Vendor(s)	Engineering Support Activity (TBD)/L1W02800	Vendor(s)/LLW	L1W08010 L1W08020	Agreement that feed transfer meets vendor(s) feed specs.	S-S
2	LLW	L2D03020A	Vendor(s)	L1W05100	Vendor(s) feed specs.	F-S
3	LLW	L2D03020A	Vendor(s)	L1W05100 L2W05100	Vendor(s) gaseous emissions spec.	F-S
4	LLW	L2W09010 L2W09020	Vendor(s)	L1W08010 L2W08010 L1W08020 L2W08020	Utilities	S-S
5	Vendor(s)	L1W05100 L2W05100	LLW	L2W07610F	Identification of utility needs for construction and operations of vendor(s) plants	S-S 7 MONTH LAG
6	LLW	L1W02850A	Vendor(s)	L1W05100 L2W05100	Historical process data packages documents	F-S
7	LLW	L2W07010A	Vendor(s)	L1W05100 L2W05100	Identification of utility capability of DOE	F-S
8	LLW	L2W07010A	Vendor(s)		Vendor(s) site location	F-S
9	LLW	L2W02025	Vendor(s)	L1W05100 L2W05100	Interface Control Drawings	F-S 18 MONTH LAG

LLW PROJECT PHASE 1 INTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
10	Vendor(s)	L1W05100 L2W05200	LLW	L2W07310	Draft PSAR	S-S 18 MONTH LAG
11	Vendor(s)	L1W05100 L2W05200	LLW	L2W07320	Draft SAR for approval	S-S 25.5 MONTH LAG
12	LLW	L1W05100 L2W05200	Vendor(s)	L2W07310A	PSAR Approval	S-F 25 MONTH LAG
13	LLW	L1W05100 L2W05100	Vendor(s)	L2W07320A	SAR Approval	S-F 49.5 MONTH LAG
14	LLW	L2W07220	Vendor(s)	L2W08010 L1W08010 L2W08020 L1W08020	Ops. QA inspections by DOE	
15	LLW	L2D03020A	Vendor(s)	L1W05100 L2W05100	Design/Operating Criteria	F-S
16	LLW	L2D03020A	Vendor(s)	L1W05100 L2W05100	D&D criteria	F-S
17	Vendor(s)	L2V1110 L1V11100	LLW	L2W111300 L1W11300	Turnover of facilities that have been D&D'd	F-S
18	Vendor(s)	L1W05100 L2W05100	LLW	L2W07220	Verification that design criteria are met	

LLW PROJECT PHASE 1 INTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
19	Vendor(s)	L2W08010 L1W08010 L2W08020 L1W08020	LLW	L2W07220	Verification that operating criteria are met	
20	Vendor(s)	L2V11100 L1V11110	LLW	L2V111300 L1V11300	Verification that D&D criteria are met.	F-S

LLW PROJECT PHASE 2 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	
	Project	Sched. ID#	Project	Sched. ID#		
1	LLW	L1W06100	RETR		Requirements for supernate - Composition, amount, and schedules	
2	RETR		LLW/Vendor(s)	L1W08030	Supernate - Composition, amount, and schedules	
3	LLW/Vendor(s) & RETR/Vendor(s)	L1W08030	RETR/Vendor(s) LLW/Vendor(s)		Agreement that feed transfer meets vendor(s) feed specs.	
4	LLW/Vendor(s)	L1W08030	RETR/Vendor(s)		Separated solids from the LLW vendor(s) plant	
5	LLW/Vendor(s)	L1W08030	RETR/Vendor(s)		Cesium waste removed by the LLW vendor(s)	
6	LLW/Vendor(s)	L1W08030	RETR/Vendor(s)		Strontium waste removed by the LLW Vendor(s)	
7	LLW/Vendor(s)	L1W08030	RETR/Vendor(s)		Technetium waste removed by the LLW vendor(s)	
8	LLW/Vendor(s)	L1W08030	S&D		Immobilized LLW	

LLW PROJECT PHASE 2 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	
	Project	Sched. ID#	Project	Sched. ID#		
9	HLW and RETR XHLLLS0206	H22B3 H12B312	LLW/Vendor(s)	L1W06100	Acceptance criteria of separated solids from the LLW vendor(s) plant	
10	HLW XHLLLS0206	H22B3 H12B312	LLW/Vendor(s)	L1W06100	Acceptance criteria of separated cesium waste specs.	
11	RETR		LLW/Vendor(s)	L1W05100	Acceptance criteria of separated solids from the LLW vendor(s) plant	
12	HLW XHLLLS0206	H22B3 H12B312	LLW/Vendor(s)	L1W06100	Acceptance criteria of separated strontium waste specs.	
13	HLW XHLLLS0206	H22B3 H12B312	LLW/Vendor(s)	L1W06100	Acceptance criteria of separated technetium waste specs.	
15	LLW/Vendor(s)	L1W08030 L2W08030	SW		Other solid waste from vendor(s) plants (equipment, etc.)	

LLW PROJECT PHASE 2 EXTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	
	Project	Sched. ID#	Project	Sched. ID#		
16	SW/RETR/Vendor(s)		LLW/Vendor(s)		Agreement that transfer of vendor(s) radioactive liquid and solid waste meets specifications or acceptance criteria	
17	RETR		LLW/Vendor(s)	L1W06100 L2W06100	Radioactive liquid effluent acceptance criteria	
18	CHAR		LLW/Vendor(s)	L1W06100	Supernate samples for vendor(s) tests	
19	LLW/Vendor(s)	L1W08030 L2W08030	RETR/Vendor(s)		Liquid effluent from the vendor(s) after turnover of DST tanks and evaporator to Retrieval Project	
20	HLW/Vendor(s) XHLLLS207	H25B2	LLW	L1W08030	LLW stream from Phase II sludge wash	
21	SW		LLW/Vendor(s)		Radioactive solid waste (equipment, etc.) acceptance criteria	

LLW PROJECT PHASE 2 INTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
1	LLW	L2W04120A	LLW/Vendor(s)	L1V06100 L2V06100	Vendor(s) feed specs.	F-S
2	LLW	L2W04120A	Vendor(s)	L1V06100 L2V06100	Vendor(s) gaseous emissions spec.	F-S
3	Vendor(s)	L1W08030 L2W08030	LLW or State (WDOE or EPA Dist 10?)		Vendor(s) gaseous emissions report	
4	LLW	L2W09030	Vendor(s)	L1W08030 L2W08030	Utilities	S-S
5	LLW/Vendor(s)	L1V06100 L2V06100	LLW	L1W07810F L2W07810F	Identification of utility needs for construction and operations of vendor(s) plants	S-S
6	LLW	L2W02220	Vendor(s)	L2W04130	Historical process data packages documents	F-F
7	LLW	L1W07810A L2W07810A L1W07810B L2W07810B L1W07810C L2W07810C L1W07810D L2W07810D L1W07810E L2W07810E L1W07810F L2W07810F	Vendor(s)	L2V06100 L1V06100	Identification of utility capability of DOE	F-S
8	LLW	L2W07530A	Vendor(s)	L1V06100 L2V06100	Vendor(s) site location	F-S
9	LLW	L1W02740	Vendor(s)	L1V06100 L2V06100	Interface control documents	F-F
10	LLW	L1W07330A	Vendor(s)	L1V06100 L2V06100	PSAR Approval	F-F

LLW PROJECT PHASE 2 INTERNAL INTERFACES

#	FROM		TO		ITEM PROVIDED	Ties
	Project	Sched. ID#	Project	Sched. ID#		
11	LLW	L2W07340A	Vendor(s)	L1V06100 L2V06100	SAR Approval	
12	LLW	L2W07245	Vendor(s)	L1V06200 L2V06200	Vendor(s) facility inspections by DOE/NRC	S-F
13	LLW	L2W07245	Vendor(s)	L1V08030 L2V08030	Ops. QA inspections by DOE/NRC	F-F
14	LLW	L2W04120A	Vendor(s)	L1V06100 L2V06100	Design/operating criteria	F-S
15	LLW	L2W04120A	Vendor(s)	L1V06100 L2V06100	D&D Criteria	F-S
16	Vendor(s)	L1W11200 L2W11200	LLW	L1W11400 L2W11400	Turnover of facilities that have been D&D'd	F-S
17	Vendor(s)	L2W07245	LLW	L1V06200 L2V06200	Verification that design criteria are met	S-F
18	Vendor(s)	L2W07245	LLW	L1W08030 L2W08030	Verification that operating criteria are met	F-F
19	Vendor(s)	L1W11200 L2W11200	LLW	L1W11400 L2W11400	Verification that D&D criteria are met	F-S
20	LLW	L2W07540A	Vendor(s)	L1V06200 L2V06200	Vendor(s) site soil characterization information for NEPA baseline for ultimate closure	F-S

1.1.1.3.02 Low Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.02.02.07	FSAR Review Comments Phase I	DOE-RL T32-00-002		29SEP00
1.1.1.3.02.01.07	FSAR Review Comments Phase I	DOE-RL T32-00-004		29SEP00
1.1.1.3.02.01.09	Initiate Cold & Hot Operations Immob Sys	DOE-RL T32-02-001		15DEC00
1.1.1.3.02.02.09	Initiate Cold & Hot Ops/LLW Immob Support Syst	DOE-RL T32-02-003		15DEC00
1.1.1.3.02.02.05	Initiate Cold Ops of LLW Pretreat/Immobili Facil	DOE-RL T32-02-005	31JAN02	
1.1.1.3.02.02.04	Issue of Final RFP - Phase II	DOE-RL T32-04-001		07JAN04
1.1.1.3.02.01.08	Complete Phase 1 Production Operations (Initial)	DOE-RL T32-05-001		31DEC04
1.1.1.3.02.02.04	Phase II Contract Award	DOE-RL T32-05-003		07JAN05
1.1.1.3.02.02.08	Complete Initial Phase I Ops/LLW Immobili Facili	DOE-RL T32-05-004		30DEC04
1.1.1.3.02.02.07	PSAR Review Comments Phase II	DOE-RL T32-06-001		31AUG06
1.1.1.3.02.01.07	PSAR Review Comments Phase II	DOE-RL T32-06-002		30AUG06
1.1.1.3.02.02.07	Complete Conceptual Design Phase II LLW	DOE-RL T32-06-003	03OCT05	
1.1.1.3.02.02.07	Key Decision 3/4, Appr Comme Constr/Ops Phase II	DOE-RL T32-09-001	01OCT08	
1.1.1.3.02.02.07	FSAR Review Comments Phase II	DOE-RL T32-10-001		30APR10

1.1.1.3.02 Low Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.02.02.07	Design, Construct, Startup Utilit/Supp Sys Ph II	DOE-RL T32-10-002		01JUL10
1.1.1.3.02.01.07	FSAR Review Comments Phase II	DOE-RL T32-10-003		30APR10
1.1.1.3.02.01.07	Design, Construct, Startup Utilities/Support Sys	DOE-RL T32-10-004		01JUL10
1.1.1.3.02.01.08	Complete Phase 1 Production Operations (Cont.)	DOE-RL T32-11-001		31DEC10
1.1.1.3.02.02.08	Complete Cont. Phase I Ops/LLW Immobili Facility	DOE-RL T32-11-002		30DEC10
1.1.1.3.02.01.09	Complete Phase I Production Operations	DOE-RL T32-11-003		17JUN09
1.1.1.3.02.02.09	Complete Phase I Ops/LLW Immobili Support System	DOE-RL T32-11-004		17JUN09
1.1.1.3.02.01.09	Complete Phase II Production Operations	DOE-RL T32-22-003		28SEP20
1.1.1.3.02.02.09	Complete Phase II Ops/LLW Immobili Support Syste	DOE-RL T32-22-004		24SEP20
1.1.1.3.02.01.11	Complete Phase II Pretreat Facility D&D (Vendor)	DOE-RL T32-27-002		09DEC25
1.1.1.3.02.02.11	Complete Phase II Immobili Facility D&D (Vendor)	DOE-RL T32-27-004		06NOV26
1.1.1.3.02.01.09	Complete Post Production Operations	DOE-RL T32-28-001		10JAN28
1.1.1.3.02.02.09	Compl Deactivation/LLW Immobiliz Support Systems	DOE-RL T32-28-002		22NOV2
1.1.1.3.02.02.01	Submit to WHC Prog Baseline Integ OutYear ADS	DOE-RL T32-28-003		11DEC2

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.02 Low Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.02.02.01	Submit to TWRS Program Integrated Outyear MYPP	DOE-RL T32-28-004		03APR29
1.1.1.3.02.02.01	Submit FY 98 ADS to WHC Program Baseline Integ	DOE-RL T32-96-001		31MAY96
1.1.1.3.02.02.01	Submit 97 Multi-Year Prog. Plan to TWRS Prog Int	DOE-RL T32-96-002		13SEP96
1.1.1.3.02.02.03	Issue of 1 Draft RFP for Privatization Phase I	DOE-RL T32-96-004	15NOV95	
1.1.1.3.02.02.03	Issue Final RFP Phase I	DOE-RL T32-96-005		15MAR96
1.1.1.3.02.02.03	Award Phase I Contract	DOE-RL T32-96-006		30AUG96
1.1.1.3.02.02.07	Issue Approved Site Evaluation Report Phase I	DOE-RL T32-96-009		15MAR96
1.1.1.3.02.01.07	Issue Approved Site Evaluation Report Phase I	DOE-RL T32-96-010		15MAR96
1.1.1.3.02.01.02	Issue LLW Feed Staging Plan	DOE-RL T32-96-020		01NOV95
1.1.1.3.02.01.02	Issue Preliminary Feed Staging Plan	DOE-RL T32-96-022		15FEB96
1.1.1.3.02.01.02	Confirmation of Preliminary Feed Staging Plan	DOE-RL T32-96-023		15AUG96
1.1.1.3.02.02.02	LLW Gaseous Effluents Performance Requirements	DOE-RL T32-96-025		30AUG96
1.1.1.3.02.02.02	Issue 242A Life Extension Study	DOE-RL T32-96-026		30SEP99
1.1.1.3.02.02.01	ADS Preparation FY97: LLW Immobilization	DOE-RL T32-97-001		30MAY97

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.02 Low Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.02.02.01	Submit 98 Multi-Year Prog. Plan to TWRS Prog Int	DOE-RL T32-97-002		12SEP97
1.1.1.3.02.02.01	Submit FY 98 ADS to WHC Program Baseline Integ	DOE-RL T32-98-001		29MAY98
1.1.1.3.02.02.01	Submit 98 Multi-Year Prog. Plan to TWRS Prog Int	DOE-RL T32-98-002		11SEP98
1.1.1.3.02.02.07	PSAR Review Comments Phase I	DOE-RL T32-98-005		30SEP98
1.1.1.3.02.01.07	PSAR Review Comments Phase I	DOE-RL T32-98-009		30SEP98
1.1.1.3.02.02.05	M-50-02-T01 Finish Construct of Phase I Facility	TPA-T T3A-04-100		04JAN02
1.1.1.3.02.02.05	M-50-02/05Hot Startup LLW Pretreat/Immobi Fac	TPA-I T3A-05-100		31JUL02
1.1.1.3.02.01.08	M-50-00 Complete Phase II Production Operations	TPA-M T3A-28-100		19APR22
1.1.1.3.02.02.05	M-50-01 Start Construction of Phase I Facilities	TPA-I T3A-99-101	04JAN00	
1.1.1.3.02.02.08	M-60-00 Complete Phase II Ops/LLW Immobil Fac	TPA-M T3B-28-100		20APR22

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

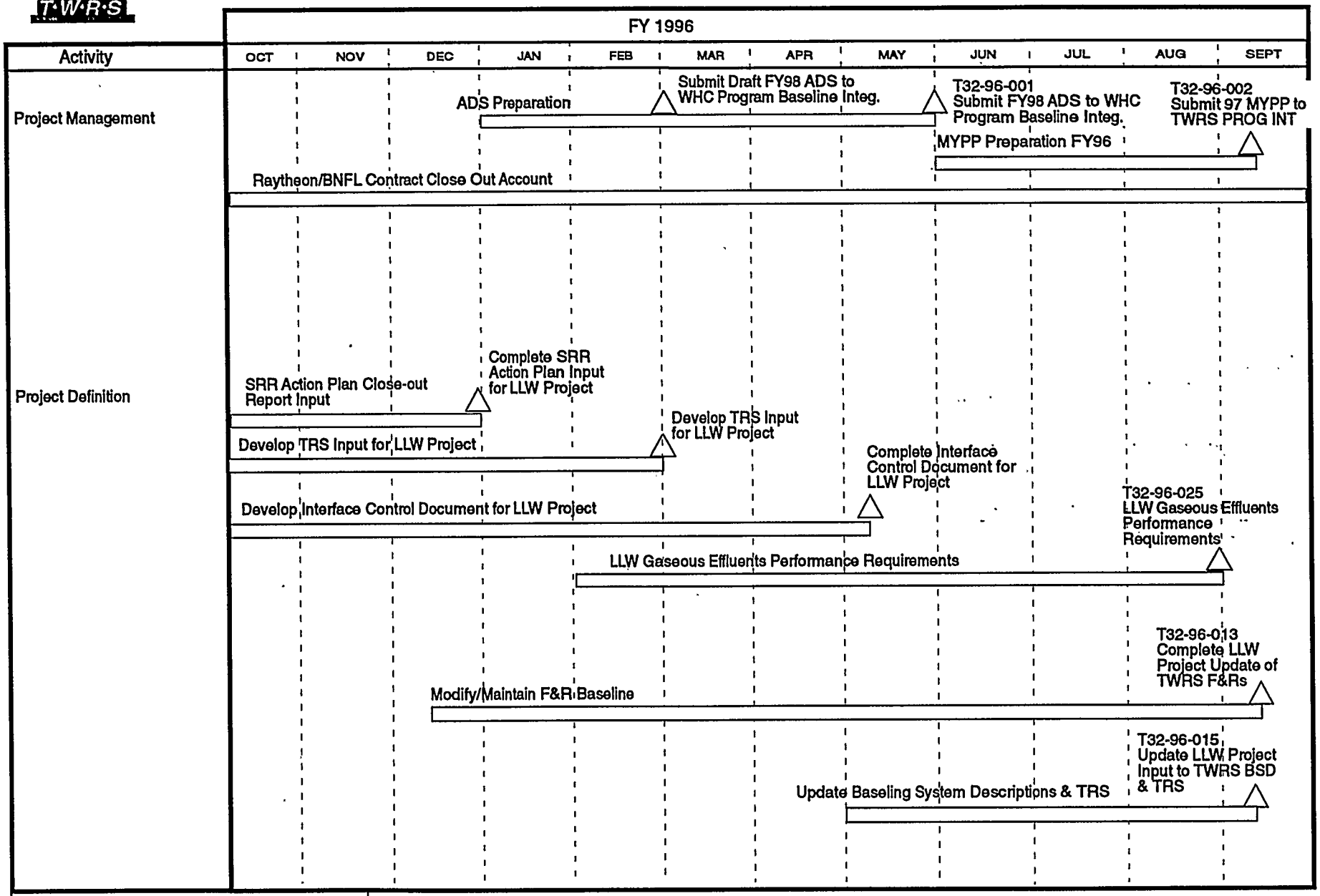
1.1.1.3.02 - Low Level Waste - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	6635857	96225	143518	219995	219705	189524	188737	192818	210800	206691	191493
	REPORT TOTAL	6635857	96225	143518	219995	219705	189524	188737	192818	210800	206691	191493

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	119272	150518	313233	329095	363599	356797	348393	330365	330438	330497	330508
	REPORT TOTAL	119272	150518	313233	329095	363599	356797	348393	330365	330438	330497	330508

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	311424	267371	267385	267324	147479	147989	147844	147915	147957	130914	95939
	REPORT TOTAL	311424	267371	267385	267324	147479	147989	147844	147915	147957	130914	95939

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
1	EXPENSE	18837	17258	16000	16000	16000
	REPORT TOTAL	18837	17258	16000	16000	16000



FY 1996 Performance Baseline Schedule

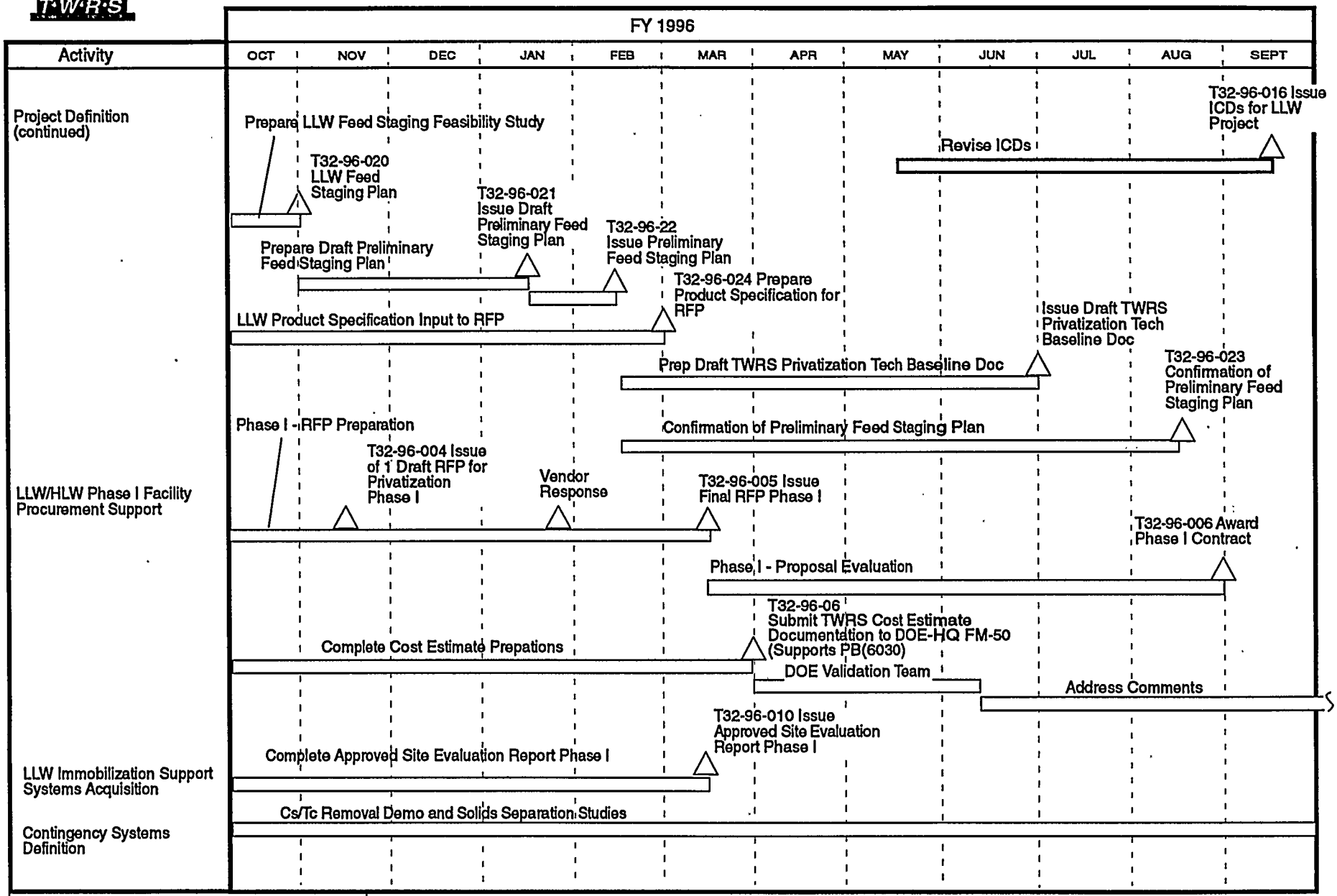
1.1.1.3.02 Low Level Waste

29509043.10 page 1

Attachment 8-7 FY 1996 Performance Baseline Schedule
Sheet 1 of 2

WHC-SP-1101
REV. 1

Draft



FY 1996 Performance Baseline Schedule

1.1.1.3.02 Low Level Waste

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.02 - Low Level Waste - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1	EXPENSE	8108	8005	7954	8138	8023	8083	8201	8175	8048	8085	8141	7264	96225
	REPORT TOTAL	8108	8005	7954	8138	8023	8083	8201	8175	8048	8085	8141	7264	96225

Attachment 8-8 Cost Estimate Baseline by Month

9.0 HIGH-LEVEL WASTE (WBS 1.1.1.3.3)

9.1. STRATEGY

- Implement high-level waste (HLW) vitrification through an alternative acquisition strategy, that is, privatization, using a two-phase approach to demonstrate HLW immobilization in 2002 (Phase 1), followed by full-scale production starting in 2013 (Phase 2).

- During Phase 1, the integrating contractor will pretreat sludges and transfer them to the vendor selected to immobilize the HLW.

- During Phase 2, one vendor will pretreat and vitrify HLW sludges.

- The HLW products in Phases 1 and 2 must meet the repository waste acceptance criteria; however, the waste form and canister configuration may be different for each phase.

- Continue to explore new and innovative methods and emerging technologies that could realize significant cost and schedule savings through a combination of technology transfer from industrial and foreign experience and limited technology development.

- Interface with the Civilian Radioactive Waste Management project to determine the acceptability and cost effectiveness of waste form and packaging alternatives that are being considered by the TWRS Program. In conjunction with the Storage and Disposal (S&D) Project, develop a waste form qualification strategy as input to the Phase 2 Request for Proposal (RFP) for privatization, based on the selected alternatives.

- Complete trade studies as identified in the System Requirements Review Action Plan that resolve the planning basis assumptions. Specifically for the HLW Project (M&O), SRR action plans HLW-1 and PW-1 need resolution to support Phase 1 and action plans PI-04 and PI-06 (see Section 9.1.29) and HLW-4 to support Phase 2. Action plans HLW-2 and HLW-3 will be dispositioned by the HLW vendor. Action plans HLW-4 (Phase 1 only), HLW-5, HLW-6, HLW-7, HLW-8, and PI-05 are assigned to the Storage and Disposal Project, all for resolution to support Phase 2.

- Perform the functional decomposition of the HLW project functions, using the systems engineering approach, to ensure that the HLW vitrification system is necessarily and sufficiently defined.

- Perform glass formulation activities, composition variability studies, and waste form qualification testing to demonstrate the viability of high-waste oxide loading and provide as input to the technical data package for the Phase 2 RFP.

- Demonstrate the efficiency of radionuclide separation using enhanced sludge washing prior to issuance of the Phase 2 RFP.

- Perform limited laboratory-scale testing using pretreated radioactive waste to the extent required to confirm the product specifications developed for Phase 2 vitrification.

- Participate with the other TWRS projects and TWRS systems engineering on tank retrieval sequence, blending, pretreatment, and vitrification options in a continuing effort to minimize total program costs.

9.1.1 Objectives

The objective of the HLW Project is to pretreat the high-level and transuranic (TRU) waste fractions of the tank waste so that a "reasonable" volume of sludge requires immobilization for offsite disposal, vitrify these sludges creating an acceptable HLW form, and seal it in canisters for transfer to the S&D Project for interim storage at the Hanford Site until they are shipped to a geologic repository for final disposal. Based on current flowsheet estimates, the HLW Project will produce 9,000 cubic meters (m^3) of vitrified waste starting in July 2002. To meet the Tri-Party Agreement milestone M-51-00, all HLW/TRU waste must be vitrified by 2028.

9.1.2 Planning Assumptions

9.1.2.1 Funding. The HLW Project baseline will be constrained by expected funding availability. The constraints for fiscal years 1996 through 2001 are assumed to be the target level funding guidance received from DOE-RL (7/26/95). Annual funding for fiscal years 2002 through project completion is assumed to be the lowest annual funding level capable of implementing a procured HLW vitrification demonstration by 2002 and full-scale HLW production by 2013. Funding profiles for each stage will be developed and agreed upon (through formal change control) as the uncertainties associated with the HLW Project are resolved, and each stage gets closer to being initiated.

9.1.2.2 Tri-Party Agreement Milestones. Interim milestones will be allowed to float as dictated by the assumed funding profile. The final Tri-Party Agreement milestones (M-50-00 and M-51-00) to complete HLW pretreatment and vitrification by 2028 will not change.

9.1.2.3 Privatization. HLW vitrification will be demonstrated by a single vendor during Phase 1 in a privately-owned facility starting in 2002, using sludges that have been pretreated and provided by the integrating (management and operating [M&O]) contractor. Costs for retrieving, pretreating, and delivering these sludges to the vendor are consolidated in the Waste Retrieval Project. Costs for vendor facility acquisition, which include capital payments during design and product payments, are divided between the Low-Level Waste (LLW) Project and the High-Level Waste (HLW) Project.

Multi-Year Program Plan activities will support preparation of the draft RFP, provide responses to prospective bidders, complete preparation of the final RFP, manage the contract when it is in place, and provide a minimal level-of-effort technical capability to assist the selected vendor. The HLW Project work scope, which is not part of privatization but will remain with the M&O contractor, includes the following:

- System engineering, site integration, and interface definition
- Technology development and feed processibility assessment associated with product specification and qualification

- Feed specification for Phase 1
- Project and contract management as assigned by DOE
- HLW/TRU alternative product definition and radioactive waste evaluation/acceptance
- Providing required infrastructure, for example, utilities
- Pretreatment of the HLW sludges for Phase 1.

9.1.2.4 Processing Scope. The processing scope includes the following.

- All single-shell and double-shell tank wastes will be vitrified; none will be disposed of in-situ.
- Blending and pretreatment will result in approximately 10 unique feed types, each requiring process qualification.
- TRU waste will be blended with other HLW feed streams and vitrified.

9.1.2.5 Plant Configuration. The plant configuration will include the following.

- The HLW vitrification facility for Phase 1 will be a privately designed, constructed, and owned plant with a nominal capacity of 1 metric ton per day, using flowsheet values and processes that will be contractually specified and 61-centimeter (cm) x 305-cm canisters. This facility may or may not be a standalone facility.
- Pretreatment, that is, settle/decant and enhanced sludge washing for Phase 1, will be performed by the integrating contractor (M&O) in Hanford existing facilities.
- HLW vitrification for Phase 2 will be performed by one vendor operating a privately designed, constructed, and owned facility having a nominal capacity of 12 metric tons per day. Canister configuration, waste oxide loading target values, and other waste form and canister specifications will be determined prior to the issuance of the RFP for Phase 2.
- Pretreatment of HLW sludges for Phase 2 will be performed by the vendor vitrifying the HLW feed streams, in a privately-owned facility, or in existing Hanford facilities that are assigned to the vendor to use under the terms and conditions of the Phase 2 contract.
- The HLW vitrification facilities in Phases 1 and 2 should include provisions for limited lag feed storage for pretreated HLW sludges, cesium eluent, technetium product, and potentially TRU/strontium product.

9.1.2.6 Decontamination and Decommissioning. The deactivation, decontamination, and decommissioning of the HLW pretreatment and vitrification facilities are the responsibility of the respective owners, and estimates of those costs should be included in the proposals. Unless additional beneficial use of these facilities is identified, it is expected that decontamination and decommissioning activities will require two (2) years for Phase 1 and five (5) years for Phase 2. They will then be transferred to the Surplus Facilities Management program for final disposition.

9.1.2.7 Waste Form Disposal Method/Timing. The canistered HLW glass will be disposed of by the Civilian Radioactive Waste Management project in one or two geologic repositories, no sooner than 2020 and perhaps starting as late as 2035. Disposal cost will be fairly allocated between the commercial nuclear power companies (for their Spent Nuclear Fuel) and the DOE (for their HLW, spent nuclear fuel, and other wastes that require geologic disposal).

9.1.2.8 Sunk Costs. Sunk costs include the following.

- All non-Hanford Waste Vitrification Plant related sunk costs from November 1991 (the TWRS MSA date) forward will be included in the program scope.
- Hanford Waste Vitrification Plant sunk costs will be annotated on the Work Breakdown Structure (WBS) dictionary but not included in the program baseline scope.

9.1.2.9 Major Program Decisions. Major technical decisions and the risks associated with them are summarized below.

Determine Disposition of Transuranic Tank Waste (SRR Program Issue PI-06). A disposition approach for Hanford tank waste, which may be designated as TRU rather than HLW, is required. The approach would define the waste form criteria to be imposed. Alternatives for separate disposition of TRU tank waste are based on the assumption that selected tank waste types can be designated as TRU waste rather than HLW. Assuming that TRU tank waste exists, the following three options have been identified as alternatives for the disposition of TRU tank waste:

1. Dispose of TRU in the geologic repository
2. Dispose of TRU in the Waste Isolation Pilot Plant
3. Neither the Waste Isolation Pilot Plant nor the geologic repository is acceptable.

The primary impact of alternatives is the potential for waste form variations, depending on the selected disposition. There could be no impact (that is, waste acceptance criteria variations have minimal impact on the waste form and immobilization process selection) or it might be that two waste forms might need to be developed, qualified, and manufactured (one for TRU waste and one for HLW). The selection will also impact the staging of the waste form manufacturing. This decision must be made before the RFP for Phase 2 is issued.

For planning purposes, the HLW Project has assumed that any TRU tank waste that exists at the Hanford Site can be disposed of in the geologic repository.

Determine Whether TRU and HLW Can Be Processed in Same Facility. While the current planning basis is to vitrify HLW and TRU wastes together rather than separately, a trade study to determine whether a single plant will be developed to immobilize TRU and HLW types is required. The following two alternatives exist for providing the capability to immobilize HLW and TRU waste:

1. Combined TRU/HLW facility
2. Separate facilities.

This decision can have significant impacts on the projected cost and schedule of HLW and TRU waste immobilization. Separate facilities represent the upper bound of facility construction and operating costs for the alternatives identified, while processing the two waste types separately in a single facility without segregation would result in somewhat lower costs. Current program planning cost estimates are based on an implementation strategy that does not segregate TRU from HLW prior to vitrification. Current cost estimates will escalate if an alternative to the current planning basis is selected.

If segregated TRU tank waste processing is required and the single facility concept using equipment changeout is selected, then some increase in schedule risk may occur as the result of incorporating downtime in the overall facility program schedule to allow for equipment changeout.

For planning purposes, the HLW Project has assumed that HLW and TRU waste can be processed in the same facility without segregating the TRU from the HLW.

Determine Acceptability of Alternative Containers for Geologic Repository (SRR Program Issue PI-04). A reference waste canister for disposal of Hanford Site waste in the geologic repository is required. Canister alternatives are derived from current acceptance criteria for the repository and interpretation of the recent evolutions in the geologic repository reference design. The alternatives for canister sizing include the following:

1. The Defense Waste Processing Facility standard canister

2. A larger canister that uses the geologic repository multi-purpose canister design envelope for development of an optimum canister size

3. Another optimum canister size to be determined.

The selection of the HLW canister will define the envelope for the HLW form to be disposed of in the geologic repository. Canister size selection impacts include the following:

1. The number of packages that must be generated by the vitrification facility

2. The dimension and weight of packages that must be positioned and moved inside the facility process cell and at the geologic repository

3. The package size that would be used as a basis for selecting the interim storage concept

4. The physical form of the HLW glass product.

The Defense Waste Processing Facility standard canister will be used for Phase 1 HLW immobilization due to time constraints and the DOE position that minimizing the HLW volume and cost is not a primary driver for Phase 1. However, current program planning cost estimates for Phase 2 are based on a 0.68-meter diameter by 4.5-meter canister as an initial estimate for a canister that uses the multi-purpose canister design envelope.

9.1.3 Constraints

The primary risks associated with this scope include the following.

1. Inadequate integration with other TWRS projects that might lead to the inability to adequately characterize tank waste, pretreat HLW to meet feed specifications for immobilization, transfer feed at the required rate, or adequately disposition system-generated waste. Comprehensive integration and analysis of interfaces with other TWRS projects is being conducted to mitigate this risk.

2. Inability to adequately define the required inputs, functions, and outputs of the HLW system. This includes, but is not limited to, the definition of HLW feed characteristics, the volume of HLW to be processed, repository requirements for acceptable waste products, and system-generated waste treatment requirements. A series of trade studies and negotiation with the DOE Office of Civilian Radioactive Waste Management (RW) are planned to lead to complete system definition.

3. Inability to get technically adequate and timely bids for the privatization scope within the allocated funding. Existing specifications for DWPF products are being used for Phase 1 to reduce this risk.

4. Due to unavailability of sample material from tank 106-C, confirmation of the RFP Phase 1 HLW feed specification will be deferred to after the contract award. This will increase the department's risk of delivering specified feed to the vendor. The basis for the HLW feed specification and an assessment of our ability to meet that feed specification will be documented in a report prior to contract award. This risk is being further mitigated by an activity to obtain the required sample from the Waste Retrieval Project in FY 1997 and do sludge washing tests to refine the required pretreatment process to meet the contract specifications.

5. Verification that a generic vitrification process can safely produce an adequate glass will not be performed for the Phase 1 feed and product specifications. This could force the vendor to include contingency costs for such unknowns as ammonia production or exothermic reactions.

6. Discussion with vendors during the Phase 1 contract award may redefine the scope of the required infrastructure. A Change Request would be required.

7. It is assumed that the HLW pretreatment during Phase 2 will be completed by 2021. A trade study will determine if adequate tank space is available to accomplish this.

9.1.3.1 Project Interfaces.

Interfaces with Other TWRS Projects. The HLW Project interfaces with several other TWRS projects: Waste Characterization, Waste Retrieval, Low-Level Waste Immobilization, and Storage and Disposal.

The Waste Characterization Project provides waste characterization data from recent sampling and historical data review. To support this need, the HLW Project, in concert with the LLW Project, will prepare a set of data quality objectives identifying the need for data, number of samples needed, and particular analyses required. The Waste Characterization Project also provides small quantities of retrieved waste that, when pretreated, will be used in the initial radioactive laboratory-scale melter system testing.

The Waste Retrieval Project provides radioactive wastes to the HLW Project for pretreatment by the M&O in Phase 1. The Waste Retrieval Project will provide all in-tank equipment and transfer lines required to retrieve, enhance sludge wash, blend, and deliver to the vendor the feed for Phase 1 immobilization.

The LLW Project immobilizes the pretreated liquid effluents generated by the HLW vitrification plant.

The Storage and Disposal Project provides interim storage of the canistered HLW glass logs. If it is decided to overpack the cesium and strontium capsules, the Storage and Disposal Project will process the capsules.

Interfaces With Other Organizations. Three organizations that perform key roles in defining the HLW Project's technical scope and requirements are WHC TWRS disposal engineering, process engineering, and systems engineering.

If the decision is made to vitrify the cesium and strontium halide salts rather than to overpack the capsules, the WHC Facility Transition Projects will maintain ownership of the cesium and strontium capsules (currently stored in its Waste Encapsulation and Storage Facility) until the HLW vitrification facility schedules them for processing. The capability to process the cesium and strontium into HLW glass would need to be included in the Phase 2 RFP.

The PNL TWRS technology organization performs many of the technology development activities required to support the HLW Project.

The DOE Office of Civilian Radioactive Waste Management and its Yucca Mountain Site Characterization Office provide technical support and programmatic guidance to the waste form producers, for example, the HLW project, in terms of the acceptability of its proposed waste form(s) for final disposal and the calculation of disposal fees.

Any secondary liquid and solid nonradioactive wastes generated by the High-Level Waste Project will be transferred to the Liquid Waste and Solid Waste Programs for processing.

After the HLW vitrification facilities have been decontaminated and decommissioned by their respective owners, they will be transferred to Surplus Facilities.

9.2 TECHNICAL REQUIREMENTS BASELINE

The systems engineering functions that define the HLW Project scope for completing the TWRS mission include the following:

1. Pretreat HLW Sludges

2. Immobilize HLW/TRU Waste. These functions involve the pretreatment and vitrification of the HLW/TRU wastes currently stored in the 28 double-shell tanks and 149 single-shell tanks at the Hanford Site.

The technical requirements baseline for the HLW Project will be established after the findings and recommendations of the system requirements review have been addressed, and the TWRS technical baseline has been reestablished and validated.

9.2.1 HLW Project Technical Documents Tree and Product Structure

The systems engineering process is being used within the TWRS Program to develop and maintain a technical baseline. The technical basis for the HLW Project is derived from the systems engineering functions and requirements work and the technical documents tree and the product structure that support the TWRS cleanup mission. For the TWRS Program Technical Baseline the TWRS Safety and Technical Integration group is providing the integrating function, funded by the Program Integration Program Element, ADS 1200. TWRS Disposal Engineering is providing the integrating support for all projects, including the HLW Project, within the Disposal Program.

For the Functional Requirements Baseline these documents include the TWRS Functions and Requirements Documents and the Initial Baseline Systems Description. In FY 1996, the HLW Project will provide input to support the TWRS F&R update to be issued in September 1996. Support for resolution of the Systems Requirements Review issues will also be provided by the HLW Project as indicated in the Planning Basis section of this narrative. These will be done in accordance with the TWRS Systems Requirements Review Action Plan, DOE/RL-95-74.

For the Technical Requirements Baseline these documents include updated F&R Documents, Technical Requirements Specifications (TRSs), Interface Control Documents, and an updated Baseline Systems Description. In FY 1996, the HLW Project will provide input to support the TWRS TRS internal review that is scheduled to begin in March 1996.

Within the HLW Project a Design Requirements Baseline will be established. Design Requirements Documents (DRDs) will be issued consistent with the TRSs. Other documents that must be prepared are Functions and Operational Requirements (F&ORs), Design Concept Descriptions, Updated Interface Control Documents, Flowsheets (Energy/Mass), Pipe and Instrumentation Diagrams, and Updated Project Level Documentation. These will extend through the design portion of Phase 1 privatization. Preliminary drafts of several of these documents have been prepared as input to the Phase 1 RFP, which is due for release in FY 1996 (draft RFP in November 1996 and final at the end of March 1996).

Privatization Phase 1 and Phase 2 activities will involve extensive integration involving the M&O contractor with the different vendors. These documents will serve a vital function in establishing and maintaining an integrated approach to meeting Disposal Program goals and objectives.

An As-Built Configuration Baseline will be generated before startup and operations in FY 2002 for Phase 1. It will include startup and operations documentation, updated flowsheets, and pipe and instrumentation diagrams.

Subsequently, an Operational Baseline will be prepared to support the operations period which begins in FY 2002 for Phase 1.

Finally, a Decontamination and Decommissioning (D&D) baseline will be prepared to support the D&D of the facilities, which will be performed at the end of Phase 1 operations.

9.2.2 Work Breakdown Structure

The WBS tree for the HLW Project is in Attachment 9-1.

9.2.3 WBS Dictionary Sheet

The WBS dictionary sheet for the HLW Project is in Attachment 9-2.

9.2.4 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the HLW Project is in Attachment 9-3.

9.2.5 Technology Needs

Successful demonstration of high-temperature melter systems (including offgas control and treatment) and definition and demonstration of efficiency of the enhanced sludge washing process are key to achieving the HLW Project goal of minimizing the volume of vitrified waste product that will be sent to the geologic repository for final disposal. Development and validation of glass formulation models that can accurately and reliably predict glass compositions based on measured waste characteristics are also needed to minimize the amount of required glass qualifications. Given the appropriate contractual incentives, the vendors may choose to buy these technology development services, if the DOE does not continue to fund them.

Also required is successful demonstration of the effectiveness of the enhanced sludge washing process.

9.3 SCHEDULE BASELINE

9.3.1 Summary Schedule

The summary schedule for the HLW Project is in Attachment 9-4.

9.3.2 Milestone Control Log

The milestone control log for the HLW Project is in Attachment 9-5. Milestone description sheets are located in Appendix A.

9.4 COST BASELINE

9.4.1 Cost Baseline Summary by Year

The cost baseline summary for the HLW Project is in Attachment 9-6.

9.4.2 Basis of Estimate

The basis of cost estimates for the HLW Project is primarily from two sources. For technology development and project-related activities, cost estimates are based on similar experience from the Hanford Waste Vitrification Plant project. For trade studies and systems engineering-related activities, cost estimates are based on similar HLW Project activities that are currently in progress or recently completed (for example, the Facility Configuration Study).

9.5 PERFORMANCE MEASURES

The performance measures utilized by the HLW Project are tied to both Cost/Schedule Control Systems Criteria (C/SCSC) and to various performance indicators relating to the overall conduct of operations with the project. These are:

- Actual cost vs. schedule (ACWP vs. BCWP)
- Estimates at completion
- Percent of level 6 and above milestones met on or ahead of schedule
- Cost of significant selected activities
- Overhead application rates
- Customer satisfaction, measured by feedback from the customer
- Percent of maximum PBI earned
- Performance indicators
  - Lost work days
  - Recordable incidents
  - First aid cases.

9.6 EXECUTION YEAR

9.6.1 Technical Objectives

- Complete planning and initial project definition for the pretreatment of HLW sludge to be used for Phase 1 immobilization feed.
- Complete contracting actions required to award a contract to a private vendor for Phase 1 HLW immobilization.
- Complete actions associated with SRR action plans (HLW-1 and PW-1 for Phase 1 and PI-04, PI-06, and HLW-4 for Phase 2).

9.6.2 FY 1996 Performance Baseline Schedule

The performance baseline schedule for the HLW Project is in Attachment 9-7.

9.6.3 Cost Estimate Baseline by Month

The FY 1996 cost estimate baseline by month for the HLW Project is in Attachment 9-8.

9.6.4 FY 1995 Work Scope Carryover Summary

None.

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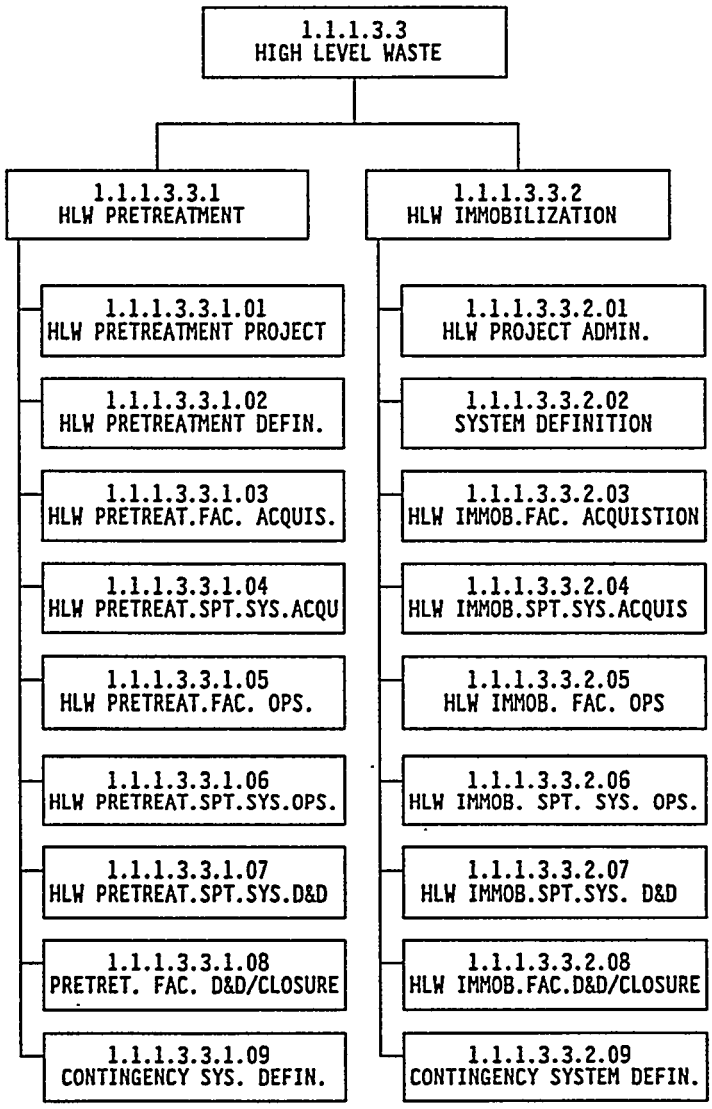
LISTING OF ATTACHMENTS

Attachment 9-1	Work Breakdown Structure
Attachment 9-2	WBS Dictionary Sheet
Attachment 9-3	Responsibility Assignment Matrix
Attachment 9-4	Summary Schedule
Attachment 9-5	Milestone Control Log
Attachment 9-6	Cost Baseline Summary by Year
Attachment 9-7	FY 1996 Performance Baseline Schedule
Attachment 9-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
HIGH LEVEL WASTE



Attachment 9-1 Work Breakdown Structure

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/18/95	1.1.1 TANK WASTE REMEDIATION SYSTEM 1.1.1.3 WASTE DISPOSAL	
3. WBS ELEMENT CODE/LEVEL 1.1.1.3.03 Level 4	4. WBS ELEMENT TITLE HIGH-LEVEL WASTE	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE 10/ 1/95	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 12400	9. BUDGET AND REPORTING NUMBERS Operating EW3130010 CENTRC 35EW31301 GPP Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	4,185.00	205,154.00	330,646.00	334,545.00	285,582.00	287,455.00	285,576.00
CENRTC	10.00	50.00	50.00				
LINE ITEM							
GPP							
TOTAL	4,195.00	205,204.00	330,696.00	334,545.00	285,582.00	287,455.00	285,576.00

B. TECHNICAL BASES

Goals and Objectives

The goal of the High Level Waste Project is to immobilize the high activity waste fraction of the waste in the 177 double and single shell tanks (including high level and transuranic waste but excluding the Cs/Sr capsules) into a form acceptable to the geologic repository (DOE-RW). To this end, the project is responsible for washing and performing alkaline leaching of the solids contents (sludges) of the tanks, incorporating the separated radionuclides generated by the LLW Project and immobilizing these products. Supporting activities to be conducted under this element include HLW input into the TWRS technical integration effort, a complete definition of the HLW system requirements, completed HLW pretreatment, vitrification, and required support facilities, safe facility operations and decontamination and decommissioning of the HLW facilities

To accomplish this overall goal the HLW Project will use a Privatization Scenario that is divided into two phases. The first phase will be a Proof-of-Concept phase during which a vendor will construct and operate a facility to immobilize the HLW from tanks 101-AZ, 102-AZ, and 106-C. The private vendor will finance the design, construction and operation of the facility and will be paid an interim payment following delivery of an acceptable facility design and thereafter upon delivery of the immobilized HLW to the Storage and Disposal Project. The goal of this phase is to demonstrate the feasibility of the privatization approach and to gather data which leads to a cost-effective tank waste remediation in the Full-Scale Production Phase (Phase 2). Approximately three percent of the waste will be processed in Phase 1.

The goal of the second, full-scale production phase is to pretreat and immobilize the remaining 97 percent of the waste.

In general, the privatization approach is expected to build upon the strengths of our nation's free enterprise system:

- Cost competitive, cost effective employment of multiple vendors
- Leading edge technology developed by industry for a wide range of applications
- Capital financing arrangements which smooth the life cycle funding requirements, reducing the need for high initial appropriation of government funds.

Major End-Item Deliverables
Major End-Item Deliverables

A. Long-term Deliverables

- Design, construction, operation, decontamination and decommissioning of a 1 MT/day HLW immobilization facility (Phase 1).

- Demonstrate the efficiency of the enhanced sludge washing process.

- Design, construction, operation, decontamination and decommissioning of a 12 MT/day HLW pretreatment and immobilization facility (Phase 2)

- Complete HLW pretreatment and immobilization processing of Hanford tank waste, clean out and shut down HLW pretreatment and immobilization facilities, decontaminate and decommission the HLW facilities and close all sites which were used by the HLW project .

B. Near-term Deliverables

- Issuance of an RFP for Phase 1 by 3/15/96

- Award of the Phase 1 contract by 8/30/96

C. FY 96 Milestones:

- Issue HLW Pretreatment Design Basis Feeds data package
- Issue HLW Pretreatment Product Specification
- Issue TWRS Process Technical Baseline
- Issue Summary Feed Pretreatment Plan
- Issue Waste Transfer Plan
- Complete HLW Pretreatment Project update of TWRS F&R
- Complete HLW Pretreatment input to TWRS TRS
- Update HLW Pretreatment input to TWRS BSD and TRS
- Issue ICD's for HLW Pretreatment
- Update Immobilize HLW F&R
- Update Immobilize HLW TRS
- Update Immobilize HLW ICD's
- Complete G2 Automated Flowsheet
- Issue HLW Strategy document, Rev 2
- Issue Final MYPP to RL
- Submit Final ADS
- Issue HLW Mission Analysis
- Issue Immobilize HLW Feed Specification
- Issue TRU Tank Waste Processing Strategy Document
- WIPP Preliminary Acceptance of TRU Waste Data
- TRU Waste Disposal Options Cost/Benefit analysis and Draft Recommendation
- Complete Immobilize HLW Annotated bibliography
- Issue Immobilize HLW Site Evaluation Report

Acceptance Criteria
Acceptance Criteria

A. Long-term Acceptance Criteria

□□

•□All Hanford HLW/TRU waste is immobilized and ready for transfer to the Storage and Disposal Project in accordance with the DOE-EM Waste Acceptance Product Specification and the DOE-RW Waste Acceptance System Requirements Documents that are in effect at the time of transfer.

•□Site Closure consistent with criteria generated using the NEPA process and in compliance with all applicable regulations.

B. Near-term Acceptance Criteria

•□Adequate technical and commercialization information is provided to DOE to allow DOE to issue the Phase 1 RFP.

•□Adequate technical and commercialization support is provided to DOE to Award the Phase 1 Contract.

C. STATEMENT OF WORK

The Statement of Work is attached and the file is located on (R drive).

HIGH LEVEL WASTE
1.1.1.3.3
Level 4 WBS Dictionary Sheet

STATEMENT OF WORK

The HLW Project is part of the Level III WBS element, Dispose of Tank Waste and is comprised of two Level V activities: HLW Pretreatment and HLW Immobilization.

Each of these Level V activities are comprised of 9 identical Level VI activities. The following is a brief description of the work scope contained in each of these Level VI activities.

1. **Project Administration**

This activity provides for the development of program plans and strategy documents that define the scope of the project as well as aid in the management and integration of the program element. Work scope that supports this activity is as follows:

- Prepare monthly reporting documentation and submit to TWRS Program Integration, to include Site Management System data, Critical Issues, Monthly Performance Review, and various technical, financial, and schedule data for special presentations.

- Participate in various external reviews, e.g., safety reviews, regulators and oversight groups such as the DNFSB, to include development of required information, coordinating and conducting meetings.

- Develop and maintain cost account plans and schedules, status the HLW Program integrated schedule and provide schedule and financial baseline status to WHC reporting systems, e.g., SMS, PTS, and MPR.

- Review and comment on program deliverables, i.e., reports, engineering studies, and other milestone media.

- Provide guidance to Cost Account Managers (CAMs) in the preparation of the HLW Program's business documentation (i.e., MYPP and ADS).

- Provide schedule and financial resources to prepare schedules and financial information supporting the CAMs in plan preparation.

- Provide the HLW Program integration prior to submittal of business plans to include reviews and incorporation of comments.

- Submit business plans to the TWRS Program Integration for submittal to RL and other customers.

- Prepare and submit a HLW Mission Analysis

- Refine the HLW MYPP to provide sufficient detail to allow the HLW Project cost estimate to be validated.

2. Project Definition

This activity will consist of performing systems engineering analysis of the HLW Project. The results of the analysis will be issued in the form of Functions and Requirements (F&R) documents, Technical Requirements Specifications (TRSs) and Interface Control Documents (ICDs), and Design Requirements Documents (DRD). The documents will be updated as needed to keep them current. In FY 1996, inputs will be provided to support the TWRS TRS Review and the update of the TWRS F&R baseline. This effort will also include the preparation of a HLW Feed Specification and a Process/Product data package to be provided to the selected vendor. The documents will be prepared as needed to support preparation of the RFPs and awarding the privatization Phase 1 and Phase 2 contracts. Trade Studies will be performed as needed to support the systems requirements review, the technical requirements review, and HLW Project specific reviews.

This activity also includes planning the feed staging for Phase 1 to ensure that the Retrieval Project is able to deliver the appropriate amount and composition of the feed to the HLW Vendor on the acceptable schedule.

This activity also includes placing all HLW technology development facilities on standby during FY96 and eventual shutdown/decommissioning of the facilities.

This activity will include studies and development work required to resolve SRR Action Plan Issues HLW-1 and PW-1 (for Phase 1) and issues PI-4, PI-6, and HLW-4 (for Phase 2).

3. HLW Facilities Acquisition

The scope of this WBS element is to provide the DOE with the necessary technical support to carry out the TWRS Privatization activities through the award of contract and to provide contract management support through the life of the contract. These activities can be broken down into four major tasks for both Phase 1 and Phase 2:

Direct support to the issuance of the Request for Proposal (RFP) and the evaluation of vendor responses, leading to the award of contract. This will include a collation and review of the vendor comments received from the Draft RFP, a final revision to the RFP, and support to vendor meetings and questions.

Development and analysis of information to support DOE policy decision relating to privatization and to support the Source Evaluation Board (SEB). This will include conducting a financial market analysis to ensure that the contract is financially feasible, conducting risk management activities on the project, support to the renegotiation of the Tri-Party Agreement, and support to the SEB in awarding the contract.

Definition of scope and requirements for the M&O contractor, as modified to accommodate and appropriately interface with privatized activities. This will include developing life-cycle cost estimates for privatization, developing site and infrastructure support information, and support of a TWRS/Privatization transition and interface team.

Management and coordination to support privatization activities and interface with the DOE. This will include project management and oversight of the contractor team supporting privatization, project control, document control, and quality assurance activities, as well as coordination with various technical organizations (i.e., regulatory, finance, technical, and procurement). Privatization close-out and transition activities are also planned under this task.

Under the Phase 1 Proof-Of-Concept privatization of Tank Waste Remediation System (TWRS), the Department of Energy (DOE) will procure from two private sector vendors, two Low Level Waste (LLW) pretreatment and immobilization facilities and (at DOE's discretion) an optional High Level Waste facility.

If any support to the vendors is needed for disposition of secondary wastes, it is provided by the Storage and Disposal Project.

The specific work scope of this activity includes the design, construction and cold startup of the vendor facilities for HLW immobilization (for phase 1) and both HLW pretreatment and immobilization for phase 2.

The selected vendors will be responsible for meeting applicable environmental, safety, and health requirements established by federal, state and local statutes; and the associated risk that accompanies these areas.

4. **Support Systems Acquisition**

This scope of work includes conducting engineering studies, identifying design requirements, completing conceptual and definitive designs, procurement of equipment, construction of facilities, and turnover to support systems operations for cold start-up of support systems. These support systems are primarily utilities including such items as water, electricity, and telecommunications, but also include infrastructure support such as siting studies for vendors facilities, establishing road access to vendors facilities, and providing any upgrades to emergency services to support the vendors facilities. This scope also includes site selection and evaluation,

maintenance of interface control documentation, integration of infrastructure and vendor system requirements, review of the vendors PSAR and FSAR and provision of permitting support to the vendor.

5. **Facilities Operations**

This work scope includes activities required for successful operation of the vendor processing facilities used to pretreat and immobilize the waste. These activities which will be managed and funded by the private vendor(s) include the following:

a. Production operations of the processing facilities
b. Preventative and corrective maintenance of the processing facilities
c. Quality assurance support for the processing facilities
d. Safety assurance support for the processing facilities
e. Engineering support for the processing facilities

6. **Support Systems Operations**

This work scope includes activities required for successful hot start-up and operation of the systems which support the operation of the vendors processing facilities (primarily available utilities). These activities include the following:

a. Systems definition support during engineering studies/conceptual design of these support systems

b. Planning and integration of preparation activities

c. Preparation of required documentation (e.g., operating procedures)

d. Training and qualification of personnel

e. Successful completion of Operational Readiness Review or Assessment

f. Cold testing of the support systems

g. Hot operations of the support systems

7. **Facility D&D/Closure**

This activity includes the decontamination and decommissioning of the Vendor Facilities for Phase 1 and Phase 2 as well as the closure of any vendor sites used during both phases. The decontamination and decommissioning of the facilities will be the responsibility of the private vendors. The facility site closures will be the responsibility of the Department of Energy.

8. **Support Systems D&D/Closure**

This activity includes the decontamination and decommissioning of the DOE owned support facilities for Phase 1 and Phase 2 as well as the closure of any sites used for support facilities.

9. **Contingency System Definition**

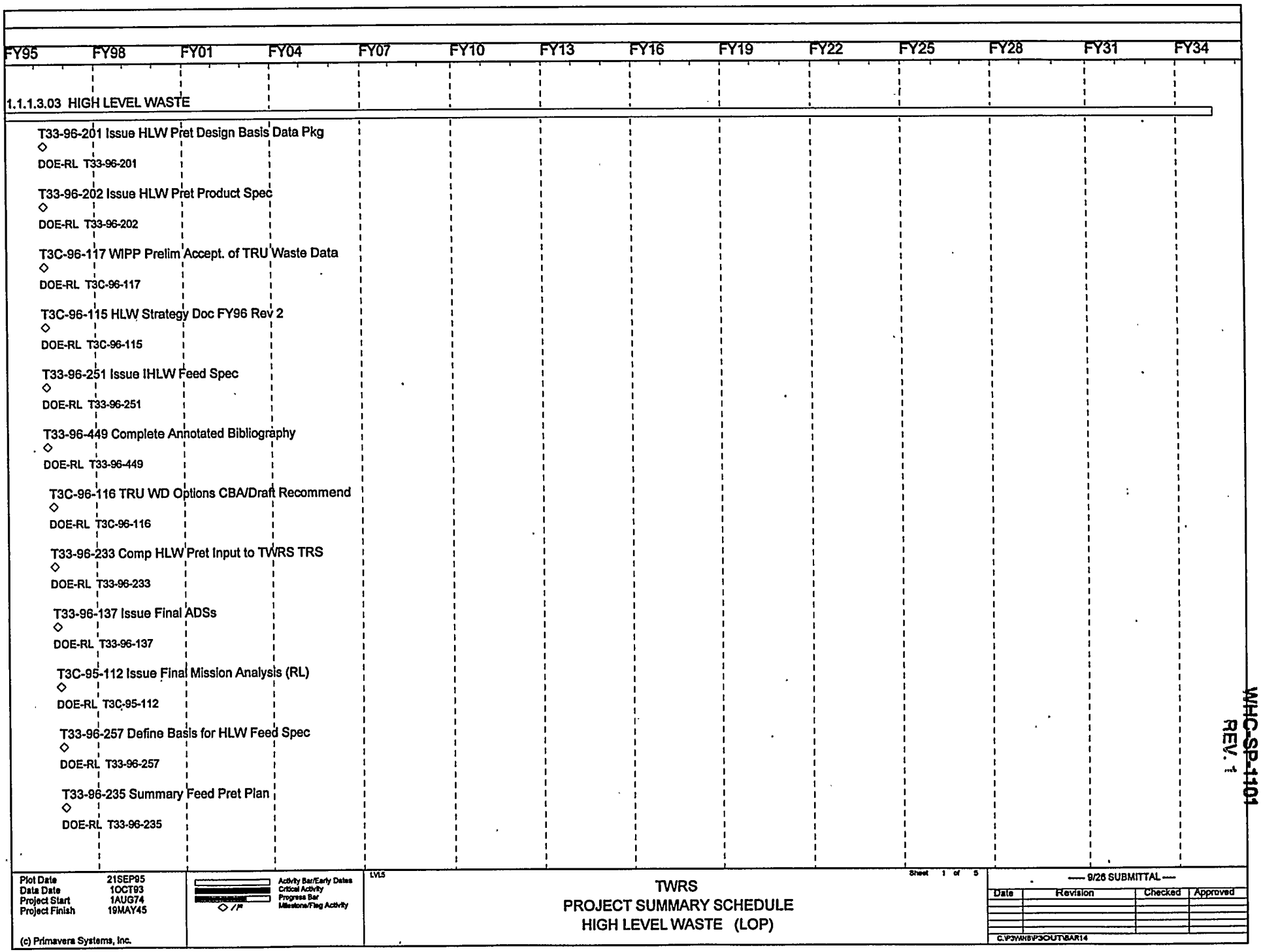
This scope of work includes the development of undemonstrated technologies and the development of strategic alternatives to the privatization approach. This activity is meant to reduce the risk to DOE of not being able to meet the overall regulatory goals of the HLW Project with the privatization approach which assumes that technology is already available. These efforts are currently not funded in the MYPP. The scope of work that deals with development of undemonstrated technologies is a potential work scope for funding by the Office of Technology Development (EM-50) through the Tank Focus Area. The other effort would require additional TWRS funding if they are to be pursued to mitigate risk. A brief description of these items follows.

a. Development Tasks of Undemonstrated Technologies (Potential Candidate Tasks for Tank Focus Area Funding). The list of technology tasks below reduce the risk to DOE by not only developing these technologies but by preserving a core competency of experts in sludge washing chemistry and HLW melter technology. These risk reduction tasks could include high waste loading glass development and demonstration, high capacity melter development, development of alternate process chemistry flowsheets, evaluation of high temperature vitrification system materials, validation of high waste loading using actual wastes, verification of the efficiency of enhanced sludge washing using actual waste, and development of alternate pretreatment technologies (e.g., acid dissolution)

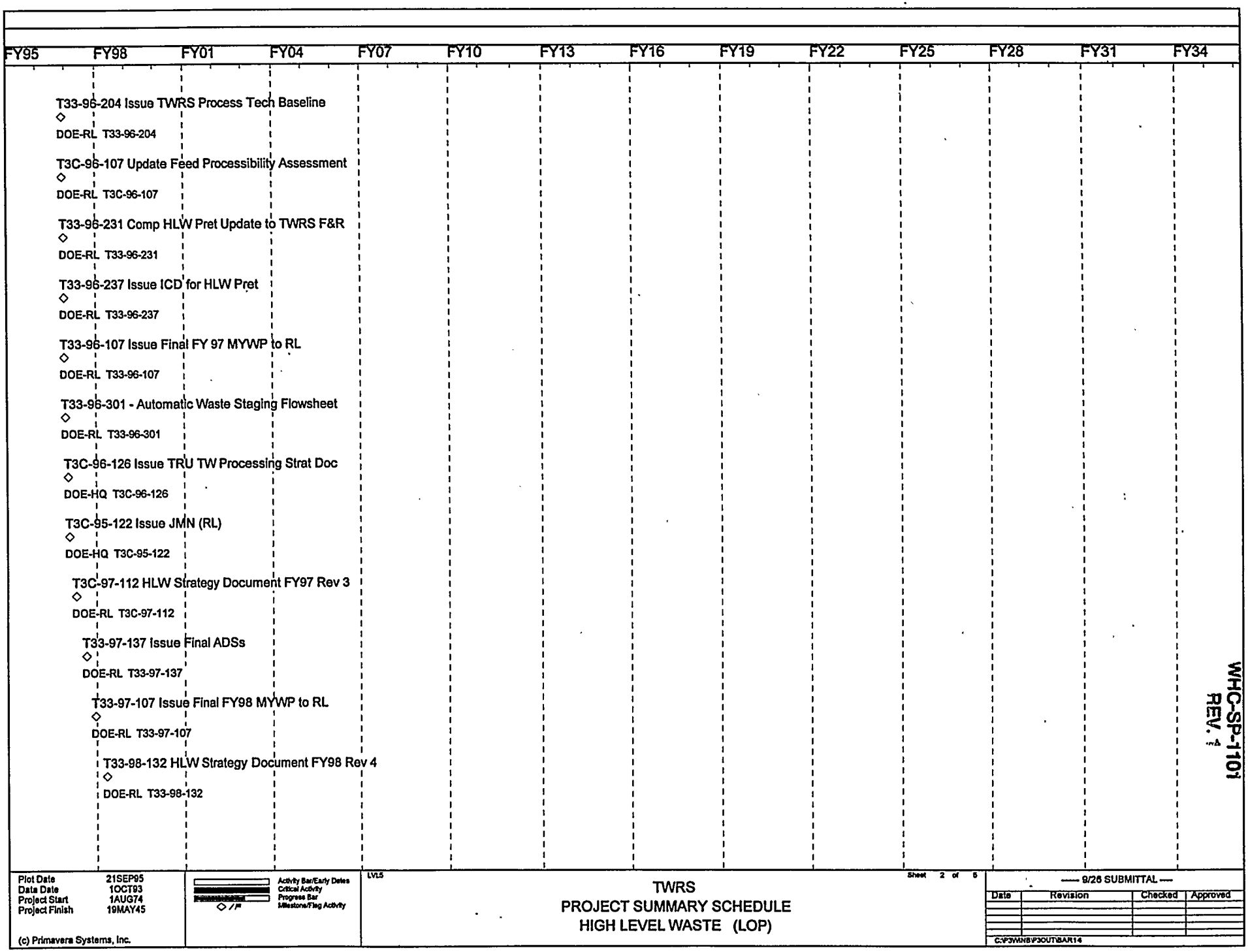
b. Development of Strategic Alternatives to the Privatization Approach.

This activity would include the development of an alternative contracting scenario in which DOE would finance the design, construction and operation of the HLW processing facilities using the technology available within the DOE complex. Risk based retrieval scenarios as well as total retrieval scenarios would be explored. This scope of work includes the development of flowsheets for pretreatment and immobilization of waste using laboratory data generated either from past program activities or future activities funded by the Tank Focus Area. This activity reduces the risk to DOE in the event that the privatization approach is not successful by preserving a core competency of engineering personnel as well as developing a back-up strategy.

WBS Number	WBS Title	Responsible Person
1.1.1.3.3	High-Level Waste Project	R.W. Powell
1.1.1.3.3.1	HLW Pretreatment	J.W. Hales
1.1.1.3.3.1.1	HLW Pretreatment Project Administration	D.K. Carter
1.1.1.3.3.1.2	HLW Pretreatment System Definition	R.A. Kirkbride
1.1.1.3.3.1.3	HLW Pretreatment Facilities Acquisition	S.E. Wagner
1.1.1.3.3.1.4	HLW Pretreatment Support Systems Acquisition	P. Felise
1.1.1.3.3.1.5	HLW Pretreatment Facilities Operations	R.U. Elwell
1.1.1.3.3.1.6	HLW Pretreatment Support Systems Operations	R.U. Elwell
1.1.1.3.3.1.7	HLW Pretreatment Support Systems D&D/Closure	D.K. Carter
1.1.1.3.3.1.8	HLW Pretreatment Facility D&D Closure	D.K. Carter
1.1.1.3.3.1.9	Contingency System Definition	R.A. Kirkbride
1.1.1.3.3.2	HLW Immobilization	P.S. Schaus
1.1.1.3.3.2.1	HLW Project Administration	D.K. Carter
1.1.1.3.3.2.2	HLW Systems Definition	R.D. Claghorn
1.1.1.3.3.2.3	HLW Immobilization Facilities Acquisition	S.E. Wagner
1.1.1.3.3.2.4	HLW Immobilization Support Systems Acquisition	P. Felise
1.1.1.3.3.2.5	HLW Immobilization Facilities Operations	R.U. Elwell
1.1.1.3.3.2.6	HLW Immobilization Support System Operations	R.U. Elwell
1.1.1.3.3.2.7	HLW Immobilization Support Systems D&D/Closure	D.K. Carter
1.1.1.3.3.2.8	HLW Immobilization Facility D&D/Closure	D.K. Carter
1.1.1.3.3.2.9	Contingency System Definition	R.D. Claghorn



Attachment 9-4 Summary Schedule
Sheet 1 of 5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FY04
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T33-96-204 Issue TWRS Process Tech Baseline
DOE-RL T33-96-204
T3C-96-107 Update Feed Processibility Assessment
DOE-RL T3C-96-107
T33-96-231 Comp HLW Pret Update to TWRS F&R
DOE-RL T33-96-231
T33-96-237 Issue ICD for HLW Pret
DOE-RL T33-96-237
T33-96-107 Issue Final FY 97 MYWP to RL
DOE-RL T33-96-107
T33-96-301 - Automatic Waste Staging Flowsheet
DOE-RL T33-96-301
T3C-96-126 Issue TRU TW Processing Strat Doc
DOE-HQ T3C-96-126
T3C-95-122 Issue JMN (RL)
DOE-HQ T3C-95-122
T3C-97-112 HLW Strategy Document FY97 Rev 3
DOE-RL T3C-97-112
T33-97-137 Issue Final ADSs
DOE-RL T33-97-137
T33-97-107 Issue Final FY98 MYWP to RL
DOE-RL T33-97-107
T33-98-132 HLW Strategy Document FY98 Rev 4
DOE-RL T33-98-132
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVLS
Sheet 2 of 5
TWRS
PROJECT SUMMARY SCHEDULE
HIGH LEVEL WASTE (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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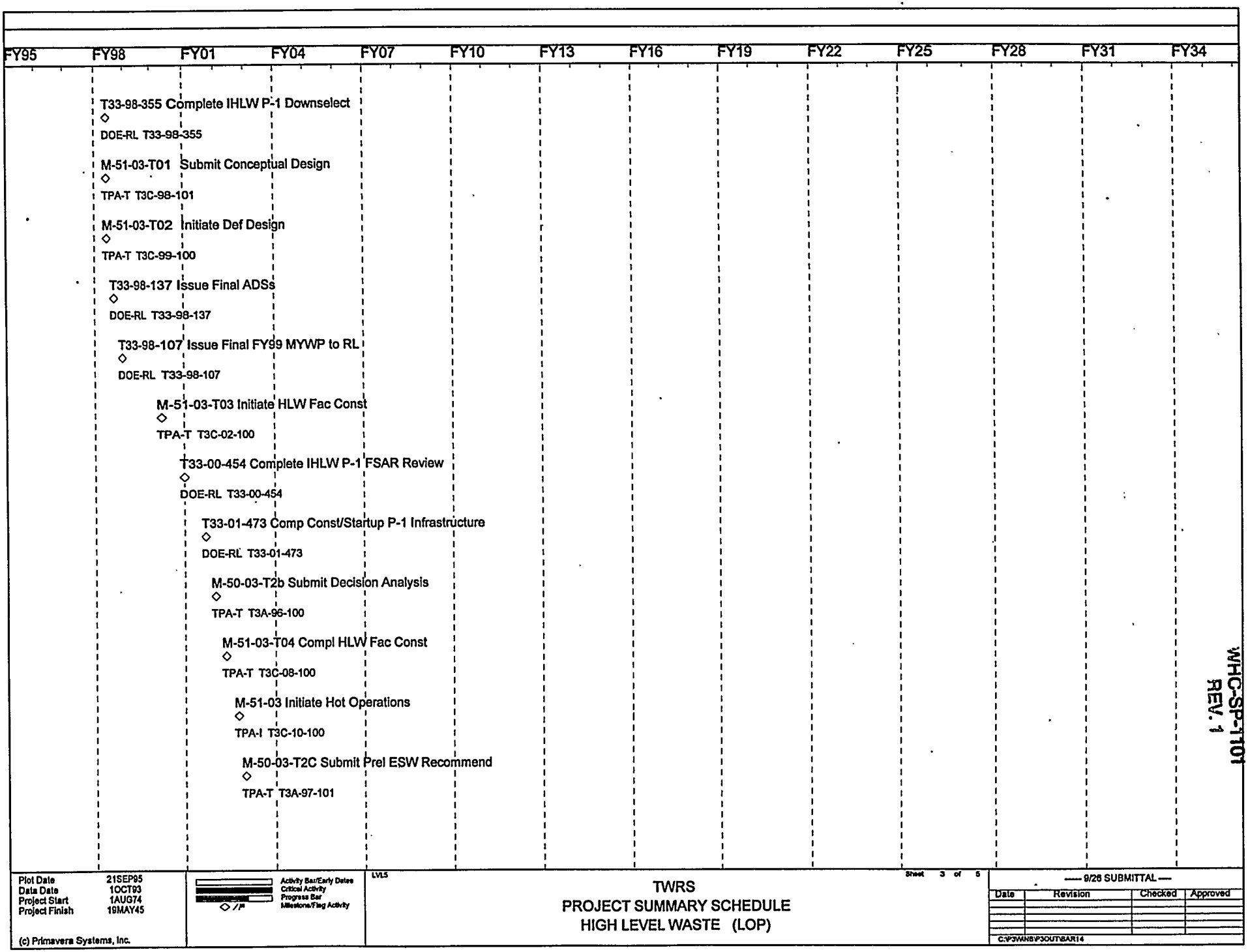

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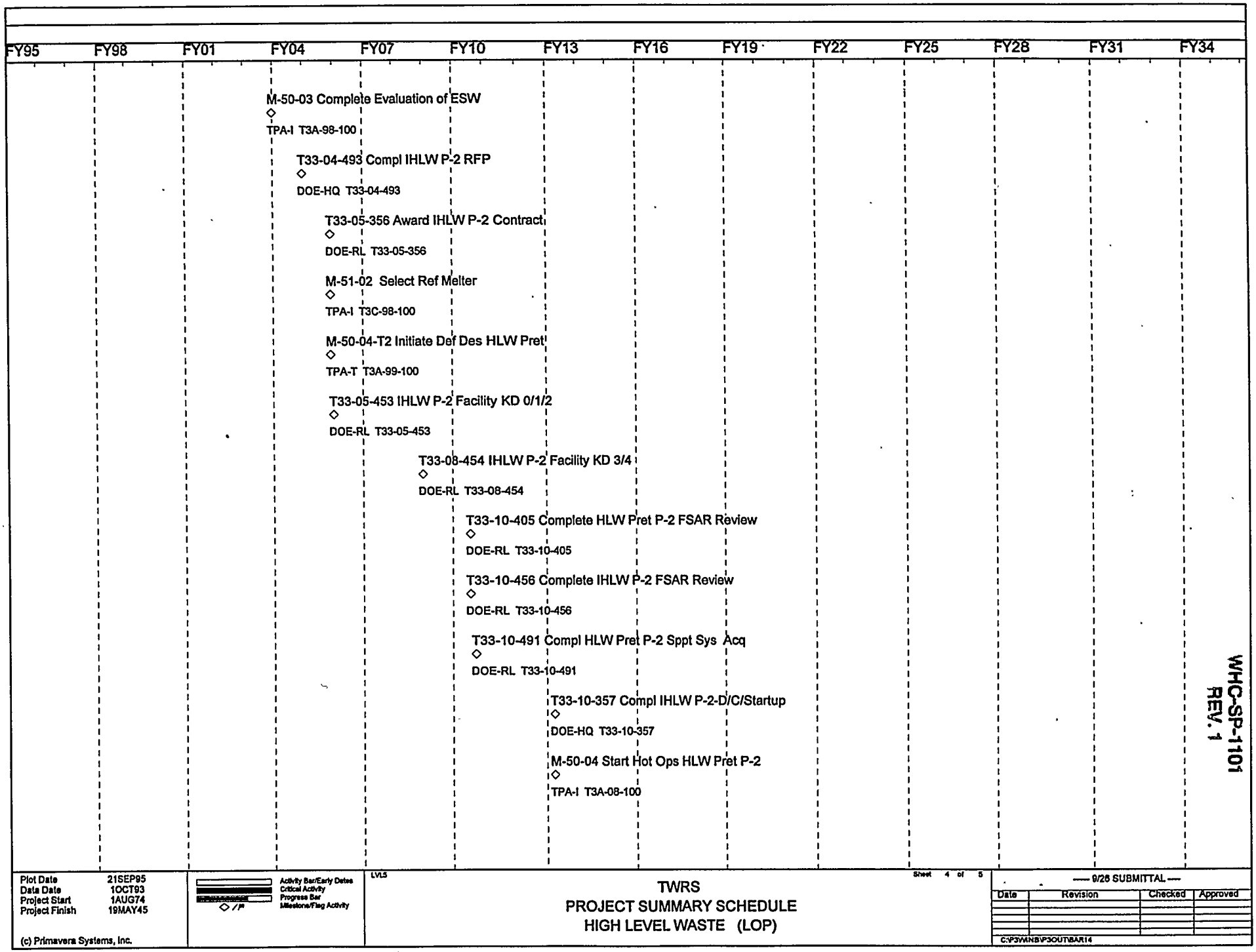
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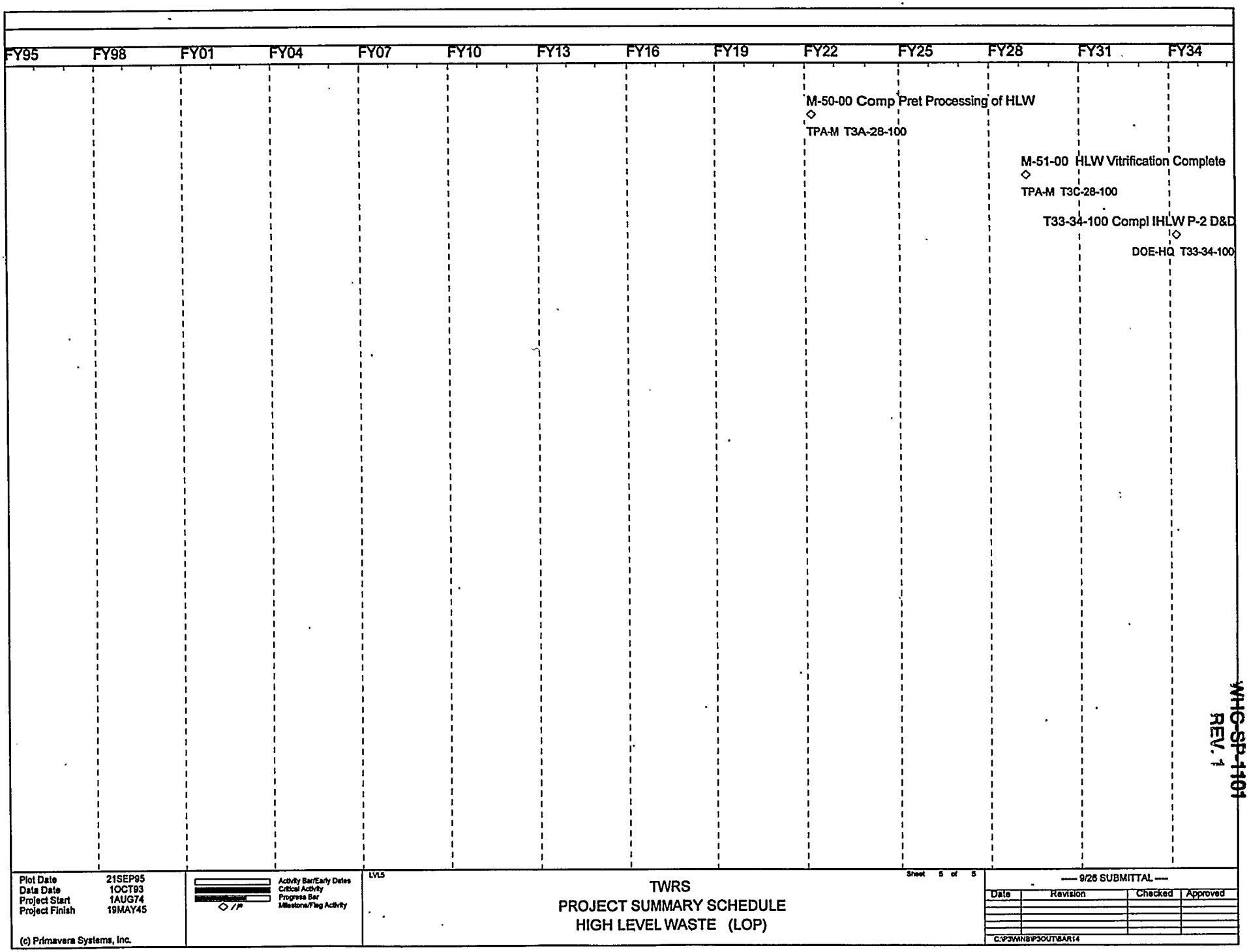
M-50-03 Complete Evaluation of ESW
TPA-I T3A-98-100
T33-04-493 Compl IHLW P-2 RFP
DOE-HQ T33-04-493
T33-05-356 Award IHLW P-2 Contract
DOE-RL T33-05-356
M-51-02 Select Ref Melter
TPA-I T3C-98-100
M-50-04-T2 Initiate Def Des HLW Pret
TPA-T T3A-99-100
T33-05-453 IHLW P-2 Facility KD 0/1/2
DOE-RL T33-05-453
T33-08-454 IHLW P-2 Facility KD 3/4
DOE-RL T33-08-454
T33-10-405 Complete HLW Pret P-2 FSAR Review
DOE-RL T33-10-405
T33-10-456 Complete IHLW P-2 FSAR Review
DOE-RL T33-10-456
T33-10-491 Compl HLW Pret P-2 Sppt Sys Acq
DOE-RL T33-10-491
T33-10-357 Compl IHLW P-2-D/C/Startup
DOE-HQ T33-10-357
M-50-04 Start Hot Ops HLW Pret P-2
TPA-I T3A-08-100
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 4 of 5
TWRS
PROJECT SUMMARY SCHEDULE
HIGH LEVEL WASTE (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
C:P3WINS\P3OUT\BAR14



Attachment 9-4 Summary Schedule
Sheet 5 of 5

1.1.1.3.03 High Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.03.02.04	T33-00-454 Complete IHLW P-1 FSAR Review	DOE-RL T33-00-454		29SEP00
1.1.1.3.03.02.04	T33-01-473 Comp Const/Startup P-1 Infrastructure	DOE-RL T33-01-473		31MAY01
1.1.1.3.03.02.03	T33-04-493 Compl IHLW P-2 RFP	DOE-HQ T33-04-493		30SEP04
1.1.1.3.03.02.03	T33-05-356 Award IHLW P-2 Contract	DOE-RL T33-05-356		30AUG05
1.1.1.3.03.02.04	T33-05-453 IHLW P-2 Facility KD 0/1/2	DOE-RL T33-05-453	030CT05	
1.1.1.3.03.02.04	T33-08-454 IHLW P-2 Facility KD 3/4	DOE-RL T33-08-454	010CT08	
1.1.1.3.03.02.03	T33-10-357 Compl IHLW P-2-D/C/Startup	DOE-HQ T33-10-357		31DEC12
1.1.1.3.03.01.04	T33-10-405 Complete HLW Pret P-2 FSAR Review	DOE-RL T33-10-405		30APR10
1.1.1.3.03.02.04	T33-10-456 Complete IHLW P-2 FSAR Review	DOE-RL T33-10-456		30APR10
1.1.1.3.03.01.04	T33-10-491 Compl HLW Pret P-2 Sppt Sys Acq	DOE-RL T33-10-491		01JUL10
1.1.1.3.03.02.08	T33-34-100 Compl IHLW P-2 D&D	DOE-HQ T33-34-100		22DEC33
1.1.1.3.03.02.01	T33-96-107 Issue Final FY 97 MYWP to RL	DOE-RL T33-96-107		16SEP96
1.1.1.3.03.02.01	T33-96-137 Issue Final ADSs	DOE-RL T33-96-137		31MAY96
1.1.1.3.03.01.02	T33-96-201 Issue HLW Pret Design Basis Data Pkg	DOE-RL T33-96-201		15JAN96

1.1.1.3.03 High Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.03.01.02	T33-96-202 Issue HLW Pret Product Spec	DOE-RL T33-96-202		15JAN96
1.1.1.3.03.01.02	T33-96-204 Issue TWRS Process Tech Baseline	DOE-RL T33-96-204		30AUG96
1.1.1.3.03.01.02	T33-96-231 Comp HLW Pret Update to TWRS F&R	DOE-RL T33-96-231		16SEP96
1.1.1.3.03.01.02	T33-96-233 Comp HLW Pret Input to TWRS TRS	DOE-RL T33-96-233		01MAY96
1.1.1.3.03.01.02	T33-96-235 Summary Feed Pret Plan	DOE-RL T33-96-235		30AUG96
1.1.1.3.03.01.02	T33-96-237 Issue ICD for HLW Pret	DOE-RL T33-96-237		16SEP96
1.1.1.3.03.02.02	T33-96-251 Issue IHLW Feed Spec	DOE-RL T33-96-251		07FEB96
1.1.1.3.03.02.02	T33-96-257 Define Basis for HLW Feed Spec	DOE-RL T33-96-257		07AUG96
1.1.1.3.03.01.	T33-96-301 - Automatic Waste Staging Flowsheet	DOE-RL T33-96-301		30SEP96
1.1.1.3.03.02.02	T33-96-449 Complete Annotated Bibliography	DOE-RL T33-96-449		15FEB96
1.1.1.3.03.02.01	T33-97-107 Issue Final FY98 MYWP to RL	DOE-RL T33-97-107		15SEP97
1.1.1.3.03.02.01	T33-97-137 Issue Final ADSs	DOE-RL T33-97-137		30MAY97
1.1.1.3.03.02.01	T33-98-107 Issue Final FY99 MYWP to RL	DOE-RL T33-98-107		15SEP98
1.1.1.3.03.02.01	T33-98-132 HLW Strategy Document FY98 Rev 4	DOE-RL T33-98-132		30JAN98

1.1.1.3.03 High Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.03.02.01	T33-98-137 Issue Final ADSs	DOE-RL T33-98-137		29MAY98
1.1.1.3.03.02.03	T33-98-355 Complete IHLW P-1 Downselect	DOE-RL T33-98-355		27FEB98
1.1.1.3.03.01.05	M-50-04 Start Hot Ops HLW Pret P-2	TPA-I T3A-08-100	02JAN13	
1.1.1.3.03.01.05	M-50-00 Comp Pret Processing of HLW	TPA-M T3A-28-100		17DEC21
1.1.1.3.03.01.02	M-50-03-T2b Submit Decision Analysis	TPA-T T3A-96-100		26SEP01
1.1.1.3.03.01.02	M-50-03-T2C Submit Prel ESW Recommend	TPA-T T3A-97-101		24SEP02
1.1.1.3.03.01.02	M-50-03 Complete Evaluation of ESW	TPA-I T3A-98-100		24SEP03
1.1.1.3.03.01.03	M-50-04-T2 Initiate Def Des HLW Pret	TPA-T T3A-99-100	31AUG05	
1.1.1.3.03.02.03	M-51-03-T03 Initiate HLW Fac Const	TPA-T T3C-02-100	01FEB00	
1.1.1.3.03.02.03	M-51-03-T04 Compl HLW Fac Const	TPA-T T3C-08-100		31JAN02
1.1.1.3.03.02.05	M-51-03 Initiate Hot Operations	TPA-I T3C-10-100	01JUL02	
1.1.1.3.03.02.05	M-51-00 HLW Vitrification Complete	TPA-M T3C-28-100		18DEC28
1.1.1.3.03.02.01	T3C-95-112 Issue Final Mission Analysis (RL)	DOE-RL T3C-95-112		09JUL96
1.1.1.3.03.02.01	T3C-95-122 Issue JMN (RL)	DOE-HQ T3C-95-122		11NOV96

1.1.1.3.03 High Level Waste

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.03.02.02	T3C-96-107 Update Feed Processibility Assessment	DOE-RL T3C-96-107		30AUG96
1.1.1.3.03.02.01	T3C-96-115 HLW Strategy Doc FY96 Rev 2	DOE-RL T3C-96-115		31JAN96
1.1.1.3.03.02.02	T3C-96-116 TRU WD Options CBA/Draft Recommend	DOE-RL T3C-96-116		22APR96
1.1.1.3.03.02.02	T3C-96-117 WIPP Prelim Accept. of TRU Waste Data	DOE-RL T3C-96-117		18JAN96
1.1.1.3.03.02.02	T3C-96-126 Issue TRU TW Processing Strat Doc	DOE-HQ T3C-96-126		29OCT96
1.1.1.3.03.02.01	T3C-97-112 HLW Strategy Document FY97 Rev 3	DOE-RL T3C-97-112		31JAN97
1.1.1.3.03.02.03	M-51-02 Select Ref Melter	TPA-I T3C-98-100		30AUG05
1.1.1.3.03.02.03	M-51-03-T01 Submit Conceptual Design	TPA-T T3C-98-101		27FEB98
1.1.1.3.03.02.03	M-51-03-T02 Initiate Def Design	TPA-T T3C-99-100	02MAR98	

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.03 - High Level Waste - Cost By Year | TOTAL USAGE FOR YEAR

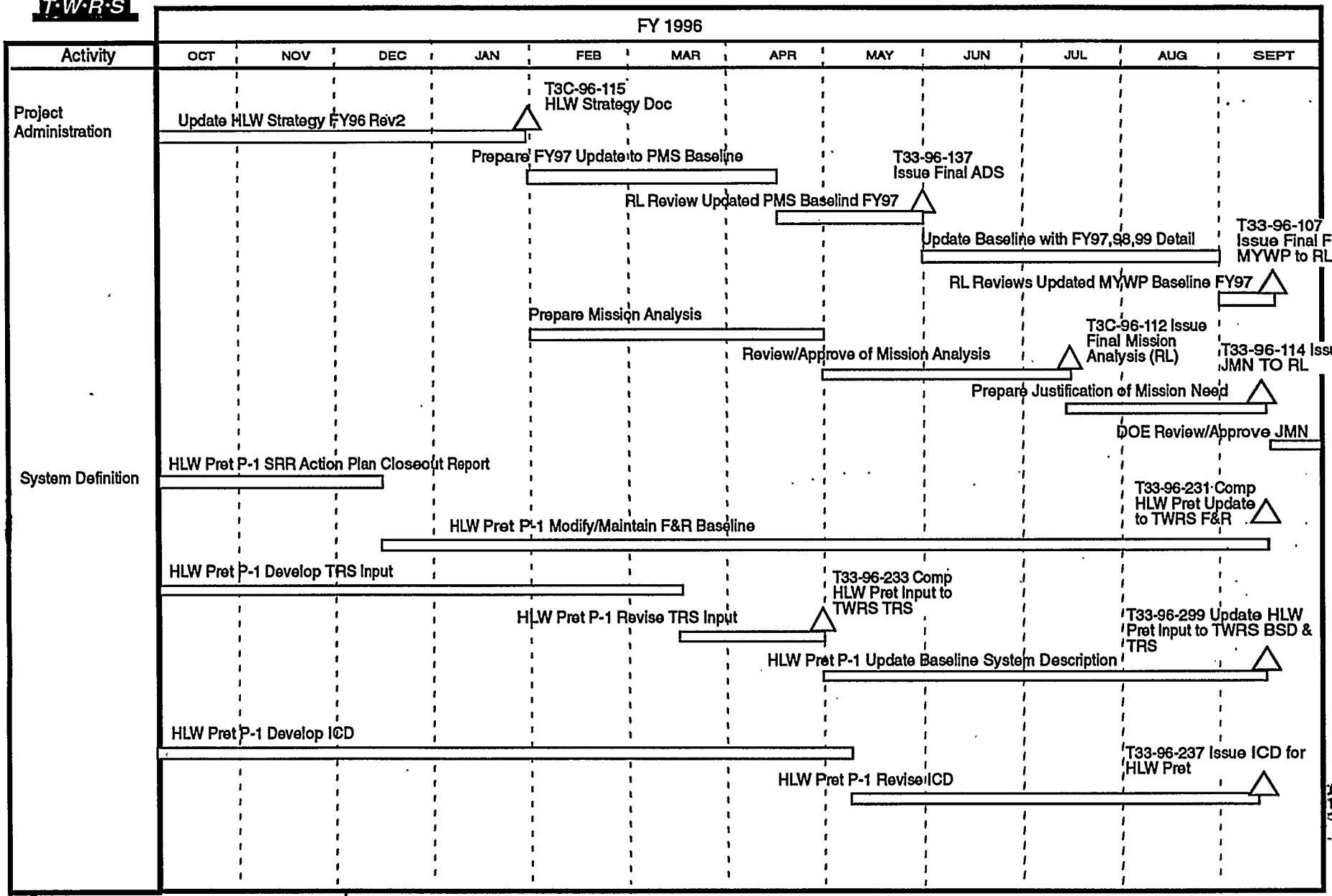
CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	9007754	4185	205154	330646	334545	285582	287455	285576	288778	290124	276210
2	CENRTC	110	10	50	50							
	REPORT TOTAL	9007864	4195	205204	330696	334545	285582	287455	285576	288778	290124	276210

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	169496	218724	465846	490617	541863	532628	520609	490658	489546	489528	489534
2	CENRTC											
	REPORT TOTAL	169496	218724	465846	490617	541863	532628	520609	490658	489546	489528	489534

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	462522	396522	396528	396534	216528	216526	216519	216526	216526	192526	140526
2	CENRTC											
	REPORT TOTAL	462522	396522	396528	396534	216528	216526	216519	216526	216526	192526	140526

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036
1	EXPENSE	25931	25756	25761	25761	25764	761	758	173	
2	CENRTC									
	REPORT TOTAL	25931	25756	25761	25761	25764	761	758	173	

Draft

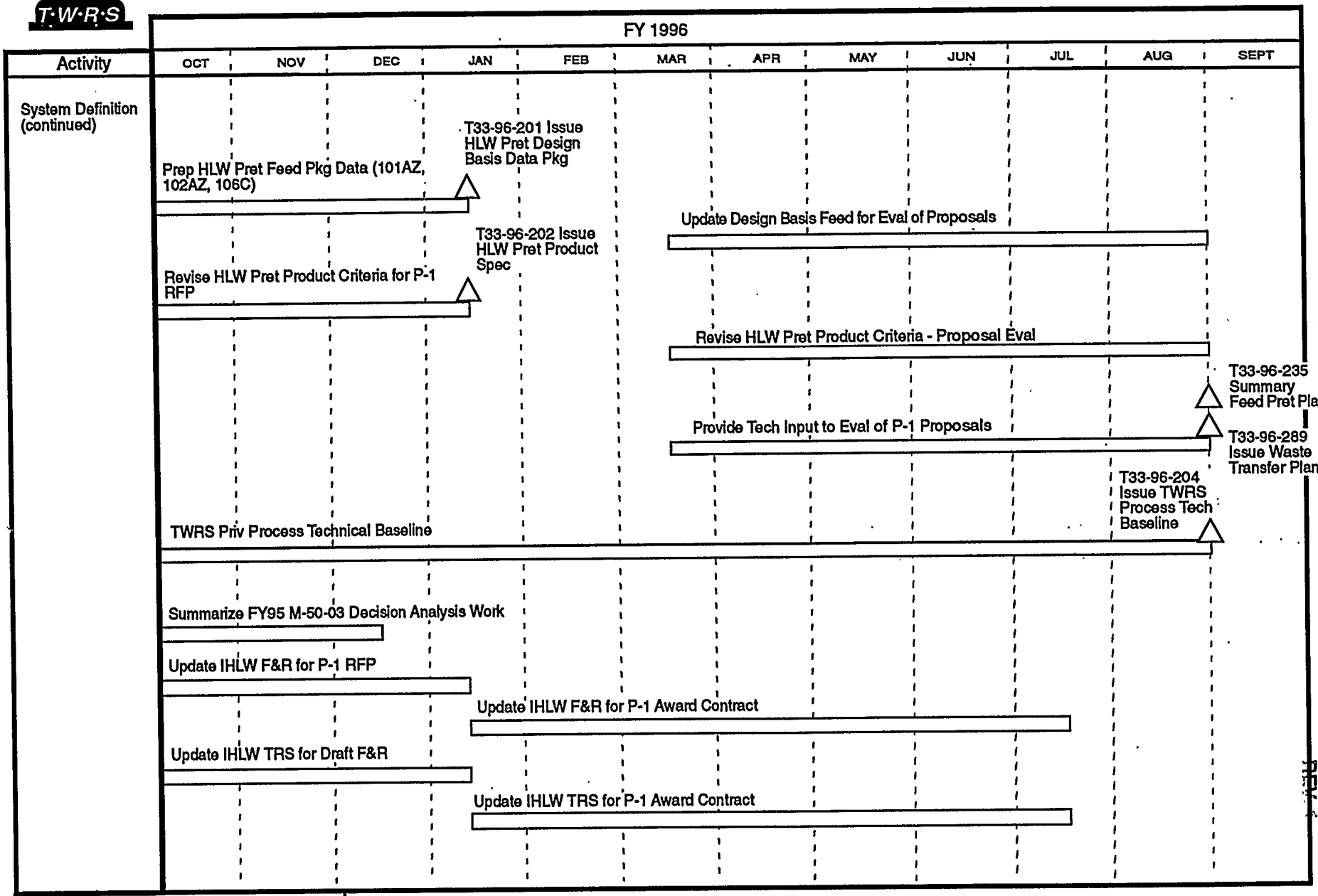


FY 1996 Performance Baseline Schedule

1.1.1.3.03 High Level Waste

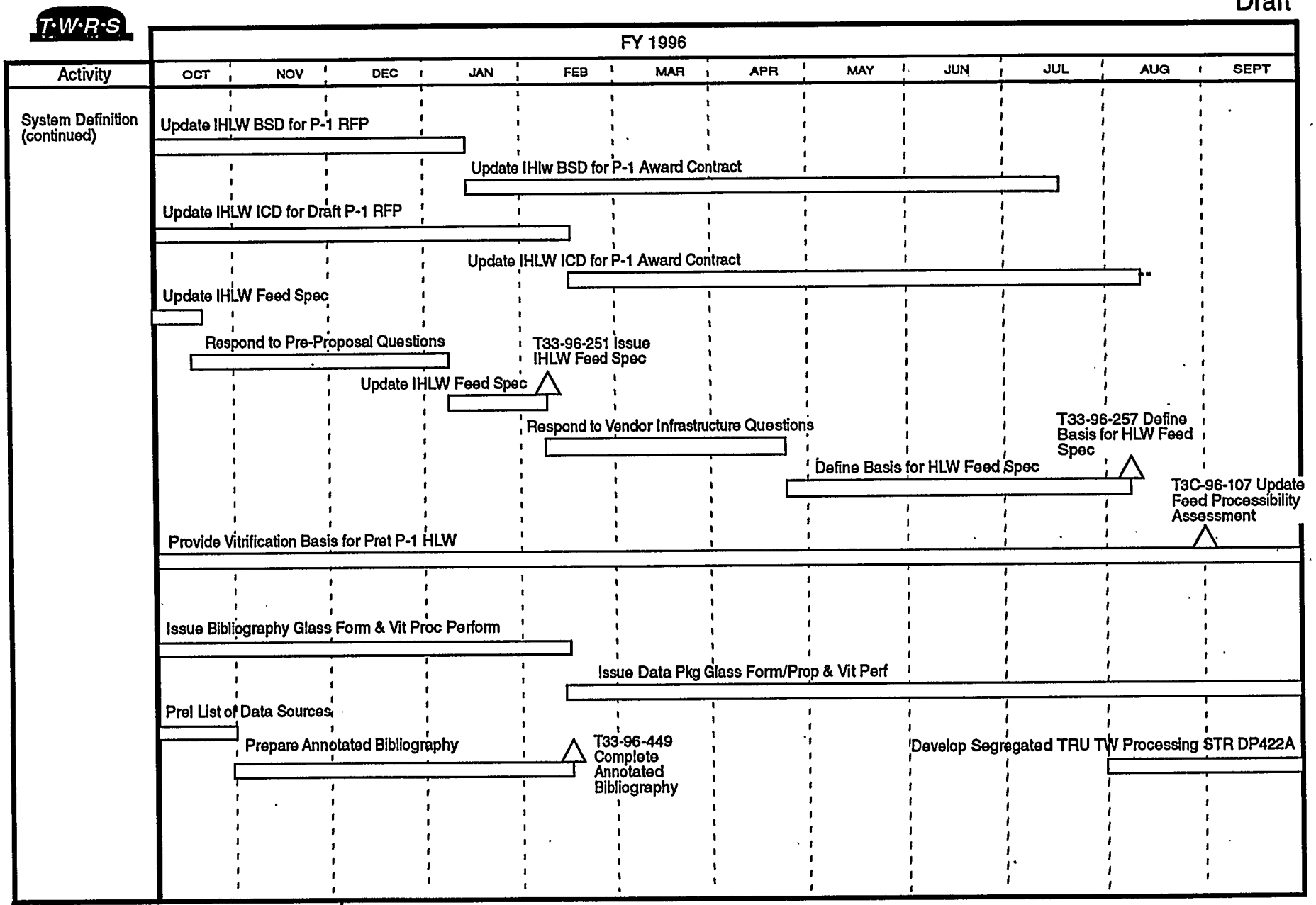
WHC-SP-1101 REV 1

Draft



FY 1996 Performance Baseline Schedule

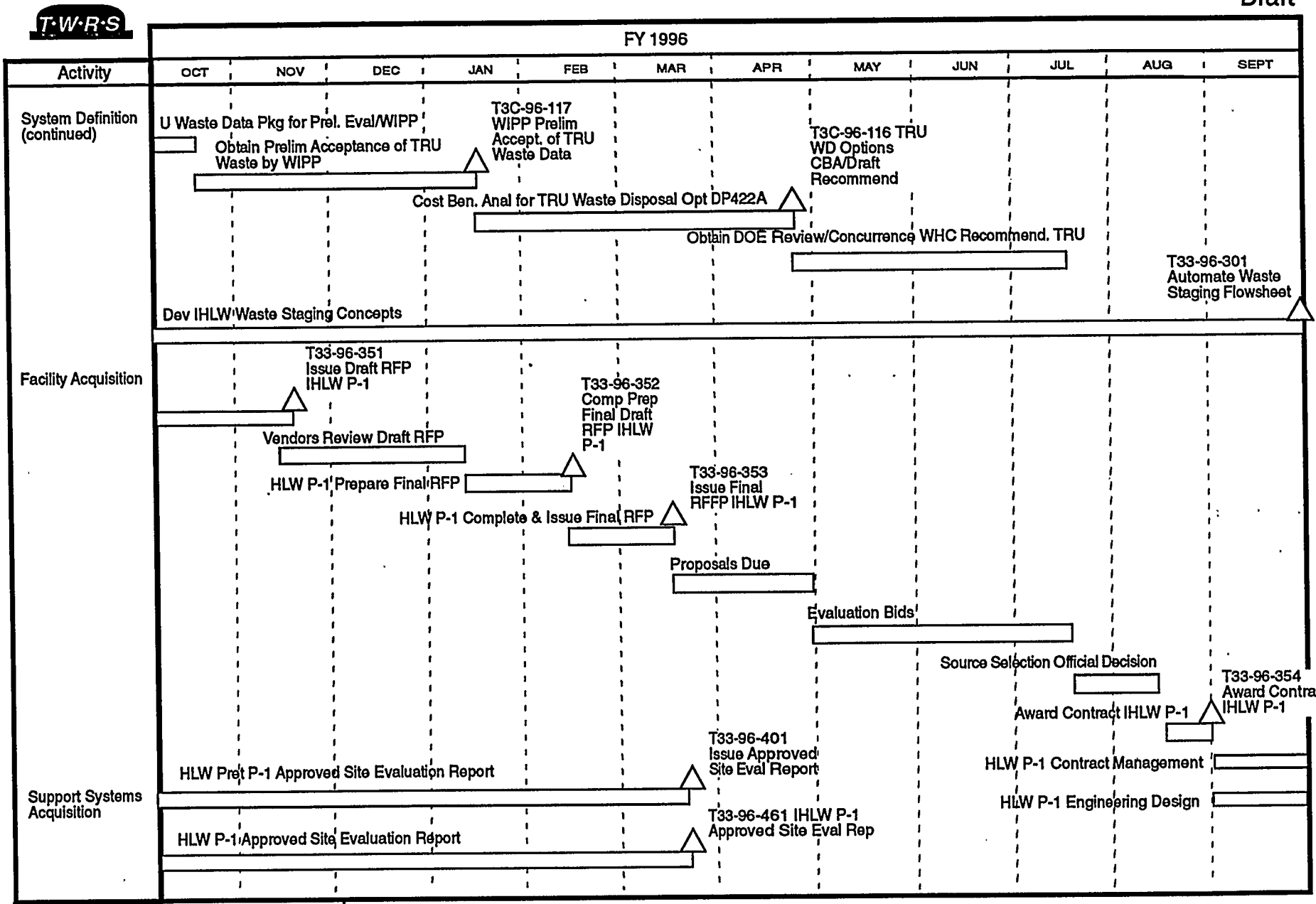
1.1.1.3.03 High Level Waste



FY 1996 Performance Baseline Schedule

1.1.1.3.03 High Level Waste

Draft



WHC-SP-1101 REV. 1

FY 1996 Performance Baseline Schedule

1.1.1.3.03 High Level Waste

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER
COST LOADING REPORT
TOTAL USAGE FOR MONTH

TWRS INTEGRAT
START DATE 01

1.1.1.3.03 - High Level Waste - FY 96 Cost/Month

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1	EXPENSE	403	372	360	349	295	333	355	328	350	363	366	311	4185
2	CENRTC	1	1	1	1	1	1	1	1	1	1	1	1	10
	REPORT TOTAL	404	372	360	350	296	334	356	328	351	364	367	313	4195

Attachment 9-8 Cost Estimate Baseline by Month

10.0 STORAGE AND DISPOSAL (WBS 1.1.1.3.4)

The Storage and Disposal Project includes three sub-projects: Low-Level Waste (LLW) Disposal, Interim Storage, and Cs and Sr Capsules. Sections 10.1, 10.2, and 10.3 contain specific information about each of these sub-projects.

The WBS tree for the Storage and Disposal Project is found in Attachment 10.0-1.

The WBS dictionary sheet for the Storage and Disposal Project is found in Attachment 10.0-2.

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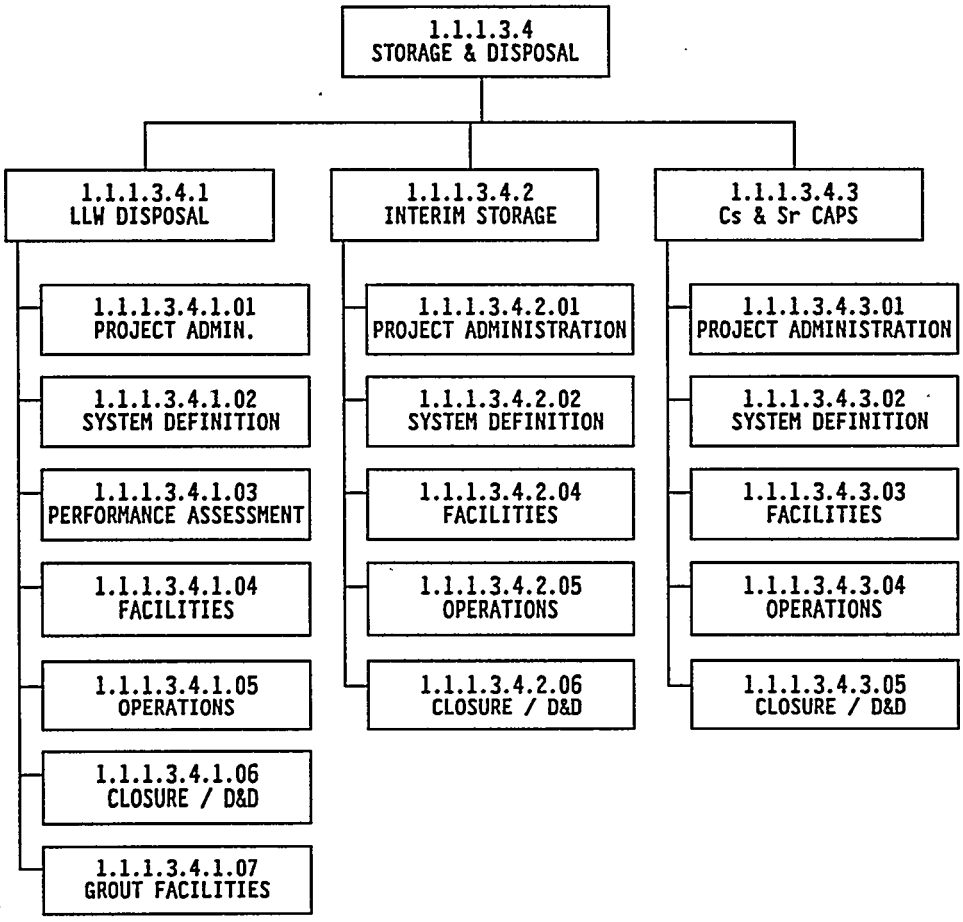
LISTING OF ATTACHMENTS

Attachment 10.0-1 Work Breakdown Structure

Attachment 10.0-2 WBS Dictionary Sheet

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
STORAGE & DISPOSAL



Attachment 10.0-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
5/17/95	1.1.1 TWRS 1.1.1.3 PROCESS TANK WASTE	
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE	
1.1.1.3.04 Level 4	STORAGE AND DISPOSAL	
5. CURRENT REV. NO.	6. EFFECTIVE REV. DATE	7. APPROVED CHANGES
0		
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO	9. BUDGET AND REPORTING NUMBERS	
12300 12301	Operating: EW3120075 CENTRC: 35EW31207 GPP: 39EW31301 Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	4,476.00	12,661.00	13,369.00	8,179.00	9,802.00	14,022.00	12,573.00
CENRTC	105.00				6,006.00		
LINE ITEM				4,673.00	19,823.00	26,923.00	29,816.00
GPP							
TOTAL	4,581.00	12,661.00	13,369.00	12,852.00	35,631.00	40,945.00	42,389.00

B. TECHNICAL BASES

Goals and Objectives
To plan and execute a multi-year effort to be prepared to accept interim storage for the low-level and high-level immobilized waste and associated high and low-level by-products produced by the Immobilization Program. In addition, the ILLW will be eventually placed in an onsite permanent disposal facility. This permanent disposal facility will also be the responsibility of this Program. The HLW will be stored at the Hanford Site until a permanent offsite disposal facility is available.

Major End-Item Deliverables
Multi-year resource loaded schedule outlining the full life cycle of the Program.

An approved Performance Assessment documenting the acceptability of the permanent disposal of ILLW at Hanford.

Functions and Requirements for the LLW and HLW Interim Storage Facility followed by design and construction of the facilities or modification of existing facilities. These facilities will provide transport from the immobilization facilities and a product acceptance function prior to storage.

For the ILLW material, Functions and Requirements followed by design and construction of facilities to permanently dispose of the immobilized waste will be provided.

An Operations phase of the Program will also be provided through the end of the Program followed by D&D in preparation for turnover for closure of the facilities. Final closure of the facilities is by others.

Acceptance Criteria
All deliverables will be completed on time and within budget in full compliance with DOE Orders.

C. STATEMENT OF WORK

LLW DISPOSAL SUBPROJECT

. Project Administration - Certain administrative activities are required to support the development of the LLW Disposal Project including inputs to the MYWP, status reports, scheduling, financial analysis, change management, ADS preparation and review by Safety and QA.

. System Definition - System Definition activities include (1) formulation of engineering studies which will establish requirements, evaluate alternatives, prepare cost estimates and make recommendaitons for facilities needed to accomplish LLW Interim Storage and Disposal missions; (2) development of product acceptance criteria to be used for accepting waste packages from the private vendors under contract to DOE; (3) development of RCRA regulatory strategies for storage and disposal of LLW; (4) preparation, review and issuance of DRDs to support specific construction projects; and (5) preparation of documentation to support the NRC classification of waste.

. PA - A radiological PA is required per DOE Order 5820.2a (with modifications being planned in Order 5820.2b). Significant work areas include (1) preparation of an interim PA to verify the adequacy of the disposal concept; (2) data generation and collection necessary to prepare the preliminary PA including glass durability studies; (3) disposal site characterization to support PA data needs and a site baseline for permitting purposes; (4) final PA preparation and review; and (5) periodic PA updates through the active life of the waste processing and disposal operations culminating in a closure PA.

. Facilities - The LLW Disposal Subproject will include the work effort necessary to provide interim storage and LLW disposal facilities ready to operate. Major tasks include project management, conceptual design, definitive design, construction and facility startup.

. Operations - Facility operations including planning, staffing, training, operations, maintenance and operational monitoring to assure compliance are provided as needed to fulfill the LLW Disposal mission. Key activities include (1) preparation for startup and conduct the ORR; (2) Phase I interim storage of LLW products; (3) Phase II operation of disposal facilities; and (4) support to facility closure, D&D and long-term monitoring.

. Closure/D&D - Facility operations will be completed on or before the TPA milestone of 2028. This subproject will provide for the disposition and closure of facilities, placement of barriers as needed over disposal facilities, establishment of long-term monitoring systems and turnover to the ER Program.

. Grout Facility - The Grout Facility will remain on a cold standby condition (per standby plan, WHC-SD-WM-005) through FY 1996 as a contingency facility with a final disposition envisioned in early FY 1997. Repairs to feed tank AP-102 and waste removal will be performed as needed to support the Phase I privatization plans.

INTERIM STORAGE PROJECT

. Systems Definition - Define requirements for the HLW Interim Storage Facility. This will include determining storage requirements for Phase I and II privatization. To determine the requirements, potential HLW streams will be investigated. These include technetium, HLW canisters, cesium, HLW sludge, TRU, capsule storage and secondary streams from vitrification. Determine equipment necessary for moving HLW canisters to storage.

Facility availability - This includes determining availability of existing facilities, looking at existing designs that are completed (HWVP CSB), the viability of sharing in the conversions of the current canister storage location, or building a new facility near the privatization facilities. This activity will satisfy task plan HLW-8 of the TWRS SRR action plan.

ROM estimates will be developed for the preferred option for HLW Interim Storage. A strategy defining the best path forward will be developed and approved before a DRD is completed.

Product acceptance strategy for the HLW products will be developed to assure the HLW product meets repository requirements and

can be safely stored. In addition, requirements for documentation as storage of the HLW product will be developed to assure proper documentation can be provided to the repository.

HLW Facility Project - A SOW will be developed based on the DRD for the HLW Interim Storage. Depending upon the outcome of the engineering study for a facility, the SOW will be for a new facility, existing facility or sharing of a facility. The facility conceptual design will be developed followed by detail design. The facility will be constructed based on the approved project design. Concurrent with the facility design, safety and permitting documentation will be developed to allow for operation of the HLW Interim Facility.

HLW Operations - HLW Interim Storage Facility operations will include support in the early phases for facility definition and engineering. During construction, preparation of required documentation and personnel training and qualification will occur. After construction, cold and hot testing and an ORR will be performed. These will be followed by the actual hot operations of the facility to continue until all hot waste is shipped to the repository. The HLW product will be shipped offsite to a repository. Product and repository fees are included under the HLW Interim Storage Project.

Facility D&D - The facility will be decontaminated and dispositioned following final shipments of waste. At this time, it is assumed that minimal contamination will occur and the facility will not have future uses after its mission.

CS/SR CAPSULES SUBPROJECT

Decision on acceptability of halides as a waste form for geologic repository disposal

Preparation of data package describing overpacking of Cs/Sr capsules for OCRWM evaluation and approval

Preparation of trade study on overpacking of Cs/Sr capsules vis-a-vis blending and vitrification of the cesium and strontium salts

Preparation of decision analysis and processing recommendation to senior RL and WHC management

Preparation, review and approval of waste acceptance documentation

Completion of required Systems Engineering documentation

Preparation, review and approval of design documentation (conceptual, preliminary and detailed)

Construction of the Cs/Sr Capsule Processing Facility

Preparation of operating and maintenance procedures and training of personnel

Turnover of systems and facility to Operations (startup and cold operations)

Radioactive operation of the Cs/Sr Capsule Processing Facility

Clean out and stabilization of facility

Disposal of secondary radioative and hazardous wastes.

10.1 LOW-LEVEL WASTE DISPOSAL (WBS 1.1.1.3.4.1)

10.1.1 STRATEGY

Current planning forecasts the eventual waste retrieval, treatment, storage and disposal of approximately 225,000 m^3 of radioactive wastes contained in 177 tanks. Waste treatment planning envisions the separations of the tank wastes into a high-level and low-level stream for immobilization utilizing vitrification technologies.

The U.S. Department of Energy (DOE) has provided planning guidance (July 1995) to contract for waste immobilization services from private vendors. Plans are to place contracts design, construct and operate relatively small capacity waste treatment facilities to prove the technical and business viability for immobilization of tank wastes at Hanford. Production is planned to commence in July 2002 utilizing two waste immobilization vendors with an expected LLW product output of 30-40 metric tons per day. Assuming technical and economic success, it is planned to award a contract in 2005 to construct and operate a larger immobilization facility to produce approximately 200 metric tons per day of vitrified LLW product starting in 2011.

The scope of the Low-Level Waste (LLW) Disposal sub-project is to receive, accept, interim store (as needed), and dispose of treated LLW at the Hanford Site. In order to be prepared to receive waste starting in July 2002, it may be necessary to establish interim storage facilities since the time and funds required to complete a Performance Assessment (PA) and construct disposal facilities are not in line with the planned startup date of July 2002. The preliminary PA is currently planned to be prepared by September 2000 with a Peer Review Panel (PRP) review by September 2001. Since completion of the PRP review is necessary to start disposal facility construction, it is apparent that it is not possible to construct facilities in time to support a LLW immobilization facility startup date of July 2002 (current planning shows the start of disposal facility construction in October 2004 due to funding constraints.)

Current planning envisions that there is adequate time to complete the PA and construct disposal facilities to support the Phase II production starting in 2011; however, a significant funding increase as shown in the Multi-Year Program Plan (MYPP) will be required to support this effort.

Another risk (in addition to the funding risk described above) is the preparation of a PA, which will provide the following:

1. Clearly show the adequacy of the planning waste immobilization and disposal plans before large dollar sums are spent

2. Be technically sound and robust enough to gain timely approval from DOE-HQ.

This PA risk will be managed by doing the following:

1. Preparation of an interim PA in FY 1996 to show that the planned waste treatment and disposal action can be successful

2. The utilization of PA lessons learned coupled with the continuation of a highly competent PA team to generate the data and models needed to write and justify the PA.

A third risk is obtaining an agreement between the DOE and NRC for the classification of single-shell low-activity tank waste as an "incidental waste" and not subject to regulatory authority by the NRC. This sub-project is currently preparing a radionuclide separations cost-benefit analysis for DOE to use in obtaining the necessary agreements with the NRC.

10.1.1.1 Objectives

The objective of the LLW Disposal sub-project is to receive, accept, interim store (as needed), and dispose of LLW products generated by the providers of the waste treatment services under contract to the DOE. The LLW products include the treated LLW product, packaged solid wastes, low-level mixed wastes, low-level liquid wastes, failed equipment, and decontamination and decommissioning wastes. This sub-project will also transport wastes as needed to interim storage and disposal facilities.

10.1.1.2 Planning Assumptions

1. The immobilization of LLW will be performed in two phases: Phase I (proof-of-concept) will begin hot operations in 2002, and Phase II (full-scale operations) in 2011. Production operations will end in 2021 (RL July 1995).

2. The Phase I LLW product will be produced at approximately 30 to 40 metric tons per day. Phase II product production will increase to approximately 200 metric tons per day (RL July 1995).

3. The immobilized LLW product will be packaged for ease of acceptance, transport, interim storage, and disposal. The contact dose will not exceed 1 rem per hour. The treated product will remain safe, clean, and stable (based on current draft of LLW product specification).

4. Routine solid wastes, mixed waste, liquids, and failed equipment will go to proper storage and disposal facilities on the Hanford Site from the private vendor to these facilities without specific involvement from this sub-project. This sub-project will develop strategies as needed for nonroutine wastes.

5. The Secretarial decision on privatization will also be the functional equivalent of the approval for justification of mission need (Key Decision 0) for LLW interim storage and disposal facilities (MYPP planning does not include special tasks or documents to obtain Key Decision 0).

6. For budget planning purposes, all LLW product will be relocated from interim storage to the LLW disposal facilities when the disposal facilities become operational (see discussion under Section 10.1.1 Strategy. The option of using an interim storage facility as a disposal facility will be resolved during FY 1996 preparation of engineering study).

7. The LLW Disposal Facilities will be relatively simple in that expensive, redundant barriers will not be required to successfully demonstrate a reasonable expectation that long-term performance objectives will be achieved.

8. LLW Disposal Facilities will be built in three phases for flexibility to better accommodate the uncertainties in the volume of LLW product to be produced and spread out the funding requirements and expenditure timing.

9. Facilities will be turned over to the Environmental Restoration (ER) Program after closure and decontamination and decommissioning (D&D) activities are completed.

10. Grout Facility cold standby will be maintained as a tank space contingency (Tri-Party Agreement, January 1994). This potential need will be re-evaluated during FY 1996. For planning purposes, turnover to the ER Program for D&D is to occur in FY 1997.

11. Nuclear Regulatory Commission waste classification determination will be consistent with the current plans being developed by DOE (NRC direction is expected to stay the same as the direction provided in 1989-1993. A cost-benefit analysis is currently being prepared to address this issue).

12. This sub-project will receive the immobilized LLW product from the vendors facilities and transport it to interim storage/disposal facilities as needed. Current planning envisions the use of a clean metal container approximately 4 ft x 4 ft x 6 ft in size.

10.1.1.3 Constraints

1. This sub-project is limited to $2.8M in FY 1996. Only those tasks necessary to support the TWRS level "0" schedule will be supported (that is,, LLW hot operations starting in July 2002).

2. The TWRS Environmental Impact Statement needs to be completed by December 1996.

3. The NRC tank waste classification decision is needed to dispose of the low-activity waste fraction generated form the processing of SST wastes.

10.1.2 TECHNICAL REQUIREMENTS BASELINE

10.1.2.1 Work Breakdown Structure

The WBS tree for the Low-Level Waste Disposal sub-project is in Attachment 10.1-1.

10.1.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Low-Level Waste Disposal sub-project is in Attachment 10.1-2. Lower-level dictionary sheets are available on the Performance Measurement Control System (PMCS).

10.1.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Low-Level Waste Disposal sub-project is in Attachment 10.1-3.

10.1.3 SCHEDULE BASELINE

10.1.3.1 Summary Schedule

See Attachment 10.1-4 for the Low-Level Waste Disposal summary schedule.

10.1.3.2 Milestone Control Log

See Attachment 10.1-5 for the Milestone Control Log. The milestones description sheets for this sub-project are located in Appendix A.

10.1.4 COST BASELINE

10.1.4.1 Cost Baseline Summary by Year

See Attachment 10.1-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up to this sub-project.

10.1.4.2 Basis of Estimate

Cost estimates are based on previous experience for similar tasks, preliminary engineering studies, and extrapolations from the costs of facilities constructed and operated in the past.

Project Administration. Costs are based on similar activities in the past with the LLW Disposal Program and the Grout Facilities. Cost estimates are based on known and well-understood project management activities.

Systems Definition. Costs are based on similar tasks for preparation of engineering studies, design requirements documents, and development of product acceptance methodology. These estimates are non-conservative in that no allowance is made for major new developments from external sources.

Performance Assessment. Cost estimates are based on the statement of work, WHC-SD-WM-PAP-062, Rev. 1, dated June 1995. These cost elements are well understood and reflect detailed planning, analysis, and recent past experience at Hanford for PA preparation.

Facilities. Design and planning costs are based on past experience with the Hanford Waste Vitrification Plant (HWVP) and percentages of estimated construction costs. Interim Storage Facility costs are estimated based on a relatively simple modification to an existing facility (i.e., grout vaults) with product handling and acceptance equipment sized to handle up to six years of Phase I LLW product. Disposal facility costs are estimated based on preliminary engineering studies performed in

FY 1995 and are described in WHC-SD-WM-RPT-159, dated May 1995. These cost estimates are very preliminary and significant engineering work is needed to support construction project validation.

Operations. Estimates are based on existing Hanford conditions for operating similar storage facilities and extrapolated to conditions expected for operation of a disposal facility. Estimates include surveillance and monitoring of waste packages and facilities. These costs are reasonably well understood; however, they could change based on engineering development and regulatory changes.

Closure and decontamination and decommissioning. The bulk of the costs are for closure of the LLW Disposal Facilities, which primarily consists of the placement of the Hanford protective barrier over the disposal facility. Barrier costs are estimated from studies and prototype work done to date. These cost estimates are very preliminary and subject to scope changes.

Grout Facility. This is a small cost item and is based on previous standby costs for the Grout Facility.

10.1.5 PERFORMANCE MEASURES

Performance measures are identified by milestones listed in the LLW Disposal sub-project work plan and will serve as the primary measure of progress.

10.1.6 EXECUTION YEAR

10.1.6.1 Technical Objectives

The FY 1996 technical objectives are as follows.

1. Prepare a revised LLW product acceptance strategy.

2. Prepare, review, and issue an engineering evaluation for LLW Interim Storage.

3. Prepare an interim PA to assess the long-term impact of the LLW disposal action and issue the document for review at Hanford.

4. Prepare supporting information for the NRC waste classification determination.

These tasks and interim milestones are displayed in Attachment 10.1-7.

10.1.6.2 FY 1996 Performance Baseline Schedule

See Attachment 10.1-7 for the FY 1996 performance baseline schedule.

10.1.6.3 Cost Estimate Baseline by Month

See Attachment 10.1-8 for the month-by-month cost estimate baseline for FY 1996.

10.1.6.4 FY 1995 Work Scope Carryover Summary

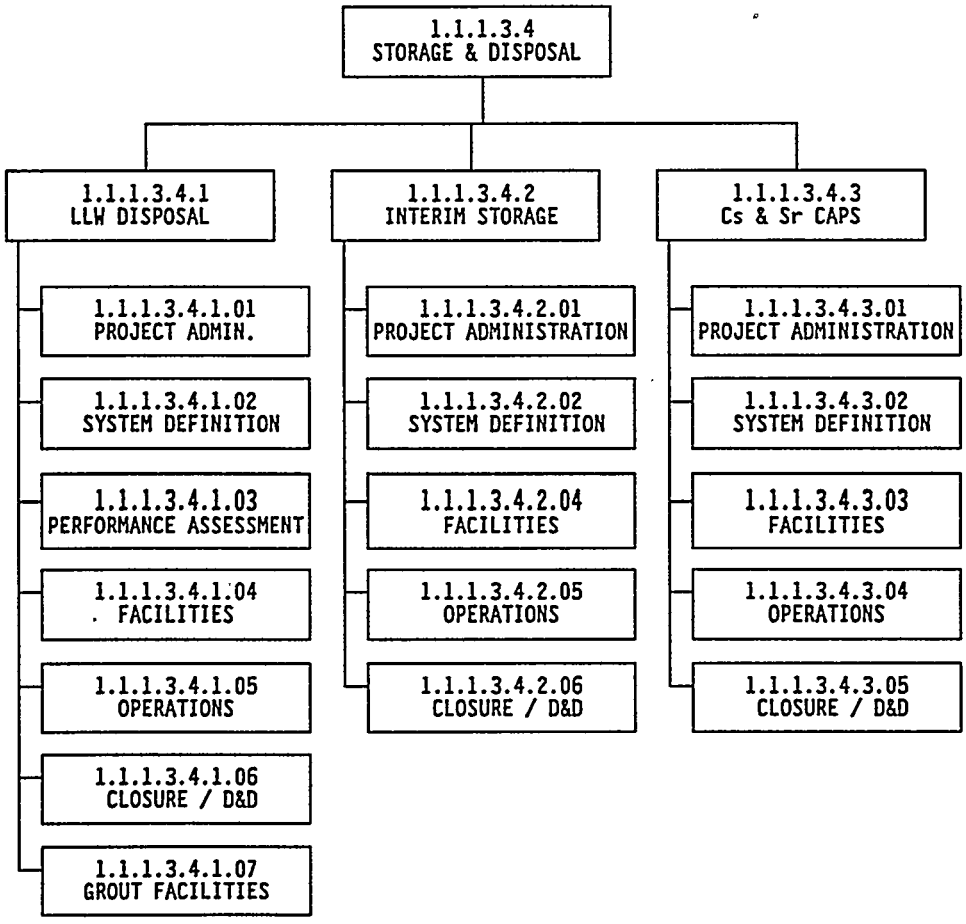
1. $75K CENRTC funding is needed to complete design and fabrication of AP-102 mixer pump removal equipment.

2. $50K of CENRTC funding is required to procure new computer file servers to support preparation of the Hanford Low-Level Tank Waste Performance Assessment.

LISTING OF ATTACHMENTS

Attachment 10.1-1	Work Breakdown Structure
Attachment 10.1-2	WBS Dictionary Sheet
Attachment 10.1-3	Responsibility Assignment Matrix
Attachment 10.1-4	Summary Schedule
Attachment 10.1-5	Milestone Control Log
Attachment 10.1-6	Cost Baseline Summary by Year
Attachment 10.1-7	FY 1996 Performance Baseline Schedule
Attachment 10.1-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
STORAGE & DISPOSAL



Attachment 10.1-1 Work Breakdown Structure

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
9/13/95	1.1.1 TWRS 1.1.1.3 PROCESS TANK WASTE 1.1.1.3.04 STORAGE AND DISPOSAL	
3. WBS ELEMENT CODE/LEVEL 1.1.1.3.04.01 Level 5	4. WBS ELEMENT TITLE LLW DISPOSAL	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 12300	9. BUDGET AND REPORTING NUMBERS Operating: EW3120075 CENTRC: 35EW31207 GPP: 39EW31301 Line Item: 39EW31301	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars) ($000)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	2,688.00	8,091.00	10,803.00	7,193.00	8,232.00	9,099.00	9,202.00
CENRTC	105.00						
LINE ITEM					8,273.00	20,953.00	9,573.00
GPP							
TOTAL	2,793.00	8,091.00	10,803.00	7,193.00	16,505.00	30,052.00	18,775.00

B. TECHNICAL BASES

Goals and Objectives
The LLW Disposal sub-project under the Storage and Disposal Project will receive treated LLW from a private supplier of treatment services under contract to the DOE and provide for interim storage, disposal, closure and monitoring of accepted wastes. Waste receipts are currently planned to commence in 2002 and continue through 2021 (2026 for D&D wastes), which is consistent with the 2028 TPA milestone for completion of this mission. Secondary LLW streams will be dispositioned directly with the solid and liquid waste facilities.

The LLW Disposal sub-project will provide sound engineering and technical basis for development of facility options, requirements, recommendations, design, construction, operation and closure of interim storage and disposal facilities. After facility D&D and/closure, as needed, a transition will be facilitated from TWRS to Environmental Restoration responsiblity of remaining facilities and lands.

STATUS OF PROJECT DOCUMENTATION

Preliminary project information generated to date include the following:

. A preliminary DRD was prepared in March 1995 to establish requirements for both LLW vitrification and disposal. It will be necessary to prepare DRDs tailored for interim storage of LLW disposal and disposition of secondary LLW streams following

Systems Engineering guidance.

. The preliminary site evaluation and selection of a LLW disposal site has been determined as described in WHC-SD-WM-SE-021, "TWRS Complex Site Evaluation Report.." Site characterization and confirmation of selection is planned during FY 1999 and 2000 resulting from analysis of near-surface and borehole soil samples.

. Preliminary information has been developed for the Hanford Low-Level Tank Waste Performance Assessment which evaluates the disposal of vitrified LLW. The drafting of an interim PA is planned for FY 1996 followed by a preliminary and final PA approval in FY 2003.

. Only limited engineering studies have been performed to date for LLW disposal facilities including retrievability considerations. No work has been performed to date for the interim storage of LLW since this is a recently identified need due to the proposed privatization plan for the treatment of LLW.

Major End-Item Deliverables

. Engineering studies supporting the preparation of DRDs and start of conceptual design (FY 1996 and 1997)
. DRDs for interim storage, disposal facilities and disposition of secondary LLW streams (FY 1997)
. Documentation supporting the NRC waste classification determination of treated tank wastes (FY 1996)
. Interim PA (FY 1996)
. Preliminary PA (FY 2001)
. Final PA (FY 2003)
. Conceptual design reports for required facilities (FY 1998)
. Preliminary and final design and specs for required facilities (FY 2000-FY 2004)
. Facilities for interim storage of LLW (FY 2002)
. Permits for facility construction and operation (FY 2001 - FY 2009)
. PSAR and FSAR for waste handling, storage and disposal (FY 2000 - FY 2009)
. LLW disposal facilities (FY 2009)
. Transportation and material handling equipment (FY 2000 - FY 2002)
Disposal facility closure (FY 2021 - FY 2026)

Acceptance Criteria

Acceptance criteria will be developed during the generation of project requirements, designs, specs and waste acceptance criteria. Criteria will be based on DOE Orders, Washington State Administrative Codes, and contract provisions for Phase I privatization of waste treatment processing.

C. STATEMENT OF WORK

REQUIRED ACTIVITIES

. Project Administration - Certain administrative activities are required to support the development of the LLW disposal project including inputs to the MYWP, status reports, scheduling, finanical analysis, change management, ADS preparation and review by Safety and QA.

. Systems Definition - Systems Definition activities include (1) formulation of engineering studies which will estabish requirements, evaluate alternatives, prepare cost estimates and make recommendations for facilities needed to accomplish LLW interim storage and disposal missions; (2) development of product acceptance criteria to be used for accepting waste packages from the private vendors under contract to DOE; (3) development of RCRA regulatory strategies for storage and disposal of LLW; (4) preparation, review and issuance of DRDs to support specific construction projects and (5) preparation of documentation to support the NRC classification of waste.

. PA - A radiological PA is required per DOE Order 5820.2a (with modifications being planned in Order 5820.2b). Significant work areas include (1) preparation of an interim PA to verify the adequacy of the disposal concept; (2) data generation and collection necessary to prepare the preliminary PA including glass durability studies; (3) disposal site characterization to support PA data needs and a site baseline for permitting purposes; (4) final PA preparation and review and; (5) periodic PA updates through the active life of the waste processing and disposal operations culminating in a closure PA.

. Facilities - The LLW Disposal sub-project will include the work effort necessasry to provide interim storage and LLW disposal facilities ready to operate. Major tasks include (1) project management; (2) conceputal design; (3) definitive design; (4) construction and; (5) facility startup.

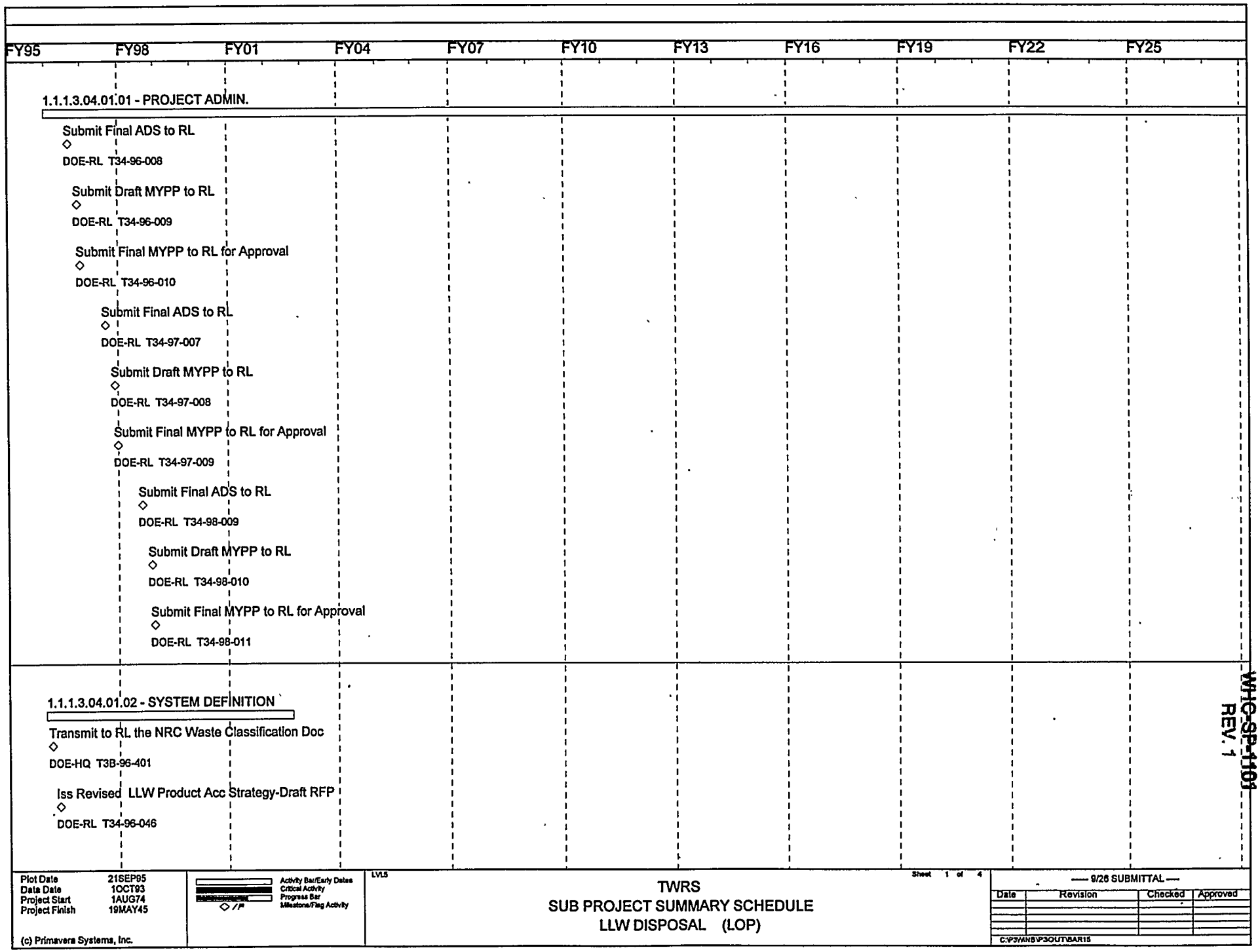
. Operations - Facility operations including planning, staffing, training, operations, maintenance and operational monitoring to assure compliance are provided as needed to fulfill the LLW disposal mission. Key activities include (1) preparation for startup and conduct of Operational Readiness Review; (2) Phase I interim storage of LLW products; (3) Phase II operation of disposal facilities and; (4) support to facility closure, D&D and long-term monitoring.

. Closure/D&D - Facility operations will be completed on or before the TPA milestone of 2028. This sub-project will provide for the disposition and closure of facilities, placement of barriers as needed over disposal facilities, establishment of long-term monitoring systems and turnover to the ER Program.

. Grout Facility - The Grout Facility will remain on a cold standby condition (per standby plan WHC-SD-WM-005) through FY 1996 as a contingency facility with a final disposition envisioned in early FY 1997. Repairs to feed tank AP-102 and waste removal will be performed as needed to support the Phase I privatization plans.

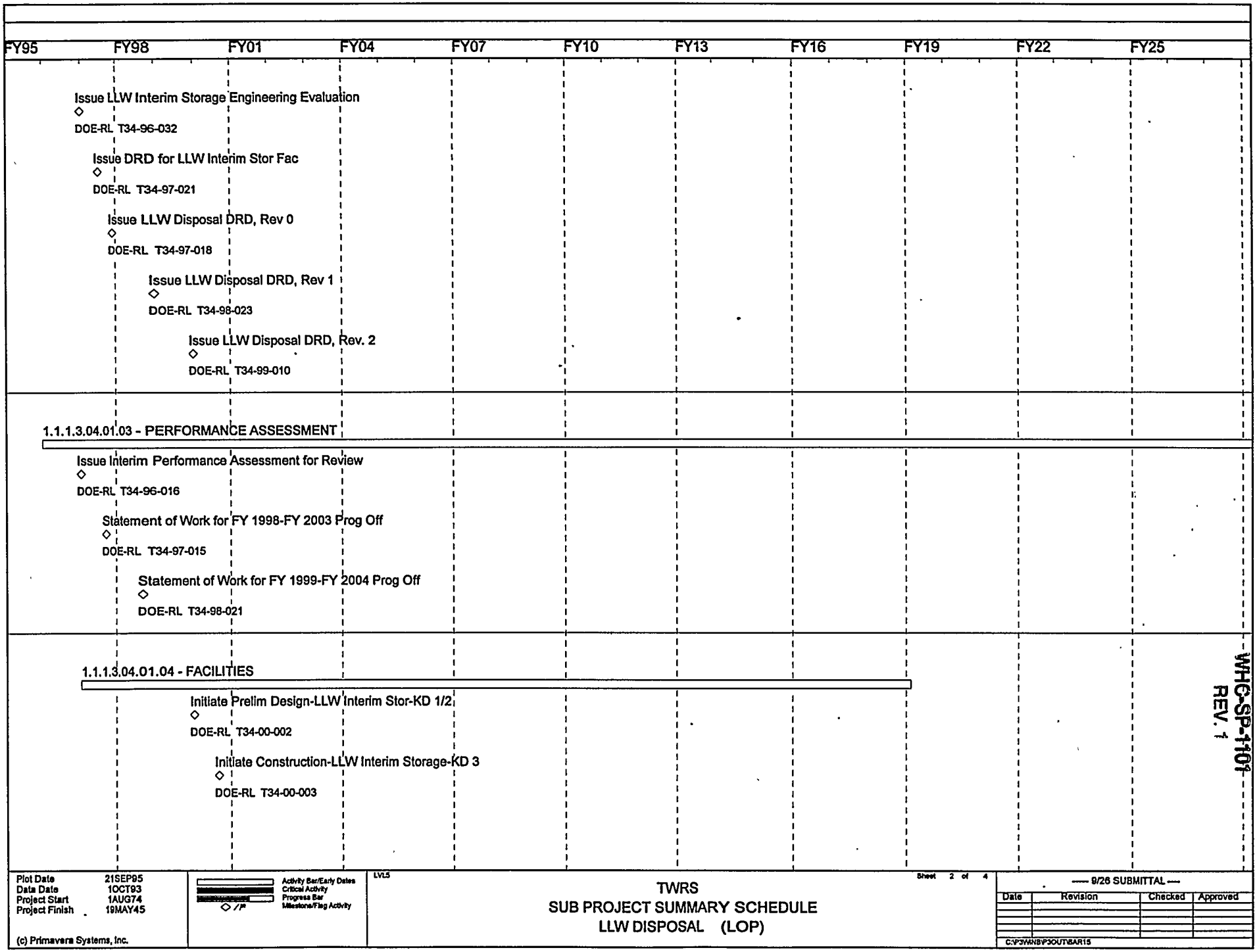
STORAGE AND DISPOSAL PROJECT
RESPONSIBILITY ASSIGNMENT MATRIX

WBS Number	WBS Title	Responsible Person
1.1.1.3.4	**Storage and Disposal Project**	**R. J. Murkowski**
1.1.1.3.4.1	**LLW Disposal Project**	**G. F. Williamson**
1.1.1.3.4.1.1	Project Administration	R. F. Wood
1.1.1.3.4.1.2	Systems Definition	C. A. Petersen
1.1.1.3.4.1.3	Performance Assessment	F. M. Mann
1.1.1.3.4.1.4	Facilities	P. Felise
1.1.1.3.4.1.5	Operations	R. U. Elwell
1.1.1.3.4.1.6	Closure/D&D	R. F. Wood
1.1.1.3.4.1.7	Grout Facilities	R. F. Wood



Attachment 10.1-4 Summary Schedule
Sheet 1 of 4

WHC-SP-1101
REV. 1


FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
Issue LLW Interim Storage Engineering Evaluation
DOE-RL T34-96-032
Issue DRD for LLW Interim Stor Fac
DOE-RL T34-97-021
Issue LLW Disposal DRD, Rev 0
DOE-RL T34-97-018
Issue LLW Disposal DRD, Rev 1
DOE-RL T34-98-023
Issue LLW Disposal DRD, Rev. 2
DOE-RL T34-99-010
1.1.1.3.04.01.03 - PERFORMANCE ASSESSMENT
Issue Interim Performance Assessment for Review
DOE-RL T34-96-016
Statement of Work for FY 1998-FY 2003 Prog Off
DOE-RL T34-97-015
Statement of Work for FY 1999-FY 2004 Prog Off
DOE-RL T34-98-021
1.1.1.3.04.01.04 - FACILITIES
Initiate Prelim Design-LLW Interim Stor-KD 1/2
DOE-RL T34-00-002
Initiate Construction-LLW Interim Storage-KD 3
DOE-RL T34-00-003
Plot Date 21SEP95
Data Date 10CT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 4
TWRS
SUB PROJECT SUMMARY SCHEDULE
LLW DISPOSAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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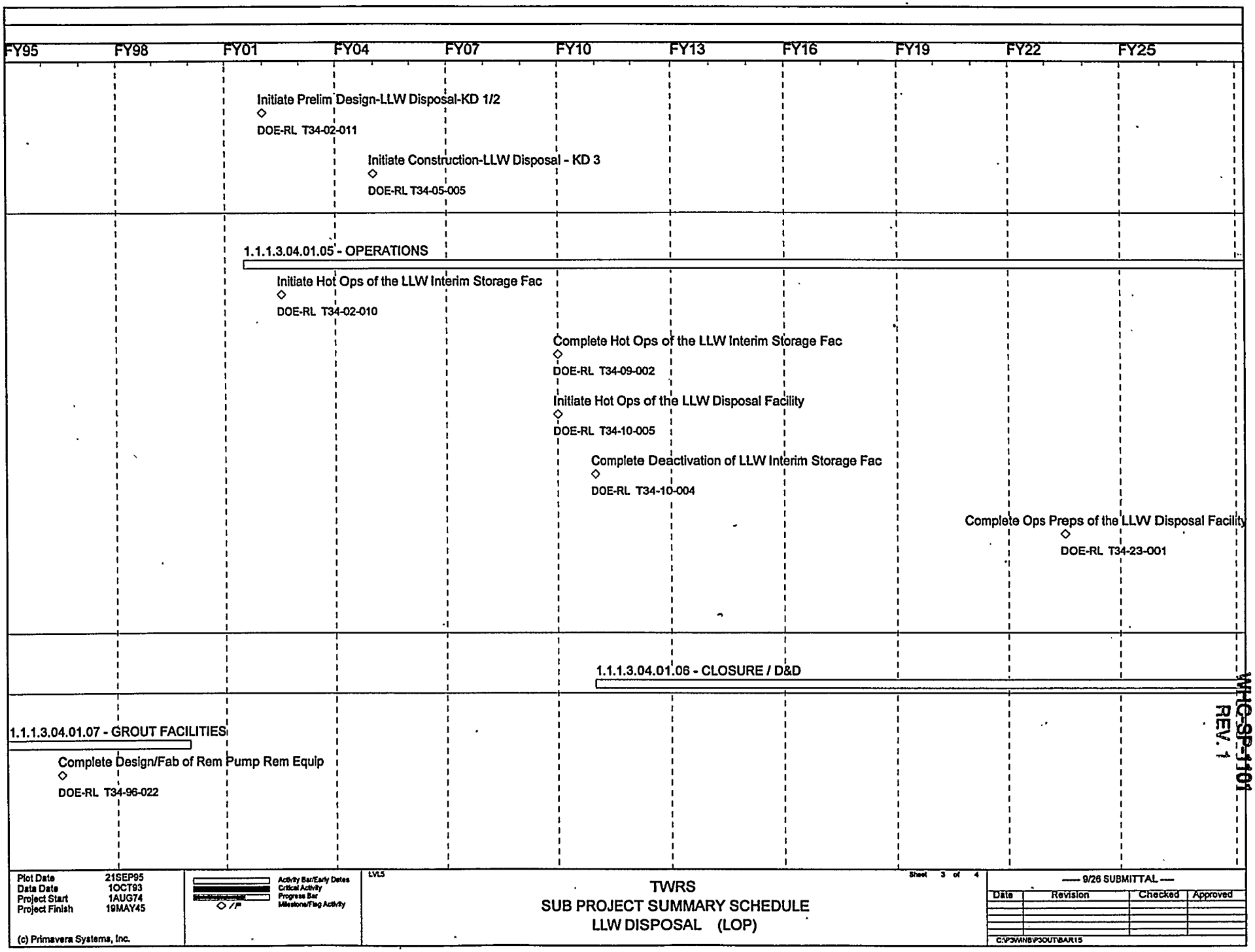
FY95
FY98
FY01
FY04
FY07
FY10
FY13
FY16
FY19
FY22
FY25
Initiate Prelim Design-LLW Disposal-KD 1/2
DOE-RL T34-02-011
Initiate Construction-LLW Disposal - KD 3
DOE-RL T34-05-005
1.1.1.3.04.01.05 - OPERATIONS
Initiate Hot Ops of the LLW Interim Storage Fac
DOE-RL T34-02-010
Complete Hot Ops of the LLW Interim Storage Fac
DOE-RL T34-09-002
Initiate Hot Ops of the LLW Disposal Facility
DOE-RL T34-10-005
Complete Deactivation of LLW Interim Storage Fac
DOE-RL T34-10-004
Complete Ops Preps of the LLW Disposal Facility
DOE-RL T34-23-001
1.1.1.3.04.01.06 - CLOSURE / D&D
1.1.1.3.04.01.07 - GROUT FACILITIES
Complete Design/Fab of Rem Pump Rem Equip
DOE-RL T34-96-022
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 3 of 4
TWRS
SUB PROJECT SUMMARY SCHEDULE
LLW DISPOSAL (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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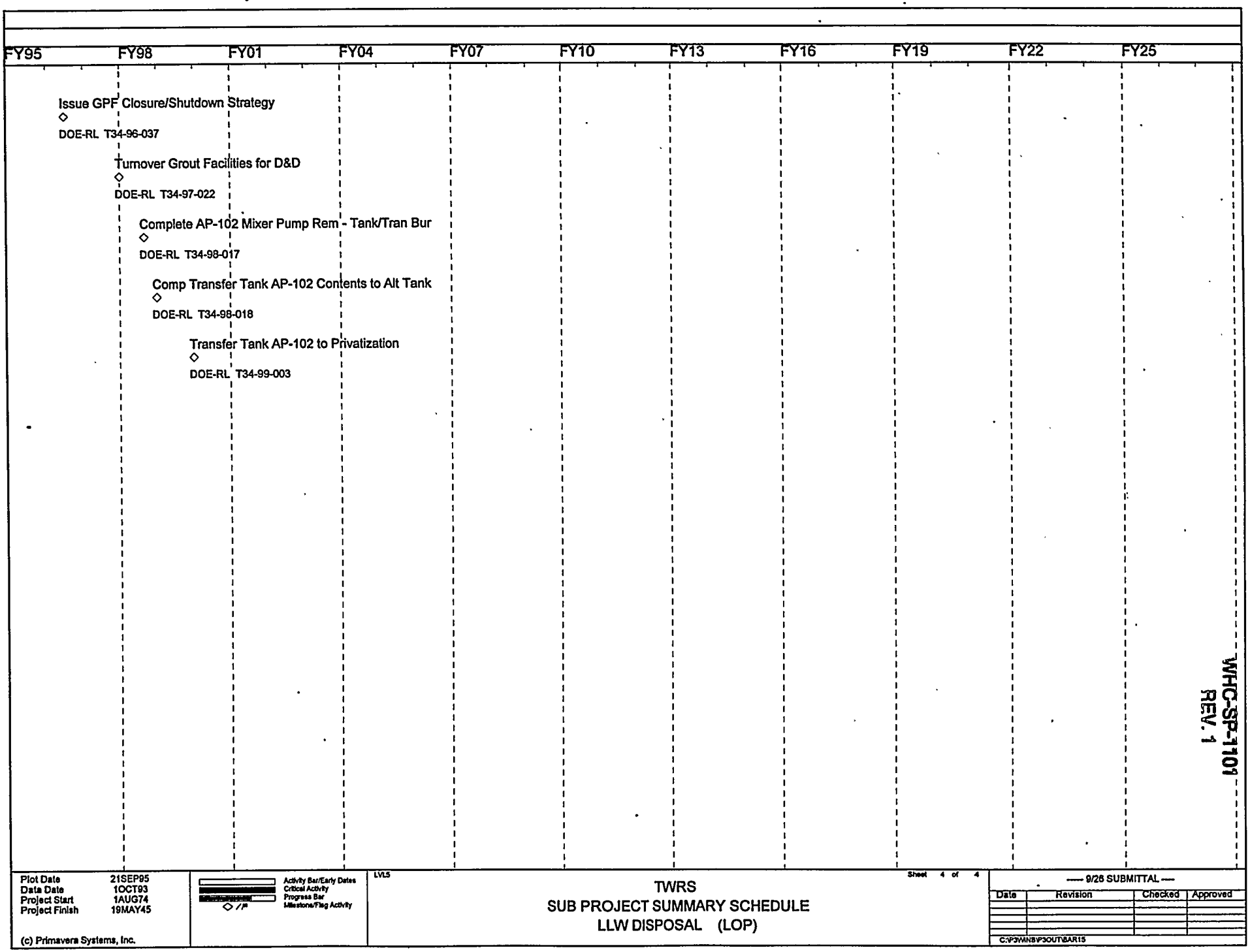


Attachment 10.1-4 Summary Schedule
Sheet 4 of 4

WHC-SP-1101
REV. 1

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.04.01 Low Level Waste Disposal

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.01.04	Initiate Prelim Design-LLW Interim Stor-KD 1/2	DOE-RL T34-00-002	01OCT99	
1.1.1.3.04.01.04	Initiate Construction-LLW Interim Storage-KD 3	DOE-RL T34-00-003	01JUN00	
1.1.1.3.04.01.05	Initiate Hot Ops of the LLW Interim Storage Fac	DOE-RL T34-02-010	01APR02	
1.1.1.3.04.01.04	Initiate Prelim Design-LLW Disposal-KD 1/2	DOE-RLT34-02=011	01OCT01	
1.1.1.3.04.01.04	Initiate Construction-LLW Disposal - KD 3	DOE-RL T34-05-005	01OCT04	
1.1.1.3.04.01.05	Complete Hot Ops of the LLW Interim Storage Fac	DOE-RL T34-09-002		30SEP09
1.1.1.3.04.01.05	Complete Deactivation of LLW Interim Storage Fac	DOE-RL T34-10-004		30SEP10
1.1.1.3.04.01.05	Initiate Hot Ops of the LLW Disposal Facility	DOE-RL T34-10-005	01OCT09	
1.1.1.3.04.01.05	Complete Ops Preps of the LLW Disposal Facility	DOE-RL T34-23-001		12APR23
1.1.1.3.04.01.05	Complete Long-Term Monitoring of LLW Disp Fac	DOE-RL T34-33-001		01SEP33
1.1.1.3.04.01.01	Submit Final ADS to RL	DOE-RL T34-96-008		31MAY96
1.1.1.3.04.01.01	Submit Draft MYPP to RL	DOE-RL T34-96-009		30AUG96
1.1.1.3.04.01.01	Submit Final MYPP to RL for Approval	DOE-RL T34-96-010		26SEP96
1.1.1.3.04.01.03	Issue Interim Performance Assessment for Review	DOE-RL T34-96-016		30SEP96

Attachment 10.1-5 Milestone Control Log
Sheet 1 of 3

WHC-SP-1181 REV 1

1.1.1.3.04.01 Low Level Waste Disposal

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.01.07	Complete Design/Fab of Rem Pump Rem Equip	DOE-RL T34-96-022		29MAR96
1.1.1.3.04.01.02	Issue LLW Interim Storage Engineering Evaluation	DOE-RL T34-96-032		30SEP96
1.1.1.3.04.01.07	Issue GPF Closure/Shutdown Strategy	DOE-RL T34-96-037		29MAR96
1.1.1.3.04.01.02	Iss Revised LLW Product Acc Strategy-Draft RFP	DOE-RL T34-96-046		15FEB96
1.1.1.3.04.01.01	Submit Final ADS to RL	DOE-RL T34-97-007		30MAY97
1.1.1.3.04.01.01	Submit Draft MYPP to RL	DOE-RL T34-97-008		29AUG97
1.1.1.3.04.01.01	Submit Final MYPP to RL for Approval	DOE-RL T34-97-009		26SEP97
1.1.1.3.04.01.03	Statement of Work for FY 1998-FY 2003 Prog Off	DOE-RL T34-97-015		13JUN97
1.1.1.3.04.01.02	Issue LLW Disposal DRD, Rev 0	DOE-RL T34-97-018		29AUG97
1.1.1.3.04.01.02	Issue DRD for LLW Interim Stor Fac	DOE-RL T34-97-021		31MAR97
1.1.1.3.04.01.07	Turnover Grout Facilities for D&D	DOE-RL T34-97-022		30SEP97
1.1.1.3.04.01.01	Submit Final ADS to RL	DOE-RL T34-98-009		29MAY98
1.1.1.3.04.01.01	Submit Draft MYPP to RL	DOE-RL T34-98-010		31AUG98
1.1.1.3.04.01.01	Submit Final MYPP to RL for Approval	DOE-RL T34-98-011		25SEP98

1.1.1.3.04.01 Low Level Waste Disposal

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.01.07	Complete AP-102 Mixer Pump Rem - Tank/Tran Bur	DOE-RL T34-98-017		29MAY98
1.1.1.3.04.01.07	Comp Transfer Tank AP-102 Contents to Alt Tank	DOE-RL T34-98-018		30SEP98
1.1.1.3.04.01.03	Statement of Work for FY 1999-FY 2004 Prog Off	DOE-RL T34-98-021		15JUN98
1.1.1.3.04.01.02	Issue LLW Disposal DRD, Rev 1	DOE-RL T34-98-023		30SEP98
1.1.1.3.04.01.07	Transfer Tank AP-102 to Privatization	DOE-RL T34-99-003		30SEP99
1.1.1.3.04.01.02	Issue LLW Disposal DRD, Rev. 2	DOE-RL T34-99-010		30SEP99
1.1.1.3.04.01.02	Transmit to RL the NRC Waste Classification Doc	DOE-HQ T3B-96-401		30NOV95

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.04.01 - LLW Disposal - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	206457	2688	8091	10803	7193	8232	9099	9202	3557	3505	3513
2	CENRTC	105	105									
3	LINE ITM	320671					8273	20953	9573	12173	11624	17630
	REPORT TOTAL	527233	2793	8091	10803	7193	16506	30052	18775	15730	15129	21143

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	3515	3026	5759	3260	7241	6152	6016	5992	6016	6029	6159
2	CENRTC											
3	LINE ITM	67951	17629					13231	50972	13230		11002
	REPORT TOTAL	71466	20655	5759	3260	7241	6152	19247	56964	19246	6029	17161

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	6255	6065	5954	5888	5962	5962	5966	6024	6024	6134	6254
2	CENRTC											
3	LINE ITM	49491	16579	360								
	REPORT TOTAL	55746	22643	6314	5888	5962	5962	5966	6024	6024	6134	6254

Attachment 10.1-6 Cost Baseline Summary by Year
Sheet 1 of 2

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

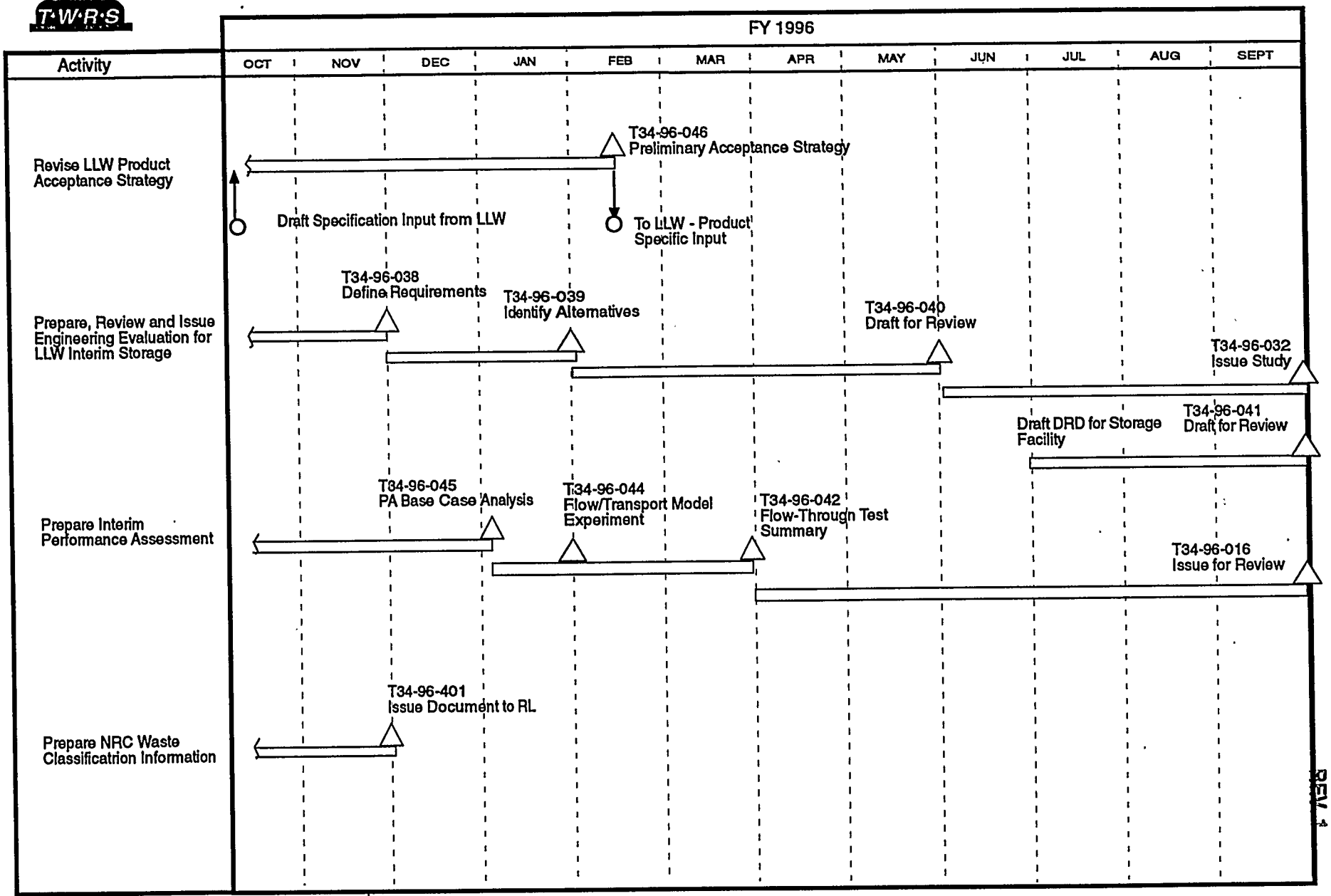
COST LOADING REPORT | UNITS IN K$s

1.1.1.3.04.01 - LLW Disposal - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034
1	EXPENSE	5504	5518	1109	969	991	829	
2	CENRTC							
3	LINE ITM							
	REPORT TOTAL	5504	5518	1109	969	991	829	

Attachment 10.1-6 Cost Baseline Summary by Year
Sheet 2 of 2

Draft



FY 1996 Performance Baseline Schedule

1.1.1.3.04.01 Storage & Disposal- LLW Disposal

29509043.16

Attachment 10.1-7

WHC-SP-1101 REV 1

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.04.01 - LLW Disposal - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.04.01.01 - PROJECT ADMIN.	46	42	40	57	52	46	53	49	56	59	64	55	619
	1.1.1.3.04.01.02 - SYSTEM DEFINITION	64	49	43	49	45	48	53	51	44	47	51	47	591
	1.1.1.3.04.01.03 - PERFORMANCE ASSESSMENT	112	102	97	112	102	107	118	113	99	104	112	102	1279
	1.1.1.3.04.01.04 - FACILITIES													
	1.1.1.3.04.01.05 - OPERATIONS													
	1.1.1.3.04.01.06 - CLOSURE / D&D													
	1.1.1.3.04.01.07 - GROUT FACILITIES	23	21	20	24	20	22	12	12	11	11	12	11	199
TOTAL	1	245	214	200	243	219	223	235	225	209	221	239	214	2688
2 - CENRTC														
	1.1.1.3.04.01.07 - GROUT FACILITIES	19	17	16	20	16	18							105
TOTAL	2	19	17	16	20	16	18							105
3 - LINE ITM														
	1.1.1.3.04.01.04 - FACILITIES													
TOTAL	3													
	REPORT TOTAL	264	231	216	262	236	241	235	225	209	221	239	214	27

Attachment 10.1-8 Cost Estimate Baseline by Month

10.2 INTERIM STORAGE
(WBS 1.1.1.3.4.2)

10.2.1 STRATEGY

10.2.1.1 Objectives

The primary objective of the High-Level Waste (HLW) Interim Storage sub-project is to provide a storage facility for the high-level fraction of the waste to be vitrified by the private contractor. This includes providing a transporter and shipping cask to move the waste in a safe, environmentally sound, and cost- effective manner. The HLW interim storage will be on line by 2003 to receive the HLW vitrified product. A secondary objective is to provide for secondary streams. These include technetium, cesium, HLW sludge, TRU and failed equipment.

10.2.1.2 Planning Assumptions

1. The HLW interim storage capability will be built in two phases. Phase I Proof-of-Principle of the interim storage assumes using a portion of the Canister Storage Building (CSB) or converting an existing facility for storage. This will be determined by engineering studies, rough order of magnitude estimates, and the development of a strategy for a path forward. Phase II of the interim storage facility will be built to support concepts recommended by the privatization contractor.

2. Engineering studies will be completed to define requirements of the HLW interim storage facility. These include the vitrified product, secondary waste streams (i.e., dry cesium, the possibility of technetium and spent equipment/risers).

3. The Interim Storage Facility will accept HLW product per product specification.

4. The Interim Storage Facility will store, monitor, and have the capability to overpack (if necessary) HLW product to prepare for shipment to a repository. The HLW product will be properly configured for acceptance by the Office of Civilian Radioactive Waste Management for disposal at an offsite federal repository.

5. Costs for repository fees and decontamination and decommissioning are included in the HLW Interim Storage Facility sub-project.

6. The HLW Interim Storage sub-project will be responsible to provide transporter and transport cask to HLW from vendor's dock to HLW Interim Storage Facility.

10.2.1.3 Constraints

1. Availability of funding in out-years (1999, 2000 and 2001) to build the HLW Interim Storage Facility in time to meet Phase I privatization schedule specification - July 2002. This can possibly be mitigated by use of available space in the CSB or use of existing facility.

2. Constrained by definition of product specification in request for proposal (RFP) to vendors.

3. Shipment of waste to a repository requires an offsite repository to be built and ready to accept wastes.

4. The acceptance of waste product and secondary streams will be contingent upon the privatization contractor process.

5. The CSB is currently planned to be turned over to the Spent Nuclear Fuels Program for storage of fuels from K-Basins. It has not yet been determined if two or three of the proposed vaults will be used (a study is currently proceeding on this issue). The CSB seems to be the most viable option in the time frame to be able to store HLW. Two alternatives will be developed. The first is to use unoccupied tube for HLW to meet the 2002 startup. The second will be to add a vault to the CSB for HLW. This requires the CSB to be engineered to allow adding the vault while K-Basin fuels are in place. This would allow TWRS to take advantage of existing load in/load out and support facilities.

10.2.2 TECHNICAL REQUIREMENTS BASELINE

10.2.2.1 Work Breakdown Structure

The WBS tree for the Interim Storage sub-project is in Attachment 10.2-1.

10.2.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Interim Storage sub-project is in Attachment 10.2-2. Lower-level dictionary sheets are available on the Performance Measurement Control System.

10.2.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Interim Storage sub-project is in Attachment 10.2-3.

10.2.3 SCHEDULE BASELINE

10.2.3.1 Summary Schedule

See Attachment 10.2-4 for the Interim Storage summary schedule.

10.2.3.2 Milestone Control Log

See Attachment 10.2-5 for the Milestone Control Log. Milestone description sheets are located in Appendix A.

10.2.4 COST BASELINE

10.2.4.1 Cost Baseline Summary by Year

See Attachment 10.2-6 for the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

10.2.4.2 Basis of Estimate

Cost estimates for systems definition work were developed by using previous knowledge from engineering study costs, development of data requirements documents, and ongoing work on product acceptance. Estimates for design and construction are based on the previously validated HWVP Canister Storage Building. Operating estimates were developed on the basis of existing operations for storage on the Site. The costs for shipment to the repository and repository fees are based on published DOE guidance for estimating repository costs. Decontamination and decommissioning costs are estimated based on cost of construction using the DOE Decommissioning Handbook. The estimate for a storage building considers one-third the cost of the CSB. This has been confirmed by ongoing studies for converting the CSB.

10.2.5 PERFORMANCE MEASURES

Potential milestones have been identified for this sub-project. In FY 1996 and FY 1997 during Systems Definition and early engineering studies, development of a strategy and design requirements document are identified. In out-years, the traditional design/construction/startup/operations milestones are identified. The milestones are contingent upon receiving timely key decisions for the phases of the project from DOE. It is assumed that any interim Tri-Party Agreement milestones currently identified will be eliminated when privatization is formally announced and the Tri-Party Agreement is renegotiated. The out-years of operations, shipment of HLW to a repository, and D&D of the facility are showing only major milestones as are completion of shipments, completion of D&D, and turnover of the facility. This is due to uncertainties in the long term as size of facility and HLW products to be stored.

10.2.6 EXECUTION YEAR

Activities were planned in FY 1996 that assumed a decision on privatization will be made in FY 1995 to allow the new baseline to start in FY 1996. The privatization decision is assumed to be Key Decision 0.

10.2.6.1 Technical Objectives

1. Develop a strategy for storing the HLW product and other HLW received from LLW. This strategy will examine the use of existing facilities, sharing facilities, or using state-of-the-art commercial ideas for a new facility.

2. Prepare rough order of magnitude (ROM) estimate based on facility search evaluation to be used in developing strategy.

3. Determine the types and forms of HLW to be stored in the facility. This includes possible secondary streams that may or may not go to interim storage or be sent to existing facilities.

4. Provide acceptance criteria for the waste into interim storage, methods for monitoring wastes, and a means of overpacking should the waste require repackaging.

5. Develop a DRD for interim storage facility that will be used to develop a statement of work (SOW) for conceptual design.

10.2.6.2 FY 1996 Performance Baseline Schedule

See Attachment 10.2-7 for the FY 1996 performance baseline schedule.

10.2.6.3 Cost Estimate Baseline by Month

See Attachment 10.2-8 for the month-by-month cost estimate baseline for FY 1996.

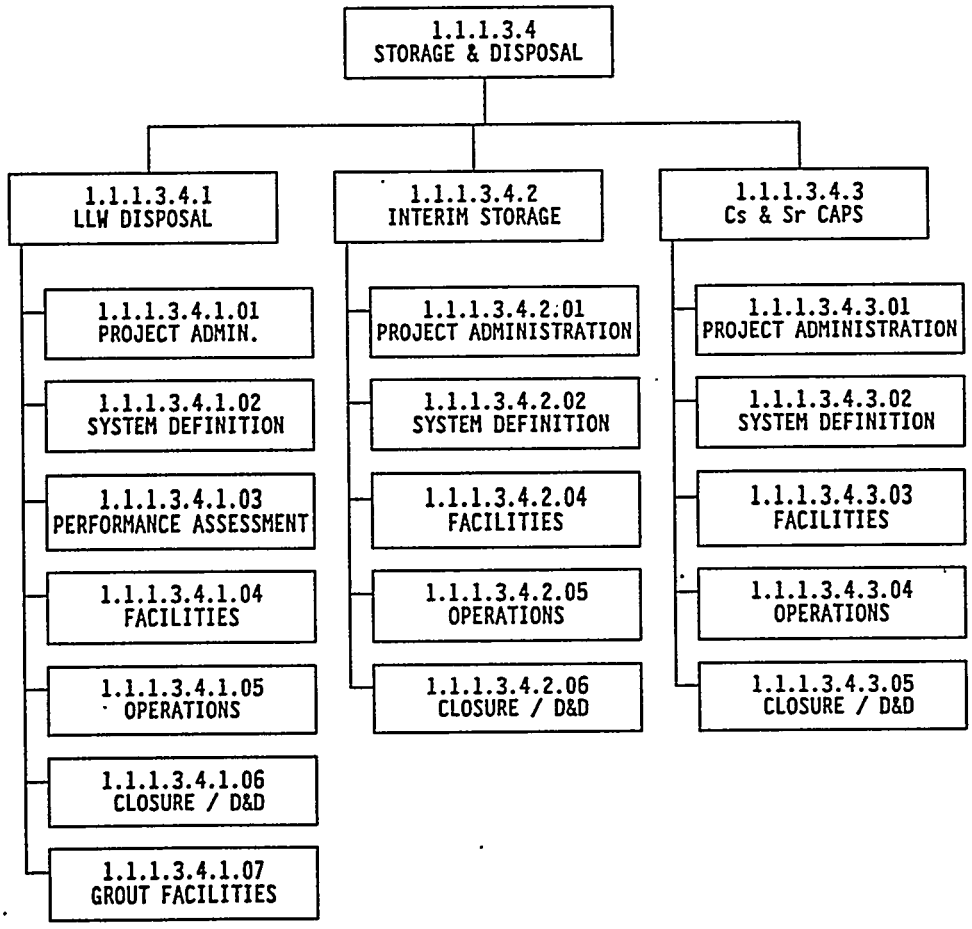
10.2.6.4 FY 1995 Work Scope Carryover Summary

None identified at this time.

LISTING OF ATTACHMENTS

Attachment 10.2-1	Work Breakdown Structure
Attachment 10.2-2	WBS Dictionary Sheet
Attachment 10.2-3	Responsibility Assignment Matrix
Attachment 10.2-4	Summary Schedule
Attachment 10.2-5	Milestone Control Log
Attachment 10.2-6	Cost Baseline Summary by Year
Attachment 10.2-7	FY 1996 Performance Baseline Schedule
Attachment 10.2-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
STORAGE & DISPOSAL



Attachment 10.2-1 Work Breakdown Structure

1 DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT			
7/15/95	1.1.1 TWRS 1.1.1.3 PROCESS TANK WASTE 1.1.1.3.04 STORAGE AND DISPOSAL			
3. WBS ELEMENT CODE/LEVEL	4. WBS ELEMENT TITLE			
1.1.1.3.04.02 Level 5	INTERIM STORAGE PROJECT			
5. CURRENT REV. NO.	6. EFFECTIVE REV. DATE	7. APPROVED CHANGES		
0				
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO	9. BUDGET AND REPORTING NUMBERS			
	Operating	CENTRC	GPP	Line Item
12300	EW3120075	35EW31207	39EW31301	39EW31301

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	1,526.00	4,172.00	2,124.00	429.00	429.00	2,828.00	429.00
CENRTC					6,006.00		
LINE ITEM				4,673.00	11,550.00	5,970.00	20,243.00
GPP							
TOTAL	1,526.00	4,172.00	2,124.00	5,102.00	17,985.00	8,798.00	20,672.00

B. TECHNICAL BASES

Goals and Objectives
Successfully identify requirements for HLW interim storage and onsite transport. Design and construct interim storage facility to accept immobilized HLW for Phase I and II privatization. Successfully operate the HLW interim storage to accept the immobilized waste. Load HLW for transfer to ultimate disposal facilities and close interim storage facility building.

Major End-Item Deliverables
Completion of design requirements, design and construction of facility by July 2003, operate the facility starting in 2003 and ultimate disposal of waste in 2034-2042. Currently, there is an issue due to Disposal Programs funding for the years during the construction of the HLW Interim Storage Facility for Phase I. This is due to needing LLW and HLW Facilities on-line at the same time. The issue is being worked with the Spent Fuels Nuclear Program and TWRS overall funding. Possible solutions are budget availability from other TWRS Programs winding down in that time frame, use of available tubes in the Canister Storage Building (CSB) or adding a vault to the CSB for Phase I.

Acceptance Criteria
N/A

C. STATEMENT OF WORK

TANK WASTE REMEDIATION SYSTEM
WORK BREAKDOWN STRUCTURE DICTIONARY

Systems Definition - Define requirements for the HLW Interim Storage Facility. This will include determining storage requirements for Phase I and II privatization. To determine the requirements, potential HLW streams will be investigated. These include technetium, HLW canisters, cesium, HLW sludge, TRU, capsule storage and secondary streams from vitrification. Determine equipment necessary for moving HLW canisters to storage.

Facility availability - This include determining availability of existing facilities, looking at existing designs that are completed (HWVP CSB), the viability of sharing in the conversions of the current canister storage location, or building a new facility near the privatization facilities. This activity will satisfy task plan HLW-8 of the TWRS Systems Requirements Review action plan.

ROM estimates will be developed for the preferred option for HLW interim storage. A strategy defining the best path forward will be developed and approved before a DRD is completed.

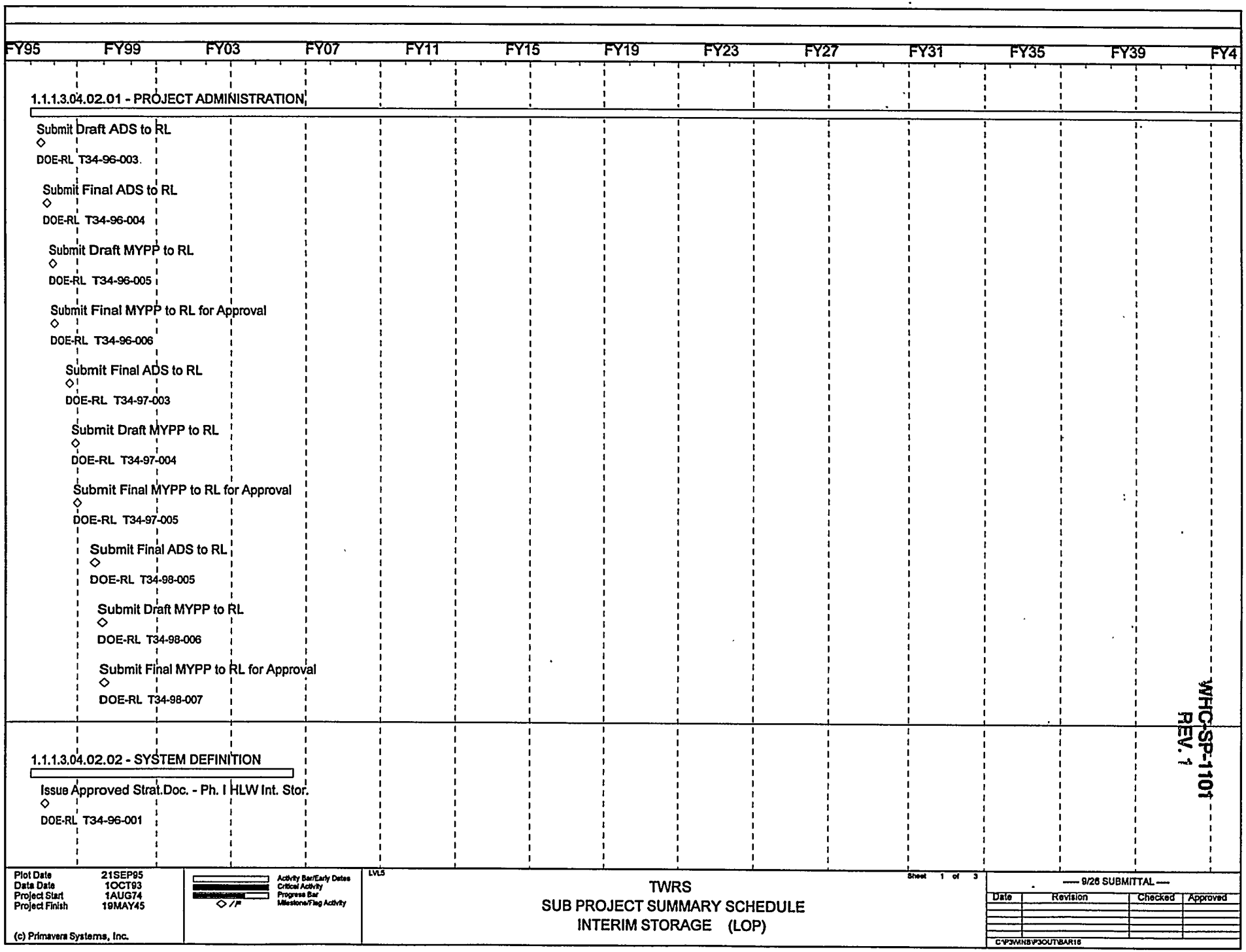
Product acceptance strategy for the HLW products will be developed to assure the HLW product meets repository requirements and can be safely stored. In addition, requirements for documentation of storage of the HLW product will be developed to assure proper documentation can be provided to the repository.

HLW Facility Project - A SOW will be developed based on the DRD for the HLW interim storage. Depending upon the outcome of the engineering study for a facility, the SOW will be for a new facility, existing facility or sharing of a facility. The facility conceptual design will be developed followed by detail design. The facility will be constructed based on the approved project design. Concurrent with the facility design, safety and permitting documentation will be developed to allow for operation of the HLW interim facility.

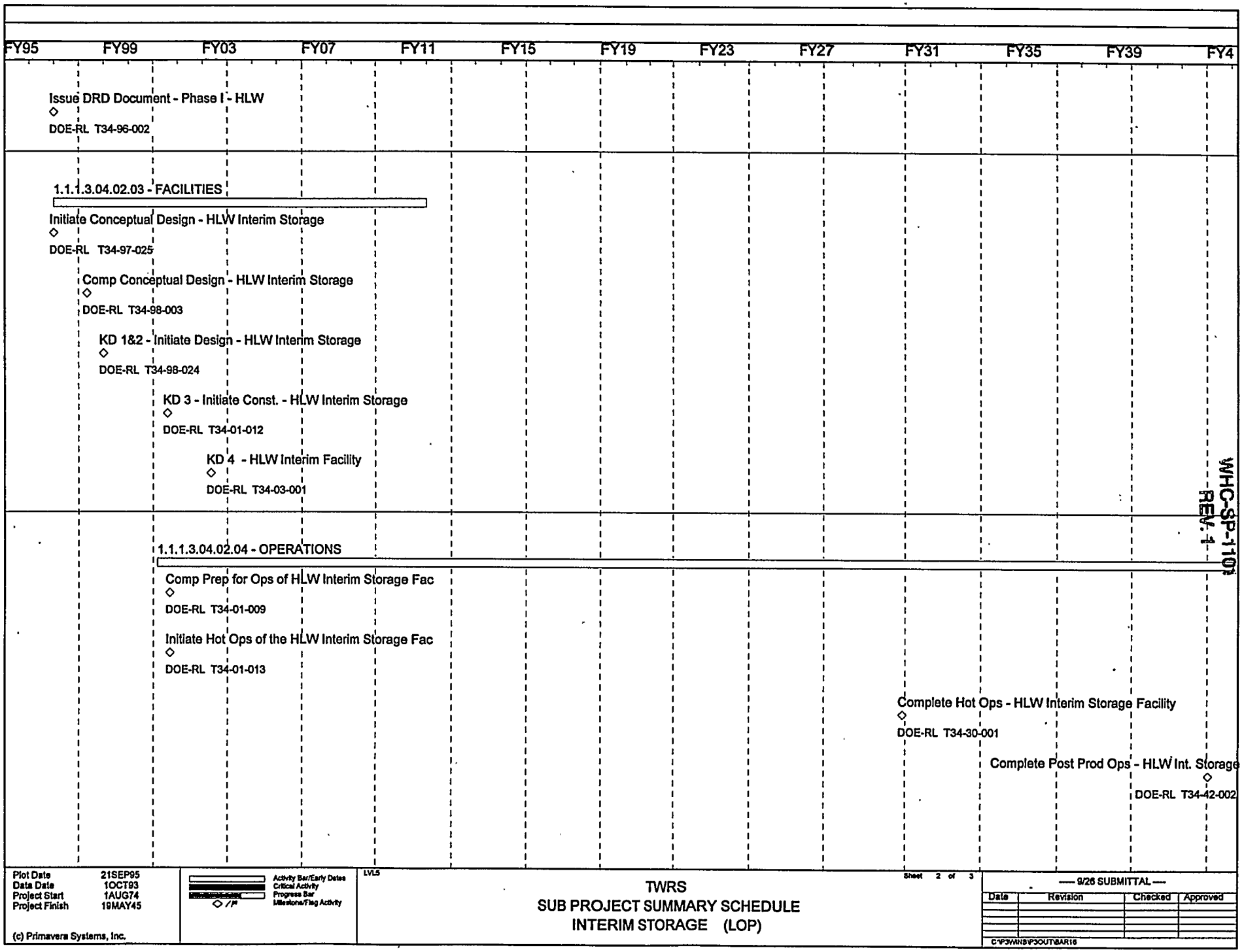
HLW Operations - HLW interim storage facility operations will include support in the early phases for facility definition and engineering. During construction, preparation of required documentation and personnel training and qualification will occur. After construction, cold and hot testing and a ORR will be performed. These will be followed by the actual hot operations of the facility to continue until all hot waste is shipped to the repository. The HLW product will be shipped offsite to a repository. Product and repository fees are included under the HLW interim storage project.

Facility D&D - The facility will be decontaminated and dispositioned following final shipments of waste. At this time, it is assumed that minimal contamination will occur and the facility will not have future uses after its mission.

WBS Number	WBS Title	Responsible Person
1.1.1.3.4	**Storage and Disposal Project**	**R. J. Murkowski**
1.1.1.3.4.2	**Interim Storage Project**	**K. C. Burgard**
1.1.1.3.4.2.1	Project Administration	R. F. Wood
1.1.1.3.4.2.2	Systems Definition	C. A. Petersen
1.1.1.3.4.2.4 (no .3)	Facilities	P. Felise
1.1.1.3.4.2.5	Operations	R. U. Elwell
1.1.1.3.4.2.6	Closure/D&D	J. Hales



Attachment 10.2-4 Summary Schedule
Sheet 1 of 3


FY95
FY99
FY03
FY07
FY11
FY15
FY19
FY23
FY27
FY31
FY35
FY39
FY4
Issue DRD Document - Phase I - HLW
DOE-RL T34-96-002
1.1.1.3.04.02.03 - FACILITIES
Initiate Conceptual Design - HLW Interim Storage
DOE-RL T34-97-025
Comp Conceptual Design - HLW Interim Storage
DOE-RL T34-98-003
KD 1&2 - Initiate Design - HLW Interim Storage
DOE-RL T34-98-024
KD 3 - Initiate Const. - HLW Interim Storage
DOE-RL T34-01-012
KD 4 - HLW Interim Facility
DOE-RL T34-03-001
1.1.1.3.04.02.04 - OPERATIONS
Comp Prep for Ops of HLW Interim Storage Fac
DOE-RL T34-01-009
Initiate Hot Ops of the HLW Interim Storage Fac
DOE-RL T34-01-013
Complete Hot Ops - HLW Interim Storage Facility
DOE-RL T34-30-001
Complete Post Prod Ops - HLW Int. Storage
DOE-RL T34-42-002
WHC-SP-1101
REV. 1
Plot Date 21SEP95
Data Date 1OCT93
Project Start 1AUG74
Project Finish 19MAY45
(c) Primavera Systems, Inc.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity
LVL5
Sheet 2 of 3
TWRS
SUB PROJECT SUMMARY SCHEDULE
INTERIM STORAGE (LOP)
9/26 SUBMITTAL
Date
Revision
Checked
Approved
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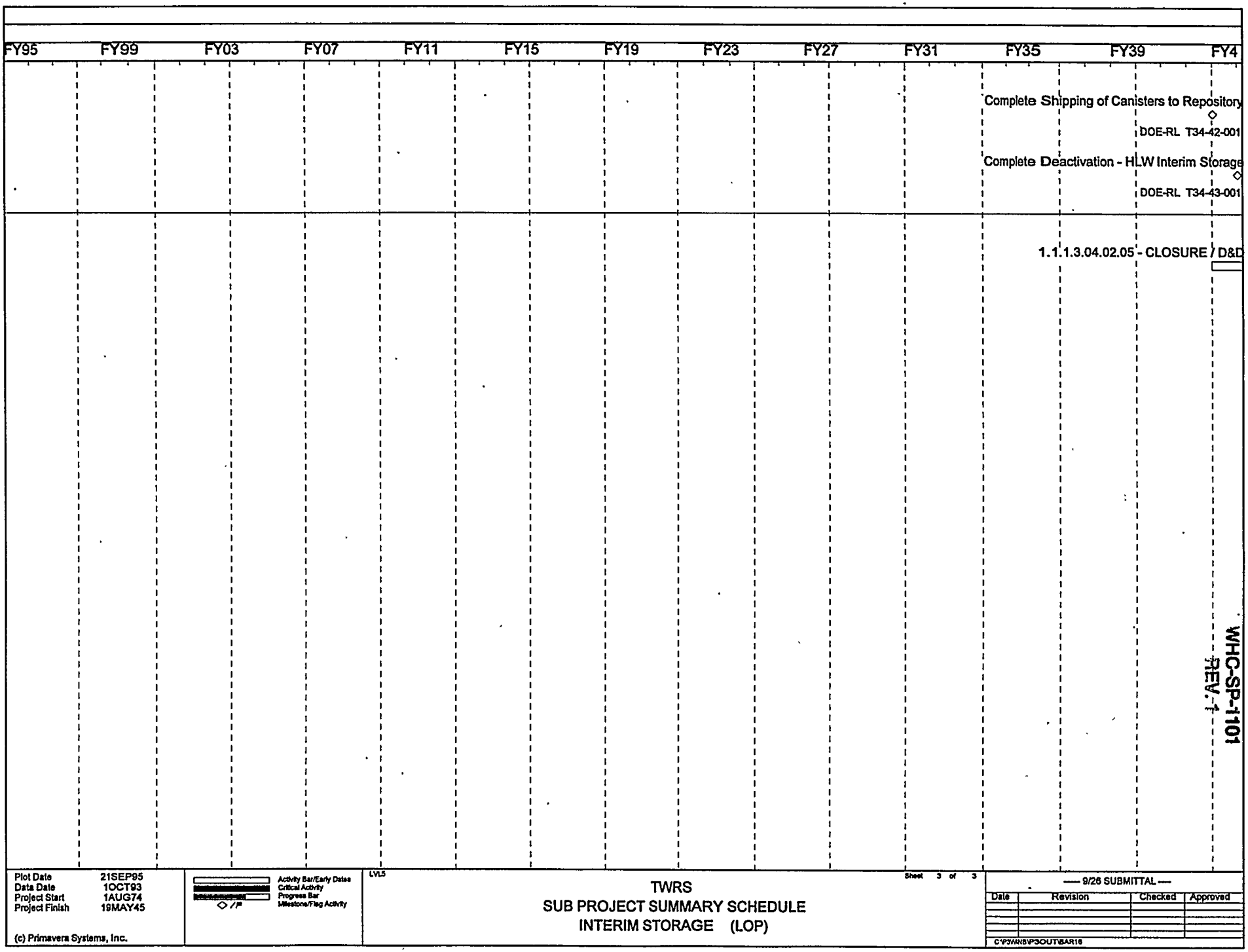


Attachment 10.2-4 Summary Schedule
Sheet 3 of 3

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.04.02 Interim Storage

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.02.04	Comp Prep for Ops of HLW Interim Storage Fac	DOE-RL T34-01-009		01JUN01
1.1.1.3.04.02.03	KD 3 - Initiate Const. - HLW Interim Storage	DOE-RL T34-01-012		30APR01
1.1.1.3.04.02.04	Initiate Hot Ops of the HLW Interim Storage Fac	DOE-RL T34-01-013	04JUN01	
1.1.1.3.04.02.03	KD 4 - HLW Interim Facility	DOE-RL T34-03-001		30JAN03
1.1.1.3.04.02.04	Complete Hot Ops - HLW Interim Storage Facility	DOE-RL T34-30-001		20AUG30
1.1.1.3.04.02.04	Complete Shipping of Canisters to Repository	DOE-RL T34-42-001		140CT42
1.1.1.3.04.02.04	Complete Post Prod Ops - HLW Int. Storage	DOE-RL T34-42-002		140CT42
1.1.1.3.04.02.04	Complete Deactivation - HLW Interim Storage	DOE-RL T34-43-001		140CT43
1.1.1.3.04.02.02	Issue Approved Strat.Doc. - Ph. I HLW Int. Stor.	DOE-RL T34-96-001		30APR96
1.1.1.3.04.02.02	Issue DRD Document - Phase I - HLW	DOE-RL T34-96-002		30SEP96
1.1.1.3.04.02.01	Submit Draft ADS to RL	DOE-RL T34-96-003		29FEB96
1.1.1.3.04.02.01	Submit Final ADS to RL	DOE-RL T34-96-004		31MAY96
1.1.1.3.04.02.01	Submit Draft MYPP to RL	DOE-RL T34-96-005		30AUG96
1.1.1.3.04.02.01	Submit Final MYPP to RL for Approval	DOE-RL T34-96-006		26SEP96

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.04.02 Interim Storage

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.02.01	Submit Final ADS to RL	DOE-RL T34-97-003		30MAY97
1.1.1.3.04.02.01	Submit Draft MYPP to RL	DOE-RL T34-97-004		29AUG97
1.1.1.3.04.02.01	Submit Final MYPP to RL for Approval	DOE-RL T34-97-005		26SEP97
1.1.1.3.04.02.03	Initiate Conceptual Design - HLW Interim Storage	DOE-RL T34-97-025	01OCT96	
1.1.1.3.04.02.03	Comp Conceptual Design - HLW Interim Storage	DOE-RL T34-98-003		30JAN98
1.1.1.3.04.02.01	Submit Final ADS to RL	DOE-RL T34-98-005		29MAY98
1.1.1.3.04.02.01	Submit Draft MYPP to RL	DOE-RL T34-98-006		31AUG98
1.1.1.3.04.02.01	Submit Final MYPP to RL for Approval	DOE-RL T34-98-007		25SEP98
1.1.1.3.04.02.03	KD 1&2 - Initiate Design - HLW Interim Storage	DOE-RL T34-98-024		30SEP98

WESTINGHOUSE HANFORD COMPANY — PRIMAVERA PROJECT PLANNER — TWRS INTEGRATED SCHEDULE

COST LOADING REPORT — UNITS IN K$s

1.1.1.3.04.02 - Interim Storage - Cost By Year — TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	4222766	1526	4172	2124	429	429	2828	429	920	2497	3636
2	CENRTC	6006					6006					
3	LINE ITM	63641				4673	11550	5970	20243	2129		
	REPORT TOTAL	4292412	1526	4172	2124	5102	17984	8799	20672	3048	2497	3636

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	4599	5506	5534	4764	3177	3082	3115	3133	4469	5122	5143
2	CENRTC											
3	LINE ITM				2825	8503	7748					
	REPORT TOTAL	4599	5506	5534	7588	11680	10830	3115	3133	4469	5122	5143

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	EXPENSE	5102	5102	5122	5143	5122	5226	5304	5208	5152	4992	5031
2	CENRTC											
3	LINE ITM											
	REPORT TOTAL	5102	5102	5122	5143	5122	5226	5304	5208	5152	4992	5031

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

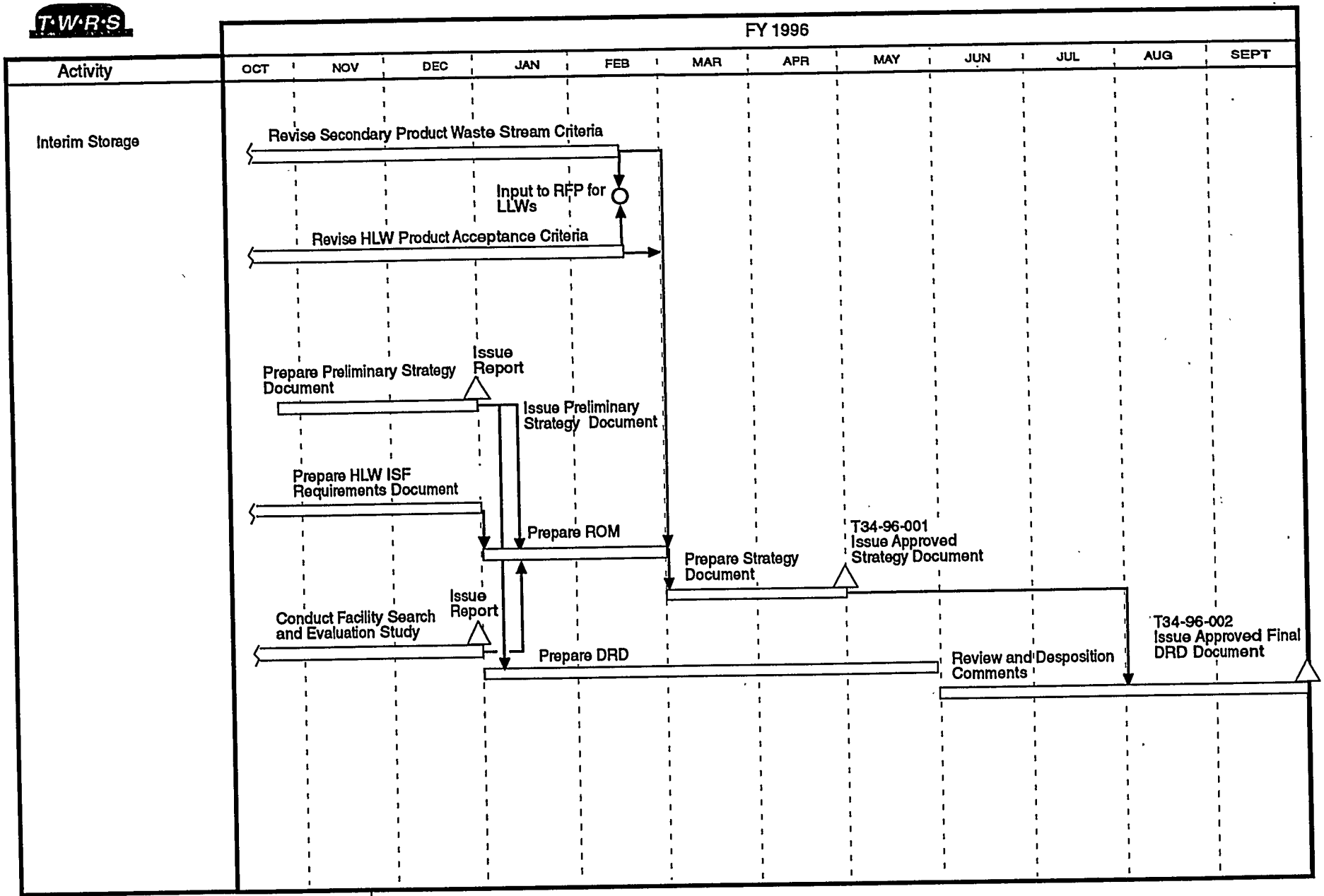
COST LOADING REPORT | UNITS IN K$s

1.1.1.3.04.02 - Interim Storage - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038
1	EXPENSE	5122	5102	4632	697	687	685	682	685	88775	654347	656946
2	CENRTC											
3	LINE ITM											
	REPORT TOTAL	5122	5102	4632	697	687	685	682	685	88775	654347	656946

CATEGORY	CATEGORY DESCRIPTION	FY 2039	FY 2040	FY 2041	FY 2042	FY 2043	FY 2044	FY 2045
1	EXPENSE	652124	663003	658299	679678	27401	764	
2	CENRTC							
3	LINE ITM							
	REPORT TOTAL	652124	663003	658299	679678	27401	764	

Attachment 10.2-6 Cost Baseline Summary by Year
Sheet 2 of 2



FY 1996 Performance Baseline Schedule

1.1.1.3.04.02 Storage & Disposal - Interim Storage

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WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

1.1.1.3.04.02 - Interim Stor - FY 96 Cost/Month | TOTAL USAGE FOR MONTH

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.04.02.01 - PROJECT ADMINISTRATION	22	20	19	30	28	23	26	24	32	34	36	30	324
	1.1.1.3.04.02.02 - SYSTEM DEFINITION	163	150	141	189	152	94	97	84	63	59	3	9	1203
	1.1.1.3.04.02.04 - FACILITIES , LEVEL V COST													
	1.1.1.3.04.02.05 - OPERATIONS , LEVEL V COST													
TOTAL	1	185	171	160	219	179	117	123	108	94	93	39	39	1526
2 - CENRTC														
TOTAL	2													
3 - LINE ITM														
TOTAL	3													
	REPORT TOTAL	185	171	160	219	179	117	123	108	94	93	39	39	1526

Attachment 10.2-8 Cost Estimate Baseline by Month

10.3 CESIUM AND STRONTIUM CAPSULES (WBS 1.1.1.3.4.3)

10.3.1 STRATEGY

The current TWRS Program baseline includes the disposition of the cesium and strontium capsules presently stored in the Waste Encapsulation Storage Facility (WESF) in the 200E Area on the Hanford Site. These highly radioactive capsules are classified as high-level waste because the encapsulated cesium and strontium was previously separated from high-level wastes contained in several of the single-shell tanks in order to reduce the thermal load on those tanks. The Transition Projects will maintain custody for these capsules in the WESF (or equivalent interim storage) until TWRS is ready to disposition them for disposal in the geologic repository.

The current TWRS technical baseline for the disposition of the Cs and Sr capsules is to overpack eight of them in a sealed canister similar to that being used for vitrified high-level waste. If overpacking is not acceptable to the Repository Program or is not economical, vitrification of the halide salts, either as separate waste streams or blended with other high-level wastes, will be considered as alternative processing. Overpacking will be performed by the M & O contractor; vitrification will be performed by the private vendor following removal of the halide salts from the capsules by the M & O contractor. In either case, the final product will be stored by the M & O contractor in the HLW Interim Storage facility (see Section 10.2.1).

Current plans call for the capsules to be maintained in interim storage until Phase II vitrification begins. This will allow sufficient time to resolve the issues through the systems engineering process (e.g., trade studies and decision analysis) regarding acceptability of alternative waste forms (i.e., halide salts) in the repository, and to evaluate the cost effectiveness of the various processing scenarios. If the ultimate decision is to vitrify rather than overpack, this schedule will coincide with that for full-scale production of vitrified HLW.

The risks associated with this strategy are primarily two-fold:

1. Halides as a waste form and/or overpacking as a packaging concept will not be acceptable to the Repository Project.

2. The capsules are maintained in an interim storage condition that precludes one or more processing options from further consideration.

These risks are being mitigated by the following:

1. Completing a trade study that establishes the technical acceptability of the halide salts and the economic viability of overpacking.

2. Imposing sufficient requirements on the interim storage of the capsules (wet or dry) that their physical condition will not deteriorate at an accelerated rate.

10.3.1.1 Objectives

The objective of the Cs/Sr Capsule sub-project is to process the CsCl and SrF_2 capsules in preparation for final disposal such that they can continue to be safely stored at the Hanford Site until they are shipped to a geologic repository. The scope of this sub-project is to evaluate processing alternatives for these capsules; recommend to DOE's Office of Civilian Radioactive Waste Management (RW) for concurrence a preferred processing option; and design, construct, start up, operate and deactivate a facility that implements the selected process. The resulting product will meet all applicable requirements for waste disposal at the geologic repository.

10.3.1.2 Planning Assumptions

1. Processing of the Cs and Sr capsules in preparation for final disposal will be performed by the integrating (M&O) contractor.

2. The Cs and Sr halide salts will be acceptable as a waste form to RW for disposal in the geologic repository.

3. The overpacking concept proposed by Hanford for the Cs and Sr capsules will be acceptable to RW.

4. Overpacking of the Cs and Sr capsules is the most cost-effective process for disposition of this waste form.

5. Capsule overpacking will utilize the same canister, canister handling equipment, closure weld, decontamination process, Multi-Purpose Canister (MPC) overpacking equipment (if used), transport, and interim storage facility (for processed capsules) as that used for the vitrified HLW.

6. Processing of the Cs and Sr capsules will be performed either in an existing Hanford facility, which is modified specifically for this mission; or in a new facility that is specifically and solely designed, built, and operated for this mission; or in a new facility in which the capsule processing is one of several missions carried out.

7. Capsule processing will start in 2013 (start of Phase II privatization) and will be completed no later than 2028 (Tri-Party Agreement milestone M-51-00).

8. Overpacked capsules will be transferred to the geologic repository beginning in 2035.

9. Transition Projects will maintain the capsules in safe, clean, and stable interim storage at WESF (or other temporary storage outside of the TWRS scope) until the TWRS Program can process them for final disposal.

10.3.1.3 Constraints

10.3.1.3.1 Risks

The following risks are associated with this scope:

1. Inadequate integration of this sub-project with other TWRS activities, in particular the vitrification of other HLW feed streams, may lead to the inability to optimize the total life-cycle cost of capsule processing and disposal.

2. Delays in receiving a definitive response from RW on the acceptability of halide salts and/or the proposed overpacking concept may preclude, or at least delay, alternative processing considerations, such as including Cs/Sr capsule processing as part of the Phase II vendor's work scope.

3. If not properly specified, the conditions of continued interim storage of the capsules prior to their processing for final disposal may compromise their long-term integrity and preclude the overpacking option, because of capsule material degradation.

Actions being taken to reduce these risks include comprehensive integration and analysis of interfaces with other TWRS projects, a series of trade studies and negotiations with RW leading to complete system definition, and frequent technical and program interactions with other Hanford programs related to interim storage of the capsules.

10.3.1.3.2 Project Interfaces

10.3.1.3.2.1 Interfaces with Other TWRS Projects

The Cs/Sr Capsule sub-project, as part of the Storage and Disposal (S&D) Project, interfaces with several of the other TWRS projects, particularly the HLW Project and Characterization Project, as well as the HLW Interim Storage sub-project within the S&D Project.

The Characterization Project provides waste characterization data on the source materials in the capsules, primarily from historical information that was compiled at the time the cesium and strontium were being recovered from the tank wastes.

Close coordination with the HLW Project is required in working with RW on the issue of halide salt and overpack processing acceptability because of the alternative waste form and canister configuration concepts that are being evaluated with RW. In the event that halide salts and/or overpacking are not acceptable to the repository, the capsules would potentially become a HLW feed stream that would be included as part of the Phase II vendor's work scope.

HLW Interim Storage provides the onsite storage capability for the Cs and Sr capsules after they have been processed for final disposal and are awaiting shipment to the repository.

10.3.1.3.2.2 Interfaces with Other Organizations

WHC's TWRS Disposal Engineering, Process Engineering, and Systems Engineering perform key technical roles in defining this sub-project's scope and requirements.

Transition Projects maintains custody of the capsules until this sub-project is ready to process the capsules for final disposal.

The Spent Nuclear Fuel Project has taken ownership of the Canister Storage Building (formerly part of the HWVP Project) and will have the lead on determining whether there is adequate space for storing other Hanford wastes (including the Cs and Sr capsules) besides the spent N-Reactor fuels currently stored in the K-Basins.

DOE's Office of Civilian Radioactive Waste Management (RW) and its Yucca Mountain Site Characterization Office provide technical support and programmatic guidance to the waste form producers (e.g., the Cs/Sr Capsule sub-project) in terms of acceptability of its proposed waste form for final disposal and the calculation of disposal fees. Disposal fees are a significant consideration in determining the most cost-effective method for processing the capsules.

Any secondary liquid and solid non-radioactive wastes generated by the Cs/Sr Capsule sub-project will be transferred to the Liquid Waste and Solid Waste Programs, respectively, for processing.

After the Cs/Sr capsule processing facilities have been deactivated, they will be transferred to the Environmental Restoration contractor for decontamination and decommissioning.

10.3.2 TECHNICAL REQUIREMENTS BASELINE

10.3.2.1 Work Breakdown Structure

The WBS tree for the Cs & Sr Capsules sub-project is found in Attachment 10.3-1.

10.3.2.2 WBS Dictionary Sheet

The WBS dictionary sheet for the Cs & Sr Capsules sub-project is found in Attachment 10.3-2. Lower level dictionary sheets are available on the Performance Measurement Control System (PMCS).

10.3.2.3 Responsibility Assignment Matrix

The Responsibility Assignment Matrix for the Cs & Sr Capsules sub-project is found in Attachment 10.3-3.

10.3.2.4 Technology Needs

No technology needs have been identified at this time. However, assuming that overpacking of the capsules is an acceptable process, considerable process development and qualification, as well as tooling and fixturing design and fabrication, will be required.

10.3.3 SCHEDULE BASELINE

10.3.3.1 Summary Schedule

See Attachment 10.3-4 for the Cs & Sr Capsules summary schedule.

10.3.3.2 Milestone Control Log

See Attachment 10.3-5 for the Milestone Control Log. Milestone description sheets are located in Appendix A.

10.3.4 COST BASELINE

10.3.4.1 Cost Baseline Summary by Year

Attachment 10.3-6 contains the cost baseline summary by year. This table contains cost data by fund type, rolled up to the sub-project.

10.3.4.2 Basis of Estimate

Basis of estimate data are included as part of the Cost Estimating Sheets. In general, the estimates in this sub-project are based on work that is ongoing or was completed within the past year.

10.3.5 PERFORMANCE MEASURES

Potential near-term milestones have been identified in the systems definition area for the sub-project in FY 1996. A data package for overpacking capsules and a decision analysis determining the optimum disposition will be completed. In the outyears based on the decision analysis, the capsules will be overpacked in a facility determined to be best suited for the sub-project. Once overpacked, the capsules will be stored until they are shipped to a repository for permanent disposal. The milestones are contingent upon receiving timely key decisions for the project phases from DOE. It is assumed any Tri-Party Agreement milestone that cannot be supported by the current privatization baseline will be renegotiated when privatization is formally announced.

10.3.6 EXECUTION YEAR

10.3.6.1 Technical Objectives

The technical objectives of the Cs/Sr Capsule sub-project in FY 1996 are threefold:

1. Work with RW to obtain a definitive evaluation regarding the acceptability of halide salts as a waste form for disposal in the geologic repository;

2. Provide a viable overpacking design concept in sufficient detail to RW that it can be evaluated for its adequacy as part of the engineered barrier system in the repository; and

3. Complete an economic trade study based on the conceptual overpack design vis-a-vis vitrification of the halide salts that will determine the most cost effective method for processing the capsules.

10.3.6.2 FY 1996 Performance Baseline Schedule

Attachment 10.3-7 contains the FY 1996 performance baseline schedule.

10.3.6.3 Cost Estimate Baseline by Month

Attachment 10.3-8 establishes the month-by-month cost estimate baseline for FY 1996.

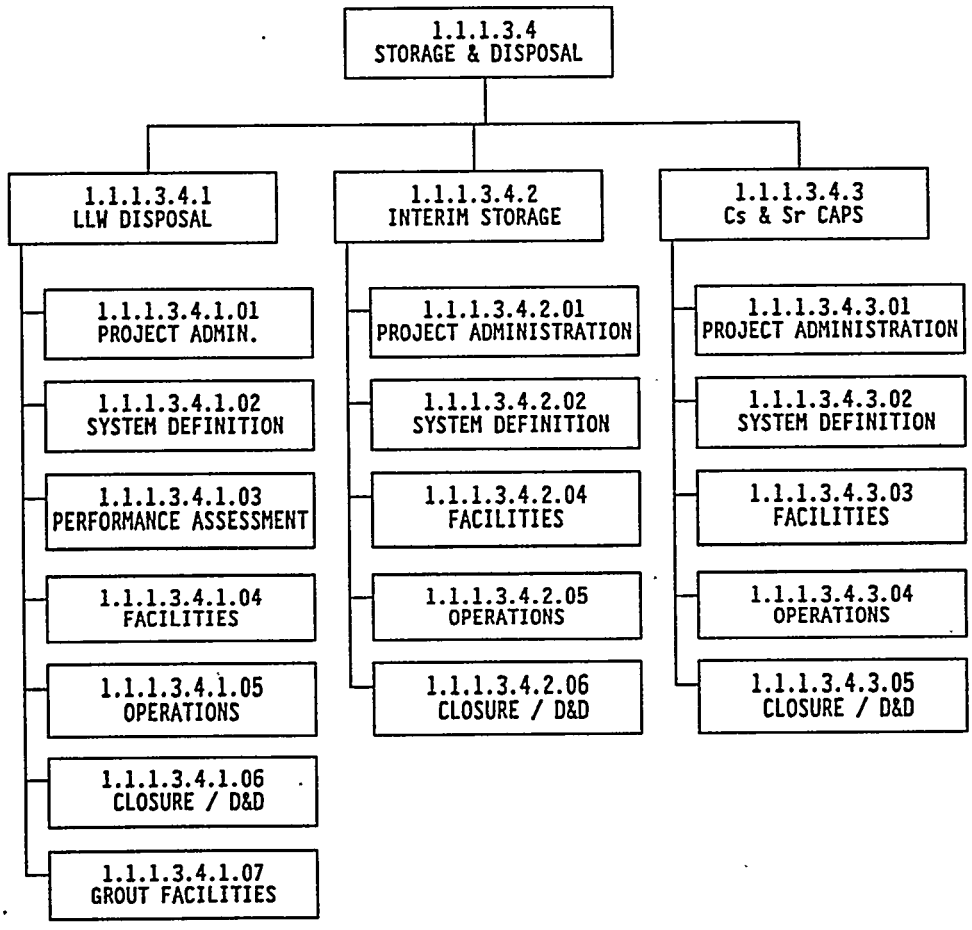
10.3.6.4 FY 1995 Work Scope Carryover Summary

It had been anticipated that a final answer from RW regarding the acceptability of the halide salts would be available by the end of FY 1995. However, based on information provided by RW staff at a meeting held in June at the Yucca Mountain Project Office, that answer will not be finalized until March 1996. A preliminary finding is expected yet this year.

LISTING OF ATTACHMENTS

Attachment 10.3-1	Work Breakdown Structure
Attachment 10.3-2	WBS Dictionary Sheet
Attachment 10.3-3	Responsibility Assignment Matrix
Attachment 10.3-4	Summary Schedule
Attachment 10.3-5	Milestone Control Log
Attachment 10.3-6	Cost Baseline Summary by Year
Attachment 10.3-7	FY 1996 Performance Baseline Schedule
Attachment 10.3-8	Cost Estimate Baseline by Month

TWRS FY 1996 WORK BREAKDOWN STRUCTURE
STORAGE & DISPOSAL



Attachment 10.3-1 Work Breakdown Structure

1. DATE PREPARED	2. PROGRAM TITLE/PARTICIPANT	
8/17/95	1.1.1 TWRS 1.1.1.3 PROCESS TANK WASTE 1.1.1.3.04 STORAGE AND DISPOSAL	
3. WBS ELEMENT CODE/LEVEL 1.1.1.3.04.03 Level 5	4. WBS ELEMENT TITLE CS/SR CAPSULES	
5. CURRENT REV. NO. 0	6. EFFECTIVE REV. DATE	7. APPROVED CHANGES
8. ADS ID - ADS SUFFIX - SUBACTIVITY NO 12300	9. BUDGET AND REPORTING NUMBERS Operating EW3120075 CENTRC GPP 39EW31301 Line Item	

10. ELEMENT DESCRIPTION

A. COST CONTENT (Escalated Dollars)

	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002
OPERATING	262.00	398.00	441.00	558.00	1,141.00	2,095.00	2,943.00
CENRTC							
LINE ITEM							
GPP							
TOTAL	262.00	398.00	441.00	558.00	1,141.00	2,095.00	2,943.00

B. TECHNICAL BASES

Goals and Objectives

Process the Cs/Sr capsules in a manner that they are acceptable for final disposal in the geologic repository:

1. Develop necessary business-related planning documents and financial and scheduling support.
2. Perform trade studies, decision analysis and other Systems Engineering activities
3. Design, construct and start up a Cs/Sr Capsule Processing Facility.
4. Operate the processing facility in a manner which meets safety and regulatory requirements
5. Produce a waste form that is acceptable to EM-36 (Waste Acceptance Product Specifications) and OCRWM (Waste Acceptance System Requirements)
6. Decommission and decontaminate the Processing Facility for turnover to Surplus Facilities (EM-60)

Provide programmatic leadership and technical expertise

Major End-Item Deliverables

Acceptance Criteria

C. STATEMENT OF WORK

Decision on acceptability of halides as a waste form for geologic repository disposal

Preparation of data package describing overpacking of Cs/Sr capsules for OCRWM evaluation and approval

Preparation of trade study on overpacking of Cs/Sr capsules vis-a-vis blending and vitrification of the cesium and strontium salts

Preparation of decision analysis and processing recommendation to senior RL and WHC management

Preparation, review and approval of waste acceptance documentation

Completion of required Systems Engineering documentation

Preparation, review and approval of design documentation (conceptual, preliminary and detailed)

Construction of the Cs/Sr Capsule Processing Facility

Preparation of operating and maintenance procedures and training of personnel

Turnover of systems and facility to Operations (startup and cold operations)

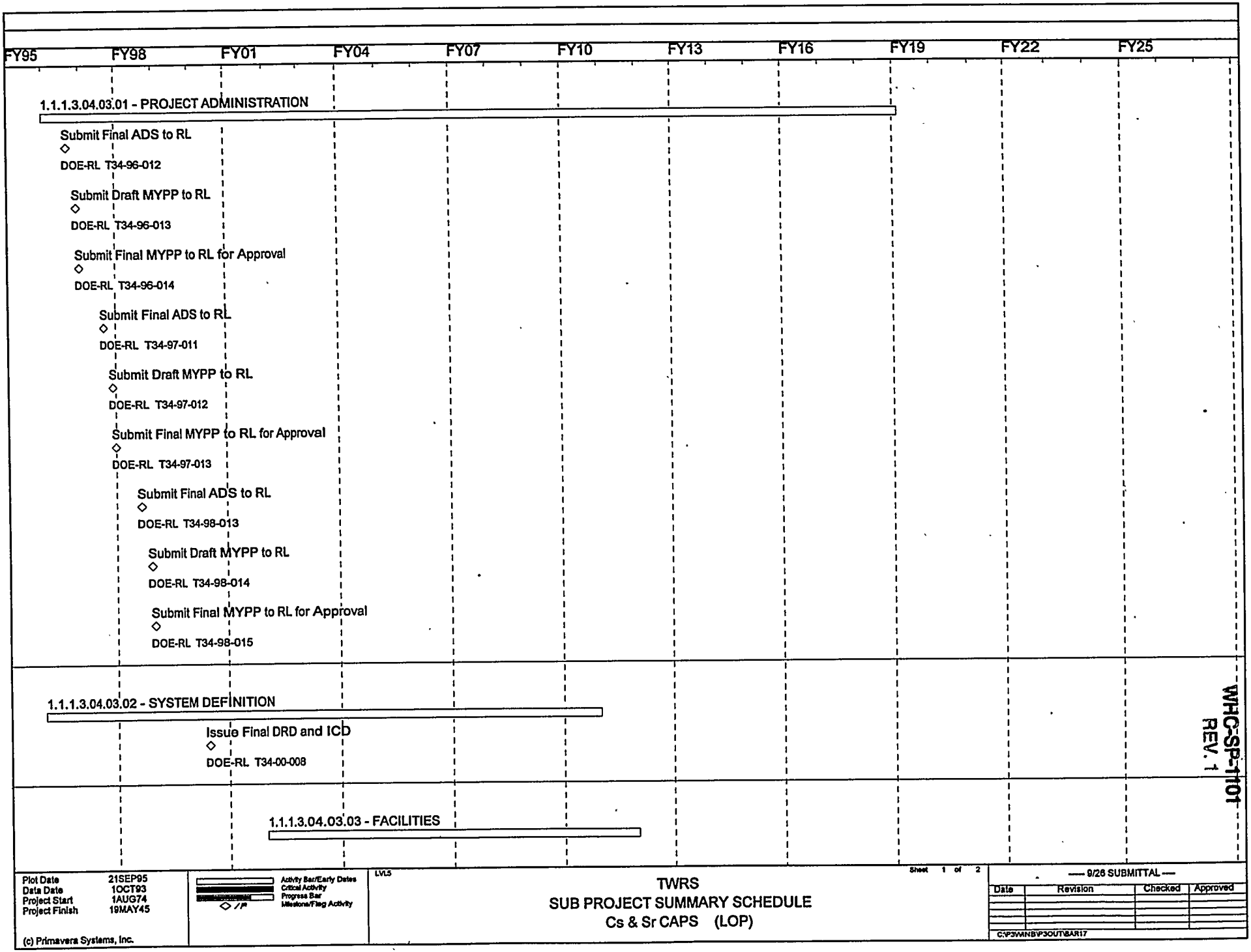
Radioactive operation of the Cs/Sr Capsule Processing Facility

Clean out and stabilization of facility

Disposal of secondary radioactive and hazardous wastes.

WBS Number	WBS Title	Responsible Person
1.1.1.3.4	**Storage and Disposal Project**	**R. J. Murkowski**
1.1.1.3.4.3	**Cs/Sr Capsules Project**	**P. S. Schaus**
1.1.1.3.4.3.1	Project Administration	R. F. Wood
1.1.1.3.4.3.2	Systems Definition	T. Crawford
1.1.1.3.4.3.3	Facilities	P. Felise
1.1.1.3.4.3.4	Operations	R. U. Elwell
1.1.1.3.4.3.5	Closure/D&D	J. Hales

Attachment 10.3-3 Responsibility Assignment Matrix



Attachment 10.3-4 Summary Schedule
Sheet 1 of 2

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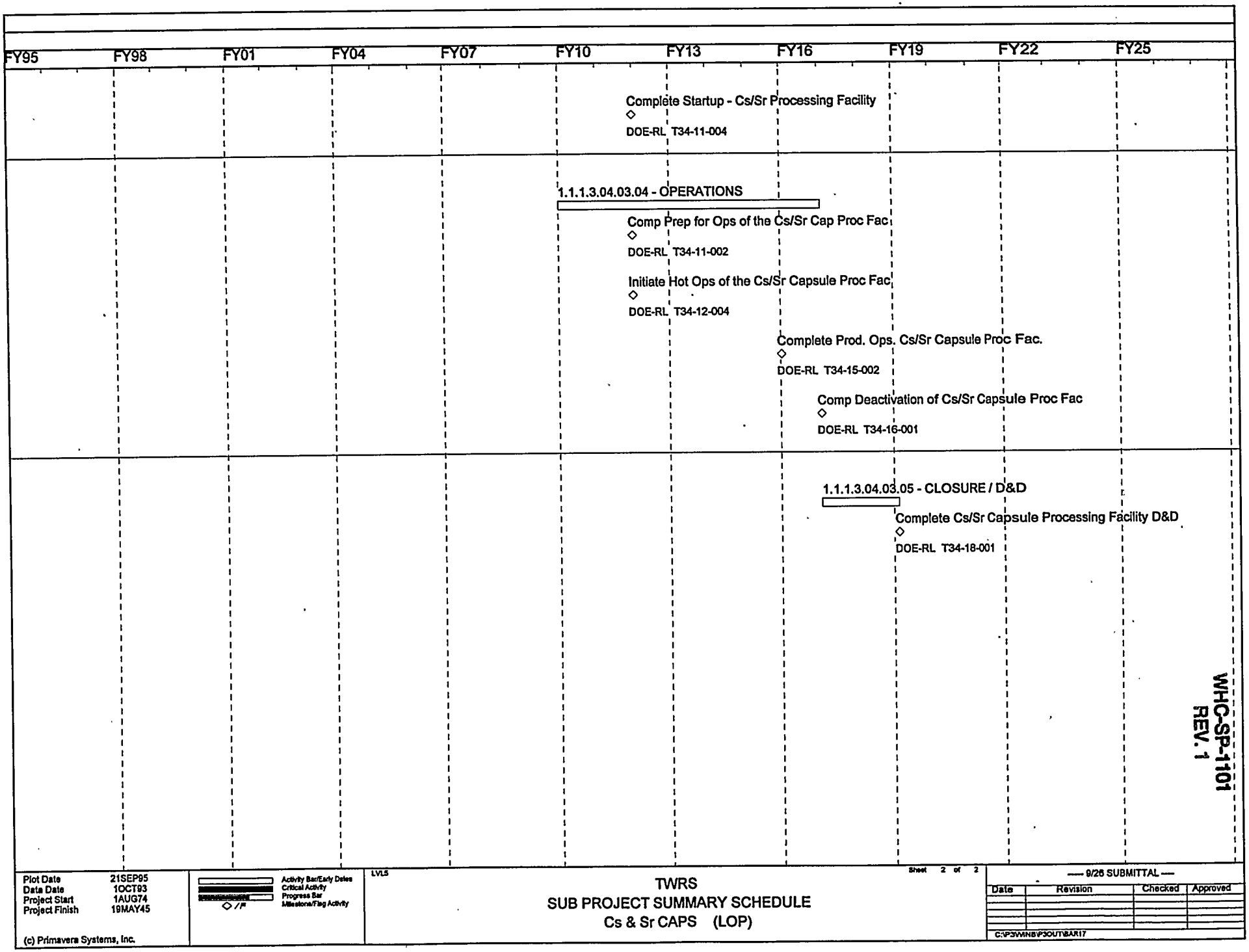


Attachment 10.3-4 Summary Schedule
Sheet 2 of 2

1.1.1.3.04.03 Cs & Sr Caps

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.03.02	Issue Final DRD and ICD	DOE-RL T34-00-008		31MAR00
1.1.1.3.04.03.04	Comp Prep for Ops of the Cs/Sr Cap Proc Fac	DOE-RL T34-11-002		30SEP11
1.1.1.3.04.03.03	Complete Startup - Cs/Sr Processing Facility	DOE-RL T34-11-004		30SEP11
1.1.1.3.04.03.04	Initiate Hot Ops of the Cs/Sr Capsule Proc Fac	DOE-RL T34-12-004	030CT11	
1.1.1.3.04.03.04	Complete Prod. Ops. Cs/Sr Capsule Proc Fac.	DOE-RL T34-15-002		080CT15
1.1.1.3.04.03.04	Comp Deactivation of Cs/Sr Capsule Proc Fac	DOE-RL T34-16-001		240CT16
1.1.1.3.04.03.05	Complete Cs/Sr Capsule Processing Facility D&D	DOE-RL T34-18-001		19NOV18
1.1.1.3.04.03.01	Submit Final ADS to RL	DOE-RL T34-96-012		30MAY96
1.1.1.3.04.03.01	Submit Draft MYPP to RL	DOE-RL T34-96-013		29AUG96
1.1.1.3.04.03.01	Submit Final MYPP to RL for Approval	DOE-RL T34-96-014		25SEP96
1.1.1.3.04.03.01	Submit Final ADS to RL	DOE-RL T34-97-011		30MAY97
1.1.1.3.04.03.01	Submit Draft MYPP to RL	DOE-RL T34-97-012		29AUG97
1.1.1.3.04.03.01	Submit Final MYPP to RL for Approval	DOE-RL T34-97-013		26SEP97
1.1.1.3.04.03.01	Submit Final ADS to RL	DOE-RL T34-98-013		29MAY98

WESTINGHOUSE HANFORD COMPANY
Controlled Milestones

1.1.1.3.04.03 Cs & Sr Caps

WBS CODE	DESCRIPTION	MILESTONE #/TYPE	EARLY START	EARLY FINISH
1.1.1.3.04.03.01	Submit Draft MYPP to RL	DOE-RL T34-98-014		31AUG98
1.1.1.3.04.03.01	Submit Final MYPP to RL for Approval	DOE-RL T34-98-015		25SEP98

WESTINGHOUSE HANFORD COMPANY | PRIMAVERA PROJECT PLANNER | TWRS INTEGRATED SCHEDULE

COST LOADING REPORT | UNITS IN K$s

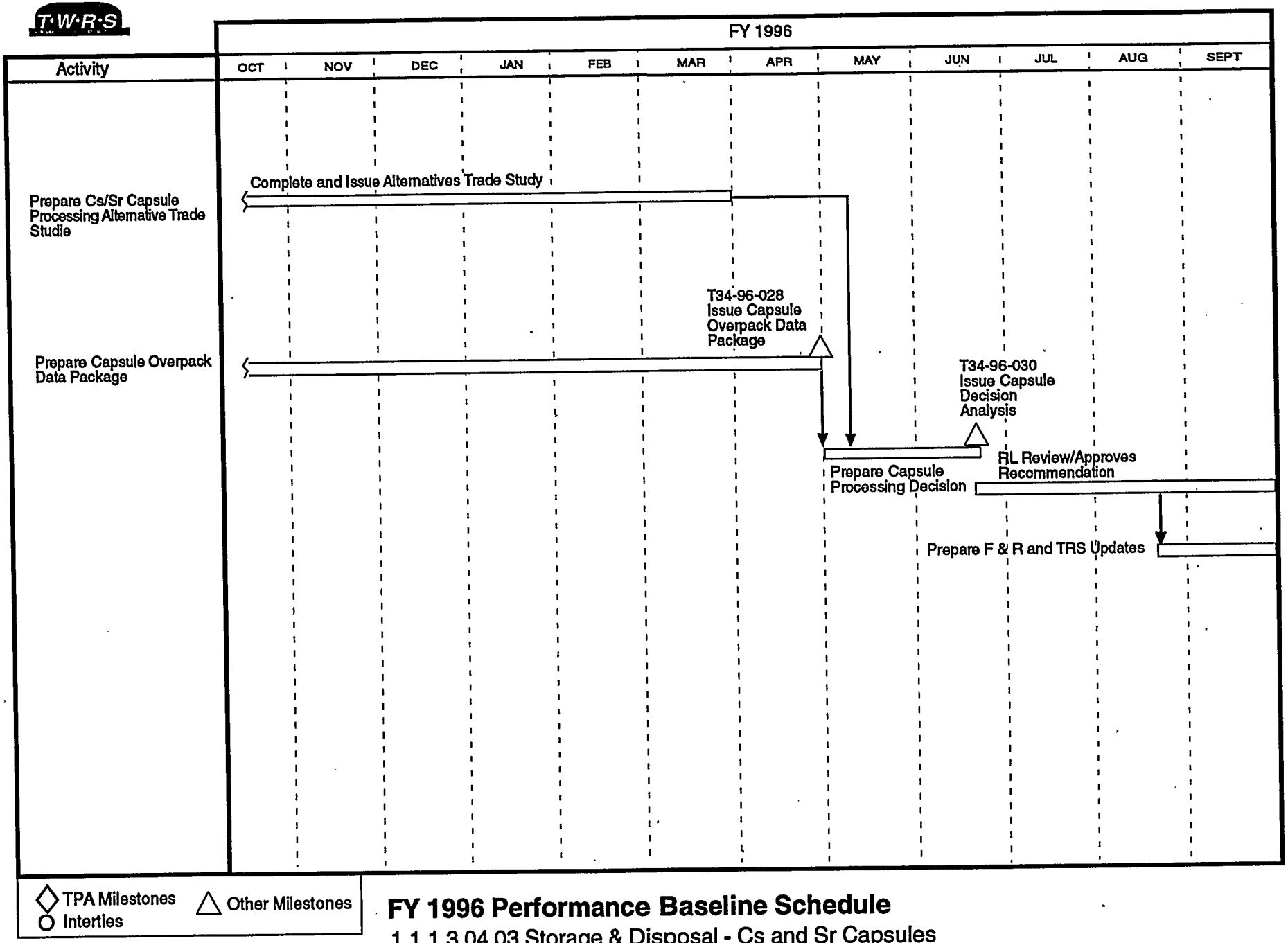
1.1.1.3.04.03 - Cs & Sr Capsules - Cost By Year | TOTAL USAGE FOR YEAR

CATEGORY	CATEGORY DESCRIPTION	TOTAL	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
1	EXPENSE	32044	262	398	441	558	1141	2095	2943	2443	2450	2439
3	LINE ITM	193338								9667	9709	9853
	REPORT TOTAL	225382	262	398	441	558	1141	2095	2943	12110	12159	12292

CATEGORY	CATEGORY DESCRIPTION	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	EXPENSE	810	875	1540	1513	2113	1975	1605	1580	1603	1585	876
3	LINE ITM	9439	34386	34523	35933	32840	16988					
	REPORT TOTAL	10249	35261	36064	37446	34952	18963	1605	1580	1603	1585	876

CATEGORY	CATEGORY DESCRIPTION	FY 2017	FY 2018	FY 2019	FY 2020
1	EXPENSE	270	442	90	
3	LINE ITM				
	REPORT TOTAL	270	442	90	

Draft



FY 1996 Performance Baseline Schedule

1.1.1.3.04.03 Storage & Disposal - Cs and Sr Capsules

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Attachment 10.3-7

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REV. 1

WESTINGHOUSE HANFORD COMPANY

PRIMAVERA PROJECT PLANNER
COST LOADING REPORT
TOTAL USAGE FOR MONTH

TWRS INTEGRATED SCHEDULE
UNITS IN K$s

1.1.1.3.04.03 - Cs & Sr Caps - FY 96 Cost/Month

CATEGORY	WBS ELEMENT	OCT FY96	NOV FY96	DEC FY96	JAN FY96	FEB FY96	MAR FY96	APR FY96	MAY FY96	JUN FY96	JUL FY96	AUG FY96	SEP FY96	FY96 TOTAL
1 - EXPENSE														
	1.1.1.3.04.03.01 - PROJECT ADMINISTRATION	4	4	4	6	6	4	5	5	6	7	7	6	64
	1.1.1.3.04.03.02 - SYSTEM DEFINITION	29	27	25	31	26	27	13	5	4	0	4	6	198
	1.1.1.3.04.03.03 - FACILITIES													
	1.1.1.3.04.03.04 - OPERATIONS													
	1.1.1.3.04.03.05 - CLOSURE / D&D													
TOTAL	1	34	30	29	37	32	31	18	10	11	7	11	12	262
3 - LINE ITM														
	1.1.3.04.03.03 - FACILITIES													
TOTAL	3													
	REPORT TOTAL	34	30	29	37	32	31	18	10	11	7	11	12	262

Attachment 10.3-8 Cost Estimate Baseline by Month