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PHASE 2 REBASELINE REPORT

FOR

TANK FARM RESTORATION AND SAFE OPERATIONS

PROJECT W-314

September 1999

Prepared by:
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9-29-99
Date

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ACRONYMS AND ABBREVIATIONS

ABU	Acceptance for Beneficial Use
A/E	Architect/Engineer
ASME	American Society of Mechanical Engineers
BA/BO	Budget Authority/Budget Outlay
CAM	Continuous Air Monitor
CDR	Conceptual Design Report
CES	Cost Estimating Schedule
CFR	Code of Federal Regulations
DCRT	Double-Contained Receiver Tank
DCS	Distributed Control System
DOE	U.S. Department of Energy
DRD	Design Requirements Document
DST	Double-Shell Tank
ECN	Engineering Change Notice
ENRAF	Enraf-Nonius Series 854
FSAR	Final Safety Analysis Report
GEMS	Gaseous Effluent Monitoring System
HEPA	High-efficiency Particulate Air (filter)
HMI	Human-Machine Interface
HNF	Project Hanford Management System
HPT	Health Physics Technicians
I&C	Instrumentation and Control
I/O	Input/Output
kVA	Kilovolt Amperage
LMHC	Lockheed Martin Hanford Corporation
MCC	Motor Control Center
MPS	Master Pump Shutdown
MYWP	Multi-Year Work Plan
NEMA	National Electrical Manufacturers' Association
O&M	Operations and Maintenance
OPC	Other Project Costs
ORP	Office of River Protection
ORR	Operational Readiness Review
PDC	Project Design Criteria
PICD	Project Interface Control Document
PDIS	Pressure Indicating Switch
PDS	Project Development Specification
P&ID	Piping and Instrumentation (Design / Diagram / Drawing)
PLC	Programmable Logic Controller
RMW	Radioactive Mixed Waste
RPP	River Protection Project
RTD	Resistance Temperature Detector

SD	Supporting Document
SST	Single-Shell Tank
SWP	Special Work Permit (protective clothing)
TAP	Toxic Air Pollutant
TCC	Total Construction Cost
TECC	Total Estimated Constructed Cost
TFLAN	Tank Farm Local Area Network
TFRSO	Tank Farm Restoration and Safe Operation
TIS	Temperature Indicating Switch
TMACS	Tank Monitoring and Control System
TPA	Tri-Party Agreement
TPC	Total Project Cost
USSR	Upgrade Scope Summary Report
Vac	Volts Alternating Current
VOC	Volatile Organic Compound
WAC	Washington Administrative Codes
WBS	Work Breakdown Structure
WHC	Westinghouse Hanford Company

1.0 EXECUTIVE SUMMARY

Project W-314, (97-D-402) Tank Farm Restoration and Safe Operations is a multi-year, multi-phase project established to upgrade selected 200 East and West Area Tank Farms to support the long-term mission of waste storage, retrieval, and transfer for vitrification. Key drivers for these upgrades include the planned timetable for transfer of waste to the privatized vitrification facility, regulatory compliance requirements (i.e., Washington State and Federal Regulations), and the Tri-Party Agreement (TPA).

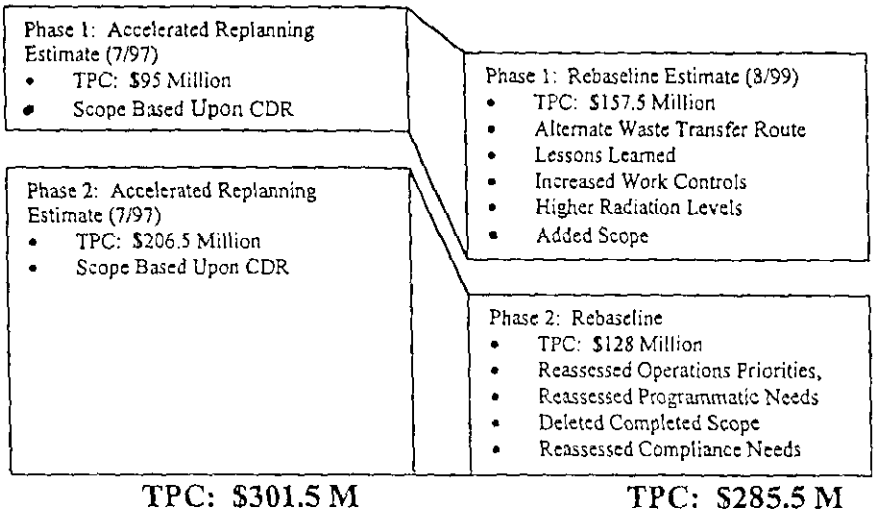
The previous baseline scope for Project W-314 was established based upon tank farm system assessments performed five to six years ago and was reflected in the previous baseline cost estimate, the Accelerated Replanning Estimate, completed in July 1997. The Accelerated Replanning Estimate splits the project into two phases: Phase 1 provides upgrades necessary to assure reliable waste retrieval and transfer to the anticipated vitrification plant. Phase 2 provides upgrades to selected primary and annulus tank farm ventilation systems that are required for compliant waste transfer, as well as other compliance-based upgrades to existing River Protection Project (RPP) facilities and systems. The Accelerated Replanning Estimate provided the basis for Baseline Change Request TWR 97-066, which identified Phases 1 and 2 as $95 million and $206.5 million, respectively.

Following completion of the Accelerated Replanning Estimate, several changes occurred that prompted a decision to rebaseline Phase 1, and subsequently Phase 2. Paramount among these was the delay in the Privatization schedule (90% case), lessons learned (in the year since the Accelerated Planning Report had been completed), and the adoption of an alternate waste transfer system route. The rebaselined cost of Phase 1, $157 million, was substantially higher than the Accelerated Replanning Estimate for a number of reasons more thoroughly discussed in the Phase 1 Rebaseline Report, HNF-3781, January 1999. Since the July 1997 Accelerated Replanning Estimate there have also been changes to the tank farm authorization basis and Programmatic needs. For example, Tank Farm Operations has been installing new Continuous Air Monitors (CAMs) and ENRAFs (liquid level measuring devices) in order to achieve desired monitoring improvements years earlier than provided by Phase 2.

In summary, the decision to rebaseline Phase 2 was prompted by: 1) the shifting of selected Phase 2 scope to Phase 1 during the Phase 1 rebaselining, 2) changes in the authorization basis, 3) programmatic needs, and 4) the dated nature of the existing scope definition.

Figure 1.1 presents a summary of the key changes from the previous baseline and their collective impact on the cost of Phase 2.

Figure 1.1: Phase 2 Changes



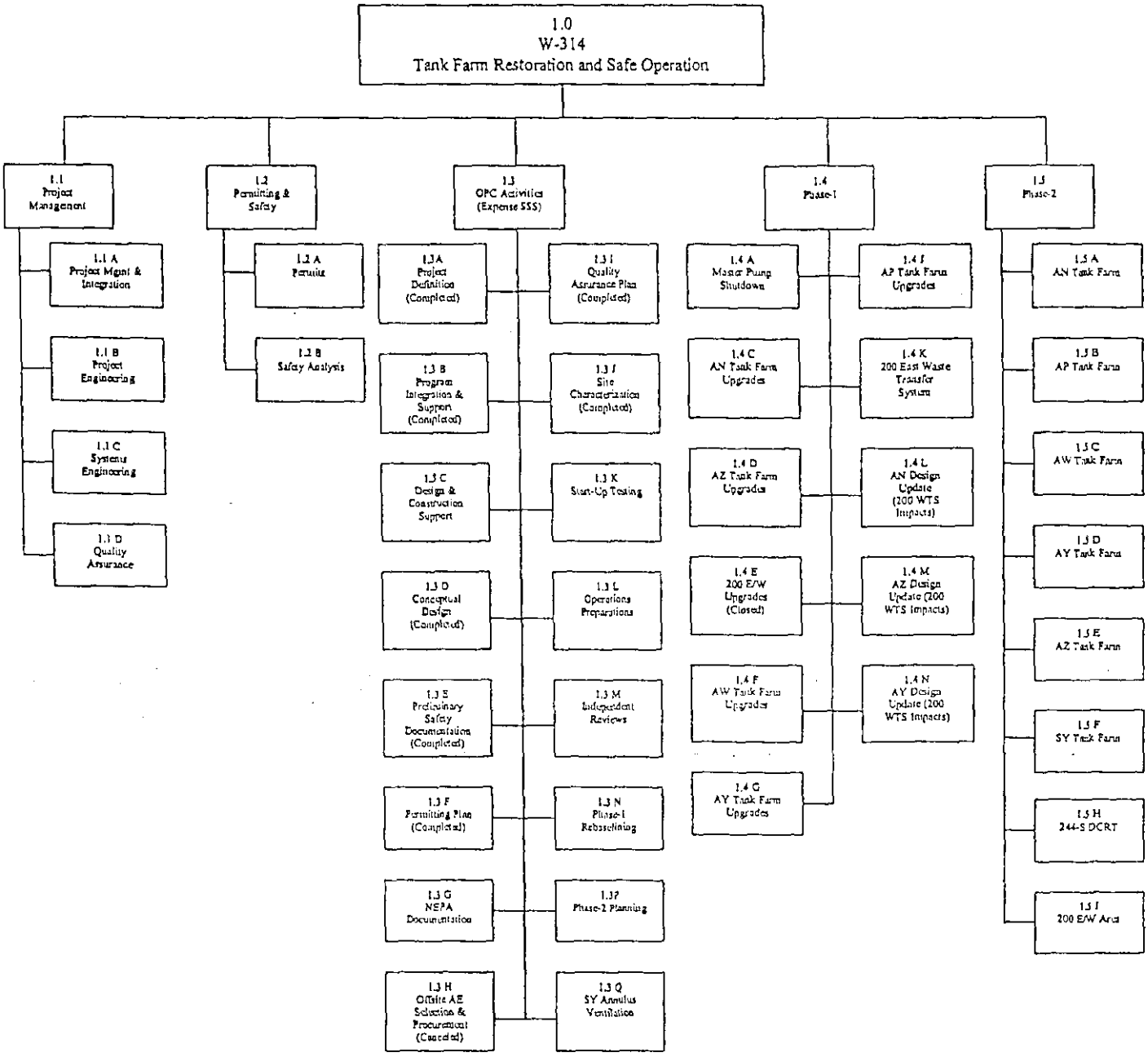
The key scope remaining in Phase 2 includes:

- The upgrade of the primary ventilation systems in the AN, AP, and AW farms, the annulus ventilation system in SY Farm, and the ventilation system of the 244-S double-contained receiver tank (DCRT).
- The installation of a new leak detector and drain plug assembly, and repair of special protective coating (SPC) in selected process pits and pipeline encasements.
- The installation of new vapor space pressure-monitoring instrumentation in the AN, AW, AY, SY, AZ farms and the 244-S DCRT. The connection of the new instrumentation and the existing vapor space pressure-monitoring in AP Tank Farm to the Tank Farm Local Area Network
- Selected electrical upgrades in AN, AP, AW, SY, 244-S DCRT, AY, and AZ Farms
- The upgrade of the 244-S DCRT temperature monitoring
- Miscellaneous alarm upgrades.

This Rebaseline Report incorporates these Phase 2 changes and establishes a more current Phase 2 technical cost and schedule baseline upon which to monitor Phase 2 project performance. It revises the Project Work Breakdown Structure, identifies the rebaseline planning basis, establishes a new cost and schedule estimate, and identifies the needed critical resources and required annual Budget Authority and Budget Outlay (BA/BO). Associated management and technical baseline documents are revised as well and provided separately as stand-alone documents.

Work Breakdown Structure: The Work Breakdown Structure (WBS), Figure 1.2, was revised as part of the rebaselining effort. WBS 1.3.Q SY Farm Annulus Ventilation was added to reflect the expense funded nature of this work (WBS 1.3 includes all expense funded activities). A detailed definition of each of the WBS elements is included in the W-314 Project Execution Plan, HNF-SD-W314-PMP-001. REV. 3, Appendix A, Project Summary Work Breakdown Structure Description.

Figure 1.2: Work Breakdown Structure



Planning Basis: Budget outlay scheduling for this Phase 2 rebaseline effort was based upon assumed funding constraints in the fiscal years 2000 and 2001, assumed schedule constraints posed by the planned timetable for transfer of waste to the privatized vitrification facility (and therefore the need date for upgraded ventilation systems), TPA milestone M-43, required integration with other ongoing RPP activities, and several key assumptions. Tables 1 and 2 below, identify funding and schedule assumptions.

Table 1.1: Funding Assumptions

Fiscal Year	Funding Assumptions ($1000s)
2000	$5.433 M (2.941 Capital + 2.492 Expense
2001	$8.477 M (5.399 Capital + 3.078 Expense)

Table 1.2: Schedule Assumptions

Milestone	Date
Complete AN Primary Ventilation Construction	2003
Complete AY I&C and Electrical Construction	2003
Complete AZ I&C and Electrical Construction	2003
Complete 244-S DCRT Ventilation Construction	2004
Complete AP Primary Ventilation Construction	2004
Complete AW Primary Ventilation Construction	2004
Complete SY Annulus Ventilation Construction	2005
Complete "Other" AP Farm Construction	2006
Complete "Other AW Farm Construction	2006
Complete W-314 Project's Portion of TPA M-43-00*	2005

* Compliance Upgrades

The above construction completion dates allow enough time for subsequent startup, testing, and other readiness activities required to transfer waste per the current vitrification timetable.

Integration: Integration will be achieved with River Protection Projects (RPP) W-211 and W-521 to minimize Phase 2 pit upgrade costs, particularly four central pump pits, AN-102, AN-105, AN-106, and AN-107. W-314 Phase 2 plans to accomplish the installation of a leak detector and drain plug assembly, and repair of the SPC on the interior pit walls during the planned W-211 upgrade of central pump pit AN-105. Similarly, W-314 Phase 2 pit work will be coordinated during the planned W-521 upgrades of AN-102, 106, and 107. A more detailed discussion of the required integration is included in Section 8.0.

Key Assumptions: The key assumptions taken in the process of refining the scope, and estimating the cost and schedule of Phase 2 are listed below. Assumptions are discussed in more detail in Sections 4.0 and 6.1.

- Field work practices will be improved to the point where the opening of a process pit, the installation of a leak detector and drain plug assembly, and the repair of the special protective pit coating can be accomplished in 34 days.
- The Annulus Emergency Pumping Plan recently submitted to the State Department of Ecology (requiring no upgrades to the Annulus Pump Pits) will be accepted.
- Phase 2 Panalarm work scope includes installation and connection of alarms to a signal converter and modem. Connecting the modems to phone lines and integrating signals to Tank Monitoring and Control System (TMACS) will be performed by others, if deemed necessary.
- Ventilation requirements as indicated in Section 6.1 are acceptable.

Status of Requirements Definition: There are a number of efforts currently underway by others to develop "upper level" tank farm system requirements. These include 12 double-shell tank (DST) Level 2 Specifications that may change currently identified W-314 requirements. In addition, Operations and Maintenance Philosophies are currently in development which may result in revised or additional requirements. Any changes in current requirements will be addressed through baseline change requests in scope.

Cost: The rebaselined Phase 1 cost estimate totals $128 million as follows:

Table 1.3: Phase 2 Cost Estimate Summary

WBS	Title	Total ($Ms)
1.1	Project Management	$ 14.4
1.2	Permitting & Safety Analysis	$ 1.2
1.3	Other Project Costs	$ 22.9
1.5	Phase 2	$ 89.5
	Total	$ 128.0

A more detailed cost estimate is presented in Section 6.0, Cost Estimate.

Contingency: The contingency for Phase 2 totals $30.6M. The contingency was established using the DOE Order 430.1, Life-Cycle Asset Management (LCAM), GPG-FM-007 guidance. Functional subject matter experts performed a qualitative risk analysis using engineering judgment to establish the potential consequences and likelihood of risk events. Both technical and programmatic risks were analyzed. As a result of this analysis, the major project risks are identified as:

- Possibility of project failure due to the lack of financial support to the end of the project;
- Potential for changes to the project due to changed or new technical requirements;
- Potential for changes to the project from various programmatic and project documents and analyses yet to be completed that contain technical data affecting the project;
- Potential changes in scope implementation and interface by operational requests and other projects;
- Potential changes in turnover activities – may be raised to a higher level of inquiry (e.g., Readiness Assessments);

- Potential changes in project scope due to inaccurate scoping/estimate assumptions and/or inaccurate, detailed, integrated planning; and
- Potential for qualified personnel or contractors to be unavailable when needed.

The risk analysis established the Phase 2 risks, associated frequencies, and potential consequences. Consequences were expressed in terms of cost and time impacts. Each of the risks were converted to contingency dollars by multiplying the median frequency times median consequence dollars. Finally, risk dollars were allocated to each of the project tasks. The allocation of contingency can be summarized as $3.1M to Project Management, $2.4M to Design, $22.6M to Construction, $2.2M to Test and Turnover, and $0.4M to Readiness.

A more detailed discussion of the risk analysis methodology can be found in the Project Execution Plan, HNF-SD-W-314-PMP-001, Rev 3, Appendix F, Risk Management Plan. Actual dollar values of the resultant contingencies at the project activity level can be found in the Phase 2 Rebaseline cost estimate, Section 6.0.

Schedule: The Summary Rebaseline Schedule, Figure 1.3, provides five key ventilation system upgrades including "Turnover to Operations" (includes start up, testing, and turnover activities) by the required programmatic need date.

The Rebaseline Schedule also provides completion of all W-314 Phase 2 compliance related upgrades by June 2005, Tri-Party Agreement Milestone, M-43. It reflects best efforts to resource level the Phase 2 work (within the aforementioned planning constraints and the BA/BO requirements of W-314 Phase 1 so as to avoid human and funding resource peaks in any one year.

Section 7.0 Schedule, provides the Summary Project Schedule for Phase 2 activities.

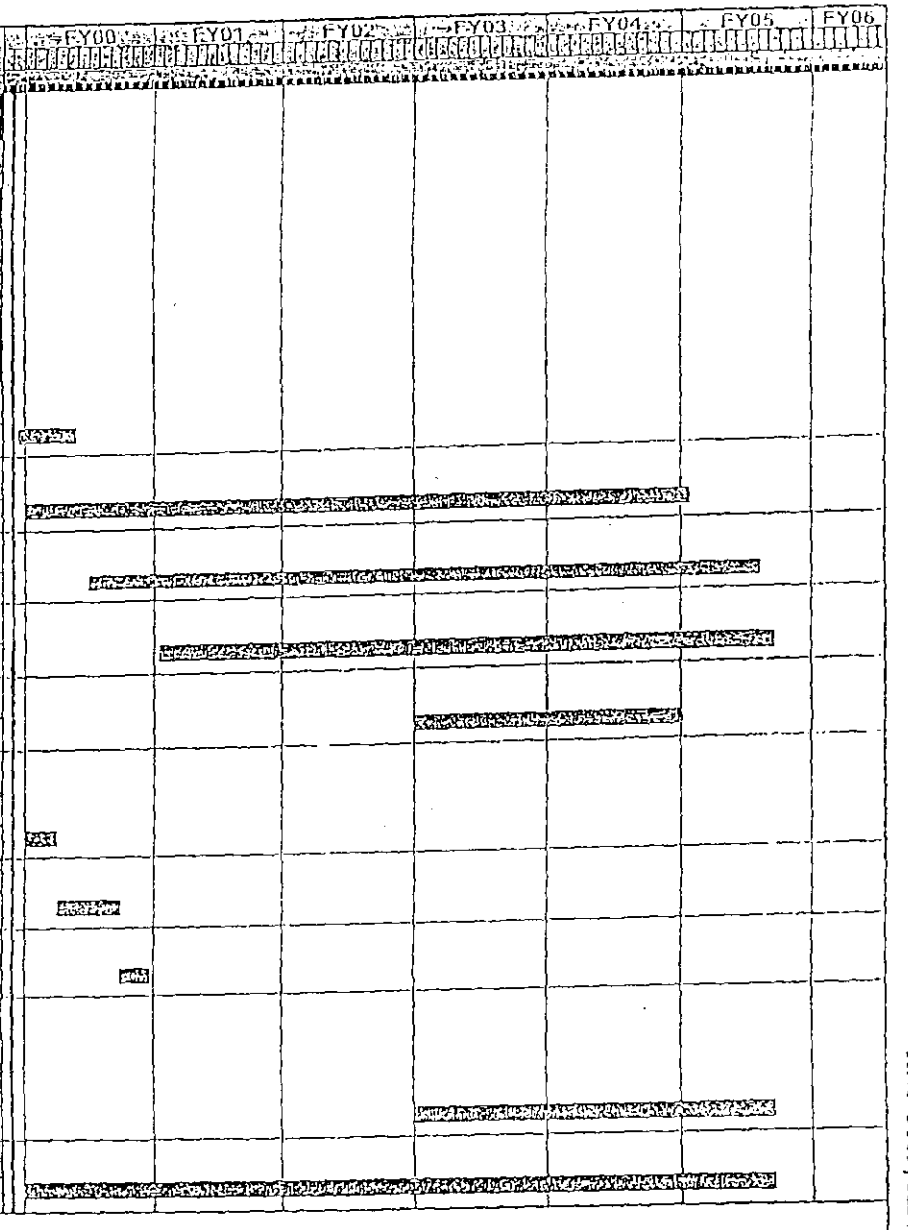
Critical Resources: Figure 1.4, "Critical Resource Needs" summarizes the construction craft and health physics technicans (HPTs) required by Fiscal Year quarter. Section 10 "Critical Resources" presents detailed resource needs for each labor classification for: 1) Phase 2 total, 2) for each farm, and 3) for each pit.

Budget Authority/ Budget Obligation Outlay (BA/BO): Table 1.4, "Required Budget Authority/Budget Outlay" indicates the Phase 2 BA funding requirements along with those of Phase 1. The BA/BO requirements of both Phases taken together fall within the annual FY00 and FY01 expense and capital targets currently in the Multi Year Wok Plan. A more detailed BA/BO outlay is provided in Section 8.0, BA/BO.

Updated Management and Technical Baseline Documents: In addition, six project documents were revised as a part of the rebaselining effort. Table 1.5 provides a brief description of each. Collectively, these documents describe the management approach and technical baseline of Project W-314. These are stand-alone documents and are provided separately

Figure 1.3: Summary Rebaseline Schedule
(consisting of the following four pages).

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.0.1.0.3.01.0.1				
Project W-314				
W314 Expense Phase 2				
+ Phase II Planning		110	17SEP99	25FEB00
+ Design & Construction Support-Phase 2		1,275	04OCT99	22OCT04
+ Startup & Testing - Phase 2		1,285	04APR00	09MAY05
+ Operations Preparation		1,170	20OCT00	14JUN05
+ Independent Reviews		502	01OCT02	27SEP04
SY Tank Farm				
+ SY Definitive Design-Engineering		60	04OCT99	30DEC99
+ SY Tank Farm - Procurement		125	03JAN00	27JUN00
+ SY Tank Farm - Construction		60	28JUN00	21SEP00
Capital- Phase 2				
Project Management				
+ Project Management and Integration		681	01OCT02	14JUN05
+ Project Engineering		1,435	04OCT99	14JUN05



Project Start	14JUL99
Project Finish	28APR06
Data Date	01SEP99
Run Date	20SEP99

Early Bar
Progress Bar
Critical Activity

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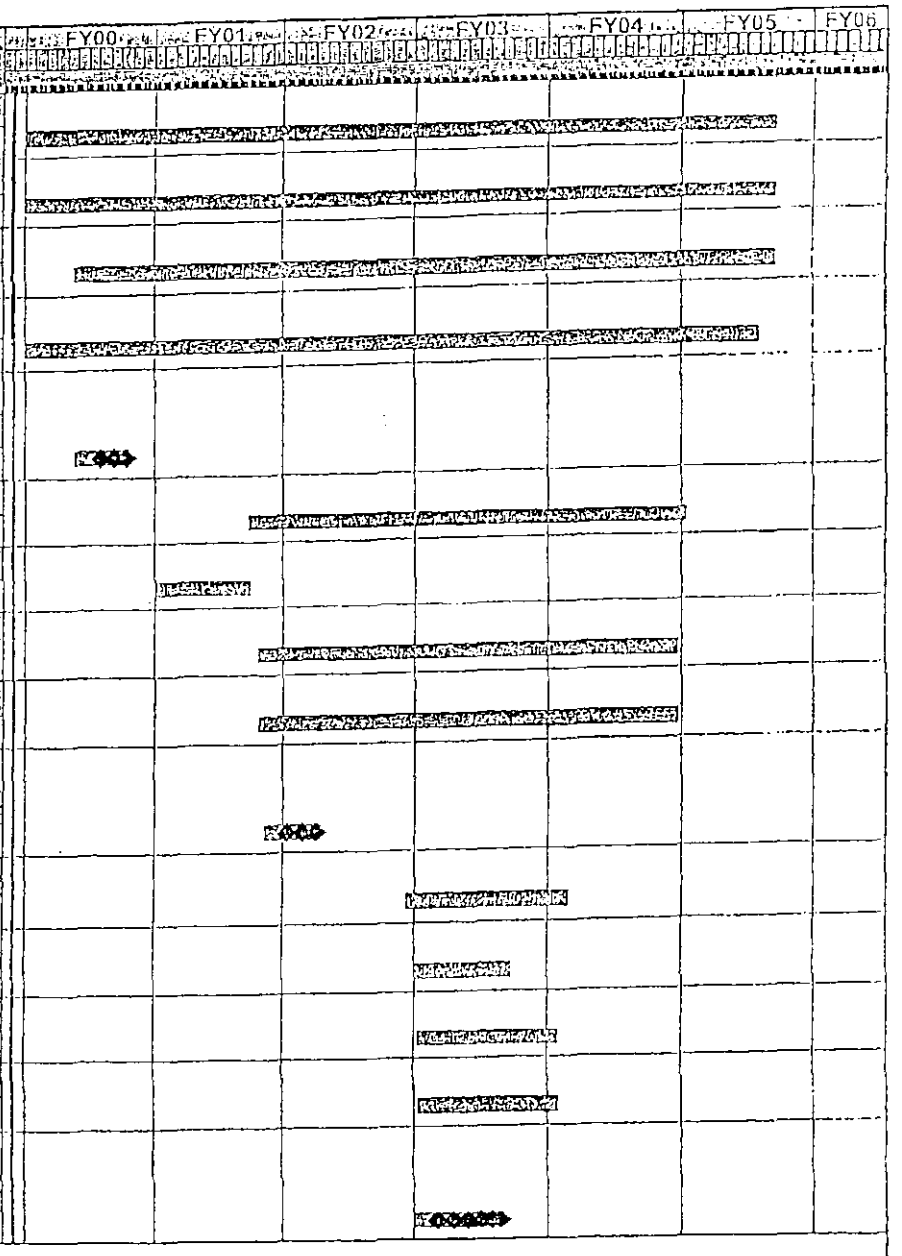
ASH1

Sheet 1 of 4

Cogema Engineering
W-314 Phase 2
Summary Schedule - Figure 1.3

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
+ Systems Engineering		1,435	04OCT99	14JUN05
+ Quality Assurance		1,435	04OCT99	14JUN05
+ SE Risk Managbment		1,339	23FEB00	14JUN05
+ Permitting and Safety		1,405	04OCT99	02MAY05
AN Tank Farm				
+ AN - Definitive Design		105	24FEB00	21JUL00
+ AN - E&I During Construction		831	28JUN01	13OCT04
+ AN - Procurement		185	02OCT00	26JUN01
+ AN - Construction		797	26JUL01	22SEP04
+ AN - HPT Support		797	26JUL01	22SEP04
AP Tank Farm				
+ AP - Definitive Design		105	08AUG01	09JAN02
+ AP - E&I During Construction		307	11SEP02	26NOV03
+ AP - Procurement		185	01OCT02	25JUN03
+ AP - Construction		267	11OCT02	31OCT03
+ AP - HPT Support		267	11OCT02	31OCT03
AW Tank Farm				
+ AW - Definitive Design		169	01OCT02	03JUN03



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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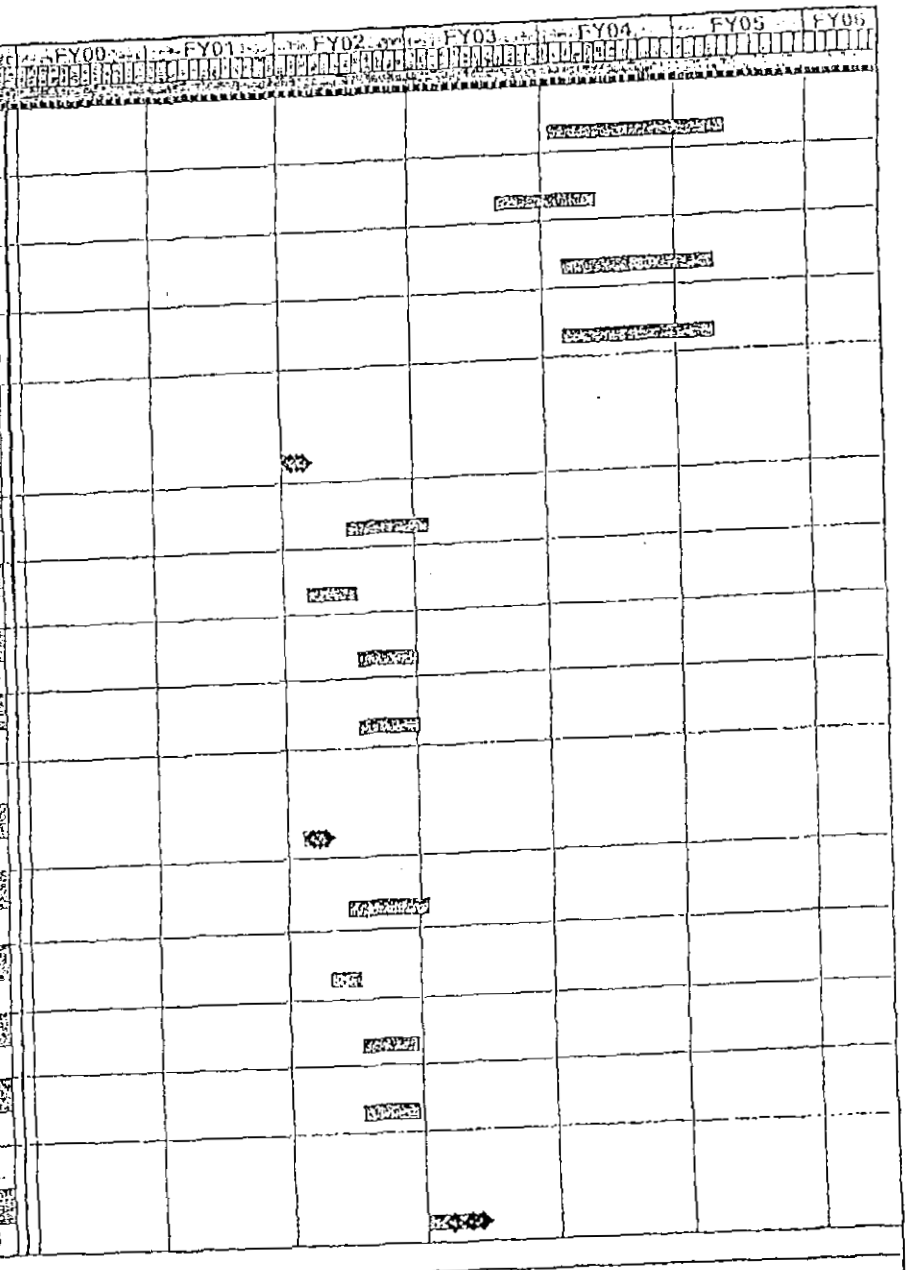
Cogema Engineering

W-314 Phase 2

Summary Schedule - Figure 1.3

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
+ AW - E&I During Construction		328	27OCT03	15FEB05
+ AW - Procurement		185	04JUN03	27FEB04
+ AW - Construction		284	26NOV03	14JAN05
+ AW - HPT Support		284	26NOV03	14JAN05
AY Tank Farm				
+ AY - Definitive Design		44	01OCT01	03DEC01
+ AY - E&I During Construction		159	25MAR02	05NOV02
+ AY - Procurement		95	04DEC01	19APR02
+ AY - Construction		116	22APR02	03OCT02
+ AY - HPT Support		116	22APR02	03OCT02
AZ Tank Farm				
+ AZ - Definitive Design		44	12NOV01	17JAN02
+ AZ - E&I During Construction		155	14MAR02	21OCT02
+ AZ - Procurement		60	21JAN02	15APR02
+ AZ - Construction		112	15APR02	20SEP02
+ AZ - HPT Support		112	15APR02	20SEP02
SY Tank Farm				
+ SY - Definitive Design		105	01OCT02	04MAR03



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 28SEP99

Early Bar
Progress Bar
Critical Activity

ASI11

Cogema Engineering
W-314 Phase 2
Summary Schedule - Figure 1.3

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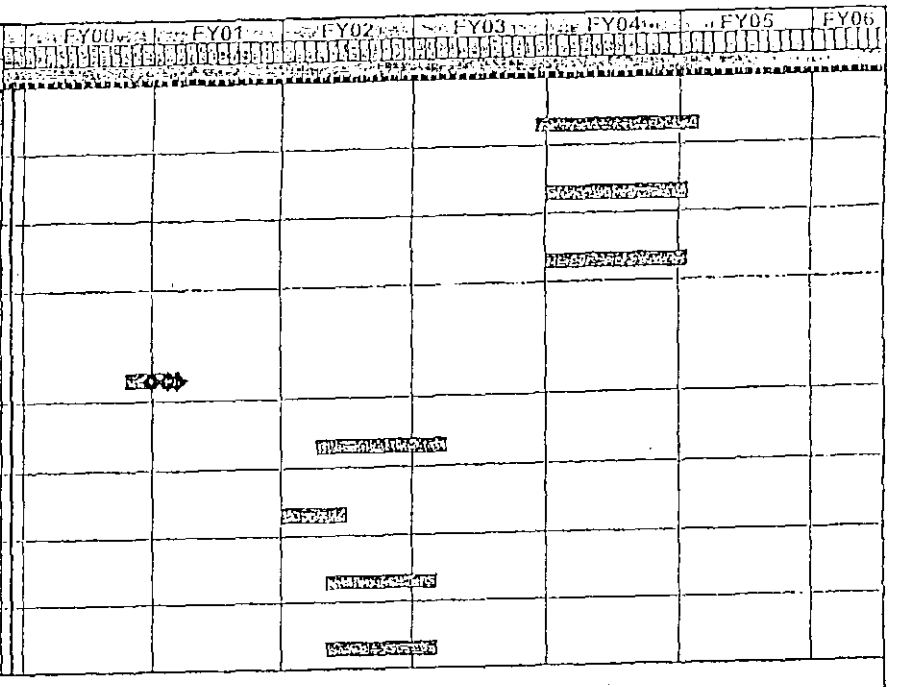
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
+ SY - E&I During Construction		311	02SEP03	22NOV04
+ SY - Construction		269	01OCT03	22OCT04
+ SY - HPT Support		269	01OCT03	22OCT04
244-S DCRT				
+ 244-S DCRT - Definitive Design		105	24JUL00	20DEC00
+ 244-S DCRT - E&I During Construction		251	07JAN02	03JAN03
+ 244-S DCRT - Procurement		125	01OCT01	01APR02
+ 244-S DCRT - Construction		212	04FEB02	04DEC02
+ 244-S DCRT - HPT Support		212	04FEB02	04DEC02



Project Start	19JUL99	Early Bar	
Project Finish	28APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	28SEP99		

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Sheet 4 of 4

Cogema Engineering
W-314 Phase 2
Summary Schedule - Figure 1.3

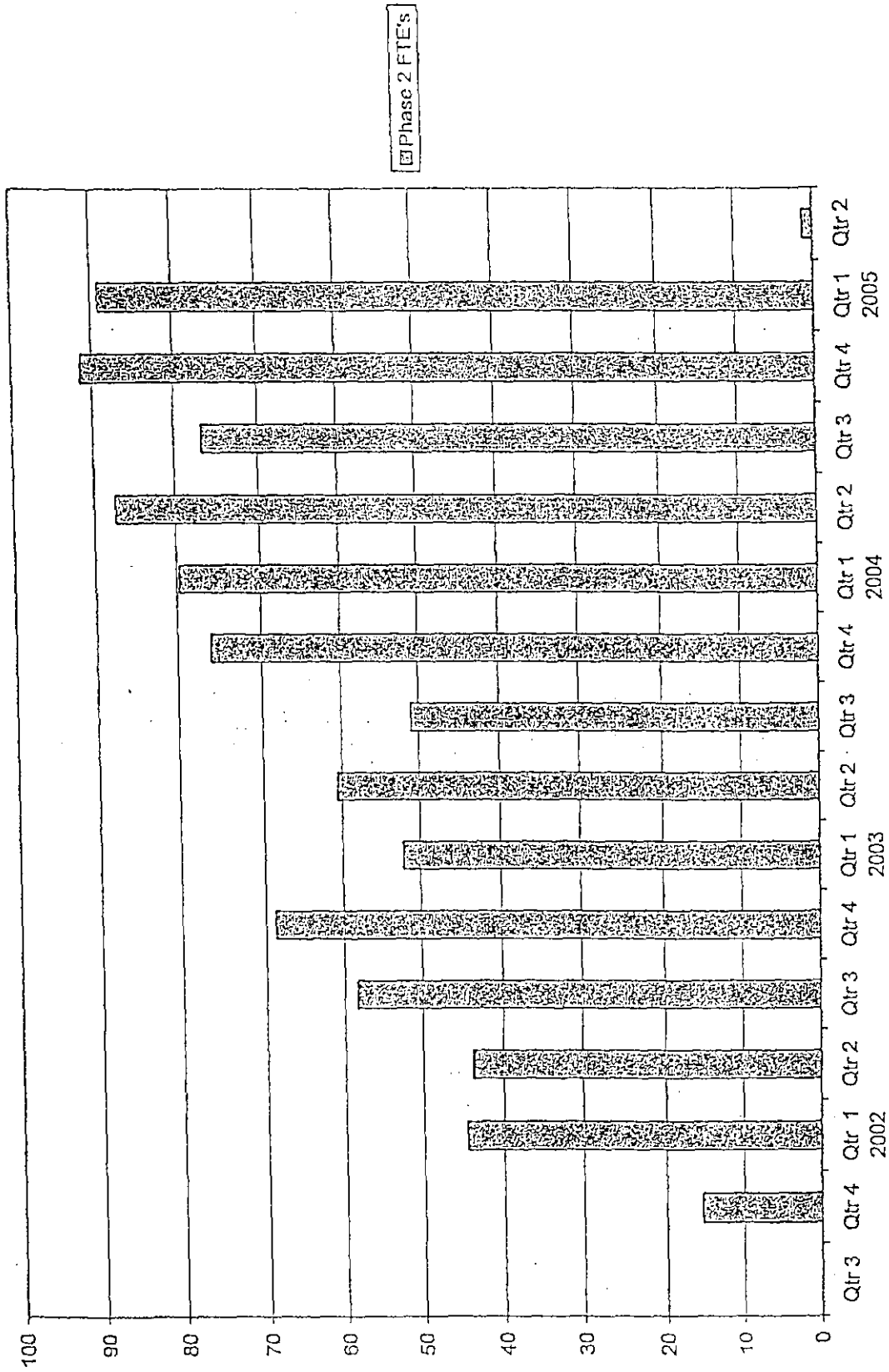

Figure 1.4: Critical Resources (Construction Craft & IPT's Only)

Table 1.4 Required Budget Authority/Budget Outlay

(consisting of one page)

9/29/1999

PROJECT W-314 TANK FARM UPGRADES
BUDGET AUTHORIZED / BUDGET OUTLAY SCHEDULE (PHASE 2 TOTALS)

Table 1.4 Required Budget Authority/Budget Outlay

	TOTAL COST ($1000s)	Prior Cost	FY99 BA	FY2000				FY2001				FY2002				FY2003				FY2004				FY2005				FY2006			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PHASE 1																															
EXPENSE	43382	26596	2996		3208 /	3208			4310 /	4310			4363 /	4363			1889 /	1889													
CAPITAL	114028	13460	12885		17575 /	17575			45924 /	45924			22876 /	22876			1308 /	1308													
TOTAL	157390																														
PHASE 2																															
EXPENSE	22903	0	2735		2493 /	2493			1441 /	1441			5568 /	5568			4913 /	4913			4469 /	4469			1284 /	1284			0 /	0	
CAPITAL	104900	0	0		2936 /	2937			5400 /	5401			23354 /	23251			29799 /	29800			32587 /	32588			10824 /	10825			0 /	0	
TOTAL	127803																														
TOTAL EXPENSE	66265	26596	5731		5701	5701			5751	5751			9931	9931			6802	6802			4469	4469			1284	1284			0 /	0	
TOTAL CAPITAL	218928	13460	12885		20511	20512			51324	51325			46230	46127			31107	31108			32587	32588			10824	10825					
TOTAL PHASES 1&2	285193	40056	18616		26212 /	26213			57075 /	57076			56161 /	56058			37909 /	37910			37056 /	37057			12108 /	12109			0 /	0	

Table 1.5: W-314 Updated Project Documentation

Project Execution Plan	Describes the overall strategy, objectives, and contractor management requirements in support of the established mission need. It also includes as appendices the Systems Engineering Management Plan, the Configuration Management Plan, and the Risk Management Plan.
Systems Engineering Management Plan	Identifies the requirements development and design activities needed for completion of design, construction, startup, and turnover of hardware upgraded by the project. This document supplements the Projects Execution Plan's "technical planning activity."
Configuration Management Plan	Defines the processes and procedures necessary to ensure technical integrity through effective planning, documenting, controlling, and validating the physical structures, systems, components, and requirements (and associated information that contains these requirements).
Risk Management Plan	Identifies risks to the project, and mitigation strategies to ensure successful completion of the project.
Upgrade Scope Summary Report	Identifies, in detail, the work, which comprises the project scope.
Design Requirements Document	Identifies system level requirements for the project and is equivalent to a Level 1 Specification as defined in the current RPP SEMP.

2.0 INTRODUCTION

This Rebaseline Report incorporates Phase 2 changes from work scope additions, deletions, and modifications, and establishes a more current Phase 2 technical cost and schedule baseline upon which to monitor Phase 2 project performance. It revises the Project Work Breakdown (WBS) Structure, identifies the rebaseline planning basis, establishes a new cost and schedule estimate, and identifies the needed critical resources and required annual Budget Authority and Budget Outlay (BA/BO). Associated management and technical baseline documents are revised as well and are provided separately as stand-alone documents.

Since the July 1997, Accelerated Re-Planning Estimate, there have been changes to the Tank Farm Authorization Basis and programmatic needs. For example,Tank Farm Operations has been installing new continuous air monitors (CAMs) and Enraf-Nonius Series 854 (ENRAFs) (liquid level measuring devices) in order to achieve desired monitoring improvements much earlier that could be provided by Phase 2.

The decision to rebaseline Phase 2 was prompted by: 1) the shifting of selected Phase 2 scope to Phase 1 during the Phase 1 rebaselining, 2) changes in the authorization basis, 3) changes in programmatic need, and 4) the dated nature of the existing Phase 2 scope definition.

3.0 TECHNICAL BASELINE

The HNF-SD-W314-DRD-001 Rev. 1, *Preliminary Design Requirements Document* for Tank Farm Restoration and Safe Operations, Project W-314 is the Project's current, DOE-approved technical baseline. However, as a part of the Phase 2 rebaselining effort, this document has been updated, and provides the technical baseline for this Phase 2 Rebaseline Report. The Design Requirements Document (DRD) Rev. 2 is being presented to DOE for review and approval concurrently with this Rebaseline Report. Approval by DOE establishes revision 2 of the DRD as the new technical baseline for Project W-314.

The DRD update was necessary for a number of reasons. Revision 1 contained detailed performance requirements that have been determined by Lockheed Martin Hanford Corporation (LMHC) and Office of River Protection (ORP) to be inappropriate for an upper level requirements document. Many of the documents used in Revision 1 have been cancelled, replaced, or revised. In addition to correcting these deficiencies, the non-performance requirements were reviewed, verified, updated, or deleted as appropriate. Performance requirements were verified using the following documents: HNF-SD-WM-SAR-067, Rev. 0, *Tank Waste Remediation System Final Safety Analysis Report*, HNF-SD-WM-TSR-006, Rev. 0-S, *Tank Waste Remediation System Technical Safety Requirements,* HNF-1939, *Waste Feed Delivery Technical Basis*, Vol. IV, Rev. B (Draft), *Waste Feed Delivery Operations and Maintenance Concept,* and Draft Double-Shell Tank Level 2 Specifications. As before, source requirements include the Authorization Basis and documents such as Department of Energy (DOE) Orders, Code of Federal Regulations (CFRs), and Washington Administrative Codes (WACs).

Changes to requirements reflected in Revision 2 primarily involve ventilation requirements. Key changes include 1) maintaining the vapor space pressure in DSTs to within limits (Rev. 1 requirement imposed a limiting condition for operation); 2) maintaining DST gaseous effluent discharge to within limits (Rev. 1 requirement imposed a limiting condition for operation); and, 3) maintaining DST flammable gas concentrations to within lower flammability limits (Rev. 1 requirement imposed a limiting condition for operation).

For a more thorough discussion of the design requirements than presented here, please see HNF-SD-W314-DRD-001 Rev. 2, *Preliminary Design Requirements Document for Tank Farm Restoration and Safe Operations, Project W-314.*

4.0 SCOPE

The mission of Project W-314 (WHC-SD-W314-MAR-001, *Mission Analysis Report Project W-314 Tank Farm Restoration and Safe Operation*) is to upgrade the existing (DST) farm facilities and systems. This project will improve the reliability of safety-related systems, reduce onsite health and safety hazards, and support waste storage, waste retrieval, and disposal activities in support of the overall River Protection Project (RPP) mission.

Project W-314 has been divided into two phases for performing all of the identified work scope. Phase 1 supports work necessary to provide initial support to the waste retrieval efforts. Phase 2 provides significant upgrade modifications to RPP equipment and systems to ensure that they meet the following requirements:

- Regulatory compliance
- Safety
- Mission requirements
- Reliability
- Operational requirements

Phase 1

Project W-314 Phase 1 activities presently address upgrades and modifications to accommodate the 200 East Area waste transfer system in support of waste retrieval needs. The present status of Phase 1 activities includes the completion of definitive design and construction in the AN Tank Farm. In addition, preparations are being made to start the installation of a new waste transfer pipeline that will connect the existing cross-site transfer line (Project W-058) to termination points in each of the DST farms in the A-Farm Complex. Phase 1 has completed the following Tri-Party Agreement (TPA) milestones:

- TPA-M-43-09: Submission of Conceptual Design Report
- TPA-M-43-10: Start of Definitive Design for Project W-314
- TPA-M-43-12: Start Construction Upgrades in First Tank Farm
- TPA-M-43-11: Provide W-314 Construction Schedule

Continuing Phase 1 construction will include pipeline connections, jumper and valve manifold installation, application of SPC, electrical upgrades, and leak detection instrumentation in each of the following tank farms: AY, AZ, AW, and AP.

A new Master Pump Shutdown (MPS) system will be installed with a programmable logic controller (PLC)/Human Machine Interface (HMI) based system connected through a Tank Farm Local Area Network (TFLAN). Further details of the Phase 1 scope are presented in the Phase 1 Rebaseline Report, HNF-3781.

Phase 2

The current Phase 2 work scope will address regulatory compliance upgrades from the CDR that support future waste storage, retrieval, and feed staging operations. The present status of Phase 2

activities include, completion of a rebaselining of Phase 2 establishing up to date scope, cost, schedule, and technical baselines, and initiation of pre-design documentation.

Phase 2 supports TPA Milestone M-43-00, "Complete W-314 Tank Farm (Compliance related) Upgrades". Phase 2 activities continue to support this process for commencement of definitive design. This includes gathering necessary design level requirements and specifications; and developing specific documents to support design (i.e., Project Development Specifications [PDSs], Project Design Criteria [PDCs]; and Project Interface Control Documents [PICDs]). The key elements of the Phase 2 scope include the following tasks:

Ventilation

- Primary ventilation and stack monitoring upgrades/replacement in AN, AP, and AW tank farms and the 244-S double-contained receiver tank (DCRT)
- Annulus ventilation replacement for SY Tank Farm
- Installation of new primary inlet air filter stations for AP Farm and the 244-S DCRT
- Use existing primary ventilation de-entrainer.

Instrumentation and Control

- Upgrade the DST high-level probes
- Upgrade DST vapor space pressure instruments
- Upgrade waste temperature monitoring for 244-S DCRT
- Installation of new remotely testable, intrinsically safe leak detectors in the following:
  - Pipeline encasements
  - Process pits
- Upgrades to alarm and monitoring systems

Electrical

- Upgrades to DST electrical systems to support ventilation and instrumentation upgrades and allow maintenance on switchgear.

Piping

- Installation of a bypass waste transfer line around 241-A-A valve pit. The new waste transfer line will connect SN-220 and LIQW-702 lines together.

4.1 AN TANK FARM UPGRADES

Refer to Figure 4.1 for an overview of AN Tank Farm upgrades.

4.1.1 INSTRUMENTATION AND CONTROL

4.1.1.1 Description

Instrumentation and control upgrades to the AN Tank Farm include primary tank systems, leak detection systems, and the new primary exhaust ventilation system. Selected existing alarms and

signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarm signals, which will be connected to TMACS.

4.1.1.1.1 Primary Tank

4.1.1.1.1.1 Liquid High-Level Measurement

WBS: 5A4J22E

New liquid high-level probes, including electronic relays, have been installed by others for all seven 241-AN tanks. The existing current/conductivity probes have been replaced with intrinsically safe resistive/conductivity probes. The portion of liquid high-level measurement upgrades for Project W-314 Phase 2 work scope involves the connection of the existing high-level alarm signals from the seven tanks to a TFLAN PLC. The connection to the TFLAN PLC will be made in the 241-AN-271 instrument building by routing signal cables between the instrument panel and a TFLAN PLC I/O panel. The signals from the liquid high-level probes will be monitored by the TFLAN PLC and displayed on the TFLAN HMI.

4.1.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5A4A08A, 5A4B08A, 5A4C08A, 5A4D08A, 5A4E08A, 5A4F08A and 5A4G08A

The existing low and high range pneumatic pressure transmitters located in the transmitter enclosure next to the leak detection pit for each tank will be replaced with new electronic indicating pressure transmitters. Existing tank riser taps and tube assemblies will be used to convey tank vapor pressure levels to the new transmitters. Analog pressure signals from the new transmitters will be routed via a field terminal box to a TFLAN PLC Input/Output (I/O) panel located in the 241-AN-271 instrument building. The vapor pressure signals will be parallel-wired from the instrument building to the ventilation skid to allow the ventilation system to independently monitor tank pressure. Low and high range vapor space pressure status of all primary tanks will be monitored by both the TFLAN PLC and the ventilation system PLC, and displayed on the TFLAN HMI.

4.1.1.1.2 Waste Transfer

4.1.1.1.2.1 Valve Position Indication

Conduit and wire will be installed for selected pits requiring future installation of valve position indication. No connections will be made at the terminal box or at the pit.

4.1.1.1.3 Leak Detection

4.1.1.1.3.1 Process Pits

WBS: 5A4B02, 5A4C02, 5A4E02, 5A4F02, and 5A4G02

New leak detection systems will be installed for selected process pits. The sensor will be an intrinsically safe, conductive type. The system will provide a local and remote alarm and be

operationally testable. Process pits have been identified as safety-class; therefore, each system will have missile shielding. The existing cover blocks will require core drill modification to accept the new sensor assembly. Conduit will be run on top of the existing cover blocks from the sensor to a junction box located on the side of the cover block. A removable wiring jumper (pigtail) will be used to connect the junction box on the cover block to a junction box located on the side of the pit. The leak detection signals will be wired to a TFLAN PLC I/O panel via a terminal box to the 241-AN-271 instrument building. The TFLAN PLC will monitor the leak detection signals as well as provide input to the MPS system.

The new leak detection system will be installed in the following process pits:

- Central Pump Pits 01A – 07A (Except 01A and 04A)

In addition, drain plug assemblies will be installed in all pits not entered by Phase 1. The following pits will require new drain plug assemblies:

- Central Pump Pits 01A – 07A (Except 01A and 04A)

4.1.1.1.3.2 Pipeline Encasement

WBS: 5A4J35

New leak detection systems will be installed in selected waste transfer pipe encasements. The sensor will be an intrinsically safe, conductive type. The system will provide a local and remote alarm and be operationally testable. The leak detection signals will be wired to a TFLAN PLC I/O panel via a terminal box to the 241-AN-271 instrument building. The TFLAN PLC will monitor the leak detection signals as well as provide input to the MPS system.

The following waste transfer pipe encasements will have a new leak detection system installed:

- DR-368 (near riser 020, 241-AN-101)
- SL-168 (Valve pit AN-A)
- SL-160 (Valve pit AN-B)
- SN-260 (Valve pit AN-B)

4.1.1.1.3.3 Power Panels

WBS: 5A4J28

The leak detection panels require 120 Vac power. New local power panels will be installed to supply power to the leak detection panels.

4.1.1.1.4 Primary Exhaust Ventilation

WBS: 5A3A00, 5A4J02, 5A4J22A, 5A4J28 and 5A2131

Instrumentation and control (I&C) equipment will be supplied with the new primary exhaust ventilation system to monitor the status and control the operation of the ventilation system. Refer to Figure 4.2, "Primary Exhaust Station Flow Diagram."

The major ventilation system components are:

- Exhaust station (dual train)
- Gaseous effluent monitoring system
- Condensate drain subsystem
- Ventilation system PLC

The primary exhaust ventilation station will consist of an inlet section containing a glycol heater and control damper; and dual trains each containing an inlet plenum, test sections, High-Efficiency Particulate Air (HEPA) filters, an outlet plenum, and exhauster fan.

A single exhaust stack will be provided with connections to exhaust monitoring systems. A gaseous effluent monitoring system (GEMS) will be installed at the exhaust stack to monitor and trend the concentration of released radioactive materials. Trending information for both radionuclides will be available at the TFLAN HMI. Manual isolation valves will facilitate the connection of either train to the exhaust stack.

A new condensate drain subsystem will be installed to handle condensate from the exhaust housing sections. Included in the subsystem are a seal pot with level measurement equipment, drain piping, and an overflow pipe. Refer to Figure 4.3, "Condensate Drain Subsystem".

A ventilation system PLC will provide monitoring and control of the primary ventilation system and will connect to the TFLAN system in the instrument building to facilitate remote monitoring of the ventilation system by the TFLAN HMI. Some limited remote control of the ventilation system by the TFLAN HMI may also be provided. The need for remote control at the HMI will be evaluated during definitive design.

4.1.1.1.4.1 Exhaust Station

Sensors and associated transmitters for measuring inlet and differential pressures, and glycol heater system level and temperature will be installed on the exhaust station. Local control will be provided by the ventilation system PLC for the exhaust train damper, exhaust heaters, and exhauster fans.

Inlet pressure: The exhaust train inlet pressure will be measured with respect to atmosphere. A pressure sense tap will be located on the exhaust manifold duct and routed to a local instrument rack. The inlet pressure tubing will connect to an indicating transmitter installed in the instrument rack and the analog signal from the transmitter will be wired to the ventilation system PLC.

Differential pressure: Differential pressures across the HEPA filters (two for each train) and exhauster fan (one for each train) will be measured. A pressure sense tap will be located on the housing on each side of the device measured and routed to a local instrument rack (one near each train). The pressure sensing tubing will connect to indicating transmitters installed in the instrument rack and the analog signals from the transmitters will be wired to the ventilation system PLC.

Exhaust train temperature: Temperatures of the glycol heater, inlet plenum (one for each train), and test sections (two for each train) will be measured. Temperature elements will be installed in wells mounted on the housing of the device measured and the temperature signals from the sensors will be wired to temperature indicating transmitters installed in the local instrument racks. Analog signals from the transmitters will be wired to the ventilation system PLC.

Level detector: The coolant level in the glycol heater system will be measured. A level detector sensor installed in the heating system will be wired to a level transmitter installed in the local instrument rack. An analog signal from the level transmitter will be wired to the ventilation system PLC.

Exhaust heater: The heater controller will be controlled by an analog signal from the ventilation system PLC. Power to the heater controller will be interrupted, both locally and remotely, by a manual on/off switch or by deactivating a permissive interlock wired from the ventilation system PLC.

Exhaust fan: The exhaust fan will be controlled by a magnetic starter. Power to the exhaust fan starter will be interrupted, both locally and remotely, by a manual on/off switch or by deactivating a permissive interlock wired from the ventilation system PLC.

Inlet damper: The inlet damper position will be controlled by an analog signal from the ventilation system PLC to the damper motor controller.

4.1.1.1.4.2 Gaseous Effluent Monitoring System

A gaseous effluent monitoring system (GEMS) will be supplied to continually monitor and trend the concentration of radioactive materials released into the environment through the exhaust stack. I & C for the GEMS will consist of a sampler cabinet, pump cabinet, instrument cabinet, stack instruments, and a data collection system. The cabinets will be weatherproof and will maintain a controlled environment.

Sampler cabinet: The sampler cabinet will contain the record sample filter holder, Beta continuous air monitor (CAM) sample head, sample flow instruments and control, and space for an optional Alpha CAM sample head.

Pump cabinet: The vacuum system located in the pump cabinet will provide a steady, non-pulsating vacuum source to ensure collection efficiency over the full range of operating conditions.

Instrument cabinet: The instrument cabinet will contain the data collection system, including a Beta CAM, an (optional) Alpha CAM, and system controls.

Stack instruments: The stack instruments will include a stack flow measurement element and transmitter, temperature element and transmitter, and stack pressure transmitter.

Data collection system: The ventilation system PLC will perform all necessary data acquisition and control of the GEMS. Process signals will be transmitted between the GEMS instrument cabinet and the ventilation system PLC, including stack and sample flow rates; total stack and

sample flow volumes; stack pressure and temperature; radiation measurement signals and alarms, and various data collection system inputs and outputs. In addition, remote monitoring and some control of the GEMS may be provided by the TFLAN HMI, including remote adjustment of the flow rate for the record sample filter holder, Beta CAM, and optional Alpha CAM.

Refer to GEMS Procurement Specification, HNF-S-0400, Rev. 1, Conceptual Design Report - Stack Monitoring System, WHC-SD-W420-CDR-001, Rev. 0, and Gaseous Effluent Monitoring System Design Criteria, WHC-SD-WM-CR-058, Rev. 0, for detailed information on the GEMS.

4.1.1.1.4.3 Condensate Drain Subsystem

The seal pot condensate level will be continually monitored by a resistive/conductivity level measurement system installed in the seal pot. Seal pot low, high, and fill level information will be sent to the ventilation system PLC. Alarms for "low," "high," and "below fill" levels will be displayed locally and on the TFLAN HMI.

4.1.1.1.4.4 Ventilation System PLC

A single safety-class qualified PLC, including analog and discrete I/O will be supplied with the primary exhaust ventilation station. The ventilation system PLC will monitor and control the primary exhaust ventilation trains and stack monitoring systems, and will monitor the seal pot level. In addition, the PLC will continually monitor all primary tank vapor space pressures and will initiate applicable alarms and corrective controls when operating limits are reached.

HEPA filter and other exhaust train differential pressure setpoints will be programmed into the ventilation system PLC. The PLC will compare the pressure differential measurements to the differential pressure set points and will modulate an exhaust damper to maintain the pressure at the set point levels.

Local indicators and manual controls, including hard-wired interlocks, will be provided to facilitate manual operation of the ventilation system independent of the PLC. At least one set of hard-wired interlocks (for high and low-pressure events) and a hard-wired relay for the CAM interlock will be provided to initiate an exhaust shutdown.

The ventilation system PLC will be connected to the TFLAN system by a coaxial cable routed between the ventilation skid and the 241-AN-271 instrument building. Operating as a separate node on the TFLAN system, the ventilation system PLC will communicate primary ventilation system status and alarms to the TFLAN HMI in the instrument building.

4.1.1.1.5 Monitoring and Control

4.1.1.1.5.1 Alarms and Signals

Miscellaneous alarms and signals will be connected to a TFLAN PLC and monitored on the TFLAN HMI. Included in this work scope are Gamewell and general local alarms originating in the AN Tank Farm and signals from instruments upgraded by W-314 Phase 2. In addition, existing Panalarm signals not addressed by other Phase 2 work scope will be connected to

TMACS. Signals also required by the MPS system will be connected either to TFLAN or TMACS to accommodate MPS interlock logic.

Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional AN Tank Farm work scope and associated WBS numbers.

4.1.1.1.5.2 TFLAN PLC Equipment

WBS: 5A4J22B

New cabinets will be installed in the 241-AN-271 instrument building to house I/O racks, panels, power supplies, and I/O cards. Communication cards and cables will be provided to connect Phase 2 installed TFLAN PLC I/O equipment to an existing TFLAN PLC.

The existing TFLAN PLC programs and HMI screens will be modified to accommodate Phase 2 instrument upgrades. In addition to modifications to existing programs and HMI screens, new programs and HMI screens will be developed to monitor and control the new primary ventilation system and to interface it with TFLAN.

4.1.1.2 Demolition

4.1.1.2.1 Primary Tank

4.1.1.2.1.1 Liquid-High Level Measurement

WBS: 5A4J22E

Remove associated relays and annunciators in the 241-AN-271 building.

4.1.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5A4A08B, 5A4B08B, 5A4C08B, 5A4D08B, 5A4E08B, 5A4F08B, and 5A4G08B

For all seven tanks, remove and dispose of the existing 14 pneumatic pressure transmitters in the transmitter cabinets located next to the leak detection pits. Abandon conduit, wire, or piping not required for terminations. This equipment is assumed to be non-contaminated waste.

Remove associated pneumatic chart recorders, annunciators, and switches located in the 241-AN-271 building.

4.1.1.2.2 Leak Detection

4.1.1.2.2.1 Process Pit Leak Detectors

WBS: 5A4B024, 5A4C024, 5A4D034, 5A4E024, 5A4F024, and 5A4G024

Remove the existing leak detectors in the process pits. Demolish the existing relay panels located in the field.

4.1.1.2.2.2 Pipeline Leak Detectors

WBS: 5A4J35C

Remove the existing leak detectors in the pipe encasements. Demolish the existing relay panels located in the field.

4.1.1.2.3 Primary Ventilation

WBS: 5A4J26E

Remove the primary exhaust stack instrument enclosure as a unit and dispose of the enclosure as Radioactive Mixed Waste (RMW. The enclosure volume (non-reduced) is assumed to be 48 cubic feet. Dispose of the stack sample piping with the instrument. Consider the piping to be RMW.

Remove all associated relays, indicators, alarms, and readouts in the 241-AN-271 building.

4.1.1.2.4 Monitoring and Control

Remove cable, conduit, alarms, indicators, switches, and other components no longer needed for the miscellaneous alarms and signals that will be removed and reconnected to the TFLAN PLC or TMACS by Project W-314 Phase 2. These include Gamewell alarms originating in the AN Tank Farm, signals from instruments being upgraded in Phase 2 that are currently input to the 242-A DCS, including general local alarms, and existing Panalarm signal input to TMACS.

Refer to "Miscellaneous Alarms and Signals" section for additional AN Tank Farm work scope and associated WBS numbers.

4.1.1.3 Assumptions

4.1.1.3.1 General

It is assumed that:

1. A (Modicon Quantum Series or equivalent) TFLAN PLC and an HMI will be installed in the 241-AN-271 instrument building by Project W-314 Phase 1. No spare slots are available for Phase 2 upgraded instruments.
2. All new instruments installed by Phase 2 will be connected to the TFLAN system via a Phase 2 installed PLC I/O panel located in the 241-AN-271instrument building unless otherwise noted.
3. All pits that are opened will have the coatings inspected and repaired as required.

4.1.1.3.2 Primary Tank

It is assumed that:

1. New liquid high-level probe systems have been installed by others, including signal wiring from associated electronic relays to the 241-AN-271 instrument building.

2. The safety classification of the vapor space pressure measurement system is safety-class.
3. New safety-class qualified electronic pressure transmitters will be installed in the existing transmitter enclosures of each tank - one low range and one high range pressure transmitter per enclosure.

4.1.1.3.3 Leak Detection

It is assumed that:

1. The safety classification of the leak detection system for the process pits is safety-class and the other leak detection systems are general services.
2. The requirements for the process pit leak detection systems will be similar to those identified for Phase 1 and therefore, the same operationally testable system developed in Phase 1 will be used in Phase 2.
3. Existing structures to mount the panels are inadequate. New structures to mount the panels for the leak detection cabinets are needed.
4. The leak detection control panel requires a 10-amp feed for panel power. New power panels will be installed. The required power for the panels are available.
5. All pit work will be remote.
6. Drain plugs will only be installed in pits entered in Phase 2. Per drawing H-14-020801, Sheets 1- 4, Waste Transfer System O&M System P&ID, only pits that show floor drains are considered.

4.1.1.3.4 Primary Ventilation

It is assumed that:

1. The safety classification of the ventilation system is safety-class.
2. A safety-class qualified PLC will monitor and control all primary ventilation system instruments and subsystems. The PLC will operate as a separate node on TFLAN.
3. A stack monitoring system will be provided similar to the unit described in the "GEMS Procurement Specification," HNF-S-0400, Rev. 1.
4. Local displays, control devices, and hard-wired interlocks will be provided on the primary ventilation skid to facilitate manual operation and shutdown of the ventilation system.

4.1.1.3.5 Monitoring and Control

It is assumed that:

1. Sufficient floor space is available in instrument building 241-AN-271 for Phase 2 TFLAN PLC I/O cabinets and equipment, and no demolition or relocation of existing equipment is necessary.
2. TFLAN PLCs will be fully configured and programmed for all instruments installed during Project W-314 Phase 1. Phase 2 PLC programming, except for the ventilation PLC, will only involve the additions of new Phase 2 instrument I/O to an existing program structure.

3. Programming of the TFLAN PLC and HMI screen modification/development will be performed during the design phase. Implementation and acceptance testing will be performed during the construction phase.
4. For Panalarm work scope, the Acromag enclosure will be mounted inside the appropriate building within 50 feet of the Panalarm; and sufficient space exists for the Acromag enclosure.

4.1.1.3.6 Demolition

It is assumed that:

1. The existing leak detectors in the process pits leak detectors in the pipe encasements will be classified as RMW for waste management purposes.
2. The primary exhaust stack instrument enclosure and sample piping will be removed together and disposed as RMW.
3. All underground electrical and pneumatic systems replaced by W-314 Phase 2 will be placed in a safe configuration and abandoned in place unless otherwise noted. Above ground electrical and signal wire, cable, and pneumatic tubing to be removed will be cut at the entrance point or just below grade. Wire, cable, conduit, and pneumatic tubing ends will be covered or otherwise sealed. Below grade portions of the wire, cable, and pneumatic tubing will be abandoned in place.
4. Cable, conduit, alarms, indicators, switches, and other components no longer needed for the miscellaneous alarms and signals are to be removed. The demolition for alarms and signals will not produce hazardous or radiological waste. Parts that can be re-used will be retained and reconnected to the TFLAN PLC or TMACS as part of Project W-314 Phase 2. Identification of these alarms will be based on the Hanford Alarms Assessment Survey, currently in progress.

4.1.2 VENTILATION

4.1.2.1 Description

There are two ventilation systems for the AN Tank Farm, the primary ventilation system and the annulus ventilation system. Planned upgrades only include the primary ventilation system. The functions of the AN Tank Farm primary ventilation system are:

1. Maintain a negative pressure within the vapor space of each of the seven primary tanks.
2. Control the build-up of flammable gases within the vapor space of each of the seven primary tanks.
3. Remove heat from the vapor space of each of the seven primary tanks.
4. The AN Tank Farm primary ventilation system can be divided into five major subsystems. These five subsystems are:
5. Air control stations
6. The seven primary tanks in the tank farm

7. Exhaust manifold
8. Exhaust station
9. Condensate drain subsystem

The air control stations (see drawing H-2-85646), primary tanks, and exhaust manifold are existing and will not be modified or upgraded. The AN Tank Farm ventilation system upgrades include a new exhaust station and a new condensate drain subsystem. The new primary exhaust station is shown conceptually on Figure 4.2. The new condensate drain subsystem is shown conceptually on Figure 4.3. The new exhaust station and condensate drain subsystem are described in detail below.

4.1.2.1.1 Exhaust Station

WBS: 5A4J02, 5A4J05 and 5A4J09

Refer to Figure 4-2 (the conceptual flow diagram for the new exhaust station). Primary tank vapors will be pulled from the vapor space of each of the seven tanks of the AN Tank Farm by one of the induced draft fans. Moisture will be removed from the vapor by the chevron mist eliminator. The vapor will be cooled by the chiller/condenser unit and pass through a second mist eliminator to remove as much liquid from the vapor stream as possible. A glycol heater will next heat the vapor to raise its temperature above the dew point, which will prevent condensation and thereby protect the downstream filters.

A dual train of filters and dual induced draft fans, all ducted to a single exhaust stack, are employed to remove radioactive and other particulate and exhaust the cleaned up vapors to the atmosphere. A gaseous effluent monitoring system (GEMS) shall be installed in each exhaust stack to monitor and record any radionuclides emitted to the atmosphere. The GEMS will be standardized with that equipment used on Project W-420, *Stack Monitoring System Upgrades* (see HNF-S-0400 Rev. 1, Procurement Specification for Gaseous Effluent Monitoring System). Connections shall be installed in each train to facilitate the addition of possible carbon absorbers/dry scrubbers if needed. Various instruments, isolation valves, and control dampers shall be used to monitor and control the functioning of the exhaust station.

The ALARA requirement dictates that construction time is minimized in and around the tank farm. To accomplish this, the exhaust station shall be designed to be modularized. Fabrication and acceptance testing (in a fabrication shop) of the exhaust station prior to shipment to the AN Tank Farm will help achieve ALARA requirements. Lifting lugs will be installed on the modularized pieces of the exhaust station to facilitate erection on a concrete foundation. A SPC will be applied to the top surface of the exhaust station concrete slab and under the exhaust station equipment. The exhaust station equipment will be designed so they can easily be removed as radiologically contaminated waste at the end of its mission. A convenient tie-in location will be chosen to connect the new exhaust station to the old exhaust manifold. The design will locate the new exhaust station as close as possible to the chosen tie-in location to minimize the duct length from the tie-in location to the new exhaust station. Condensate generated from the vapor stream will be drained from the exhaust station via the condensate drain subsystem.

4.1.2.1.2 Condensate Drain Subsystem

WBS: 5A4J07 and 5A4J08

Refer to Figure 4.3 (the conceptual drawing for the new condensate drain subsystem). The new AN Tank Farm primary ventilation exhaust station equipment will require drains for the removal of condensate. Figure 4.2 shows drain lines needed to remove condensate from the exhaust station equipment.

The seal pot acts as a trap to prevent vapors from the primary tank migrating into the environment. The drain lines terminate under water in the seal pot. A fill pipe with hose connection and an overflow pipe control the water level in the seal pot. The overflow pipe drains excess water/condensate to a primary tank. Instruments shall be provided to detect the level of water/condensate in the seal pot. Piping shall be included to add water to the seal pot. Condensate shall drain to and from the seal pot by gravity. All condensate drain and overflow piping shall be heat-traced and insulated as necessary to prevent freeze-ups. The overflow piping shall be routed above ground as much as possible to a nearby receiver tank.

The old AN Tank Farm condensate drain subsystem is assumed to be unacceptable or is contaminated such that it is not economically feasible to use. However, an investigation of the actual conditions may permit the use of some or all of this subsystem.

4.1.2.2 Demolition

4.1.2.2.1 Ventilation System

WBS: 5A4J26E

The existing primary ventilation exhaust station will be removed after installation and startup of the new exhaust station and condensate drain subsystem. The concrete foundations will be left in place. The old ventilation system equipment will be removed and treated as mixed waste unless investigation determines otherwise. The old drain pit, if not reused, will be retired in place with the old drain lines cut and capped at their point of entry into the drain pit.

4.1.2.3 Assumptions

1. The primary ventilation system will be classified as safety-class.
2. The system shall consist of dual exhaust trains that are modular with a standardized design and the ability to add additional treatment as needed.
3. Each exhaust train will be designed to handle a maximum flow rate of 2,400 scfm. The design flow rate shall be 2000 scfm. The velocity of the exhaust gases leaving the stack shall be 2,500 ft/min at all times, in all weather.
4. The new ventilation exhaust station and condensate drain subsystem will be constructed while the existing ventilation system is operating.

5. After installation of the new ventilation exhaust station and condensate drain subsystem, the old exhaust station will be removed. This will involve the removal of the old exhaust station equipment from their concrete foundations; the foundations will be retired in place.
6. It is assumed that all primary ventilation exhaust station equipment that contacts the vapor stream and all condensate drain subsystem equipment is RMW for disposal purposes.
7. The radiological stack monitoring and recording equipment shall be standardized with the existing gaseous effluent monitoring system (GEMS) equipment developed by Project W-420.
8. The exhaust station will include one 30-foot high exhaust stack.
9. The existing exhaust manifold (duct connecting all seven primary tanks to the new exhaust station tie-in point) will not be replaced, double-contained, or altered as part of this project.
10. The new exhaust duct (from the tie-in point to the new exhaust station) will not be double-contained or equipped with leak detection equipment.
11. The seal pot will be located above grade, on the exhaust station concrete pad.

4.1.3 ELECTRICAL

4.1.3.1 Description

The electrical system upgrades include procuring and installing a new electrical breaker at the existing motor control center as the main power source to the primary ventilation system and a 120 Vac panel including transformer. Local connections for a diesel generator to supply back-up power and transformer connected to a 120 Vac panel with duplex receptacles. A second breaker shall be procured and staged as a spare main breaker. Upgrading and connecting a new ventilation system ground grid to the existing ground grid, cathodic protection and freeze protection systems.

4.1.3.1.1 Main Power to Primary Ventilation Skid

WBS: 5A4J26A

A 480 Vac, 60 Hz power system shall be provided to the primary ventilation system from the existing motor control center AN271 Building. A new circuit breaker will be installed in the compartment C1 to feed the new skid starters and mini-power center.

4.1.3.1.2 Power Receptacle for Portable Diesel Generator

WBS: 5A3A00

A new power receptacle will be provided for connection of an existing portable diesel generator as a backup power source to the primary ventilation system to allow preventive maintenance on electrical equipment.

4.1.3.1.3 Spare Circuit Breaker for Loadcenter (F8X402)

WBS: 5A4J26B

A main circuit breaker for the switchgear will be procured as a backup spare breaker so that the existing breaker can be maintained, tested, and calibrated to ensure acceptable performance of the device.

4.1.3.1.4 Ventilation Skid Ground Grid and Bonding

WBS: 5A4J26C

The new primary ventilation system will be bonded to a new ground grid that will be connected from the existing tank farm ground grid.

4.1.3.1.5 Freeze Protection for Primary Ventilation Drainage Systems

WBS: 5A4J26D

Freeze protection for the primary ventilation drainage system will be provided. The 120 Vac power for the freeze protection will be supplied from the mini-power center.

4.1.3.2 Demolition

4.1.3.2.1 Primary Ventilation

WBS: 5A4J26E

All underground electrical systems that are replaced by Project W-314 will be placed in a safe configuration and abandoned in place unless otherwise noted. Above-ground electrical conduit and cable to be removed and will be cut at the entrance point or just below grade. Wire, cable and conduit ends will be covered or otherwise sealed. Associated conduit, wiring, panels, and junction boxes shall be remove. The feeders of the primary fan motors shall be removed.

4.1.3.3 Assumptions

4.1.3.3.1 General

1. All modifications and installations will be to the 1999 National Electric Code.
2. Sufficient cubicle space is available and the bus ratings of the motor control centers are adequate in instrument building AN271 for Phase 2, cabinets and equipment, and no demolition or relocation of existing equipment is necessary.
3. Existing structures to mount the panels are adequate.
4. The required power for any new panel loads is available.
5. Implementation and acceptance testing will be performed during the construction phase.
6. All site plans are diagrammatic and conduit routings will be field routed to avoid obstructions. Pull boxes will be installed as necessary.

7. Refer to the following drawings and sketches for systems configuration, equipment location, and cabling details as the best available design:

   a) 241-AN Tank Farm One-Line Diagram, Figure E-1 (Ref. WHC-SD-W314-CDR-001, Rev. 1).

   b) 241-AN Tank Farm Site Plan, Figure P-1. (Ref. WHC-SD-W314-CDR-001, Rev. 1)..

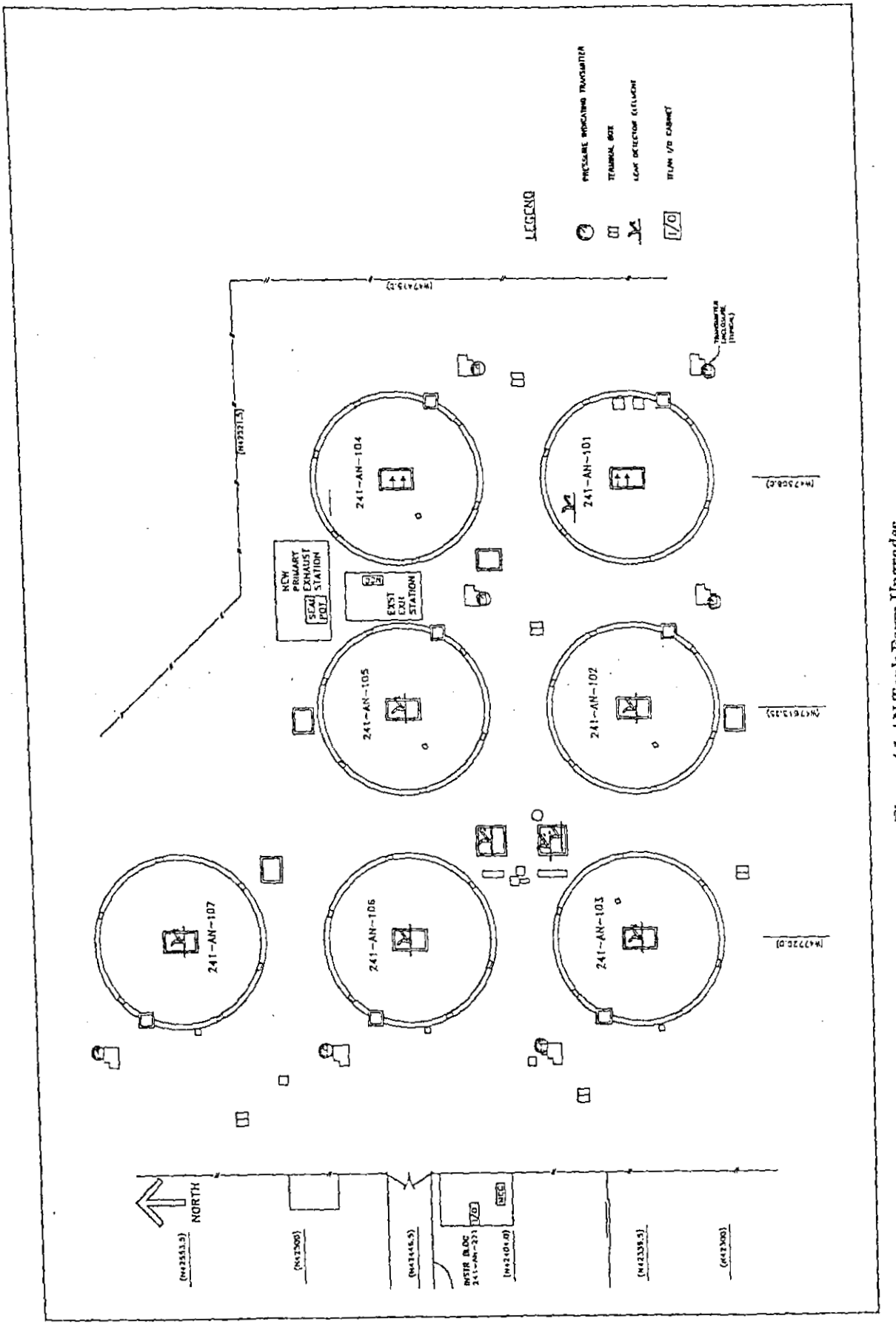

Figure 4.1 AN Tank Farm Upgrades

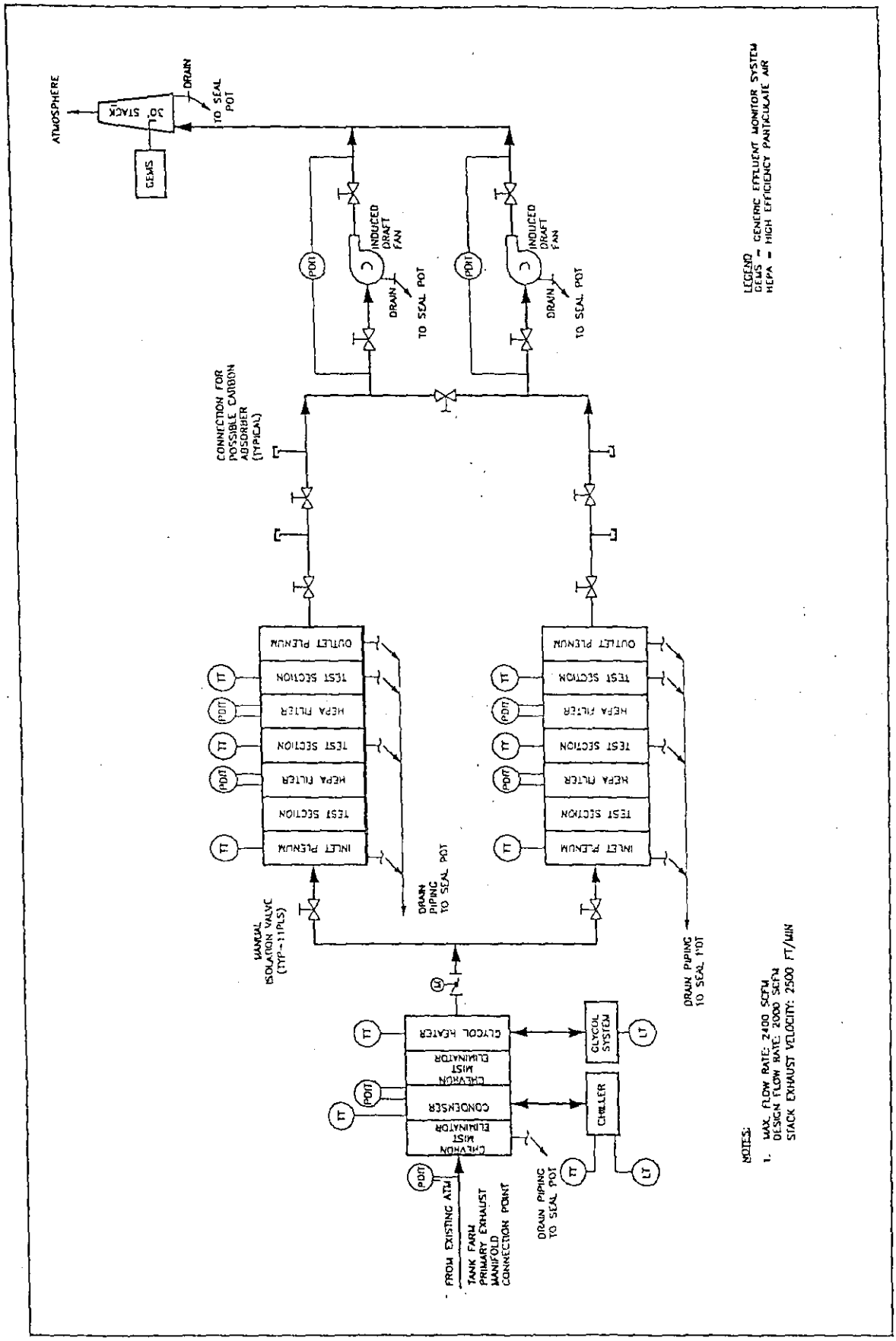

Figure 4.2 Primary Exhaust Station Flow Diagram - AN, AP and AW Tank Farms

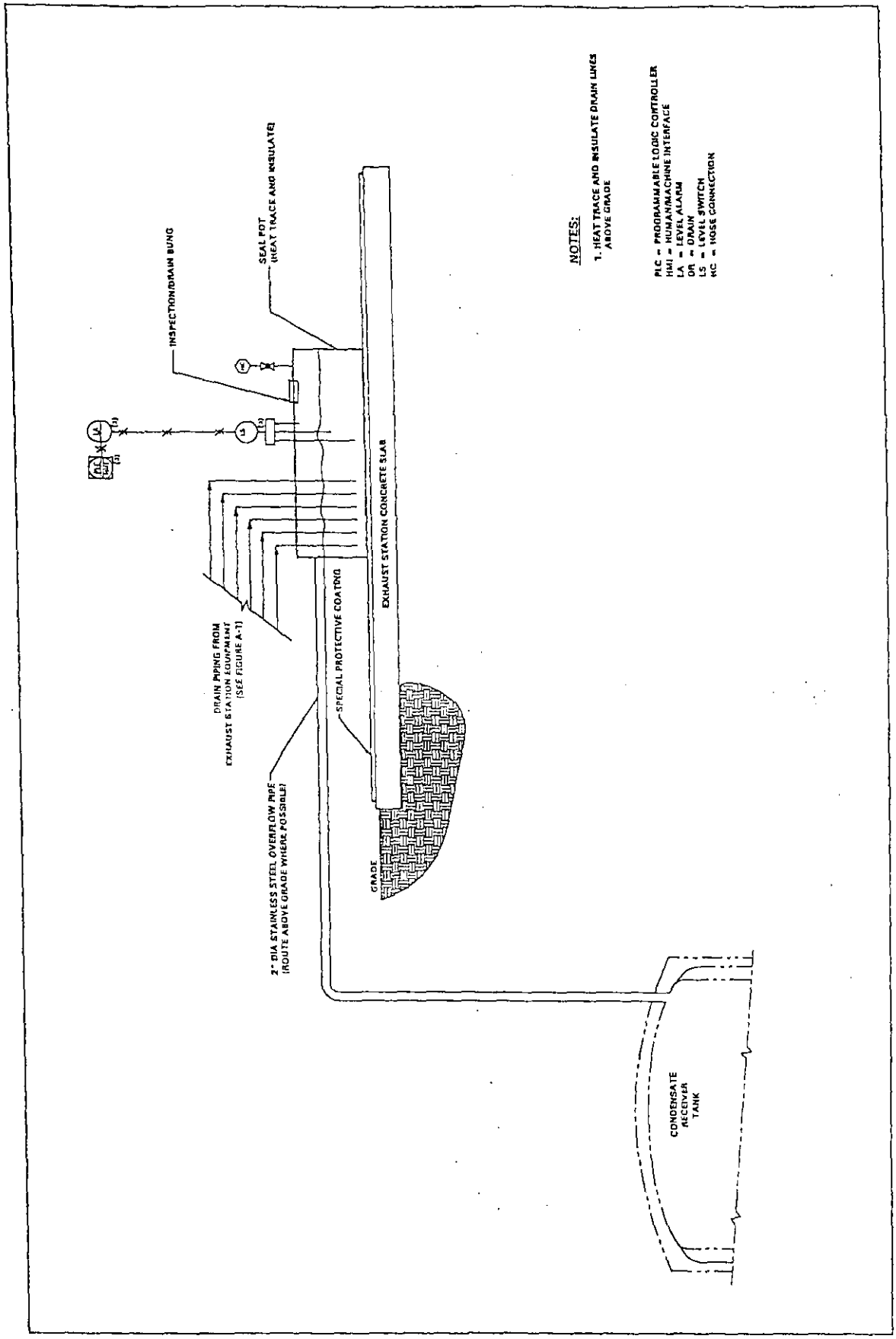

Figure 4.3 Condensate Drain Subsystem - AN, AP, AW Tank Farms and 244-S DCRT

4.2 AP TANK FARM UPGRADES

Refer to Figure 4.4 for an overview of AP Tank Farm Upgrades.

4.2.1 INSTRUMENTATION AND CONTROL

4.2.1.1 Description

I & C upgrades to AP Tank Farm include primary tank systems, leak detection systems, and the new primary exhaust ventilation system. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarm signals, which will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description," in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "241-AP-271 instrument building."

4.2.1.1.1 Primary Tank

4.2.1.1.1.1 Liquid High-Level Measurement

WBS: 5B4J22F

Similar to the AN Tank Farm description except for all eight 241-AP tanks.

4.2.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5BAJ22E

New electronic pressure transmitters have been installed by others for all eight 241-AP tanks including signal wiring to the instrument panel in the 241-AP-271 building. Analog signals from the existing electronic pressure transmitters will be relocated from the associated chart recorders in the instrument panel to a TFLAN PLC I/O panel in the instrument building. Low and high range vapor space pressure status of all primary tanks will be monitored by the TFLAN PLC and displayed on the TFLAN HMI.

4.2.1.1.2 Waste Transfer

4.2.1.1.2.1 Valve Position Indication

Similar to AN Tank Farm description.

4.2.1.1.3 Leak Detection

4.2.1.1.3.1 Process Pits

WBS: 5B4A02, 5B4B09, 5B4C02, 5B4C10, 5B4E02, 5B4F02, 5B4G02, and 5B4H02

Similar to the AN Tank Farm description except for the new leak detection system will be installed in the following process pits:

- Central Pump Pits 01A – 08A (Except 02A and 04A)
- Pump Pit 02D
- Drain Pit 03D

In addition, drain plug assemblies will be installed in all pits not entered by Phase 1. The following pits will require new drain plug assemblies:

- Central Pump Pits 01A – 08A
- Pump Pit 02D
- Drain Pit 03D

4.2.1.1.3.2 Pipeline Encasement

WBS: 5B4J35

Similar to the AN Tank Farm description except for the following waste transfer pipe encasements. The pipe encasements will have a new leak detection system installed:

- SN-621 (Near pump pit 02D)
- SN-650 (Near riser 023, 241-AP-102)
- SN-609 (Near Valve pit)
- SN-610 (Near Valve pit)
- SL-509 (Near Valve pit)
- SL-510 (Near Valve pit)

4.2.1.1.3.3 Power Panels

WBS: 5B4J28

Similar to the AN Tank Farm description.

4.2.1.1.4 Primary Exhaust Ventilation

WBS: 5B3B00, 5B4J02, 5B4J22A, 5B4J28, and 5B2131

Similar to the AN Tank Farm description.

4.2.1.1.5 Monitoring and Control

4.2.1.1.5.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional AP Tank Farm work scope and associated WBS numbers.

4.2.1.1.5.2 TFLAN PLC Equipment

WBS: 5B4J22B

Similar to the AN Tank Farm description.

4.2.1.2 Demolition

4.2.1.2.1 Primary Tank

4.2.1.2.1.1 Liquid High-Level Measurement

WBS: 5B4J22G

Similar to the AN Tank Farm description.

4.2.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5B4J22G

Remove associated pneumatic chart recorders, annunciators, and switches located in the 241-AP-271 building.

4.2.1.2.2 Leak Detection

4.2.1.2.2.1 Process Pit Leak Detectors

WBS: 5B4A024, 5B4B094, 5B4C024, 5B4C104, 5B4E024, 5B4F024, 5B4G024, and 5B4H024

Similar to the AN Tank Farm description.

4.2.1.2.2.2 Pipeline Leak Detectors

WBS: 5B4J35C

Similar to the AN Tank Farm description.

4.2.1.2.3 Primary Ventilation

WBS: 5B4J26E

Similar to the AN Tank Farm description.

4.2.1.2.4 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" section for additional AP Tank Farm work scope and associated WBS numbers.

4.2.1.3 Assumptions

4.2.1.3.1 General

Similar to the AN Tank Farm description.

4.2.1.3.2 Primary Tank

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

1. The existing electronic vapor space pressure transmitters and signal wiring to the 241-AP-271 instrument building will not be replaced by W-314 Phase 2.

4.2.1.3.3 Leak Detection

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

1. Drain plugs will only be installed in pits entered in Phase 2. Per drawing H-14-020803, Sheets 1- 5, Waste Transfer System (WT) O&M System P&ID, only pits that show floor drains are considered.

4.2.1.3.4 Primary Ventilation

Similar to the AN Tank Farm description.

4.2.1.3.5 Monitoring and Control

Similar to the AN Tank Farm description.

4.2.1.3.6 Demolition

Similar to the AN Tank Farm description.

4.2.2 VENTILATION

4.2.2.1 Description

There are two ventilation systems for the AP Tank Farm, the primary ventilation system and the annulus ventilation system. Planned upgrades only include the primary ventilation system. The functions of the AP Tank Farm primary ventilation system are:

1. Maintain a negative pressure within the vapor space of each of the eight primary tanks.
2. Control the build-up of flammable gases within the vapor space of each of the eight primary tanks.
3. Remove heat from the vapor space of each of the eight primary tanks.

The AP Tank Farm primary ventilation system can be divided into five major subsystems. These five subsystems are:

1. Air control stations
2. The eight primary tanks in the tank farm
3. Exhaust manifold
4. Exhaust station
5. Condensate drain subsystem

The AP Tank Farm ventilation scope differs from AN Tank Farm in one way: the installation of new air control stations. The AP Tank Farm ventilation system upgrades include new air control stations, a new exhaust station, and a new condensate drain subsystem. The exhaust station and condensate drain subsystem are similar to the AN Tank Farm subsystems.

4.2.2.1.1 Air Control Stations

WBS: 5B4J09

The air control stations are shown on drawings H-2-85646 and H-2-85647. These stations will consist of an airflow controller, pre-filter, HEPA filter, and vacuum relief valve. Each tank will require one new air control station. The primary purposes of an air control station are to regulate airflow into the primary tank and to filter radioactive particulate in case of backflow from the primary tank if negative pressure is lost.

4.2.2.1.2 Exhaust Station

WBS: 5B4J02, 5B4J05 and 5B4J34

Similar to the AN Tank Farm exhaust station.

4.2.2.1.3 Condensate Drain Subsystem

WBS: 5B4J07 and 5B4J08

Similar to the AN Tank Farm condensate drain subsystem.

4.2.2.2 Demolition

4.2.2.2.1 Ventilation System

WBS: 5B4J26E

The existing primary ventilation exhaust station will be removed after installation and startup of the new exhaust station and condensate drain subsystem. The concrete foundations will be left in place. The old ventilation system equipment will be removed and treated as mixed waste unless investigation determines otherwise. The old drain pit, if not reused, will be retired in place with the old drain lines cut and capped at their point of entry into the drain pit.

4.2.2.3 Assumptions

The assumptions for the AP Tank Farm are similar to those for the AN Tank Farm.

4.2.3 ELECTRICAL

4.2.3.1 Description

The electrical system upgrades include a new electrical breaker as the power source to the primary ventilation system panel including transformer. Connections for a diesel generator to supply back-up power with panel with duplex receptacles including transformer. Purchasing of a spare main breaker. Upgrading and connecting to the existing ground grid, cathodic protection, and freeze protection systems.

NOTE : For all references stating "Similar to the AN Tank Farm description." in this section, the AN text referring to the AN271 Building is changed to the AP271 Building.

4.2.3.1.1 Main Power Feed to Primary Ventilation Skid

WBS: 5B4J26A

Similar to the AN Tank Farm description.

4.2.3.1.2 Power Receptacle for Portable Diesel Generator

WBS: 5B4J26B

Similar to the AN Tank Farm description

4.2.3.1.3 120 Vac Ground Fault Receptacle for Diesel Generator Battery Charger

WBS: 5B4J26B

Ground fault duplex receptacles in a weatherproof enclosure for the diesel generator battery charger will be provided. The receptacle will be fence-mounted outside at the southeast corner of the AP Tank Farm where the existing support equipment is stored.

4.2.3.1.4 Ventilation Skid Ground Grid and Bonding

WBS: 5B4J26C

Similar to the AN Tank Farm description

4.2.3.1.5 Freeze Protection for Primary Ventilation Drainage Systems

WBS: 5B4J26D

Similar to the AN Tank Farm description

4.2.3.2 Demolition

4.2.3.2.1 Primary Ventilation

WBS: 5B4J26E

Similar to the AN Tank Farm description

4.2.3.3 Assumptions

Note 1: All assumptions in this section are "similar to AN Farm."

Note 2: All drawings referenced by the above Note 1 in this section reflect the AP Farm drawings in the WHC-SD-W314-CDR-001, Rev. 1.

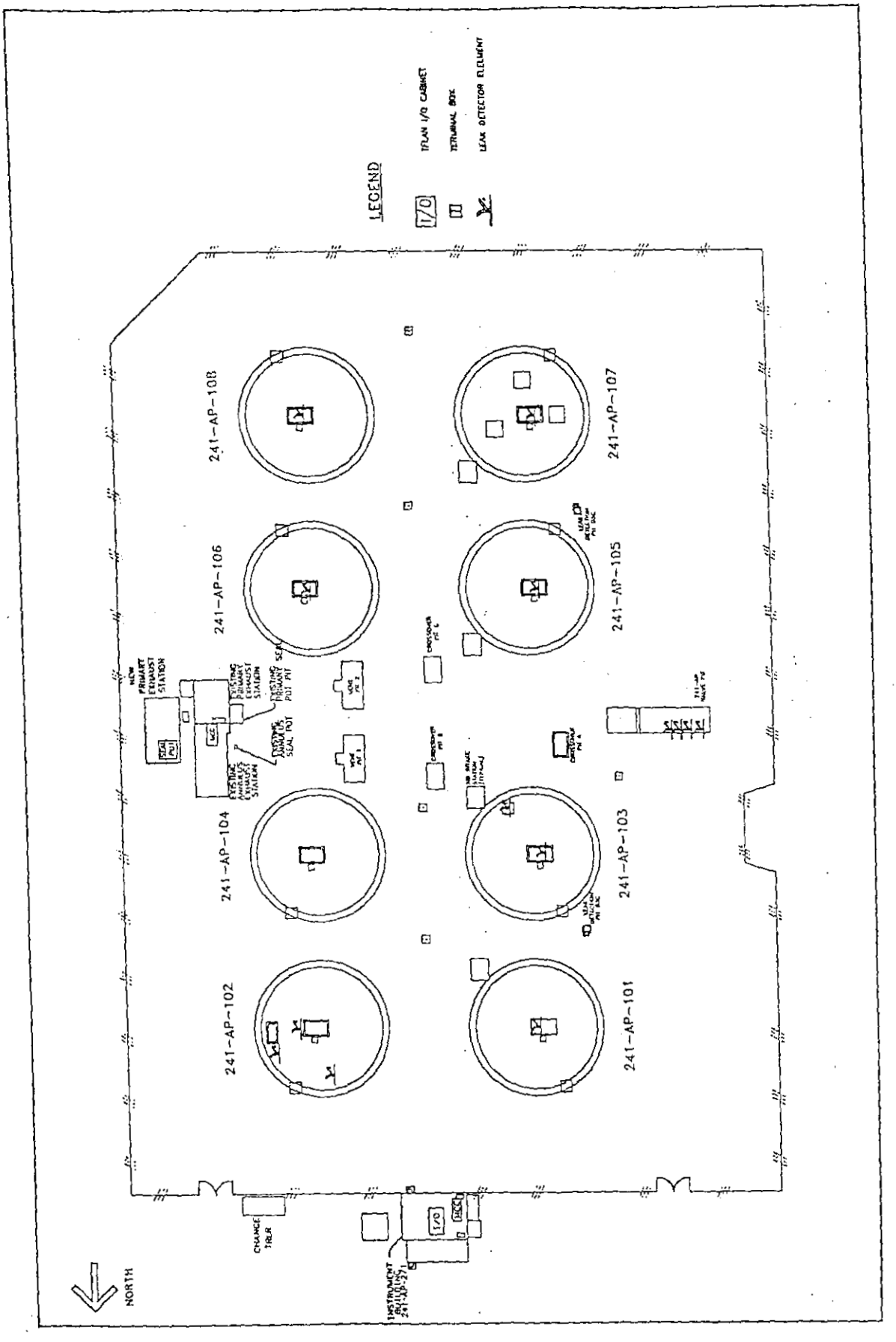

Figure 4.4 AP Tank Farm Upgrades

4.3 AW TANK FARM UPGRADES

Refer to Figure 4.5 for an overview of AW Tank Farm Upgrades.

4.3.1 INSTRUMENTATION AND CONTROL

4.3.1.1 Description

I & C upgrades to AW Tank Farm include primary tank systems, leak detection systems, and the new primary exhaust ventilation system. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarm signals, which will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "241-AW-271 instrument building."

4.3.1.1.1 Primary Tank

4.3.1.1.1.1 Liquid High-Level Measurement

WBS: 5C4J22D

Similar to the AN Tank Farm description except for all six 241-AW tanks.

4.3.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5C4A08A, 5C4B08A, 5C4C08A, 5C4D08A, 5C4E08A, and 5C4F08A

Similar to the AN Tank Farm description except for all six 241-AW tanks.

4.3.1.1.2 Waste Transfer

4.3.1.1.2.1 Valve Position Indication

Similar to AN Tank Farm description.

4.3.1.1.3 Leak Detection

4.3.1.1.3.1 Process Pits

WBS: 5C4A02, 5C4B02, 5C4B10, 5C4B11, 5C4C02, 5C4D02, 5C4E02, and 5C4F02

Similar to the AN Tank Farm description except for the new leak detection system which will be installed in the following process pits:

- Central Pump Pits 01A – 06A
- Drain Pit 02D

- Feed Pump Pit 02E

In addition, drain plug assemblies will be installed in all pits not entered by Phase 1. The following pits will require new drain plug assemblies:

- Central Pump Pits 01A – 06A
- Drain Pit 02D
- Feed Pump Pit 02E

4.3.1.1.3.2 Pipeline Encasement

WBS: 5C4J35

Similar to the AN Tank Farm description, except the new leak detection system will be installed in the following waste transfer pipe encasements:

- DR-334 (Drain Pit 02D)
- DR-335 (Drain Pit 02D)
- DR-361 (Drain Pit 02D)
- SN-267 (Central Pump Pit 02A)
- SN-268 (Central Pump Pit 02A)
- SN-269 (Feed Pump Pit 02E)
- SN-270 (Feed Pump Pit 02E)
- SN-274 (Central Pump Pit 04A)
- SN-220 (Valve Pit AW - A)
- SL-168 (Valve Pit AW - A)
- V021 (Valve Pit AW - A)
- SL-167 (Valve Pit AW - B)
- SN-219 (Valve Pit AW - B)
- V023 (Valve Pit AW - B)
- V022 (Valve Pit AW - B)

4.3.1.1.3.3 Power Panels

WBS: 5C4J28

Similar to the AN Tank Farm description.

4.3.1.1.4 Primary Ventilation Upgrades

WBS: 5C3B00, 5C4J02, 5C4J22A, 5C4J28, and 5C2131

Similar to the AN Tank Farm description.

4.3.1.1.5 Monitoring and Control

4.3.1.1.5.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" section for additional AW Tank Farm work scope and associated WBS numbers.

4.3.1.1.5.2 TFLAN PLC Equipment

WBS: 5C4J22B

Similar to the AN Tank Farm description.

4.3.1.2 Demolition

4.3.1.2.1 Primary Tank

4.3.1.2.1.1 Liquid High-Level Measurement

WBS: 5C4J22E

Similar to the AN Tank Farm description except for all six 241-AW tanks.

4.3.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5C4A08B, 5C4B08B, 5C4C08B, 5C4D08B, 5C4E08B and 5C4F08B

Similar to the AN Tank Farm description except for all six 241-AW tanks.

4.3.1.2.2 Leak Detection

4.3.1.2.2.1 Process Pit Leak Detectors

WBS: 5C4A024, 5C4B024, 5C4B104, 5C4B114, 5C4C024, 5C4D024, 5C4E024, and 5C4F024

Similar to the AN Tank Farm description.

4.3.1.2.2.2 Pipeline Leak Detectors

WBS: 5C4J35C

Similar to the AN Tank Farm description.

4.3.1.2.3 Primary Ventilation

WBS: 5C4J26F

Similar to the AN Tank Farm description.

4.3.1.2.4 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional AW Tank Farm work scope and associated WBS numbers.

4.3.1.3 Assumptions

4.3.1.3.1 General

It is assumed that:

Similar to the AN Tank Farm description.

4.3.1.3.2 Primary Tank

It is assumed that:

Similar to the AN Tank Farm description.

4.3.1.3.3 Leak Detection

Similar to the AN Tank Farm description, except for the following:

4.3.1.3.4 Primary Ventilation

Similar to the AN Tank Farm description.

4.3.1.3.5 Monitoring and Control

Similar to the AN Tank Farm description.

4.3.1.3.6 Demolition

Similar to the AN Tank Farm description.

4.3.2 VENTILATION

4.3.2.1 Description

There are two ventilation systems for the AW Tank Farm,: the primary ventilation system and the annulus ventilation system. Planned upgrades only include the primary ventilation system. The functions of the AW Tank Farm primary ventilation system are:

1. Maintain a negative pressure within the vapor space of each of the six primary tanks.
2. Control the buildup of flammable gases within the vapor space of each of the six primary tanks.
3. Remove heat from the vapor space of each of the six primary tanks.

The AW Tank Farm primary ventilation system can be divided into five major subsystems. These five subsystems are:

1. Air control stations
2. The six primary tanks in the tank farm
3. Exhaust manifold
4. Exhaust station
5. Condensate drain subsystem

The air control stations (see drawing H-2-85646), the primary tanks, and the exhaust manifold are existing and will not be modified or upgraded. The AW Tank Farm ventilation system upgrades include a new exhaust station and a new condensate drain subsystem. The new primary exhaust station and the new condensate drain subsystem are similar to the AN Tank Farm description.

4.3.2.1.1 Exhaust Station

WBS: 5C4J02, 5C4J05 and 5C4J34

Similar to the AN Tank Farm exhaust station.

4.3.2.1.2 Condensate Drain Subsystem

WBS: 5C4J07 and 5C4J08

Similar to the AN Tank Farm condensate drain subsystem.

4.3.2.2 DEMOLITION

4.3.2.2.1 Ventilation System

WBS: 5C4J26F

The existing primary ventilation exhaust station will be removed after installation and startup of the new exhaust station and condensate drain subsystem. The concrete foundations will be left in place. The old ventilation system equipment will be removed and treated as mixed waste unless investigation determines otherwise. The old drain pit, if not reused, will be retired in place with the old drain lines cut and capped at their point of entry into the drain pit.

4.3.2.3 Assumptions

The assumptions for the AW Tank Farm are similar to those for the AN Tank Farm.

4.3.3 ELECTRICAL

4.3.3.1 Description

The electrical system upgrades include a new electrical breaker as the power source to the primary ventilation system and a panel including transformer. In addition, the following upgrades will be provided:

- Connections for a diesel generator to supply back-up power with a panel with at least (4) ground fault duplex receptacles including transformer
- Purchasing of a spare main breaker
- Upgrading and connecting to the existing ground grid, cathodic protection and freeze protection systems
- Installing (3) new circuit breakers into the existing "A" panel board in the 241-AW-271 building.

NOTE 1: For all references stating "similar to the AN Tank Farm description" in this section, the AN text referring to the AN271 Building is changed to the AW271 Building.

NOTE 2: For all references stating "similar to the AN Tank Farm description except for . . . " in this section will state alterations or differences from the AN text.

4.3.3.1.1 Main Power Feed to Primary Ventilation Skid

WBS: 5C4J26A

Similar to the AN Tank Farm description

4.3.3.1.2 Power Receptacle for Portable Diesel Generator

WBS: 5C4J26B

Similar to the AN Tank Farm description with the following addition:

Also provide, install, and wire an existing generator set; a new enclosed 100AF/100AT, 3 pole, 600 Vac circuit breaker; and a 3 kVA mini-power center with 120 Vac ground fault receptacles. All wire will be routed via a NEMA 4 wire gutter. Also install the reel mounted 100 A, 4 pole, and 4W power cord with plug to match the power receptacle for connecting to ventilation skid.

4.3.3.1.3 Spare Circuit Breaker for AW241-EDS-ENCL-100, 1000 kVA Loadcenter (C8S35)

WBS: 5C4J26C

Similar to the AN Tank Farm description

4.3.3.1.4 Ventilation Skid Ground Grid and Bonding

WBS: 5C4J26D

Similar to the AN Tank Farm description.

4.3.3.1.5 Freeze Protection for Primary Ventilation Drainage Systems

WBS: 5C4J26E

Similar to the AN Tank Farm description.

4.3.3.1.6 Circuit Breakers for Panelboard "AW271-EDS-DP-102A"

WBS: 5C4J26A

Procure and install three (3) new single pole, 100AF/20AT, 600 Vac circuit breakers in panelboard AW271-EDS-DP-102A located in the AW Farm AW271 building. These breakers for support of instrumentation power requirements.

4.3.3.2 Demolition

4.3.3.2.1 Primary Ventilation

WBS: 5C4J26F

Similar to the AN Tank Farm description.

4.3.3.3 Assumptions

Note 1: All assumptions in this section are "similar to AN Farm."

Note 2: All drawings referenced by the above Note 1 in this section reflect the AW Farm drawings in the WHC-SD-W314-CDR-001, Rev. 1.

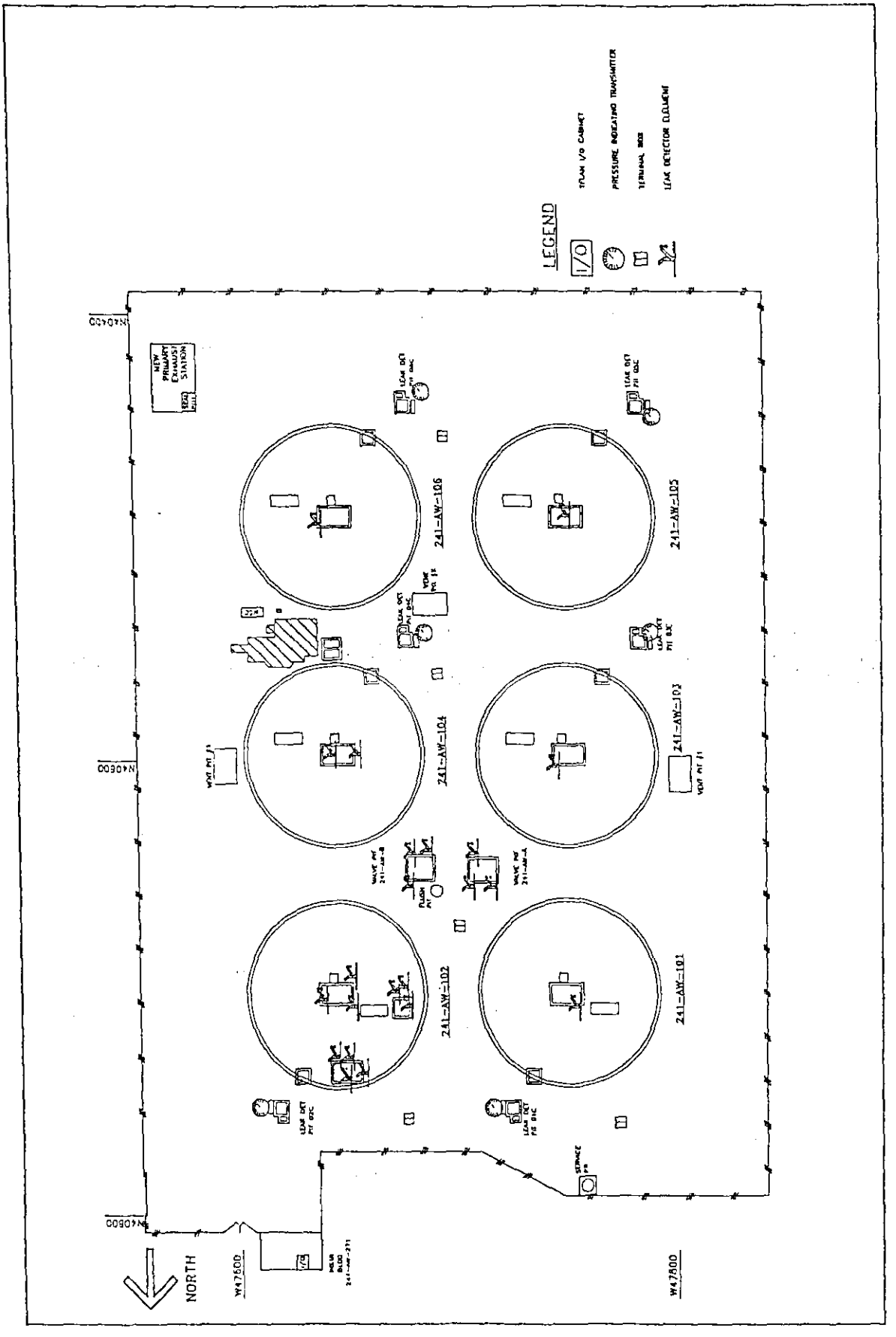

Figure 4.5 AW Tank Farm Upgrades

4.4 AY TANK FARM UPGRADES

Refer to Figure 4.6 for an overview of AY Tank Farm Upgrades.

4.4.1 INSTRUMENTATION AND CONTROL

4.4.1.1 Description

Instrumentation and control upgrades to AY Tank Farm include primary tank systems, and leak detection systems. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarms and Micon signals, which will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "241-AY-801A instrument building" for existing tank farm instrumentation and "241-AZ-702 control building" for TFLAN connections.

4.4.1.1.1 Primary Tank

4.4.1.1.1.1 Liquid High-Level Measurement

WBS: 5D4J22E

Similar to the AN Tank Farm description except for both 241-AY tanks.

The high-level alarm signals from the two probes will be routed from the 241-AY-801A instrument building to a TFLAN PLC I/O panel located in the 241-AZ-702 building.

4.4.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5D4A08A and 5D4B08A

Similar to the AN Tank Farm description except for both 241-AY tanks.

The pressure measurement signals from the electronic transmitters will be routed to a terminal box in the 241-AY-801 instrument building and from there to a TFLAN PLC I/O panel located in the 241-AZ-702 building. No connections will be made to the existing primary exhaust ventilation system.

4.4.1.1.2 Leak Detection

4.4.1.1.2.1 Pipeline Encasement

WBS: 5D4J29

Similar to the AN Tank Farm description except for the new leak detection system will be installed in the following waste transfer pipe encasements:

SL-505 (Pump Pit 01A)
SL-504 (Pump Pit 02A)
SL-503 (Pump Pit 02A)

4.4.1.1.2.2 Power Panels

WBS: 5D4J28

Similar to the AN Tank Farm description.

4.4.1.1.3 Monitoring and Control

4.4.1.1.3.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional AY Tank Farm work scope and associated WBS numbers.

4.4.1.1.3.2 TFLAN PLC Equipment

WBS: 5D4J22B

Similar to the AN Tank Farm description.

4.4.1.2 Demolition

4.4.1.2.1 Primary Tank

4.4.1.2.1.1 Liquid High-Level Measurement

WBS: 5D4J22F

Similar to the AN Tank Farm description.

4.4.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5D4A08B and 5D4B08B

Similar to the AN Tank Farm description.

4.4.1.2.2 Leak Detection

4.4.1.2.2.1 Pipeline Leak Detectors

WBS: 5D4J29C

Similar to the AN Tank Farm description.

4.4.1.2.3 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" section for additional AY Tank Farm work scope and associated WBS numbers.

4.4.1.3 Assumptions

4.4.1.3.1 General

Similar to the AN Tank Farm description.

4.4.1.3.2 Primary Tank

Similar to the AN Tank Farm description.

4.4.1.3.3 Leak Detection

Similar to the AN Tank Farm description.

4.4.1.3.4 Monitoring and Control

Similar to the AN Tank Farm description.

4.4.1.3.5 Demolition

Similar to the AN Tank Farm description except that no demolition of the existing primary exhaust stack instrument enclosure will be performed.

4.4.2 ELECTRICAL

4.4.2.1 Description

The electrical system upgrades include a new motor control center (MCC) electrical breaker as the power source to the primary ventilation system and a 120 Vac panel including transformer.

NOTE : For all references stating "Similar to the AN Tank Farm description." in this section, the AN text referring to the AN271 Building is changed to the AY271 Building.

4.4.2.1.1 Motor Control Center for Primary Ventilation

WBS: 5D4J26A

The existing MCC-AY1 will be replaced with a new one to accommodate the existing load as shown on 241-AY Tank Farm One-Line Diagram (Ref. WHC-SD-W314-CDR-001, Rev. 1, Figure E-4). The trip setting of the feeder breaker in the existing switchgear will be changed to provide overcurrent protection to the existing feeder to MCC-AY1. The switchgear is located at substation 241-A. A new mini-power center will be provided to supply power to the new instrumentation equipment and control panel. This mini-power center will be fed from the new MCC. The new motor control center will be bonded to the existing ground grid.

4.4.2.2 Demolition

4.4.2.2.1 Primary Ventilation

WBS: 5D4J26C

Disconnect and remove the feeders of the primary fan motors. Disconnect and remove associated conduit, wiring, panels, and junction boxes.

4.4.2.3 Assumptions

4.4.2.3.1 General

Note 1: All assumptions in this section are "similar to AN Farm."

Note 2: All drawings referenced by the above Note 1 in this section reflect the AY Farm drawings in the WHC-SD-W314-CDR-001, Rev. 1.

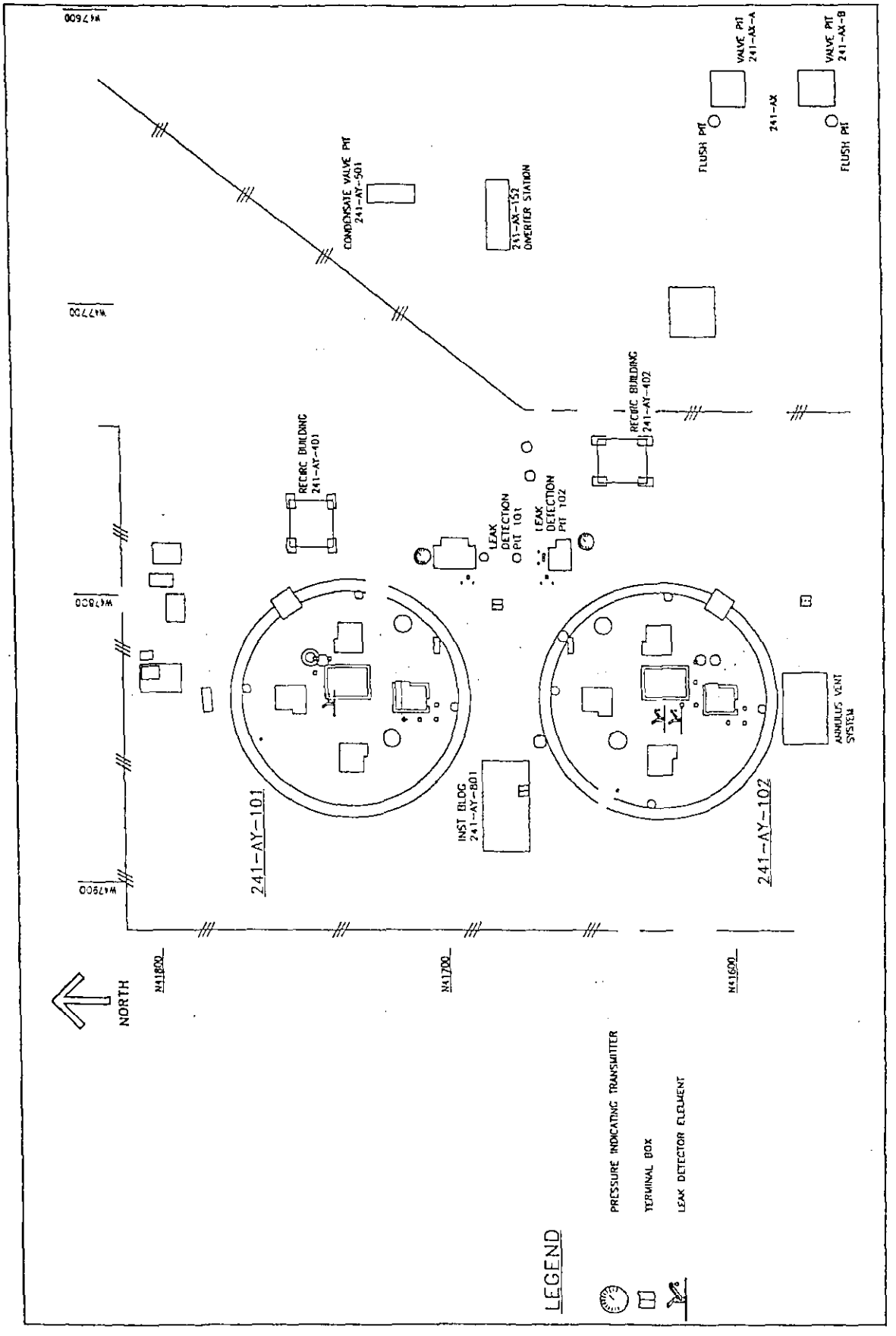

Figure 4.6 AY Tank Farm Upgrades

4.5 AZ TANK FARM UPGRADES

Refer to Figure 4.7 for an overview of AZ Tank Farm Upgrades.

4.5.1 INSTRUMENTATION AND CONTROL

4.5.1.1 Description

Instrumentation and control upgrades to AZ Tank Farm include primary tank systems and leak detection systems. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarm Micon signals, which will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "241-AZ-801A instrument building" for existing tank farm instrumentation and "241-AZ-702 control building" for TFLAN connections.

4.5.1.1.1 Primary Tank

4.5.1.1.1.1 Liquid High-Level Measurement

WBS: 5E4J22E

Similar to the AN Tank Farm description except for both 241-AZ tanks.

The high-level alarm signals from the two probes will be routed from the 241-AZ-801A instrument building to a TFLAN PLC I/O panel located in the 241-AZ-702 building.

4.5.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5E4A08A and 5E4B08A

Similar to the AN Tank Farm description except for both 241-AZ tanks.

The pressure measurement signals from the electronic transmitters will be routed to a terminal box in the 241-AZ-801A instrument building and from there to a TFLAN PLC I/O panel located in the 241-AZ-702 building. No connections will be made to the existing primary exhaust ventilation system.

4.5.1.1.2 Leak Detection

4.5.1.1.2.1 Pipeline Encasement

WBS: 5E4J29

Similar to the AN Tank Farm description except for the leak detection signals which will be wired to a TFLAN PLC I/O panel located in building 241-AZ-702. Wires will be routed via a

field terminal box to a terminal box in the 241-AZ-801A instrument building then to the PLC in building 241-AZ-702.

The following waste transfer pipe encasements will have a new leak detection system installed:

- PW-4507
- PW-4508

4.5.1.1.2.2 Power Panels

WBS: 5E4J28

Similar to the AN Tank Farm description.

4.5.1.1.3 Monitoring and Control

4.5.1.1.3.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" section for additional AZ Tank Farm work scope and associated WBS numbers.

4.5.1.1.3.2 TFLAN PLC Equipment

WBS: 5E4J22B

Similar to the AN Tank Farm description.

4.5.1.2 Demolition

4.5.1.2.1 Primary Tank

4.5.1.2.1.1 Liquid High-Level Measurement

WBS: 5E4J22F

Similar to the AN Tank Farm description.

4.5.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5E4A08B and 5E4B08B

Similar to the AN Tank Farm description.

4.5.1.2.2 Leak Detection

4.5.1.2.2.1 Pipeline Leak Detectors

WBS: 5E4J29C

Similar to the AN Tank Farm description.

4.5.1.2.3 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional AZ Tank Farm work scope and associated WBS numbers.

4.5.1.3 Assumptions

4.5.1.3.1 General

Similar to the AN Tank Farm description.

4.5.1.3.2 Primary Tank

Similar to the AN Tank Farm description.

4.5.1.3.3 Leak Detection

Similar to the AN Tank Farm description.

4.5.1.3.4 Monitoring and Control

Similar to the AN Tank Farm description.

4.5.1.3.5 Demolition

Similar to the AN Tank Farm description except that no demolition of the existing primary exhaust stack instrument enclosure will be performed.

4.5.2 ELECTRICAL

4.5.2.1 Description

The electrical system upgrades include a MCC, which will feed the mini-power center and a second MCC to replace the exiting MCC as the power source to the heater controllers.

NOTE : For all references stating "Similar to the AN Tank Farm description." in this section, the AN text referring to the AN271 Building is changed to the AZ271 Building.

4.5.2.1.1 Motor Control Center for Primary Ventilation

WBS: 5E4J26A

The existing EDS-MCC-704 will be replaced with a new MCC located inside the 241-AZ-801A building as shown on 241-AZ Tank Farm One-Line Diagram (Ref. WHC-SD-W314-CDR-001, Rev. 1, Figure E-5 and Figure E-5A). A new mini-power center will be provided to supply power to the instrumentation equipment and control panel. This mini-power center will be fed from the new EDS-MCC-704. The new MCC will be bonded to the existing ground grid.

4.5.2.2 Demolition

4.5.2.2.1 Primary Ventilation

WBS: 5E4J26C

Similar to the AN Tank Farm description.

4.5.2.3 Assumptions

4.5.2.3.1 General

Note 1: All assumptions in this section are "similar to AN Farm."

Note 2: All drawings referenced by the above Note 1 in this section reflect the AZ Farm drawings in WHC-SD-W314-CDR-001, Rev. 1.

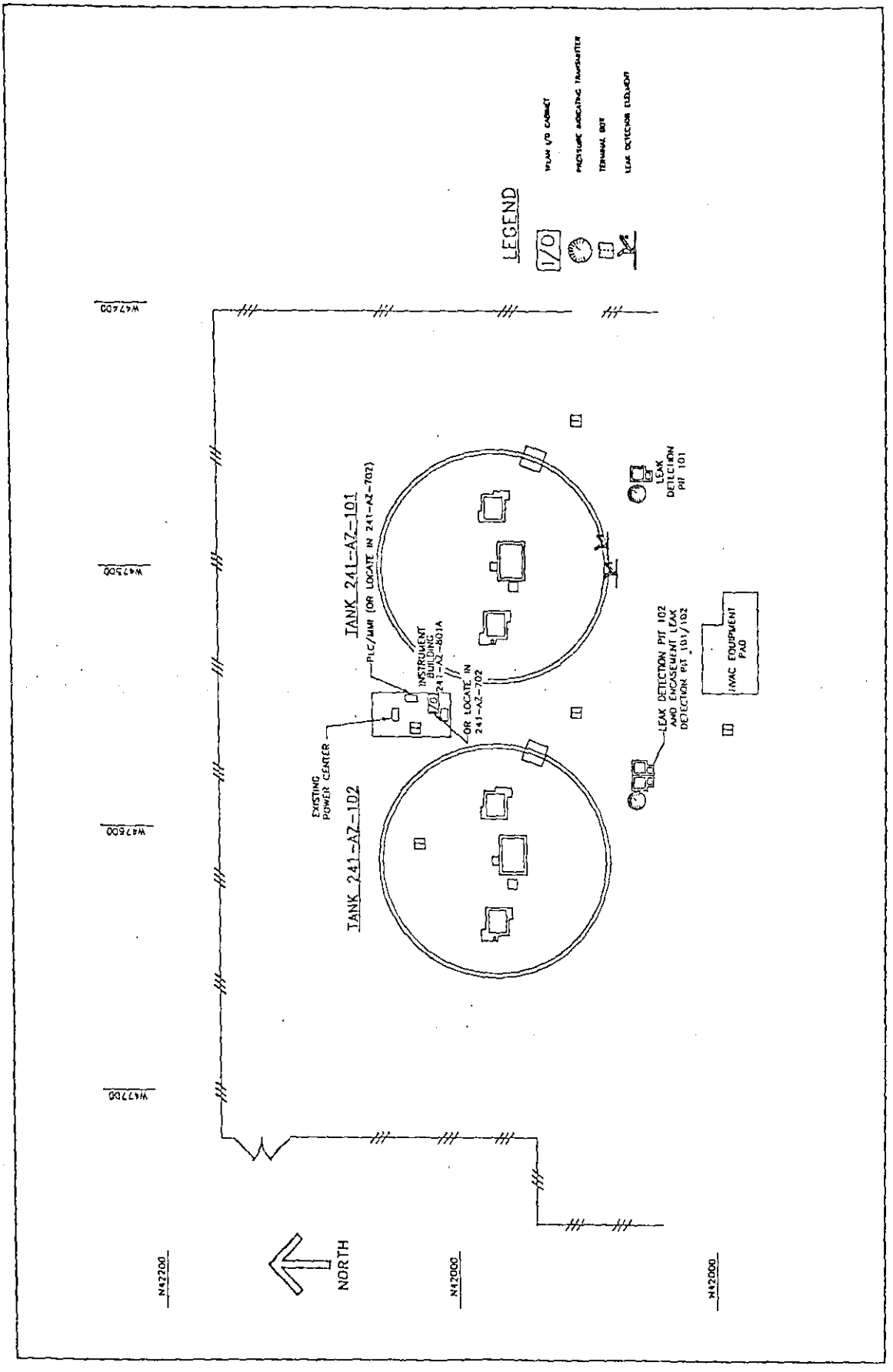

Figure 4.7 AZ Tank Farm Upgrades

4.6 SY TANK FARM UPGRADES

4.6.1 INSTRUMENTATION AND CONTROL

Refer to Figure 4.8 for an overview of SY Tank Farm Upgrades.

4.6.1.1 Description

Instrumentation and control upgrades to SY Tank Farm include primary tank systems, leak detection systems, and the new annulus exhaust ventilation system. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for Panalarm signals, which will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "241-SY-271 instrument building" for existing tank farm instrumentation and "242-S building" for TFLAN connections.

4.6.1.1.1 Primary Tank

4.6.1.1.1.1 Liquid High-Level Measurement

WBS: 5F4J22

New intrinsically safe resistive/conductivity liquid high-level probes will be installed in all three tanks. The high-level alarm signals from the three probes will connect to a TFLAN I/O panel in the 242-S building. Signal wires will be routed via a field terminal box to a terminal box in the 241-SY-271 instrument building and then to the PLC in Building 242-S. The signals from the liquid high-level probes will be monitored by the TFLAN PLC and displayed on the TFLAN HMI.

4.6.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5F4A08A, 5F4B08A, and 5F4C08A

Similar to the AN Tank Farm description except for all three 241-SY tanks.

4.6.1.1.2 Waste Transfer

4.6.1.1.2.1 Valve Position Indication

Similar to AN Tank Farm description.

4.6.1.1.3 Leak Detection

4.6.1.1.3.1 Process Pits

WBS: 5F4A02, 5F4B02, 5F4B14, 5F4B15, 5F4C02, 5F4K01 and 5F4L01

Similar to the AN Tank Farm description except for the new leak detection system, which will be installed in the following process pits:

- Central Pump Pits 01A – 03A
- Flush Pits 02E
- Valve Pits A and B
- Drain Pit 02D

In addition, drain plug assemblies will be installed in all pits not entered by Phase 1. The following pits will require new drain plug assemblies:

- Central Pump Pits 01A – 03A
- Flush Pits 02E
- Valve Pits A and B
- Drain Pit 02D

4.6.1.1.3.2 Pipeline Encasement

WBS: 5F4J35

Similar to the AN Tank Farm description except for the new leak detection system which will be installed in the following waste transfer pipe encasements:

SL-178 (Pit 01A)
SN-278 (Pit 01A)
SL-177 (Pit 02A)
SN-277 (Pit 02A)
PW-475 (Pit 02A)
PW-476 (Pit 02A)
SL-179 (Pit 03A)
SN-279 (Pit 03A)
PW-479 (Pit 03A)
PW-480 (Pit 03A)
Valve Pit A
Valve Pit A
Valve Pit A
Valve Pit B
Valve Pit B
Valve Pit B

4.6.1.1.3.3 Power Panels

WBS: 5F4J28

Similar to the AN Tank Farm description.

4.6.1.1.4 Annulus Ventilation

WBS: 13Q

The annulus ventilation system will be refurbished with components of similar capacity.

(I&C) equipment will be supplied with the new annulus exhaust ventilation system to monitor the status and control the operation of the ventilation system. Refer to Figure 4.9 "Annulus Exhaust Station Flow Diagram."

The annulus ventilation exhaust station will consist of a single exhaust train containing a control/isolation valve, an inlet plenum, prefilter, test sections, HEPA filters, an outlet plenum, and an exhaust fan. The existing CAM will be reconnected to a new exhaust stack.

The ventilation system will be designed to operate under local manual control only. Instruments for measuring inlet and differential pressure and train temperature will be installed on the exhaust station. Hard-wired permissives/interlocks from the new differential pressure indicating switches, the existing CAM, and a temperature-indicating switch will control exhaust fan operation.

4.6.1.1.4.1 Exhaust Station

Inlet pressure: The exhaust train inlet pressure will be measured with respect to atmosphere by a differential pressure-indicating switch (PDIS). A pressure sense tap will be located on the exhaust manifold duct and routed to a local (high/low) PDIS. The PDIS will provide a local indication of inlet pressure and will provide permissives for starting or stopping the exhaust fan when the high or low-pressure setpoint is reached.

Differential pressure: Differential pressure across the prefilter and the two HEPA filters will be measured by differential pressure indicating switches. A pressure sense tap will be located on the housing on each side of the device measured and routed to a PDIS. Each PDIS will provide a local indication of differential pressure and an interlock to the exhaust fan.

Exhaust train temperature: The temperature of the inlet plenum will be measured by a temperature-indicating switch (TIS). The temperature element will be installed in a well mounted on the inlet plenum housing and the temperature signal from the sensor will be wired to the TIS. The TIS will provide a local indication of heater temperature.

Exhaust fan: The exhaust fan will be controlled by a magnetic starter. Power to the exhaust fan starter will be interrupted by a manual on/off switch and interlocks hard-wired to a starter relay from ventilation system instruments.

4.6.1.1.4.2 Continuous Air Monitor

The existing CAM will be connected to the new stack and an interlock from the CAM will be hard-wired to the exhaust fan.

4.6.1.1.4.3 Ventilation System Monitoring and Control

Local indicators and manual controls, including hard-wired interlocks, will be provided to facilitate manual operation of the ventilation system. At least one set of hard-wired interlocks

(for high and low-pressure events) and a hard-wired relay from the CAM will be provided to initiate an exhaust shutdown.

NOTE: The need for remote monitoring of the annulus ventilation system at the TFLAN PLC/HMI will be evaluated during definitive design.

4.6.1.1.5 Monitoring and Control

4.6.1.1.5.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" for additional SY Tank Farm work scope and associated WBS numbers.

4.6.1.1.5.2 TFLAN PLC Equipment

WBS: 5F4J22

Similar to the AN Tank Farm description.

4.6.1.2 Demolition

4.6.1.2.1 Primary Tank

4.6.1.2.1.1 Liquid High-Level Measurement

WBS: N/A

SY tanks do not have high-level probes.

4.6.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5F4A08B, 5F4B08B and 5F4C08B

Similar to the AN Tank Farm description except for all three 241-SY tanks.

4.6.1.2.2 Leak Detection

4.6.1.2.2.1 Process Pit Leak Detectors

WBS: 5F4A024, 5F4B024, 5F4B144, 5F4B154, 5F4C024, 5F4J164, 5F4J174, 5F4K014, and 5F4L014

Similar to the AN Tank Farm description.

4.6.1.2.2.2 Pipeline Leak Detectors

WBS: 5F4J35C

Similar to the AN Tank Farm description.

4.6.1.2.3 Annulus Ventilation

WBS: 13Q2, 13Q4

Similar to the AN Tank Farm description, except for the annulus ventilation system. The existing stack CAM will not be removed.

4.6.1.2.4 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional SY Tank Farm work scope and associated WBS numbers.

4.6.1.3 Assumptions

4.6.1.3.1 General

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

- The annulus exhaust stack instrument enclosure will not be removed
- The existing CAM will be reconnected to the new exhaust stack.

4.6.1.3.2 Primary Tank

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

1. New intrinsically safe liquid high-level probe systems, one for each tank including associated cabling, have not been installed by others.
2. The new liquid high-level probes will be similar to the resistive-conductivity probes used for pit leak detection.

4.6.1.3.3 Leak Detection

Similar to the AN Tank Farm description.

4.6.1.3.4 Annulus Ventilation

Similar to the AN Tank Farm description, except for the annulus ventilation system and:

1. A condensate drain subsystem is not required.
2. A GEMS is not required.
3. A ventilation system PLC is not required.

4.6.1.3.5 Monitoring and Control

Similar to the AN Tank Farm description.

4.6.1.3.6 Demolition

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

The annulus exhaust stack instrument enclosure will not be removed.

4.6.2 VENTILATION

4.6.2.1 Description

Project W-314 Phase 2 ventilation upgrades to the SY Tank Farm consist of upgrading only the annulus ventilation system. The primary ventilation system upgrades are not part of the Project W-314, Phase 2 scope of work.

The SY annulus ventilation system can be subdivided into the following major subsystems:

- Inlet air filters (15 total)
- Tank farm annulus portion of the double-shell tanks (three total)
- Exhaust manifold
- Exhaust station

Only the exhaust station will be upgraded. A condensate drain subsystem is not required for the SY annulus ventilation system.

4.6.2.1.1 Exhaust Station

WBS: 13Q2, 13Q4

The SY Tank Farm annulus exhaust station system flow diagram is shown on Figure 4.9. The new annulus exhaust station will be designed, fabricated, tested, and installed as a modular unit. It will be installed on a concrete slab with anchor bolts. Components of the single train exhaust station will be standardized as much as possible with exhaust stations to be installed in the AN, AP, AW and tank farms. The exhaust station modular unit/units will be fabricated with lifting lugs so the exhaust station module or modules can be easily lifted and erected on a concrete slab/foundation.

The exhaust station instrumentation will be hard-wired to an instrumentation cabinet mounted at some convenient location on the structural steel supports of the exhaust station. The exhaust station equipment requiring electrical power will be hard-wired to an electrical power cabinet installed at some convenient location on the structural steel of the exhaust station. Heat-traced sight glasses shall be installed in the ducts, exhaust fans, and exhaust stack of the dual filter train exhaust station as a means of seeing and removing any condensation that may occur in the exhaust station equipment.

For standardization and ease of maintenance purposes, a GEMS designed by Project W-420, Stack Monitoring System Upgrades, shall be installed to monitor and sample possible

radionuclides that may exit the exhaust stack. The GEMS will be installed as part of the exhaust station.

The individual components of the annulus exhaust station are shown on the flow diagram (see Figure 4.9). The annulus exhaust station will pass an operational readiness review (ORR) and acceptance for beneficial use (ABU) tests. The old annulus exhaust station will be shut down and the new station connected to a tie-in flange on the existing annulus exhaust manifold. Minimum downtime is desired.

A radioactive shielding wall is not needed around the exhaust station. A protective canopy with flood lighting installed below the canopy is not needed.

4.6.2.1.2 DEMOLITION AND DISPOSAL

WBS: 13Q4

The old annulus exhaust station shall be dismantled into manageable pieces upon acceptance and operation of the new station. That portion of the exhaust manifold downstream of the chosen tie-in location will become waste. The waste shall be placed into approved containers, reduced in size if economical, and transported to the Hanford low-level burial grounds for storage/burial. All waste is expected to be radioactive, low-level, mixed waste until sampled and proved otherwise. It is desirable to leave old concrete slabs and piers in place if they will not interfere with operations.

4.6.2.2 Assumptions

The existing annulus exhaust manifold, upstream of the chosen tie-in location, will not be modified except for a tie-in connection to the new annulus exhaust station. No encasement is required for the existing annulus exhaust manifold.

1. The existing annulus exhaust manifold, upstream of the chosen tie-in location, will accommodate any potential new design flow.
2. The tank dome loading criteria will be met.
3. All waste is radioactive, low-level, mixed waste.
4. Old concrete footings/slabs will not be removed.
5. New air control stations similar to the existing design shown on drawings H-2-85646 and H-2-85647 are not required.
6. No drain pit, seal pot, or drain piping to and from the seal pot will be required.
7. The old exhaust station will be shut down only when the new station has been fully tested and is ready for tie-in.
8. The new exhaust station stack exhaust will be sampled and monitored with a GEMS used on Project W-420, Stack Monitoring System Upgrades. It is not necessary to monitor for toxic air pollutants (TAPs) and volatile organic compounds (VOCs).

4.6.3 ELECTRICAL

4.6.3.1 Description

The electrical system upgrades include a new electrical breaker as the power source to the existing Ventilation Equipment Power Panel located on the existing vent skid pad fed from the MCC-241-SY-271 in the 241-SY-271 building. A mini-power center will provide a panel including transformer. Connections for a diesel generator to supply back-up power with a 120 Vac panel with ground fault duplex receptacles including transformer. Upgrading and connecting to the existing ground grid.

NOTE : For all references stating "similar to the AN Tank Farm description" in this section, the AN text referring to the AN271 Building is changed to the SY271 Building.

4.6.3.1.1 Main Power Feed to Annulus Ventilation Skid

WBS: 13Q4

A new 480 Vac, 60 Hz circuit breaker will be installed to feed the existing ventilation equipment power panel located on the existing vent equipment pad and mini-power center for the new instrumentation control panel. A mini-power center will be installed to supply 120 Vac power to a new I&C panel.

Power for the annulus ventilation system will be upgraded as follows:

1. Power to the new fans will be supplied for annulus exhaust and will replace the existing exhaust fans.
2. The existing circuit breaker to the annulus ventilation skid power panel will have the power feed cable replaced to support the upgraded load.
3. A new mini-power center will be provided to supply power to the instrumentation equipment and control panel. This mini-power center will be fed from the new ventilation equipment.

4.6.3.1.2 Power Receptacle for Portable Diesel Generator

WBS: 13Q2

Procure and install one new power receptacle for the portable diesel generator. This receptacle, transfer switch, and associated hardware will provide the capability to connect backup power to the annulus ventilation skid.

4.6.3.1.3 Ground Grid and Bonding

WBS: 13Q4

Similar to the AN Tank Farm description.

4.6.3.2 Demolition

4.6.3.2.1 Annulus Ventilation

WBS: 13Q4

Similar to the AN Tank Farm description.

4.6.3.3 Assumptions

Note 1: All assumptions in this section are similar to AN Farm.

Note 2: All drawings referenced by the above Note 1 in this section reflect the SY Farm drawings in WHC-SD-W314-CDR-001, Rev. 1

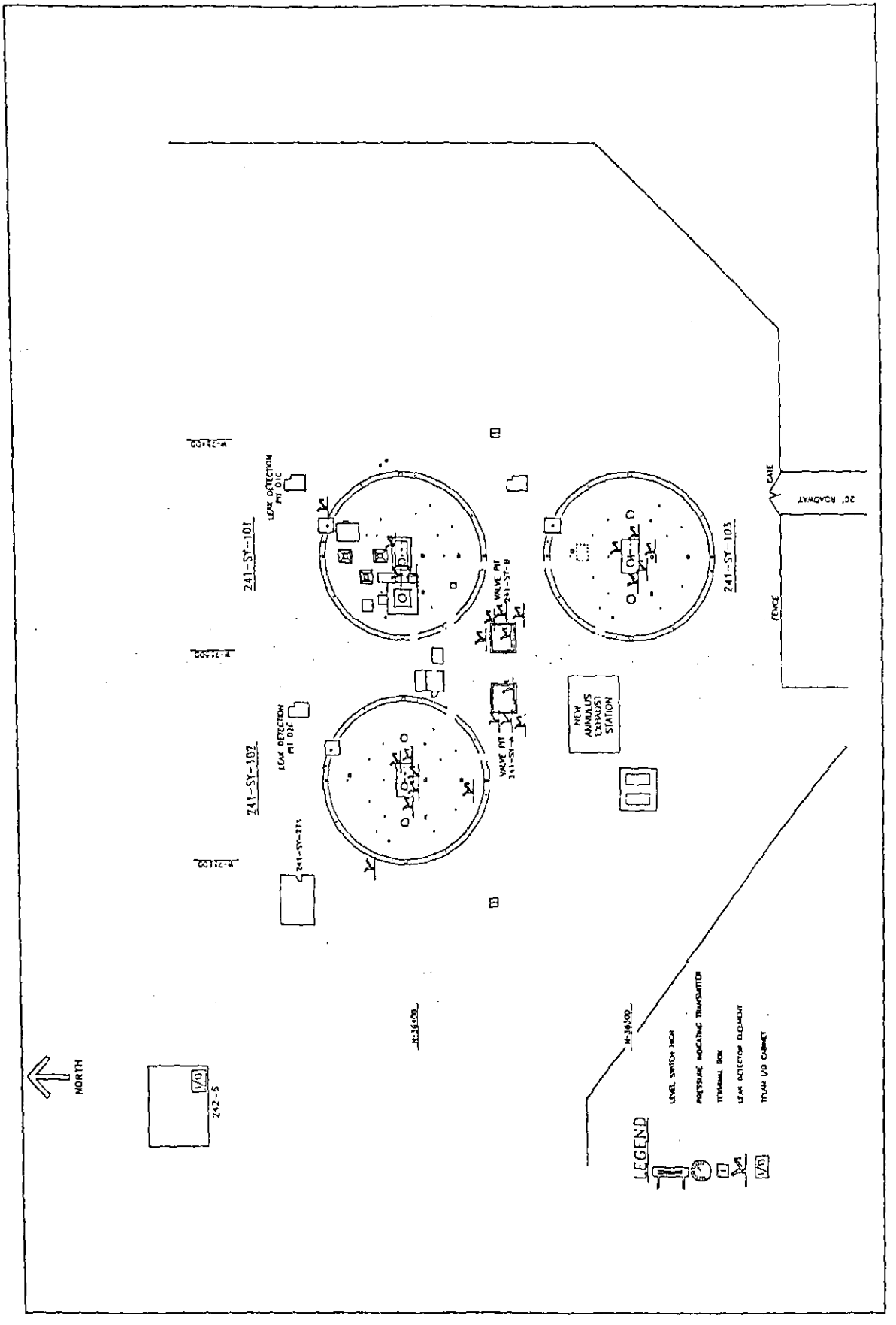

Figure 4.8 SY Tank Farm Upgrades

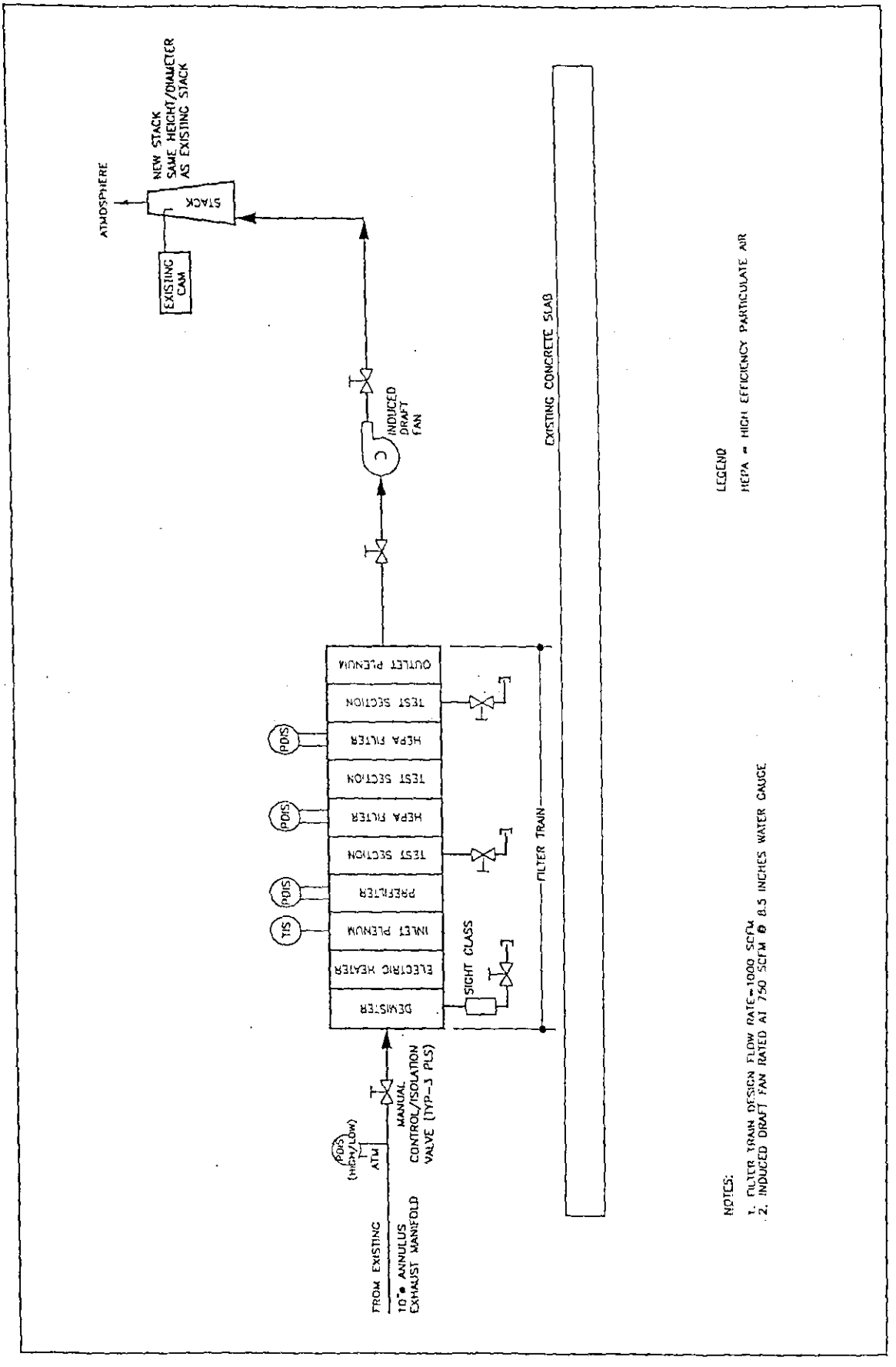

Figure 4.9 Annulus Exhaust Station Flow Diagram - SY Tank Farm

4.7 244-S DCRT UPGRADES

Refer to Figure 4.10 for an overview of 244-S DCRT upgrades.

4.7.1 INSTRUMENTATION AND CONTROL

4.7.1.1 Description

Instrumentation and control upgrades to the 244-S DCRT primary tank systems, leak detection systems, and the new primary/annulus exhaust ventilation system. Selected existing alarms and signals, and signals from Phase 2 upgraded systems will be connected to the TFLAN system, except for temperature signals, that will be connected to TMACS.

NOTE: For all statements "similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "244-S instrument building" for existing tank farm instrumentation and "242-S building" for TFLAN connections.

4.7.1.1.1 Primary Tank

4.7.1.1.1.1 Waste Temperature Measurement

WBS: 5H4B02A

The existing thermocouple tree in 244-S DCRT will be replaced with a new temperature probe assembly. The signals from the temperature probe will be routed from the terminal box on the temperature probe assembly to a field terminal box and from there to a terminal box in the 244-S instrument building. The temperature signals will be parallel-wired in the 244-S instrument building with one branch routed to a TFLAN PLC I/O panel located in the 242-S building. The signals input to the TFLAN I/O panel will be monitored by the TFLAN PLC and displayed on the TFLAN HMI. The other branch of the temperature signal wiring will connect to a new local TMACS assembly in the 244-S instrument building where the temperature signals will be converted to RS-232 for transmission to TMACS via a modem.

4.7.1.1.1.2 Vapor Space Pressure Measurement

WBS: 5H4B11A

Similar to the AN Tank Farm description except for the 244-S DCRT primary tank.

4.7.1.1.2 Leak Detection

4.7.1.1.2.1 Tank Annulus Liquid Presence Detector

WBS: 5H4B03

New annulus leak detection system will be installed in the tank annulus. The system shall provide a local and remote alarm. These devices will be located in the existing opening used by

the specific gravity and weight factor tubes. These tubes are to be removed per the demolition section. The annulus leak detection wires will be routed via a field terminal box to a terminal box in the instrument building then to the TFLAN PLC in Building 242-S. The annulus leak detection signals will be monitored by the TFLAN PLC and displayed on the TFLAN HMI.

4.7.1.1.2.2 Tank Pump Pit Liquid Presence Detector

WBS: 5H4B00

New pump pit leak detection system will be installed in the tank pump pit. The system shall provide a local and remote alarm. These devices will be located in the existing opening used by the specific gravity and weight factor tubes. These tubes are to be removed per the demolition section. The annulus leak detection wires will be routed via a field terminal box to a terminal box in the instrument building then to the TFLAN PLC in building 242-S. The annulus leak detection signals will be monitored by the TFLAN PLC and displayed on the TFLAN HMI.

4.7.1.1.2.3 Pipeline Encasement

WBS: 5H4B35

Similar to the AN Tank Farm description except for the following waste transfer pipe encasements which will have a new leak detection system installed:

- V456
- V522
- V560
- V561
- V562
- Flush Pit Drain
- WT-SNL-5350-M17 (3)

4.7.1.1.2.4 Power Panels

WBS: 5H4B16

Similar to the AN Tank Farm description.

4.7.1.1.3 Primary/Annulus Ventilation

WBS: 5H3B00, 5H4B05, 5H4B12A and 5H4B16

I&C equipment will be supplied with the new primary/annulus exhaust ventilation system to monitor the status and control the operation of the ventilation system. Refer to Figure 4.11 "Primary/Annulus Exhaust Station Flow Diagram." The major ventilation system components are:

- Exhaust station
- GEMS

- Condensate drain subsystem

The primary exhaust ventilation station will consist of an inlet section containing a glycol heater and manual control/isolation valve; and a single train containing inlet plenum, test sections, HEPA filters, outlet plenum, and exhaust fan.

A new exhaust stack and GEMS will be provided by Project W-420. Connections from the GEMS to the new exhaust ventilation system will be performed by Project W-314 Phase 2.

A new condensate drain subsystem will be installed to handle condensate from the exhaust housing sections. Included in the subsystem are a seal pot with level measurement equipment, drain piping, and an overflow pipe.

The ventilation system will be designed to operate under local manual control only. Instruments for measuring inlet and differential pressure, exhaust flow, glycol heater temperature, and train temperature will be installed on the exhaust station. Hard-wired permissives and interlocks from the differential pressure indicating switches, GEMS, and heater temperature switch will control exhaust fan operation.

NOTE: As an alternative to installing a new 244-S DCRT ventilation system, an evaluation will be performed during definitive design to determine whether a portable exhauster can be used.

4.7.1.1.3.1 Exhaust Station

Exhaust flow: A local flow indicator will be provided to measure exhaust flow at the tank inlet plenum.

Inlet pressure: The tank and vault inlet pressure will be measured with respect to atmosphere by differential pressure-indicating switches (PDIS). A pressure sense tap will be located on the exhaust manifold duct and routed to a local PDIS. The PDIS will provide a local indication of inlet pressure and will provide permissives for starting or stopping the exhaust fan when the high or low-pressure setpoint is reached.

Differential pressure: Differential pressure across the two HEPA filters will be measured by differential pressure indicating switches. A pressure sense tap will be located on the housing on each side of the device measured and routed to a PDIS. Each PDIS will provide a local indication of differential pressure and an interlock to the exhaust fan.

Exhaust train temperature: The temperature of the glycol heater and train at the test section will be measured by temperature-indicating switches (TIS). The temperature element will be installed in a well mounted on the device housing and the temperature signal from the sensor will be wired to the TIS. The temperature indication switches will provide local indications of heater and train temperatures.

Level detector: The coolant level in the glycol heater system will be measured by a level detector. The level detector sensor installed in the glycol heating system will be wired to the level indicator to provide local indication of glycol level.

Exhaust heater: Power to the heater controller will be interrupted by a manual on/off switch or by deactivating a permissive interlock from the exhaust fan.

Exhaust fan: The exhaust fan will be controlled by a magnetic starter. Power to the exhaust fan starter will be interrupted by a manual on/off switch and by interlocks hard-wired to a starter relay from ventilation system instruments.

4.7.1.1.3.2 Gaseous Effluent Monitoring System

Similar to the AN Tank Farm description except that the GEMS PLC will perform all necessary data acquisition and control of the GEMS. The GEMS will be installed by Project W-420 and will be integrated into the 244-S DCRT ventilation system by Project W-314 Phase 2.

4.7.1.1.3.3 Condensate Drain Subsystem

The seal pot condensate level will be continually monitored by a resistive/conductivity level measurement system installed in the seal pot. Alarms for "low," "high," and "below fill" levels will be displayed locally.

4.7.1.1.3.4 Ventilation System Monitoring and Control

Local indicators and manual controls, including hard-wired interlocks, will be provided to facilitate manual operation of the ventilation system. At least one set of hard-wired interlocks (for high and low-pressure events) and a hard-wired relay from the GEMS will be provided to initiate an exhaust shutdown.

NOTE: The need for remote monitoring of the primary/annulus ventilation system at the TFLAN PLC/HMI will be evaluated during definitive design.

4.7.1.1.4 Monitoring and Control

4.7.1.1.4.1 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional 244-S DCRT work scope and associated WBS numbers.

4.7.1.1.4.2 TFLAN PLC Equipment

WBS: 5H4B12B

Similar to the AN Tank Farm description.

4.7.1.2 Demolition

4.7.1.2.1 Primary Tank

4.7.1.2.1.1 Waste Temperature Measurement

WBS: 5H4B02B

Remove and dispose of the existing temperature tree in the 244-S DCRT. The temperature tree will be disposed of in a flexible receiver container and treated as "long-length contained equipment." Remove and dispose of the temperature tree terminal box. Remove and dispose of the temperature transmitter and associated instrument panel tank temperature readouts and switches in the 241-SY-271 building. The volume of waste for the temperature tree is assumed to be an approximate total of 3 cubic feet of RMW material.

4.7.1.2.1.2 Vapor Space Pressure Measurement

WBS: 5H4B11B

Similar to the AN Tank Farm description except for the 244-S DCRT primary tank.

4.7.1.2.2 Leak Detection

4.7.1.2.2.1 Tank Annulus Liquid Presence Detectors

WBS: 5H4B03B

The three sensing legs into the annulus, the specific gravity and weight factor transmitters, and their readouts will be removed. Volume of this waste is assumed to be 3 cubic feet of RMW.

4.7.1.2.2.2 Tank Pump Pit Liquid Presence Detectors

WBS: 5H4B004

The three sensing legs into the pump pit, the specific gravity and weight factor transmitters, and their readouts will be removed. Volume of this waste is assumed to be 3 cubic feet of RMW.

4.7.1.2.2.3 Pipeline Leak Detectors

WBS: 5H4B35C

Similar to the AN Tank Farm description.

4.7.1.2.2.4 Primary/Annulus Ventilation

WBS: None

The existing exhaust stack instrument enclosure will be removed by Project W-420.

4.7.1.2.3 Monitoring and Control

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "other Upgrades" for additional 244-S DCRT work scope and associated WBS numbers.

4.7.1.3 Assumptions

4.7.1.3.1 General

Similar to the AN Tank Farm description.

4.7.1.3.2 Primary Tank

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

1. One existing temperature thermocouple tree will be removed from the 244-S DCRT and a new temperature measurement assembly can be installed in the same riser.
2. The safety classification of the waste temperature measurement system is safety-significant.
3. The new temperature probe assemblies will be similar to the unit installed in Tank 241-AN-105 by Project W-211 with 18 resistance temperature detectors (RTDs) mounted.
4. The existing thermocouple tree is not connected to TMACS and new TMACS interface equipment must be added. The new temperature tree signals are required inputs to TFLAN. NOTE: The need for both TFLAN and TMACS connections from the temperature tree will be evaluated during definitive design.

4.7.1.3.3 Leak Detection

Similar to the AN Tank Farm description, except for the following:

It is assumed that:

1. An ENRAF type level instrument will be used for leak detection in the tank annulus. The use of the ENRAF type level instrument is what is planned by operations for the tank annulus systems in the SY Tank Farm.

4.7.1.3.4 Primary/Annulus Ventilation

Similar to the AN Tank Farm description, except for the primary/annulus ventilation system and:

1. The GEMS will be procured and installed by Project W-420 and will be connected to the new ventilation system by Project W-314 Phase 2.
2. A ventilation system PLC is not required.

4.7.1.3.5 Monitoring and Control

Similar to the AN Tank Farm description.

4.7.1.3.6 Demolition

Similar to the AN Tank Farm description, except for the following.

It is assumed that:

1. The existing thermocouple tree will be classified as RMW and most contaminants will be removed from the trees when flushed with water during their removal from the tank.

2. The temperature tree will be disposed of in a flexible receiver container and treated as long-length contained equipment.
3. The existing annulus leak detectors and leak detectors in the pipe encasements will be classified as RMW for waste management purposes.
4. The primary/annulus exhaust stack instrument enclosure will be removed by Project W-420.

4.7.2 VENTILATION SYSTEM

4.7.2.1 Description

The 244-S DCRT is mainly an underground facility with a single tank (TK-244-S, 20,000 gallons of nominal capacity) located below a pump pit and filter pit (see drawings H-2-71052 and H-2-71057). One annulus air control station (see drawing H-2-71048) conveys filtered air into the annulus space around tank 244-S DCRT. There is no air control station that conveys air into the primary vapor space of Tank 244-S DCRT, air infiltrates into the primary vapor space via risers. The primary exhaust and annulus exhaust duct merge in the filter pit upstream of the filter trains which are located in the subsurface filter pit (see drawing H-2-71047).

Project W-314 Phase 2 ventilation upgrades to the 244-S DCRT facility will include:

- Installing a new primary air control station at grade elevation and ducting it to an existing riser that will convey filtered air directly into the primary vapor space of Tank 244-S DCRT.
- Complete removal of all filter train equipment from the 244-S DCRT facility filter pit downstream of annulus exhaust connection Z and primary exhaust connection Y located in the filter pit (see drawing H-2-71057) and dispose of this equipment as radioactive, low-level mixed waste.
- Installing an annulus exhaust duct from connection Z to above grade and installing a primary exhaust duct from connection Y to above grade. The annulus and primary exhaust ducts will be merged upstream of the new primary/annulus exhaust station.
- Construction of a new primary/annulus exhaust station (see DCRT Ventilation System Flow Diagram, Figure 4.11). The ventilation system upgrades include the replacement of the existing ventilation equipment with a new exhaust station consisting of a single glycol heater at the system inlet, followed by a single exhaust train with two HEPA filters, induced draft fan, and one exhaust stack.
- Installation of a condensate drain subsystem (see Figure 4.3) consisting of a seal pot, drain lines from the exhaust station to the seal pot, and drain line from the seal pot to tank 244-S DCRT.
- Tying-in the exhaust station to the merged exhaust ducts, system testing, and turnover.
- Demolition and disposal of the old exhaust fan, exhaust stack, and stack monitoring equipment.

NOTE: Project W-420, Stack Monitoring System Upgrades will be installing a new exhaust stack with new Gaseous Effluent monitoring equipment. Coordination with this project is necessary.

4.7.2.1.1 Air Control Station

WBS: 5H.4.B.10

A new, properly sized air control station is required to convey air directly into the vapor space of the 244-S DCRT. The standardized air control station design is shown on drawings H-2-85646 and H-2-85647. This air control station consists of an airflow controller, pre-filter, HEPA filter, and vacuum relief valve. The primary purpose of this air control station is to regulate the flow of air into the vapor space of the primary tank and to remove radioactive particulate from the vapor in case of backflow from the primary tank.

A new primary air intake duct will be installed that will connect this air control station, located at ground level, to a spare primary tank riser located in the pump pit. The 244-S tank vapor space presently receives its inflow through leaking tank risers and miscellaneous other vapor space openings, which must be sealed after installation of the new primary air control station. Excavation and core drilling will be required to install the air intake duct through a wall of the pump pit.

The air control station shall be completely fabricated (except for the 6'x 5'x 0.67' concrete footing) and tested in the fabricator's shop prior to shipment to the 244-S DCRT. After successful shop testing the air control station shall be shipped to the 244-S DCRT and reassembled on its concrete footing and riser flange. Recommended spare parts (see drawings H-2-85646 sheet 1) shall be delivered to the customer's warehouse. There are no instrumentation signals from the air control station that require routing. Digital pictures have been taken that show the one existing air control station connected to the six-inch annulus air inlet duct and are included in the references to aid the reader.

The existing 244-S DCRT annulus air intake assembly (see drawings H-2-71048, Section A) will not be replaced.

4.7.2.1.2 Primary/Annulus Exhaust Station

WBS: 5H.4.B.05 and 5H.4.B.06

Existing primary/annulus dual filter trains are located in the 11-foot x 11-foot x 1-foot subsurface filter pit (see drawing H-2-71057 sheet 1 of 2). A new primary/annulus exhaust station, as shown on the DCRT Ventilation System Flow Diagram (Figure 4.11),will be installed on a concrete slab at grade. The exhaust station will be connected to the new primary and annulus exhaust ducts that originate at the Y and Z nozzles located in the filter pit. These nozzles are shown on drawing H-2-71057, sheet 1 of 2.

The location of the new primary/annulus exhaust station will be as close as possible to the DCRT filter pit to minimize exhaust duct lengths. The new primary exhaust duct and a separate annulus exhaust duct will route the exhaust gases from the Y and Z nozzles through the filter pit to above

grade and merge before reaching the new exhaust station. A flow meter shall be installed above grade in the primary exhaust duct (see Figure 4-11). Pipe supports shall be required in the filter pit. The existing four-inch diameter exhaust pipe routed from the filter pit to above grade is assumed to be unfit for reuse. It shall be sealed at each end. Excavation and core drilling will be required to install the two exhaust ducts through a wall of the filter pit.

The new primary/annulus exhaust station will be designed, procured , and installed as a modular assembly. The exhaust station will be fabricated, assembled, and fully tested in the contractor's shop prior to delivery to the Hanford Site. The exhaust station modules will be hoisted (via built-in lifting lugs) off the transport truck, set on a concrete pad and tied down with anchor bolts. The exhaust station instruments will be wired to an instrument cabinet mounted in some convenient location on the structural steel of the exhaust station. The exhaust station equipment requiring electrical power will be wired to an electrical power cabinet mounted in some convenient location on the structural steel of the exhaust station. The stack GEMS will be installed as part of the exhaust station. When the new ventilation system passes acceptance testing, the old ventilation system will be shut down and the new equipment will be placed in service using minimum downtime.

A concrete shielding wall is not required around the exhaust station. A removable metal canopy will not be installed over the exhaust station. Flood lighting will not be installed.

4.7.2.1.3 Condensate Drain Subsystem

WBS: 5H4J07

The 244-S DCRT condensate drain subsystem is similar to the AN Tank Farm condensate drain subsystem except the overflow pipe will drain excess condensate from the seal pot through the wall of the 244-S DCRT pump pit and into a suitable riser that empties into primary tank 244-S.

4.7.2.2 Demolition

WBS: 5H4B10

The existing filter pit dual exhaust trains, exhaust fan, stack assembly and any other miscellaneous waste generated during the construction of the upgrades to the 244-S DCRT facility shall be removed, placed in approved containers, reduced in size, if economical, and transported to the Hanford low-level burial grounds for storage/burial.

Refer to drawing H-2-71048 (plan view). The existing one-inch diameter stack drain piping shall be capped at grade upon removal of fan K1-5-1. All items that are declared waste will be checked for radiological contamination and disposed of as either clean or contaminated waste.

The filter pit and pump pit should be considered to have a general dose rate greater than 100 millirem/hr, be a high radiation area, high contamination area, and an airborne radioactivity area. A closed, certified containment tent may be required around the filter and pump pits prior to removing the pit cover blocks.

4.7.2.3 Assumptions

1. The primary and annulus exhaust piping shall not require encasement.
2. A seal pot will be installed on the exhaust station slab because it will be less expensive than trying to install a seal pot inside the contaminated filter pit.
3. The pump pit wall must be core drilled to route the condensate drain overflow pipe into the pump pit.
4. There is a water supply in the area of the 244-S DCRT facility.
5. The old exhaust filter trains and exhaust fan/stack assembly shall be considered mixed waste.
6. The soil excavated to install the primary air intake duct, the two exhaust ducts, and the condensate drain subsystem overflow pipe will be placed back into the excavation and compacted; no excess soil will be created that would require removal.
7. The excavation needed to construct a concrete pad for the air control station and the primary/annulus exhaust station will be placed and compacted around the concrete pads. No soil will be hauled away.
8. Project W-420, Stack Monitoring System Upgrades will supply and install a GEMS and exhaust stack prior to the new exhaust station being built. Project W-314, Phase 2 will reuse this GEMS on the new exhaust station.

4.7.3 ELECTRICAL

4.7.3.1 Description

A new power system shall feed the new DCRT ventilation system from the panelboard and a new mini-power center shall supply power for the I&C panel. A new circuit breaker shall be provided to feed an existing panel in the instrumentation and electrical control house.

NOTE : For all references stating "similar to the AN Tank Farm description" in this section, the AN text referring to the AN271 Building is changed to the 244-S DCRT Building.

4.7.3.1.1 Existing Panelboard A to Primary Ventilation Skid

WBS: 5H4B14A

Install 480 Vac power system from panelboard A to supply the DCRT ventilation system. Install new mini-power center to supply the I&C panel.

The new equipment will include a new circuit breaker to feed a new mini-power center with a circuit panelboard in a NEMA type 4 enclosure. New circuit breakers and feeders for the primary ventilation fans to be powered from existing panelboard A. Two new ventilation exhaust heaters will be installed.

4.7.3.1.2 Ventilation Skid Ground Grid and Bonding

WBS: 5H4B14D

The new primary ventilation system will be bonded to a new ground grid that will be connected from the existing tank farm ground grid.

4.7.3.1.3 Freeze Protection for Primary Ventilation Drainage Systems

WBS: 5H4B14E

Freeze protection for the primary ventilation drainage system will be provided. The power for the freeze protection will be supplied from the mini-power center.

4.7.3.2 Demolition

WBS: 5H4B14F

Similar to the AN Tank Farm description

4.7.3.3 Assumptions

Note 1: All assumptions in this section are similar to the AN Farm.

Note 2: All drawings referenced by the above Note 1 in this section reflect the DCRT Farm drawings in WHC-SD-W314-CDR-001, Rev. 1.

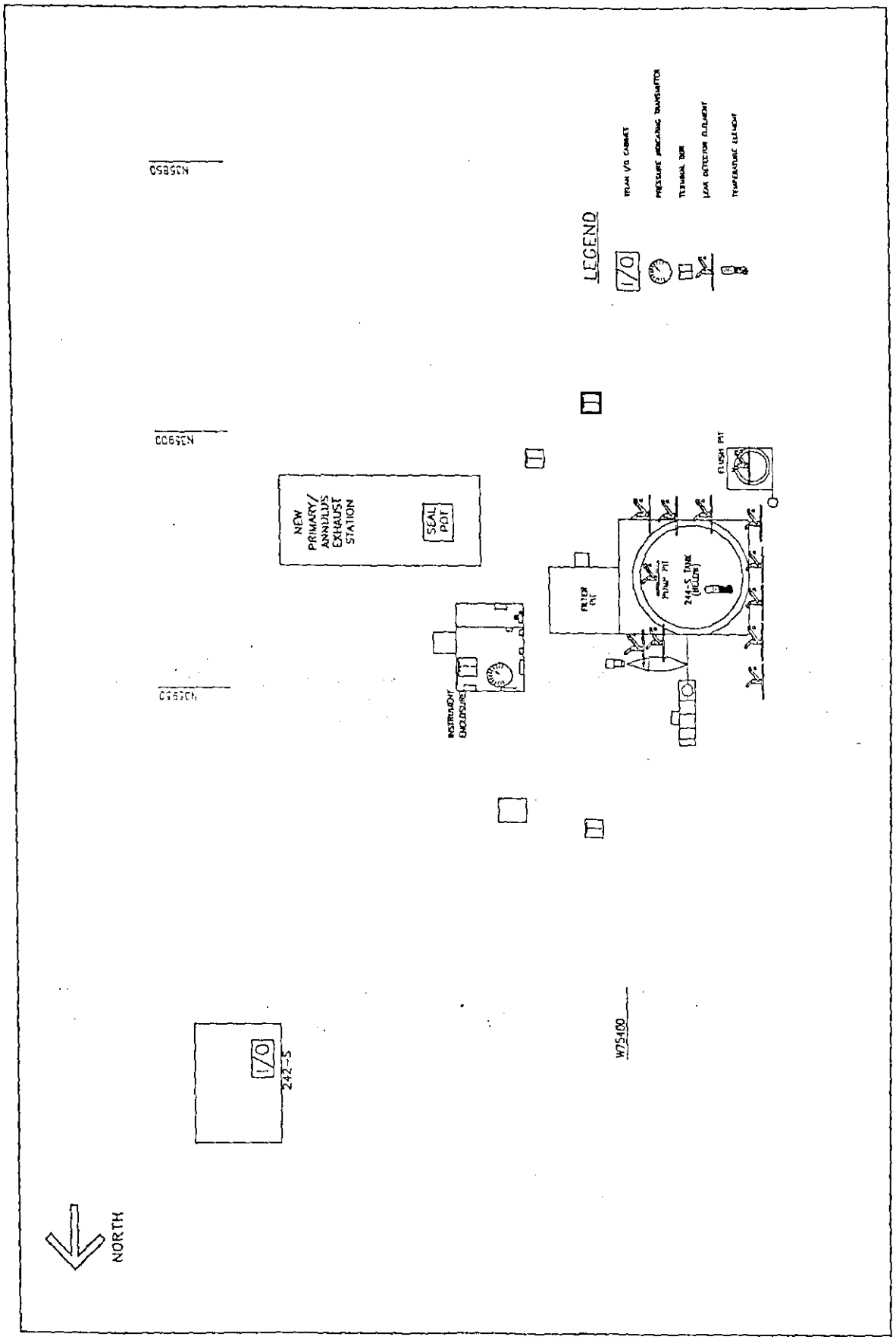

Figure 4.10 244-S DCRT Upgrades

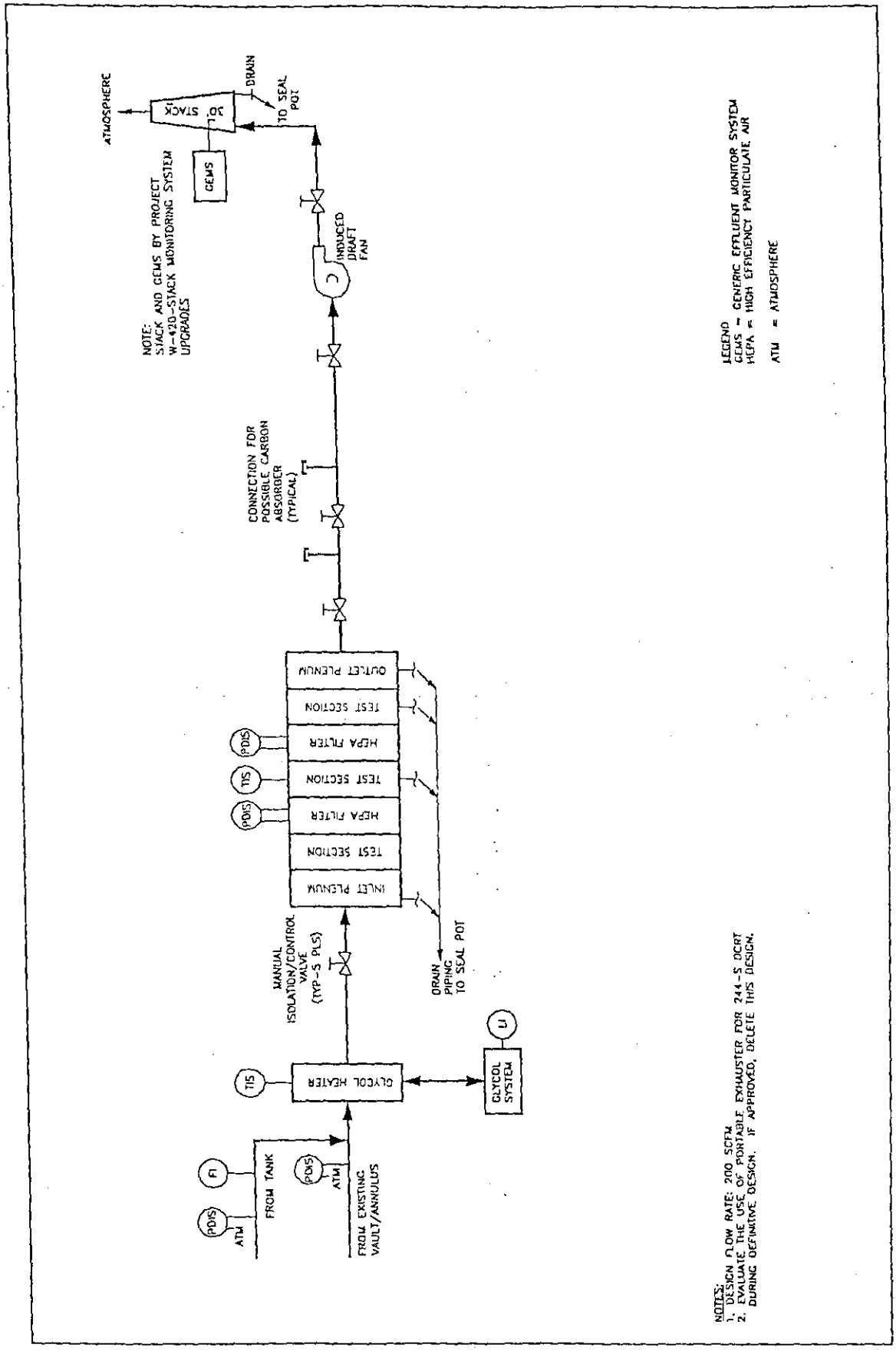

Figure 4.11 Primary/Annulus Exhaust Station Flow Diagram - 244-S DCRT

4.8 200 EAST/WEST UPGRADES

4.8.1 INSTRUMENTATION AND CONTROL

4.8.1.1 Description

I&C upgrades to the 200 East and 200 West Areas. Included in this work scope are Panalarm modifications in the A, BY, C, an U Tank Farms and the CR-271, 242-T, 244-AR, and 204-AR facilities. In addition, selected existing alarms and signals, including Gamewell alarms and selected 242-A DCS signals, will be connected to the TFLAN system; and Panalarm signals will be connected to TMACS.

NOTE: For all statements "Similar to the AN Tank Farm description" in this section, any references in the AN Tank Farm description to the "241-AN-271 instrument building" are replaced with "242-A building."

4.8.1.1.1 Monitoring and Control

4.8.1.1.2 Alarms and Signals

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" under "Other Upgrades" for additional 200 East/West Area work scope and associated WBS numbers.

4.8.1.1.3 TFLAN PLC Equipment

Similar to the AN Tank Farm description.

4.8.1.2 Demolition

Similar to the AN Tank Farm description. Refer to "Miscellaneous Alarms and Signals" for additional 200 East/West Area work scope and associated WBS numbers.

4.8.1.3 Assumptions

4.8.1.3.1 Monitoring and Control

Similar to the AN Tank Farm description.

4.8.1.3.2 Demolition

Similar to the AN Tank Farm description except for the following:

1. Leak detection systems are not applicable.
2. Primary exhaust stack instrument enclosure is not applicable

4.8.2 PIPING

4.8.2.1 Description

241-A-A Valve Pit bypass for SN-220 and LIQW-702

WBS: 5I4E

A new buried waste transfer line will be provided to enable lines LIQW-702 and SN-220 to bypass Valve Pit 241-A-A. A conceptual layout of the bypass arrangement is shown in attached sketch SK-2-W314-A01. A section of each of these lines will be removed to facilitate the bypass connection. The portion of these lines connected to the pit will be capped. The new transfer line will include the transfer pipe, non-jacketed encasement for leak detection, and a cathodic protection system.

Leak detection for the bypass line will utilize the existing system in place for line SN-220. The new transfer line will slope down from the LIQW-702 connection towards SN-220. New leak detection instrumentation will not be required for the new transfer pipe.

New anodes will be added for the new encasement pipe. These will be connected to the existing cathodic protection system for LIQW-702 and SN-220.

The modification will negate the need to use and maintain 241-A-A and will allow continued transfers from 204-A-R.

The following work will be performed;

- Excavate a pipe trench from the bypass connection point on LIQW-702 to the connection point on SN-220. For estimating purposes, the bypass pipe is assumed to be six feet from the pit, connection to connection, and will be buried three feet below the surface.
- Excavate at both LIQW-702 and SN-220, a 4-foot deep by 6-foot square pit centered at the bypass connection point.
- Remove and contain a 3-foot section of each pipe, including enclosure pipe.
- Decontaminate, clean, and prepare for welding, the open ends of LIQW-702 and SN-220.
- Cap each pipe connected to 241-A-A.
- Fabricate bypass pipe assembly in field per ASME B31.3 and perform separate hydrostatic leak tests on the pipe and enclosure prior to connecting to existing pipe. It is assumed that existing LIQW-702 and SN-220 are code-compliant and currently meet the leakage requirements of ASME B31.3.
- Connect bypass pipe with enclosure to LIQW-702 and SN-220. Include code-required in-process examination
- Radiograph closure welds (100% per ASME B31.3).
- Install anodes for cathodic protection and connect to system.
- Refill excavation and remove pipe sections for burial.

Current anti-contamination requirements to enter the work area are one pair of Special Work Permits (SWPs). Assumed requirements for decontamination and tie-in of the piping are two pairs of SWPs and respirator with supplied air. The requirements for excavation are unknown at this time. Radiation levels will be monitored during excavation and appropriate work clothing will be required. Work interruption and upgraded anti-contamination requirements should be assumed.

4.8.2.2 Demolition

WBS: 5I4E03

The demolition portion of the piping modification is included in section 1.1 above.

4.8.2.3 Assumptions

The existing cathodic protection system for LIQW-702 and SN-220 will be used. Additional anodes only will be required for the bypass.

Assumed requirements for decontamination and tie-in of the piping are 2 pairs of SWPs and respirator with supplied air.

4.9 OTHER UPGRADES

4.9.1 INSTRUMENTATION AND CONTROL - MISCELLANEOUS ALARMS AND SIGNALS

4.9.1.1 Description

This section describes the alarm and signal upgrades for the AN, AP, AW, AY, AZ, and SY Tank Farms, the 244-S DCRT, 200 East/West Areas, and single-shell tank (SST) farms. The work scope includes:

- connecting alarms from the Tank Farms Local Area Network (TFLAN) system to the 242-A Distributed Control System (DCS)
- connecting tank farm general local alarms to the TFLAN PLC
- upgrading the Gamewell Alarm systems in the DST Farms and 244-S DCRT
- moving selected alarm signals from Panalarms for the DST Farms; A, BY, C, and U SST Farms; and CR-271, 242-T, 244-AR and 204-AR Facilities to the TMACS
- connecting selected AY and AZ Tank Farm primary ventilation signals from the MICON system to the TMACS.

Figure 4.12 illustrates the anticipated tank farm instrument monitoring and control system configuration with Project W-314 Phase 1 and Phase 2 upgrades completed. The shaded components and connections depict existing items, items to be supplied by W-314 Phase 1, or items supplied by others. Other than W-314 Phase 2 supplied ventilation systems, with ventilation system PLCs acting as separate TFLAN nodes, and modem connections to TMACS, W-314 Phase 2 upgraded systems all tie into TFLAN through a W-314 Phase 1 supplied PLC.

4.9.1.2 TFLAN Connections

Monitoring and control upgrades consist of connections of selected existing tank farm signals and Phase 2 supplied systems to PLCs attached to a new TFLAN system. The new TFLAN system will be installed prior to W-314 Phase 2 construction and will perform both tank farm monitoring and MPS functions.

Signals from new and upgraded tank farm instruments will be monitored by a TFLAN PLC installed in a local instrument building, control building, or operating center, and displayed on a TFLAN HMI.

4.9.1.2.1 242-A DCS

The 242-A DCS work scope consists of re-routing alarms disconnected during upgrades back to the 242-A DCS via the TFLAN. Approximately 30 alarms resident in the 242-A Building identified for AW, AY, and AZ tank farms and the MPS system will be reconnected to the 242-A DCS. Another six general building alarms from the DST instrument buildings will be re-routed to the 242-A DCS. These alarms will be transmitted from each facility over the TFLAN to the TFLAN PLC located in the 242-A Building.

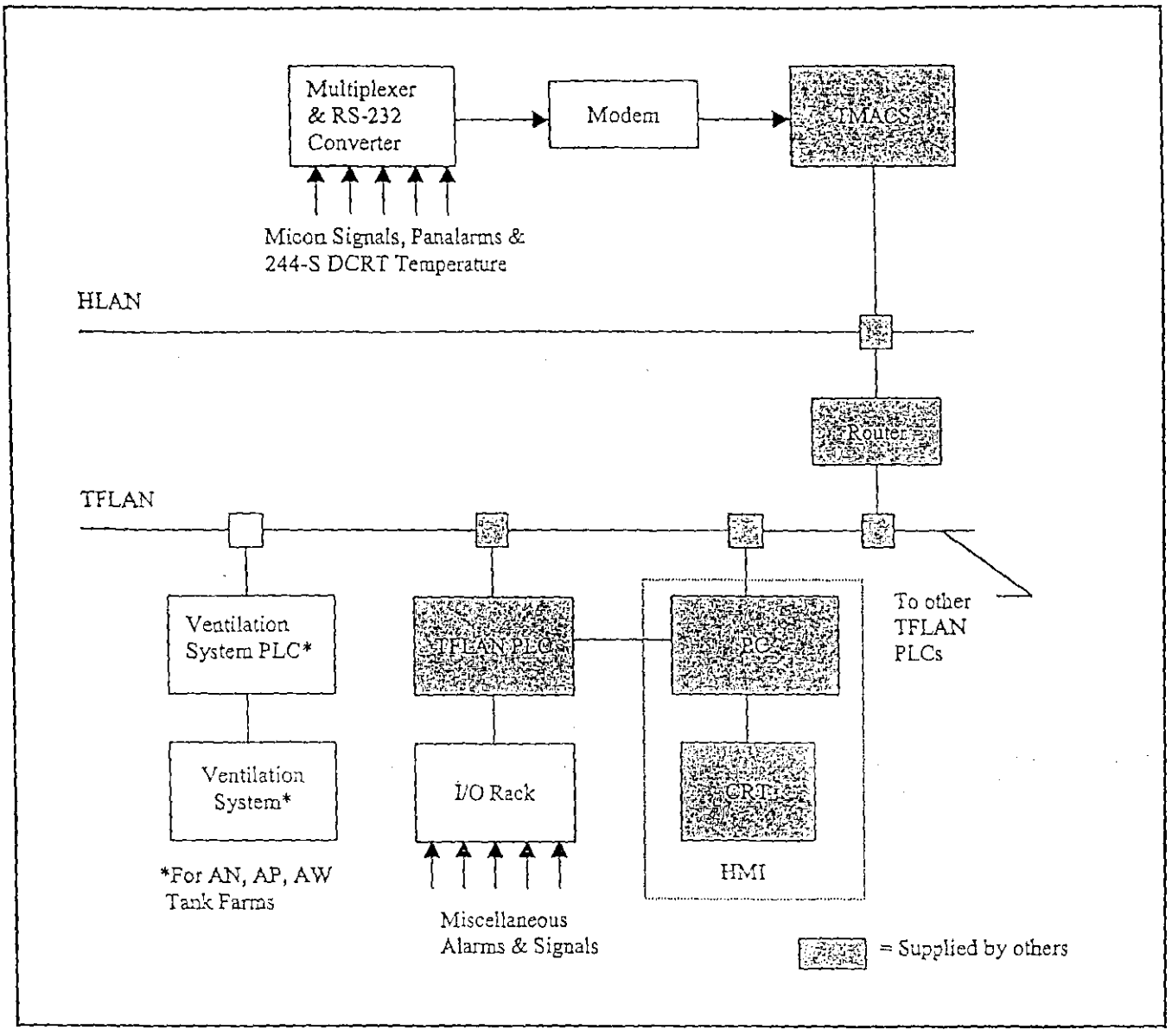

Figure 4.12. Project W-314 Monitoring and Control System Configuration

The TFLAN PLC in the 242-A building will relay the status of the approximately 36 alarms to the 242-A DCS employing I/O modules installed in the local TFLAN I/O rack. Following is a summary of this work scope:

4.9.1.2.1.1 242-A Resident Alarms

WBS: 5C4J22E, 5D4J22F, 5E4J22F and 5I4F04

1. Install relay output cards and an additional PLC panel in the 242-A Building to support the connection of 30 signals from the TFLAN to the 242-A DCS.

2. Disconnect the 30 existing alarm relay contacts from the 242-A DCS and reconnect new TFLAN output signals corresponding to the existing alarms.
3. Modify the TFLAN software to output the 30 signals.

4.9.1.2.1.2 General Building Alarms

WBS: 5A4J22, 5B4J22, 5C4J22, 5E4J22, and 5F4J22

The general building alarms in 241-AN-271, 241-AP-271, 241-AW-271, 241-SY-271, 241-AZ-702, and 241-AZ-271 will be connected to TFLAN. Following is a summary of this work scope:

1. Parallel the signals from the master alarm panel in each instrument building to a TFLAN PLC I/O rack in the same building.
2. Connect the signals to an existing TFLAN PLC digital input card (supplied by W-314 Phase 2).
3. Modify the TFLAN program to recognize the general building alarm signals.

4.9.1.2.2 Gamewell Alarms

WBS: 5A4J22D, 5B4J22D, 5C4J22E, 5D4J22F, 5E4J22F, 5F4J22E, and 5I4F03

Gamewell alarm work scope consists of connecting any active signal that feeds the Gamewell system located within the DSTs, 244-S DCRT (including SY Tank Farm), and 242-A building to the TFLAN system and removing the Gamewell boxes. There are approximately 30 signals that will be connected to TFLAN. The remaining work scope will be demolition work. Alarm signals will be taken from the input to the Gamewell systems and re-routed to a TFLAN PLC I/O panel. Existing TFLAN software will be modified to handle the 30 additional alarm signals. Following is a summary of this work scope:

1. Disconnect two Gamewell alarm signals located in each DST instrument building plus one Gamewell alarm in the 242-A building and reconnect them to TFLAN.
2. Install analog input cards in the TFLAN PLC I/O panel.
3. Re-route displaced signals.
4. Modify the TFLAN program to recognize the 30 Gamewell alarm signals.

4.9.1.3 TMACS Connections

In addition to their connection to a PLC on the TFLAN, selected tank temperature signals will also be transmitted to the TMACS. A signal multiplexer and converter will be employed to convert tank farm instrument signals to EIA RS-232 serial data. The instrument serial data will then be transmitted by modem over telephone lines to TMACS. Communication between TMACS and the TFLAN HMIs will take place via the Hanford Local Area Network (HLAN). This connection permits signal information, e.g., TFM and MPS data on the PLCs to be monitored by TMACS.

4.9.1.3.1 Panalarms

WBS: 5A4J22C, 5B4J22C, 5C4J22C, 5D4J22C, 5E4J22C, 5F4J22C, and 5I4F02

Panalarm work scope for the DSTs consists of paralleling the signals from the Panalarms to TMACS. This work scope involves only alarm signals that have not been connected to TFLAN by previous W-314 work scope. New ACROMAG I/O control modules, ACROMAG DC input modules, ACROMAG RS-485 to 232 converters, and modems will be installed in a new enclosure that will be mounted near the Panalarms.

Power will be supplied to the ACROMAG enclosures from an existing 120 Vac distribution panel. Conduit and wiring will be supplied to connect the ACROMAG enclosure to Panalarm equipment. The signals will be paralleled from the input terminal block of the Panalarm to the new enclosure.

One ACROMAG will handle 16 signals and each ACROMAG will require an ACROMAG RS-485 to RS-232 converter and modem. For ACROMAG details, refer to drawing H-2-140317, Item Nos. 5 and 7. For ACROMAG RS-485 to RS-232 converter details, refer to drawing H-2-820812, Sheet 1, Item No. 6. The approximate number of signals to be paralleled to TMACS is given below:

- AN Farm: 35 signals
- AP Farm: 70 signals
- AW Farm: 20 signals
- AY/AZ Farms: 80 signals (40 signals/Farm)
- SY Farm: 40 signals

Total = 245 signals

NOTE: Primary ventilation signals from the MICON systems in both AY and AZ Tank Farms are also included in the above estimate.

This work scope also includes moving selected SST and hazardous facility alarms from a Panalarm to the TMACS. For the selected alarm signals from Panalarms for A, BY, C, U Farms and CR-271, 242-T, 244-AR, and 204-AR Facilities to the TMACS. These Panalarms are allocated as follows:

- 271-A building (Three Panalarms)
- 271-CR building (One Panalarm)
- 204-AR building (One Panalarm)
- 244-AR building (One Panalarm)
- 242-T building (One Panalarm)
- 244-U building (One Panalarm)
- 244-BX building (One Panalarm)

An additional ACROMAG I/O and DC input module, ACROMAG RS-485 to RS-232 converter, and modem will be required for each Panalarm. It is assumed that a total of nine SST Panalarms will be required with 15 signals per Panalarm for a total of 135 signals. It is also assumed that all installations will be similar and that the ACROMAG enclosure will be mounted inside the appropriate building in close proximity to the Panalarm (within 50 feet); and that sufficient space exists for the equipment.

Signals will be paralleled from each Panalarm input terminal block to the ACROMAG enclosure. All ACROMAGs, converters, and modems will be installed in a NEMA 3R enclosure and mounted inside the corresponding building with the Panalarm. Each enclosure will be large enough to mount two ACROMAGs and their corresponding converters, modems, and terminal blocks. Following is a summary of this work scope:

1. Install NEMA 3R enclosures, ACROMAGs, ACROMAG RS-485 to RS-232 Converters, and modems.
2. Connect all signals between the ACROMAGs, converters, and modems.
3. Connect 120 Vac power to ACROMAG enclosures.

4.9.1.4 Software Modifications

4.9.1.4.1 TFLAN Programming

WBS: 5A11.

NOTE: TFLAN PLC and HMI programming is covered under Title II detailed design estimate.

Following is a summary of points per facility to be added to the TFLAN program:

AN Farm:	One signal
AP Farm:	11 signals
AW Farm:	One signal
AY Farm:	One signal
AZ Farm:	One signal
SY Farm:	Zero signals
244S DCRT:	Zero signals
200E/200W:	30 signals for 242-A DCS
	10 signals for 242-A Gamewell

Total = 55 signals

4.9.1.4.2 TMACS Programming

WBS: None. Other Project Cost (OPC) expense is estimated below to account for modifications to the TMACS software, testing, and engineering change notices (ECNs) for documentation changes to support the Panalarm work scope.

Man-hours per alarm:	5 M/H
Number of alarms:	380 alarms

Total hours = 1,900 M/H

4.9.1.5 Demolition

The demolition for each alarm work scope is described below.

4.9.1.5.1 242-A DCS

WBS: 5I4F04

The 30 signals (60 wires) from the old contacts to the 242-A DCS will be removed and the associated conduit inside the 242-A building will be removed. It is assumed that 500 feet of conduit will require demolition. Where conduit leaves the 242-A building, the wiring will be cut back and the conduit capped and abandoned in place.

4.9.1.5.2 Gamewell Alarms

WBS: 5A4J22F, 5B4J22G, 5C4J22E, 5D4J22F, 5E4J22F, 5F4J22E and 5I4F04

Demolition will include the removal of seven Gamewell panels, associated wiring, and conduit. Where the conduit leaves the associated instrument building, the wires will be pulled back and the conduit capped and abandoned in place.

4.9.1.5.3 Panalarms

No demolition is anticipated for the Panalarm work scope.

4.9.1.6 Assumptions

4.9.1.6.1 General

It is assumed that:

1. No radiological work or work in a contaminated area is necessary for this scope and no radiologically contaminated waste will be generated.
2. The new equipment installed will be general service.
3. No conduit will require underground burial. All work is inside work and conduit will be hung per existing requirements for runs inside buildings.

4.9.1.6.2 242-A DCS

It is assumed that:

1. Alarm signals to the 242-A DCS will be routed from the TFLAN PLC situated locally at the 242-A Building.
2. The general building alarms will be input to the local TFLAN PLC located in the associated instrument building. Alarm signals to the DCS will be transmitted from the 242-A PLC.

4.9.1.6.3 Gamewell Alarms

It is assumed that:

1. Four of the seven Gamewell alarms have already had their associated signals deactivated or moved to TMACS and the only W-314 Phase 2 work scope required will be demolition of the Gamewell box and associated conduit and wiring.

4.9.1.6.4 Panalarms

It is assumed that:

1. There will be adequate room inside the associated instrument buildings to mount the identified equipment.
2. There is adequate space and capacity available in local 120 Vac power distribution panels to supply power to the ACROMAG units.
3. Connection to TMACS will be through ACROMAGs and modems. W-314 work scope does not include installation and connection of telephone lines to the modems.
4. Programming of the TMACS software to handle new signals will be performed by Operations and funded by Project W-314 Phase 2.
5. Signals from the SST Farm and Hazardous Facilities that are to be connected to TMACS are located in one Panalarm inside an instrument building.

4.9.2 REFERENCES

HNF-4158, Rev B (draft), *Level 2 Specifications for Double-Shell Tank Ventilation System*, Prepared by Parsons Infrastructure & Technology Group, July 2, 1999

HNF-S-0400 Rev. 1, Procurement Specification for Gaseous Effluent Monitoring System, dated 1 December 1998

HNF-S-0400, Rev. 1, GEMS Procurement Specification

HNF-SD-W314-RPT-003, Rev.3, *Tank Farm Restoration and Safe Operations (TFRSO) Project W-314 Upgrade Scope Summary Report*, Prepared by Lockheed Martin Hanford Corporation, July 22,1998

WHC-SD-W314-CDR-001, Rev. 1,*Conceptual Design Report, Tank Farm Restoration And Safe Operations, Project W-314*, Prepared for Numatec Hanford Corporation, Prepared by Fluor Daniel Northwest, Inc., November 1996

WHC-SD-W420-CDR-001, Rev. 0, *Conceptual Design Report*

WHC-SD-WM-CR-058, Rev. 0, Gaseous Effluent Monitoring System Design Criteria

WHC-SD-WM-ES-284, Rev 0, DST Ventilation Upgrade Engineering Study, (Tank Farm Restoration and Safe Operations/W-314), Prepared by Westinghouse Hanford Company, February 1994

WHC-SD-WM-TI-612, Rev 0, An Engineering Review of Tank Farm Ventilation Systems, Prepared by Los Alamos Technical Associates Inc., March 1993

DRAWINGS

Drawing H-2-85646 Rev. 0, sheets 1 through 6, Air Control Station

Drawing H-2-85647 Rev. 0, sheets 1 through 4, Airflow Controller

Drawing H-2-71057 Sheet 1 of 2

Drawing H-2-71047 Rev. 6

Drawing H-2-71048 Rev. 8

Drawing H-2-71085 Rev. 3

Drawing H-2-46786 Rev. 4

Drawing H-2-71050 Rev. 9, Sheet 1 of 2

Drawing H-2-71050 Rev. 2, Sheet 2 of 2

Drawing H-2-85646 Rev 0, Sheets 1 thru 6

Drawing H-2-85647 Rev 0, Sheets 1 thru 4

Drawing H-14-020231 Sheet 1 of 3

Drawing H-14-020803, Sheets 1-5

Refer to the following drawings and sketches for systems configuration, equipment location, and cabling details as the best available design:

241-AN Tank Farm One-Line Diagram, Figure E-1 (Ref. WHC-SD-W314-CDR-001, Rev. 1).

241-AN Tank Farm Site Plan, Figure P-1. (Ref. WHC-SD-W314-CDR-001, Rev. 1).

Tank Farms Electrical Upgrades Engineering Study, (Tank Farm Restoration and Safe Operations/W-314) WHC-SD-W314-ES-001, Rev. 1, ECN# 605193).

Drawing H-14-020801, Sheets 1-4.

Drawing H-2-140317.

Pipe Codes M-9 and M-26 extracted from WHC-SD-W314-CDR-001, Rev. 1, pages E-20, 21

WHC-SD-WM-EV-040, Rev. 1, Page A-26

WHC-SD-W314-CDR-001, Rev. 1, Figure P-18

Extract from Drawing No. ES-314E-M40, Rev. 10

Sketch SK-W314-A01

4.10 RELATIVE RANKING OF MAJOR UPGRADES

An effort was undertaken by a multi-discipline team to rank the Project W-314 Phase 2 work scope as identified in the CDR, WHC –SD-W-314 CDR-001 and the *W-314 Upgrade Scope Summary Report*, HNF-SD-W-314-RPT-003. The identified work scope was ranked in the order of importance to supporting the W-314 and RPP missions. The W-314 Phase 2 work scope was evaluated to determine if any of the identified requirements or needs had changed due to scope that may have already been completed by Operations or other projects, or due to changed operational/programmatic commitments or requirements. HNF-4403, *"W-314 Phase 2 Work Scope Final Decision Report"*, September 1999, discusses this evaluation in detail. Table 4.10.1 below presents in summary the major scope elements of Project W-314 and their relative ranking according to importance in meeting the RPP and Waste Retrieval mission. The identified work is grouped into categories of similar upgrades. The ranking assigned to each work item shows the relative importance compared to all the work items listed. highest priorities indicated are for the 241-A-A bypass line, ventilation upgrades, electrical upgrades, and process pit upgrades.

Table 4.10.1: Relative Ranking of Major Scope Upgrades

REMAINING PHASE 2 SCOPE RELATIVE RANKING				
Ranking	Major Scope Upgrade		Ranking	Major Scope Upgrade
	PIPELINE UPGRADES			ANNULUS LEAK DETECTION
1	241-A-A Valve Pit Bypass		12	244-S-DCRT
	VENTILATION SYS. UPGRADES			ALARMS
3	244-S DCRT		14	DST Gamewell Alarms
4	AN Farm		15	242-A DCS Alarms
5	SY Farm		20	DST Panalarms to TMACS
6	AP Farm			
7	AW Farm			VAPOR SPACE PRESSURE
			13	AZ Farm
	ELECTRICAL UPGRADES		16	AN Farm
2	244-S DCRT (HVAC electrical)		16	AW Farm
8	AN Farm		16	SY Farm
8	AP Farm		17	244-S DCRT
8	AW Farm		19	AP Farm
8	SY Farm		23	AY Farm
11	AY Farm			
11	AZ Farm			LIQUID HIGH-LEVEL ALARMS
			18	AY Farm
	PROCESS PITS		18	AZ Farm
9	AN Farm		21	SY Farm
9	AP Farm		22	AN Farm
9	AW Farm		22	AP Farm
9	SY Farm		22	AW Farm
10	244-S DCRT (Pump Pit)			

4.11 CHANGES FROM PREVIOUS BASELINE/TRACEABILITY AND JUSTIFICATION

The originally identified W-314 Phase 2 work scope was documented in HNF-SD-W314-RPT-003, *Tank Farm Restoration and Safe Operation Project W-314 Upgrade Scope Summary Report (USSR)*, Rev. 3, which modified the WHC-SD-W314-CDR-001, *Conceptual Design Report for TFRSO*, Rev. 1. The CDR-001 provided details of the work to be accomplished and the USSR, Rev, 3 refined that work scope to reflect later changes and requirements. Table 4.11.1 provided below lists each original work scope item, a reference back to the CDR and/or USSR where that work scope item is discussed, indicates if the work scope is still valid or if it has been removed, and a brief statement of reasons why it was retained or removed from the W-314 Phase 2 scope.

Table 4.11.1: Changes From Previous Baseline

Item No.	Work Scope Deleted or Revised	Reasoning
1.	244 A DCRT Upgrades (CDR Pgs. 68 to 75)	Not required to support retrieval mission. By-pass transfer pipeline to be installed to support retrieval. .
2.	A Complex Transfer Piping (CDR Pg 84 to 86)	Not required to support retrieval mission. By-pass transfer pipeline to be installed to support retrieval. .
3.	Level Transmitter Cards (CDR Pg. 11-AN, Pg. 28-AP, Pg. 35-AW, Pg. 42-AY, Pg. 50-AZ, Pg. 59-SY, USSR Pg. 19, 51)	Completed by plant forces.
4.	DST Annulus CAMs (CDR Pg. 13-AN, Pg. 29-AP, Pg. 36-AW, Pg. 43-AY, Pg. 51-AZ, Pg. 60-SY, Pg. 77 244-S DCRT, USSR Pg. 18, 39)	To be installed now by plant forces.
5.	Gamma Probes (CDR Pg. Pg. 13-AN, Pg. 29-AP, Pg. 36-AW, Pg. 43-AY, Pg. 51-AZ, Pg. 60-SY)	Gamma probes no longer required by Operations. All scope in Leak Detector Pits was deleted. Leak Detector Pits are not required to support retrieval. Leak Detector Pits are not on the active waste transfer system.

6.	Clean-Out Boxes (COBs) (CDR. Pg. 14-AN, Pg. 36-AW, Pg. 44-AY, Pg. 52-AZ, Pg. 60-SY, USSR Pg. 18, 42)	All COBs in the waste transfer route have already received intrinsically safe relays. A-Complex COBs in AY and AZ tank farms are no longer required. Pipelines with these COBs are not part of the active waste transfer system.
7.	Move SY alarms from 242- S (CDR. Pg 63, 84, USSR Pg. 19, 22, 58)	No longer necessary. 242-S control room will be utilized for cross-site transfers.
8.	244S DCRT 13.8 kVA/480 VAC electrical upgrade (CDR Pg. 75, USSR Pg. 20, 61)	Being installed by plant forces in FY 99.
9.	FIC liquid level instrument replacement. (CDR Pg. 11-AN, Pg. 28-AP, Pg. 35-AW, Pg. 42-AY, Pg. 50-AZ, Pg. 76-244-S DCRT, USSR Pg. 19, 51)	Being installed by plant forces in FY 96 thru FY 99.
10.	SY primary ventilation support systems (CDR Pg. 61, 62, USSR Pg. 53)	New program strategy being developed by the program office to address SY ventilation.
11.	Central Pump Pits AP 02A, 04A (CDR Pg. 14, 23, USSR Pg. 18, 28, 43)	• W-211 completes the required upgrades in AP-02A and AP-04A. • W-314 Phase 2 installs a new leak detector, drain plug assembly, and SPC in 20 CPPs: AN 02A, 03A, 05A, 06A, 07A, AP 01A, 03A, 05A, 06A, 07A, O8A, AW 01A, 02A, 03A, 04A, 05A, 06A, AY SY 01A, 02A, and 03A. NOTE: All remaining pit work will be coordinated by Life-Cycle Projects to minimize required pit entries and reduce costs.
12.	Annulus Pump Pits (28 Total) (CDR Pg. 14, 23-AN, Pg. 29, 31-AP, Pg. 36, 38-AW, Pg. 43, 46-AY, Pg.	An Emergency Annulus Pumping Plan for all DST annuli (including SY Farm) was delivered to Ecology in June 1999. It outlines several options for pumping a DST annulus in the unlikely event of a leak. It does not include prior upgrading of all annulus pump pits. Option five (the preferable option) does

	52, 54-AZ, Pg. 60, 64-SY, USSR Pg. 18, 28, 43)	not include the use of the annulus pump pits (pumps directly from an annulus riser back to the primary tank). There normally would be no transfers through these pits unless the primary tank leaks. To upgrade now is deemed unwarranted. The same is true for the transfer lines and encasement leak detection going to/from the annulus pits.
13.	Leak Detection Pits (28 total) and sumps (CDR Pg. 13, 23-AN, Pg. 29, 31-AP, Pg. 36, 38-AW, Pg. 43, 46-AY, Pg. 51, 54-AZ, Pg. 60, 64-SY, USSR Pg. 18, 28, 40)	All work scope deleted (gamma probes, leak detectors, drain plug assembly, and SPC) including pipe encasements. No Regulatory, Operations, or Programmatic driver to perform this work.
14.	Service Pits (AN, AP, AW, SY, 244-S DCRT, AY, AZ) (CDR Pg. 13, 14, 23-AN, Pg. 28, 29, 31-AP, Pg. 36, 38-AW, Pg. 43, 46-AY/AZ, Pg. 54-AZ, Pg. 59, 60, 64-SY, Pg. 76-244-S DCRT, USSR Pg. 18, 19, 28, 43, 48, 49)	Phase 2 scope was only: leak detector, and/or SPC, and/or water meter, depending on the specific service pit. AN, AP, AW, SY, and 244-S DCRT do not require a leak detector, radiation back flow detectors or SPC because they never receive waste. The existing water meters are operating fine and meet Operations requirements. Should Operations encounter problems with any service pit, Operations Maintenance would immediately act rather than wait for a capital funded project to provide the fix. These pits are not required to meet the M-43 compliance milestone or Phase 1 of privatization. AY and AZ pits are no longer required ("green field line").
15.	Flush Pits (AN, AP, AW, SY-A, SY-B) (CDR Pg. 14, 23-AN, Pg. 29, 31-AP, Pg. 36, 38-AW, Pg. 60, 64-SY, Pg. 77- 244-S DCRT, USSR Pg. 18, 19, 21, 22, 28, 43)	• Phase 2 scope for flush pits was only to install leak detection in AN, AP, AW (also to receive a water meter), SY-A, and SY-B (also to receive a drain plug assembly). • Flush pits see only raw, uncontaminated water and are not necessary to support waste transfer or compliance requirements. • Project W-058 bypassed the SY-A and SY-B flush pits. The nozzle from the flushing system has been blanked off. • Flush Pit SY- 02E serves as a central pump pit and does see contaminated water. Phase 2 will install an intrinsically safe leak detector with signal to local TFLAN PLC, drain plug assembly, and SPC.
16.	Encasement Drain Pits (AY, AZ) (CDR Pg. 43, 46-AY, Pg. 51, 54-AZ, USSR pg. 18,	All work scope deleted (leak detector, drain plug assembly, and SPC), including pipe encasements. No Regulatory, Operations, or Programmatic driver to perform this work.

	28, 43)	
17.	Sluice Pits (AY-01B, 01C, 01D, 01E, 02B, 02C, 02D, 02E, AZ-01B, 01C, 02B, and 02C), including pipeline encasement leak detection. (CDR Pg. 43, 46-AY, Pg. 52, 54-AZ, USSR Pg. 18, 28, 43)	• Project W-521 is installing pumps in the four AY-101 sluice pits, including a leak detector, drain plug assembly, and SPC. By installing mixer pumps, these pits are removed from the active transfer system. In addition, the AY-101sluice pits will not be used after June 2005 (while they are non-compliant) until the pit upgrade is completed by W-521 (making them compliant). • Project W-211 is installing mixer pumps in each of the AY-102 pits, including a leak detector and drain plug. Once W-314 Phase 1 (new "green field" line) is completed AZ sluice pits 01B, 01C, 02B and 02C will no longer be part of the active waste transfer system.
18.	AN Condensate Receiver Pit (CDR Pg. 14, 23-AN, USSR Pg. 43)	The condensate receiver pit is no longer in use and the condensate from ventilation systems is no longer routed through this pit. This pit is not part of the active waste transfer system.
19.	AN Supernate Receiver Pit. (CDR Pg. 14, 23-AN, USSR Pg. 43)	Waste transfers involving this pit will no longer occur following completion of interim stabilization of A-101/AX-101 by September 2003, at which time the transfer routes involving this pit will be deactivated. This pit is not part of the active waste transfer system.
20.	AP Mixer Pump Pits, AP-07D, 07E, and 07F (CDR Pg. 29, 31, USSR Pg. 43)	The mixer pump pits are not part of the active waste transfer system. There are no transfer pipelines that lead into or from these pits.
21.	AP Jumper Storage Pit (CDR Pg. 29, 31-AP, USSR Pg. 43)	The function of this pit is to store AP jumpers. It is not an integral part of the waste transfer system. It is completely isolated.
22.	244-S DCRT Filter Pit (CDR Pg. 80)	• Original scope called for complete demolition of this concrete pit. • Current plan is to re-use this pit, removing existing jumpers and installing a non-filtered duct jumper.
23.	DST waste temperature measuring devices (CDR Pg. 12-AN, Pg. 28-AP, Pg. 35-AW, Pg. 42-AY, Pg. 50-AZ, USSR Pg. 18, 51)	To be done by Retrieval Projects as required. No need to replace until mixer pump installed.

24.	SY Farm tank level multiplexer box (CDR Pg. 59-SY)	Plant forces will upgrade when required
25.	DST TMACS/TFLAN connections (CDR Pg. 12-AN, Pg. 28-AP, Pg. 35-AW, Pg. 42-AY, Pg. 50-AZ, Pg. 59-SY, USSR Pg. 19, 51)	No need to have same instrument outputs on multiple central computer systems.
26.	All Annulus Leak Detectors (three probes per DST for total of 84 leak detectors) (CDR Pg. 13-AN, Pg. 28-AP, Pg. 36-AW, Pg. 43-AY, Pg. 51-AZ, Pg. 59-SY, USSR Pg 18, 37)	All existing annulus riser leak detectors in all DST Farms are compliant except for those in SY Farm. W-420 will be completing installation of these in SY Farm this calendar year.
27.	DST Liquid High-Level Alarm Probes (all but SY Farm) (CDR Pg. 11-AN, Pg. 28-AP, Pg. 35-AW, Pg. 42-AY, Pg. 50-AZ, Pg. 59-SY, USSR Pg. 41).	• Recently upgraded for Basis of Interim Operation (BIO), already completed by plant forces (except SY Farm not installed) • Phase 2 will, for each DST, connect the existing probe output signal to TFLAN. Phase 2 will install a new probe in the three SY DST tanks and connect to the TFLAN PLC.
28.	Valve Position Indication and Waste Flow Meters (CDR Pg. 12-AN, Pg. 28-AP, Pg. 35, 36-AW, Pg. 42, 43-AY, Pg. 51-AZ, Pg. 59-SY, USSR Pg. 18, 19, 44)	• Original scope included this upgrade in CPPs 02A, 03A, 05A, 07A, AP Pump Pit (PP) 02D, AW Feed Pump Pit 02E, and SY Feed Pump Pit 02E • Phase 2 installs no piping jumper manifolds in pits and replaces no valves in existing jumpers. Retrieval projects W-211, 521, 522, and W-314 Phase 1 will install new jumper manifolds with valve position indication and waste flow meters in pits they enter. Phase 2 will provide conduit, wire, and junction boxes near identified pits for future VPI connections, if appropriate.

29.	AN, AP, AW Primary Ventilation Scope Revisions (Current Requirements) • Dual Stack reduced to single stack design 30 ft high • Condensate seal pot pit and associated leak detector • Double-encased drain lines reduced to single pipe • Motorized isolation valves reduced to manually operated • Primary Ventilation Inlet Filters and Pressure Vacuum Relief Devices (AN and AW only) • Refit Pad • No lighting • No Shielding • No Cover • PLC controlled with manual operation override • Minimum remote monitoring • Use existing power source (CDR Pg. 20-AN, Pg. 31-AP, Pg. 37-AW, USSR Pg. 18, 34)	Modified design meets regulatory requirements and reduces complexity and maintenance requirements. No pit, seal pot now mounted on ventilation skid Safety Program already has completed this scope. Existing pad is to be re-used
30.	Primary ventilation inlet stations in AN/AW Farms (CDR Pg. 21-AN, Pg. 38-AW, USSR Pg. 18, 34)	Safety program upgrade already completed this work.

31.	SY primary stack monitor (CDR Pg. 63-SY, USSR Pg. 19, 54)	To be accomplished with SY ventilation upgrade strategy being developed by the RPP Programs.
32.	SY Annulus Ventilation Scope Revisions. • Single train similar to existing site portable systems • Refit pad • No lighting • No shielding • No cover • Manually operated system (no PLC) • Minimum remote monitoring • Use existing power source (CDR Pg. 64-SY, USSR Pg. 18, 35)	Modified design meets regulatory requirements and reduces complexity and maintenance requirements.
33.	244-S DCRT Primary Ventilation Scope Revisions. • Annulus inlet filters deleted • Primary inlet filter added. • Re-use existing filter pit. Remove existing jumpers and replace with non-restricted jumpers • Manually-operated system only (No PLC) • Incorporates Project W-420 installed GEMS system • No demister (CDR Pg. 78- 244-S DCRT, USSR Pg. 18, 36) **NOTE: If use of portable**	Modified design meets regulatory requirements and reduces complexity and maintenance requirements.

	exhauster approved, delete DCRT ventilation upgrades completely.	
34.	AY Tank Farm electrical scope for HVAC control panels and associated heater controllers. (CDR Pg. 41-AY, USSR Pg. 19, 59)	HVAC system was recently replaced in AY/AZ Farms and meets all minimum requirements.
35.	SST Upgrades, all upgrades deleted. (CDR Pg.67, 68-SSTs, USSR Pg. 63)	• Originally scoped to provide 13.8kV/480 Vac transformers, power meters, 480 Vac power stations, mini power stations, circuit breakers, steel racks, and lighting power. • Not required to support retrieval mission.
36.	AN/AP 242-A DCS signal sharing with TFLAN. (CDR Pg. 18-AN, Pg. 33-AP)	The evaporator does not need this information any longer.
	RECOMMENDED ADDITIONS	
40.	Add a diesel generator power receptacle in SY Tank Farm ventilation MCC	To correct mission in the CDR estimate. Needed to support retrieval mission.

5.0 ENVIRONMENTAL PERMITTING

Environmental/permitting documentation requirements for the TFRSO project have been developed consistent with the guidance in GPG-FM-021, Environmental Interfaces. Phase 2 permitting and required regulatory tasks are summarized in Table 5.1. A more thorough discussion of the required Air Permits, Resource Conservation and Recovery Act (RCRA), Dangerous Waste Regulations, and the National Environmental Policy Act is presented in the HNF-SD-W-314-PMP-001, Rev.3, *Project Execution Plan, Tank Farm Restoration and Safe Operations, Project W-314*. Further detailed definition and discussion of the above mentioned subjects is also available in HNF-3054, Rev. 0, *Project W-314 Phase 1 Environmental Permits and Approvals Plan*.

Phase 2 Permit Approval/ Requirement planning assumptions are summarized in Table 5.2.

Table 5.1: Project W-314 Phase 2 Permits and Approvals

Affected Environment	Permit, Approval or Requirement	Regulation or Standard	Responsible Agency	Applicability (yes or no and assumed action)
NEPA	NEPA Documentation	40 CFR 1500-1508 10 CFR 1021 DOE Order 451.1A	DOE	Yes. Review planned scope of work to assure bounding of project scope by existing NEPA documentation (e.g., Tank Waste Remediation System Environmental Impact Statement
SEPA	SEPA Documentation	WAC 197-11	Ecology	Yes. Ecology will review the SA. No separate SEPA Checklist will be required.
All Media	Cultural Resource Review	10 CFR 1021 36 CFR 63 36 CFR 800 43 CFR 7	DOE State Historic Preservation Office	Yes. CRR has been approved for work inside tank farms. Any work 150 meters outside the existing fence, removal of existing tanks, modification or demolishing existing structures will require a separate CRR.
	Ecological Compliance Review	10 CFR 1021 DOE Order 5484.1 50 CFR 17 50 CFR 402.6 WAC 232-12	DOE USFWS Ecology	Yes. Annual update to the RPP blanket tank farms ECR will be required prior to start of construction. If outside the boundaries specified in the tank farm ECR, a separate one would be required. The annual update to the tank farms ECR will be reviewed for restrictions and/or other impacts prior to obtaining excavation permit

All Media	American Indian Policies Review	DOE 1230.2 42 USC 1966	DOE BIA	No.
	Excavation Permit	36 CFR 800	DOE	Yes. Includes review of NOC conditions, & review of ECR/CRR.
	Preoperational Monitoring of Facility, Site, and Operations	DOE Order 5400.1	DOE	Yes. Document in memo-to-file the conclusion that existing tank farm monitoring will be sufficient.
	General Public & Environmental Protection; Radiation Protection Standards	DOE Order 5400.1 DOE Order 5400.5	DOE	Yes. Covered by compliance with radiological/ALARA requirements in work packages during construction.
All Air Emissions	Air Operating Permit	WAC 173-401	Ecology WDOH EPA	Yes. AOP will require revision for both radionuclide and non-radionuclide air emissions. Prepare AOP modification requests in parallel with NOC development.
Non-Radioactive Air Emissions	New Source Review; Source Registration	WAC 173-400-110 WAC 173-400-101	Ecology	Yes. Perform review in parallel with the WAC 173-460 applicability evaluation.
	Substantial Alteration of Emission Control Technology	WAC 173-400-114	Ecology	Yes. Review will be performed in parallel with the WAC 173-460 applicability evaluation.
	Prevention of Significant Deterioration	WAC 173-400-141	Ecology	Yes. Criteria Pollutant evaluation (e.g., particulate) will be performed in parallel with the WAC 173-460 applicability evaluation.
	Toxic Air Pollutants (TAP) /NOC; New Source Review	WAC 173-460-030 WAC 173-460-040	Ecology	Yes. Perform WAC 173-460 applicability evaluation. Prepare an application for approval to construct and operate all upgrades necessary to retrieve and deliver waste from each tank (assume five NOC applications will be required).

Radioactive Air Emissions	Source Review/NOC; Radiation Protection – Air Emissions	WAC 246-247-060 WAC 246-247	WDOH	Yes. Prepare an application for approval to construct and operate all upgrades necessary to retrieve and deliver waste feed from each tank (assume five NOC applications will be required).
Radioactive Air Emissions	NESHAP	40 CFR 61 Subpart H	EPA	Yes. Prepare an application for approval to construct and operate all upgrades necessary to retrieve and deliver waste feed from each tank (assume five NOC applications will be required).
Domestic Waste Water Disposal	Septic Systems <14,500 gpd capacity	WAC 246-272	WDOH	No.
	Septic Systems >14,500 gpd capacity	WAC 173-216 WAC 173-240 WAC 173-221, -221A	Ecology	No.
Storm Water Disposal	Storm Water Discharge Under General Permit	40 CFR 122 WAC 173-226	EPA Ecology	No.
	Storm Water Discharge Under UIC Permit	WAC 173-218	Ecology	No.
	Engineering Approval; System ID. Number	WAC 246-290	WDOH	No.
	Operator Certification	WAC 246-292	WDOH	No.
Radioactive Waste Management	Reprocessing, Management, or Disposal of Spent Nuclear Fuel	DOE Order 5820.2A DOE Order 6430.1A 10 CFR 962 40 CFR 191	DOE EPA NRC	Yes. Covered by RPP procedures and requirements in Work Packages.
Solid Waste	Solid Waste Management	WAC 173-304 DOE 5400.1	Ecology DOE BCHD	No.
Dangerous Waste	Dangerous Waste Management	WAC 173-303 40 CFR 260 through 268	Ecology EPA	Yes. It is assumed the DST System RCRA Part B Permit will be issued. Modifications could cause a delay of up to 12 months between completion of design and obtaining approval to construct. Design submittal will be critical to minimize potential impacts to the project. Permit negotiations will be monitored closely to determine alt. strategies to avoid delays.
	Notice of Intent (NOI)	WAC 173-303-281	Ecology	No.
USTs	Underground Storage Tank Permit	WAC 173-360 40 CFR 280	Ecology EPA	No.

Affected Environment	Permit, Approval or Requirement	Regulation or Standard	Responsible Agency	Applicability (yes or no and assumed action)
Special Substances	Polychlorinated biphenyl's	40 CFR 761 WAC 173-303	EPA Ecology	Yes. This is covered by the DST Waste Acceptance Criteria review prior to any waste transfer.
	Used oils	WAC 173-303 40 CFR 279	Ecology EPA	No.
	Asbestos	BCCAA Reg. 1, Article 8 40 CFR 61	BCCAA EPA	No.
	Chlorofluoro-Carbons Ozone Depleting Substances	40 CFR 82	EPA	No.
	Pollution Prevention Plans for Hazardous Substances and Wastes	WAC 173-307	Ecology	Yes. This is covered by RPP internal procedures.
	Notification/ Reporting of Hazardous Materials Spills/Releases	40 CFR 302 40 CFR 372 WAC 173-340	EPA Ecology	Yes. This is covered by site-wide and RPP internal procedures.

Table 5.1 Abbreviations

ALARA	as low as reasonably achievable
AOP	Air Operating Permit
BCCAA	Benton County Clean Air Authority
BCHD	Benton County Health Department
BIA	Bureau of Indian Affairs
CRR	Cultural Resources Review
CFR	Code of Federal Regulations
DOE	United States Department of Energy
Ecology	State of Washington Department of Ecology
ECR	Ecological Compliance Review EPA
EPA	U.S. Environmental Protection Agency
EIS	Effluent information system
gpd	gallons per day
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction
NRC	U.S. Nuclear Regulatory Commission
PCB	Polychlorinated Biphenyl
PNNL	Pacific Northwest National Laboratory
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RPP	River Protection Projects
SA	Safety Analysis
SEPA	State Environmental Policy Act
SWP	Special Work Permits (Protective Clothing)
TAP	Toxic Air Pollutants
UIC	underground injection control

USC	United States Code
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
WAC	Washington Administrative Code
WDOH	Washington State Department of Health

Table 5.2 Project W-314 Phase 2 Permits/Regulatory Tasks Planning Assumptions

Permit, Approval or Requirement	Planning Assumptions
National Environmental Policy Act (NEPA)	For planning purposes, a conservative assumption has been made that assumes preparation of a Supplemental Analysis (SA). The expected outcome is the existing NEPA documentation (e.g., RPP EIS) and SA together will bound the potential range of environmental impacts.
State Environmental Policy Act (SEPA)	Planning assumption is that Ecology will review the SA. The expected outcome is that independent SEPA documentation will not be necessary.
Cultural Resources Review (CRR)	A Cultural Resources exemption (Battelle letter dated 8/16/94) has been approved by RL for the 18 tank farm areas on the Hanford Site. The exemption does not include removal of tanks, or modifying and/or demolishing any permanent structure(s) w/in or 150 meters outside of the tank farms. Planning assumption is that this project is adequately covered by this existing exemption. No level of effort is planned.
Ecological Compliance Review (ECR)	A blanket Biological Review is performed annually by PNNL for the tank farm facilities in the 200 E and 200W Areas (#98-200-047). Planning assumption is that the requirements specified in the biological review letter will apply to the project. No level of effort is planned.
Excavation Permit	Planning basis is three excavation permits required for construction activities associated with each of the seven tank farms included within the scope of this project. Typical environmental review activities assumed to support each excavation permit include CRR, ECR, permit condition implementation, and general technical compliance review.
Preoperational Monitoring of Facility, Site, and Operations	It is assumed that existing tank farm monitoring will be sufficient for this project. Document with memo to file. No level of effort is planned.
General Public & Environmental Protection, Radiation Protection Standards	These requirements are captured in individual work packages, internal procedures, and in implementation of applicable permit conditions. Planning basis is that environmental staff will be asked to review work packages and to provide general support for periodic design, construction, and implementation assistance.
Air Operating Permit (AOP)	It is assumed the AOP will be final. The planned approach will be to submit a request for modification of the AOP at the same time as both the radioactive & non-radioactive NOC applications are submitted to the regulatory agencies for approval. Ventilation system upgrades, or upgrades to ventilation system monitoring systems are assumed to be classified as "significant modifications." It is assumed that significant modifications will require an additional six months beyond approval of the radioactive/non-radioactive NOCs before commencement of construction.

Permit, Approval or Requirement	Planning Assumptions
Permit, Approval or Requirement	Planning Assumptions
New Source Review; Source registration	Planning assumption is that the review will be performed in parallel with the WAC 173-460 (TAP) evaluation. The assumed outcome is no new source requiring source registration.
Prevention of Significant Deterioration (PSD)	Planning assumption is that the PSD review will be performed in parallel with the WAC 173-460 (TAP) evaluation. Planning basis assumes that no PSD permit will be required.
Notice of Construction (NOC) – Toxic Air Pollutants (TAP)	Planning basis is each of the NOCs will encompass both construction and operation. For planning purposes, it is assumed that five NOC applications will be required for ventilation and monitoring system upgrades in S (244-S DCRT), AN, AW, AP, and SY Farms. Work scope associated with creation of potential fugitive emissions (e.g., excavation) in those and other farms will be included in the NOC applications above. Approval must be obtained prior to the start of construction.
NOC – Radioactive Air Emissions	It is assumed that NOC approval will be required for radioactive air emissions. The planning basis assumes five NOC applications will be required for ventilation and monitoring system upgrades in S (244-S DCRT), AN, AW, AP, and SY Farms. Work scope associated with creation of potential fugitive emissions in those and other farms will be included in the NOC applications above. Approval must be obtained prior to the start of construction.
Resource Conservation and Recovery Act (RCRA)	Planning basis is that the DST RCRA Part B Permit will be issued and in force. The planning assumption is that significant time lags (6 months to 1 year) will be likely between completion of definitive design and approval to construct to allow for public comment. It is also assumed that the Tri-Party Agreement (TPA) Milestone for upgrading non-compliant lines (2005) will be applicable to all transfer lines for this project. Compliance with WAC 173-303 technical standards (e.g., secondary containment) and other conditions of the permit will be mandatory, unless modified by separate regulatory agreement.
Hazardous Waste Reduction	It is assumed that existing site-wide programs and RPP internal procedures will satisfy applicable requirements. No level of effort is planned.
Polychlorinated biphenyls (PCBs)	The waste must meet DST Waste Acceptance Criteria prior to transfer. Evaluation for potential PCBs will be required as part of this process. Any project level of effort is included as part of design review.
Notification and Reporting of Hazardous Materials Spills/Releases	It is assumed that existing site-wide programs and RPP internal procedures will satisfy applicable requirements. No additional project scope is planned.

6.0 COST ESTIMATE

The total cost of Phase 2 is $128 M.

Section 6.1 presents the Phase 2 cost estimate with the Cost Estimate Basis. Section 6.2 presents the changes from the previous baseline.

Cost Estimating Methodology: Work scope packages were prepared by system for each farm/area in the project scope. A Cost Estimating Structure (CES) was developed assigning the Work Scope Package tasks to the appropriate element of the project WBS.

With the CES as a foundation, takeoffs from the scope and drawings were made. Additional adders included general conditions (Hanford), construction management, and health physics technician costs. This total represented the unburdened Direct Construction Costs. Mark-up burdens were applied to arrive at the fully burdened Total Construction Cost (TCC).

The development of the Total Estimated Constructed Cost (TECC) was accomplished by adding the burdened Title II and III engineering costs to the TCC. The Total Project Cost (TPC) was then determined by adding the estimated other project costs (OPC), which included client inputs, to the TECC.

Estimate Credibility: The cost estimate was generated using information from:

- The USSR, Rev. 4
- Phase 2 scope definition with assumptions
- Drawings based on plant physical layouts and dimensions
- Use of Phase 1 cost of definitive design information for like items
- Lessons learned, tank farm environment, and downtime costs of the current AN construction
- Estimating team with more than collective 100 years cost estimating Hanford-related experience
- Use of vendor quotes
- Cost data obtained from standard databases (e.g., Richards, RS Means, Corps of Engineers, Saylor, and established Hanford labor rates)
- Incorporation of cost and schedule information from Phase 1 activities.

6.1 DETAILED COST ESTIMATE

(consisting of the following 46 pages)

W-314 Tank Farm Restoration and Safe Operations (TFRSO
PROJECT COST SUMMARY

Cost Code	Description	Escalated Total Cost	Contingency %	Contingency Total	Total Dollars
020	Title II Design	$8,100,000	28.00%	$2,300,000	$10,400,000
030	Title III Design	$4,600,000	24.00%	$1,100,000	$5,700,000
050	Construction Management	$9,200,000	40.00%	$3,700,000	$12,900,000
550	Other Structures	$700,000	43.00%	$300,000	$1,000,000
700	Special Equipment/Process Systems	$21,000,000	38.00%	$7,900,000	$28,900,000
7060	Electrical	$1,100,000	36.00%	$400,000	$1,500,000
7065	Instrumentation/Controls	$12,800,000	40.00%	$5,100,000	$17,900,000
788	HPT Support	$5,700,000	25.00%	$1,400,000	$7,100,000
810	Demolition	$2,700,000	41.00%	$1,100,000	$3,800,000
	Total Estimated Cost (TEC)	$65,900,000	35.00%	$23,300,000	$89,200,000
900	Other Project Costs	$31,200,000	24.00%	$7,400,000	$38,600,000
	Other Project Cost (OPC)	$31,200,000	24.00%	$7,400,000	$38,600,000
	TOTAL PROJECT COST (TPC)	$97,100,000	32.00%	$30,700,000	$127,800,000

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Type of Estimate: Final Estimate
Architect/Engineer: 9/28/99
Operating Contractor: 9/28/99

Remarks:
A/E Lead Estimator: Ben Lindholm
A/E Project Manager: Jim Anderson 9-27-99

COGEMA Engineering Corp.
By: BL/TW/BT/GH
09/27/1999

(Rounded to the nearest $ 100000)

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
W-314 Tank Farm Restoration and Safe Operations (TFRSO) Phase II	$89,366,239	8.73%	$7,798,968	$97,165,206	31.52%	$30,624,976	$127,790,183
-- 1 Project Management	$10,685,330	7.72%	$825,391	$11,510,720	24.98%	$2,874,997	$14,385,717
--- 1A PM & Integration	$4,163,868	9.73%	$405,163	$4,569,031	54.72%	$2,499,991	$7,069,022
--- 1A0 PM & Integration Phase II	$4,163,868	9.73%	$405,163	$4,569,031	54.72%	$2,499,991	$7,069,022
--- 1A0100 PM & Integration - FY 2003	$1,251,141	7.59%	$94,962	$1,346,102	54.72%	$736,533	$2,082,636
--- 1A0101 PM & Integration - FY 2004	$1,581,364	9.69%	$153,234	$1,734,598	54.72%	$949,102	$2,683,700
--- 1A0102 PM & Integration - FY 2005	$1,331,364	11.79%	$156,968	$1,488,331	54.72%	$814,355	$2,302,687
--- 1B Project Engineering	$2,879,210	6.23%	$179,363	$3,058,573	8.17%	$250,000	$3,308,573
--- 1B5 Project Engineering Phase II	$2,879,210	6.23%	$179,363	$3,058,573	8.17%	$250,000	$3,308,573
--- 1B5A Project Engineering AN	$526,607	3.39%	$17,852	$544,459	8.17%	$44,503	$588,961
--- 1B5B Project Engineering AP	$484,526	6.89%	$33,384	$517,910	8.17%	$42,333	$560,243
--- 1B5C Project Engineering AW	$427,183	9.34%	$39,899	$467,082	8.17%	$38,178	$505,260
--- 1B5D Project Engineering AY	$178,755	5.84%	$10,439	$189,194	8.17%	$15,464	$204,658
--- 1B5E Project Engineering AZ	$157,628	5.84%	$9,206	$166,834	8.17%	$13,637	$180,471
--- 1B5F Project Engineering SY	$429,512	8.99%	$38,613	$468,125	8.17%	$38,263	$506,388
--- 1B5G Project Engineering DCRT	$674,999	4.44%	$29,970	$704,969	8.17%	$57,622	$762,591
--- 1C SE Management	$1,944,807	6.60%	$128,372	$2,073,179	4.82%	$100,010	$2,173,189
--- 1C5 SE Management Phase II	$1,944,807	6.60%	$128,372	$2,073,179	4.82%	$100,010	$2,173,189
--- 1C5A SE Management AN	$253,094	3.22%	$8,150	$261,244	4.82%	$12,602	$273,846
--- 1C5B SE Management AP	$281,649	6.89%	$19,406	$301,054	4.82%	$14,523	$315,577
--- 1C5C SE Management AW	$256,988	9.34%	$24,003	$280,991	4.82%	$13,555	$294,546
--- 1C5D SE Management AY	$69,114	5.84%	$4,036	$73,151	4.82%	$3,529	$76,679
--- 1C5E SE Management AZ	$63,436	5.84%	$3,705	$67,140	4.82%	$3,239	$70,379
--- 1C5F SE Management SY	$245,307	8.99%	$22,053	$267,360	4.82%	$12,897	$280,257
--- 1C5G SE Management DCRT	$175,219	4.44%	$7,780	$182,999	4.82%	$8,828	$191,827
--- 1C5K SE Risk Management	$600,000	6.54%	$39,240	$639,240	4.82%	$30,837	$670,077
--- 1D Quality Assurance	$1,697,444	6.63%	$112,493	$1,809,937	1.38%	$24,995	$1,834,932

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
1D5 Quality Assurance Phase II	$1,697,444	6.63%	$112,493	$1,809,937	1.38%	$24,995	$1,834,932
1D5A Quality Assurance AN	$309,933	3.22%	$9,980	$319,913	1.38%	$4,418	$324,331
1D5B Quality Assurance AP	$349,162	6.89%	$24,057	$373,220	1.38%	$5,154	$378,374
1D5C Quality Assurance AW	$321,635	9.34%	$30,041	$351,676	1.38%	$4,857	$356,532
1D5D Quality Assurance AY	$105,986	5.84%	$6,190	$112,175	1.38%	$1,549	$113,725
1D5E Quality Assurance AZ	$95,844	5.84%	$5,597	$101,441	1.38%	$1,401	$102,842
1D5F Quality Assurance SY	$302,578	8.99%	$27,202	$329,779	1.38%	$4,554	$334,334
1D5G Quality Assurance DCRT	$212,306	4.44%	$9,426	$221,732	1.38%	$3,062	$224,794
2 Permitting & Safety	**$982,366**	**6.19%**	**$60,765**	**$1,043,131**	**16.78%**	**$174,996**	**$1,218,126**
2A Permitting	**$321,526**	**6.30%**	**$20,263**	**$341,788**	**16.78%**	**$57,338**	**$399,127**
2A5 Permitting Phase II	$321,526	6.30%	$20,263	$341,788	16.78%	$57,338	$399,127
2A5A Permitting AN	$48,158	3.22%	$1,551	$49,709	16.78%	$8,339	$58,048
2A5B Permitting AP	$48,158	6.89%	$3,318	$51,477	16.78%	$8,636	$60,112
2A5C Permitting AW	$48,158	9.17%	$4,416	$52,575	16.78%	$8,820	$61,395
2A5D Permitting AY	$20,237	5.67%	$1,147	$21,385	16.78%	$3,588	$24,972
2A5E Permitting AZ	$20,237	5.67%	$1,147	$21,385	16.78%	$3,588	$24,972
2A5F Permitting SY	$48,158	8.82%	$4,248	$52,406	16.78%	$8,792	$61,198
2A5G Permitting DCRT	$48,158	4.62%	$2,225	$50,383	16.78%	$8,452	$58,836
2A5K Permitting Annual Updates	$40,259	5.49%	$2,210	$42,469	16.78%	$7,125	$49,594
2B Safety Analysis	**$660,840**	**6.13%**	**$40,503**	**$701,342**	**16.78%**	**$117,657**	**$819,000**
2B5 Safety Analysis Phase II	$660,840	6.13%	$40,503	$701,342	16.78%	$117,657	$819,000
2B5A Safety Analysis AN	$123,839	3.22%	$3,988	$127,827	16.78%	$21,444	$149,271
2B5B Safety Analysis AP	$123,839	6.37%	$7,889	$131,728	16.78%	$22,099	$153,826
2B5C Safety Analysis AW	$103,016	8.99%	$9,261	$112,278	16.78%	$18,836	$131,113
2B5D Safety Analysis AY	$55,892	5.49%	$3,068	$58,960	16.78%	$9,891	$68,852
2B5E Safety Analysis AZ	$48,220	5.67%	$2,734	$50,955	16.78%	$8,548	$59,503
2B5F Safety Analysis SY	$112,880	8.64%	$9,753	$122,633	16.78%	$20,573	$143,205
2B5G Safety Analysis DCRT	$93,153	4.09%	$3,810	$96,963	16.78%	$16,267	$113,230

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
-- 3 OPC Activities	$17,671,970	5.27%	$930,828	$18,602,798	23.12%	$4,300,500	$22,903,298
— 3C Design & Construction Support	$5,672,088	6.16%	$349,608	$6,021,696	25.15%	$1,514,662	$7,536,358
— 3C5 Design & Construction Support Phase II	$5,672,088	6.16%	$349,608	$6,021,696	25.15%	$1,514,662	$7,536,358
— 3C5A Design & Construction Support - AN	$989,492	3.22%	$31,862	$1,021,353	25.58%	$261,253	$1,282,606
— 3C5B Design & Construction Support - AP	$1,036,768	6.37%	$66,042	$1,102,810	25.54%	$281,692	$1,384,503
— 3C5C Design & Construction Support - AW	$857,312	8.47%	$72,614	$929,926	25.00%	$232,481	$1,162,407
— 3C5D Design & Construction Support - AY	$515,971	5.49%	$28,327	$544,298	24.77%	$134,802	$679,100
— 3C5E Design & Construction Support - AZ	$506,641	5.67%	$28,727	$535,367	24.76%	$132,567	$667,934
— 3C5F Design & Construction Support - SY	$1,038,816	8.64%	$89,754	$1,128,570	24.73%	$279,084	$1,407,654
— 3C5G Design & Construction Support - 244S - DCRT	$727,088	4.44%	$32,283	$759,371	25.39%	$192,783	$952,154
— 3K Startup & Testing	$5,859,813	7.66%	$449,053	$6,308,866	34.08%	$2,149,996	$8,458,862
— 3K5 Startup & Testing Phase II	$5,859,813	7.66%	$449,053	$6,308,866	34.08%	$2,149,996	$8,458,862
— 3K5A Startup & Testing AN	$1,100,720	4.27%	$47,001	$1,147,720	34.43%	$395,206	$1,542,926
— 3K5B Startup & Testing AP	$1,382,866	8.12%	$112,289	$1,495,155	34.00%	$508,353	$2,003,508
— 3K5C Startup & Testing AW	$1,390,977	10.39%	$144,522	$1,535,499	34.00%	$522,070	$2,057,569
— 3K5D Startup & Testing AY	$199,816	6.19%	$12,369	$212,184	34.00%	$72,143	$284,327
— 3K5E Startup & Testing AZ	$199,816	6.37%	$12,728	$212,544	34.00%	$72,265	$284,809
— 3K5F Startup & Testing SY	$457,607	9.69%	$44,342	$501,949	34.00%	$170,663	$672,612
— 3K5G Startup & Testing DCRT	$1,128,011	6.72%	$75,802	$1,203,814	34.00%	$409,297	$1,613,110
— 3L Operations Preparations	$1,482,455	6.70%	$99,300	$1,581,755	26.87%	$424,995	$2,006,750
— 3L5 Operations Preparations Phase II	$1,482,455	6.70%	$99,300	$1,581,755	26.87%	$424,995	$2,006,750
— 3L5A Operations Preparations AN	$814,057	5.65%	$45,979	$860,036	29.78%	$256,112	$1,116,148
— 3L5B Operations Preparations AP	$69,802	9.17%	$6,401	$76,202	22.99%	$17,520	$93,723
— 3L5C Operations Preparations AW	$142,776	11.27%	$16,091	$158,867	22.93%	$36,423	$195,290
— 3L5D Operations Preparations AY	$12,691	7.07%	$897	$13,588	23.11%	$3,140	$16,729
— 3L5E Operations Preparations AZ	$300,354	5.84%	$17,541	$317,894	23.42%	$74,448	$392,342
— 3L5F Operations Preparations SY	$44,419	11.09%	$4,926	$49,345	26.37%	$13,012	$62,357
— 3L5G Operations Preparations DCRT	$98,357	7.59%	$7,465	$105,822	23.00%	$24,339	$130,161

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
--- 3M Independent Reviews	$200,000	8.64%	$17,280	$217,280		$0	$217,280
—— 3M5 Independent Reviews Phase II	$200,000	8.64%	$17,280	$217,280		$0	$217,280
——— 3M5F00 Independent Reviews - FY 2004	$100,000	7.59%	$7,590	$107,590		$0	$107,590
——— 3M5G00 Independent Reviews - FY 2005	$100,000	9.69%	$9,690	$109,690		$0	$109,690
--- 3P Phase II Planning	$3,954,919	0.21%	$8,381	$3,963,300	1.26%	$49,994	$4,013,294
—— 3P5 Phase II Planning	$3,954,919	0.21%	$8,381	$3,963,300	1.26%	$49,994	$4,013,294
——— 3P5000 Phase II Planning - Prior Years	$2,704,000		$0	$2,704,000		$0	$2,704,000
——— 3P5001 Phase II Planning - FY 2000	$1,250,919	0.67%	$8,381	$1,259,300	3.97%	$49,994	$1,309,294
--- 3Q SY Annulus Ventilation Upgrade	$502,695	1.43%	$7,206	$509,901	31.55%	$160,853	$670,754
—— 3Q1 SY Definitive Design - Title II	$175,000	0.67%	$1,173	$176,173	20.00%	$35,235	$211,407
——— 3Q11 SY Definitive Design - Engineering	$175,000	0.67%	$1,173	$176,173	20.00%	$35,235	$211,407
—— 3Q3 SY Procurement	$77,695	1.33%	$1,033	$78,729	30.00%	$23,619	$102,347
——— 3Q3B HVAC Procurement	$77,695	1.33%	$1,033	$78,729	30.00%	$23,619	$102,347
—— 3Q4 SY Tank Farm Construction	$250,000	2.00%	$5,000	$255,000	40.00%	$102,000	$357,000
——— 3Q40 SY Tank Farm Construction	$250,000	2.00%	$5,000	$255,000	40.00%	$102,000	$357,000
-- 5 W-314 Tank Farm Restoration and Safe Operations (TFRSO) Construction Phase II	$60,026,573	9.97%	$5,981,984	$66,008,557	35.26%	$23,274,484	$89,283,041
--- 5A AN Tank Farm	$9,331,030	7.29%	$680,158	$10,011,188	35.83%	$3,586,750	$13,597,938
—— 5A1 AN Definitive Design - Title II	$1,087,978	2.00%	$21,760	$1,109,738	35.14%	$389,951	$1,499,689
——— 5A11 AN Definitive Design - Engineering	$749,678	2.00%	$14,994	$764,672	35.14%	$268,698	$1,033,370
——— 5A12 AN Definitive Design - Engineering Support	$338,300	2.00%	$6,766	$345,066	35.14%	$121,253	$466,319
—— 5A2 AN Engineering/Inspection - Title III	$693,044	6.63%	$45,949	$738,993	25.00%	$184,748	$923,741
——— 5A21 AN Engineering/Inspection - Title III	$693,044	6.63%	$45,949	$738,993	25.00%	$184,748	$923,741
—— 5A3 AN Procurement	$1,370,598	3.98%	$54,550	$1,425,148	30.00%	$427,544	$1,852,692
——— 5A3A HVAC Procurement	$1,370,598	3.98%	$54,550	$1,425,148	30.00%	$427,544	$1,852,692
—— 5A4 AN Tank Farm Construction	$5,489,067	9.33%	$512,130	$6,001,197	40.00%	$2,400,479	$8,401,675
——— 5A4A AN Tank 101	$51,888	9.33%	$4,841	$56,729	40.00%	$22,692	$79,421
——— 5A4B AN Tank 102	$350,985	9.33%	$32,747	$383,732	40.00%	$153,493	$537,225

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
5A4C AN Tank 103	$491,245	9.33%	$45,833	$537,078	40.00%	$214,831	$751,910
5A4D AN Tank 104	$28,774	9.33%	$2,685	$31,459	40.00%	$12,583	$44,042
5A4E AN Tank 105	$397,671	9.33%	$37,103	$434,774	40.00%	$173,909	$608,683
5A4F AN Tank 106	$404,128	9.33%	$37,705	$441,833	40.00%	$176,733	$618,566
5A4G AN Tank 107	$406,761	9.33%	$37,951	$444,711	40.00%	$177,885	$622,596
5A4J AN Tank Farm Site Work	$1,980,588	9.33%	$184,789	$2,165,376	40.00%	$866,151	$3,031,527
5A4N Construction Management	$1,231,542	9.33%	$114,903	$1,346,445	40.00%	$538,578	$1,885,024
5A4P Construction Equipment	$145,485	9.33%	$13,574	$159,059	40.00%	$63,624	$222,682
5A6 AN HPT Support	$690,344	6.63%	$45,770	$736,113	25.00%	$184,028	$920,142
5A61 AN HPT Support	$690,344	6.63%	$45,770	$736,113	25.00%	$184,028	$920,142
5B AP Tank Farm	**$13,630,452**	**9.56%**	**$1,302,901**	**$14,933,353**	**36.08%**	**$5,387,235**	**$20,320,588**
5B1 AP Definitive Design - Title II	$1,222,398	5.95%	$72,733	$1,295,131	35.00%	$453,296	$1,748,427
5B11 AP Definitive Design - Engineering	$603,370	5.95%	$35,900	$639,270	35.00%	$223,745	$863,015
5B12 AP Definitive Design - Engineering Support	$619,029	5.95%	$36,832	$655,861	35.00%	$229,551	$885,412
5B2 AP Engineering/Inspection - Title III	$908,353	10.00%	$90,835	$999,189	25.00%	$249,797	$1,248,986
5B21 AP Engineering/Inspection - Title III	$908,353	10.00%	$90,835	$999,189	25.00%	$249,797	$1,248,986
5B3 AP Procurement	$1,587,609	9.33%	$148,124	$1,735,733	30.00%	$520,720	$2,256,453
5B3B HVAC Procurement	$1,587,609	9.33%	$148,124	$1,735,733	30.00%	$520,720	$2,256,453
5B4 AP Tank Farm Construction	$8,712,712	10.00%	$871,271	$9,583,983	40.00%	$3,833,593	$13,417,576
5B4A AP Tank 101	$448,465	10.00%	$44,846	$493,311	40.00%	$197,325	$690,636
5B4B AP Tank 102	$523,744	10.00%	$52,374	$576,118	40.00%	$230,447	$806,565
5B4C AP Tank 103	$939,205	10.00%	$93,920	$1,033,125	40.00%	$413,250	$1,446,375
5B4D AP Tank 104	$26,681	10.00%	$2,668	$29,350	40.00%	$11,740	$41,089
5B4E AP Tank 105	$456,001	10.00%	$45,600	$501,601	40.00%	$200,640	$702,241
5B4F AP Tank 106	$523,093	10.00%	$52,309	$575,402	40.00%	$230,161	$805,563
5B4G AP Tank 107	$456,001	10.00%	$45,600	$501,601	40.00%	$200,640	$702,241
5B4H AP Tank 108	$517,101	10.00%	$51,710	$568,812	40.00%	$227,525	$796,336
5B4J AP Tank Farm Site Work	$2,618,264	10.00%	$261,826	$2,880,091	40.00%	$1,152,036	$4,032,127
5B4N Construction Management	$1,978,915	10.00%	$197,892	$2,176,807	40.00%	$870,723	$3,047,529

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
5B4P Construction Equipment	$225,242	10.00%	$22,524	$247,766	40.00%	$99,106	$346,873
5B6 AP HPT Support	$1,199,379	10.00%	$119,938	$1,319,317	25.00%	$329,829	$1,649,146
5B61 AP HPT Support	$1,199,379	10.00%	$119,938	$1,319,317	25.00%	$329,829	$1,649,146
5C AW Tank Farm	**$13,309,076**	**12.57%**	**$1,672,302**	**$14,981,379**	**35.20%**	**$5,274,142**	**$20,255,521**
5C1 AW Definitive Design - Title II	$1,530,918	9.33%	$142,835	$1,673,752	25.00%	$418,438	$2,092,190
5C11 AW Definitive Design - Engineering	$677,348	9.33%	$63,197	$740,545	25.00%	$185,136	$925,681
5C12 AW Definitive Design - Engineering Support	$853,569	9.33%	$79,638	$933,207	25.00%	$233,302	$1,166,509
5C2 AW Engineering/Inspection - Title III	$728,141	13.23%	$96,333	$824,475	25.00%	$206,119	$1,030,593
5C21 AW Engineering/Inspection - Title III	$728,141	13.23%	$96,333	$824,475	25.00%	$206,119	$1,030,593
5C3 AW Procurement	$1,370,598	11.13%	$152,548	$1,523,145	30.00%	$456,944	$1,980,089
5C3B HVAC Procurement	$1,370,598	11.13%	$152,548	$1,523,145	30.00%	$456,944	$1,980,089
5C4 AW Tank Farm Construction	$8,552,741	13.23%	$1,131,528	$9,684,269	40.00%	$3,873,708	$13,557,977
5C4A AW Tank 101	$515,054	13.23%	$68,142	$583,196	40.00%	$233,278	$816,474
5C4B AW Tank 102	$1,331,148	13.23%	$176,111	$1,507,259	40.00%	$602,904	$2,110,162
5C4C AW Tank 103	$454,872	13.23%	$60,180	$515,052	40.00%	$206,021	$721,073
5C4D AW Tank 104	$526,743	13.23%	$69,688	$596,431	40.00%	$238,572	$835,004
5C4E AW Tank 105	$464,744	13.23%	$61,486	$526,229	40.00%	$210,492	$736,721
5C4F AW Tank 106	$455,457	13.23%	$60,257	$515,714	40.00%	$206,286	$722,000
5C4J AW Tank Farm Site Work	$2,734,946	13.23%	$361,833	$3,096,779	40.00%	$1,238,712	$4,335,491
5C4N Construction Management	$1,855,719	13.23%	$245,512	$2,101,231	40.00%	$840,492	$2,941,724
5C4P Construction Equipment	$214,058	13.23%	$28,320	$242,378	40.00%	$96,951	$339,329
5C6 AW HPT Support	$1,126,678	13.23%	$149,059	$1,275,737	25.00%	$318,934	$1,594,672
5C61 AW HPT Support	$1,126,878	13.23%	$149,059	$1,275,737	25.00%	$318,934	$1,594,672
5D AY Tank Farm	**$2,140,227**	**7.30%**	**$156,258**	**$2,296,485**	**31.08%**	**$713,804**	**$3,010,289**
5D1 AY Definitive Design - Title II	$510,380	5.95%	$30,368	$540,748	20.00%	$108,150	$648,897
5D11 AY Definitive Design - Engineering	$426,545	5.95%	$25,379	$451,925	20.00%	$90,385	$542,309
5D12 AY Definitive Design - Engineering Support	$83,835	5.95%	$4,988	$88,823	20.00%	$17,765	$106,588
5D2 AY Engineering/Inspection - Title III	$233,578	7.75%	$18,102	$251,680	25.00%	$62,920	$314,600
5D21 AY Engineering/Inspection - Title III	$233,578	7.75%	$18,102	$251,680	25.00%	$62,920	$314,600

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
— 5D3 AY Procurement	$37,763	6.63%	$2,504	$40,266	30.00%	$12,080	$52,346
—— 5D3A Electrical Procurement	$37,763	6.63%	$2,504	$40,266	30.00%	$12,080	$52,346
— 5D4 AY Tank Farm Construction	$1,178,914	7.75%	$91,366	$1,270,280	38.00%	$482,707	$1,752,987
—— 5D4A AY Tank 101	$19,346	7.75%	$1,499	$20,845	38.00%	$7,921	$28,766
—— 5D4B AY Tank 102	$22,487	7.75%	$1,743	$24,230	38.00%	$9,207	$33,437
—— 5D4J AY Tank Farm Site Work	$857,533	7.75%	$66,459	$923,992	38.00%	$351,117	$1,275,109
—— 5D4N Construction Management	$250,501	7.75%	$19,414	$269,915	38.00%	$102,568	$372,482
—— 5D4P Construction Equipment	$29,048	7.75%	$2,251	$31,299	38.00%	$11,894	$43,193
— 5D6 AY HPT Support	$179,592	7.75%	$13,918	$193,511	24.78%	$47,948	$241,459
—— 5D61 AY HPT Support	$179,592	7.75%	$13,918	$193,511	24.78%	$47,948	$241,459
— 5E AZ Tank Farm	$2,199,915	7.36%	$161,841	$2,361,756	32.29%	$762,493	$3,124,249
— 5E1 AZ Definitive Design - Title II	$513,191	6.18%	$31,715	$544,906	20.00%	$108,981	$653,887
—— 5E11 AZ Definitive Design - Engineering	$413,968	6.18%	$25,583	$439,551	20.00%	$87,910	$527,461
—— 5E12 AZ Definitive Design - Engineering Support	$99,223	6.18%	$6,132	$105,355	20.00%	$21,071	$126,425
— 5E2 AZ Engineering/Inspection - Title III	$231,831	7.75%	$17,967	$249,798	25.00%	$62,449	$312,247
—— 5E21 AZ Engineering/Inspection - Title III	$231,831	7.75%	$17,967	$249,798	25.00%	$62,449	$312,247
— 5E3 AZ Procurement	$66,174	6.85%	$4,533	$70,707	30.00%	$21,212	$91,919
—— 5E3A Electrical Procurement	$66,174	6.85%	$4,533	$70,707	30.00%	$21,212	$91,919
— 5E4 AZ Tank Farm Construction	$1,211,225	7.75%	$93,870	$1,305,094	40.00%	$522,038	$1,827,132
—— 5E4A AZ Tank 101	$26,692	7.75%	$2,069	$28,761	40.00%	$11,504	$40,265
—— 5E4B AZ Tank 102	$29,188	7.75%	$2,262	$31,450	40.00%	$12,580	$44,030
—— 5E4J AZ Tank Farm Site Work	$873,270	7.75%	$67,678	$940,948	40.00%	$376,379	$1,317,327
—— 5E4N Construction Management	$251,980	7.75%	$19,528	$271,508	40.00%	$108,603	$380,112
—— 5E4P Construction Equipment	$30,095	7.75%	$2,332	$32,427	40.00%	$12,971	$45,398
— 5E6 AZ HPT Support	$177,495	7.75%	$13,756	$191,251	25.00%	$47,813	$239,064
—— 5E61 AZ HPT Support	$177,495	7.75%	$13,756	$191,251	25.00%	$47,813	$239,064
— 5F SY Tank Farm	$11,299,781	12.15%	$1,372,759	$12,672,540	35.68%	$4,521,103	$17,193,644
— 5F1 SY Definitive Design - Title II	$1,256,662	9.10%	$114,356	$1,371,018	23.66%	$324,342	$1,695,360
—— 5F11 SY Definitive Design - Engineering	$626,228	9.10%	$56,987	$683,214	23.66%	$161,628	$844,842

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
5F12 SY Definitive Design - Engineering Support	$630,434	9.10%	$57,369	$687,804	23.66%	$162,714	$850,517
5F2 SY Engineering/Inspection - Title III	$762,546	12.53%	$95,547	$858,092	25.00%	$214,523	$1,072,616
5F21 SY Engineering/Inspection - Title III	$762,546	12.53%	$95,547	$858,092	25.00%	$214,523	$1,072,616
5F4 SY Tank Farm Construction	$8,124,536	12.53%	$1,018,004	$9,142,540	40.00%	$3,657,016	$12,799,557
5F4A SY Tank 101	$570,465	12.53%	$71,479	$641,945	40.00%	$256,778	$898,723
5F4B SY Tank 102	$1,361,654	12.53%	$170,615	$1,532,269	40.00%	$612,907	$2,145,176
5F4C SY Tank 103	$558,844	12.53%	$70,023	$628,867	40.00%	$251,547	$880,415
5F4J SY Tank Farm Site Work	$2,624,167	12.53%	$328,808	$2,952,975	40.00%	$1,181,190	$4,134,165
5F4K SY Valve Pit A Modifications	$516,402	12.53%	$64,705	$581,108	40.00%	$232,443	$813,551
5F4L SY Valve Pit B Modifications	$471,361	12.53%	$59,062	$530,423	40.00%	$212,169	$742,592
5F4N Construction Management	$1,807,307	12.53%	$226,456	$2,033,763	40.00%	$813,505	$2,847,268
5F4P Construction Equipment	$214,335	12.53%	$26,856	$241,191	40.00%	$96,476	$337,668
5F6 SY HPT Support	$1,156,038	12.53%	$144,852	$1,300,890	25.00%	$325,222	$1,626,112
5F61 SY HPT Support	$1,156,038	12.53%	$144,852	$1,300,890	25.00%	$325,222	$1,626,112
5H 244S - DCRT	**$6,635,083**	**6.92%**	**$459,248**	**$7,094,331**	**35.28%**	**$2,502,663**	**$9,596,994**
5H1 244S - DCRT Definitive Design - Title II	$1,028,281	3.33%	$34,242	$1,062,523	30.00%	$318,757	$1,381,279
5H11 244 S DCRT Definitive Design - Engineering	$689,981	3.33%	$22,976	$712,957	30.00%	$213,887	$926,845
5H12 244 S DCRT Definitive Design - Engineering	$338,300	3.33%	$11,265	$349,565	30.00%	$104,870	$454,435
5H2 244S - DCRT Engineering/Inspection - Title III	$395,555	7.75%	$30,656	$426,211	25.00%	$106,553	$532,764
5H21 244S - DCRT Engineering/Inspection - Title III	$395,555	7.75%	$30,656	$426,211	25.00%	$106,553	$532,764
5H3 244S - DCRT Procurement	$705,287	6.40%	$45,138	$750,425	30.00%	$225,128	$975,553
5H3B HVAC Procurement	$705,287	6.40%	$45,138	$750,425	30.00%	$225,128	$975,553
5H4 244S - DCRT Construction	$3,950,088	7.75%	$306,132	$4,256,220	40.00%	$1,702,488	$5,958,708
5H4B 244S - DCRT	$3,050,724	7.75%	$236,431	$3,287,156	40.00%	$1,314,862	$4,602,018
5H4N Construction Management	$806,299	7.75%	$62,488	$868,787	40.00%	$347,515	$1,216,302
5H4P Construction Equipment	$93,065	7.75%	$7,213	$100,278	40.00%	$40,111	$140,389
5H6 244S - DCRT HPT Support	$555,872	7.75%	$43,080	$598,952	25.00%	$149,738	$748,690
5H61 244S - DCRT HPT Support	$555,872	7.75%	$43,080	$598,952	25.00%	$149,738	$748,690
5I 200 E/W Bypass Line	**$1,481,008**	**11.92%**	**$176,517**	**$1,657,525**	**31.75%**	**$526,293**	**$2,183,818**

Final Estimate
WORK BREAKDOWN STRUCTURE SUMMARY

WBS Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
5I1 200E/W Definitive Design - Title II	$497,953	9.33%	$46,459	$544,413	25.00%	$136,103	$680,516
5I11 200 E/W Bypass Definitive Design - Engineering	$497,953	9.33%	$46,459	$544,413	25.00%	$136,103	$680,516
5I2 200 E/W Engineering/Inspection - Title III	$181,008	13.23%	$23,947	$204,956	20.00%	$40,991	$245,947
5I21 200 E/W Engineering/Inspection - Title III	$181,008	13.23%	$23,947	$204,956	20.00%	$40,991	$245,947
5I4 200 E/W Construction	$719,240	13.23%	$95,156	$814,396	40.00%	$325,758	$1,140,154
5I4E 244A-A Bypass Line	$374,087	13.23%	$49,492	$423,578	40.00%	$169,431	$593,010
5I4F 200 E/W Site Alarms	$183,655	13.23%	$24,298	$207,953	40.00%	$83,181	$291,134
5I4N Construction Management	$143,999	13.23%	$19,051	$163,051	40.00%	$65,220	$228,271
5I4P Construction Equipment	$17,499	13.23%	$2,315	$19,814	40.00%	$7,926	$27,740
5I6 200 E/W HPT Support	$82,806	13.23%	$10,955	$93,761	25.00%	$23,440	$117,201
5I61 200 E/W HPT Support	$82,806	13.23%	$10,955	$93,761	25.00%	$23,440	$117,201

Final Estimate
W-314 Tank Farm Restoration and Safe Operations (TFRSO
COST CODE ACCOUNT SUMMARY

Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020	Title II Design							
5A1111	Drawings	$108,010	2%	$2,160	$110,170	35%	$38,713	$148,882
5A1112	Construction Specifications	$4,481	2%	$90	$4,571	35%	$1,606	$6,177
5A1113	Procurement Specifications	$11,351	2%	$227	$11,578	35%	$4,068	$15,647
5A1114	Calculations	$15,302	2%	$306	$15,608	35%	$5,484	$21,092
5A1115	Checking/Internal Reviews	$31,367	2%	$627	$31,995	35%	$11,243	$43,237
5A1116	Interdiscipline Reviews	$8,831	2%	$177	$9,008	35%	$3,165	$12,173
5A1117	Client Reviews	$11,416	2%	$228	$11,644	35%	$4,092	$15,736
5A1118	Support Activities for Engineering	$35,936	2%	$719	$36,655	35%	$12,880	$49,535
5A1121	Drawings	$143,966	2%	$2,879	$146,845	35%	$51,600	$198,445
5A1122	Construction Specifications	$11,518	2%	$230	$11,749	35%	$4,128	$15,877
5A1123	Procurement Specifications	$16,864	2%	$337	$17,202	35%	$6,044	$23,246
5A1124	Calculations	$20,314	2%	$406	$20,720	35%	$7,281	$28,001
5A1125	Checking/Internal Reviews	$40,198	2%	$804	$41,002	35%	$14,408	$55,410
5A1126	Interdiscipline Reviews	$8,831	2%	$177	$9,008	35%	$3,165	$12,173
5A1127	Client Reviews	$12,882	2%	$258	$13,140	35%	$4,617	$17,757
5A1128	Support Activities for Engineering	$35,936	2%	$719	$36,655	35%	$12,880	$49,535
5A1131	Drawings	$71,995	2%	$1,440	$73,435	35%	$25,804	$99,240
5A1132	Construction Specifications	$6,870	2%	$137	$7,007	35%	$2,462	$9,469
5A1134	Calculations	$15,302	2%	$306	$15,608	35%	$5,484	$21,092
5A1135	Checking/Internal Reviews	$17,831	2%	$357	$18,188	35%	$6,391	$24,579
5A1136	Interdiscipline Reviews	$4,507	2%	$90	$4,597	35%	$1,615	$6,212
5A1137	Client Reviews	$8,081	2%	$162	$8,242	35%	$2,896	$11,139
5A1138	Support Activities for Engineering	$35,936	2%	$719	$36,655	35%	$12,880	$49,535
5A1141	Drawings	$36,014	2%	$720	$36,735	35%	$12,908	$49,643
5A1142	Support Activities for Engineering	$35,936	2%	$719	$36,655	35%	$12,880	$49,535
5A1201	AN Definitive Design - Engineering Support	$338,300	2%	$6,766	$345,066	35%	$121,253	$466,319
5B1111	Drawings	$86,217	6%	$5,130	$91,347	35%	$31,971	$123,318
5B1112	Construction Specifications	$1,956	6%	$116	$2,072	35%	$725	$2,798
5B1113	Procurement Specifications	$3,951	6%	$235	$4,186	35%	$1,465	$5,651
5B1114	Calculations	$12,147	6%	$723	$12,870	35%	$4,505	$17,375
5B1115	Checking/Internal Reviews	$28,179	6%	$1,677	$29,856	35%	$10,450	$40,306
5B1116	Interdiscipline Reviews	$6,136	6%	$365	$6,501	35%	$2,275	$8,776
5B1117	Client Reviews	$10,539	6%	$627	$11,166	35%	$3,908	$15,075
5B1118	Support Activities for Engineering	$32,548	6%	$1,937	$34,485	35%	$12,070	$46,555
5B1121	Drawings	$114,861	6%	$6,834	$121,695	35%	$42,593	$164,288
5B1122	Construction Specifications	$5,012	6%	$298	$5,310	35%	$1,859	$7,169
5B1123	Procurement Specifications	$6,074	6%	$361	$6,435	35%	$2,252	$8,687
5B1124	Calculations	$15,901	6%	$946	$16,847	35%	$5,897	$22,744
5B1125	Checking/Internal Reviews	$36,284	6%	$2,159	$38,443	35%	$13,455	$51,898
5B1126	Interdiscipline Reviews	$6,136	6%	$365	$6,501	35%	$2,275	$8,776
5B1127	Client Reviews	$11,476	6%	$683	$12,159	35%	$4,256	$16,415

Final Estimate
W-314 Tank Farm Restoration and Safe Operations (TFRSO
COST CODE ACCOUNT SUMMARY

Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020	Title II Design							
5B1128	Support Activities for Engineering	$32,548	6%	$1,937	$34,485	35%	$12,070	$46,555
5B1131	Drawings	$57,516	6%	$3,422	$60,939	35%	$21,329	$82,267
5B1132	Construction Specifications	$2,919	6%	$174	$3,093	35%	$1,082	$4,175
5B1134	Calculations	$12,147	6%	$723	$12,870	35%	$4,505	$17,375
5B1135	Checking/Internal Reviews	$16,175	6%	$962	$17,138	35%	$5,998	$23,136
5B1136	Interdiscipline Reviews	$3,333	6%	$198	$3,531	35%	$1,236	$4,767
5B1137	Client Reviews	$7,204	6%	$429	$7,633	35%	$2,672	$10,305
5B1138	Support Activities for Engineering	$32,548	6%	$1,937	$34,485	35%	$12,070	$46,555
5B1141	Drawings	$29,012	6%	$1,726	$30,739	35%	$10,758	$41,497
5B1142	Support Activities for Engineering	$32,548	6%	$1,937	$34,485	35%	$12,070	$46,555
5B1201	AP Definitive Design - Engineering Support	$619,029	6%	$36,832	$655,861	35%	$229,551	$885,412
5C1111	Drawings	$108,373	9%	$10,111	$118,484	25%	$29,621	$148,105
5C1112	Construction Specifications	$1,956	9%	$182	$2,139	25%	$535	$2,673
5C1113	Procurement Specifications	$3,518	9%	$328	$3,847	25%	$962	$4,808
5C1114	Calculations	$11,715	9%	$1,093	$12,808	25%	$3,202	$16,010
5C1115	Checking/Internal Reviews	$29,777	9%	$2,778	$32,555	25%	$8,139	$40,694
5C1116	Interdiscipline Reviews	$6,136	9%	$572	$6,708	25%	$1,677	$8,385
5C1117	Client Reviews	$10,539	9%	$983	$11,523	25%	$2,881	$14,403
5C1118	Support Activities for Engineering	$32,181	9%	$3,003	$35,184	25%	$8,796	$43,980
5C1121	Drawings	$144,362	9%	$13,469	$157,831	25%	$39,458	$197,289
5C1122	Construction Specifications	$4,944	9%	$461	$5,405	25%	$1,351	$6,756
5C1123	Procurement Specifications	$5,376	9%	$502	$5,878	25%	$1,469	$7,347
5C1124	Calculations	$15,469	9%	$1,443	$16,912	25%	$4,228	$21,140
5C1125	Checking/Internal Reviews	$38,274	9%	$3,571	$41,845	25%	$10,461	$52,306
5C1126	Interdiscipline Reviews	$6,136	9%	$572	$6,708	25%	$1,677	$8,385
5C1127	Client Reviews	$11,476	9%	$1,071	$12,547	25%	$3,137	$15,684
5C1128	Support Activities for Engineering	$32,181	9%	$3,003	$35,184	25%	$8,796	$43,980
5C1131	Drawings	$72,352	9%	$6,750	$79,103	25%	$19,776	$98,878
5C1132	Construction Specifications	$2,919	9%	$272	$3,191	25%	$798	$3,989
5C1134	Calculations	$11,715	9%	$1,093	$12,808	25%	$3,202	$16,010
5C1135	Checking/Internal Reviews	$16,929	9%	$1,580	$18,509	25%	$4,627	$23,136
5C1136	Interdiscipline Reviews	$3,333	9%	$311	$3,643	25%	$911	$4,554
5C1137	Client Reviews	$7,204	9%	$672	$7,877	25%	$1,969	$9,846
5C1138	Support Activities for Engineering	$32,181	9%	$3,003	$35,184	25%	$8,796	$43,980
5C1141	Drawings	$36,119	9%	$3,370	$39,489	25%	$9,872	$49,361
5C1142	Support Activities for Engineering	$32,181	9%	$3,003	$35,184	25%	$8,796	$43,980
5C1201	AW Definitive Design - Engineering Support	$853,569	9%	$79,638	$933,207	25%	$233,302	$1,166,509
5D1111	Drawings	$56,978	6%	$3,390	$60,368	20%	$12,074	$72,441
5D1112	Construction Specifications	$895	6%	$53	$948	20%	$190	$1,137
5D1113	Procurement Specifications	$698	6%	$42	$739	20%	$148	$887
5D1114	Calculations	$15,666	6%	$932	$16,598	20%	$3,320	$19,917

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020 Title II Design								
5D1115	Checking/Internal Reviews	$17,659	6%	$1,051	$18,710	20%	$3,742	$22,452
5D1116	Interdiscipline Reviews	$3,854	6%	$229	$4,083	20%	$817	$4,900
5D1117	Client Reviews	$7,728	6%	$460	$8,188	20%	$1,638	$9,825
5D1118	Support Activities for Engineering	$24,128	6%	$1,436	$25,564	20%	$5,113	$30,677
5D1121	Drawings	$75,940	6%	$4,518	$80,459	20%	$16,092	$96,551
5D1122	Construction Specifications	$2,290	6%	$136	$2,426	20%	$485	$2,911
5D1123	Procurement Specifications	$1,061	6%	$63	$1,125	20%	$225	$1,350
5D1124	Calculations	$20,746	6%	$1,234	$21,981	20%	$4,396	$26,377
5D1125	Checking/Internal Reviews	$22,810	6%	$1,357	$24,167	20%	$4,833	$29,001
5D1126	Interdiscipline Reviews	$3,854	6%	$229	$4,083	20%	$817	$4,900
5D1127	Client Reviews	$8,665	6%	$516	$9,181	20%	$1,836	$11,017
5D1128	Support Activities for Engineering	$24,128	6%	$1,436	$25,564	20%	$5,113	$30,677
5D1131	Drawings	$37,954	6%	$2,258	$40,213	20%	$8,043	$48,255
5D1132	Construction Specifications	$1,327	6%	$79	$1,406	20%	$281	$1,687
5D1134	Calculations	$15,666	6%	$932	$16,598	20%	$3,320	$19,917
5D1135	Checking/Internal Reviews	$10,052	6%	$598	$10,651	20%	$2,130	$12,781
5D1136	Interdiscipline Reviews	$1,927	6%	$115	$2,042	20%	$408	$2,450
5D1137	Client Reviews	$5,270	6%	$314	$5,583	20%	$1,117	$6,700
5D1138	Support Activities for Engineering	$24,128	6%	$1,436	$25,564	20%	$5,113	$30,677
5D1141	Drawings	$18,993	6%	$1,130	$20,123	20%	$4,025	$24,147
5D1142	Support Activities for Engineering	$24,128	6%	$1,436	$25,564	20%	$5,113	$30,677
5D1201	AY Definitive Design - Engineering Support	$83,835	6%	$4,988	$88,823	20%	$17,765	$106,588
5E1111	Drawings	$54,093	6%	$3,343	$57,435	20%	$11,487	$68,923
5E1112	Construction Specifications	$895	6%	$55	$950	20%	$190	$1,140
5E1113	Procurement Specifications	$698	6%	$43	$741	20%	$148	$889
5E1114	Calculations	$15,666	6%	$968	$16,634	20%	$3,327	$19,961
5E1115	Checking/Internal Reviews	$16,727	6%	$1,034	$17,761	20%	$3,552	$21,313
5E1116	Interdiscipline Reviews	$3,854	6%	$238	$4,092	20%	$818	$4,910
5E1117	Client Reviews	$7,728	6%	$478	$8,206	20%	$1,641	$9,847
5E1118	Support Activities for Engineering	$24,128	6%	$1,491	$25,619	20%	$5,124	$30,743
5E1121	Drawings	$72,116	6%	$4,457	$76,573	20%	$15,315	$91,888
5E1122	Construction Specifications	$2,290	6%	$142	$2,431	20%	$486	$2,916
5E1123	Procurement Specifications	$1,061	6%	$66	$1,127	20%	$225	$1,353
5E1124	Calculations	$20,746	6%	$1,282	$22,029	20%	$4,406	$26,434
5E1125	Checking/Internal Reviews	$21,463	6%	$1,326	$22,789	20%	$4,558	$27,347
5E1126	Interdiscipline Reviews	$3,854	6%	$238	$4,092	20%	$818	$4,910
5E1127	Client Reviews	$8,665	6%	$536	$9,201	20%	$1,840	$11,041
5E1128	Support Activities for Engineering	$24,128	6%	$1,491	$25,619	20%	$5,124	$30,743
5E1131	Drawings	$36,011	6%	$2,225	$38,237	20%	$7,647	$45,884
5E1132	Construction Specifications	$1,327	6%	$82	$1,409	20%	$282	$1,691
5E1134	Calculations	$15,666	6%	$968	$16,634	20%	$3,327	$19,961

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020	Title II Design							
5E1135	Checking/Internal Reviews	$9,443	6%	$584	$10,027	20%	$2,005	$12,032
5E1136	Interdiscipline Reviews	$1,927	6%	$119	$2,046	20%	$409	$2,455
5E1137	Client Reviews	$5,270	6%	$326	$5,595	20%	$1,119	$6,714
5E1138	Support Activities for Engineering	$24,128	6%	$1,491	$25,619	20%	$5,124	$30,743
5E1141	Drawings	$17,956	6%	$1,110	$19,066	20%	$3,813	$22,879
5E1142	Support Activities for Engineering	$24,128	6%	$1,491	$25,619	20%	$5,124	$30,743
5E1201	AZ Definitive Design - Engineering Support	$99,223	6%	$6,132	$105,355	20%	$21,071	$126,425
5F1111	Drawings	$95,054	9%	$8,650	$103,704	24%	$24,533	$128,237
5F1112	Construction Specifications	$2,722	9%	$248	$2,970	24%	$703	$3,673
5F1113	Procurement Specifications	$3,685	9%	$335	$4,021	24%	$951	$4,972
5F1114	Calculations	$11,450	9%	$1,042	$12,492	24%	$2,955	$15,447
5F1115	Checking/Internal Reviews	$26,923	9%	$2,450	$29,373	24%	$6,949	$36,322
5F1116	Interdiscipline Reviews	$6,136	9%	$558	$6,694	24%	$1,584	$8,278
5F1117	Client Reviews	$10,539	9%	$959	$11,498	24%	$2,720	$14,219
5F1118	Support Activities for Engineering	$31,722	9%	$2,887	$34,609	24%	$8,187	$42,797
5F1121	Drawings	$126,678	9%	$11,528	$138,206	24%	$32,695	$170,901
5F1122	Construction Specifications	$6,801	9%	$619	$7,420	24%	$1,755	$9,176
5F1123	Procurement Specifications	$5,543	9%	$504	$6,047	24%	$1,431	$7,478
5F1124	Calculations	$15,037	9%	$1,368	$16,405	24%	$3,881	$20,286
5F1125	Checking/Internal Reviews	$34,880	9%	$3,174	$38,054	24%	$9,002	$47,056
5F1126	Interdiscipline Reviews	$6,106	9%	$556	$6,662	24%	$1,576	$8,238
5F1127	Client Reviews	$11,476	9%	$1,044	$12,521	24%	$2,962	$15,483
5F1128	Support Activities for Engineering	$31,722	9%	$2,887	$34,609	24%	$8,187	$42,797
5F1131	Drawings	$63,447	9%	$5,774	$69,220	24%	$16,375	$85,596
5F1132	Construction Specifications	$4,079	9%	$371	$4,450	24%	$1,053	$5,503
5F1134	Calculations	$11,450	9%	$1,042	$12,492	24%	$2,955	$15,447
5F1135	Checking/Internal Reviews	$15,125	9%	$1,376	$16,501	24%	$3,904	$20,405
5F1136	Interdiscipline Reviews	$3,303	9%	$301	$3,603	24%	$852	$4,456
5F1137	Client Reviews	$7,204	9%	$656	$7,860	24%	$1,859	$9,720
5F1138	Support Activities for Engineering	$31,722	9%	$2,887	$34,609	24%	$8,187	$42,797
5F1141	Drawings	$31,701	9%	$2,885	$34,586	24%	$8,182	$42,768
5F1142	Support Activities for Engineering	$31,722	9%	$2,887	$34,609	24%	$8,187	$42,797
5F1201	SY Definitive Design - Engineering Support	$630,434	9%	$57,369	$687,804	24%	$162,714	$850,517
5H1111	Drawings	$103,098	3%	$3,433	$106,531	30%	$31,959	$138,491
5H1112	Construction Specifications	$2,487	3%	$83	$2,570	30%	$771	$3,340
5H1113	Procurement Specifications	$4,914	3%	$164	$5,077	30%	$1,523	$6,601
5H1114	Calculations	$15,037	3%	$501	$15,537	30%	$4,661	$20,198
5H1115	Checking/Internal Reviews	$29,306	3%	$976	$30,282	30%	$9,085	$39,367
5H1116	Interdiscipline Reviews	$6,136	3%	$204	$6,340	30%	$1,902	$8,242
5H1117	Client Reviews	$11,068	3%	$369	$11,437	30%	$3,431	$14,868
5H1118	Support Activities for Engineering	$35,228	3%	$1,173	$36,401	30%	$10,920	$47,322

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020	Title II Design							
5H1121	Drawings	$137,361	3%	$4,574	$141,935	30%	$42,581	$184,516
5H1122	Construction Specifications	$6,506	3%	$217	$6,723	30%	$2,017	$8,739
5H1123	Procurement Specifications	$7,469	3%	$249	$7,718	30%	$2,315	$10,033
5H1124	Calculations	$19,783	3%	$659	$20,442	30%	$6,133	$26,575
5H1125	Checking/Internal Reviews	$37,621	3%	$1,253	$38,873	30%	$11,662	$50,535
5H1126	Interdiscipline Reviews	$6,136	3%	$204	$6,340	30%	$1,902	$8,242
5H1127	Client Reviews	$12,353	3%	$411	$12,764	30%	$3,829	$16,593
5H1128	Support Activities for Engineering	$35,228	3%	$1,173	$36,401	30%	$10,920	$47,322
5H1131	Drawings	$68,562	3%	$2,283	$70,845	30%	$21,254	$92,099
5H1132	Construction Specifications	$3,882	3%	$129	$4,011	30%	$1,203	$5,215
5H1134	Calculations	$15,037	3%	$501	$15,537	30%	$4,661	$20,198
5H1135	Checking/Internal Reviews	$16,925	3%	$564	$17,488	30%	$5,246	$22,735
5H1136	Interdiscipline Reviews	$3,333	3%	$111	$3,443	30%	$1,033	$4,477
5H1137	Client Reviews	$7,552	3%	$251	$7,803	30%	$2,341	$10,144
5H1138	Support Activities for Engineering	$35,228	3%	$1,173	$36,401	30%	$10,920	$47,322
5H1141	Drawings	$34,503	3%	$1,149	$35,652	30%	$10,696	$46,348
5H1142	Support Activities for Engineering	$35,228	3%	$1,173	$36,401	30%	$10,920	$47,322
5H1201	244 S DCRT Definitive Design - Engineering Support	$338,300	3%	$11,265	$349,565	30%	$104,870	$454,435
5I1111	Drawings	$55,660	9%	$5,193	$60,853	25%	$15,213	$76,066
5I1112	Construction Specifications	$2,576	9%	$240	$2,816	25%	$704	$3,520
5I1113	Procurement Specifications	$4,246	9%	$396	$4,642	25%	$1,161	$5,803
5I1114	Calculations	$6,870	9%	$641	$7,511	25%	$1,878	$9,388
5I1115	Checking/Internal Reviews	$23,411	9%	$2,184	$25,595	25%	$6,399	$31,994
5I1116	Interdiscipline Reviews	$4,414	9%	$412	$4,825	25%	$1,206	$6,032
5I1117	Client Reviews	$17,579	9%	$1,640	$19,219	25%	$4,805	$24,024
5I1118	Support Activities for Engineering	$33,710	9%	$3,145	$36,855	25%	$9,214	$46,069
5I1121	Drawings	$74,132	9%	$6,916	$81,048	25%	$20,262	$101,310
5I1122	Construction Specifications	$7,371	9%	$688	$8,058	25%	$2,015	$10,073
5I1123	Procurement Specifications	$6,309	9%	$589	$6,898	25%	$1,724	$8,622
5I1124	Calculations	$9,160	9%	$855	$10,014	25%	$2,504	$12,518
5I1125	Checking/Internal Reviews	$31,589	9%	$2,947	$34,536	25%	$8,634	$43,170
5I1126	Interdiscipline Reviews	$4,414	9%	$412	$4,825	25%	$1,206	$6,032
5I1127	Client Reviews	$20,047	9%	$1,870	$21,917	25%	$5,479	$27,397
5I1128	Support Activities for Engineering	$33,710	9%	$3,145	$36,855	25%	$9,214	$46,069
5I1131	Drawings	$37,032	9%	$3,455	$40,487	25%	$10,122	$50,608
5I1132	Construction Specifications	$4,413	9%	$412	$4,825	25%	$1,206	$6,031
5I1134	Calculations	$6,870	9%	$641	$7,511	25%	$1,878	$9,388
5I1135	Checking/Internal Reviews	$13,535	9%	$1,263	$14,798	25%	$3,699	$18,497
5I1136	Interdiscipline Reviews	$2,207	9%	$206	$2,413	25%	$603	$3,017
5I1137	Client Reviews	$12,653	9%	$1,181	$13,833	25%	$3,458	$17,292
5I1138	Support Activities for Engineering	$33,710	9%	$3,145	$36,855	25%	$9,214	$46,069

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
020 Title II Design								
5I1141	Drawings	$18,628	9%	$1,738	$20,366	25%	$5,092	$25,458
5I1142	Support Activities for Engineering	$33,710	9%	$3,145	$36,855	25%	$9,214	$46,069
TOTAL 020 Title II Design		$7,647,760	6%	$494,467	$8,142,227	28%	$2,258,017	$10,400,244
030 Title III Design								
5A2111	ECN'S	$45,307	7%	$3,004	$48,310	25%	$12,078	$60,388
5A2112	USQ's	$27,351	7%	$1,813	$29,164	25%	$7,291	$36,455
5A2113	NCR Resolution	$2,093	7%	$139	$2,232	25%	$558	$2,790
5A2114	Meetings & Field Support	$41,129	7%	$2,727	$43,856	25%	$10,964	$54,820
5A2115	Update RVR	$10,555	7%	$700	$11,255	25%	$2,814	$14,069
5A2116	Prepare ATP's	$36,943	7%	$2,449	$39,392	25%	$9,848	$49,240
5A2117	ATP Test Director	$75,645	7%	$5,015	$80,660	25%	$20,165	$100,825
5A2118	CGI Evaluation	$14,673	7%	$973	$15,646	25%	$3,911	$19,557
5A2119	As-Built Verification	$21,110	7%	$1,400	$22,510	25%	$5,627	$28,137
5A2121	AN Inspection - Title III	$60,891	7%	$4,037	$64,928	25%	$16,232	$81,161
5A2131	AN Engineering Support - Title III	$357,347	7%	$23,692	$381,039	25%	$95,260	$476,298
5B2111	ECN'S	$47,930	10%	$4,793	$52,723	25%	$13,181	$65,904
5B2112	USQ's	$29,042	10%	$2,904	$31,946	25%	$7,986	$39,932
5B2113	NCR Resolution	$2,093	10%	$209	$2,302	25%	$576	$2,878
5B2114	Meetings & Field Support	$41,129	10%	$4,113	$45,242	25%	$11,311	$56,553
5B2115	Update RVR	$10,555	10%	$1,056	$11,611	25%	$2,903	$14,513
5B2116	Prepare ATP's	$21,110	10%	$2,111	$23,221	25%	$5,805	$29,027
5B2117	ATP Test Director	$75,645	10%	$7,565	$83,210	25%	$20,802	$104,012
5B2118	CGI Evaluation	$14,240	10%	$1,424	$15,665	25%	$3,916	$19,581
5B2119	As-Built Verification	$21,110	10%	$2,111	$23,221	25%	$5,805	$29,027
5B2121	AP Inspection - Title III	$63,537	10%	$6,354	$69,890	25%	$17,473	$87,363
5B2131	AP Engineering Support - Title III	$581,961	10%	$58,196	$640,158	25%	$160,039	$800,197
5C2111	ECN'S	$47,930	13%	$6,341	$54,272	25%	$13,568	$67,840
5C2112	USQ's	$29,110	13%	$3,851	$32,961	25%	$8,240	$41,202
5C2113	NCR Resolution	$2,093	13%	$277	$2,370	25%	$593	$2,963
5C2114	Meetings & Field Support	$41,129	13%	$5,441	$46,571	25%	$11,643	$58,213
5C2115	Update RVR	$10,555	13%	$1,396	$11,952	25%	$2,988	$14,939
5C2116	Prepare ATP's	$21,110	13%	$2,793	$23,903	25%	$5,976	$29,879
5C2117	ATP Test Director	$117,866	13%	$15,594	$133,459	25%	$33,365	$166,824
5C2118	CGI Evaluation	$14,240	13%	$1,884	$16,124	25%	$4,031	$20,156
5C2119	As-Built Verification	$21,110	13%	$2,793	$23,903	25%	$5,976	$29,879
5C2121	AW Inspection - Title III	$77,678	13%	$10,277	$87,955	25%	$21,989	$109,944
5C2131	AW Engineering Support - Title III	$345,319	13%	$45,686	$391,004	25%	$97,751	$488,755

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
030 Title III Design								
5D2111	ECN'S	$32,029	8%	$2,482	$34,511	25%	$8,628	$43,139
5D2112	USQ's	$18,987	8%	$1,472	$20,459	25%	$5,115	$25,573
5D2113	NCR Resolution	$1,395	8%	$108	$1,504	25%	$376	$1,879
5D2114	Meetings & Field Support	$24,265	8%	$1,881	$26,145	25%	$6,536	$32,682
5D2115	Update RVR	$7,037	8%	$545	$7,582	25%	$1,896	$9,478
5D2116	Prepare ATP's	$7,037	8%	$545	$7,582	25%	$1,896	$9,478
5D2117	ATP Test Director	$38,702	8%	$2,999	$41,702	25%	$10,425	$52,127
5D2118	CGI Evaluation	$5,445	8%	$422	$5,866	25%	$1,467	$7,333
5D2119	As-Built Verification	$17,592	8%	$1,363	$18,955	25%	$4,739	$23,694
5D2121	AY Inspection - Title III	$16,685	8%	$1,293	$17,978	25%	$4,495	$22,473
5D2131	AY Engineering Support - Title III	$64,404	8%	$4,991	$69,395	25%	$17,349	$86,744
5E2111	ECN'S	$31,233	8%	$2,421	$33,654	25%	$8,413	$42,067
5E2112	USQ's	$22,536	8%	$1,747	$24,282	25%	$6,071	$30,353
5E2113	NCR Resolution	$1,395	8%	$108	$1,504	25%	$376	$1,879
5E2114	Meetings & Field Support	$24,265	8%	$1,881	$26,145	25%	$6,536	$32,682
5E2115	Update RVR	$7,037	8%	$545	$7,582	25%	$1,896	$9,478
5E2116	Prepare ATP's	$7,037	8%	$545	$7,582	25%	$1,896	$9,478
5E2117	ATP Test Director	$35,184	8%	$2,727	$37,911	25%	$9,478	$47,388
5E2118	CGI Evaluation	$5,445	8%	$422	$5,866	25%	$1,467	$7,333
5E2119	As-Built Verification	$17,592	8%	$1,363	$18,955	25%	$4,739	$23,694
5E2121	AZ Inspection - Title III	$17,906	8%	$1,388	$19,294	25%	$4,823	$24,117
5E2131	AZ Engineering Support - Title III	$62,202	8%	$4,821	$67,023	25%	$16,756	$83,778
5F2111	ECN'S	$45,307	13%	$5,677	$50,983	25%	$12,746	$63,729
5F2112	USQ's	$27,449	13%	$3,439	$30,889	25%	$7,722	$38,611
5F2113	NCR Resolution	$2,791	13%	$350	$3,140	25%	$785	$3,926
5F2114	Meetings & Field Support	$40,098	13%	$5,024	$45,122	25%	$11,280	$56,402
5F2115	Update RVR	$10,555	13%	$1,323	$11,878	25%	$2,969	$14,847
5F2116	Prepare ATP's	$21,110	13%	$2,645	$23,755	25%	$5,939	$29,694
5F2117	ATP Test Director	$93,237	13%	$11,683	$104,920	25%	$26,230	$131,149
5F2118	CGI Evaluation	$14,240	13%	$1,784	$16,025	25%	$4,006	$20,031
5F2119	As-Built Verification	$21,110	13%	$2,645	$23,755	25%	$5,939	$29,694
5F2121	SY Inspection - Title III	$43,240	13%	$5,418	$48,657	25%	$12,164	$60,822
5F2131	SY Engineering Support - Title III	$443,409	13%	$55,559	$498,968	25%	$124,742	$623,710
5H2111	ECN'S	$38,801	8%	$3,007	$41,808	25%	$10,452	$52,259
5H2112	USQ's	$31,400	8%	$2,434	$33,834	25%	$8,458	$42,292
5H2113	NCR Resolution	$2,093	8%	$162	$2,255	25%	$564	$2,819
5H2114	Meetings & Field Support	$37,975	8%	$2,943	$40,918	25%	$10,229	$51,147
5H2115	Update RVR	$10,555	8%	$818	$11,373	25%	$2,843	$14,216
5H2116	Prepare ATP's	$24,629	8%	$1,909	$26,537	25%	$6,634	$33,172
5H2117	ATP Test Director	$54,535	8%	$4,226	$58,761	25%	$14,690	$73,452
5H2118	CGI Evaluation	$14,240	8%	$1,104	$15,344	25%	$3,836	$19,180

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
030 Title III Design								
5H2119	As-Built Verification	$21,110	8%	$1,636	$22,746	25%	$5,687	$28,433
5H2121	244S - DCRT Inspection - Title III	$24,112	8%	$1,869	$25,981	25%	$6,495	$32,476
5H2131	244S - DCRT Engineering Support - Title III	$136,106	8%	$10,548	$146,654	25%	$36,663	$183,317
5I2111	ECN'S	$28,746	13%	$3,803	$32,549	20%	$6,510	$39,059
5I2112	USQ's	$16,894	13%	$2,235	$19,129	20%	$3,826	$22,955
5I2113	NCR Resolution	$2,093	13%	$277	$2,370	20%	$474	$2,844
5I2114	Meetings & Field Support	$48,530	13%	$6,420	$54,950	20%	$10,990	$65,940
5I2115	Update RVR	$9,759	13%	$1,291	$11,050	20%	$2,210	$13,260
5I2116	Prepare ATP's	$21,110	13%	$2,793	$23,903	20%	$4,781	$28,684
5I2117	ATP Test Director	$14,074	13%	$1,862	$15,935	20%	$3,187	$19,123
5I2118	CGI Evaluation	$5,445	13%	$720	$6,165	20%	$1,233	$7,398
5I2119	As-Built Verification	$19,351	13%	$2,560	$21,911	20%	$4,382	$26,293
5I2121	200 E/W Inspection - Title III	$15,007	13%	$1,985	$16,992	20%	$3,398	$20,390
TOTAL 030 Title III Design		$4,134,057	10%	$419,336	$4,553,393	25%	$1,128,100	$5,681,493
050 Construction Management								
5A4N	Construction Management	$1,231,542	9%	$114,903	$1,346,445	40%	$538,578	$1,885,024
5B4N	Construction Management	$1,978,915	10%	$197,892	$2,176,807	40%	$870,723	$3,047,529
5C4N	Construction Management	$1,855,719	13%	$245,512	$2,101,231	40%	$840,492	$2,941,724
5D4N	Construction Management	$250,501	8%	$19,414	$269,915	38%	$102,568	$372,482
5E4N	Construction Management	$251,980	8%	$19,528	$271,508	40%	$108,603	$380,112
5F4N	Construction Management	$1,807,307	13%	$226,456	$2,033,763	40%	$813,505	$2,847,268
5H4N	Construction Management	$806,299	8%	$62,488	$868,787	40%	$347,515	$1,216,302
5I4N	Construction Management	$143,999	13%	$19,051	$163,051	40%	$65,220	$228,271
TOTAL 050 Construction Management		$8,326,263	11%	$905,243	$9,231,506	40%	$3,687,204	$12,918,710
550 Other Structures								
5A4J02	Ventilation Exhaust Train Installation	$157,875	9%	$14,730	$172,605	40%	$69,042	$241,646
5B4J02	Ventilation Exhaust Train Installation	$159,162	10%	$15,916	$175,078	40%	$70,031	$245,110
5C4J02	Ventilation Exhaust Train Installation	$158,338	13%	$20,948	$179,287	40%	$71,715	$251,001
5H4B05	Ventilation Train Installation	$157,838	8%	$12,232	$170,070	40%	$68,028	$238,098
TOTAL 550 Other Structures		$633,213	10%	$63,827	$697,040	40%	$278,816	$975,856

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5A3A00	HVAC Procurement	$1,370,598	4%	$54,550	$1,425,148	30%	$427,544	$1,852,692
5A4B028	Coatings for Cover Blocks	$16,607	9%	$1,549	$18,156	40%	$7,262	$25,418
5A4B02A	Install Drain Plug	$5,598	9%	$522	$6,120	40%	$2,448	$8,568
5A4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,518	9%	$795	$9,313	40%	$3,725	$13,038
5A4B02J	Central Pump Pit Weather Delays	$154,037	9%	$14,372	$168,409	40%	$67,364	$235,773
5A4C021	Mobilization & Setup	$81,126	9%	$7,569	$88,695	40%	$35,478	$124,173
5A4C022	Spray Fixative	$43,399	9%	$4,049	$47,448	40%	$18,979	$66,427
5A4C023	Remove Cover Block	$4,571	9%	$426	$4,997	40%	$1,999	$6,996
5A4C025	Clean Debris/Wash Down Pit	$44,936	9%	$4,193	$49,129	40%	$19,652	$68,781
5A4C026	SPC Coatings- Pit	$24,751	9%	$2,309	$27,060	40%	$10,824	$37,885
5A4C028	Coatings for Cover Blocks	$16,607	9%	$1,549	$18,156	40%	$7,262	$25,418
5A4C02A	Install Drain Plug	$5,598	9%	$522	$6,120	40%	$2,448	$8,568
5A4C02B	Replace Cover Block	$16,269	9%	$1,518	$17,787	40%	$7,115	$24,902
5A4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,518	9%	$795	$9,313	40%	$3,725	$13,038
5A4C02J	Central Pump Pit Weather Delays	$94,792	9%	$8,844	$103,636	40%	$41,455	$145,091
5A4E028	Coatings for Cover Blocks	$16,607	9%	$1,549	$18,156	40%	$7,262	$25,418
5A4E02A	Install Drain Plug	$5,598	9%	$522	$6,120	40%	$2,448	$8,568
5A4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,518	9%	$795	$9,313	40%	$3,725	$13,038
5A4E02J	Central Pump Pit Weather Delays	$212,570	9%	$19,833	$232,402	40%	$92,961	$325,363
5A4F028	Coatings for Cover Blocks	$16,607	9%	$1,549	$18,156	40%	$7,262	$25,418
5A4F02A	Install Drain Plug	$5,598	9%	$522	$6,120	40%	$2,448	$8,568
5A4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,518	9%	$795	$9,313	40%	$3,725	$13,038
5A4F02J	Central Pump Pit Weather Delays	$213,283	9%	$19,899	$233,182	40%	$93,273	$326,455
5A4G028	Coatings for Cover Blocks	$16,607	9%	$1,549	$18,156	40%	$7,262	$25,418
5A4G02A	Install Drain Plug	$5,598	9%	$522	$6,120	40%	$2,448	$8,568
5A4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,518	9%	$795	$9,313	40%	$3,725	$13,038
5A4G02J	Central Pump Pit Weather Delays	$212,570	9%	$19,833	$232,402	40%	$92,961	$325,363
5A4J02	Ventilation Exhaust Train Installation	$27,099	9%	$2,528	$29,627	40%	$11,851	$41,478
5A4J05	Ventilation Exhaust Duct Installation	$367,177	9%	$34,258	$401,435	40%	$160,574	$562,008
5A4J07	Seal Pot Drain Piping	$186,509	9%	$17,401	$203,910	40%	$81,564	$285,474
5A4J09	Ventilation Exhaust Tie-In	$56,256	9%	$5,249	$61,505	40%	$24,602	$86,107
5A4P	Construction Equipment	$145,485	9%	$13,574	$159,059	40%	$63,624	$222,682
5B3B00	HVAC Procurement	$1,587,609	9%	$148,124	$1,735,733	30%	$520,720	$2,256,453
5B4A021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4A022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4A023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4A025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4A026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4A028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4A02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4A02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5B4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4A02J	Central Pump Pit Weather Delays	$59,823	10%	$5,982	$65,805	40%	$26,322	$92,127
5B4B091	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4B092	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4B093	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4B095	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4B096	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4B098	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4B09A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4B09B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4B09H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4B09J	Pump Pit Weather Delays	$131,610	10%	$13,161	$144,771	40%	$57,908	$202,679
5B4C021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4C022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4C023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4C025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4C026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4C028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4C02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4C02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4C02J	Central Pump Pit Weather Delays	$59,823	10%	$5,982	$65,805	40%	$26,322	$92,127
5B4C101	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4C102	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4C103	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4C105	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4C106	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4C108	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4C10A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4C10B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4C10H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4C10J	Drain Pit Weather Delays	$131,610	10%	$13,161	$144,771	40%	$57,908	$202,679
5B4E021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4E022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4E023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4E025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4E026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4E028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4E02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4E02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5B4E02J	Central Pump Pit Weather Delays	$59,823	10%	$5,982	$65,805	40%	$26,322	$92,127
5B4F021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4F022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4F023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4F025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4F026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4F028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4F02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4F02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4F02J	Central Pump Pit Weather Delays	$131,610	10%	$13,161	$144,771	40%	$57,908	$202,679
5B4G021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4G022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4G023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4G025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4G026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4G028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4G02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4G02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4G02J	Central Pump Pit Weather Delays	$59,823	10%	$5,982	$65,805	40%	$26,322	$92,127
5B4H021	Mobilization & Setup	$81,513	10%	$8,151	$89,665	40%	$35,866	$125,531
5B4H022	Spray Fixative	$43,655	10%	$4,365	$48,020	40%	$19,208	$67,229
5B4H023	Remove Cover Block	$4,615	10%	$462	$5,077	40%	$2,031	$7,108
5B4H025	Clean Debris/Wash Down Pit	$45,349	10%	$4,535	$49,883	40%	$19,953	$69,837
5B4H026	SPC Coatings- Pit	$24,976	10%	$2,498	$27,474	40%	$10,989	$38,463
5B4H028	Coatings for Cover Blocks	$16,726	10%	$1,673	$18,399	40%	$7,359	$25,758
5B4H02A	Install Drain Plug	$5,652	10%	$565	$6,217	40%	$2,487	$8,704
5B4H02B	Replace Cover Block	$16,370	10%	$1,637	$18,007	40%	$7,203	$25,210
5B4H02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,567	10%	$857	$9,424	40%	$3,769	$13,193
5B4H02J	Central Pump Pit Weather Delays	$125,268	10%	$12,527	$137,794	40%	$55,118	$192,912
5B4J02	Ventilation Exhaust Train Installation	$27,363	10%	$2,736	$30,099	40%	$12,040	$42,139
5B4J05	Ventilation Exhaust Duct Installation	$368,641	10%	$36,864	$405,505	40%	$162,202	$567,707
5B4J07	Seal Pot Drain Piping	$177,830	10%	$17,783	$195,613	40%	$78,245	$273,858
5B4J09	Inlet Air Filter Stations	$225,790	10%	$22,579	$248,369	40%	$99,348	$347,717
5B4J10	Ventilation Exhaust Tie-in	$33,663	10%	$3,366	$37,030	40%	$14,812	$51,841
5B4P	Construction Equipment	$225,242	10%	$22,524	$247,766	40%	$99,106	$346,873
5C3B00	HVAC Procurement	$1,370,598	11%	$152,548	$1,523,145	30%	$456,944	$1,980,089
5C4A021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4A022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4A023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291

Final Estimate
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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5C4A025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4A026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4A028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4A02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4A02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4A02J	Central Pump Pit Weather Delays	$119,226	13%	$15,774	$134,999	40%	$54,000	$188,999
5C4B021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4B022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4B023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4B025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4B026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4B028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4B02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4B02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4B02J	Central Pump Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4B101	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4B102	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4B103	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4B105	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4B106	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4B108	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4B10A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4B10B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4B10H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4B10J	Drain Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4B111	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4B112	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4B113	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4B115	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4B116	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4B118	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4B11A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4B11B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4B11H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4B11J	Feed Pump Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4C021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4C022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4C023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4C025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5C4C026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4C028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4C02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4C02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4C02J	Central Pump Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4D021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4D022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4D023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4D025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4D026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4D028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4D02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4D02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4D02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4D02J	Central Pump Pit Weather Delays	$119,226	13%	$15,774	$134,999	40%	$54,000	$188,999
5C4E021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4E022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4E023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4E025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4E026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4E028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4E02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4E02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4E02J	Central Pump Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4F021	Mobilization & Setup	$80,802	13%	$10,690	$91,492	40%	$36,597	$128,089
5C4F022	Spray Fixative	$43,562	13%	$5,763	$49,325	40%	$19,730	$69,055
5C4F023	Remove Cover Block	$4,599	13%	$608	$5,208	40%	$2,083	$7,291
5C4F025	Clean Debris/Wash Down Pit	$45,162	13%	$5,975	$51,137	40%	$20,455	$71,592
5C4F026	SPC Coatings- Pit	$24,871	13%	$3,290	$28,162	40%	$11,265	$39,426
5C4F028	Coatings for Cover Blocks	$16,622	13%	$2,199	$18,822	40%	$7,529	$26,350
5C4F02A	Install Drain Plug	$5,632	13%	$745	$6,377	40%	$2,551	$8,928
5C4F02B	Replace Cover Block	$16,252	13%	$2,150	$18,402	40%	$7,361	$25,763
5C4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,501	13%	$1,125	$9,626	40%	$3,850	$13,476
5C4F02J	Central Pump Pit Weather Delays	$59,613	13%	$7,887	$67,500	40%	$27,000	$94,500
5C4J02	Ventilation Exhaust Train Installation	$27,267	13%	$3,607	$30,874	40%	$12,350	$43,224
5C4J05	Ventilation Exhaust Duct Installation	$540,104	13%	$71,456	$611,560	40%	$244,624	$856,183
5C4J07	Seal Pot Drain Piping	$258,194	13%	$34,159	$292,354	40%	$116,941	$409,295
5C4J09	Ventilation Exhaust Tie-In	$33,474	13%	$4,429	$37,903	40%	$15,161	$53,064
5C4P	Construction Equipment	$214,058	13%	$28,320	$242,378	40%	$96,951	$339,329

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5D4P	Construction Equipment	$29,048	8%	$2,251	$31,299	38%	$11,894	$43,193
5E4P	Construction Equipment	$30,095	8%	$2,332	$32,427	40%	$12,971	$45,398
5F4A021	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380
5F4A022	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4A023	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4A025	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4A026	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4A028	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4A02A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4A02B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4A02J	Central Pump Pit Weather Delays	$59,186	13%	$7,416	$66,602	40%	$26,641	$93,242
5F4B021	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380
5F4B022	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4B023	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4B025	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4B026	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4B028	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4B02A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4B02B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4B02J	Central Pump Pit Weather Delays	$130,209	13%	$16,315	$146,524	40%	$58,610	$205,133
5F4B141	Mobilization & Setup	$32,871	13%	$4,119	$36,990	40%	$14,796	$51,786
5F4B143	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4B145	Clean Debris/Wash Down Pit	$31,520	13%	$3,949	$35,469	40%	$14,188	$49,657
5F4B146	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4B148	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4B14A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4B14B	Replace Cover Block	$10,396	13%	$1,303	$11,699	40%	$4,679	$16,378
5F4B14H	Shop Fab (Drain Plug, LDE sleeve, & missile shield	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4B151	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380
5F4B152	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4B153	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4B155	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4B156	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4B158	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4B15A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4B15B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4B15H	Shop Fab (Drain Plug, LDE sleeve, & missile shield	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4B15J	Drain Pit Weather Delays	$59,186	13%	$7,416	$66,602	40%	$26,641	$93,242
5F4C021	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
700	Special Equipment/Process Systems							
5F4C022	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4C023	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4C025	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4C026	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4C028	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4C02A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4C02B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4C02J	Central Pump Pit Weather Delays	$59,186	13%	$7,416	$66,602	40%	$26,641	$93,242
5F4J35A	Encased Pipe Leak Detectors Assembly	$806,441	13%	$101,047	$907,488	40%	$362,995	$1,270,483
5F4K011	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380
5F4K012	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4K013	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4K015	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4K016	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4K018	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4K01A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4K01B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4K01H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4K01J	Valve Pit Weather Delays	$91,597	13%	$11,477	$103,074	40%	$41,230	$144,303
5F4L011	Mobilization & Setup	$80,854	13%	$10,131	$90,985	40%	$36,394	$127,380
5F4L012	Spray Fixative	$43,372	13%	$5,435	$48,807	40%	$19,523	$68,330
5F4L013	Remove Cover Block	$4,566	13%	$572	$5,138	40%	$2,055	$7,194
5F4L015	Clean Debris/Wash Down Pit	$44,879	13%	$5,623	$50,503	40%	$20,201	$70,704
5F4L016	SPC Coatings- Pit	$24,719	13%	$3,097	$27,816	40%	$11,126	$38,942
5F4L018	Coatings for Cover Blocks	$16,570	13%	$2,076	$18,646	40%	$7,458	$26,105
5F4L01A	Install Drain Plug	$5,592	13%	$701	$6,293	40%	$2,517	$8,810
5F4L01B	Replace Cover Block	$16,226	13%	$2,033	$18,259	40%	$7,304	$25,562
5F4L01H	Shop Fab (Drain, LDE sleeve, & missile shield)	$8,493	13%	$1,064	$9,557	40%	$3,823	$13,380
5F4L01J	Valve Pit Weather Delays	$59,186	13%	$7,416	$66,602	40%	$26,641	$93,242
5F4P	Construction Equipment	$214,335	13%	$26,856	$241,191	40%	$96,476	$337,668
5H3B00	HVAC Procurement	$705,287	6%	$45,138	$750,425	30%	$225,128	$975,553
5H4B001	Mobilization & Setup	$80,027	8%	$6,202	$86,230	40%	$34,492	$120,721
5H4B002	Spray Fixative	$43,558	8%	$3,376	$46,933	40%	$18,773	$65,707
5H4B003	Remove Cover Block	$4,598	8%	$356	$4,955	40%	$1,982	$6,937
5H4B005	Clean Debris/Wash Down Pit	$45,106	8%	$3,496	$48,602	40%	$19,441	$68,042
5H4B006	SPC Coatings- Pit	$24,836	8%	$1,925	$26,761	40%	$10,704	$37,466
5H4B008	Coatings for Cover Blocks	$16,539	8%	$1,282	$17,821	40%	$7,128	$24,950
5H4B00B	Replace Cover Block	$16,141	8%	$1,251	$17,391	40%	$6,957	$24,348
5H4B00J	Pump Pit Weather Delays	$47,682	8%	$3,695	$51,378	40%	$20,551	$71,929
5H4B05	Ventilation Train Installation	$11,904	8%	$923	$12,827	40%	$5,131	$17,958

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
700 Special Equipment/Process Systems								
5H4B06	Ventilation Exhaust Duct Installation	$465,377	8%	$36,067	$501,443	40%	$200,577	$702,021
5H4B07	Seal Pot Drain Piping	$223,558	8%	$17,326	$240,884	40%	$96,354	$337,237
5H4B09	Inlet Air Filter Stations	$100,323	8%	$7,775	$108,098	40%	$43,239	$151,337
5H4P	Construction Equipment	$93,065	8%	$7,213	$100,278	40%	$40,111	$140,389
5I4E01	Pipe Excavation	$64,407	13%	$8,521	$72,929	40%	$29,171	$102,100
5I4E02	Shop Fab Pipe	$29,626	13%	$3,920	$33,545	40%	$13,418	$46,964
5I4E03	Demo Existing Pipe At Tie-In	$27,886	13%	$3,689	$31,576	40%	$12,630	$44,206
5I4E04	Pipe Installation	$40,873	13%	$5,407	$46,280	40%	$18,512	$64,792
5I4E05	Pipeline Hot Tie-In	$20,210	13%	$2,674	$22,884	40%	$9,154	$32,038
5I4E07	Pipeline Bed/Bfkl/Tape	$23,164	13%	$3,065	$26,229	40%	$10,492	$36,720
5I4E08	ATP & Testing	$11,612	13%	$1,536	$13,149	40%	$5,259	$18,408
5I4P	Construction Equipment	$17,499	13%	$2,315	$19,814	40%	$7,926	$27,740
TOTAL 700 Special Equipment/Process Systems		$19,059,906	10%	$1,964,717	$21,024,623	37%	$7,865,778	$28,890,402
7060 Electrical								
5A4C021	Mobilization & Setup	$2,723	9%	$254	$2,977	40%	$1,191	$4,168
5A4J26A	Main Power Feed to Ventilation Skid	$32,626	9%	$3,044	$35,670	40%	$14,268	$49,939
5A4J26B	Spare Circuit Breaker for 241-AN-US, 1000 kva Load	$6,950	9%	$648	$7,598	40%	$3,039	$10,638
5A4J26C	Ventilation Skid Ground Grid and Bonding	$28,645	9%	$2,673	$31,318	40%	$12,527	$43,845
5A4J26D	Freeze Protection for Ventilation Drain Lines	$12,458	9%	$1,162	$13,620	40%	$5,448	$19,068
5B4A021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4B091	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4C021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4C101	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4E021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4F021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4G021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4H021	Mobilization & Setup	$2,750	10%	$275	$3,024	40%	$1,210	$4,234
5B4J26A	Main Power Feed to Ventilation Skid	$32,849	10%	$3,285	$36,133	40%	$14,453	$50,587
5B4J26B	Power Receptacle on Portable Diesel Generator	$1,243	10%	$124	$1,367	40%	$547	$1,914
5B4J26C	Ventilation Skid Ground Grid and Bonding	$28,918	10%	$2,892	$31,809	40%	$12,724	$44,533
5B4J26D	Freeze Protection For Ventilation	$13,647	10%	$1,365	$15,011	40%	$6,005	$21,016
5C4A021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4B021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4B101	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4B111	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4C021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4D021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
7060 Electrical								
5C4E021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4F021	Mobilization & Setup	$2,740	13%	$362	$3,102	40%	$1,241	$4,343
5C4J26A	Main Power Feed to Ventilation Skid	$32,742	13%	$4,332	$37,074	40%	$14,829	$51,903
5C4J26B	Power Receptacle On Portable Diesel Generator	$36,821	13%	$4,871	$41,693	40%	$16,677	$58,370
5C4J26C	Spare Circuit Breaker For AW241-EDS-ENCL-100, 1000	$6,820	13%	$902	$7,722	40%	$3,089	$10,811
5C4J26D	Ventilation Skid Ground Grid and Bonding	$28,809	13%	$3,811	$32,621	40%	$13,048	$45,669
5C4J26E	Freeze Protection For Ventilation	$14,009	13%	$1,853	$15,862	40%	$6,345	$22,207
5D3A00	Electrical Procurement	$37,763	7%	$2,504	$40,266	30%	$12,080	$52,346
5D4J26A	Motor Control Center - AY1	$81,874	8%	$6,345	$88,219	38%	$33,523	$121,742
5D4J26C	Electrical Demolition	$30,645	8%	$2,375	$33,020	38%	$12,548	$45,568
5E3A00	Electrical Procurement	$66,174	7%	$4,533	$70,707	30%	$21,212	$91,919
5E4J26A	Motor Control Center	$129,785	8%	$10,058	$139,844	40%	$55,938	$195,781
5E4J26C	Electrical Demolition	$55,391	8%	$4,293	$59,684	40%	$23,874	$83,557
5F4A021	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5F4B021	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5F4B141	Mobilization & Setup	$1,360	13%	$170	$1,531	40%	$612	$2,143
5F4B151	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5F4C021	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5F4K011	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5F4L011	Mobilization & Setup	$2,720	13%	$341	$3,061	40%	$1,224	$4,286
5H4B001	Mobilization & Setup	$2,739	8%	$212	$2,952	40%	$1,181	$4,132
5H4B02A	Temperature Probes	$127,144	8%	$9,854	$136,998	40%	$54,799	$191,797
5H4B14A	Existing PNLBD "A" to Ventilation Skid	$32,520	8%	$2,520	$35,040	40%	$14,016	$49,056
5H4B14D	Ventilation Skid Ground Grid and Bonding	$33,559	8%	$2,601	$36,160	40%	$14,464	$50,624
5H4B14E	Freeze Protection For Ventilation	$6,535	8%	$506	$7,041	40%	$2,817	$9,858
5I4E06	Pipe Cathodic Protection	$48,150	13%	$6,370	$54,520	40%	$21,808	$76,328
TOTAL 7060 Electrical		$993,136	9%	$90,704	$1,083,840	39%	$420,014	$1,503,854
7065 Instrumentation/Controls								
5A4A08A	Vapor Space Pressure Measurement	$29,557	9%	$2,758	$32,315	40%	$12,926	$45,241
5A4A11	Valve Position Indicator Conduit & Wire - V-601	$21,718	9%	$2,026	$23,745	40%	$9,498	$33,242
5A4B027	Core Drill Cover Block (1 Hole)	$14,815	9%	$1,382	$16,197	40%	$6,479	$22,676
5A4B029	Install LDE Sleeve	$5,054	9%	$472	$5,525	40%	$2,210	$7,735
5A4B02C	Install LDE Probe Assembly	$20,364	9%	$1,900	$22,264	40%	$8,906	$31,170
5A4B02D	Site Instrumentation (Wiring & LDE Cabinet)	$38,550	9%	$3,597	$42,147	40%	$16,859	$59,005
5A4B02E	Install Missile Shield	$12,253	9%	$1,143	$13,397	40%	$5,359	$18,755
5A4B02F	ATP	$3,268	9%	$305	$3,572	40%	$1,429	$5,001
5A4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,795	9%	$1,287	$15,083	40%	$6,033	$21,116

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7065	Instrumentation/Controls							
5A4B08A	Vapor Space Pressure Measurement	$30,776	9%	$2,871	$33,647	40%	$13,459	$47,106
5A4B11	Valve Position Indicator Conduit & Wire - V-602	$15,547	9%	$1,451	$16,997	40%	$6,799	$23,796
5A4C027	Core Drill Cover Block (1 Hole)	$14,815	9%	$1,382	$16,197	40%	$6,479	$22,676
5A4C029	Install LDE Sleeve	$5,054	9%	$472	$5,525	40%	$2,210	$7,735
5A4C02C	Install LDE Probe Assembly	$20,364	9%	$1,900	$22,264	40%	$8,906	$31,170
5A4C02D	Site Instrumentation (Wiring & LDE Cabinet)	$47,104	9%	$4,395	$51,498	40%	$20,599	$72,098
5A4C02E	Install Missile Shield	$12,253	9%	$1,143	$13,397	40%	$5,359	$18,755
5A4C02F	ATP	$3,268	9%	$305	$3,572	40%	$1,429	$5,001
5A4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,795	9%	$1,287	$15,083	40%	$6,033	$21,116
5A4C08A	Vapor Space Pressure Measurement	$19,499	9%	$1,819	$21,319	40%	$8,527	$29,846
5A4D08A	Vapor Space Pressure Measurement	$28,161	9%	$2,627	$30,789	40%	$12,316	$43,104
5A4E027	Core Drill Cover Block (1 Hole)	$14,815	9%	$1,382	$16,197	40%	$6,479	$22,676
5A4E029	Install LDE Sleeve	$5,054	9%	$472	$5,525	40%	$2,210	$7,735
5A4E02C	Install LDE Probe Assembly	$20,364	9%	$1,900	$22,264	40%	$8,906	$31,170
5A4E02D	Site Instrumentation (Wiring & LDE Cabinet)	$41,013	9%	$3,827	$44,840	40%	$17,936	$62,775
5A4E02E	Install Missile Shield	$12,253	9%	$1,143	$13,397	40%	$5,359	$18,755
5A4E02F	ATP	$3,268	9%	$305	$3,572	40%	$1,429	$5,001
5A4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,795	9%	$1,287	$15,083	40%	$6,033	$21,116
5A4E08A	Vapor Space Pressure Measurement	$32,013	9%	$2,987	$35,000	40%	$14,000	$49,000
5A4F027	Core Drill Cover Block (1 Hole)	$14,815	9%	$1,382	$16,197	40%	$6,479	$22,676
5A4F029	Install LDE Sleeve	$5,054	9%	$472	$5,525	40%	$2,210	$7,735
5A4F02C	Install LDE Probe Assembly	$20,364	9%	$1,900	$22,264	40%	$8,906	$31,170
5A4F02D	Site Instrumentation (Wiring & LDE Cabinet)	$50,609	9%	$4,722	$55,331	40%	$22,132	$77,463
5A4F02E	Install Missile Shield	$12,253	9%	$1,143	$13,397	40%	$5,359	$18,755
5A4F02F	ATP	$3,268	9%	$305	$3,572	40%	$1,429	$5,001
5A4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,795	9%	$1,287	$15,083	40%	$6,033	$21,116
5A4F08A	Vapor Space Pressure Measurement	$28,161	9%	$2,627	$30,789	40%	$12,316	$43,104
5A4G027	Core Drill Cover Block (1 Hole)	$14,815	9%	$1,382	$16,197	40%	$6,479	$22,676
5A4G029	Install LDE Sleeve	$5,054	9%	$472	$5,525	40%	$2,210	$7,735
5A4G02C	Install LDE Probe Assembly	$20,364	9%	$1,900	$22,264	40%	$8,906	$31,170
5A4G02D	Site Instrumentation (Wiring & LDE Cabinet)	$41,013	9%	$3,827	$44,840	40%	$17,936	$62,775
5A4G02E	Install Missile Shield	$12,253	9%	$1,143	$13,397	40%	$5,359	$18,755
5A4G02F	ATP	$3,268	9%	$305	$3,572	40%	$1,429	$5,001
5A4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,795	9%	$1,287	$15,083	40%	$6,033	$21,116
5A4G08A	Vapor Space Pressure Measurement	$30,689	9%	$2,863	$33,552	40%	$13,421	$46,973
5A4G11	Valve Position Indicator Conduit & Wire - V-607	$10,414	9%	$972	$11,385	40%	$4,554	$15,940
5A4J22A	Ventilation Exhaust Skid Connections	$56,713	9%	$5,291	$62,005	40%	$24,802	$86,807
5A4J22B	PLC Equipment	$125,254	9%	$11,686	$136,940	40%	$54,776	$191,716
5A4J22C	Panalarms	$49,554	9%	$4,623	$54,178	40%	$21,671	$75,849
5A4J22D	Gamewells	$5,539	9%	$517	$6,056	40%	$2,423	$8,479
5A4J22E	Liquid High Level Probes	$2,900	9%	$271	$3,170	40%	$1,268	$4,439

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7065	Instrumentation/Controls							
5A4J26D	Freeze Protection for Ventilation Drain Lines	$354	9%	$33	$388	40%	$155	$543
5A4J27A	Site Conduit Excavation	$95,866	9%	$8,944	$104,811	40%	$41,924	$146,735
5A4J27B	Site Conduit Installation	$169,759	9%	$15,838	$185,597	40%	$74,239	$259,836
5A4J27C	Site Conduit Bed\Bkfl	$48,082	9%	$4,486	$52,568	40%	$21,027	$73,595
5A4J28	Site Pull Wire & Terminate	$105,209	9%	$9,816	$115,025	40%	$46,010	$161,034
5A4J35A	Encased Pipe Leak Detectors Assembly	$123,935	9%	$11,563	$135,498	40%	$54,199	$189,697
5A4J35B	Encased Pipe Leak Detectors Conduit & Wire	$67,045	9%	$6,255	$73,300	40%	$29,320	$102,621
5B4A027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4A029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4A02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4A02D	Site Instrumentation (Wiring & LDE Cabinet)	$47,509	10%	$4,751	$52,260	40%	$20,904	$73,164
5B4A02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4A02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4A11	Valve Position Indicator Conduit & Wire - V-101	$9,723	10%	$972	$10,695	40%	$4,278	$14,973
5B4B097	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4B099	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4B09C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4B09D	Site Instrumentation (Wiring & LDE Cabinet)	$60,724	10%	$6,072	$66,796	40%	$26,718	$93,515
5B4B09E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4B09F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4B09H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4C027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4C029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4C02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4C02D	Site Instrumentation (Wiring & LDE Cabinet)	$46,869	10%	$4,687	$51,556	40%	$20,622	$72,178
5B4C02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4C02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4C107	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4C109	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4C10C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4C10D	Site Instrumentation (Wiring & LDE Cabinet)	$26,228	10%	$2,623	$28,851	40%	$11,540	$40,392
5B4C10E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4C10F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4C10H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4C11	Valve Position Indicator Conduit & Wire - V-103	$11,855	10%	$1,186	$13,041	40%	$5,216	$18,257
5B4D11	Valve Position Indicator Conduit & Wire - V-104	$26,681	10%	$2,668	$29,350	40%	$11,740	$41,089
5B4E027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4E029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4E02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
7065	Instrumentation/Controls							
5B4E02D	Site Instrumentation (Wiring & LDE Cabinet)	$53,530	10%	$5,353	$58,882	40%	$23,553	$82,435
5B4E02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4E02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4E11	Valve Position Indicator Conduit & Wire - V-105	$11,239	10%	$1,124	$12,362	40%	$4,945	$17,307
5B4F027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4F029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4F02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4F02D	Site Instrumentation (Wiring & LDE Cabinet)	$47,380	10%	$4,738	$52,118	40%	$20,847	$72,965
5B4F02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4F02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4F11	Valve Position Indicator Conduit & Wire - V-106	$12,693	10%	$1,269	$13,962	40%	$5,585	$19,547
5B4G027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4G029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4G02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4G02D	Site Instrumentation (Wiring & LDE Cabinet)	$53,530	10%	$5,353	$58,882	40%	$23,553	$82,435
5B4G02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4G02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4G11	Valve Position Indicator Conduit & Wire - V-107	$11,239	10%	$1,124	$12,362	40%	$4,945	$17,307
5B4H027	Core Drill Cover Block (1 Hole)	$14,953	10%	$1,495	$16,448	40%	$6,579	$23,027
5B4H029	Install LDE Sleeve	$5,103	10%	$510	$5,613	40%	$2,245	$7,858
5B4H02C	Install LDE Probe Assembly	$20,415	10%	$2,042	$22,457	40%	$8,983	$31,439
5B4H02D	Site Instrumentation (Wiring & LDE Cabinet)	$47,380	10%	$4,738	$52,118	40%	$20,847	$72,965
5B4H02E	Install Missile Shield	$12,373	10%	$1,237	$13,610	40%	$5,444	$19,054
5B4H02F	ATP	$3,299	10%	$330	$3,629	40%	$1,452	$5,081
5B4H02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,835	10%	$1,384	$15,219	40%	$6,087	$21,306
5B4H11	Valve Position Indicator Conduit & Wire - V-108	$13,044	10%	$1,304	$14,348	40%	$5,739	$20,087
5B4J22A	Ventilation Exhaust Skid Connections	$98,789	10%	$9,879	$108,668	40%	$43,467	$152,135
5B4J22B	PLC Equipment	$143,224	10%	$14,322	$157,547	40%	$63,019	$220,565
5B4J22C	Panalarms	$79,933	10%	$7,993	$87,926	40%	$35,170	$123,096
5B4J22D	Gamewells	$5,571	10%	$557	$6,128	40%	$2,451	$8,580
5B4J22E	Vapor Space Pressure Measurement	$5,987	10%	$599	$6,585	40%	$2,634	$9,219
5B4J22F	Liquid High Level Probes	$2,844	10%	$284	$3,128	40%	$1,251	$4,379
5B4J26D	Freeze Protection For Ventilation	$358	10%	$36	$394	40%	$157	$551
5B4J27A	Site Conduit Excavation	$191,497	10%	$19,150	$210,647	40%	$84,259	$294,906
5B4J27B	Site Conduit Installation	$228,159	10%	$22,816	$250,975	40%	$100,390	$351,365
5B4J27C	Site Conduit Bed\Bkfl	$96,039	10%	$9,604	$105,643	40%	$42,257	$147,900
5B4J28	Site Pull Wire & Terminate	$143,345	10%	$14,334	$157,679	40%	$63,072	$220,751
5B4J35A	Encased Pipe Leak Detectors Assembly	$191,354	10%	$19,135	$210,489	40%	$84,196	$294,685

Final Estimate
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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
7065	Instrumentation/Controls							
5B4J35B	Encased Pipe Leak Detectors Conduit & Wire	$56,616	10%	$5,662	$62,278	40%	$24,911	$87,189
5C4A027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4A029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4A02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4A02D	Site Instrumentation (Wiring & LDE Cabinet)	$36,199	13%	$4,789	$40,989	40%	$16,395	$57,384
5C4A02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4A02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4A08A	Vapor Space Pressure Measurement	$29,571	13%	$3,912	$33,483	40%	$13,393	$46,877
5C4B027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4B029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4B02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4B02D	Site Instrumentation (Wiring & LDE Cabinet)	$30,021	13%	$3,972	$33,993	40%	$13,597	$47,590
5C4B02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4B02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4B08A	Vapor Space Pressure Measurement	$30,796	13%	$4,074	$34,870	40%	$13,948	$48,819
5C4B107	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4B109	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4B10C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4B10D	Site Instrumentation (Wiring & LDE Cabinet)	$36,057	13%	$4,770	$40,828	40%	$16,331	$57,159
5C4B10E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4B10F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4B10H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4B117	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4B119	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4B11C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4B11D	Site Instrumentation (Wiring & LDE Cabinet)	$35,565	13%	$4,705	$40,270	40%	$16,108	$56,378
5C4B11E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4B11F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4B11H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4B12	Valve Position Indicator Conduit & Wire - V-105, 1	$30,929	13%	$4,092	$35,021	40%	$14,008	$49,029
5C4C027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4C029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4C02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4C02D	Site Instrumentation (Wiring & LDE Cabinet)	$27,924	13%	$3,694	$31,618	40%	$12,647	$44,266
5C4C02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4C02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4C08A	Vapor Space Pressure Measurement	$37,277	13%	$4,932	$42,209	40%	$16,884	$59,093
5C4D027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609

Final Estimate
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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
7065	Instrumentation/Controls							
5C4D029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4D02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4D02D	Site Instrumentation (Wiring & LDE Cabinet)	$39,717	13%	$5,255	$44,971	40%	$17,989	$62,960
5C4D02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4D02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4D02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4D08A	Vapor Space Pressure Measurement	$26,069	13%	$3,449	$29,518	40%	$11,807	$41,326
5C4D11	Valve Position Indicator Conduit & Wire - V-604	$11,673	13%	$1,544	$13,217	40%	$5,287	$18,504
5C4E027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4E029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4E02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4E02D	Site Instrumentation (Wiring & LDE Cabinet)	$26,876	13%	$3,556	$30,431	40%	$12,172	$42,604
5C4E02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4E02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4E08A	Vapor Space Pressure Measurement	$37,277	13%	$4,932	$42,209	40%	$16,884	$59,093
5C4E11	Valve Position Indicator Conduit & Wire - V-605	$10,920	13%	$1,445	$12,365	40%	$4,946	$17,310
5C4F027	Core Drill Cover Block (1 Hole)	$14,893	13%	$1,970	$16,863	40%	$6,745	$23,609
5C4F029	Install LDE Sleeve	$5,085	13%	$673	$5,757	40%	$2,303	$8,060
5C4F02C	Install LDE Probe Assembly	$20,188	13%	$2,671	$22,858	40%	$9,143	$32,002
5C4F02D	Site Instrumentation (Wiring & LDE Cabinet)	$39,717	13%	$5,255	$44,971	40%	$17,989	$62,960
5C4F02E	Install Missile Shield	$12,329	13%	$1,631	$13,961	40%	$5,584	$19,545
5C4F02F	ATP	$3,288	13%	$435	$3,723	40%	$1,489	$5,212
5C4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,686	13%	$1,811	$15,497	40%	$6,199	$21,696
5C4F08A	Vapor Space Pressure Measurement	$26,069	13%	$3,449	$29,518	40%	$11,807	$41,326
5C4J22A	Ventilation Exhaust Skid Connections	$56,911	13%	$7,529	$64,440	40%	$25,776	$90,217
5C4J22B	PLC Equipment	$121,849	13%	$16,121	$137,969	40%	$55,188	$193,157
5C4J22C	Panalarms	$33,579	13%	$4,443	$38,022	40%	$15,209	$53,230
5C4J22D	Liquid High Level Probes	$2,783	13%	$368	$3,152	40%	$1,261	$4,412
5C4J26E	Freeze Protection For Ventilation	$356	13%	$47	$404	40%	$161	$565
5C4J27A	Site Conduit Excavation	$65,007	13%	$8,600	$73,607	40%	$29,443	$103,050
5C4J27B	Site Conduit Installation	$168,705	13%	$22,320	$191,025	40%	$76,410	$267,435
5C4J27C	Site Conduit Bed\Bkfl	$32,593	13%	$4,312	$36,906	40%	$14,762	$51,668
5C4J28	Site Pull Wire & Terminate	$100,970	13%	$13,358	$114,328	40%	$45,731	$160,060
5C4J35A	Encased Pipe Leak Detectors Assembly	$462,088	13%	$61,134	$523,223	40%	$209,289	$732,512
5C4J35B	Encased Pipe Leak Detectors Conduit & Wire	$116,674	13%	$15,436	$132,110	40%	$52,844	$184,954
5D4A08A	Vapor Space Pressure Measurement	$18,730	8%	$1,452	$20,182	38%	$7,669	$27,851
5D4B08A	Vapor Space Pressure Measurement	$21,871	8%	$1,695	$23,566	38%	$8,955	$32,522
5D4J22B	PLC Equipment	$91,014	8%	$7,054	$98,067	38%	$37,266	$135,333
5D4J22C	Panalarms	$49,862	8%	$3,864	$53,726	38%	$20,416	$74,142
5D4J22D	242-A DCS	$1,164	8%	$90	$1,254	38%	$477	$1,730

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Contingency Subtotal	Contingency %	Contingency Total	Total Dollars
7065	Instrumentation/Controls							
5D4J22E	Liquid High Level Probes	$2,825	8%	$219	$3,043	38%	$1,156	$4,200
5D4J27A	Site Conduit Excavation	$109,594	8%	$8,494	$118,088	38%	$44,873	$162,961
5D4J27B	Site Conduit Installation	$132,723	8%	$10,286	$143,009	38%	$54,344	$197,353
5D4J27C	Site Conduit Bed\Bkfl	$54,956	8%	$4,259	$59,215	38%	$22,502	$81,717
5D4J28	Site Pull Wire & Terminate	$107,271	8%	$8,314	$115,585	38%	$43,922	$159,507
5D4J29A	Encased Pipe Leak Detectors Assembly	$91,635	8%	$7,102	$98,737	38%	$37,520	$136,257
5D4J29B	Encased Pipe Leak Detectors Conduit & Wire	$48,939	8%	$3,793	$52,731	38%	$20,038	$72,769
5E4A08A	Vapor Space Pressure Measurement	$26,081	8%	$2,021	$28,103	40%	$11,241	$39,344
5E4B08A	Vapor Space Pressure Measurement	$28,577	8%	$2,215	$30,792	40%	$12,317	$43,108
5E4J22B	PLC Equipment	$95,359	8%	$7,390	$102,749	40%	$41,100	$143,849
5E4J22C	Panalarms	$49,764	8%	$3,857	$53,621	40%	$21,448	$75,070
5E4J22D	242-A DCS	$2,324	8%	$180	$2,504	40%	$1,002	$3,506
5E4J22E	Liquid High Level Probes	$7,233	8%	$561	$7,794	40%	$3,118	$10,912
5E4J27A	Site Conduit Excavation	$81,741	8%	$6,335	$88,075	40%	$35,230	$123,306
5E4J27B	Site Conduit Installation	$142,898	8%	$11,075	$153,973	40%	$61,589	$215,562
5E4J27C	Site Conduit Bed\Bkfl	$40,993	8%	$3,177	$44,170	40%	$17,668	$61,838
5E4J28	Site Pull Wire & Terminate	$113,992	8%	$8,834	$122,826	40%	$49,131	$171,957
5E4J29A	Encased Pipe Leak Detectors Assembly	$60,983	8%	$4,726	$65,709	40%	$26,284	$91,993
5E4J29B	Encased Pipe Leak Detectors Conduit & Wire	$25,307	8%	$1,961	$27,268	40%	$10,907	$38,176
5F4A027	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4A029	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4A02C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4A02D	Site Instrumentation (Wiring & LDE Cabinet)	$43,348	13%	$5,432	$48,779	40%	$19,512	$68,291
5F4A02E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4A02F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4A07	SY Tank 101 High Level Alarm - Riser	$106,327	13%	$13,323	$119,650	40%	$47,860	$167,510
5F4A08A	Vapor Space Pressure Measurement	$32,457	13%	$4,067	$36,524	40%	$14,610	$51,133
5F4B027	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4B029	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4B02C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4B02D	Site Instrumentation (Wiring & LDE Cabinet)	$42,179	13%	$5,285	$47,464	40%	$18,986	$66,450
5F4B02E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4B02F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4B07	SY Tank 102 High Level Alarm - Riser	$106,577	13%	$13,354	$119,931	40%	$47,972	$167,903
5F4B08A	Vapor Space Pressure Measurement	$46,198	13%	$5,789	$51,987	40%	$20,795	$72,782
5F4B11	Valve Position Indicator Conduit & Wire - V-103, 1	$47,552	13%	$5,958	$53,511	40%	$21,404	$74,915
5F4B147	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4B149	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4B14C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
7065	Instrumentation/Controls							
5F4B14D	Site Instrumentation (Wiring & LDE Cabinet)	$26,427	13%	$3,311	$29,738	40%	$11,895	$41,633
5F4B14E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4B14F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4B14H	Shop Fab (Drain Plug, LDE sleeve, & missile shield	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4B157	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4B159	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4B15C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4B15D	Site Instrumentation (Wiring & LDE Cabinet)	$29,012	13%	$3,635	$32,647	40%	$13,059	$45,705
5F4B15E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4B15F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4B15H	Shop Fab (Drain Plug, LDE sleeve, & missile shield	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4C027	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4C029	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4C02C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4C02D	Site Instrumentation (Wiring & LDE Cabinet)	$39,722	13%	$4,977	$44,699	40%	$17,880	$62,579
5F4C02E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4C02F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4C07	SY Tank 103 High Level Alarm - Riser	$108,201	13%	$13,558	$121,759	40%	$48,704	$170,462
5F4C08A	Vapor Space Pressure Measurement	$22,588	13%	$2,830	$25,418	40%	$10,167	$35,585
5F4J22C	Panalarms	$239,715	13%	$30,036	$269,751	40%	$107,901	$377,652
5F4J27A	Site Conduit Excavation	$78,420	13%	$9,826	$88,247	40%	$35,299	$123,545
5F4J27B	Site Conduit Installation	$154,242	13%	$19,326	$173,568	40%	$69,427	$242,995
5F4J27C	Site Conduit Bed\Bkfl	$39,330	13%	$4,928	$44,258	40%	$17,703	$61,961
5F4J28	Site Pull Wire & Terminate	$89,053	13%	$11,158	$100,212	40%	$40,085	$140,296
5F4J35A	Encased Pipe Leak Detectors Assembly	$493,884	13%	$61,884	$555,767	40%	$222,307	$778,074
5F4J35B	Encased Pipe Leak Detectors Conduit & Wire	$144,777	13%	$18,141	$162,917	40%	$65,167	$228,084
5F4K017	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4K019	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4K01C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4K01D	Site Instrumentation (Wiring & LDE Cabinet)	$42,221	13%	$5,290	$47,511	40%	$19,005	$66,516
5F4K01E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4K01F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143
5F4K01H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4K11	Valve Position Indicator Conduit & Wire	$54,049	13%	$6,772	$60,821	40%	$24,329	$85,150
5F4L017	Core Drill Cover Block (1 Hole)	$14,797	13%	$1,854	$16,651	40%	$6,660	$23,312
5F4L019	Install LDE Sleeve	$5,048	13%	$633	$5,681	40%	$2,272	$7,953
5F4L01C	Install LDE Probe Assembly	$20,274	13%	$2,540	$22,815	40%	$9,126	$31,941
5F4L01D	Site Instrumentation (Wiring & LDE Cabinet)	$44,344	13%	$5,556	$49,901	40%	$19,960	$69,861
5F4L01E	Install Missile Shield	$12,241	13%	$1,534	$13,775	40%	$5,510	$19,285
5F4L01F	ATP	$3,264	13%	$409	$3,673	40%	$1,469	$5,143

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
7065 Instrumentation/Controls								
5F4L01H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,737	13%	$1,721	$15,458	40%	$6,183	$21,641
5F4L11	Valve Position Indicator Conduit & Wire - V-301, 3	$39,295	13%	$4,924	$44,219	40%	$17,688	$61,907
5H4B007	Core Drill Cover Block (1 Hole)	$14,878	8%	$1,153	$16,031	40%	$6,412	$22,443
5H4B009	Install LDE Sleeve	$5,083	8%	$394	$5,477	40%	$2,191	$7,668
5H4B00C	Install LDE Probe Assembly	$19,905	8%	$1,543	$21,448	40%	$8,579	$30,027
5H4B00D	Site Instrumentation (Wiring & LDE Cabinet)	$22,246	8%	$1,724	$23,971	40%	$9,588	$33,559
5H4B00E	Install Missile Shield	$12,327	8%	$955	$13,283	40%	$5,313	$18,596
5H4B00F	ATP	$3,287	8%	$255	$3,542	40%	$1,417	$4,959
5H4B00H	Shop Fab (Drain, LDE sleeve, & missile shield)	$13,505	8%	$1,047	$14,552	40%	$5,821	$20,373
5H4B02A	Temperature Probes	$5,861	8%	$454	$6,315	40%	$2,526	$8,841
5H4B03A	ENRAF Leak Detectors In Annulus Riser	$62,581	8%	$4,850	$67,431	40%	$26,973	$94,404
5H4B11A	Vapor Space Pressure Measurement	$34,165	8%	$2,648	$36,813	40%	$14,725	$51,538
5H4B12A	Ventilation Skid Connections	$49,576	8%	$3,842	$53,418	40%	$21,367	$74,786
5H4B12B	PLC Equipment	$89,017	8%	$6,899	$95,916	40%	$38,367	$134,283
5H4B14E	Freeze Protection For Ventilation	$343	8%	$27	$369	40%	$148	$517
5H4B15A	Site Conduit Excavation	$251,597	8%	$19,499	$271,095	40%	$108,438	$379,534
5H4B15B	Site Conduit Installation	$156,558	8%	$12,133	$168,692	40%	$67,477	$236,168
5H4B15C	Site Conduit Bed\Bkfl	$126,072	8%	$9,771	$135,842	40%	$54,337	$190,179
5H4B16	Site Pull Wire & Terminate	$103,849	8%	$8,048	$111,897	40%	$44,759	$156,656
5H4B35A	Encased Pipe Leak Detectors Assembly	$274,143	8%	$21,246	$295,389	40%	$118,156	$413,545
5H4B35B	Encased Pipe Leak Detectors Conduit & Wire	$35,089	8%	$2,719	$37,808	40%	$15,123	$52,931
5I4F01	242-A DCS	$33,085	13%	$4,377	$37,463	40%	$14,985	$52,448
5I4F02	Panalarms	$143,199	13%	$18,945	$162,144	40%	$64,858	$227,002
5I4F03	Gamewells	$5,424	13%	$718	$6,142	40%	$2,457	$8,598
5I4F04	Site Alarm Demolition	$1,947	13%	$258	$2,204	40%	$882	$3,086
TOTAL 7065 Instrumentation/Controls		$11,600,899	11%	$1,231,128	$12,832,026	40%	$5,117,066	$17,949,093
788 HPT Support								
5A6100	AN HPT Support	$690,344	7%	$45,770	$736,113	25%	$184,028	$920,142
5B6100	AP HPT Support	$1,199,379	10%	$119,938	$1,319,317	25%	$329,829	$1,649,146
5C6100	AW HPT Support	$1,126,678	13%	$149,059	$1,275,737	25%	$318,934	$1,594,672
5D6100	AY HPT Support	$179,592	8%	$13,918	$193,511	25%	$47,948	$241,459
5E6100	AZ HPT Support	$177,495	8%	$13,756	$191,251	25%	$47,813	$239,064
5F6100	SY HPT Support	$1,156,038	13%	$144,852	$1,300,890	25%	$325,222	$1,626,112
5H6100	244S - DCRT HPT Support	$555,872	8%	$43,080	$598,952	25%	$149,738	$748,690
5I6100	200 E/W Bypass HPT Support	$82,806	13%	$10,955	$93,761	25%	$23,440	$117,201

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788 HPT Support								
TOTAL 788 HPT Support		$5,168,204	10%	$541,328	$5,709,532	25%	$1,426,953	$7,136,485
810 Demolition								
5A4A08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4B024	Demo Existing Instruments in Pits	$11,191	9%	$1,044	$12,235	40%	$4,894	$17,129
5A4B08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4C024	Demo Existing Instruments in Pits	$11,191	9%	$1,044	$12,235	40%	$4,894	$17,129
5A4C08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4D08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4E024	Demo Existing Instruments in Pits	$11,191	9%	$1,044	$12,235	40%	$4,894	$17,129
5A4E08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4F024	Demo Existing Instruments in Pits	$11,191	9%	$1,044	$12,235	40%	$4,894	$17,129
5A4F08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4G024	Demo Existing Instruments in Pits	$11,191	9%	$1,044	$12,235	40%	$4,894	$17,129
5A4G08B	Remove Existing Vapor Pressure Instruments	$613	9%	$57	$670	40%	$268	$938
5A4J09	Ventilation Exhaust Tie-In	$191,152	9%	$17,835	$208,987	40%	$83,595	$292,582
5A4J22F	Demo Existing Instruments in 271	$20,930	9%	$1,953	$22,883	40%	$9,153	$32,036
5A4J26E	Electrical Ventilation Demolition	$436	9%	$41	$476	40%	$191	$667
5A4J35C	Encased LDE Assembly Removal	$42,263	9%	$3,943	$46,207	40%	$18,483	$64,689
5B4A024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4B094	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4C024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4C104	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4E024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4F024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4G024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4H024	Demo Existing Instruments in Pits	$11,260	10%	$1,126	$12,386	40%	$4,954	$17,340
5B4J10	Ventilation Exhaust Tie-In	$191,797	10%	$19,180	$210,977	40%	$84,391	$295,368
5B4J22G	Demo Existing Instruments in 271	$18,149	10%	$1,815	$19,964	40%	$7,985	$27,949
5B4J26E	Electrical Ventilation Demolition	$440	10%	$44	$484	40%	$194	$677
5B4J35C	Encased LDE Assembly Removal	$95,057	10%	$9,506	$104,563	40%	$41,825	$146,388
5C4A024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4A08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4B024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4B08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4B104	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4B114	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4C024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801

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810 Demolition								
5C4C08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4D024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4D08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4E024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4E08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4F024	Demo Existing Instruments in Pits	$11,229	13%	$1,486	$12,715	40%	$5,086	$17,801
5C4F08B	Remove Existing Vapor Pressure Instruments	$616	13%	$82	$698	40%	$279	$977
5C4J09	Ventilation Exhaust Tie-in	$191,563	13%	$25,344	$216,907	40%	$86,763	$303,669
5C4J22E	Demo Existing Instruments in 271	$32,661	13%	$4,321	$36,982	40%	$14,793	$51,774
5C4J26F	Electrical Ventilation Demolition	$438	13%	$58	$496	40%	$199	$695
5C4J35C	Encased LDE Assembly Removal	$212,188	13%	$28,072	$240,260	40%	$96,104	$336,364
5D4A08B	Remove Existing Vapor Pressure Instruments	$616	8%	$48	$663	38%	$252	$915
5D4B08B	Remove Existing Vapor Pressure Instruments	$616	8%	$48	$663	38%	$252	$915
5D4J22F	Demo Existing Instruments in 271	$7,639	8%	$592	$8,231	38%	$3,128	$11,358
5D4J29C	Encased LDE Assembly Removal	$47,393	8%	$3,673	$51,066	38%	$19,405	$70,471
5E4A08B	Remove Existing Vapor Pressure Instruments	$611	8%	$47	$658	40%	$263	$922
5E4B08B	Remove Existing Vapor Pressure Instruments	$611	8%	$47	$658	40%	$263	$922
5E4J22F	Demo Existing Instruments in 271	$27,676	8%	$2,145	$29,820	40%	$11,928	$41,749
5E4J29C	Encased LDE Assembly Removal	$39,822	8%	$3,086	$42,909	40%	$17,163	$60,072
5F4A024	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4A08B	Remove Existing Vapor Pressure Instruments	$612	13%	$77	$689	40%	$275	$964
5F4B024	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4B08B	Remove Existing Vapor Pressure Instruments	$612	13%	$77	$689	40%	$275	$964
5F4B144	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4B154	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4C024	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4C08B	Remove Existing Vapor Pressure Instruments	$612	13%	$77	$689	40%	$275	$964
5F4J22E	Demo Existing Instruments in 271	$27,638	13%	$3,463	$31,101	40%	$12,440	$43,541
5F4J35C	Encased LDE Assembly Removal	$550,668	13%	$68,999	$619,666	40%	$247,867	$867,533
5F4K014	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5F4L014	Demo Existing Instruments in Pits	$11,182	13%	$1,401	$12,583	40%	$5,033	$17,616
5H4B004	Demo Existing Instruments in Pits	$11,221	8%	$870	$12,090	40%	$4,836	$16,926
5H4B02B	Remove Existing Temperature Tree	$32,057	8%	$2,484	$34,542	40%	$13,817	$48,358
5H4B03B	Removal of Sensing Legs in the Annulus Risers	$48,778	8%	$3,780	$52,558	40%	$21,023	$73,582
5H4B10	Ventilation Exhaust Tie-in	$106,313	8%	$8,239	$114,552	40%	$45,821	$160,373
5H4B11B	Remove Existing Vapor Pressure Instruments	$14,831	8%	$1,149	$15,981	40%	$6,392	$22,373
5H4B14F	Electrical Ventilation Demolition	$219	8%	$17	$236	40%	$94	$331
5H4B35C	Encased LDE Assembly Removal	$117,236	8%	$9,086	$126,322	40%	$50,529	$176,851
5I4E03	Demo Existing Pipe At Tie-in	$108,157	13%	$14,309	$122,467	40%	$48,987	$171,453

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810 Demolition								
TOTAL 810 Demolition		$2,463,136	11%	$271,234	$2,734,369	40%	$1,092,535	$3,826,905
900 Other Project Costs								
1A0100	PM & Integration - FY 2003	$1,251,141	8%	$94,962	$1,346,102	55%	$736,533	$2,082,636
1A0101	PM & Integration - FY 2004	$1,581,364	10%	$153,234	$1,734,598	55%	$949,102	$2,683,700
1A0102	PM & Integration - FY 2005	$1,331,364	12%	$156,968	$1,488,331	55%	$814,355	$2,302,687
1B5A1A	Project Engineering (Vent, 3 Pits) AN-DD	$63,379	3%	$2,149	$65,528	8%	$5,356	$70,884
1B5A2A	Project Engineering (Vent, 3 Pits) AN- Procurement	$111,668	3%	$3,786	$115,453	8%	$9,437	$124,890
1B5A3A	Project Engineering (Vent, 3 Pits) AN- Constructio	$144,866	3%	$4,911	$149,777	8%	$12,242	$162,020
1B5A4A	Project Engineering (Vent, 3 Pits) AN- TTA	$67,604	3%	$2,292	$69,896	8%	$5,713	$75,609
1B5A5A	Project Engineering (Vent, 3 Pits) AN- MSA	$26,214	3%	$889	$27,103	8%	$2,215	$29,318
1B5A6A	Project Engineering (Vent, 3 Pits) AN- FDH RA	$72,433	3%	$2,455	$74,889	8%	$6,121	$81,010
1B5A8A	Project Engineering ("P" Pits, VSPM) AN- Construct	$21,126	3%	$716	$21,843	8%	$1,785	$23,628
1B5A9A	Project Engineering ("P" Pits, VSPM) AN- TTA	$17,936	3%	$608	$18,544	8%	$1,516	$20,060
1B5AAA	Project Engineering ("P" Pits, VSPM) AN- MSA	$1,380	3%	$47	$1,426	8%	$117	$1,543
1B5B1A	Project Engineering AP-DD	$63,379	7%	$4,367	$67,746	8%	$5,537	$73,283
1B5B2A	Project Engineering AP- Procurement	$111,668	7%	$7,694	$119,362	8%	$9,756	$129,118
1B5B3A	Project Engineering AP- Construction	$165,993	7%	$11,437	$177,430	8%	$14,503	$191,932
1B5B4A	Project Engineering AP- TTA	$106,925	7%	$7,367	$114,292	8%	$9,342	$123,634
1B5B5A	Project Engineering AP- MSA	$36,562	7%	$2,519	$39,081	8%	$3,194	$42,275
1B5C1A	Project Engineering AW-DD	$63,379	9%	$5,920	$69,299	8%	$5,664	$74,963
1B5C2A	Project Engineering AW- Procurement	$111,668	9%	$10,430	$122,098	8%	$9,980	$132,078
1B5C3A	Project Engineering AW- Construction	$108,650	9%	$10,148	$118,798	8%	$9,710	$128,508
1B5C4A	Project Engineering AW- TTA	$106,925	9%	$9,987	$116,912	8%	$9,556	$126,468
1B5C5A	Project Engineering AW- MSA	$36,562	9%	$3,415	$39,976	8%	$3,268	$43,244
1B5D1A	Project Engineering AY-DD	$27,162	6%	$1,586	$28,749	8%	$2,350	$31,099
1B5D2A	Project Engineering AY- Procurement	$57,343	6%	$3,349	$60,692	8%	$4,961	$65,653
1B5D3A	Project Engineering AY- Construction	$69,415	6%	$4,054	$73,469	8%	$6,005	$79,474
1B5D4A	Project Engineering AY- TTA	$17,936	6%	$1,047	$18,983	8%	$1,552	$20,535
1B5D5A	Project Engineering AY- MSA	$6,898	6%	$403	$7,301	8%	$597	$7,898
1B5E1A	Project Engineering AZ-DD	$27,162	6%	$1,586	$28,749	8%	$2,350	$31,099
1B5E2A	Project Engineering AZ- Procurement	$36,217	6%	$2,115	$38,332	8%	$3,133	$41,465
1B5E3A	Project Engineering AZ- Construction	$69,415	6%	$4,054	$73,469	8%	$6,005	$79,474
1B5E4A	Project Engineering AZ- TTA	$17,936	6%	$1,047	$18,983	8%	$1,552	$20,535
1B5E5A	Project Engineering AZ- MSA	$6,898	6%	$403	$7,301	8%	$597	$7,898
1B5F1A	Project Engineering (Annulus Vent) SY-DD	$36,217	9%	$3,256	$39,472	8%	$3,226	$42,699
1B5F2A	Project Engineering (Annulus Vent) SY- Procurement	$75,451	9%	$6,783	$82,234	8%	$6,722	$88,956
1B5F3A	Project Engineering (Annulus Vent) SY- Constructio	$36,217	9%	$3,256	$39,472	8%	$3,226	$42,699

Final Estimate
W-314 Tank Farm Restoration and Safe Operations (TFRSO
COST CODE ACCOUNT SUMMARY

Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
900	Other Project Costs							
1B5F4A	Project Engineering (Annulus Vent) SY- TTA	$26,214	9%	$2,357	$28,571	8%	$2,335	$30,906
1B5F5A	Project Engineering (Annulus Vent) SY- MSA	$5,519	9%	$496	$6,015	8%	$492	$6,506
1B5F7A	Project Engineering (Pits) SY-DD	$27,162	9%	$2,442	$29,604	8%	$2,420	$32,024
1B5F8A	Project Engineering (Pits) SY- Construction	$135,812	9%	$12,210	$148,022	8%	$12,099	$160,121
1B5F9A	Project Engineering (Pits) SY- TTA	$62,775	9%	$5,644	$68,419	8%	$5,592	$74,011
1B5FAA	Project Engineering (Pits) SY- MSA	$24,144	9%	$2,171	$26,315	8%	$2,151	$28,466
1B5G1A	Project Engineering DCRT-DD	$412,860	4%	$18,331	$431,191	8%	$35,244	$466,435
1B5G2A	Project Engineering DCRT- Procurement	$63,379	4%	$2,814	$66,193	8%	$5,410	$71,604
1B5G3A	Project Engineering DCRT- Construction	$129,776	4%	$5,762	$135,538	8%	$11,079	$146,617
1B5G4A	Project Engineering DCRT- TTA	$53,118	4%	$2,358	$55,476	8%	$4,534	$60,011
1B5G5A	Project Engineering DCRT- MSA	$15,866	4%	$704	$16,571	8%	$1,354	$17,925
1C5A1A	SE Management (Vent, 3 Pits) AN-DD	$27,256	3%	$878	$28,134	5%	$1,357	$29,491
1C5A2A	SE Management (Vent, 3 Pits) AN- Procurement	$48,023	3%	$1,546	$49,569	5%	$2,391	$51,961
1C5A3A	SE Management (Vent, 3 Pits) AN- Construction	$62,300	3%	$2,006	$64,306	5%	$3,102	$67,408
1C5A4A	SE Management (Vent, 3 Pits) AN- TTA	$63,598	3%	$2,048	$65,646	5%	$3,167	$68,813
1C5A5A	SE Management (Vent, 3 Pits) AN- MSA	$24,660	3%	$794	$25,455	5%	$1,228	$26,682
1C5A8A	SE Management ("P" Pits, VSPM) AN- Construction	$9,085	3%	$293	$9,378	5%	$452	$9,830
1C5A9A	SE Management ("P" Pits, VSPM) AN- TTA	$16,873	3%	$543	$17,416	5%	$840	$18,256
1C5AAA	SE Management ("P" Pits, VSPM) AN- MSA	$1,298	3%	$42	$1,340	5%	$65	$1,404
1C5B1A	SE Management AP-DD	$27,256	7%	$1,878	$29,134	5%	$1,405	$30,540
1C5B2A	SE Management AP- Procurement	$48,023	7%	$3,309	$51,332	5%	$2,476	$53,808
1C5B3A	SE Management AP- Construction	$71,386	7%	$4,918	$76,304	5%	$3,681	$79,985
1C5B4A	SE Management AP- TTA	$100,589	7%	$6,931	$107,519	5%	$5,187	$112,706
1C5B5A	SE Management AP- MSA	$34,395	7%	$2,370	$36,765	5%	$1,774	$38,538
1C5C1A	SE Management AW-DD	$27,256	9%	$2,546	$29,802	5%	$1,438	$31,240
1C5C2A	SE Management AW- Procurement	$48,023	9%	$4,485	$52,508	5%	$2,533	$55,041
1C5C3A	SE Management AW- Construction	$46,725	9%	$4,364	$51,089	5%	$2,465	$53,554
1C5C4A	SE Management AW- TTA	$100,589	9%	$9,395	$109,984	5%	$5,306	$115,289
1C5C5A	SE Management AW- MSA	$34,395	9%	$3,212	$37,607	5%	$1,814	$39,422
1C5D1A	SE Management AY-DD	$11,681	6%	$682	$12,363	5%	$596	$12,960
1C5D2A	SE Management AY- Procurement	$15,413	6%	$900	$16,313	5%	$787	$17,100
1C5D3A	SE Management AY- Construction	$18,658	6%	$1,090	$19,747	5%	$953	$20,700
1C5D4A	SE Management AY- TTA	$16,873	6%	$985	$17,858	5%	$861	$18,720
1C5D5A	SE Management AY- MSA	$6,490	6%	$379	$6,869	5%	$331	$7,200
1C5E1A	SE Management AZ-DD	$11,681	6%	$682	$12,363	5%	$596	$12,960
1C5E2A	SE Management AZ- Procurement	$9,734	6%	$568	$10,303	5%	$497	$10,800
1C5E3A	SE Management AZ- Construction	$18,658	6%	$1,090	$19,747	5%	$953	$20,700
1C5E4A	SE Management AZ- TTA	$16,873	6%	$985	$17,858	5%	$861	$18,720
1C5E5A	SE Management AZ- MSA	$6,490	6%	$379	$6,869	5%	$331	$7,200
1C5F1A	SE Management (Annulus Vent) SY-DD	$15,575	9%	$1,400	$16,975	5%	$819	$17,794
1C5F2A	SE Management (Annulus Vent) SY- Procurement	$32,448	9%	$2,917	$35,365	5%	$1,706	$37,071

Final Estimate
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COST CODE ACCOUNT SUMMARY

Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
900	Other Project Costs							
1C5F3A	SE Management (Annulus Vent) SY- Construction	$7,788	9%	$700	$8,488	5%	$409	$8,897
1C5F4A	SE Management (Annulus Vent) SY- TTA	$24,660	9%	$2,217	$26,877	5%	$1,297	$28,174
1C5F5A	SE Management (Annulus Vent) SY- MSA	$5,192	9%	$467	$5,658	5%	$273	$5,931
1C5F7A	SE Management (Pits) SY-DD	$11,681	9%	$1,050	$12,731	5%	$614	$13,346
1C5F8A	SE Management (Pits) SY- Construction	$66,194	9%	$5,951	$72,145	5%	$3,480	$75,625
1C5F9A	SE Management (Pits) SY- TTA	$59,055	9%	$5,309	$64,364	5%	$3,105	$67,469
1C5FAA	SE Management (Pits) SY- MSA	$22,714	9%	$2,042	$24,756	5%	$1,194	$25,950
1C5G1A	SE Management DCRT-DD	$27,256	4%	$1,210	$28,467	5%	$1,373	$29,840
1C5G2A	SE Management DCRT- Procurement	$27,256	4%	$1,210	$28,467	5%	$1,373	$29,840
1C5G3A	SE Management DCRT- Construction	$55,811	4%	$2,478	$58,289	5%	$2,812	$61,100
1C5G4A	SE Management DCRT- TTA	$49,970	4%	$2,219	$52,189	5%	$2,518	$54,706
1C5G5A	SE Management DCRT- MSA	$14,926	4%	$663	$15,589	5%	$752	$16,341
1C5K1A	SE Risk Management FY 2000	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1C5K2A	SE Risk Management FY 2001	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1C5K3A	SE Risk Management FY 2002	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1C5K4A	SE Risk Management FY 2003	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1C5K5A	SE Risk Management FY 2004	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1C5K6B	SE Risk Management FY 2005	$100,000	7%	$6,540	$106,540	5%	$5,139	$111,679
1D5A1A	Quality Assurance (Vent, 3 Pits) AN- DD	$30,425	3%	$980	$31,405	1%	$434	$31,838
1D5A2A	Quality Assurance (Vent, 3 Pits) AN- Procurement	$53,606	3%	$1,726	$55,332	1%	$764	$56,096
1D5A3A	Quality Assurance (Vent, 3 Pits) AN- Construction	$69,543	3%	$2,239	$71,782	1%	$991	$72,773
1D5A4A	Quality Assurance (Vent, 3 Pits) AN - TTA	$87,374	3%	$2,813	$90,188	1%	$1,245	$91,433
1D5A5A	Quality Assurance (Vent, 3 Pits) AN - MSA	$33,880	3%	$1,091	$34,971	1%	$483	$35,454
1D5A8A	Quality Assurance ("P" Pits, VSPM) AN- Constructio	$10,142	3%	$327	$10,468	1%	$145	$10,613
1D5A9A	Quality Assurance ("P" Pits, VSPM) AN - TTA	$23,181	3%	$746	$23,927	1%	$330	$24,258
1D5AAA	Quality Assurance ("P" Pits, VSPM) AN - MSA	$1,783	3%	$57	$1,841	1%	$25	$1,866
1D5B1A	Quality Assurance AP- DD	$30,425	7%	$2,096	$32,521	1%	$449	$32,970
1D5B2A	Quality Assurance AP- Procurement	$53,606	7%	$3,693	$57,299	1%	$791	$58,091
1D5B3A	Quality Assurance AP- Construction	$79,684	7%	$5,490	$85,175	1%	$1,176	$86,351
1D5B4A	Quality Assurance AP - TTA	$138,194	7%	$9,522	$147,715	1%	$2,040	$149,755
1D5B5A	Quality Assurance AP - MSA	$47,253	7%	$3,256	$50,509	1%	$698	$51,207
1D5C1A	Quality Assurance AW- DD	$30,425	9%	$2,842	$33,267	1%	$459	$33,726
1D5C2A	Quality Assurance AW- Procurement	$53,606	9%	$5,007	$58,613	1%	$809	$59,422
1D5C3A	Quality Assurance AW- Construction	$52,157	9%	$4,871	$57,029	1%	$788	$57,816
1D5C4A	Quality Assurance AW - TTA	$138,194	9%	$12,907	$151,101	1%	$2,087	$153,188
1D5C5A	Quality Assurance AW - MSA	$47,253	9%	$4,413	$51,667	1%	$714	$52,380
1D5D1A	Quality Assurance AY- DD	$13,039	6%	$761	$13,801	1%	$191	$13,991
1D5D2A	Quality Assurance AY- Procurement	$27,527	6%	$1,608	$29,135	1%	$402	$29,537
1D5D3A	Quality Assurance AY- Construction	$33,323	6%	$1,946	$35,269	1%	$487	$35,756
1D5D4A	Quality Assurance AY - TTA	$23,181	6%	$1,354	$24,535	1%	$339	$24,873
1D5D5A	Quality Assurance AY - MSA	$8,916	6%	$521	$9,436	1%	$130	$9,567

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Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
900	Other Project Costs							
1D5E1A	Quality Assurance AZ- DD	$13,039	6%	$761	$13,801	1%	$191	$13,991
1D5E2A	Quality Assurance AZ- Procurement	$17,386	6%	$1,015	$18,401	1%	$254	$18,655
1D5E3A	Quality Assurance AZ- Construction	$33,323	6%	$1,946	$35,269	1%	$487	$35,756
1D5E4A	Quality Assurance AZ - TTA	$23,181	6%	$1,354	$24,535	1%	$339	$24,873
1D5E5A	Quality Assurance AZ - MSA	$8,916	6%	$521	$9,436	1%	$130	$9,567
1D5F1A	Quality Assurance (Annulus Vent) SY- DD	$17,386	9%	$1,563	$18,949	1%	$262	$19,210
1D5F2A	Quality Assurance (Annulus Vent) SY- Procurement	$36,220	9%	$3,256	$39,476	1%	$545	$40,022
1D5F3A	Quality Assurance (Annulus Vent) SY- Construction	$8,693	9%	$781	$9,474	1%	$131	$9,605
1D5F4A	Quality Assurance (Annulus Vent) SY - TTA	$33,880	9%	$3,046	$36,926	1%	$510	$37,436
1D5F5A	Quality Assurance (Annulus Vent) SY - MSA	$7,133	9%	$641	$7,774	1%	$107	$7,881
1D5F7A	Quality Assurance ("P" Pits) SY- DD	$13,039	9%	$1,172	$14,211	1%	$196	$14,408
1D5F8A	Quality Assurance ("P" Pits) SY- Construction	$73,889	9%	$6,643	$80,532	1%	$1,112	$81,644
1D5F9A	Quality Assurance ("P" Pits) SY - TTA	$81,133	9%	$7,294	$88,427	1%	$1,221	$89,648
1D5FAA	Quality Assurance ("P" Pits) SY - MSA	$31,205	9%	$2,805	$34,010	1%	$470	$34,480
1D5G1A	Quality Assurance DCRT- DD	$30,425	4%	$1,351	$31,776	1%	$439	$32,215
1D5G2A	Quality Assurance DCRT- Procurement	$30,425	4%	$1,351	$31,776	1%	$439	$32,215
1D5G3A	Quality Assurance DCRT- Construction	$62,299	4%	$2,766	$65,065	1%	$899	$65,963
1D5G4A	Quality Assurance DCRT - TTA	$68,651	4%	$3,048	$71,699	1%	$990	$72,689
1D5G5A	Quality Assurance DCRT - MSA	$20,506	4%	$910	$21,417	1%	$296	$21,712
2A5A2A	Permitting (Vents, 3 Pits) AN - DD	$1,855	3%	$60	$1,915	17%	$321	$2,236
2A5A3A	Permitting (Vents, 3 Pits) AN - Procurement	$13,961	3%	$450	$14,410	17%	$2,417	$16,828
2A5A4A	Permitting (Vents, 3 Pits) AN - Construction	$6,510	3%	$210	$6,720	17%	$1,127	$7,847
2A5A5A	Permitting (Vents, 3 Pits) AN - TTA	$1,754	3%	$56	$1,810	17%	$304	$2,114
2A5A6A	Permitting ("P" Pits, VSPM) AN - DD	$1,855	3%	$60	$1,915	17%	$321	$2,236
2A5A7A	Permitting ("P" Pits, VSPM) AN - Procurement	$13,961	3%	$450	$14,410	17%	$2,417	$16,828
2A5A8A	Permitting ("P" Pits, VSPM) AN - Construction	$6,510	3%	$210	$6,720	17%	$1,127	$7,847
2A5A9A	Permitting ("P" Pits, VSPM) AN - TTA	$1,754	3%	$56	$1,810	17%	$304	$2,114
2A5B2A	Permitting AP - DD	$3,710	7%	$256	$3,965	17%	$665	$4,630
2A5B3A	Permitting AP - Procurement	$27,921	7%	$1,924	$29,845	17%	$5,007	$34,852
2A5B4A	Permitting AP - Construction	$13,020	7%	$897	$13,917	17%	$2,335	$16,252
2A5B5A	Permitting AP - TTA	$3,508	7%	$242	$3,749	17%	$629	$4,378
2A5C2A	Permitting AW - DD	$3,710	9%	$340	$4,050	17%	$679	$4,729
2A5C3A	Permitting AW - Procurement	$27,921	9%	$2,560	$30,482	17%	$5,114	$35,595
2A5C4A	Permitting AW - Construction	$13,020	9%	$1,194	$14,214	17%	$2,385	$16,598
2A5C5A	Permitting AW - TTA	$3,508	9%	$322	$3,829	17%	$642	$4,472
2A5D2A	Permitting AY - DD	$3,710	6%	$210	$3,920	17%	$658	$4,578
2A5D4A	Permitting AY - Construction	$13,020	6%	$738	$13,758	17%	$2,308	$16,066
2A5D5A	Permitting AY - TTA	$3,508	6%	$199	$3,706	17%	$622	$4,328
2A5E2A	Permitting AZ - DD	$3,710	6%	$210	$3,920	17%	$658	$4,578
2A5E4A	Permitting AZ - Construction	$13,020	6%	$738	$13,758	17%	$2,308	$16,066
2A5E5A	Permitting AZ - TTA	$3,508	6%	$199	$3,706	17%	$622	$4,328

Final Estimate
W-314 Tank Farm Restoration and Safe Operations (TFRSO
COST CODE ACCOUNT SUMMARY

Cost Code/WBS	Description	Estimate Subtotal	Escalation %	Escalation Total	Subtotal	Contingency %	Contingency Total	Total Dollars
900	Other Project Costs							
2A5F2A	Permitting (Annulus Vent) SY - DD	$1,855	9%	$164	$2,018	17%	$339	$2,357
2A5F3A	Permitting (Annulus Vent) SY - Procurement	$13,961	9%	$1,231	$15,192	17%	$2,549	$17,741
2A5F4A	Permitting (Annulus Vent) SY - Construction	$6,510	9%	$574	$7,084	17%	$1,188	$8,273
2A5F5A	Permitting (Annulus Vent) SY - TTA	$1,754	9%	$155	$1,908	17%	$320	$2,229
2A5F6A	Permitting (Pits) SY - DD	$1,855	9%	$164	$2,018	17%	$339	$2,357
2A5F7A	Permitting (Pits) SY - Procurement	$13,961	9%	$1,231	$15,192	17%	$2,549	$17,741
2A5F8A	Permitting (Pits) SY - Construction	$6,510	9%	$574	$7,084	17%	$1,188	$8,273
2A5F9A	Permitting (Pits) SY - TTA	$1,754	9%	$155	$1,908	17%	$320	$2,229
2A5G2A	Permitting DCRT - DD	$3,710	5%	$171	$3,881	17%	$651	$4,532
2A5G3A	Permitting DCRT - Procurement	$27,921	5%	$1,290	$29,211	17%	$4,900	$34,112
2A5G4A	Permitting DCRT - Construction	$13,020	5%	$602	$13,622	17%	$2,285	$15,907
2A5G5A	Permitting DCRT - TTA	$3,508	5%	$162	$3,670	17%	$616	$4,285
2A5K2A	Env. Plan Summary & Permit Plan Annual Updates- FY	$7,188	5%	$395	$7,582	17%	$1,272	$8,854
2A5K3A	Env. Plan Summary & Permit Plan Annual Updates- FY	$7,160	5%	$393	$7,553	17%	$1,267	$8,820
2A5K4A	Env. Plan Summary & Permit Plan Annual Updates- FY	$7,188	5%	$395	$7,582	17%	$1,272	$8,854
2A5K5A	Env. Plan Summary & Permit Plan Annual Updates- FY	$7,160	5%	$393	$7,553	17%	$1,267	$8,820
2A5K6A	Env. Plan Summary & Permit Plan Annual Updates- FY	$7,188	5%	$395	$7,582	17%	$1,272	$8,854
2A5K7A	Env. Plan Summary & Permit Plan Annual Updates- FY	$4,377	5%	$240	$4,617	17%	$775	$5,391
2B5A1A	Safety Analysis (Vent, 3 Pits) AN - DD	$23,014	3%	$741	$23,755	17%	$3,985	$27,741
2B5A2A	Safety Analysis (Vent, 3 Pits) AN - Procurement	$40,549	3%	$1,306	$41,855	17%	$7,022	$48,876
2B5A3A	Safety Analysis (Vent, 3 Pits) AN - Construction	$52,604	3%	$1,694	$54,298	17%	$9,109	$63,407
2B5A8A	Safety Analysis ("P" Pits, VSPM) AN - Construction	$7,671	3%	$247	$7,918	17%	$1,328	$9,247
2B5B1A	Safety Analysis AP - DD	$23,014	6%	$1,466	$24,480	17%	$4,107	$28,587
2B5B2A	Safety Analysis AP - Procurement	$40,549	6%	$2,583	$43,132	17%	$7,236	$50,368
2B5B3A	Safety Analysis AP - Construction	$60,276	6%	$3,840	$64,115	17%	$10,756	$74,871
2B5C1A	Safety Analysis AW - DD	$23,014	9%	$2,069	$25,083	17%	$4,208	$29,291
2B5C2A	Safety Analysis AW - Procurement	$40,549	9%	$3,645	$44,194	17%	$7,414	$51,608
2B5C3A	Safety Analysis AW - Construction	$39,453	9%	$3,547	$43,000	17%	$7,214	$50,214
2B5D1A	Safety Analysis AY - DD	$9,863	5%	$541	$10,405	17%	$1,746	$12,150
2B5D2A	Safety Analysis AY - Procurement	$20,822	5%	$1,143	$21,966	17%	$3,685	$25,651
2B5D3A	Safety Analysis AY - Construction	$25,206	5%	$1,384	$26,590	17%	$4,461	$31,051
2B5E1A	Safety Analysis AZ - DD	$9,863	6%	$559	$10,423	17%	$1,748	$12,171
2B5E2A	Safety Analysis AZ - Procurement	$13,151	6%	$746	$13,897	17%	$2,331	$16,228
2B5E3A	Safety Analysis AZ - Construction	$25,206	6%	$1,429	$26,635	17%	$4,468	$31,104
2B5F1A	Safety Analysis (Annulus Vent) SY - DD	$13,151	9%	$1,136	$14,287	17%	$2,397	$16,684
2B5F2A	Safety Analysis (Annulus Vent) SY - Procurement	$27,398	9%	$2,367	$29,765	17%	$4,993	$34,759
2B5F3A	Safety Analysis (Annulus Vent) SY - Construction	$6,576	9%	$568	$7,144	17%	$1,198	$8,342
2B5F7A	Safety Analysis (Pits) SY - DD	$9,863	9%	$852	$10,715	17%	$1,798	$12,513
2B5F8A	Safety Analysis (Pits) SY - Construction	$55,892	9%	$4,829	$60,721	17%	$10,187	$70,908
2B5G1A	Safety Analysis DCRT - DD	$23,014	4%	$941	$23,956	17%	$4,019	$27,974
2B5G2A	Safety Analysis DCRT - Procurement	$23,014	4%	$941	$23,956	17%	$4,019	$27,974

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2B5G3A	Safety Analysis DCRT - Construction	$47,125	4%	$1,927	$49,052	17%	$8,229	$57,281
3C5A1A	Design (Vent, 3 Pits) - AN	$56,309	3%	$1,813	$58,122	35%	$20,445	$78,567
3C5A2A	Pre-Construction Planning (Vent, 3 Pits) - AN	$128,971	3%	$4,153	$133,123	25%	$33,281	$166,404
3C5A3A	Procurement (Vent, 3 Pits) - AN	$49,319	3%	$1,588	$50,907	25%	$12,727	$63,634
3C5A4A	During Construction (Vent, 3 Pits) - AN	$612,177	3%	$19,712	$631,889	25%	$157,972	$789,861
3C5A5A	Pre-Construction Planning ("P" Pits, VSPM) - AN	$58,869	3%	$1,896	$60,765	25%	$15,191	$75,956
3C5A6A	During Construction ("P" Pits, VSPM) - AN	$83,847	3%	$2,700	$86,547	25%	$21,637	$108,184
3C5B1A	Design - AP	$56,309	6%	$3,587	$59,896	35%	$20,964	$80,859
3C5B2A	Pre-Construction Planning - AP	$211,356	6%	$13,463	$224,819	25%	$56,205	$281,024
3C5B3A	Procurement - AP	$49,319	6%	$3,142	$52,460	25%	$13,115	$65,575
3C5B4A	During Construction - AP	$719,785	6%	$45,850	$765,635	25%	$191,409	$957,044
3C5C1A	Design - AW	$56,309	8%	$4,769	$61,078	25%	$15,270	$76,348
3C5C2A	Pre-Construction Planning - AW	$200,521	8%	$16,984	$217,505	25%	$54,376	$271,881
3C5C3A	Procurement - AW	$49,319	8%	$4,177	$53,496	25%	$13,374	$66,870
3C5C4A	During Construction - AW	$551,163	8%	$46,683	$597,846	25%	$149,462	$747,308
3C5D1A	Design - AY	$24,132	5%	$1,325	$25,457	20%	$5,091	$30,549
3C5D2A	Pre-Construction Planning - AY	$70,221	5%	$3,855	$74,076	25%	$18,519	$92,595
3C5D3A	Procurement - AY	$25,326	5%	$1,390	$26,716	25%	$6,679	$33,395
3C5D4A	During Construction - AY	$396,292	5%	$21,756	$418,048	25%	$104,512	$522,560
3C5E1A	Design - AZ	$24,132	6%	$1,368	$25,501	20%	$5,100	$30,601
3C5E2A	Pre-Construction Planning - AZ	$70,221	6%	$3,982	$74,203	25%	$18,551	$92,753
3C5E3A	Procurement - AZ	$15,995	6%	$907	$16,902	25%	$4,226	$21,128
3C5E4A	During Construction - AZ	$396,292	6%	$22,470	$418,762	25%	$104,690	$523,452
3C5F1A	Design (Annulus Vent) - SY	$32,177	9%	$2,780	$34,957	20%	$6,991	$41,948
3C5F2A	Pre-Construction Planning (Annulus Vent) - SY	$49,612	9%	$4,286	$53,898	25%	$13,475	$67,373
3C5F3A	Procurement (Annulus Vent) - SY	$49,319	9%	$4,261	$53,580	25%	$13,395	$66,975
3C5F4A	During Construction (Annulus Vent) - SY	$147,668	9%	$12,758	$160,426	25%	$40,107	$200,532
3C5F5A	Design (Pits) - SY	$24,132	9%	$2,085	$26,217	20%	$5,243	$31,461
3C5F6A	Pre-Construction Planning (Pits) - SY	$148,836	9%	$12,859	$161,695	25%	$40,424	$202,119
3C5F7A	During Construction (Pits) - SY	$587,073	9%	$50,723	$637,797	25%	$159,449	$797,246
3C5G1A	Design - 244S - DCRT	$56,309	4%	$2,500	$58,809	30%	$17,643	$76,452
3C5G2A	Pre-Construction Planning - 244S - DCRT	$80,862	4%	$3,590	$84,453	25%	$21,113	$105,566
3C5G3A	Procurement - 244S - DCRT	$27,992	4%	$1,243	$29,235	25%	$7,309	$36,543
3C5G4A	During Construction - 244S - DCRT	$561,925	4%	$24,949	$586,875	25%	$146,719	$733,594
3K5A3A1	Op's PRO'S for Vent (Vent, 3 Pits)	$148,469	4%	$6,340	$154,809	34%	$53,307	$208,116
3K5A3A2	Op's PRO'S for Pit Work (Vent, 3 Pits)	$19,993	4%	$854	$20,846	34%	$7,178	$28,025
3K5A3A3	Maint PRO'S for Vent (Vent, 3 Pits)	$141,205	4%	$6,029	$147,234	34%	$50,699	$197,933
3K5A3A4	Maint PRO'S for Pits (Vent, 3 Pits)	$23,487	4%	$1,003	$24,490	34%	$8,433	$32,923
3K5A3A5	Develop Training for Vent (Vent, 3 Pits)	$140,188	4%	$5,986	$146,174	34%	$50,333	$196,507
3K5A3A6	Perform Training for Vent (Vent, 3 Pits)	$46,729	4%	$1,995	$48,725	34%	$16,778	$65,502
3K5A3A7	Develop Training for Pits (Vent, 3 Pits)	$18,093	4%	$773	$18,866	34%	$6,496	$25,362

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3K5A3A8	Perform Training for Pits (Vent, 3 Pits)	$5,946	4%	$254	$6,200	34%	$2,135	$8,335
3K5A3A9	Ops Drills for Vent (Vent, 3 Pits)	$59,934	4%	$2,559	$62,493	34%	$21,519	$84,012
3K5A3AA	OTP'S for Vent (Vent, 3 Pits)	$85,879	4%	$3,667	$89,546	34%	$30,834	$120,380
3K5A3AB	OTP's For Pits (Vent, 3 Pits)	$31,190	4%	$1,332	$32,522	34%	$11,198	$43,720
3K5A3AC	Vent Startup (Vent, 3 Pits)	$142,353	4%	$6,078	$148,431	34%	$51,111	$199,542
3K5A3AE	OP'S LOE Support (Vent, 3 Pits)	$103,909	4%	$4,437	$108,346	34%	$37,308	$145,654
3K5A3AF	Op's PRO'S for Pit Work ("P" Pits, VSPM)	$19,993	4%	$854	$20,846	34%	$7,178	$28,025
3K5A3AG	Maint PRO'S for Pits ("P" Pits, VSPM)	$23,487	4%	$1,003	$24,490	34%	$8,433	$32,923
3K5A3AH	Develop Training for Pits ("P" Pits, VSPM)	$18,093	4%	$773	$18,866	34%	$6,496	$25,362
3K5A3AJ	Perform Training for Pits ("P" Pits, VSPM)	$5,946	4%	$254	$6,200	34%	$2,135	$8,335
3K5A3AK	OTP's For Pits ("P" Pits, VSPM)	$31,190	4%	$1,332	$32,522	34%	$11,198	$43,720
3K5A3AL	OP'S LOE Support ("P" Pits, VSPM)	$34,636	4%	$1,479	$36,115	34%	$12,436	$48,551
3K5B3A1	Op's PRO'S for Vent	$148,469	8%	$12,056	$160,525	34%	$54,578	$215,103
3K5B3A2	Op's PRO'S for Pit Work	$40,586	8%	$3,296	$43,882	34%	$14,920	$58,801
3K5B3A3	Maint PRO'S for Vent	$141,205	8%	$11,466	$152,671	34%	$51,908	$204,579
3K5B3A4	Maint PRO'S for Pits	$47,068	8%	$3,822	$50,890	34%	$17,303	$68,193
3K5B3A5	Develop Training for Vent	$141,205	8%	$11,466	$152,671	34%	$51,908	$204,579
3K5B3A6	Perform Training for Vent	$47,068	8%	$3,822	$50,890	34%	$17,303	$68,193
3K5B3A7	Develop Training for Pits	$35,301	8%	$2,866	$38,168	34%	$12,977	$51,145
3K5B3A8	Perform Training for Pits	$11,767	8%	$955	$12,723	34%	$4,326	$17,048
3K5B3A9	Ops Drills for Vent	$59,934	8%	$4,867	$64,800	34%	$22,032	$86,833
3K5B3AA	OTP'S for Vent	$85,879	8%	$6,973	$92,852	34%	$31,570	$124,422
3K5B3AB	OTP's for Pits	$343,514	8%	$27,893	$371,408	34%	$126,279	$497,686
3K5B3AC	Vent Startup	$142,325	8%	$11,557	$153,882	34%	$52,320	$206,201
3K5B3AE	OP'S LOE Support	$138,546	8%	$11,250	$149,796	34%	$50,930	$200,726
3K5C3A1	Op's PRO'S for Vent	$148,469	10%	$15,426	$163,895	34%	$55,724	$219,619
3K5C3A2	Op's PRO'S for Pit Work	$40,586	10%	$4,217	$44,803	34%	$15,233	$60,036
3K5C3A3	Maint PRO'S for Vent	$141,205	10%	$14,671	$155,876	34%	$52,998	$208,874
3K5C3A4	Maint PRO'S for Pits	$47,068	10%	$4,890	$51,959	34%	$17,666	$69,625
3K5C3A5	Develop Training for Vent	$141,205	10%	$14,671	$155,876	34%	$52,998	$208,874
3K5C3A6	Perform Training for Vent	$47,068	10%	$4,890	$51,959	34%	$17,666	$69,625
3K5C3A7	Develop Training for Pits	$35,301	10%	$3,668	$38,969	34%	$13,249	$52,218
3K5C3A8	Perform Training for Pits	$11,767	10%	$1,223	$12,990	34%	$4,416	$17,406
3K5C3A9	Ops Drills for Vent	$59,934	10%	$6,227	$66,161	34%	$22,495	$88,656
3K5C3AA	OTP'S for Vent	$85,879	10%	$8,923	$94,801	34%	$32,232	$127,034
3K5C3AB	OTP's for Pits	$351,596	10%	$36,531	$388,127	34%	$131,963	$520,091
3K5C3AC	Vent Startup	$142,353	10%	$14,790	$157,143	34%	$53,429	$210,572
3K5C3AE	OP'S LOE Support	$138,546	10%	$14,395	$152,940	34%	$52,000	$204,940
3K5D3A2	Op's PRO'S for Pit Work	$36,407	6%	$2,254	$38,660	34%	$13,144	$51,804
3K5D3A4	Maint PRO'S for Pits	$47,068	6%	$2,914	$49,982	34%	$16,994	$66,976
3K5D3A7	Develop Training for Pits	$35,301	6%	$2,185	$37,486	34%	$12,745	$50,232

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3K5D3A8	Perform Training for Pits	$11,767	6%	$728	$12,495	34%	$4,248	$16,744
3K5D3AE	OP'S LOE Support	$69,273	6%	$4,288	$73,561	34%	$25,011	$98,571
3K5E3A2	Op's PRO'S for Pit Work	$36,407	6%	$2,319	$38,726	34%	$13,167	$51,892
3K5E3A4	Maint PRO'S for Pits	$47,068	6%	$2,998	$50,066	34%	$17,023	$67,089
3K5E3A7	Develop Training for Pits	$35,301	6%	$2,249	$37,550	34%	$12,767	$50,317
3K5E3A8	Perform Training for Pits	$11,767	6%	$750	$12,517	34%	$4,256	$16,772
3K5E3AE	OP'S LOE Support	$69,273	6%	$4,413	$73,685	34%	$25,053	$98,739
3K5F3A1	Op's PRO'S for Vent (Annulus Vent)	$10,597	10%	$1,027	$11,623	34%	$3,952	$15,575
3K5F3A2	Op's PRO'S for Pit Work	$25,849	10%	$2,505	$28,353	34%	$9,640	$37,993
3K5F3A3	Maint PRO'S for Vent (Annulus Vent)	$13,669	10%	$1,325	$14,994	34%	$5,098	$20,092
3K5F3A4	Maint PRO'S for Pits	$33,399	10%	$3,236	$36,635	34%	$12,456	$49,091
3K5F3A5	Develop Training for Vent (Annulus Vent)	$10,144	10%	$983	$11,127	34%	$3,783	$14,910
3K5F3A6	Perform Training for Vent (Annulus Vent)	$3,512	10%	$340	$3,852	34%	$1,310	$5,162
3K5F3A7	Develop Training for Pits	$25,064	10%	$2,429	$27,493	34%	$9,348	$36,840
3K5F3A8	Perform Training for Pits	$8,362	10%	$810	$9,172	34%	$3,118	$12,290
3K5F3AA	OTP'S for Vent (Annulus Vent)	$74,911	10%	$7,259	$82,170	34%	$27,938	$110,108
3K5F3AB	OTP's for Pits	$182,923	10%	$17,725	$200,648	34%	$68,220	$268,868
3K5F3AC	Vent Startup (Annulus Vent)	$19,995	10%	$1,938	$21,933	34%	$7,457	$29,390
3K5F3AE	OP'S LOE Support (Pits)	$49,184	10%	$4,766	$53,950	34%	$18,343	$72,292
3K5G3A1	Op's PRO'S for Vent	$148,469	7%	$9,977	$158,446	34%	$53,872	$212,318
3K5G3A2	Op's PRO'S for Pit Work	$40,586	7%	$2,727	$43,313	34%	$14,727	$58,040
3K5G3A3	Maint PRO'S for Vent	$141,205	7%	$9,489	$150,694	34%	$51,236	$201,930
3K5G3A4	Maint PRO'S for Pits	$47,068	7%	$3,163	$50,231	34%	$17,079	$67,310
3K5G3A5	Develop Training for Vent	$141,205	7%	$9,489	$150,694	34%	$51,236	$201,930
3K5G3A6	Perform Training for Vent	$47,068	7%	$3,163	$50,231	34%	$17,079	$67,310
3K5G3A7	Develop Training for Pits	$35,301	7%	$2,372	$37,673	34%	$12,809	$50,482
3K5G3A8	Perform Training for Pits	$11,767	7%	$791	$12,558	34%	$4,270	$16,827
3K5G3A9	Ops Drills for Vent	$59,934	7%	$4,028	$63,961	34%	$21,747	$85,708
3K5G3AA	OTP'S for Vent	$85,879	7%	$5,771	$91,650	34%	$31,161	$122,810
3K5G3AB	OTP's for Pits	$88,631	7%	$5,956	$94,587	34%	$32,160	$126,746
3K5G3AC	Vent Startup	$142,353	7%	$9,566	$151,919	34%	$51,652	$203,571
3K5G3AE	OP'S LOE Support	$138,546	7%	$9,310	$147,856	34%	$50,271	$198,127
3L5A1N	Operations Preparations AN - ("P" Pits, VSPM)	$118,554	5%	$6,307	$124,861	25%	$30,657	$155,518
3L5A1O	Operations Preparations AN - (Vent, 3 Pits)	$388,470	5%	$20,667	$409,137	25%	$100,455	$509,592
3L5A2M	Operation Preparations AN RA- Close Issue	$37,421	6%	$2,316	$39,738	38%	$15,235	$54,973
3L5A2N	Operation Preparations AN RA- SSR	$226,526	6%	$14,022	$240,548	38%	$92,224	$332,772
3L5A2O	Operation Preparations AN RA- Admin Support	$43,085	6%	$2,667	$45,752	38%	$17,541	$63,293
3L5B1N	Operations Preparations AP - Pit	$50,765	9%	$4,655	$55,420	23%	$12,742	$68,162
3L5B1O	Operations Preparations AP- Electrical	$9,518	9%	$873	$10,391	23%	$2,389	$12,780
3L5B1P	Operations Preparations AP- VSPM Ventilation	$9,518	9%	$873	$10,391	23%	$2,389	$12,780
3L5C1N	Operations Preparations AW - Pit	$57,110	11%	$6,436	$63,547	23%	$14,569	$78,116

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3L5C1O	Operations Preparations AW-Ventilation	$76,147	11%	$8,582	$84,729	23%	$19,426	$104,155
3L5C1P	Operations Preparations AW- VSPM Ventilation	$9,518	11%	$1,073	$10,591	23%	$2,428	$13,019
3L5D1N	Operations Preparations AY- VSPM Ventilation	$6,346	7%	$449	$6,794	23%	$1,570	$8,364
3L5D1O	Operations Preparations AY-Electrical	$6,346	7%	$449	$6,794	23%	$1,570	$8,364
3L5E1N	Operations Preparations AZ- VSPM Ventilation	$9,518	6%	$556	$10,074	23%	$2,359	$12,434
3L5E1O	Operations Preparations AZ-Electrical	$290,835	6%	$16,985	$307,820	23%	$72,088	$379,908
3L5F1O	Operations Preparations SY- (Annulus Vent)	$12,850	11%	$1,425	$14,275	26%	$3,764	$18,039
3L5F1P	Operations Preparations SY- (Pits)	$31,569	11%	$3,501	$35,070	26%	$9,248	$44,318
3L5G1N	Operations Preparations 244S DCRT- Pit	$12,691	8%	$963	$13,654	23%	$3,141	$16,795
3L5G1O	Operations Preparations 244S DCRT- Ventilation	$76,147	8%	$5,780	$81,927	23%	$18,843	$100,770
3L5G1P	Operations Preparations 244S DCRT- VSPM Ventilatio	$9,518	8%	$722	$10,241	23%	$2,355	$12,596
3M5F00	Independent Reviews - FY 2004	$100,000	8%	$7,590	$107,590			$107,590
3M5G00	Independent Reviews - FY 2005	$100,000	10%	$9,690	$109,690			$109,690
3P5000	Phase II Planning - Prior Years	$2,704,000			$2,704,000			$2,704,000
3P5001	Phase II Planning - FY 2000	$1,250,919	1%	$8,381	$1,259,300	4%	$49,994	$1,309,294
3Q1100	SY Definitive Design - Engineering	$175,000	1%	$1,173	$176,173	20%	$35,235	$211,407
3Q3B00	HVAC Procurement	$77,695	1%	$1,033	$78,729	30%	$23,619	$102,347
3Q4000	SY Tank Farm Construction	$250,000	2%	$5,000	$255,000	40%	$102,000	$357,000
TOTAL	900 Other Project Costs	$29,339,666	6%	$1,816,984	$31,156,650	24%	$7,350,492	$38,507,141
PROJECT TOTAL	W-314 Tank Farm Restoration and Safe Operati	$89,366,239	9%	$7,798,968	$97,165,207	32%	$30,624,976	$127,790,183

ESTIMATE BASIS

1. Estimate Purpose
Preliminary Cost Estimate: This estimate will be used to establish the Total Project Cost Baseline for W-314 Tank Farm Restoration and Safe Operations (TFRSO) Phase 2.

2. Estimate Technical Basis
   A. This estimate is prepared for Lockheed Martin Hanford Corporation (LMHC), as requested by the Statement of Work and Task Order #1802, release 9 & 11.

   B. The technical scope of work description is in the following reference documents:
      1. Engineering packages for AN, AP, AW, AY, AZ, SY, 244S DCRT and the 200 E/W bypass line.
      2. Engineering sketches
      3. HNF-SD-W314-RPT-003, Rev.4 *Project W-314 Upgrade Scope Summary Report*
      4. Technical Baseline Report (TBR), see TBRs for W-314 Phase II
      5. Phase I Design Requirements and Drawings, HNF. 3781 Rev. 0
      6. Conceptual Design Report (CDR) Rev.0, WHC-SD-W314-CDR-001, Rev. 1

   C. The estimate is consistent with the cost/schedule work breakdown structure.

   D. This estimate utilizes the Industry Standard Construction Specification Institute (CSI) System. The CSI format is used to accumulate all costs on the project. The CSI format is separated into the following categories:
      01 – General
      02 – Excavation and Civil
      03 – Concrete
      04 – Masonry
      05 – Metals
      06 – Wood and Plastics
      07 – Thermal and Moisture Protection
      08 – Doors and Windows
      09 – Finishes
      10 – Specialties
      11 – Equipment
      15 – Mechanical
      16 – Electrical and Instrumentation/Controls

ESTIMATE BASIS

E. The following constraints and/or special conditions exist:

1. The estimated cost of work in the Hanford tank farms is adjusted to account for special training, work site access, work controls, and procedures required for constructing facilities in the 200 East/West tank farms. The procedures are defined in HNF-IP-0842, *TWRS Administration Manual.*

2. All excavation activities in the tank farms must be performed by hand excavation. Excavated materials are surveyed by Health Physics Technicians (HPTs) prior and during excavation activities.

3. Estimate Methodology

A. **Direct Costs:** A detailed takeoff of material quantities is utilized in the preparation of this estimate.

(1) Construction labor, material, and equipment units are estimated based upon Industry Standard Commercial Estimating Manuals and Databases.

(2) Historical Hanford data and construction experience is utilized in developing the method of performance and productivity units. Some construction activities method of performance and productivity units are based upon similar projects at the Hanford Site (W-151, W-030, W-058, W-320, and W-314 Phase 1).

B. **General Direct Cost Adjustments:**

(1) The direct cost can be adjusted by the estimator, as appropriate; to reflect influences by work site or other identified project or special conditions.

(2) A Special Work Procedure (SWP) adjustment is applied to the estimate to account for Hanford tank farm work requirements. The SWP adjusts direct labor upward to account for daily pre-job safety meetings; gaining access authorization to the tank farm(s) from Operations; dressing and undressing personal protective equipment (PPE); clearing or releasing work areas of contaminated materials; and moving materials, tools, and equipment in and out of the farm. The SWP adjustments are applied as follows:

a. Labor hours are adjusted upward 78% for work in the tank farms with PPE.
b. Labor hours are adjusted upward 100% for work in the tank farms with PPE and respirator.

ESTIMATE BASIS

TIME LINE FOR EIGHT-HOUR WORK DAY IN FARM		TIME LINE FOR EIGHT-HOUR WORK DAY IN TENT (Rotating through lunch)	
7.30	Start	7.30	Start
7:45-8:00	Start pre-job	7:45-8:00	Start pre-job
8:30	End pre-job	8:30	End pre-job
8:30-9:15	Access-controlled entry (ACE) in/suit up	8:30-9:30	Ace in/suit up
9:15-11:00	Actual work in farm	9:30-10:00	Certify tent
11:00-11:30	Exit farm	10:00-12:00	Actual work in tent
11:30-12:00	Lunch	12:00-12:15	In farm turnaround
12:00-12:30	Re-enter farm	12:15-2:45	Actual work in tent
12:30-3:15	Actual work in farm	2:45-3:15	Exit tent
3:15-3:45	Exit farm	3:15-3:45	Exit farm

*The total hours worked in the tank farm is 4.5 hours per day.

(3) Premium Pay:
Overtime requirements and shift differential pay for craft labor are union-negotiated under the Hanford Site Stabilization Agreement (HSSA). The cost estimate includes overtime allowances for alternative shifts due to extreme weather conditions and safety concerns. The estimate basis is based on working one shift five days a week. Also, overtime allowances are made for pit work rotation through lunch.

(4) Sales tax is applied to all materials and procured equipment purchases at 8%.

(5) Construction consumable items, such as small tools, weld rod, tape, caulking, plastics, gloves, paper, are estimated at 3.2% of direct construction labor dollars. This is an allowance based on the estimator's experience and the requirements of these items to be used during construction.

(6) Equipment usage of government-owned equipment, controlled by Dyncorp, is included in the estimate at 8% of direct construction labor dollars. This is an allowance based on similar projects previously estimated at the Hanford Site (W-151, W-030, W-058, W-320, and W-314 Phase I).

(7) General Conditions: This is an allowance based on similar projects previously estimated at the Hanford Site (W-151, W-030, W-058, W-320, and W-314 Phase I).This is 25% of direct construction labor hours and includes the following:

a. All project personnel are required to attend four hours of safety meetings each month. The estimate includes the cost for conducting and attending these meetings. The meeting dates are coordinated with the Project Hanford Management Contract (PHMC) mandatory safety meetings to minimize impacts to construction.
b. Detailed daily construction work planning is conducted outside normal shift hours.

ESTIMATE BASIS

c. Haul men and materials
d. Step-off pad support
e. Clean-up support
f. Non-project materials
g. Training
h. General condition materials

(8) Construction support staffing is a percentage of direct construction labor hours at 23%. Staffing is based on recent projects (Projects W-151, W-030,
W-058, W-320, and W-314 Phase I) for tank farm construction work. These items include Project Management, Construction Department Management, Construction Superintendents/Supervision, Project Controls, Construction Engineering, Contract Management, Safety/Industrial Hygiene Support, Construction Document Control, and other miscellaneous Construction Support Personnel.

(9) Construction foreman costs is included at 9% of direct construction labor hours This is an allowance based on similar projects previously estimated at the Hanford Site (W-151, W-030, W-058, W-320, and W-314 Phase I).

(10) The cost estimate includes cost anticipated due to historically documented delays from inclement weather. Construction work inside the tank farm and occasionally outside the tank farm is constrained due to weather conditions by operations procedure or health and safety concerns. Based on historical data, weather delay impact will idle 20 personnel (construction related) for each day of delay. This assumption applies to construction forces working in or around the tank farm.

C. **Direct Cost Adjustments:**

(1) Title II & III Engineering Costs are based upon planning provided by COGEMA Engineering Corporation for:

AN Tank Farm
AW Tank Farm
AP Tank Farm
AZ Tank Farm
AY Tank Farm
SY Tank Farm
244S DCRT
200 E/W Bypass Line

(2) Staffing for Title II & III is based on planning sheets developed to provide detailed backup to the estimated hours in the estimate.
(3) HPTs are based on a ratio of 1:4 of craft in-tank farm work man-hours.

ESTIMATE BASIS

D. Rates:

(1) Construction craft labor rates are those listed in Appendix A of the Hanford Site Stabilization Agreement (HSSA). The HSSA rates include base wage, fringe benefits, and other compensation as negotiated between Fluor Daniel Hanford, Inc. (FDH) and the National Building and Construction Trades Department AFL-CIO. COGEMA Engineering incorporates costs for workmen compensation, FICA, State and Federal Unemployment Insurance, and fee to develop a fully burdened rate by craft.
(2) Engineering rates are based on the approved Architect/Engineer (A/E) Contractor Pools Rate Sheet.
(3) PHMC rates are provided by LMHC and include Overhead and Profit (OH&P), General and Administrative (G&A), fee, and Essential Site Services (ESS). The rates used for the estimate are FY2000 rates.

E. Site Allocations Adjustments:

FDH G&A/ESS and Government Furnished Services (GFS) rates are applied to Enterprise Contractor costs that provide engineering, construction, and procurement services. Work is performed by PHMC contractors, and provided by COGEMA Engineering with labor and material rates, which included site allocations.

Site allocation adjustments for labor, materials, and procured equipment for Enterprise Contractors are developed and provided by FDH for cost estimating use as follows:

(1) FDH GFS = 3% (FY 00) 5% (FY 01 through FY 06)
(2) FDH G&A/ESS = 19.1% (FY 00) 19.9% (FY 01 through FY 06)
(3) Compounded rate for GFS & G&A/ESS for FY 2000 = 22.7% & FY 01 through FY06 =25.9%.

The compounded rate is applied to engineering labor, construction labor and material, and procurement.

ESTIMATE BASIS

4. Escalation

Escalation percentages are based upon the latest budget guidance from the U. S. Department Of Energy for construction projects dated January 1999.

Description	Other Project Costs Project Management			
	Start	Finish	Midpoint	Percentage
1.A	Oct 02	Jun 05	Feb 04	9.34

Description	Other Project Costs Permitting & Safety			
	Start	Finish	Midpoint	Percentage
2.A	Mar 00	Oct 05	Dec 02	6.89
2.B	Mar 00	Nov 04	Jul 02	6.02

Description	Other Project Costs Phase II Planning			
	Start	Finish	Midpoint	Percentage
3.P.5.0.0.0	Sep 99	Sep 99	-	0
3.P.5.0.0.1	Oct 99	Mar 00	Dec 99	.67

ESTIMATE BASIS

Description	Other Project Costs Independent Reviews			
	Start	Finish	Midpoint	Percentage
3.M.5.F	Oct 02	Oct 03	Apr 03	7.59
3.M.5.G	Oct 03	Oct 04	Apr 04	9.69

Description	Other Project Costs AN Farm				Other Project Costs AP Farm			
	Start	Finish	Midpoint	Percentage	Start	Finish	Midpoint	Percentage
1.B.5	Mar 00	Apr 02	Apr 01	3.39	Aug 01	May 04	Dec 02	6.89
1.C.5	Mar 00	Feb 02	Mar 01	3.22	Aug 01	May 04	Dec 02	6.89
1.D.5	Mar 00	Feb 02	Mar 01	3.22	Aug 01	May 04	Dec 02	6.89
2.A.5	Mar 00	Feb 02	Mar 01	3.22	Aug 01	May 04	Dec 02	6.89
2.B.5	Mar 00	Feb 02	Mar 01	3.22	Aug 01	Oct 03	Sep 02	6.37
3.C.5	Mar 00	Feb 02	Mar 01	3.22	Aug 01	Oct 03	Sep 02	6.37
3.K.5	Oct 00	Sep 02	Sep 01	4.27	Oct 02	Mar 04	Jun 03	8.12
3.L.5 MSA	Nov 01	Jul 02	Mar 02	5.32	Sep 03	May 04	Jan 03	9.17
3.L.5 RA	Jul 02	Sep 02	Jul 02	6.19	-	-	-	-

ESTIMATE BASIS

Description	Other Project Costs AW Farm				Other Project Costs AY Farm			
	Start	Finish	Midpoint	Percentage	Start	Finish	Midpoint	Percentage
1.B.5	Oct 02	Jun 05	Feb 04	9.34	Oct 01	Feb 03	Jun 02	5.84
1.C.5	Oct 02	Jun 05	Feb 04	9.34	Oct 01	Feb 03	Jun 02	5.84
1.D.5	Oct 02	Jun 05	Feb 04	9.34	Oct 01	Feb 03	Jun 02	5.84
2.A.5	Oct 02	May 05	Jan 04	9.17	Oct 01	Dec 02	May 02	5.67
2.B.5	Oct 02	Jan 05	Dec 03	8.99	Oct 01	Oct 03	Apr 02	5.49
3.C.5	Oct 02	Aug 04	Sep 03	8.47	Oct 01	Oct 03	Apr 02	5.49
3.K.5	Dec 03	May 05	Aug 04	10.39	May 02	Dec 02	Aug 02	6.19
3.L.5 MSA	Aug 04	Jun 05	Jan 05	11.27	Dec 02	Feb 03	Jan 02	7.07

ESTIMATE BASIS

Description	Other Project Costs AZ Farm				Other Project Costs SY Farm			
	Start	Finish	Midpoint	Percentage	Start	Finish	Midpoint	Percentage
1.B.5	Nov 01	Jan 03	Jun 02	5.84	Oct 02	Feb 05	Dec 03	8.99
1.C.5	Nov 01	Jan 03	Jun 02	5.84	Oct 02	Feb 05	Dec 03	8.99
1.D.5	Nov 01	Jan 03	Jun 02	5.84	Oct 02	Feb 05	Dec 03	8.99
2.A.5	Nov 01	Dec 02	May 02	5.67	Oct 02	Jan 05	Nov 03	8.82
2.B.5	Nov 01	Oct 02	May 02	5.67	Oct 02	Oct 04	Oct 03	8.64
3.C.5	Nov 01	Oct 02	May 02	5.67	Oct 02	Oct 04	Oct 03	8.64
3.K.5	May 02	Jan 03	Sep 02	6.37	Oct 03	Nov 04	Apr 04	9.69
3.L.5 MSA	May 02	Jul 02	Jun 02	5.84	Nov 04	Jan 05	Dec 04	11.09
3.Q.1	-	-	-	-	Oct 99	Jan 00	Dec 99	.67
3.Q.3	-	-	-	-	Jan 00	Jul 00	Apr 00	1.33
3.Q.4	-	-	-	-	Jul 00	Oct 00	Aug 00	2.00

ESTIMATE BASIS

Description	Other Project Costs 244 S DCRT			
	Start	Finish	Midpoint	Percentage
1.B.5	Aug 00	Dec 02	Oct 01	4.44
1.C.5	Aug 00	Dec 02	Oct 01	4.44
1.D.5	Aug 00	Dec 02	Oct 01	4.44
2.A.5	Aug 00	Feb 03	Nov 01	4.62
2.B.5	Aug 00	Aug 02	Aug 01	4.09
3.C.5	Mar 01	Jun 02	Oct 01	4.44
3.K.5	Apr 02	Jul 03	Nov 02	6.72
3.L.5 ORR	Dec 02	Sep 03	Apr 03	7.59

09/29/99 W-314 Phase 2
Tank Farm Restoration and Safe Operations (TFRSO)
COGEMA Job No. C-0101 Rev.3

ESTIMATE BASIS

Description	TITLE II				TITLE III			
	Start	Finish	Midpoint	Percentage	Start	Finish	Midpoint	Percentage
AN TANK FARM	Mar 00	Aug 00	Jun 00	2.00	Jun 01	Nov 02	Feb 02	6.63
AP TANK FARM	Aug 01	Jan 02	Nov 01	5.95	Sep 02	Dec 03	May 03	10.00
AW TANK FARM	Oct 02	Jun 03	Feb 03	9.33	Nov 03	Feb 05	Jun 04	13.23
AY TANK FARM	Oct 01	Dec 01	Nov 01	5.95	Apr 02	Nov 02	Jul 02	7.75
AZ TANK FARM	Nov 01	Feb 02	Dec 01	6.18	Mar 02	Nov 02	Jul 02	7.75
SY TANK FARM	Oct 02	Mar 03	Jan 03	9.10	Sep 03	Dec 04	Apr 04	12.53
244S DCRT	Aug 00	Jan 01	Nov 00	3.33	Jan 02	Jan 03	Jul 02	7.75
200 E/W BYPASS LINE	Oct 02	Jun 03	Feb 03	9.33	Nov 03	Feb 05	Jun 04	13.23

09/29/99 W-314 Phase 2
Tank Farm Restoration and Safe Operations (TFRSO)
COGEMA Job No. C-0101 Rev.3

ESTIMATE BASIS

Description	Procurement				Construction			
	Start	Finish	Midpoint	Percentage	Start	Finish	Midpoint	Percentage
AN TANK FARM	Oct 00	Jul 01	Feb 01	3.98	Jul 01	Oct 04	Feb 03	9.33
AP TANK FARM	Oct 02	Jul 03	Feb 03	9.33	Oct 02	Nov 03	May 03	10.00
AW TANK FARM	Jun 03	Mar 04	Oct 03	11.13	Dec 03	Jan 05	Jul 04	13.23
AY TANK FARM	Dec 01	Apr 02	Feb 02	6.63	May 02	Oct 02	Jul 02	7.75
AZ TANK FARM	Feb 02	May 02	Mar 02	6.85	Apr 02	Oct 02	Jul 02	7.75
SY TANK FARM	-	-	-	-	Oct 03	Nov 04	Apr 04	12.53
244S DCRT	Oct 01	Apr 02	Jan 02	6.40	Feb 02	Dec 02	Jul 02	7.75
200 E/W BYPASS LINE	Jun 03	Mar 04	Oct 03	11.13	Dec 03	Jan 05	Jul 04	13.23

ESTIMATE BASIS

Description	HPT			
	Start	Finish	Midpoint	Percentage
AN TANK FARM	Jul 01	Oct 04	Feb 03	9.33
AP TANK FARM	Oct 02	Nov 03	May 03	10.00
AW TANK FARM	Dec 03	Jan 05	Jul 04	13.23
AY TANK FARM	May 02	Oct 02	Jul 02	7.75
AZ TANK FARM	Apr 02	Oct 02	Jul 02	7.75
SY TANK FARM	Oct 03	Nov 04	Apr 04	12.53
244S DCRT	Feb 02	Dec 02	Jul 02	7.75
200 E/W BYPASS LINE	Dec 03	Jan 05	Jul 04	13.23

5. Contingency Analysis:

Risk based Contingency Evaluation was performed by others and included the estimate per LCAM Guidance. See *Phase 2 Rebaseline Report Section 11 (HNF-5109, Rev. 0.)* COGEMA Engineering Corp. applied the contingency dollar spread according to the LCAM output

ESTIMATE BASIS

6. **ASSUMPTIONS:**

1) CONSTRUCTION

AN Tank Farm

HVAC:

A) The ventilation skid procurement includes dual train filter assembly, exhaust fans, heater, Programmable Logic Controller (PLC) for instrumentation, all necessary electrical components, exhaust stack, platform, seismic analysis, testing and ATPs, all necessary instrumentation, seal pot assembly, heat trace and insulation for drain lines, and shipping.

B) The installation of the ventilation skid includes reassembling the skid that the vendor dismantles for shipment.

C) All equipment and duct are general service items and once on site, the Operating Contractor prepares the proper documentation for safety-class requirements.

D) The slab on grade for the ventilation skid has a special protective coating applied to protect the concrete. The slab is sized according to the ventilation skid dimensions.

E) The seal pot drain lines drain to the nearest riser within the AN tank farm. The existing seal pot drain lines are abandoned in place.

F) The low point collection drain line, for the HVAC duct, is routed to the seal pot on the skid (estimated at 20 linear feet).

G) The existing ventilation system is removed and buried as one unit. The existing HEPA filters are removed prior to demolition to reduce radiation levels. The HEPA filters are placed in a separate burial container for disposal.

H) All greenhouses do not have a ventilation skid installed. If they are required, it is to be provided, tested, and installed by Operations.

I) The tie-in for the new 12-inch duct to the existing duct is assumed to be contaminated. The cost estimate also assumes that the seal pot line is complete, ventilation skid, and stack, and the monitoring system is in place prior to removing the existing duct.

J) The final tie-in to an existing 12-inch riser for the seal pot drain line assumes that mock-ups will not be performed since Phase I will be doing a similar tie-in with the same assembly, therefore, the procedure is approved. At the existing riser location, the existing seal pot lines will be cut and the existing nozzle assembly is reused. Excavation is not required to tie in the new line, since the drain line is above the ground.

K) A sensitive leak test is performed at the final tie in at the riser and connection to the existing duct for the final tie-in weld only.

L) Excess excavated dirt is spread within the tank farm.

M) Carbon steel duct supports are fabricated off-site ready and ready for installation. The support steel is coated with a primer and finish coat prior to coming on-site.

N) A flow meter is procured as a unit and installed during shop fabrication of the new duct. It will be located after the tie-in point so that existing ductwork will not need to be modified.

O) The estimate does not include costs for relocation and demolition of existing equipment for installing a new skid pad.

ESTIMATE BASIS

AN Tank Farm Cont:

INSTRUMENT & CONTROLS:

A) New leak detectors are installed in selected central pump pits, which have been identified as safety-class. Drain plug assemblies are installed in all pits not entered by Phase I. The new leak detectors are similar to Phase I design and require a missile shield at the leak detector box. Modifications to the cover block require a core drill and a sleeve similar to Phase I.
B) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly is not replaced; only the probe assembly is replaced.
C) The vendor provides all necessary instrumentation for the HVAC skid and stack. All components are located on the skid and tested prior to site arrival.
D) All existing underground electrical and pneumatic systems that are being replaced by Project W-314, Phase 2 will be placed in a safe configuration and abandoned in place. Above ground electrical and signal wire, cable, and pneumatic tubing, to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
E) A single-point connection on the skid is available to tie into the site system once installed.
F) The liquid high-level measurement system is general services. Others have installed new liquid high-level probe systems, including the cabling from the associated electronic relays to the 241-AN-271 instrument building.
G) The vapor space pressure measurement system is safety-class.
H) The ventilation system is safety-class.
I) Sufficient floor space is available in instrument building 241-AN-271 for Phase 2 TFLAN I/O cabinets and equipment.
J) A junction box, conduit, and wire for future motor actuated valves are included for selected central pump pits.
K) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) All power cable and conduit lengths for the primary ventilation exhaust skid are estimated.
B) The estimate assumes identical breakers can be procured and staged near the Motor Control Center (MCC) for the replacement of the existing breakers.
C) All electrical components and equipment for the ventilation skid are procured and self-contained on the skid by the vendor.
D) The vendor supplies the freeze protection control panel for the seal pot drain line and the duct low point drain line. Onsite construction forces installs heat trace, insulation, and tie in connections to the panel once on-site.
E) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.
F) New lighting is not be required at the new skid location. Existing tank farm lighting will be used or portable lighting will be available when required.

ESTIMATE BASIS

AN Tank Farm Cont:

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges, and field input.
C) Demolition of the existing ventilation system does not include removal of the existing slab, electrical conduit, instrumentation conduit, and electrical starters and controllers.
D) Removal of vapor pressure instruments and existing leak detectors do not require a greenhouse or any special receiver assembly.

PIT WORK:

A) Remote entry is calculated in the unit rates for work inside each pit, as contamination and radiation information is not current. This assumption is also based on how Phase I construction costs were generated.
B) A special protective coating is included in the estimate to cover repairs in the pit. This allowance is only for minor repairs to the pits and the bottom of the cover blocks.
C) New drain plug assemblies are included in the estimate and are similar in design to Phase I.
D) Weather delays are added to the pit work to account for downtime.
E) During pit intrusive work, crews rotate during lunch to maximize time working in a pit.
F) Removal of debris inside the pit is limited to loose items (left inside the pit from prior operations) and existing leak detectors. This does not include abandoned jumpers left in place.
G) Washing the pit is not considered as decontamination of the pit for entry. It is to prepare the surfaces that require Special Protective Coating touchups. The excess water is drained from the pit into the tank using the existing drain.
H) A spray fixative is required to fix contamination to the walls during construction work. The application is repeated throughout the pit work to assure a safe environment. A vendor, prior to the coverblocks being removed, will do the initial application.

AP Tank Farm

HVAC:

A) The ventilation skid procurement includes dual train filter assembly, exhaust fans, heater, PLC for instrumentation, all necessary electrical components, exhaust stack, platform, seismic analysis, testing and ATPs, all necessary instrumentation, seal pot assembly, heat trace and insulation for drain lines, and shipping.
B) The installation of the ventilation skid includes reassembling the skid that the vendor dismantles for shipment.
C) All equipment and duct are general service items and once on site, the operating contractor prepares the proper documentation for safety-class requirements.

ESTIMATE BASIS

AP Tank Farm Cont:

HVAC CONT:

D) The slab on grade for the ventilation skid has a special protective coating applied to protect the concrete. The slab is sized according to the ventilation skid dimensions.
E) The seal pot drain lines drain to the nearest riser within the AP tank farm. The existing seal pot drain lines are abandoned in place.
F) The low-point collection drain line, for the HVAC duct, is routed to the seal pot on the skid (estimated at 20 linear feet).
G) The existing ventilation system is removed and buried as one unit. The existing HEPA filters are removed prior to demolition to reduce radiation levels. The HEPA filters will be placed in a separate burial container for disposal.
H) All greenhouses do not have a ventilation skid installed, if they are required, it is to be provided, tested, and installed by operations.
I) The tie-in for the new 12-inch duct to the existing duct is assumed to be contaminated. The Cost Estimate also assumes that the seal pot line is complete, ventilation skid, stack, and the monitoring system is in place prior to removing the existing duct.
J) The final tie-in to existing 12-inch riser for the seal pot drain line assumes that mock-ups will not be performed since Phase I will be doing a similar tie-in with the same assembly, therefore the procedure is approved. At the existing riser location, the existing seal pot lines will be cut and the existing nozzle assembly is reused. Excavation is not required to tie in the new line since the drain line is above the ground.
K) A sensitive leak test is performed at the final tie-in at the riser and connection to the existing duct for the final tie-in weld only.
L) Excess excavated dirt is spread within the tank farm.
M) Carbon steel duct supports are fabricated off-site and ready for installation. The support steel is coated with a primer and finish coat prior to coming on-site.
N) A flow meter is procured as a unit and installed during shop fabrication of the new duct. It will be located after the tie-in point so that existing ductwork will not need to be modified.
O) The estimate does not include costs for relocation and demolition of existing equipment for installing of a new skid pad.
P) The Inlet Air Filter Stations are procured off-site from a qualified vendor. The inlet air filter station will be fully self-contained with all HVAC connections (including flanges) and instrumentation. The stations will be tested at the vendor's shop prior to shipment. Installation includes bolting the flanges to the existing tank farm flanges and setting the unit on the slab, installed prior to shipment.

INSTRUMENT & CONTROL:

A) New leak detectors are installed in selected pits. The pits have been identified as safety-class. Drain plug assemblies are installed in all pits not entered by Phase I. The new leak detectors are similar to Phase I design and require a missile shield at the leak detector box. Modifications to the cover block require a core drill and a sleeve similar to Phase I.
B) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly is not to be replaced, only the probe assembly is replaced.
C) The vendor provides all necessary instrumentation for the HVAC skid and stack. All components are located on the skid and tested prior to site arrival:

ESTIMATE BASIS

AP Tank Farm Cont:

INSTRUMENT & CONTROLS CONT:

D) All existing underground electrical and pneumatic systems that are being replaced by Project W-314, Phase 2 will be placed in a safe configuration and abandoned in place. Above ground electrical and signal wire, cable, and pneumatic tubing to be removed, shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
E) A single point connection on the skid is available to tie into the site system once installed.
F) The safety classification of the liquid high-level measurement system is assumed to be general service. Others have installed new liquid high-Level probe systems, including the cabling from the associated electronic relays to the 241-AP-271 Instrument Building.
G) The safety classification of the ventilation system is assumed to be safety-class.
H) Sufficient floor space is available in Instrument Building 241-AP-271 for Phase 2 TFLAN I/O cabinets and equipment.
I) A junction box, conduit, and wire for future motor actuated valves are included for selected central pump pits.
J) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.
K) Instrumentation for inlet air filter stations are provided by vendor and are local instruments requiring no tie-in to tank farm monitoring equipment.

ELECTRICAL:

A) All power cable and conduit lengths for the primary ventilation exhaust skid are estimated.
B) The estimate assumes identical breakers can be procured and staged near the Motor Control Center for the replacement of the existing breakers.
C) All electrical components and equipment for the ventilation skid will be procured and self-contained on the skid by the vendor.
D) The vendor supplies the freeze protection control panel for the seal pot drain line and the duct low point drain line. Onsite construction forces will install heat trace, insulation and tie-in connections to the panel once on-site.
E) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.
F) New lighting is not required at the new skid location. Either existing tank farm lighting will be used or portable lighting will be available when required.
G) Electrical power is not required for the new inlet air filter stations.

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial costs is based on informational drawings, site charges, and field input.
C) Demolition of the existing ventilation system does not include removal of the existing slab, electrical conduit, instrumentation conduit, and electrical starters and controllers.
D) Vapor pressure measurement instruments in AP Tank Farm are being relocated into the 241 Building only.

ESTIMATE BASIS

AP Tank Farm Cont:

DEMOLITION CONT:

E) Removal of existing leak detectors does not require a greenhouse or any special receiver assembly.
F) Removal of existing inlet air filter stations is required and will be dismantled to accommodate burial in one container for each station.

PIT WORK:

A) Remote entry is calculated in the unit rates for work inside each pit, as contamination and radiation information is not up-to-date. This assumption is also based on how Phase I construction costs were generated.
B) A special protective coating is included in the estimate to cover repairs in the pit. This allowance is only for minor repairs to the pits and repairs to the bottom of the cover blocks.
C) New drain plug assemblies are included in the estimate and are similar in design to Phase I.
D) Weather delays are added to the pit work to account for downtime.
E) During pit intrusive work, crews rotate during lunch to maximize time working in a pit.
F) Removal of debris inside the pit is limited to loose items (left inside the pit from prior operations) and existing leak detectors. This does not include abandoned jumpers left in place.
G) Washing the pit is not to be considered as decontamination of the pit for entry. It is to prepare the surfaces that require Special Protective Coatings touchups. The excess water is drained from the pit into the tank using the existing drain.
H) A spray fixative is required to fix contamination to the walls during construction work. The application is repeated throughout the pit work to assure a safe environment. A vendor, prior to the coverblocks being removed, will do the initial application.

AW Tank Farm

HVAC:

A) The ventilation skid procurement includes dual train filter assembly, exhaust fans, heater, PLC for instrumentation, all necessary electrical components, exhaust stack, platform, seismic analysis, testing and ATPs, all necessary instrumentation, seal pot assembly, heat trace and insulation for drain lines, and shipping.
B) The installation of the ventilation skid includes reassembling the skid that the vendor dismantles for shipment.
C) All equipment and duct are general service items and once on site, the Operating Contractor prepares the proper documentation for safety-class requirements.
D) The slab on grade for the ventilation skid has a special protective coating applied to protect the concrete. The slab is sized according to the ventilation skid dimensions.
E) The seal pot drain lines drain to the nearest riser within the AW tank farm. The existing seal pot drain lines are abandoned in place.
F) The low-point collection drain line, for the HVAC duct, is routed to the seal pot on the skid, (estimated at 20 linear feet).

ESTIMATE BASIS

AW Tank Farm Cont:

HVAC CONT:

G) The existing ventilation system will be removed as a system and not cut up for burial. The existing filters will be removed prior to demolition to reduce radiation levels. The HEPA filters will be placed in a separate burial container for disposal.
H) All greenhouses will not have a ventilation skid installed and if a ventilation skid is required, it will be provided, tested, and installed by operations.
I) The tie-in for the new 12-inch duct to the existing duct is assumed to be contaminated. The cost estimate also assumes that the seal pot line is complete, ventilation skid, stack and the monitoring system is in place prior to removing the existing duct.
J) The final tie-in to existing 12-inch riser for the seal pot drain line assumes that mock-ups will not be performed since Phase I will be doing a similar tie-in with the same assembly. Therefore, the procedure is approved. At the existing riser location, the existing seal pot lines will be cut and the existing nozzle assembly is reused. Excavation is not required to tie-in the new line, since the drain line is above the ground.
K) A sensitive leak test is performed at the final tie-in at the riser and connection to the existing duct for the final tie-in weld only.
L) Excess excavated dirt is spread within the tank farm.
M) Carbon steel duct supports are fabricated off-site and ready for installation. The support steel is coated with a primer and finish coat prior to coming on-site.
N) A flow meter is procured as a unit and installed during shop fabrication of the new duct. It is located after the tie-in point so that existing ductwork will not need to be modified.
O) The estimate does not include costs for relocation and demolition of existing equipment for installing of a new skid pad.

INSTRUMENT & CONTROL:

A) New leak detectors are installed in selected pits. Which have been identified as safety-class. Drain plug assemblies are installed in all pits not entered by Phase I. The new leak detectors are similar to Phase I design and require a missile shield at the leak detector box. Modifications to the cover block require a core drill and a sleeve similar to Phase I.
B) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly is replaced; only the probe assembly is replaced.
C) The vendor provides all necessary instrumentation for the HVAC skid and stack. All Phase 2 components are located on the skid and tested prior to site arrival.
D) All existing underground electrical and pneumatic systems that are being replaced by Project W-314; Phase 2 will be placed in a safe configuration and abandoned in place. Aboveground electrical and signal wire, cable, and pneumatic tubing to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
E) A single-point connection on the skid is available to tie into the site system once installed.
F) The safety classification of the liquid high-level measurement system is assumed to be general service. Others have installed new liquid high-level probe systems, including the cabling from the associated electronic relays to the 241-AW-271 instrument building.

ESTIMATE BASIS

AW Tank Farm Cont:

INSTRUMENT & CONTROL CONT:

G) The safety classification of the vapor space pressure measurement system is assumed to be safety-class.
H) The safety classification of the ventilation system is assumed to be safety-class.
I) Sufficient floor space is available in Instrument Building 241-AW-271 for Phase 2 TFLAN I/O cabinets and equipment.
J) A junction box, conduit, and wire for future motor actuator valves are included for selected pits.
K) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) All power cable and conduit lengths for the primary ventilation exhaust skid are estimated.
B) The estimate assumes identical breakers can be procured and staged near the Motor Control Center for the replacement of existing breakers.
C) All electrical components and equipment for the ventilation skid will be procured and self-contained on the skid by the vendor.
D) The vendor will supply the freeze protection control panel for the seal pot drain line and the duct low point drain line. Onsite construction forces will install heat trace, insulation, and tie-in connections to the panel once on-site.
E) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.
F) New lighting is not required at the new skid location. Existing tank farm lighting will be used or portable lighting will be available when required.

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges, and field input.
C) Demolition of the existing ventilation system does not include removal of existing slab, electrical conduit, instrumentation conduit, and electrical starters or controllers.
D) Removal of vapor pressure instruments and existing leak detectors do not require a greenhouse or any special receiver assembly.

PIT WORK:

A) Remote entry is calculated in the unit rates for work inside each pit, as contamination and radiation information is not current. This assumption is also based on how Phase I construction costs were generated.
B) A special protective coating is included in the estimate to cover repairs in the pit. This allowance is only for minor repairs to the pits and repairs to the bottom of the cover blocks.

ESTIMATE BASIS

AW Tank Farm Cont:

PIT WORK CONT:

C) New drain plug assemblies are included in the estimate and are similar in design to Phase I.
D) Weather delays are added to the pit work to account for downtime.
E) During pit intrusive work, crews rotate during lunch to maximize time working in a pit.
F) Removal of debris inside the pit is limited to loose items (left inside the pit from prior operations) and existing leak detectors. This does not include abandoned jumpers.
G) Washing the pit is not to be considered as decontamination of the pit for entry. It is to prepare the surfaces that require Special Protective Coating touchups. The excess water is drained from the pit into the tank using the existing drain.
H) A spray fixative is required to fix contamination to the walls during construction work. The application is repeated throughout the pit work to assure a safe environment. A vendor, prior to the coverblocks being removed, will do the initial application.

AY Tank Farm

INSTRUMENT & CONTROLS:

A) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly will not be replaced; only the probe assembly is replaced.
B) All existing underground electrical and pneumatic systems that are being replaced by Project W-314 will be placed in a safe configuration and abandoned in place. Above-ground electrical and signal wire, cable, and pneumatic tubing to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
C) The safety classification of the liquid high-level measurement system is assumed to be general service. Others have installed new liquid high-level probe systems, including the cabling from the associated electronic relays to the 241-AY-271 instrument building.
D) The safety classification of the vapor space pressure measurement system is assumed to be safety-class.
E) Sufficient floor space is available in Instrument Building 241-AY-271 for Phase 2 TFLAN I/O cabinets and equipment.
F) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) The estimate assumes identical breakers can be procured and staged near the Motor Control Center for the replacement of existing breakers.
B) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.

ESTIMATE BASIS

AY Tank Farm Cont:

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges and field input.
C) Removal of vapor pressure instruments will not require a greenhouse or any special receiver assembly.

AZ Tank Farm

INSTRUMENT & CONTROLS:

A) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly will not be replaced, only the probe assembly will be replaced.
B) All existing underground electrical and pneumatic systems that are being replaced by Project W-314; Phase 2 will be placed in a safe configuration and abandoned in place. Above-ground electrical and signal wire, cable, and pneumatic tubing to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
C) The safety classification of the liquid high-level measurement system is assumed to be general service. Others have installed new liquid high-level probe systems, including the cabling from the associated electronic relays to the 241-AZ-271 instrument building.
D) The safety classification of the vapor space pressure measurement system is assumed to be safety-class.
E) Sufficient floor space is available in Instrument Building 241-AZ-271 for Phase 2 TFLAN I/O cabinets and equipment.
F) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) The estimate assumes identical breakers can be procured and staged near the Motor Control Center for the replacement of existing breakers.
B) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges, and field input.
C) Removal of vapor pressure instruments will not require a greenhouse or any special receiver assembly

ESTIMATE BASIS

SY Tank Farm

HVAC:

A) All SY annulus ventilation cost is covered in 3.Q. as directed by LMHC. This includes engineering, procurement, and construction. All cost was supplied by LMHC for incorporation into the estimate.

INSTRUMENT & CONTROLS:

A) New leak detectors are installed for selected pits. Which have been identified as safety-class. Drain plug assemblies are installed in all pits not entered by Phase I. The new leak detectors are similar to Phase I design and require a missile shield at the leak detector box. Modifications to the cover block require a core drill and a sleeve similar to Phase I.
B) New leak detection probes will be installed in selected waste transfer pipe encasements. The existing pipe assembly is replaced with a new encased assembly similar to Phase I design.
C) All instrumentation connections and setup is covered in 3.Q.
D) All existing underground electrical and pneumatic systems that are being replaced by Project W-314, Phase2 will be placed in a safe configuration and abandoned in place. Aboveground electrical and signal wire, cable, and pneumatic tubing to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
E) All PLC equipment and tank farm monitoring for the ventilation is covered in 3.Q.
F) The safety classification of the liquid high-level measurement system is assumed to be general service. New liquid high-level probe assemblies will be replaced. These instruments are similar to the ENRAFS currently being used in the tank farms.
G) The safety classification of the vapor space pressure measurement system is assumed to be safety-class.
H) Sufficient floor space is available in Instrument Building 242-S for Phase 2 TFLAN I/O cabinets and equipment.
I) A junction box, conduit, and wire for future motor actuator valves are included for selected pits.
J) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) All electrical upgrades for the ventilation system are under 3.Q.

ESTIMATE BASIS

SY Tank Farm Cont:

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges, and field input.
C) Demolition of the ventilation system is covered under 3.Q.
D) Removal of vapor pressure instruments will not require a greenhouse or any special receiver assembly.
E) Removal of existing leak detectors and existing leak detectors do not require a greenhouse or any special receiver assembly.

PIT WORK:

A) Remote entry is calculated in the unit rates for work inside each pit, as contamination and radiation information is not current. This assumption is also based on how Phase I construction costs were generated.
B) A special protective coating is included in the estimate to cover repairs in the pit. This allowance is only for minor repairs to the pits and repairs to the bottom of the cover blocks.
C) New drain plug assemblies are included in the estimate and are similar in design to Phase I.
D) Weather delays are added to the pit work to account for downtime.
E) During pit intrusive work, crews will rotate during lunch to maximize time working in a pit.
F) Removal of debris inside the pit is limited to loose items (left inside the pit from prior operations) and existing leak detectors. This does not include abandoned jumpers not being used.
G) Washing the pit is not to be considered decontamination of the pit for entry. It is to prepare the surfaces that require Special Protective Coating touchups. The excess water is drained from the pit into the tank using the existing drain.
H) A spray fixative is required to fix contamination to the walls during construction work. The application is repeated throughout the pit work to assure a safe environment. A vendor prior to the coverblocks being removed will do the initial application.

ESTIMATE BASIS

244-S DCRT

HVAC:

A) The ventilation skid procurement includes a single train filter assembly, exhaust fan, heater, all necessary electrical components, seismic analysis, testing and ATPs, seal pot assembly, heat trace and insulation for drain lines, and shipping.
B) The installation of the ventilation skid includes reassembling the skid that the vendor dismantles for shipment.
C) All equipment and duct are general service items and once on-site, the Operating Contractor prepares the proper documentation for safety-class requirements.
D) The slab on grade for the ventilation skid has a special protective coating applied to protect the concrete. The slab is sized according to the ventilation skid dimensions.
E) The seal pot drain lines drain to the pump pit. The existing seal pot drain lines are abandoned in place.
F) The low point collection drain line, for the HVAC duct, is routed to the seal pot on the skid (estimated at 20 linear feet).
G) The existing ventilation system will be removed as a system and not cut up for burial. The existing filters will be removed prior to demolition to reduce radiation levels. The HEPA filters will be placed in a separate burial container for disposal.
H) All greenhouses will not have a ventilation skid installed and if a ventilation skid is required, it will be provided, tested, and installed by operations.
I) In the filter pit, there are existing nozzles that will be reused to route the primary and annulus ventilation ducts above ground. The jumpers will be non-filtered and not encased. The filter pit will not be coated after completion.
J) The final tie-in to existing riser in the pump pit for the seal pot drain line will be routed underground. At the existing riser location, the existing seal pot lines will be cut and the existing nozzle assembly is reused.
K) A sensitive leak test is performed at the final tie-in at the riser for the tie-in weld only.
L) Excess excavated dirt is spread within the tank farm.
M) Carbon steel duct supports are fabricated off-site and ready for installation. The support steel is coated with a primer and finishing coat prior to coming on-site.
N) A flow meter is procured as a unit and installed during shop fabrication of the new duct. It is located after the tie-in point so that existing ductwork will not need to be modified.
O) The estimate does not include cost for relocation and demolition of existing equipment for installation of a new skid pad.
P) The primary inlet air filter station is procured off-site from a qualified vendor. The inlet air filter station will be fully self-contained with all HVAC connections (including flanges) and instrumentation. The stations are tested at the vendor's shop prior to shipment. Installation includes bolting the flanges to the existing tank farm flanges and setting the unit on the slab, installed prior to shipment.
Q) W-420 will be installing a stack prior to W-314 modifications; therefore the stack is reused for the new skid.

ESTIMATE BASIS

244-S DCRT Cont:

INSTRUMENT & CONTROLS:

A) A new leak detector is installed in the pump pit, which has been identified as safety-class. The leak detector is for the annulus pump pit, which is not accessible. No Drain plug assemblies are installed in the annulus pit. The new leak detector will be similar to Phase I design and will require a missile shield at the leak detector box. Modifications to the cover block require a core drill and a sleeve similar to Phase I.
B) New leak detection probes are installed in selected waste transfer pipe encasements. The existing pipe assembly is replaced; only the probe assembly will be replaced.
C) The vendor provides all necessary instrumentation for the HVAC skid. All components located on the skid are tested prior to site arrival. The instruments will be locally controlled and monitored. The instrumentation will not be tied into a PLC or the site system.
D) All existing underground electrical and pneumatic systems that are being replaced by Project W-314, are placed in a safe configuration and abandoned in place. Above-ground electrical and signal wire, cable, and pneumatic tubing to be removed shall be cut at the entrance point or just below grade. Wire, cable, and pneumatic tubing shall be abandoned in place.
E) The temperature measurement device is safety-class.
F) The ENRAF leak detectors in the annulus risers is general service items.
G) The vapor space pressure measurement system is safety-class.
H) The ventilation system is safety-class.
I) A junction box, conduit, and wire for future motor actuated valves are included for selected central pump pits.
J) Conduit excavation, backfill, and bedding are based on 24-inch depth. Common trenches have been utilized in generating total cubic yards.

ELECTRICAL:

A) All power cable and conduit lengths for the primary ventilation exhaust skid are estimated.
B) The estimate assumes identical breakers can be procured and staged near the Motor Control Center for the replacement of existing breakers.
C) All electrical components and equipment for the ventilation skid will be procured and self-contained on the skid by the vendor.
D) The vendor will supply the freeze protection control panel for the seal pot drain line and the duct low point drain line. Onsite construction forces will install heat trace, insulation, and tie-in connections to the panel once on-site.
E) Conduit excavation, backfill, and bedding are based on a depth of 24 inches.
F) New lighting is not required at the new skid location. Either existing tank farm lighting will be used or portable lighting will be available when required.
G) The new power load required for the 244-S DCRT is completed prior to construction starting. New electrical upgrades start at panelboard A.

ESTIMATE BASIS

244-S DCRT Cont:

DEMOLITION:

A) Burial cost includes cost of container, site handling, and burial cost for each type of waste.
B) Data for the calculation of burial cost is based on informational drawings, site charges, and field input.
C) Demolition of the existing ventilation system does not include removal of existing slab, electrical conduit, instrumentation conduit, and electrical starters or controllers.
D) Removal of vapor pressure instruments will not require a greenhouse or any special receiver assembly.
E) Removal of existing leak detectors will not require a greenhouse or any special receiver assembly.
F) Removal of the temperature probe and the annulus sensing legs will use a receiver assembly. The receiver is already fabricated and available for use once Project W-314 starts construction.

PIT WORK:

A) Remote entry is calculated in the unit rates for work inside each pit, as contamination and radiation information is not current. This assumption is also based on how Phase I construction costs were generated.
B) A special protective coating is included in the estimate to cover repairs in the pump pit. This allowance is only for minor repairs to the pits and repairs to the bottom of the cover blocks.
C) New drain plug assemblies are included in the estimate for the pump pit and are similar in design to Phase I.
D) Weather delays have been added to the pit work to account for downtime.
E) During pit intrusive work, crews rotate during lunch to maximize time working in a pit.
F) Removal of debris inside the pit is limited to loose items (left inside the pit from prior operations) and existing leak detectors. This does not include abandoned jumpers.
G) Washing the pit is not to be considered as decontamination of the pit for entry. It is to prepare the surfaces that require SPC touchups. The excess water is drained from the pit into the tank using the existing drain.
H) A spray fixative is required to fix contamination to the walls during construction work. The application will be repeated throughout the pit work to assure a safe environment. A vendor prior, to the coverblocks being removed, will do the initial application.

ESTIMATE BASIS

200 E/W Bypass Line:

PIPING:

A) The encased pipe is similar to Phase 1 design. The pipe is not insulated and does not have a self-contained cathodic protection system.
B) Modification to the existing low-point leak detection is not required.
C) Existing pipe line will be abandoned in place.
D) New cathodic protection will be installed while the trench is opened.
E) The existing rectifier will handle the additional load.
F) No final flush test will be done in the field, only x-ray on final weld with a sensitive leak test.
G) The lines that are removed will be capped.

2) HPT SUPPORT

General:

A) HPT hours are calculated based on craft man-hours worked in each farm. This ratio will cover HPT surveys for excavation, pit work, greenhouse surveys, pit entry regulations, prep, pre-job planning, Job Control System (JCS) reviews, and etc. The ratio of 1:4 was used.

3) TITLE II AND III

General:

A) Planning sheets are provided to estimating by COGEMA Engineering Corporation project management group. The planning sheets define activities and task being performed by farm and by discipline. Backup information can be provided.
B) Title III cost includes software development for the upgrades into the Phase I Master Pump System Shutdown (MPPS).
C) Title III FDH inspection hours are estimated by COGEMA Engineering Corporation.
D) Title II cost includes survey for support of definitive design.

4) OTHER PROJECT COSTS

General:

A) The planning sheets are provided to COGEMA Engineering Corporation by LMHC to include in the estimate.

ESTIMATE BASIS

GENERAL NOTES:

A) Burnout is not included in the estimate.
B) The estimate/schedule takes into consideration that tank-intrusive work is not performed on every other Friday due to the eight-nines work schedule.
C) Training costs are included in the general condition percentage.
D) Allowances for additional change rooms, lunchrooms, and other supporting facilities for craft is not in the scope of this cost estimate. These costs may be required to meet schedules and support tank farm operations.
E) This cost estimate is based upon an eight-hour shift and does not include overtime (other than intrusive work and graveyard).
F) This cost estimate is based upon free access to tank farms in a timely fashion to meet schedules that are compatible with W-314 Phase 2.
G) Excavation inside the tank farms is excavated by hand, off mask, and with non-sparking shovels.
H) Rerouting of existing piping, conduit, etc. is not necessary for new installations, as potential interferences are not known at this time.
I) Removal of debris in existing pits will not require shearing activities of the jumpers for burial.
J) Duct and piping runs do not include expansion joints.
K) Encasement Leak Detection Element assemblies do not require pit entry. SY Tank Farm is the only farm that will require core drilling from the outside of the pit.
L) All new HVAC duct and tie-in points are above ground and require no excavation.
M) During the tie-in activities of the HVAC system, no portable exhauster is required.
N) All greenhouses have open tops with the option to close the roof.
O) If contaminated excavated material is encountered, the material can be used as backfill.
P) No downtime allowances for waste transfer activities are included in the estimate.
Q) The ventilation skid will only have a seismic analysis performed by the vendor.
R) Leak testing costs only cover the new installation work. If a system is required to be leak-tested, operation will have to perform these tests.
The cost for system leak testing is not included in the estimate.
S) W-521, W-211, and W-314 are sharing pit entry cost. Where scope is identified as shared work, W-314 has included only the components needed to be replaced and not the cost of opening and closing the pit. See the *Validation Report Summary* for location of pits.
T) Vendor quotes for procurement items and construction materials are available upon request.

6.2 CHANGES FROM PREVIOUS BASELINE

(consisting of the following five pages)

Table 6.2: Changes From Previous Baseline

CDR '97 Cost (K$)	Rebaseline Est. Cost	Delta	Description CDR '97 WBS	Description Rebaseline Estimate	Comments
$13,178,906	$10,326,973	-$2,851,933	Project Management –1	Project Management –1	Reduction in PM, PE & QA costs area result of: 1) 200 E/W Transfer Line scope removal (Waste Transfer System) and reduction (STT and # of pits).
$7,060,951	$4,154,707	-$2,906,244	Project Management & Integration - 1A	Project Management & Integration - 1A	Reduction in project management costs are a result of: W-314 Phase 1 Rebaseline included the core management team through the quarter of FY03. Although Phase 2 overlaps with Phase 1 in FY99, 00, 01, 02, and 03, only Project Management costs beginning in the second quarter of FY03 are included.
$2,966,134	$2,879,210	-$86,924	Project Engineering - 1B	Project Engineering - 1B	Reduction in project engineering costs are a result of: 1) 200 E/W Transfer Line scope being moved to Phase 1 (WTS); 2) elimination of SST work scope and over all tank entries
$1,014,000	$1,944,807	$930,807	Systems Engineering Management - 1C	Systems Engineering Management - 1C	SE increase is from applying a Life Cycle Asset Management (LCAM) program to W-314 per DOE Order 430.1. This represents the first time a comprehensive SE approach has been applied to a Tank Farms project (not included in 97 CDR estimate).
$2,137,821	$1,348,248	-$789,573	Quality Assurance - 1D	Quality Assurance - 1D	Reduction in quality assurance costs are a result of: 1) 200 E/W Transfer line scope being moved to Phase 1 (Waste Transfer System); and 2) the elimination of work scope related to Single-Shell Tanks.
$518,553	$982,366	$463,813	Safety & Permitting - 2	Safety & Permitting - 2	97CDR estimate was based on 1 permit per farm. Several permits per farm are required. This
$60,000	$321,526	$261,526	Permitting - 2A	Permitting - 2A	

Table 6.2: Changes From Previous Baseline

CDR '97 Cost (K$)	Rebaseline Est. Cost	Delta	Description CDR '97 - WBS	Description Rebaseline Estimate	Comments
					increase is consistent with the Phase 1 Rebaseline estimate.
$458,553	$660,840	$202,287	Safety Analysis	Safety Analysis	Extensive ventilation scope results in safety analysis costs higher than the CDR.
$25,819,789	$17,566,353	-$8,253,436	OPC Activities - 3	OPC Activities - 3	
$5,746,525	$5,672,088	-$74,437	Design & Construction Support - 3C	Design & Construction Support - 3C	Although the # of pits were reduced, minimal reductions in overall cost occur. This is a result of applying lessons learned from similar Phase 1 work (refer to Baseline Change Request TWR-99-056). These cost increases from lessons learned were not included in the 97 CDR.
$16,226	$0	-$16,226	Site Characterization - 3J		Site characterization was completed prior to the start of Phase 1 field work.
$13,911,304	$5,859,813	-$8,051,491	Startup & Testing - 3K	Startup & Testing - 3K	Reduction in cost is directly related to removal of 200E/W Waste Transfer Lines (predominantly in-farm work), SST work, and the significant reduction in the number of pits for Phase 2.
$5,505,734	$1,389,733	-$4,116,001	Operations Preparations - 3L	Operations Preparations - 3L	Reduction in cost is directly related to removal of 200E/W Waste Transfer Lines (predominantly in-farm work), SST work, and the significant reduction in the number of pits for Phase 2.
$640,000	$200,000	-$440,000	Independent Reviews - 3M	Independent Reviews - 3M	W-314 Phase 1 and 2 overlap in FY00, 01, 02, and 03. DOE annual review ($100K/yr) for these years are included in W-314 Phase 1. In addition, scope reductions and tighter planning have reduced the Phase 2 schedule by two years.
$0	$3,954,919	$3,954,919		Phase II Planning - 3P	Phase 2 Planning costs were omitted from the 97 CDR estimate.

Table 6.2: Changes From Previous Baseline

CDR '97 Cost (K$)	Rebaseline Est. Cost	Delta	Description CDR '97 - WBS	Description Rebaseline Estimate	Comments
$0	$489,800	$489,800		SY Annulus Ventilation Upgrade - 3Q	Upgrade now limited to replacing components of like capacity.
$92,015,713	$50,021,195	-$41,994,518	Phase 2 - 5	W-314 TFSO Construction - 5	
$14,471,001	$7,730,467	-$6,740,534	AN Tank Farm - 5A	AN Tank Farm - 5A	The reduction in costs is a result of the following: 1) 7 central pump pits: cut installation of all valve position indicators and waste flow meters ; 2) Central Pump Pits 241-AN-01A and 04A were cut completely (performed in Phase 1) 2) 7 annulus pump pits - all scope removed (including pipeline encasement leak detection); 3) flush pit, service pit, condensate receiver pit, supernate receiver pit and clean out boxes - all scope removed.
$17,892,839	$11,360,524	-$6,532,315	AP Tank Farm - 5B	AP Tank Farm - 5B	The reduction in costs is a result of the following: 1) 6 central pump pits: cut installation of all valve position indicators and waste flow meters ; 2) Central Pump Pits 241-AP-02A and 04A were cut completely (performed in Phase 1); work scope. 2) 8 annulus pump pits - all scope removed (including pipeline encasement leak detection); 3) 3 mixer pump pits removed; 4) 2 leak detection(LD)pits and sumps removed; 5) service pit, flush pit, jumper storage pit and clean out boxes - all scope removed.

Table 6.2: Changes From Previous Baseline

CDR '97 Cost (K$)	Rebaseline Est. Cost	Delta	Description CDR '97 - WBS	Description Rebaseline Estimate	Comments
$15,188,266	$11,087,760	-$4,100,506	AW Tank Farm - 5C	AW Tank Farm - 5C	The reduction in costs is a result of the following: 1) 6 central pump pits: installation of valve position indicators and waste flow meters - scope was removed ; 2) 6 annulus pump pits - all scope removed; 3) 6 LD pits and sumps - all scope removed; 4) feed pit, service pit, clean out boxes and AW flush pits - all scope removed.
$6,188,180	$1,778,815	-$4,409,365	AY Tank Farm - 5D	AY Tank Farm - 5D	The reduction in costs is a result of the following: 1) 2 central pump pits: installation of valve position indicators and waste flow meters - all scope was removed ; 2) 2 annulus pump pits - all scope removed; 3) 2 LD pits and sumps - all scope removed; 4) Sluice pits (8)- all scope removed; 5) encasement drain pit and clean out boxes - all scope removed.
$5,372,690	$1,829,922	-$3,542,768	AZ Tank Farm - 5E	AZ Tank Farm - 5E	The reduction in costs is a result of the following: 1) 2 central pump pits: installation of valve position indicators and waste flow meters - all scope was removed ; 2) 2 annulus pump pits - all scope removed; 3) 2 LD pits and sumps - all scope removed; 4) Sluice pits (4)- all scope removed; 5) encasement drain pit and clean out boxes - all scope removed

Table 6.2: Changes From Previous Baseline

CDR '97 Cost (K$)	Rebaseline Est. Cost	Delta	Description CDR '97 - WBS	Description Rebaseline Estimate	Comments
$10,113,332	$9,513,953	-$599,379	SY Tank Farm - 5F	SY Tank Farm - 5F	The reduction in costs is a result of the following: 1) 3 central pump pits: installation of valve position indicators and waste flow meters - all scope was removed ; 2) 3 annulus pump pits - all scope removed; 3) 3 LD pits and sumps - all scope removed; 4) Flush pits (3) - all scope removed; 5)Valve pits (2) - valve position indicators - scope removed; 6) clean out boxes - all scope removed; 7) SY primary ventilation system instrumentation - all work scope removed. Cost of remaining work (7 process pits and instrumentation increased due to lessons learned (TWR-99-056).
$5,116,409	$0	-$5,116,409	244-A DCRT - 5G		No Phase 2 scope remains from 97 CDR for 244-A DCRT
$4,686,335	$5,499,517	$813,182	244-S DCRT - 5H	244S - DCRT - 5H	The cost increase is a result of additional ventilation work (better defined) compared to the 97 CDR 244S-DCRT.
$9,799,287	$1,220,238	-$8,579,049	200 E/W Area Bypass Lines - 5I	200 E/W Bypass Lines - 5I	Reflects design costs only. Scope was moved to Phase 1, and waste transfer line route was moved outside the farms.
$3,187,374	$0	-$3,187,374	SST Support Systems		
$28,240,183	$10,469,353	-$17,770,830	Site Adders		
$23,511,994	$7,798,968	-$15,713,026	Escalation		
$33,907,791	$30,624,976	-$3,282,815	Contingency		
$217,192,929	$127,790,182	-$89,402,747	TOTALS		

7.0 SCHEDULE

Planning Basis: The scheduling of project activities for the Phase 2 rebaseline effort was based upon assumed funding constraints in the fiscal years 2000 and 2001, assumed schedule constraints posed by the planned timetable for transfer of waste to the privatized vitrification facility (and therefore the need date for upgraded ventilation systems), TPA Milestone M-43, "Compliance Upgrades," required integration with other ongoing RPP activities, and resource leveling requirements. Tables 7.1 and 7.2 below, identify funding and schedule assumptions.

Table 7.1: Funding Assumptions

Fiscal Year	Funding Assumptions ($1000s)
2000	$5.433 M (2.941 Capital + 2.492 Expense
2001	$8.477 M (5.399 Capital + 3.078 Expense)

Table 7.2: Schedule Assumptions

Milestone	Date
Complete AN Primary Ventilation Construction	2003
Complete AY I&C and Electrical Construction	2003
Complete AZ I&C and Electrical Construction	2003
Complete 244-S DCRT Ventilation Construction	2004
Complete AP Primary Ventilation Construction	2004
Complete AW Primary Ventilation Construction	2004
Complete SY Annulus Ventilation Construction	2005
Complete "Other" AP Farm Construction	2006
Complete "Other AW Farm Construction	2006
Complete W-314 Project's Portion of TPA M-43-00*	2005

* Compliance Upgrades

The above construction completion dates allow enough time for subsequent startup, testing, and other readiness activities required to transfer waste per the current vitrification timetable.

TPA Milestone M-43: The required completion date of TPA Milestone M-43 "Compliance Upgrades" is June 2005. Specifically what this entails is still being negotiated with the State. For purposes of this rebaseline of W-314 Phase 2, completion of all activities were assumed to be required by June 2005.

Integration: Integration will be achieved with River Protection Projects (RPP) W-211 and W-521 to minimize Phase 2 pit upgrade costs, particularly four central pump pits, AN-102, AN-105, AN-106, and AN-107. W-314 Phase 2 plans to accomplish the installation of a leak detector and drain plug assembly, and repair of the SPC on the interior pit walls during the planned W-211 upgrade of central pump pit AN-105. Similarly, W-314 Phase 2 pit work will be coordinated during the planned W-521 upgrades of AN-102, 106, and 107. A more detailed discussion of the required integration is included in Section 8.0.

Resource Leveling: The scheduling of Phase 2 project activities also includes the adjustment of activity time phasing to avoid annual funding and critical resource peaks and valleys. The results are represented in the BA/BO schedule outlay, Section 8, and the Phase 2 required Critical Resources, Section 10.

Phase 2 Schedule: The W-314 Phase 2 Schedule, Figure 7.1, provides five key ventilation system upgrades including "Turnover to Operations" (includes start up, testing, and turnover activities) by the required programmatic need dates. Activities highlights by fiscal year are:

FY00: Activities include: SY annulus ventilation refurbishment, the preparation of required system engineering documents (Project Design Concepts, Project Design Specifications, and Project Interface Control Documents), AN Farm and 244-S DCRT definitive design.

FY 01: Activities include completion of 244-S DCRT definitive design, AN Farm primary ventilation procurement activities, one AN Farm process pit upgrade, and AP definitive design.

FY02: Activities include: AN Farm primary ventilation construction and upgrades of two AN process pits, AY Farm definitive design, and 244-S DCRT ventilation procurement and construction.

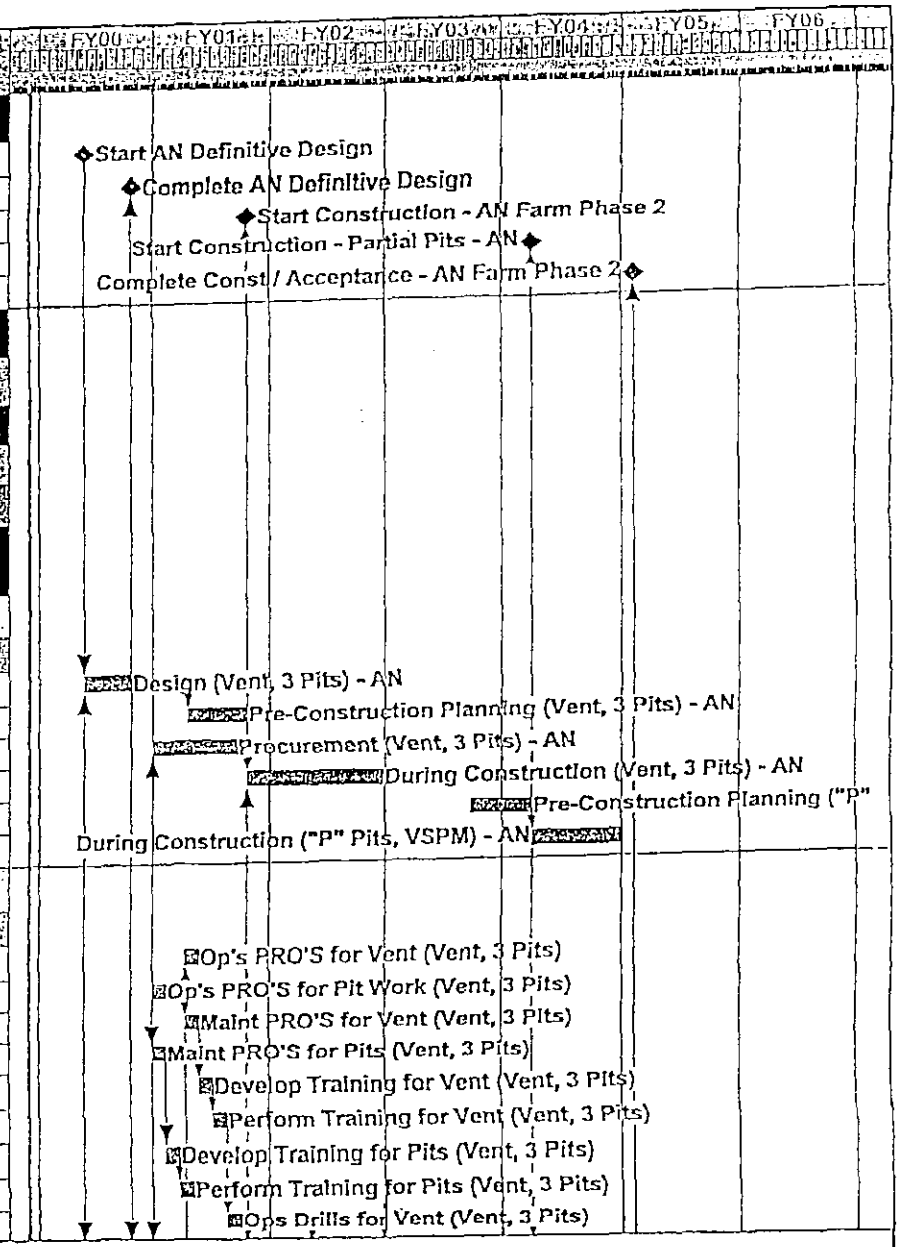
FY03: Activities include: AP construction (site instrumentation and electrical upgrades, process pit upgrades), AW primary ventilation system procurement, AY and AZ Farm construction (site instrumentation and electrical upgrades and process pit upgrades), and completion of 244-S DCRT ventilation system upgrades.

FY04: Activities include: Completion of AN Farm construction (upgrades of two AN process pits), completion of AP Farm construction (process pit upgrades), AW Farm process pit upgrades, AW Farm primary ventilation system construction, and SY process pit upgrades

FY05: Activities include: AW construction completion, SY construction completion

Figure 7.1 Detailed Schedule
(consisting of the following 53 pages)

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A0001	Start AN Definitive Design	0	24FEB00*	
5A1202	Complete AN Definitive Design	0		21JUL00
5A1203	Start Construction - AN Farm Phase 2	0	26JUL01*	
5A1205	Start Construction - Partial Pits - AN	0	02JAN04	
5A1206	Complete Const / Acceptance - AN Farm Phase 2	0		10NOV04
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.01.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support Phase 2				
Design & Construction Support - AN Farm				
3C5A1A	Design (Vent, 3 Pits) - AN	105	24FEB00	21JUL00
3C5A2A	Pre-Construction Planning (Vent, 3 Pits) - AN	130	22JAN01	25JUL01
3C5A3A	Procurement (Vent, 3 Pits) - AN	185	02OCT00	26JUN01
3C5A4A	During Construction (Vent, 3 Pits) - AN	297	26JUL01	27SEP02
3C5A5A	Pre-Construction Planning ("P" Pits, VSPM) - AN	130	25JUN03*	31DEC03
3C5A6A	During Construction ("P" Pits, VSPM) - AN	185	02JAN04	22SEP04
Startup & Testing - Phase 2				
Startup & Testing - AN Farm				
3K5A3A1	Op's PRO'S for Vent (Vent, 3 Pits)	30	16JAN01	27FEB01
3K5A3A2	Op's PRO'S for Pit Work (Vent, 3 Pits)	30	02OCT00*	10NOV00
3K5A3A3	Maint PRO'S for Vent (Vent, 3 Pits)	30	16JAN01	27FEB01
3K5A3A4	Maint PRO'S for Pits (Vent, 3 Pits)	30	02OCT00	10NOV00
3K5A3A5	Develop Training for Vent (Vent, 3 Pits)	30	28FEB01	10APR01
3K5A3A6	Perform Training for Vent (Vent, 3 Pits)	30	11APR01	22MAY01
3K5A3A7	Develop Training for Pits (Vent, 3 Pits)	30	13NOV00	28DEC00
3K5A3A8	Perform Training for Pits (Vent, 3 Pits)	30	29DEC00	09FEB01
3K5A3A9	Ops Drills for Vent (Vent, 3 Pits)	30	23MAY01	05JUL01



Project Start	19JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	28SEP99		

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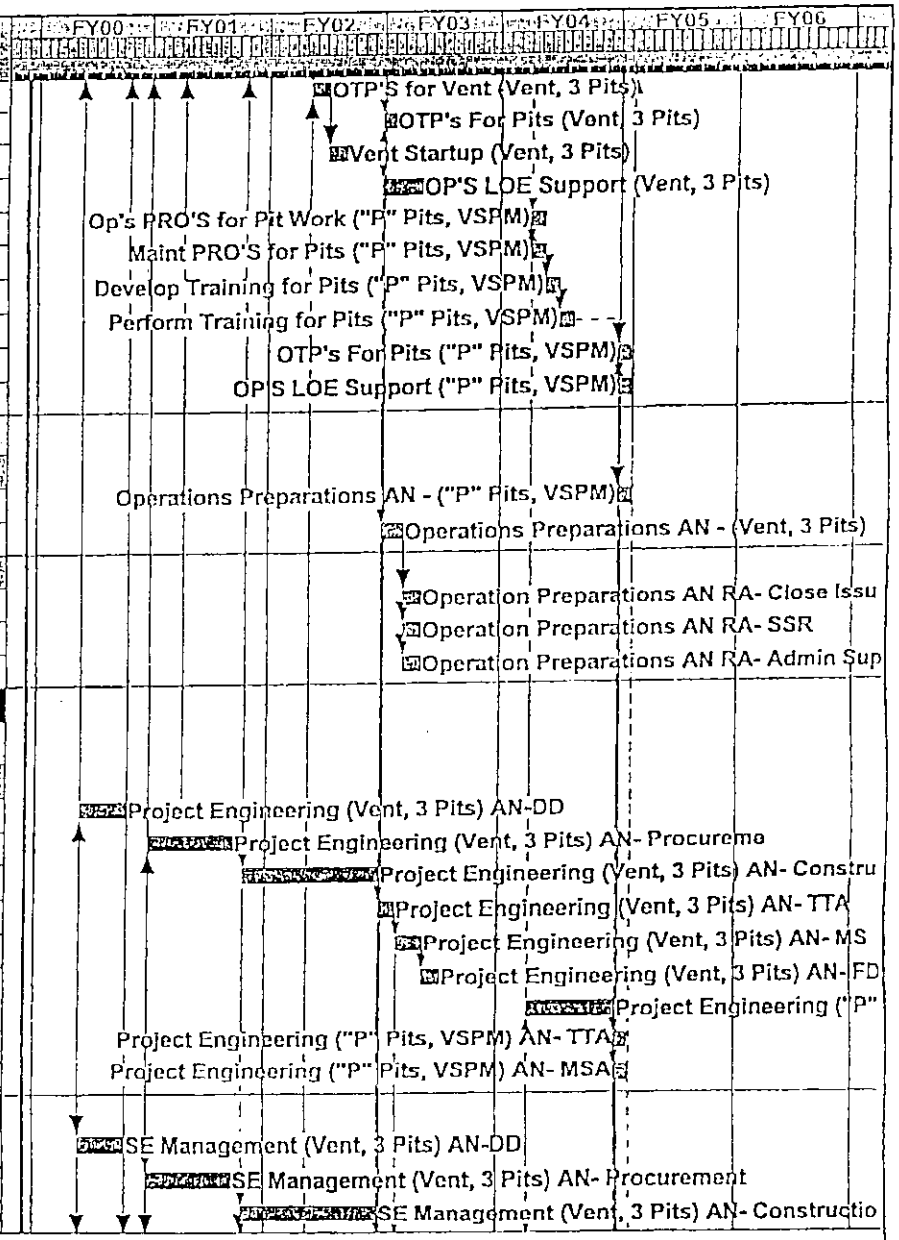
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AN Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3K5A3AA	OTP'S for Vent (Vent, 3 Pits)	40	11FEB02	08APR02
3K5A3AB	OTP's For Pits (Vent, 3 Pits)	30	23SEP02	01NOV02
3K5A3AC	Vent Startup (Vent, 3 Pits)	40	09APR02	04JUN02
3K5A3AE	OP'S LOE Support (Vent, 3 Pits)	89	23SEP02	30JAN03
3K5A3AF	Op's PRO'S for Pit Work ("P" Pits, VSPM)	30	02JAN04	12FEB04
3K5A3AG	Maint PRO'S for Pits ("P" Pits, VSPM)	30	02JAN04	12FEB04
3K5A3AH	Develop Training for Pits ("P" Pits, VSPM)	30	13FEB04	26MAR04
3K5A3AJ	Perform Training for Pits ("P" Pits, VSPM)	30	29MAR04	07MAY04
3K5A3AK	OTP's For Pits ("P" Pits, VSPM)	30	23SEP04	03NOV04
3K5A3AL	OP'S LOE Support ("P" Pits, VSPM)	35	23SEP04	10NOV04
Operations Preparation				
Ops Prep - MSA AN Farm				
3L5A1N	Operations Preparations AN - ("P" Pits, VSPM)	35	23SEP04	10NOV04
3L5A1O	Operations Preparations AN - (Vent, 3 Pits)	49	23SEP02	02DEC02
Ops Prep-FDH RA AN Farm				
3L5A2M	Operation Preparations AN RA- Close Issue	40	03DEC02	30JAN03
3L5A2N	Operation Preparations AN RA- SSR	40	03DEC02	30JAN03
3L5A2O	Operation Preparations AN RA- Admin Support	40	03DEC02	30JAN03
Capital- Phase 2				
Project Management				
Project Engineering				
1B5A1A	Project Engineering (Vent, 3 Pits) AN-DD	105	24FEB00	21JUL00
1B5A2A	Project Engineering (Vent, 3 Pits) AN- Procureme	185	02OCT00	26JUN01
1B5A3A	Project Engineering (Vent, 3 Pits) AN- Construct	297	26JUL01	27SEP02
1B5A4A	Project Engineering (Vent, 3 Pits) AN- TTA	40	23SEP02	15NOV02
1B5A5A	Project Engineering (Vent, 3 Pits) AN- MSA	55	18NOV02	07FEB03
1B5A6A	Project Engineering (Vent, 3 Pits) AN- FDH RA	40	10FEB03	07APR03
1B5A8A	Project Engineering ("P" Pits, VSPM) AN- Constru	185	02JAN04	22SEP04
1B5A9A	Project Engineering ("P" Pits, VSPM) AN- TTA	30	23SEP04	03NOV04
1B5AAA	Project Engineering ("P" Pits, VSPM) AN- MSA	35	23SEP04	10NOV04
Systems Engineering				
1C5A1A	SE Management (Vent, 3 Pits) AN-DD	105	24FEB00	21JUL00
1C5A2A	SE Management (Vent, 3 Pits) AN- Procurement	185	02OCT00	26JUN01
1C5A3A	SE Management (Vent, 3 Pits) AN- Construction	297	26JUL01	27SEP02



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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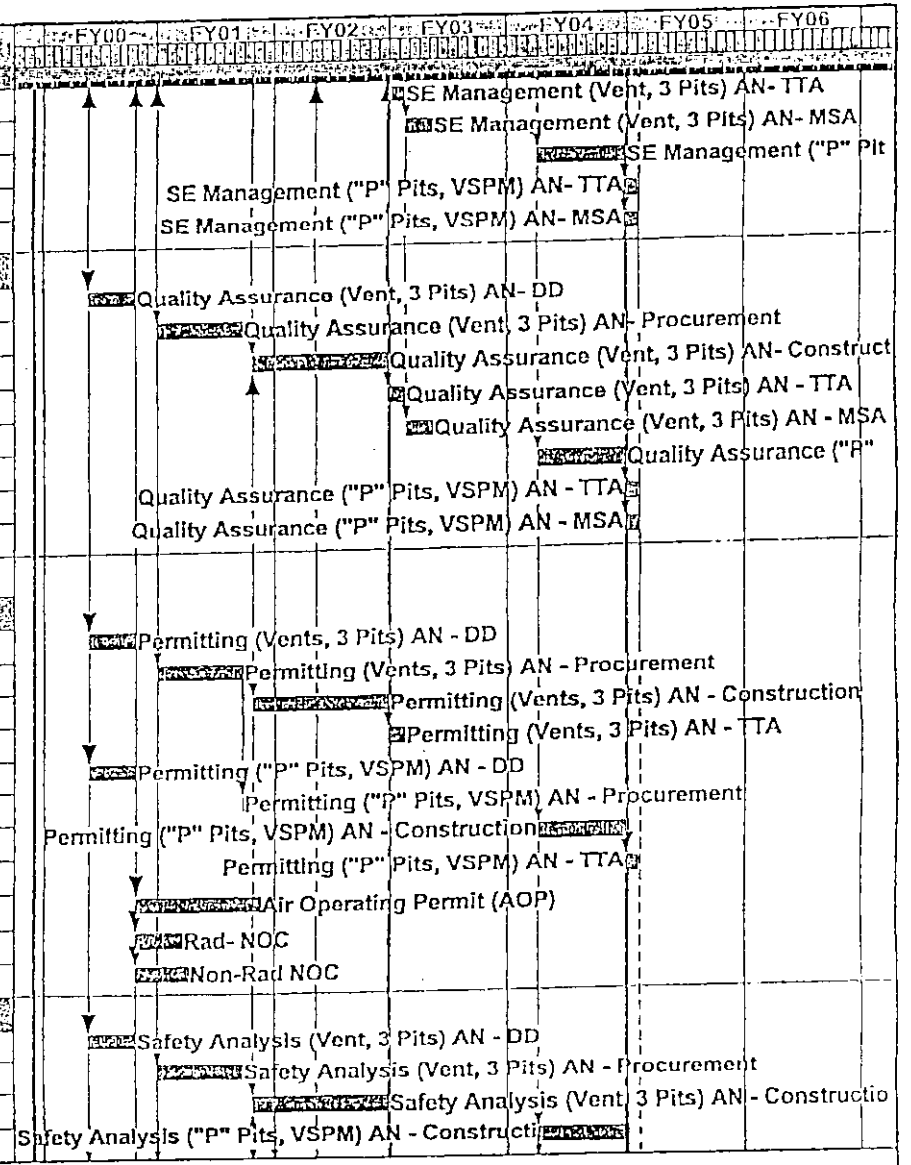
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AN Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
1C5A4A	SE Management (Vent, 3 Pits) AN- TTA	40	23SEP02	15NOV02
1C5A5A	SE Management (Vent, 3 Pits) AN- MSA	55	18NOV02	07FEB03
1C5A8A	SE Management ("P" Pits, VSPM) AN-	185	02JAN04	22SEP04
1C5A9A	SE Management ("P" Pits, VSPM) AN- TTA	30	23SEP04	03NOV04
1C5AAA	SE Management ("P" Pits, VSPM) AN- MSA	35	23SEP04	10NOV04
Quality Assurance				
1D5A1A	Quality Assurance (Vent, 3 Pits) AN- DD	105	24FEB00	21JUL00
1D5A2A	Quality Assurance (Vent, 3 Pits) AN- Procurement	185	02OCT00	26JUN01
1D5A3A	Quality Assurance (Vent, 3 Pits) AN- Constructio	297	26JUL01	27SEP02
1D5A4A	Quality Assurance (Vent, 3 Pits) AN - TTA	40	23SEP02	15NOV02
1D5A5A	Quality Assurance (Vent, 3 Pits) AN - MSA	55	18NOV02	07FEB03
1D5A8A	Quality Assurance ("P" Pits, VSPM) AN- Construct	185	02JAN04	22SEP04
1D5A9A	Quality Assurance ("P" Pits, VSPM) AN - TTA	30	23SEP04	03NOV04
1D5AAA	Quality Assurance ("P" Pits, VSPM) AN - MSA	35	23SEP04	10NOV04
Permitting and Safety				
Permits				
2A5A2A	Permitting (Vents, 3 Pits) AN - DD	105	24FEB00	21JUL00
2A5A3A	Permitting (Vents, 3 Pits) AN - Procurement	185	02OCT00	26JUN01
2A5A4A	Permitting (Vents, 3 Pits) AN - Construction	297	26JUL01	27SEP02
2A5A5A	Permitting (Vents, 3 Pits) AN - TTA	40	23SEP02	15NOV02
2A5A6A	Permitting ("P" Pits, VSPM) AN - DD	105	24FEB00	21JUL00
2A5A7A	Permitting ("P" Pits, VSPM) AN - Procurement	1	27JUN01	27JUN01
2A5A8A	Permitting ("P" Pits, VSPM) AN - Construction	185	02JAN04	22SEP04
2A5A9A	Permitting ("P" Pits, VSPM) AN - TTA	30	23SEP04	03NOV04
AN.AOP	Air Operating Permit (AOP)	272	24JUL00	20AUG01
AN.NOC1	Rad- NOC	147	24JUL00	17DEC00
AN.NOC2	Non-Rad NOC	168	24JUL00	07JAN01
Safety Analysis				
2B5A1A	Safety Analysis (Vent, 3 Pits) AN - DD	105	24FEB00	21JUL00
2B5A2A	Safety Analysis (Vent, 3 Pits) AN - Procurement	185	02OCT00	26JUN01
2B5A3A	Safety Analysis (Vent, 3 Pits) AN - Construction	297	26JUL01	27SEP02
2B5A8A	Safety Analysis ("P" Pits, VSPM) AN - Constructi	185	02JAN04	22SEP04



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

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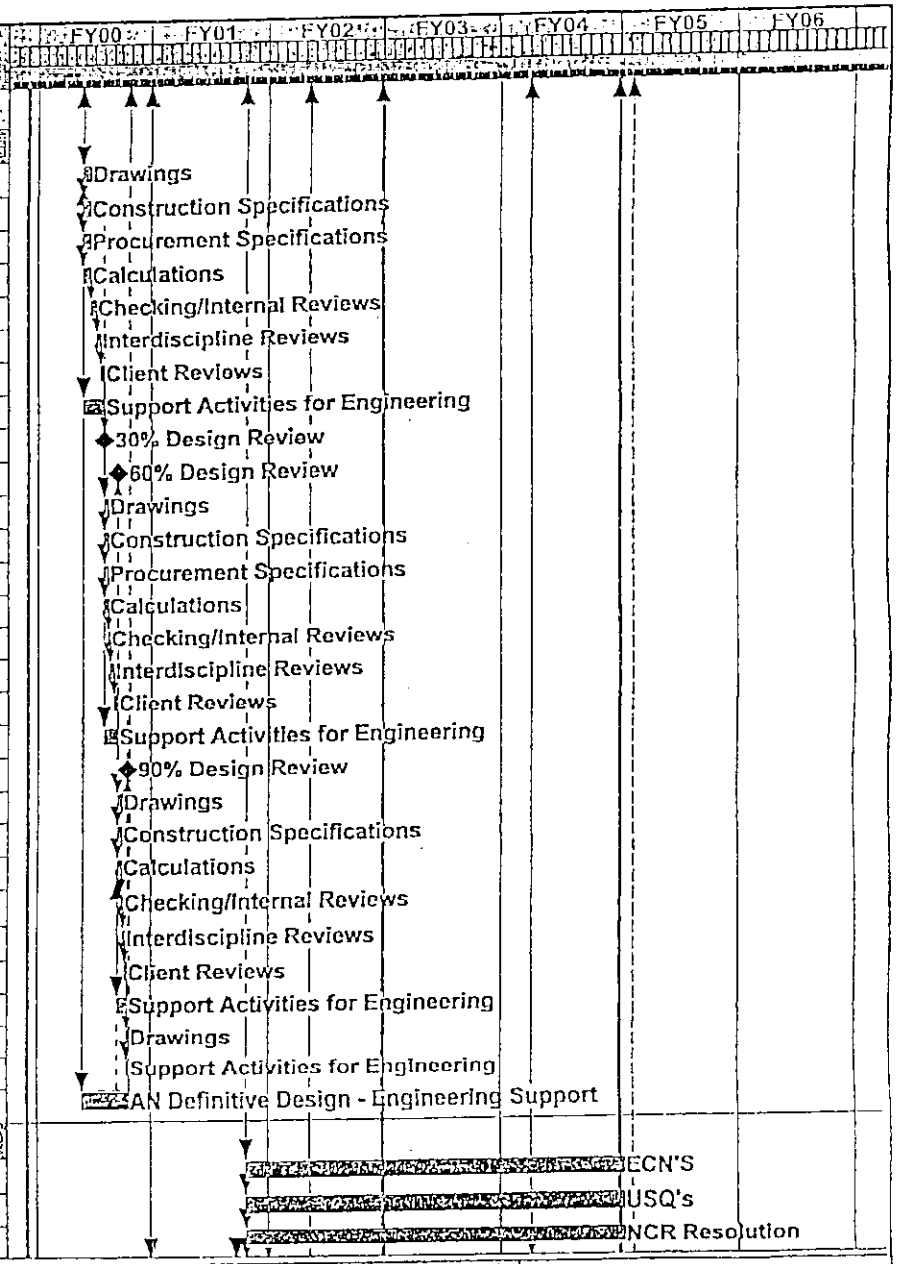
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
AN Tank Farm				
AN - Definitive Design				
5A1111	Drawings	20	24FEB00	22MAR00
5A1112	Construction Specifications	20	24FEB00	22MAR00
5A1113	Procurement Specifications	20	24FEB00	22MAR00
5A1114	Calculations	20	24FEB00	22MAR00
5A1115	Checking/Internal Reviews	10	23MAR00	05APR00
5A1116	Interdiscipline Reviews	10	06APR00	19APR00
5A1117	Client Reviews	10	20APR00	03MAY00
5A1118	Support Activities for Engineering	50	24FEB00	03MAY00
5A1119	30% Design Review	0	04MAY00	
5A1120	60% Design Review	0	16JUN00	
5A1121	Drawings	10	04MAY00	17MAY00
5A1122	Construction Specifications	10	04MAY00	17MAY00
5A1123	Procurement Specifications	10	04MAY00	17MAY00
5A1124	Calculations	10	04MAY00	17MAY00
5A1125	Checking/Internal Reviews	5	18MAY00	24MAY00
5A1126	Interdiscipline Reviews	5	25MAY00	01JUN00
5A1127	Client Reviews	10	02JUN00	15JUN00
5A1128	Support Activities for Engineering	30	04MAY00	15JUN00
5A1130	90% Design Review	0	17JUL00	
5A1131	Drawings	10	16JUN00	29JUN00
5A1132	Construction Specifications	10	16JUN00	29JUN00
5A1134	Calculations	10	16JUN00	29JUN00
5A1135	Checking/Internal Reviews	3	30JUN00	05JUL00
5A1136	Interdiscipline Reviews	2	06JUL00	07JUL00
5A1137	Client Reviews	5	10JUL00	14JUL00
5A1138	Support Activities for Engineering	20	16JUN00	14JUL00
5A1141	Drawings	5	17JUL00	21JUL00
5A1142	Support Activities for Engineering	5	17JUL00	21JUL00
5A1201	AN Definitive Design - Engineering Support	105	24FEB00	21JUL00
AN - E&I During Construction				
5A2111	ECN'S	812	26JUL01	13OCT04
5A2112	USQ's	812	26JUL01	13OCT04
5A2113	NCR Resolution	812	26JUL01	13OCT04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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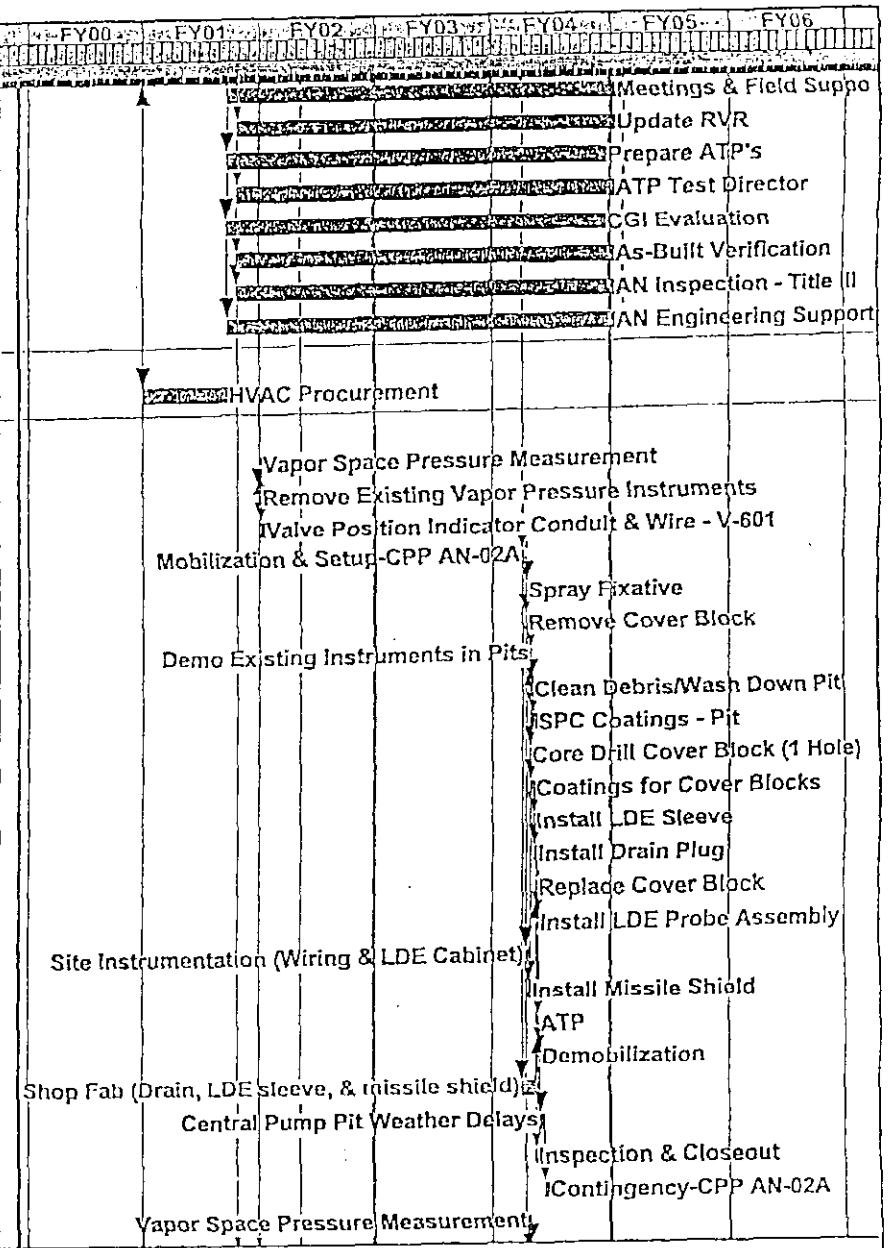
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A2114	Meetings & Field Support	831	28JUN01	13OCT04
5A2115	Update RVR	812	26JUL01	13OCT04
5A2116	Prepare ATP's	812	28JUN01	16SEP04
5A2117	ATP Test Director	812	26JUL01	13OCT04
5A2118	CGI Evaluation	812	28JUN01	16SEP04
5A2119	As-Built Verification	812	26JUL01	13OCT04
5A2121	AN Inspection - Title III	812	26JUL01	13OCT04
5A2131	AN Engineering Support - Title III	831	28JUN01	13OCT04
AN - Procurement				
5A3A00	HVAC Procurement	185	02OCT00*	26JUN01
AN - Construction				
5A4A08A	Vapor Space Pressure Measurement	3	09OCT01	11OCT01
5A4A08B	Remove Existing Vapor Pressure Instruments	6	01OCT01*	08OCT01
5A4A11	Valve Position Indicator Conduit & Wire - V-601	6	12OCT01	19OCT01
5A4B021	Mobilization & Setup-CPP AN-02A	6	02JAN04	09JAN04
5A4B022	Spray Fixative	2	12JAN04	13JAN04
5A4B023	Remove Cover Block	1	14JAN04	14JAN04
5A4B024	Demo Existing Instruments in Pits	1	23JAN04	23JAN04
5A4B025	Clean Debris/Wash Down Pit	5	26JAN04	30JAN04
5A4B026	SPC Coatings - Pit	10	02FEB04	13FEB04
5A4B027	Core Drill Cover Block (1 Hole)	2	23JAN04	26JAN04
5A4B028	Coatings for Cover Blocks	8	27JAN04	05FEB04
5A4B029	Install LDE Sleeve	2	06FEB04	09FEB04
5A4B02A	Install Drain Plug	2	10FEB04	11FEB04
5A4B02B	Replace Cover Block	1	13FEB04	13FEB04
5A4B02C	Install LDE Probe Assembly	1	18FEB04	18FEB04
5A4B02D	Site Instrumentation (Wiring & LDE Cabinet)	5	12JAN04	16JAN04
5A4B02E	Install Missile Shield	3	20JAN04	22JAN04
5A4B02F	ATP	2	19FEB04	20FEB04
5A4B02G	Demobilization	2	23FEB04	24FEB04
5A4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	02JAN04	11FEB04
5A4B02J	Central Pump Pit Weather Delays	12	25FEB04	11MAR04
5A4B02M	Inspection & Closeout	1	12FEB04	12FEB04
5A4B02N	Contingency-CPP AN-02A	9	12MAR04	24MAR04
5A4B08A	Vapor Space Pressure Measurement	3	20JAN04	22JAN04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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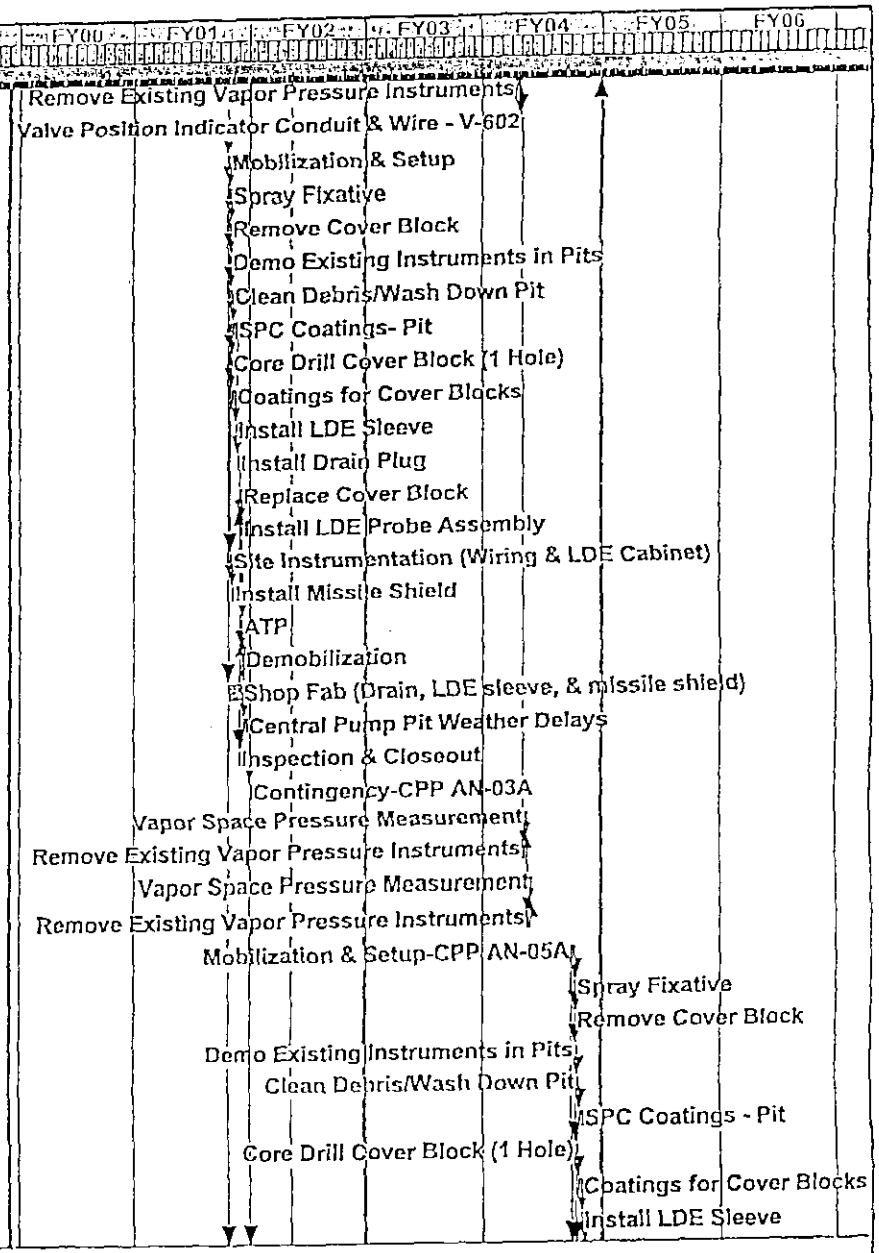
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A4B08B	Remove Existing Vapor Pressure Instruments	6	12JAN04	19JAN04
5A4B11	Valve Position Indicator Conduit & Wire - V-602	6	23JAN04	30JAN04
5A4C021	Mobilization & Setup	6	26JUL01	02AUG01
5A4C022	Spray Fixative	2	03AUG01	06AUG01
5A4C023	Remove Cover Block	1	07AUG01	07AUG01
5A4C024	Demo Existing Instruments in Pits	1	08AUG01	08AUG01
5A4C025	Clean Debris/Wash Down Pit	5	09AUG01	15AUG01
5A4C026	SPC Coatings- Pit	10	16AUG01	29AUG01
5A4C027	Core Drill Cover Block (1 Hole)	2	08AUG01	09AUG01
5A4C028	Coatings for Cover Blocks	8	10AUG01	21AUG01
5A4C029	Install LDE Sleeve	2	22AUG01	23AUG01
5A4C02A	Install Drain Plug	2	30AUG01	31AUG01
5A4C02B	Replace Cover Block	1	05SEP01	05SEP01
5A4C02C	Install LDE Probe Assembly	1	06SEP01	06SEP01
5A4C02D	Site Instrumentation (Wiring & LDE Cabinet)	5	03AUG01	09AUG01
5A4C02E	Install Missile Shield	3	10AUG01	14AUG01
5A4C02F	ATP	2	07SEP01	10SEP01
5A4C02G	Demobilization	2	11SEP01	12SEP01
5A4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	26JUL01	05SEP01
5A4C02J	Central Pump Pit Weather Delays	12	13SEP01	28SEP01
5A4C02M	Inspection & Closeout	1	04SEP01	04SEP01
5A4C02N	Contingency-CPP AN-03A	9	01OCT01	11OCT01
5A4C08A	Vapor Space Pressure Measurement	3	10FEB04	12FEB04
5A4C08B	Remove Existing Vapor Pressure Instruments	6	02FEB04	09FEB04
5A4D08A	Vapor Space Pressure Measurement	3	24FEB04	26FEB04
5A4D08B	Remove Existing Vapor Pressure Instruments	6	13FEB04	23FEB04
5A4E021	Mobilization & Setup-CPP AN-05A	6	01JUL04	09JUL04
5A4E022	Spray Fixative	2	12JUL04	13JUL04
5A4E023	Remove Cover Block	1	14JUL04	14JUL04
5A4E024	Demo Existing Instruments in Pits	1	15JUL04	15JUL04
5A4E025	Clean Debris/Wash Down Pit	5	16JUL04	22JUL04
5A4E026	SPC Coatings - Pit	10	23JUL04	05AUG04
5A4E027	Core Drill Cover Block (1 Hole)	2	15JUL04	16JUL04
5A4E028	Coatings for Cover Blocks	8	19JUL04	28JUL04
5A4E029	Install LDE Sleeve	2	30JUL04	02AUG04



Project Start 18JUL99
Project Finish 26APR04
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

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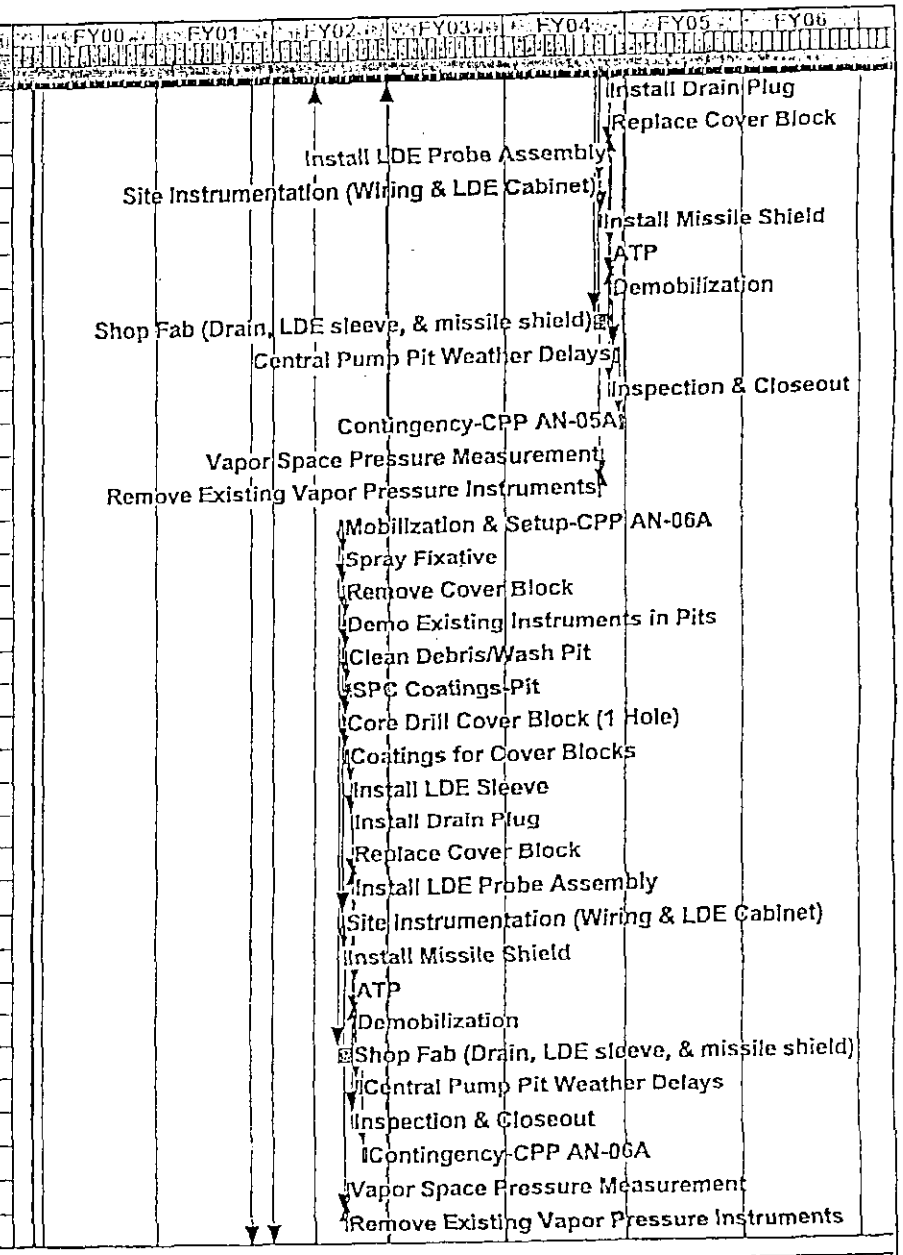
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A4E02A	Install Drain Plug	2	05AUG04	06AUG04
5A4E02B	Replace Cover Block	1	11AUG04	11AUG04
5A4E02C	Install LDE Probe Assembly	1	13AUG04	13AUG04
5A4E02D	Site Instrumentation (Wiring & LDE Cabinet)	5	12JUL04	16JUL04
5A4E02E	Install Missile Shield	3	20JUL04	22JUL04
5A4E02F	ATP	2	16AUG04	17AUG04
5A4E02G	Demobilization	2	19AUG04	20AUG04
5A4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	01JUL04	11AUG04
5A4E02J	Central Pump Pit Weather Delays	12	24AUG04	09SEP04
5A4E02M	Inspection & Closeout	1	10AUG04	10AUG04
5A4E02N	Contingency-CPP AN-05A	9	10SEP04	22SEP04
5A4E08A	Vapor Space Pressure Measurement	3	20JUL04	22JUL04
5A4E08B	Remove Existing Vapor Pressure Instruments	6	12JUL04	19JUL04
5A4F021	Mobilization & Setup-CPP AN-06A	6	01MAY02	08MAY02
5A4F022	Spray Fixative	2	09MAY02	10MAY02
5A4F023	Remove Cover Block	2	13MAY02	14MAY02
5A4F024	Demo Existing Instruments in Pits	1	15MAY02	15MAY02
5A4F025	Clean Debris/Wash Pit	5	16MAY02	22MAY02
5A4F026	SPC Coatings-Pit	10	23MAY02	06JUN02
5A4F027	Core Drill Cover Block (1 Hole)	2	15MAY02	16MAY02
5A4F028	Coatings for Cover Blocks	8	20MAY02	30MAY02
5A4F029	Install LDE Sleeve	2	03JUN02	04JUN02
5A4F02A	Install Drain Plug	2	06JUN02	07JUN02
5A4F02B	Replace Cover Block	1	11JUN02	11JUN02
5A4F02C	Install LDE Probe Assembly	1	13JUN02	13JUN02
5A4F02D	Site Instrumentation (Wiring & LDE Cabinet)	5	09MAY02	15MAY02
5A4F02E	Install Missile Shield	3	17MAY02	21MAY02
5A4F02F	ATP	2	17JUN02	18JUN02
5A4F02G	Demobilization	2	19JUN02	20JUN02
5A4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	01MAY02	11JUN02
5A4F02J	Central Pump Pit Weather Delays	12	24JUN02	10JUL02
5A4F02M	Inspection & Closeout	1	10JUN02	10JUN02
5A4F02N	Contingency-CPP AN-06A	9	11JUL02	23JUL02
5A4F08A	Vapor Space Pressure Measurement	3	24MAY02	29MAY02
5A4F08B	Remove Existing Vapor Pressure Instruments	6	16MAY02	23MAY02



Project Start	19JUL99	Early Bar	
Project Finish	26APR08	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	20SEP99		

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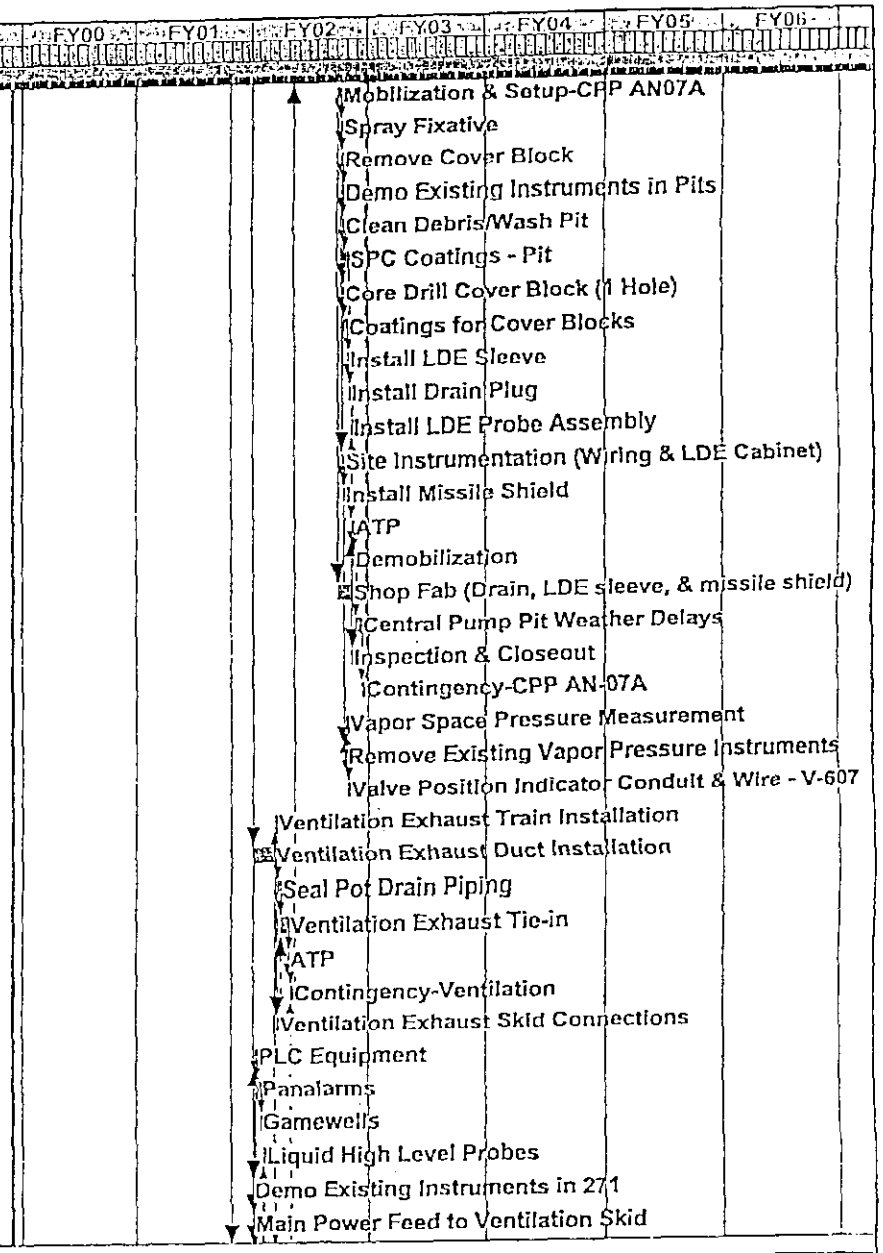
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AN Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A4G021	Mobilization & Setup-CPP AN07A	6	01JUL02	09JUL02
5A4G022	Spray Fixative	2	10JUL02	11JUL02
5A4G023	Remove Cover Block	2	12JUL02	15JUL02
5A4G024	Demo Existing Instruments in Pits	1	16JUL02	16JUL02
5A4G025	Clean Debris/Wash Pit	5	17JUL02	23JUL02
5A4G026	SPC Coatings - Pit	10	24JUL02	06AUG02
5A4G027	Core Drill Cover Block (1 Hole)	2	16JUL02	17JUL02
5A4G028	Coatings for Cover Blocks	8	18JUL02	29JUL02
5A4G029	Install LDE Sleeve	2	30JUL02	31JUL02
5A4G02A	Install Drain Plug	2	07AUG02	08AUG02
5A4G02C	Install LDE Probe Assembly	1	13AUG02	13AUG02
5A4G02D	Site Instrumentation (Wiring & LDE Cabinet)	5	10JUL02	16JUL02
5A4G02E	Install Missile Shield	3	17JUL02	19JUL02
5A4G02F	ATP	2	14AUG02	15AUG02
5A4G02G	Demobilization	2	19AUG02	20AUG02
5A4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	01JUL02	09AUG02
5A4G02J	Central Pump Pit Weather Delays	12	22AUG02	09SEP02
5A4G02M	Inspection & Closeout	1	12AUG02	12AUG02
5A4G02N	Contingency-CPP AN-07A	9	10SEP02	20SEP02
5A4G08A	Vapor Space Pressure Measurement	3	25JUL02	29JUL02
5A4G08B	Remove Existing Vapor Pressure Instruments	6	17JUL02	24JUL02
5A4G11	Valve Position Indicator Conduit & Wire - V-607	6	30JUL02	06AUG02
5A4J02	Ventilation Exhaust Train Installation	3	13DEC01	17DEC01
5A4J05	Ventilation Exhaust Duct Installation	51	01OCT01*	12DEC01
5A4J07	Seal Pot Drain Piping	6	18DEC01	27DEC01
5A4J09	Ventilation Exhaust Tie-in	17	28DEC01	22JAN02
5A4J11	ATP	3	23JAN02	25JAN02
5A4J12	Contingency-Ventilation	10	28JAN02	08FEB02
5A4J22A	Ventilation Exhaust Skid Connections	5	18DEC01	26DEC01
5A4J22B	PLC Equipment	8	08OCT01	17OCT01
5A4J22C	Panalarms	8	18OCT01	29OCT01
5A4J22D	Gamewells	2	30OCT01	31OCT01
5A4J22E	Liquid High Level Probes	3	05NOV01	07NOV01
5A4J22F	Demo Existing Instruments in 271	5	01OCT01	05OCT01
5A4J26A	Main Power Feed to Ventilation Skid	5	01OCT01	05OCT01



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

ASH1

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

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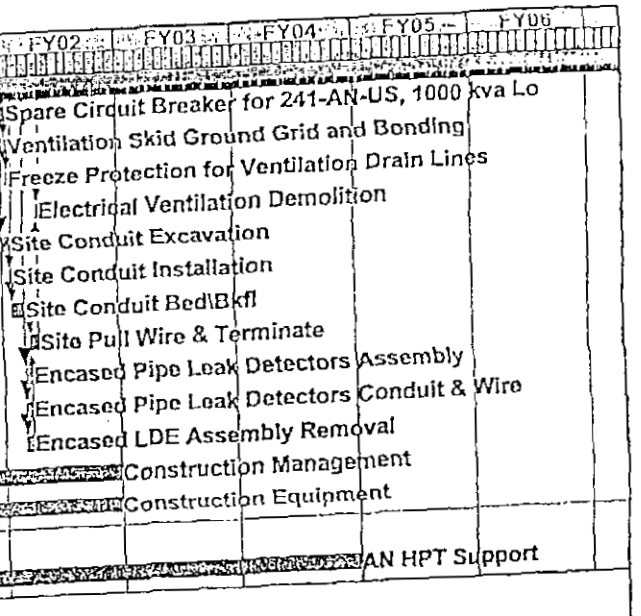
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5A4J26B	Spare Circuit Breaker for 241-AN-US, 1000 kva Lo	7	08OCT01	16OCT01
5A4J26C	Ventilation Skid Ground Grid and Bonding	5	17OCT01	23OCT01
5A4J26D	Freeze Protection for Ventilation Drain Lines	1	24OCT01	24OCT01
5A4J26E	Electrical Ventilation Demolition	2	22JAN02	23JAN02
5A4J27A	Site Conduit Excavation	20	01OCT01	26OCT01
5A4J27B	Site Conduit Installation	5	29OCT01	02NOV01
5A4J27C	Site Conduit Bed\Bkfl	25	05NOV01	11DEC01
5A4J28	Site Pull Wire & Terminate	15	31DEC01	21JAN02
5A4J35A	Encased Pipe Leak Detectors Assembly	10	13DEC01	28DEC01
5A4J35B	Encased Pipe Leak Detectors Conduit & Wire	10	13DEC01	28DEC01
5A4J35C	Encased LDE Assembly Removal	10	13DEC01	28DEC01
5A4N	Construction Management	297	26JUL01	27SEP02
5A4P	Construction Equipment	297	26JUL01	27SEP02
AN - HPT Support				
5A6100	AN HPT Support	797	26JUL01	22SEP04



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

ASHI

Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AN Farm - Figure 7.1

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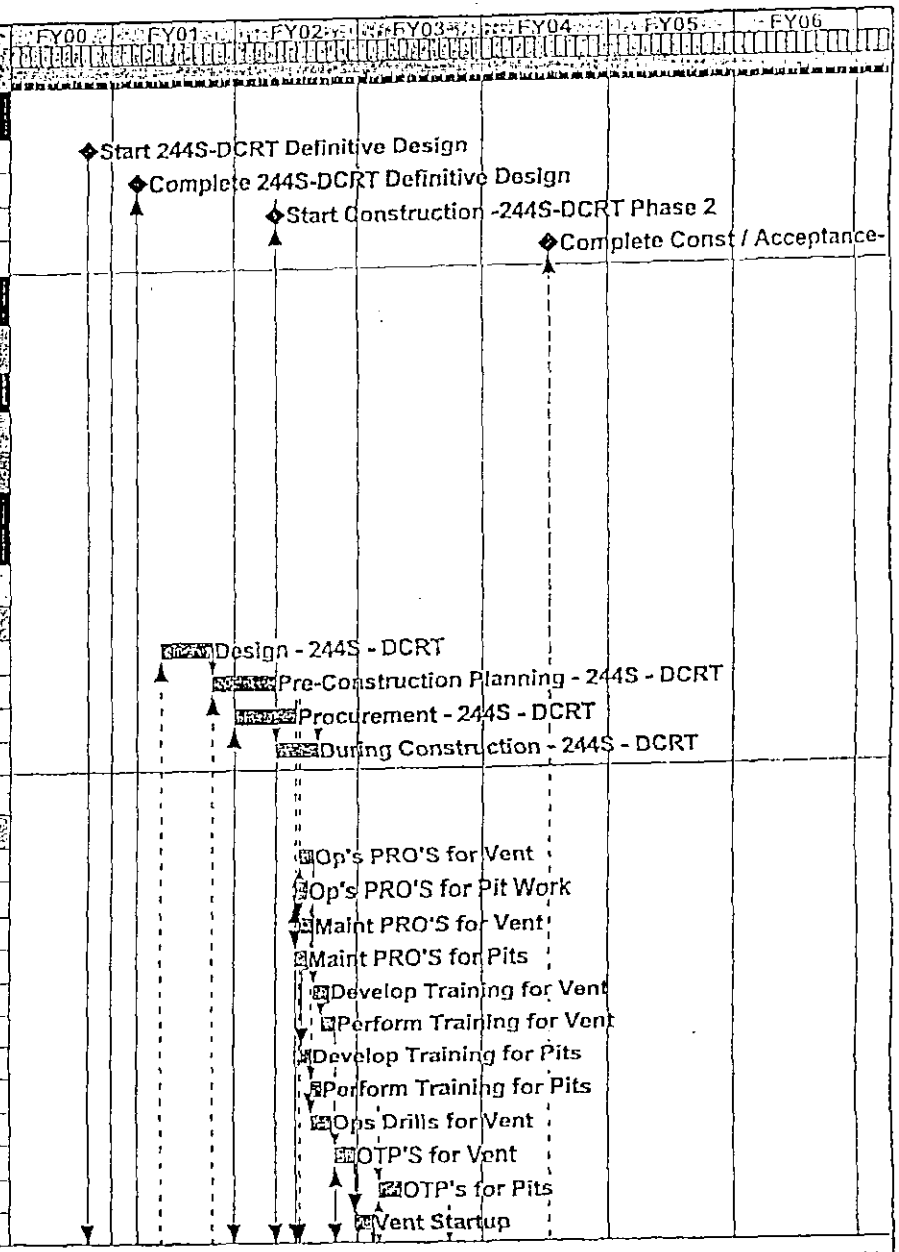
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5H0050	Start 244S-DCRT Definitive Design	0	24JUL00	
5H1202	Complete 244S-DCRT Definitive Design	0		20DEC00
5H1203	Start Construction -244S-DCRT Phase 2	0	04FEB02	
5H1204	Complete Const / Acceptance-244S-DCRT Phase	0		12APR04
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.04.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - 244S-DCRT				
3C5G1A	Design - 244S - DCRT	105	01MAR01*	27JUL01
3C5G2A	Pre-Construction Planning - 244S - DCRT	130	27JUL01	01FEB02
3C5G3A	Procurement - 244S - DCRT	125	01OCT01	01APR02
3C5G4A	During Construction - 244S - DCRT	84	04FEB02	03JUN02
Startup & Testing - Phase 2				
Startup & Testing - 244S-DCRT				
3K5G3A1	Op's PRO'S for Vent	30	15APR02	24MAY02
3K5G3A2	Op's PRO'S for Pit Work	30	01APR02	10MAY02
3K5G3A3	Maint PRO'S for Vent	30	15APR02	24MAY02
3K5G3A4	Maint PRO'S for Pits	30	01APR02	10MAY02
3K5G3A5	Develop Training for Vent	30	28MAY02	09JUL02
3K5G3A6	Perform Training for Vent	30	17JUN02	29JUL02
3K5G3A7	Develop Training for Pits	20	22APR02	17MAY02
3K5G3A8	Perform Training for Pits	20	20MAY02	17JUN02
3K5G3A9	Ops Drills for Vent	39	20MAY02	15JUL02
3K5G3AA	OTP'S for Vent	40	30JUL02	24SEP02
3K5G3AB	OTP's for Pits	45	05DEC02	10FEB03
3K5G3AC	Vent Startup	40	25SEP02	19NOV02



Project Start	10JUL99	Early Bar
Project Finish	26APR05	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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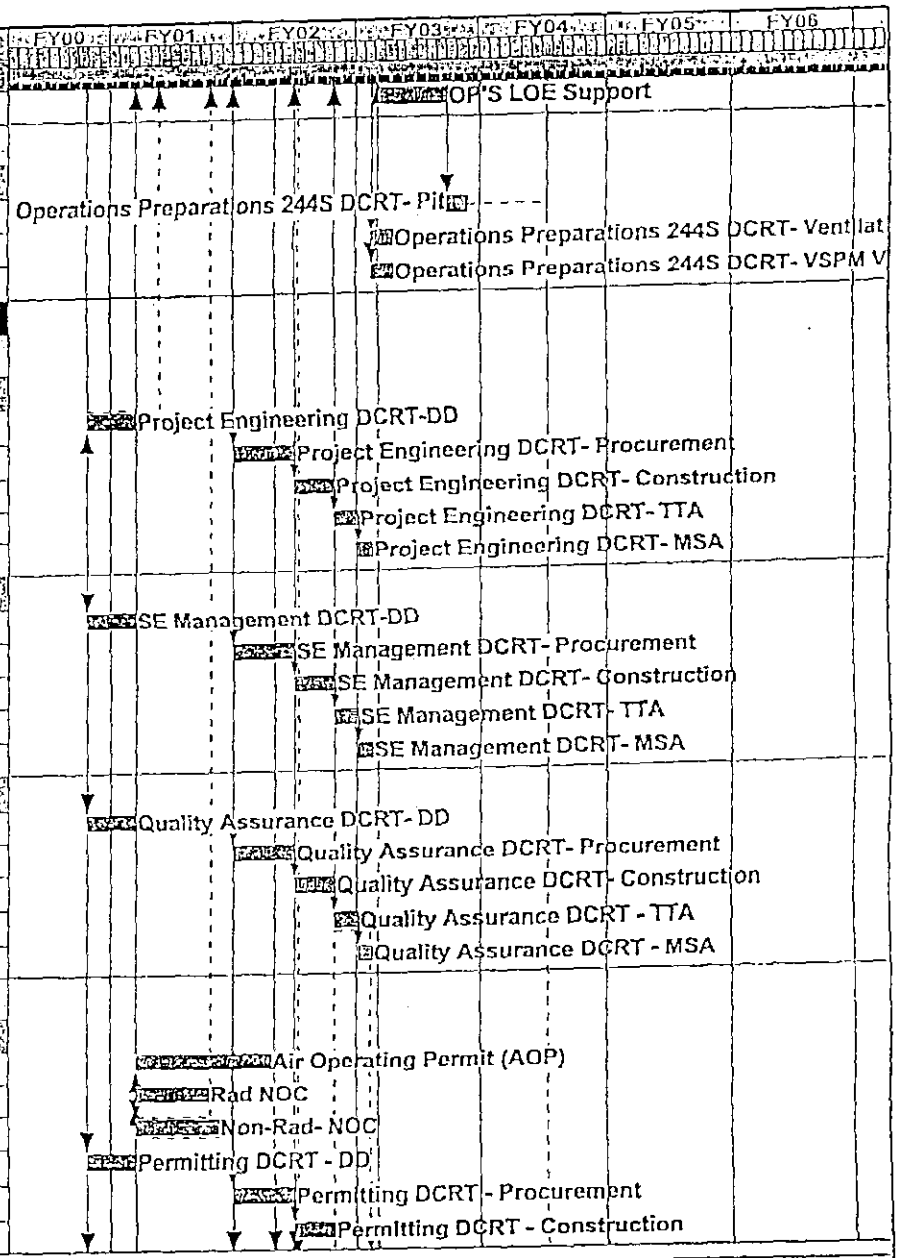
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

244S-DCRT - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3K5G3AE	OP'S LOE Support	144	05DEC02	01JUL03
Operations Preparation				
Ops Prep - MSA - 244S-DCRT				
3L5G1N	Operations Preparations 244S DCRT- Pit	40	02JUL03	27AUG03
3L5G1O	Operations Preparations 244S DCRT- Ventilation	40	20NOV02	21JAN03
3L5G1P	Operations Preparations 244S DCRT- VSPM	40	20NOV02	21JAN03
Capital- Phase 2				
Project Management				
Project Engineering				
1B5G1A	Project Engineering DCRT-DD	105	24JUL00	20DEC00
1B5G2A	Project Engineering DCRT- Procurement	125	01OCT01	01APR02
1B5G3A	Project Engineering DCRT- Construction	84	01APR02*	29JUL02
1B5G4A	Project Engineering DCRT- TTA	50	30JUL02	08OCT02
1B5G5A	Project Engineering DCRT- MSA	30	09OCT02	19NOV02
Systems Engineering				
1C5G1A	SE Management DCRT-DD	105	24JUL00	20DEC00
1C5G2A	SE Management DCRT- Procurement	125	01OCT01	01APR02
1C5G3A	SE Management DCRT- Construction	84	01APR02	29JUL02
1C5G4A	SE Management DCRT- TTA	50	30JUL02	08OCT02
1C5G5A	SE Management DCRT- MSA	30	09OCT02	19NOV02
Quality Assurance				
1D5G1A	Quality Assurance DCRT- DD	105	24JUL00	20DEC00
1D5G2A	Quality Assurance DCRT- Procurement	125	01OCT01	01APR02
1D5G3A	Quality Assurance DCRT- Construction	84	01APR02	29JUL02
1D5G4A	Quality Assurance DCRT - TTA	50	30JUL02	08OCT02
1D5G5A	Quality Assurance DCRT - MSA	30	09OCT02	19NOV02
Permitting and Safety				
Permits				
244.AOP	Air Operating Permit (AOP)	273	21DEC00	23JAN02
244.NOC1	Rad NOC	147	21DEC00	23JUL01
244.NOC2	Non-Rad- NOC	168	21DEC00	21AUG01
2A5G2A	Permitting DCRT - DD	105	24JUL00	20DEC00
2A5G3A	Permitting DCRT - Procurement	125	01OCT01	01APR02
2A5G4A	Permitting DCRT - Construction	84	01APR02	29JUL02



Project Start	19JUL99	Early Bar	
Project Finish	28APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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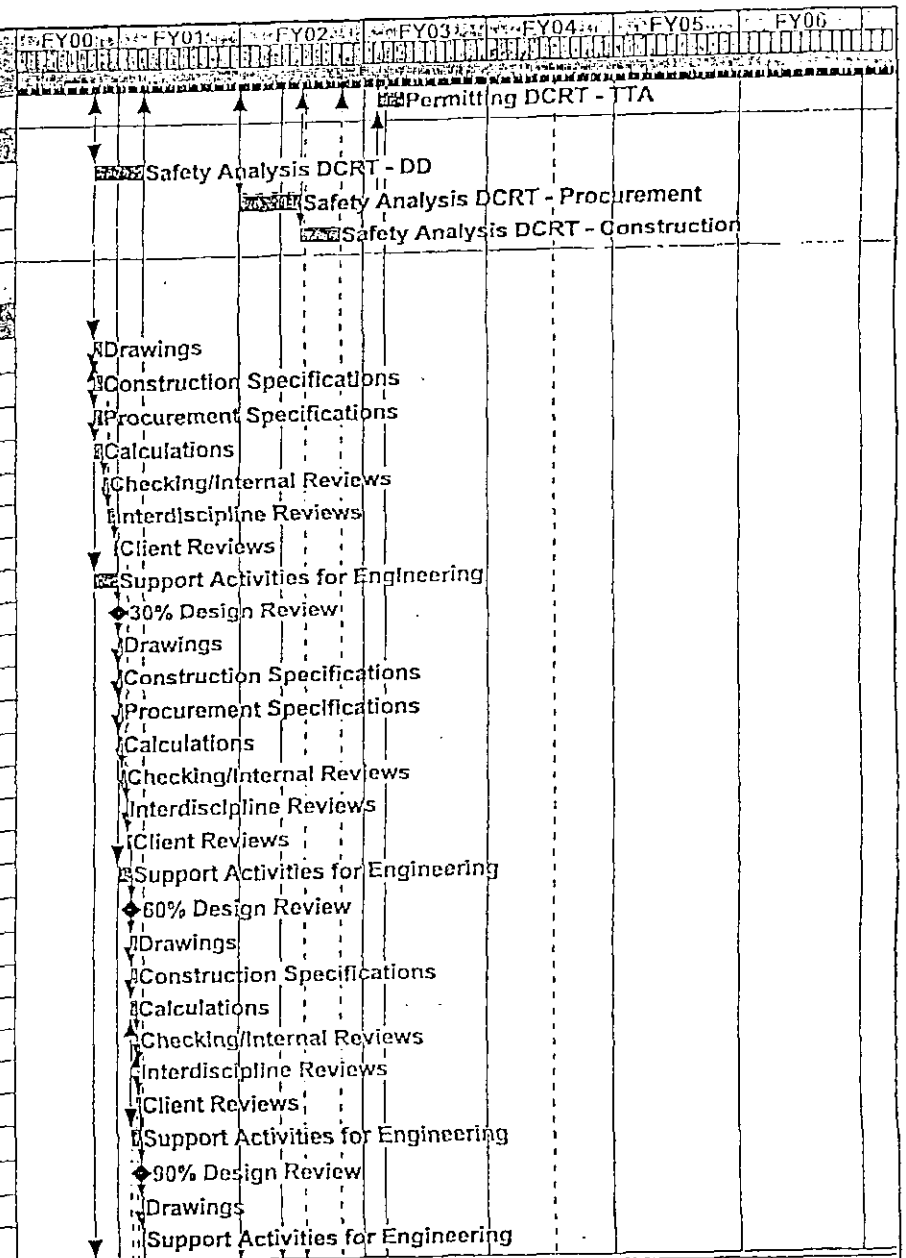
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

244S-DCRT - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
2A5G5A	Permitting DCRT - TTA	50	12NOV02	27JAN03
Safety Analysis				
2B5G1A	Safety Analysis DCRT - DD	105	24JUL00	20DEC00
2B5G2A	Safety Analysis DCRT - Procurement	125	01OCT01	01APR02
2B5G3A	Safety Analysis DCRT - Construction	84	01APR02	29JUL02
244-S DCRT				
244-S DCRT - Definitive Design				
5H1111	Drawings	20	24JUL00	18AUG00
5H1112	Construction Specifications	20	24JUL00	18AUG00
5H1113	Procurement Specifications	20	24JUL00	18AUG00
5H1114	Calculations	20	24JUL00	18AUG00
5H1115	Checking/Internal Reviews	10	21AUG00	01SEP00
5H1116	Interdiscipline Reviews	10	05SEP00	18SEP00
5H1117	Client Reviews	10	19SEP00	02OCT00
5H1118	Support Activities for Engineering	50	24JUL00	02OCT00
5H1119	30% Design Review	0		02OCT00
5H1121	Drawings	10	03OCT00	16OCT00
5H1122	Construction Specifications	10	03OCT00	16OCT00
5H1123	Procurement Specifications	10	03OCT00	16OCT00
5H1124	Calculations	10	03OCT00	16OCT00
5H1125	Checking/Internal Reviews	5	17OCT00	23OCT00
5H1126	Interdiscipline Reviews	5	24OCT00	30OCT00
5H1127	Client Reviews	10	31OCT00	13NOV00
5H1128	Support Activities for Engineering	30	03OCT00	13NOV00
5H1129	60% Design Review	0		13NOV00
5H1131	Drawings	10	14NOV00	29NOV00
5H1132	Construction Specifications	10	14NOV00	29NOV00
5H1134	Calculations	10	14NOV00	29NOV00
5H1135	Checking/Internal Reviews	3	30NOV00	04DEC00
5H1136	Interdiscipline Reviews	3	05DEC00	07DEC00
5H1137	Client Reviews	5	08DEC00	14DEC00
5H1138	Support Activities for Engineering	20	14NOV00	13DEC00
5H1139	90% Design Review	0		14DEC00
5H1141	Drawings	4	15DEC00	20DEC00
5H1142	Support Activities for Engineering	4	15DEC00	20DEC00



Project Start	19JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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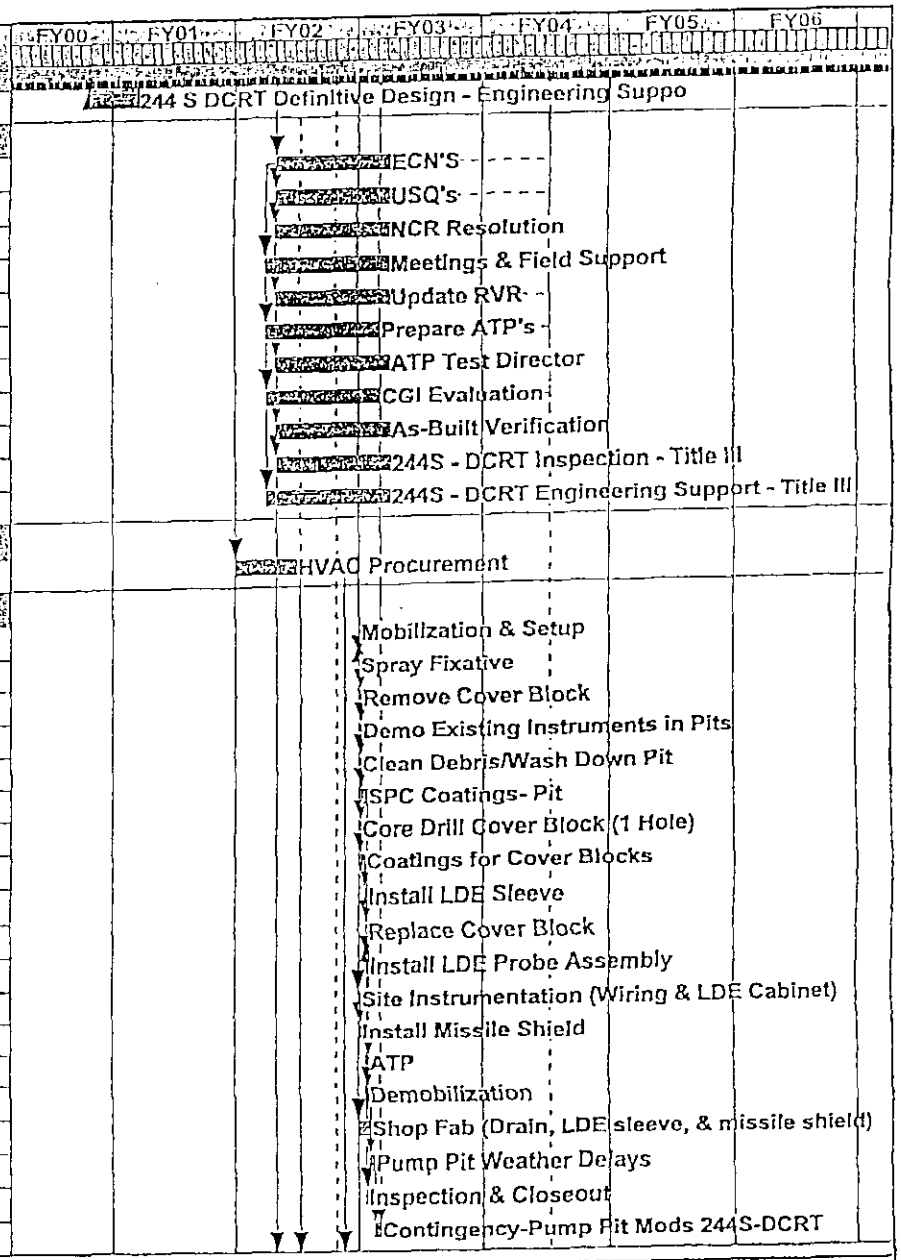
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
244S-DCRT - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5H1201	244 S DCRT Definitive Design - Engineering	105	24JUL00	20DEC00
244-S DCRT - E&I During Construction				
5H2111	ECN'S	231	04FEB02	03JAN03
5H2112	USQ's	231	04FEB02	03JAN03
5H2113	NCR Resolution	231	04FEB02	03JAN03
5H2114	Meetings & Field Support	251	07JAN02	03JAN03
5H2115	Update RVR	231	04FEB02	03JAN03
5H2116	Prepare ATP's	232	07JAN02	04DEC02
5H2117	ATP Test Director	231	04FEB02	03JAN03
5H2118	CGI Evaluation	232	07JAN02	04DEC02
5H2119	As-Built Verification	231	04FEB02	03JAN03
5H2121	244S - DCRT Inspection - Title III	231	04FEB02	03JAN03
5H2131	244S - DCRT Engineering Support - Title III	251	07JAN02	03JAN03
244-S DCRT - Procurement				
5H3B00	HVAC Procurement	125	01OCT01*	01APR02
244-S DCRT - Construction				
5H4B001	Mobilization & Setup	2	01OCT02*	02OCT02
5H4B002	Spray Fixative	2	03OCT02	04OCT02
5H4B003	Remove Cover Block	1	07OCT02	07OCT02
5H4B004	Demo Existing Instruments in Pits	1	08OCT02	08OCT02
5H4B005	Clean Debris/Wash Down Pit	2	09OCT02	10OCT02
5H4B006	SPC Coatings- Pit	10	11OCT02	24OCT02
5H4B007	Core Drill Cover Block (1 Hole)	2	08OCT02	09OCT02
5H4B008	Coatings for Cover Blocks	8	10OCT02	21OCT02
5H4B009	Install LDE Sleeve	2	22OCT02	23OCT02
5H4B00B	Replace Cover Block	1	25OCT02	25OCT02
5H4B00C	Install LDE Probe Assembly	1	28OCT02	28OCT02
5H4B00D	Site Instrumentation (Wiring & LDE Cabinet)	5	01OCT02	07OCT02
5H4B00E	Install Missile Shield	3	08OCT02	10OCT02
5H4B00F	ATP	2	29OCT02	30OCT02
5H4B00G	Demobilization	2	31OCT02	01NOV02
5H4B00H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	01OCT02	08NOV02
5H4B00J	Pump Pit Weather Delays	12	04NOV02	19NOV02
5H4B00M	Inspection & Closeout	1	24OCT02	24OCT02
5H4B00N	Contingency-Pump Pit Mods 244S-DCRT	9	20NOV02	04DEC02



Project Start 10JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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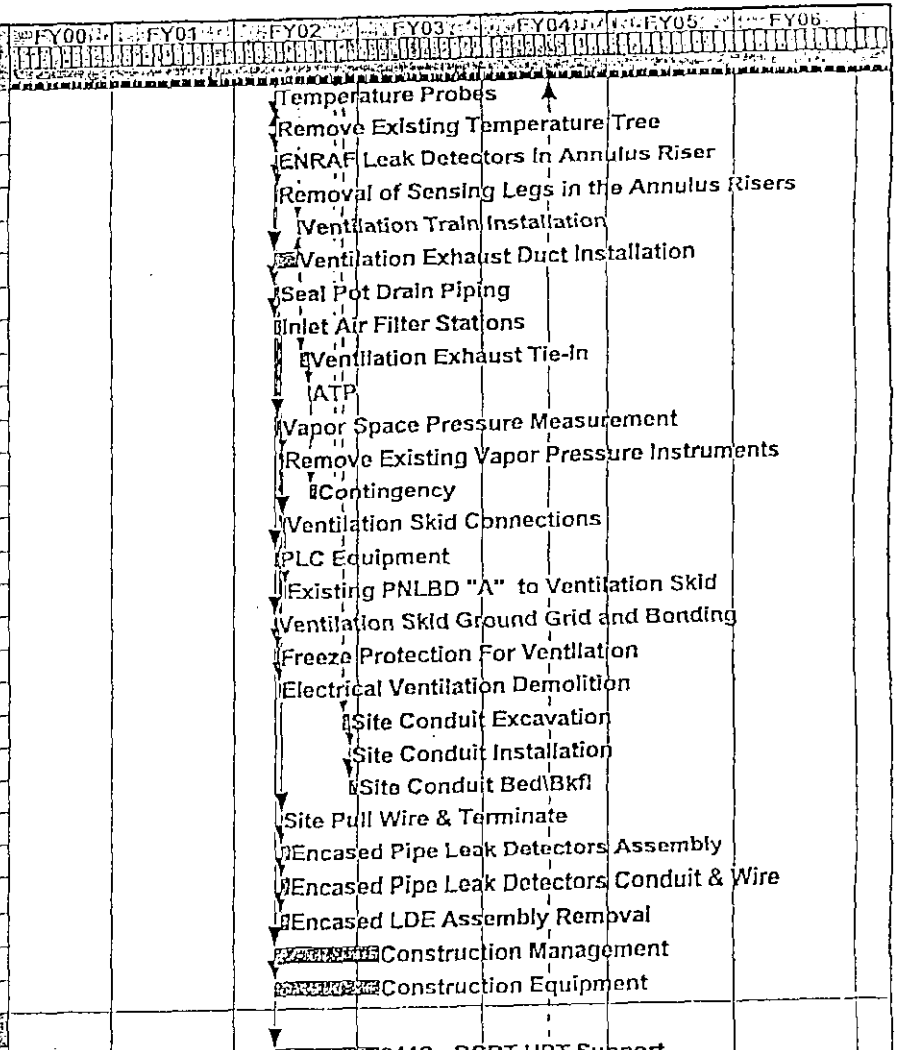
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
244S-DCRT - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5H4B02A	Temperature Probes	2	04FEB02	05FEB02
5H4B02B	Remove Existing Temperature Tree	1	04FEB02	04FEB02
5H4B03A	ENRAF Leak Detectors in Annulus Riser	3	04FEB02	06FEB02
5H4B03B	Removal of Sensing Legs in the Annulus Risers	1	07FEB02	07FEB02
5H4B05	Ventilation Train Installation	3	17APR02	19APR02
5H4B06	Ventilation Exhaust Duct Installation	51	04FEB02	16APR02
5H4B07	Seal Pot Drain Piping	6	04FEB02	11FEB02
5H4B09	Inlet Air Filter Stations	10	06FEB02	20FEB02
5H4B10	Ventilation Exhaust Tie-in	17	22APR02	14MAY02
5H4B11	ATP	3	15MAY02	17MAY02
5H4B11A	Vapor Space Pressure Measurement	10	08FEB02	22FEB02
5H4B11B	Remove Existing Vapor Pressure Instruments	2	25FEB02	26FEB02
5H4B12	Contingency	10	20MAY02	03JUN02
5H4B12A	Ventilation Skid Connections	3	27FEB02	01MAR02
5H4B12B	PLC Equipment	8	04FEB02	13FEB02
5H4B14A	Existing PNLBD "A" to Ventilation Skid	2	04MAR02	05MAR02
5H4B14D	Ventilation Skid Ground Grid and Bonding	5	04FEB02	08FEB02
5H4B14E	Freeze Protection For Ventilation	2	11FEB02	12FEB02
5H4B14F	Electrical Ventilation Demolition	2	14FEB02	15FEB02
5H4B15A	Site Conduit Excavation	10	22AUG02	05SEP02
5H4B15B	Site Conduit Installation	2	06SEP02	09SEP02
5H4B15C	Site Conduit Bed\Bkfl	15	10SEP02	30SEP02
5H4B16	Site Pull Wire & Terminate	2	21FEB02	22FEB02
5H4B35A	Encased Pipe Leak Detectors Assembly	20	19FEB02	18MAR02
5H4B35B	Encased Pipe Leak Detectors Conduit & Wire	20	19FEB02	18MAR02
5H4B35C	Encased LDE Assembly Removal	20	19FEB02	18MAR02
5H4N	Construction Management	212	04FEB02	04DEC02
5H4P	Construction Equipment	212	04FEB02	04DEC02
244-S DCRT - HPT Support				
5H6100	244S - DCRT HPT Support	212	04FEB02	04DEC02



Project Start	19JUL99	Early Bar	
Project Finish	28APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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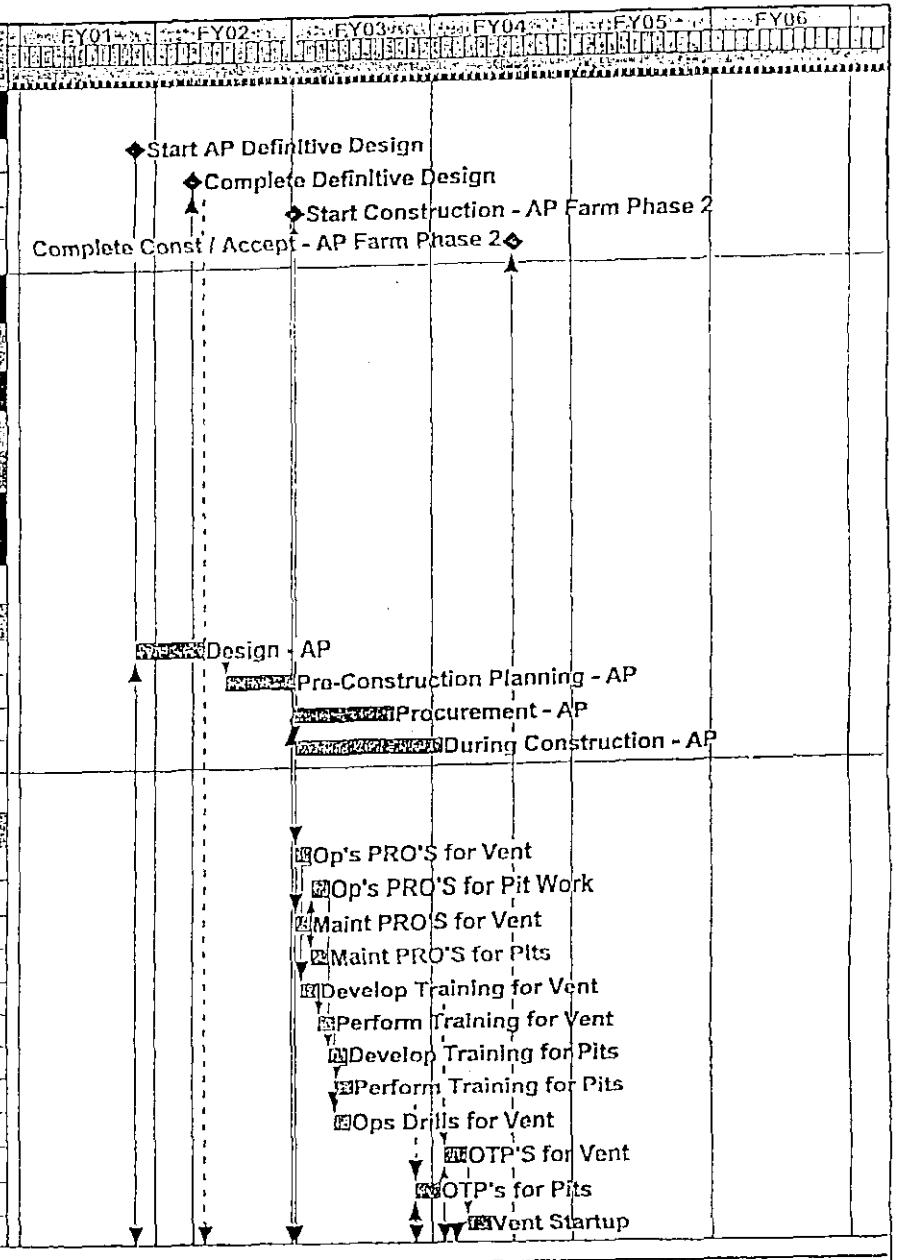
Sheet 5 of 5

Cogema Engineering
W-314 Phase 2 -Detailed Schedule
244S-DCRT - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B0099	Start AP Definitive Design	0	08AUG01*	
5B1202	Complete Definitive Design	0		09JAN02
5B1203	Start Construction - AP Farm Phase 2	0	10OCT02	
5B1204	Complete Const / Accept - AP Farm Phase 2	0		03MAY04
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1E01.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - AP Farm				
3C5B1A	Design - AP	128	08AUG01	11FEB02
3C5B2A	Pre-Construction Planning - AP	130	09APR02	10OCT02
3C5B3A	Procurement - AP	185	01OCT02	25JUN03
3C5B4A	During Construction - AP	268	10OCT02	31OCT03
Startup & Testing - Phase 2				
Startup & Testing - AP Farm				
3K5B3A1	Op's PRO'S for Vent	30	11OCT02	21NOV02
3K5B3A2	Op's PRO'S for Pit Work	30	22NOV02	09JAN03
3K5B3A3	Maint PRO'S for Vent	30	11OCT02	21NOV02
3K5B3A4	Maint PRO'S for Pits	30	22NOV02	09JAN03
3K5B3A5	Develop Training for Vent	30	25OCT02	09DEC02
3K5B3A6	Perform Training for Vent	30	10DEC02	23JAN03
3K5B3A7	Develop Training for Pits	30	10JAN03	21FEB03
3K5B3A8	Perform Training for Pits	30	28JAN03	11MAR03
3K5B3A9	Ops Drills for Vent	30	24JAN03	07MAR03
3K5B3AA	OTP'S for Vent	40	03NOV03	02JAN04
3K5B3AB	OTP's for Pits	45	21AUG03	23OCT03
3K5B3AC	Vent Startup	40	05JAN04	01MAR04



Project Start 19JUL99
Project Finish 28APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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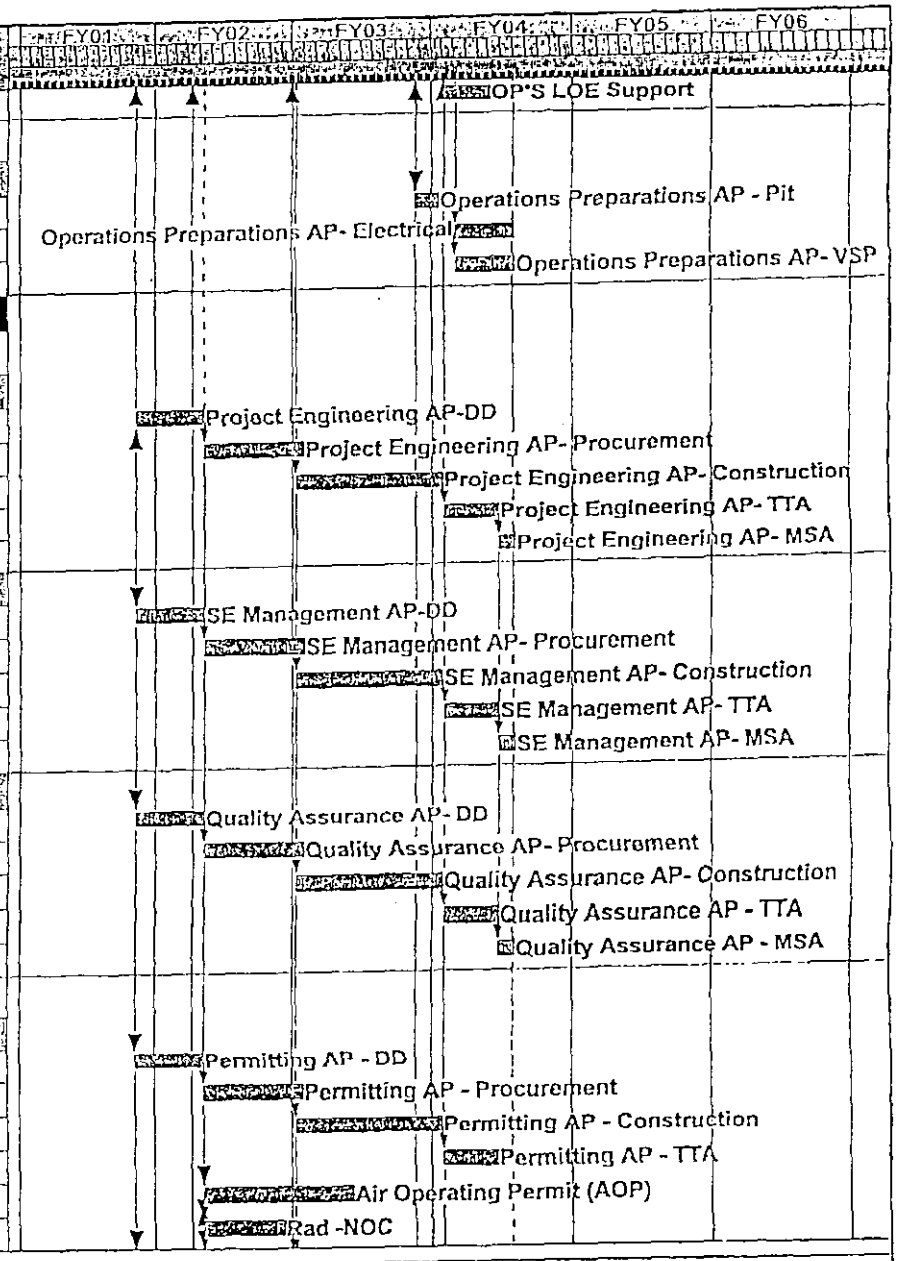
Sheet 1 of 10

Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3K5B3AE	OP'S LOE Support	80	03NOV03	01MAR04
Operations Preparation				
Ops Prep - MSA AP Farm				
3L5B1N	Operations Preparations AP - Pit	45	21AUG03	23OCT03
3L5B1O	Operations Preparations AP- Electrical	105	03DEC03	03MAY04
3L5B1P	Operations Preparations AP- VSPM Ventilation	105	03DEC03	03MAY04
Capital- Phase 2				
Project Management				
Project Engineering				
1B5B1A	Project Engineering AP-DD	128	08AUG01	11FEB02
1B5B2A	Project Engineering AP- Procurement	185	12FEB02	01NOV02
1B5B3A	Project Engineering AP- Construction	268	10OCT02	31OCT03
1B5B4A	Project Engineering AP- TTA	95	03NOV03	22MAR04
1B5B5A	Project Engineering AP- MSA	30	23MAR04	03MAY04
Systems Engineering				
1C5B1A	SE Management AP-DD	128	08AUG01	11FEB02
1C5B2A	SE Management AP- Procurement	185	12FEB02	01NOV02
1C5B3A	SE Management AP- Construction	267	10OCT02	30OCT03
1C5B4A	SE Management AP- TTA	95	03NOV03	22MAR04
1C5B5A	SE Management AP- MSA	30	23MAR04	03MAY04
Quality Assurance				
1D5B1A	Quality Assurance AP- DD	128	08AUG01	11FEB02
1D5B2A	Quality Assurance AP- Procurement	185	12FEB02	01NOV02
1D5B3A	Quality Assurance AP- Construction	267	10OCT02	30OCT03
1D5B4A	Quality Assurance AP - TTA	95	03NOV03	22MAR04
1D5B5A	Quality Assurance AP - MSA	30	23MAR04	03MAY04
Permitting and Safety				
Permits				
2A5B2A	Permitting AP - DD	128	08AUG01	11FEB02
2A5B3A	Permitting AP - Procurement	185	12FEB02	01NOV02
2A5B4A	Permitting AP - Construction	267	10OCT02	30OCT03
2A5B5A	Permitting AP - TTA	95	03NOV03	22MAR04
AP.AOP	Air Operating Permit (AOP)	273	12FEB02	13MAR03
AP.NOC1	Rad -NOC	147	12FEB02	10SEP02



Project Start	19JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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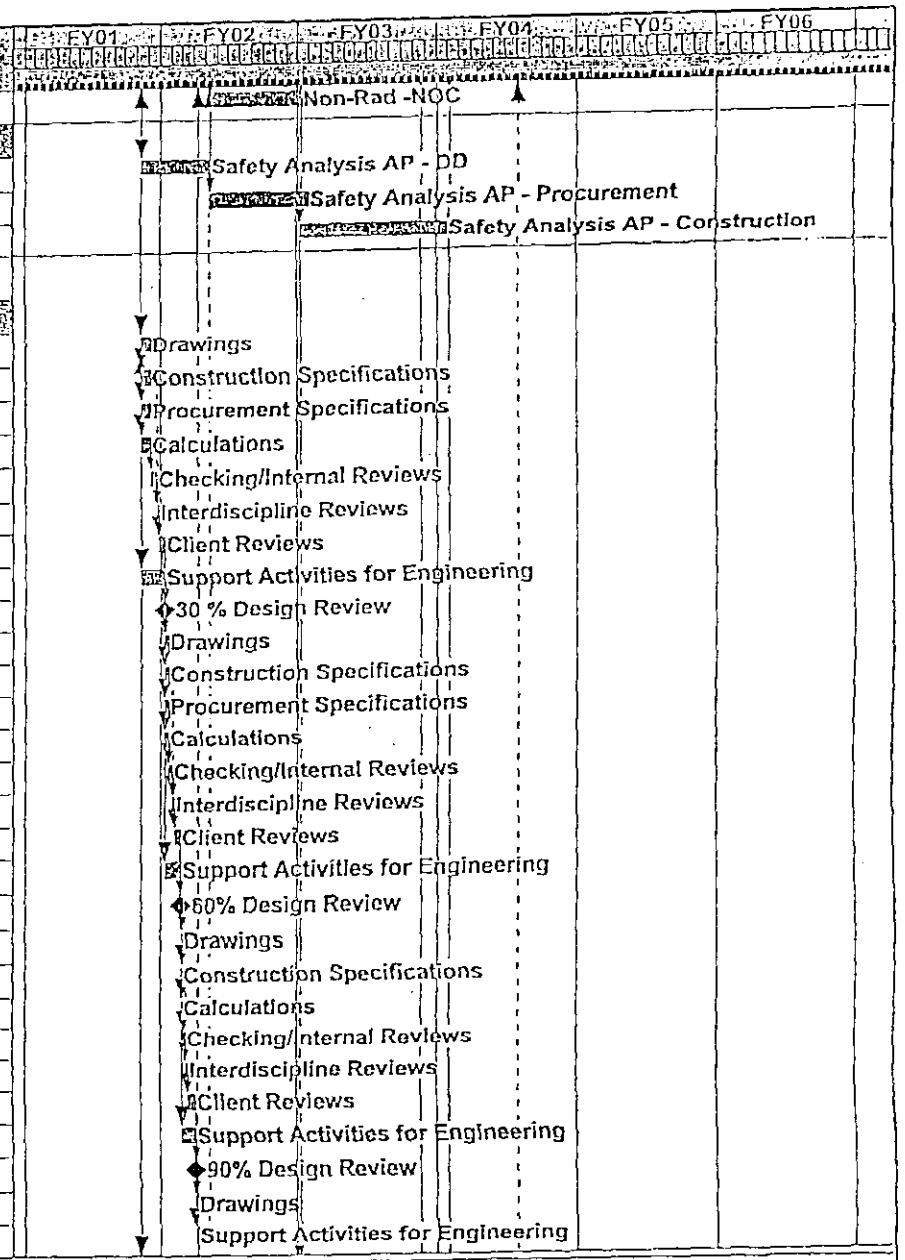
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
AP.NOC2	Non-Rad -NOC	168	12FEB02	09OCT02
Safety Analysis				
2B5B1A	Safety Analysis AP - DD	128	08AUG01	11FEB02
2B5B2A	Safety Analysis AP - Procurement	185	12FEB02	01NOV02
2B5B3A	Safety Analysis AP - Construction	267	10OCT02	30OCT03
AP Tank Farm				
AP - Definitive Design				
5B1111	Drawings	20	08AUG01	05SEP01
5B1112	Construction Specifications	20	08AUG01	05SEP01
5B1113	Procurement Specifications	20	08AUG01	05SEP01
5B1114	Calculations	20	08AUG01	05SEP01
5B1115	Checking/Internal Reviews	10	06SEP01	19SEP01
5B1116	Interdiscipline Reviews	5	20SEP01	26SEP01
5B1117	Client Reviews	10	27SEP01	10OCT01
5B1118	Support Activities for Engineering	45	08AUG01	10OCT01
5B1119	30 % Design Review	0		10OCT01
5B1121	Drawings	10	11OCT01	24OCT01
5B1122	Construction Specifications	10	11OCT01	24OCT01
5B1123	Procurement Specifications	10	11OCT01	24OCT01
5B1124	Calculations	10	11OCT01	24OCT01
5B1125	Checking/Internal Reviews	5	25OCT01	31OCT01
5B1126	Interdiscipline Reviews	5	01NOV01	07NOV01
5B1127	Client Reviews	10	08NOV01	21NOV01
5B1128	Support Activities for Engineering	30	11OCT01	21NOV01
5B1129	60% Design Review	0		21NOV01
5B1131	Drawings	5	26NOV01	30NOV01
5B1132	Construction Specifications	5	26NOV01	30NOV01
5B1134	Calculations	5	26NOV01	30NOV01
5B1135	Checking/Internal Reviews	5	03DEC01	07DEC01
5B1136	Interdiscipline Reviews	5	10DEC01	14DEC01
5B1137	Client Reviews	10	17DEC01	02JAN02
5B1138	Support Activities for Engineering	25	26NOV01	02JAN02
5B1139	90% Design Review	0		02JAN02
5B1141	Drawings	5	03JAN02	09JAN02
5B1142	Support Activities for Engineering	5	03JAN02	09JAN02



Project Start 19JUL99
Project Finish 25APR08
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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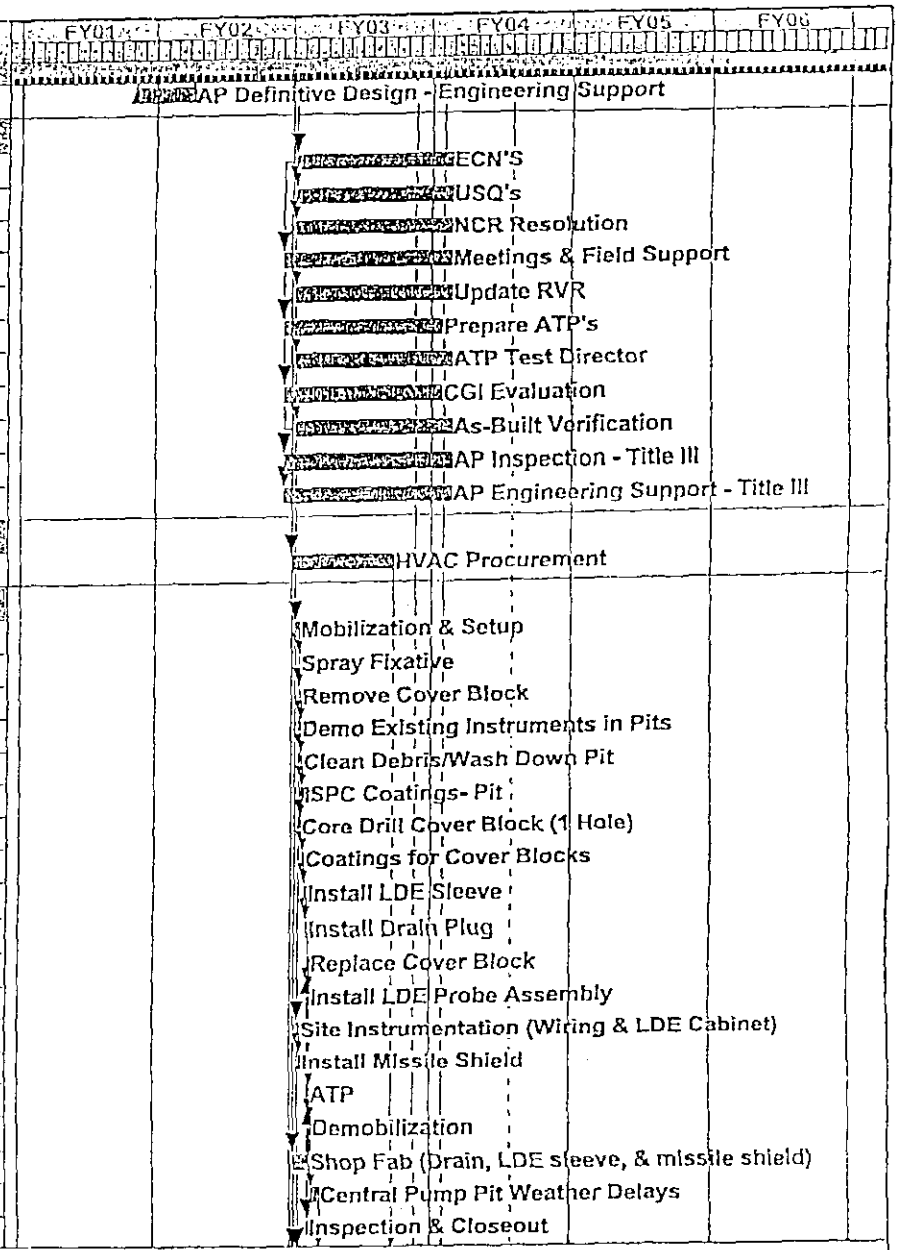
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AP Farm - Figure 7.1

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish
5B1201	AP Definitive Design - Engineering Support	105	08AUG01	09JAN02
AP - E&I During Construction				
5B2111	ECN'S	285	11OCT02	26NOV03
5B2112	USQ's	285	11OCT02	26NOV03
5B2113	NCR Resolution	285	11OCT02	26NOV03
5B2114	Meetings & Field Support	307	11SEP02	26NOV03
5B2115	Update RVR	285	11OCT02	26NOV03
5B2116	Prepare ATP's	289	11SEP02	31OCT03
5B2117	ATP Test Director	285	11OCT02	26NOV03
5B2118	CGI Evaluation	289	11SEP02	31OCT03
5B2119	As-Built Verification	285	11OCT02	26NOV03
5B2121	AP Inspection - Title III	307	11SEP02	26NOV03
5B2131	AP Engineering Support - Title III	307	11SEP02	26NOV03
AP - Procurement				
5B3B00	HVAC Procurement	185	01OCT02*	25JUN03
AP - Construction				
5B4A021	Mobilization & Setup	6	11OCT02	18OCT02
5B4A022	Spray Fixative	2	21OCT02	22OCT02
5B4A023	Remove Cover Block	1	23OCT02	23OCT02
5B4A024	Demo Existing Instruments in Pits	1	24OCT02	24OCT02
5B4A025	Clean Debris/Wash Down Pit	5	25OCT02	31OCT02
5B4A026	SPC Coatings- Pit	10	01NOV02	14NOV02
5B4A027	Core Drill Cover Block (1 Hole)	2	24OCT02	25OCT02
5B4A028	Coatings for Cover Blocks	8	29OCT02	07NOV02
5B4A029	Install LDE Sleeve	2	08NOV02	11NOV02
5B4A02A	Install Drain Plug	2	13NOV02	14NOV02
5B4A02B	Replace Cover Block	1	18NOV02	18NOV02
5B4A02C	Install LDE Probe Assembly	1	20NOV02	20NOV02
5B4A02D	Site Instrumentation (Wiring & LDE Cabinet)	5	21OCT02	25OCT02
5B4A02E	Install Missile Shield	3	28OCT02	30OCT02
5B4A02F	ATP	2	21NOV02	22NOV02
5B4A02G	Demobilization	2	25NOV02	26NOV02
5B4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	11OCT02	20NOV02
5B4A02J	Central Pump Pit Weather Delays	12	27NOV02	16DEC02
5B4A02M	Inspection & Closeout	1	15NOV02	15NOV02



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	28SEP99	

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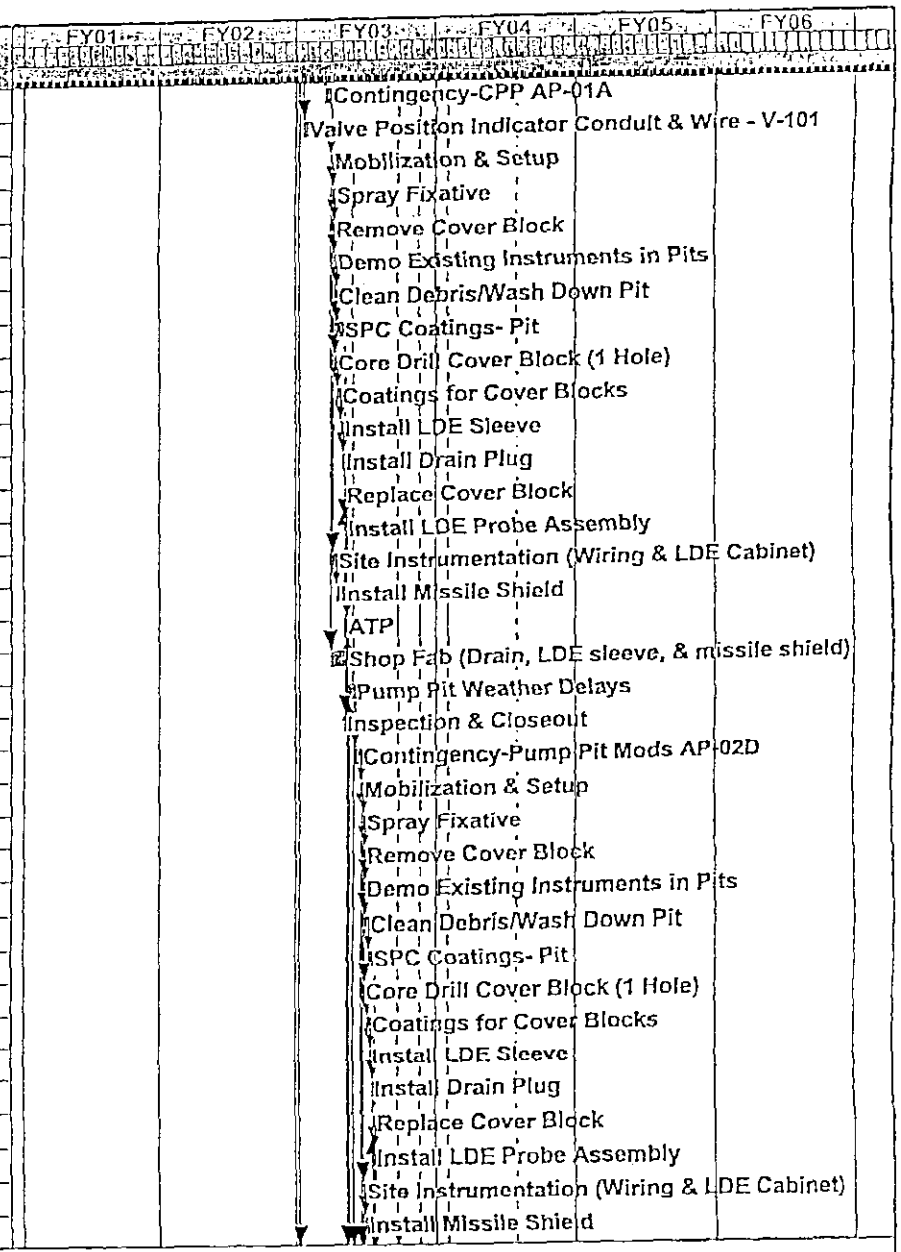
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4A02N	Contingency-CPP AP-01A	9	17DEC02	31DEC02
5B4A11	Valve Position Indicator Conduit & Wire - V-101	6	21OCT02	28OCT02
5B4B091	Mobilization & Setup	6	02JAN03	09JAN03
5B4B092	Spray Fixative	2	10JAN03	13JAN03
5B4B093	Remove Cover Block	1	14JAN03	14JAN03
5B4B094	Demo Existing Instruments in Pits	1	15JAN03	15JAN03
5B4B095	Clean Debris/Wash Down Pit	2	16JAN03	17JAN03
5B4B096	SPC Coatings- Pit	10	20JAN03	31JAN03
5B4B097	Core Drill Cover Block (1 Hole)	2	15JAN03	16JAN03
5B4B098	Coatings for Cover Blocks	8	21JAN03	30JAN03
5B4B099	Install LDE Sleeve	2	31JAN03	03FEB03
5B4B09A	Install Drain Plug	2	04FEB03	05FEB03
5B4B09B	Replace Cover Block	1	07FEB03	07FEB03
5B4B09C	Install LDE Probe Assembly	1	11FEB03	11FEB03
5B4B09D	Site Instrumentation (Wiring & LDE Cabinet)	5	10JAN03	16JAN03
5B4B09E	Install Missile Shield	3	17JAN03	21JAN03
5B4B09F	ATP	2	12FEB03	13FEB03
5B4B09H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	02JAN03	11FEB03
5B4B09J	Pump Pit Weather Delays	12	19FEB03	06MAR03
5B4B09M	Inspection & Closeout	1	06FEB03	06FEB03
5B4B09N	Contingency-Pump Pit Mods AP-02D	9	07MAR03	19MAR03
5B4C021	Mobilization & Setup	6	20MAR03	27MAR03
5B4C022	Spray Fixative	2	28MAR03	31MAR03
5B4C023	Remove Cover Block	1	01APR03	01APR03
5B4C024	Demo Existing Instruments in Pits	1	02APR03	02APR03
5B4C025	Clean Debris/Wash Down Pit	5	03APR03	09APR03
5B4C026	SPC Coatings- Pit	10	10APR03	23APR03
5B4C027	Core Drill Cover Block (1 Hole)	2	02APR03	03APR03
5B4C028	Coatings for Cover Blocks	8	07APR03	16APR03
5B4C029	Install LDE Sleeve	2	17APR03	18APR03
5B4C02A	Install Drain Plug	2	22APR03	23APR03
5B4C02B	Replace Cover Block	1	25APR03	25APR03
5B4C02C	Install LDE Probe Assembly	1	29APR03	29APR03
5B4C02D	Site Instrumentation (Wiring & LDE Cabinet)	5	28MAR03	03APR03
5B4C02E	Install Missile Shield	3	04APR03	08APR03



Project Start	19JUL99	Early Bar	
Project Finish	26APR08	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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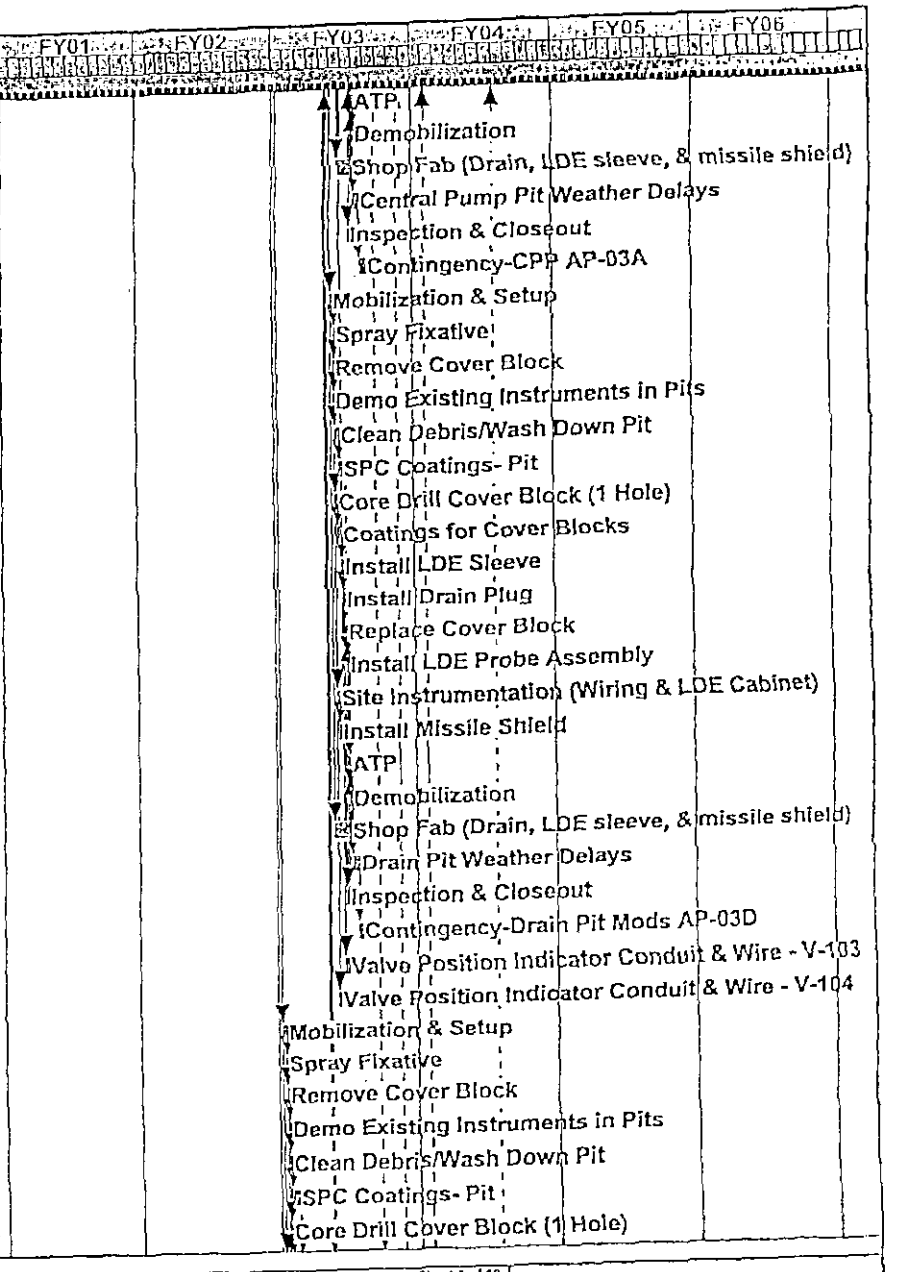
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4C02F	ATP	2	30APR03	01MAY03
5B4C02G	Demobilization	2	02MAY03	05MAY03
5B4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	20MAR03	29APR03
5B4C02J	Central Pump Pit Weather Delays	12	06MAY03	21MAY03
5B4C02M	Inspection & Closeout	1	24APR03	24APR03
5B4C02N	Contingency-CPP AP-03A	9	22MAY03	04JUN03
5B4C101	Mobilization & Setup	6	28FEB03	07MAR03
5B4C102	Spray Fixative	2	10MAR03	11MAR03
5B4C103	Remove Cover Block	1	12MAR03	12MAR03
5B4C104	Demo Existing Instruments in Pits	1	13MAR03	13MAR03
5B4C105	Clean Debris/Wash Down Pit	5	14MAR03	20MAR03
5B4C106	SPC Coatings- Pit	10	21MAR03	03APR03
5B4C107	Core Drill Cover Block (1 Hole)	2	13MAR03	14MAR03
5B4C108	Coatings for Cover Blocks	8	18MAR03	27MAR03
5B4C109	Install LDE Sleeve	2	28MAR03	31MAR03
5B4C10A	Install Drain Plug	2	02APR03	03APR03
5B4C10B	Replace Cover Block	1	07APR03	07APR03
5B4C10C	Install LDE Probe Assembly	1	09APR03	09APR03
5B4C10D	Site Instrumentation (Wiring & LDE Cabinet)	5	10MAR03	14MAR03
5B4C10E	Install Missile Shield	3	17MAR03	19MAR03
5B4C10F	ATP	2	10APR03	11APR03
5B4C10G	Demobilization	2	14APR03	15APR03
5B4C10H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	28FEB03	09APR03
5B4C10J	Drain Pit Weather Delays	12	16APR03	01MAY03
5B4C10M	Inspection & Closeout	1	04APR03	04APR03
5B4C10N	Contingency-Drain Pit Mods AP-03D	9	02MAY03	14MAY03
5B4C11	Valve Position Indicator Conduit & Wire - V-103	6	28MAR03	04APR03
5B4D11	Valve Position Indicator Conduit & Wire - V-104	6	10MAR03	17MAR03
5B4E021	Mobilization & Setup	6	11OCT02	18OCT02
5B4E022	Spray Fixative	2	21OCT02	22OCT02
5B4E023	Remove Cover Block	1	23OCT02	23OCT02
5B4E024	Demo Existing Instruments in Pits	1	24OCT02	24OCT02
5B4E025	Clean Debris/Wash Down Pit	5	25OCT02	31OCT02
5B4E026	SPC Coatings- Pit	10	01NOV02	14NOV02
5B4E027	Core Drill Cover Block (1 Hole)	2	24OCT02	25OCT02



Project Start 16JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

ASH1

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AP Farm - Figure 7.1

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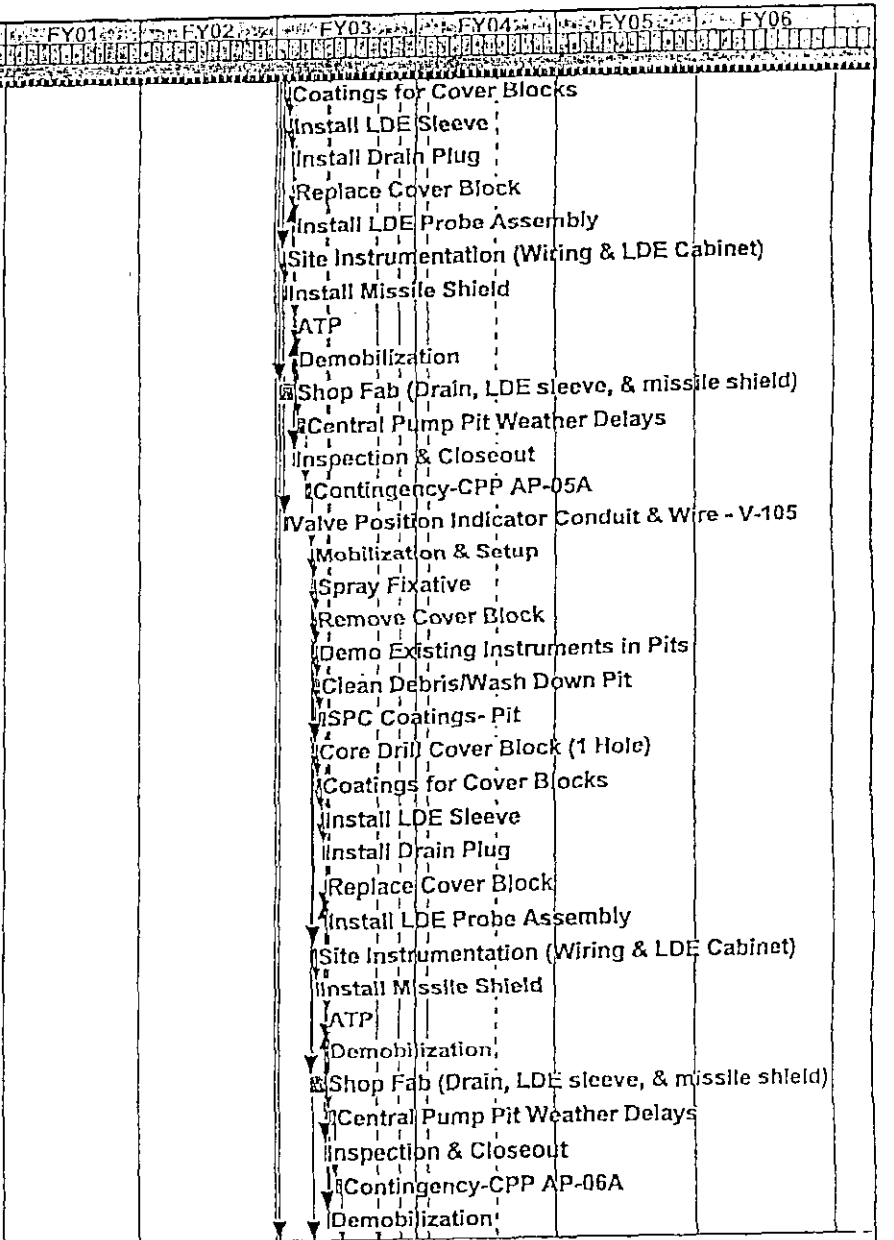
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4E028	Coatings for Cover Blocks	8	29OCT02	07NOV02
5B4E029	Install LDE Sleeve	2	08NOV02	11NOV02
5B4E02A	Install Drain Plug	2	12NOV02	13NOV02
5B4E02B	Replace Cover Block	1	15NOV02	15NOV02
5B4E02C	Install LDE Probe Assembly	1	20NOV02	20NOV02
5B4E02D	Site Instrumentation (Wiring & LDE Cabinet)	5	21OCT02	25OCT02
5B4E02E	Install Missile Shield	3	28OCT02	30OCT02
5B4E02F	ATP	2	21NOV02	22NOV02
5B4E02G	Demobilization	2	25NOV02	26NOV02
5B4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	11OCT02	20NOV02
5B4E02J	Central Pump Pit Weather Delays	12	27NOV02	16DEC02
5B4E02M	Inspection & Closeout	1	14NOV02	14NOV02
5B4E02N	Contingency-CPP AP-05A	9	17DEC02	31DEC02
5B4E11	Valve Position Indicator Conduit & Wire - V-105	6	21OCT02	28OCT02
5B4F021	Mobilization & Setup	6	02JAN03	09JAN03
5B4F022	Spray Fixative	2	10JAN03	13JAN03
5B4F023	Remove Cover Block	1	14JAN03	14JAN03
5B4F024	Demo Existing Instruments in Pits	1	15JAN03	15JAN03
5B4F025	Clean Debris/Wash Down Pit	5	16JAN03	22JAN03
5B4F026	SPC Coatings- Pit	10	23JAN03	05FEB03
5B4F027	Core Drill Cover Block (1 Hole)	2	15JAN03	16JAN03
5B4F028	Coatings for Cover Blocks	8	20JAN03	29JAN03
5B4F029	Install LDE Sleeve	2	30JAN03	31JAN03
5B4F02A	Install Drain Plug	2	03FEB03	04FEB03
5B4F02B	Replace Cover Block	1	07FEB03	07FEB03
5B4F02C	Install LDE Probe Assembly	1	11FEB03	11FEB03
5B4F02D	Site Instrumentation (Wiring & LDE Cabinet)	5	10JAN03	16JAN03
5B4F02E	Install Missile Shield	3	17JAN03	21JAN03
5B4F02F	ATP	2	12FEB03	13FEB03
5B4F02G	Demobilization	2	14FEB03	18FEB03
5B4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	02JAN03	11FEB03
5B4F02J	Central Pump Pit Weather Delays	12	19FEB03	06MAR03
5B4F02M	Inspection & Closeout	1	06FEB03	06FEB03
5B4F02N	Contingency-CPP AP-06A	9	07MAR03	19MAR03
5B4F09G	Demobilization	2	14FEB03	18FEB03



Project Start	19JUL99	Early Bar
Project Finish	26APR08	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	20SEP99	

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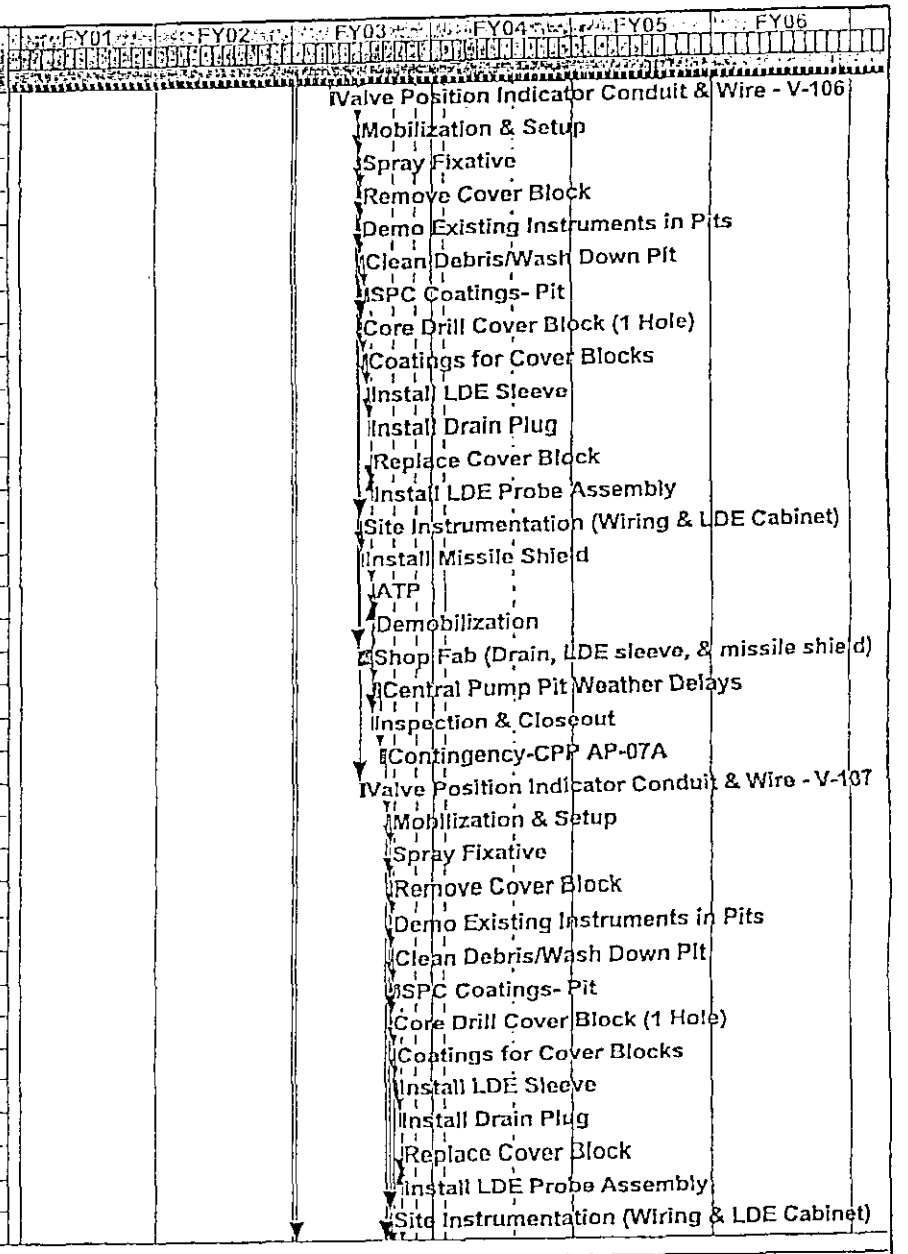
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4F11	Valve Position Indicator Conduit & Wire - V-106	6	10JAN03	17JAN03
5B4G021	Mobilization & Setup	6	20MAR03	27MAR03
5B4G022	Spray Fixative	2	28MAR03	31MAR03
5B4G023	Remove Cover Block	1	01APR03	01APR03
5B4G024	Demo Existing Instruments in Pits	1	02APR03	02APR03
5B4G025	Clean Debris/Wash Down Pit	5	03APR03	09APR03
5B4G026	SPC Coatings- Pit	10	10APR03	23APR03
5B4G027	Core Drill Cover Block (1 Hole)	2	02APR03	03APR03
5B4G028	Coatings for Cover Blocks	8	07APR03	16APR03
5B4G029	Install LDE Sleeve	2	18APR03	21APR03
5B4G02A	Install Drain Plug	2	23APR03	24APR03
5B4G02B	Replace Cover Block	1	28APR03	28APR03
5B4G02C	Install LDE Probe Assembly	1	29APR03	29APR03
5B4G02D	Site Instrumentation (Wiring & LDE Cabinet)	5	28MAR03	03APR03
5B4G02E	Install Missile Shield	3	04APR03	08APR03
5B4G02F	ATP	2	30APR03	01MAY03
5B4G02G	Demobilization	2	02MAY03	05MAY03
5B4G02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	20MAR03	29APR03
5B4G02J	Central Pump Pit Weather Delays	12	06MAY03	21MAY03
5B4G02M	Inspection & Closeout	1	28APR03	28APR03
5B4G02N	Contingency-CPP AP-07A	9	22MAY03	04JUN03
5B4G11	Valve Position Indicator Conduit & Wire - V-107	6	28MAR03	04APR03
5B4H021	Mobilization & Setup	6	05JUN03	12JUN03
5B4H022	Spray Fixative	2	13JUN03	16JUN03
5B4H023	Remove Cover Block	1	17JUN03	17JUN03
5B4H024	Demo Existing Instruments in Pits	1	18JUN03	18JUN03
5B4H025	Clean Debris/Wash Down Pit	5	19JUN03	25JUN03
5B4H026	SPC Coatings- Pit	10	26JUN03	10JUL03
5B4H027	Core Drill Cover Block (1 Hole)	2	18JUN03	19JUN03
5B4H028	Coatings for Cover Blocks	8	23JUN03	02JUL03
5B4H029	Install LDE Sleeve	2	03JUL03	07JUL03
5B4H02A	Install Drain Plug	2	09JUL03	10JUL03
5B4H02B	Replace Cover Block	1	15JUL03	15JUL03
5B4H02C	Install LDE Probe Assembly	1	16JUL03	16JUL03
5B4H02D	Site Instrumentation (Wiring & LDE Cabinet)	5	13JUN03	19JUN03



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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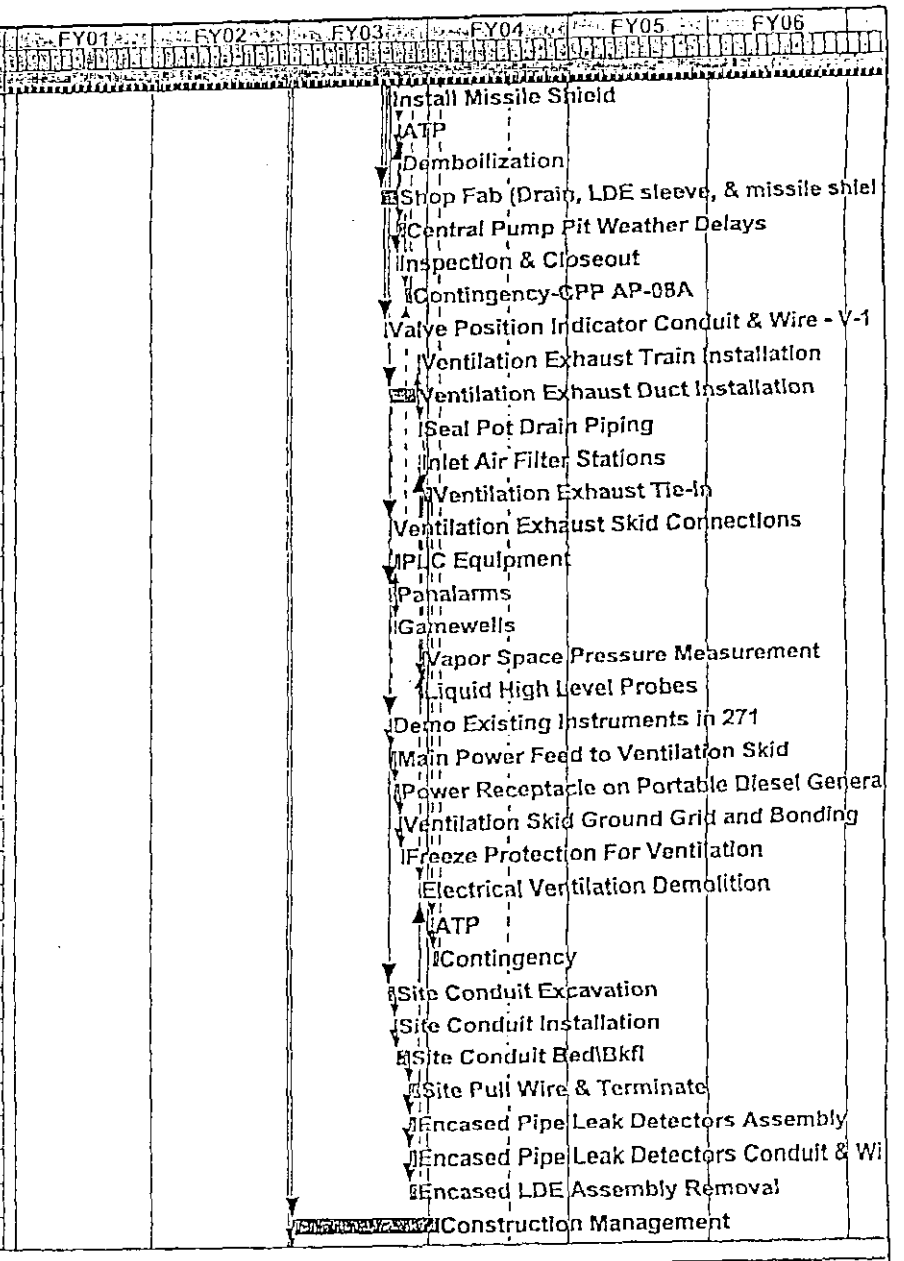
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4H02E	Install Missile Shield	3	20JUN03	24JUN03
5B4H02F	ATP	2	17JUL03	18JUL03
5B4H02G	Demboilization	2	21JUL03	22JUL03
5B4H02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	05JUN03	16JUL03
5B4H02J	Central Pump Pit Weather Delays	12	23JUL03	07AUG03
5B4H02M	Inspection & Closeout	1	14JUL03	14JUL03
5B4H02N	Contingency-CPP AP-08A	9	08AUG03	20AUG03
5B4H11	Valve Position Indicator Conduit & Wire - V-108	6	13JUN03	20JUN03
5B4J02	Ventilation Exhaust Train Installation	3	09SEP03	11SEP03
5B4J05	Ventilation Exhaust Duct Installation	51	26JUN03	08SEP03
5B4J07	Seal Pot Drain Piping	6	12SEP03	19SEP03
5B4J09	Inlet Air Filter Stations	3	10SEP03	12SEP03
5B4J10	Ventilation Exhaust Tie-in	17	22SEP03	14OCT03
5B4J22A	Ventilation Exhaust Skid Connections	5	26JUN03	02JUL03
5B4J22B	PLC Equipment	8	09JUL03	18JUL03
5B4J22C	Panalarms	8	26JUN03	08JUL03
5B4J22D	Gamewells	2	09JUL03	10JUL03
5B4J22E	Vapor Space Pressure Measurement	6	17SEP03	24SEP03
5B4J22F	Liquid High Level Probes	2	15SEP03	16SEP03
5B4J22G	Demo Existing Instruments in 271	5	26JUN03	02JUL03
5B4J26A	Main Power Feed to Ventilation Skid	5	03JUL03	10JUL03
5B4J26B	Power Receptacle on Portable Diesel Generator	7	11JUL03	21JUL03
5B4J26C	Ventilation Skid Ground Grid and Bonding	5	22JUL03	28JUL03
5B4J26D	Freeze Protection For Ventilation	1	29JUL03	29JUL03
5B4J26E	Electrical Ventilation Demolition	2	10SEP03	11SEP03
5B4J26M	ATP	3	15OCT03	17OCT03
5B4J26N	Contingency	10	20OCT03	31OCT03
5B4J27A	Site Conduit Excavation	10	26JUN03	10JUL03
5B4J27B	Site Conduit Installation	2	11JUL03	14JUL03
5B4J27C	Site Conduit Bed\Bkfl	25	15JUL03	18AUG03
5B4J28	Site Pull Wire & Terminate	15	19AUG03	09SEP03
5B4J35A	Encased Pipe Leak Detectors Assembly	10	19AUG03	02SEP03
5B4J35B	Encased Pipe Leak Detectors Conduit & Wire	10	19AUG03	02SEP03
5B4J35C	Encased LDE Assembly Removal	10	19AUG03	02SEP03
5B4N	Construction Management	267	11OCT02	31OCT03



Project Start 18JUL99
Project Finish 28APR08
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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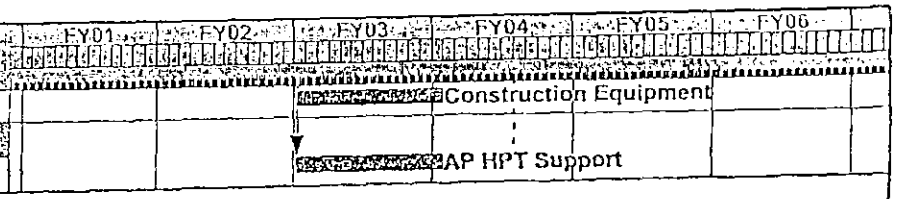
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5B4P	Construction Equipment	267	11OCT02	31OCT03
AP - HPT Support				
5B6100	AP HPT Support	267	11OCT02	31OCT03



Project Start	19JUL99	Early Bar	
Project Finish	26APR08	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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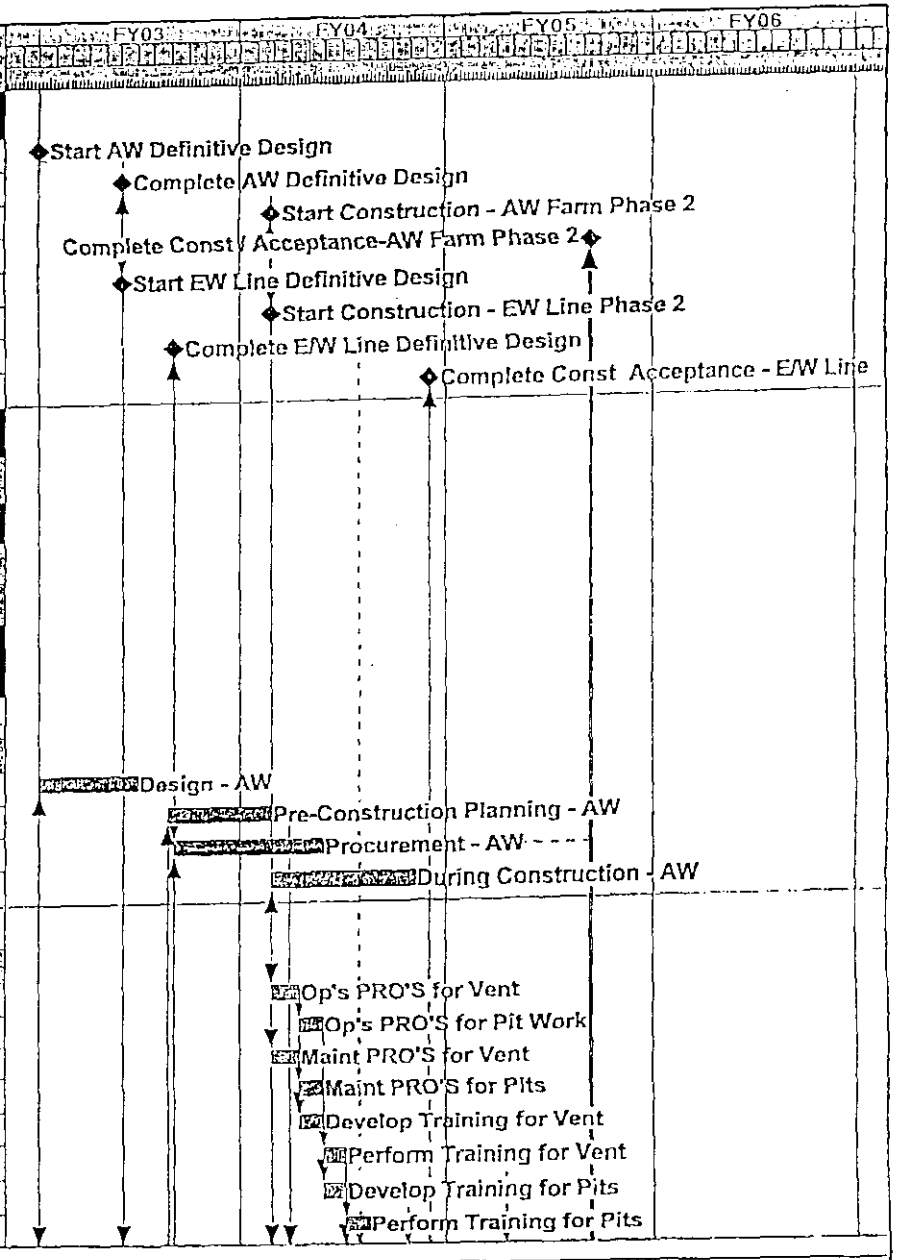
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AP Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C0050	Start AW Definitive Design	0	01OCT02*	
5C1202	Complete AW Definitive Design	0		04MAR03
5C1203	Start Construction - AW Farm Phase 2	0	26NOV03	
5C1204	Complete Const / Acceptance-AW Farm Phase 2	0		14JUN05
5I0050	Start EW Line Definitive Design	0	05MAR03*	
5I1199	Start Construction - EW Line Phase 2	0	26NOV03	
5I1202	Complete E/W Line Definitive Design	0		03JUN03
5I1203	Complete Const Acceptance - E/W Line Phase 2	0		03SEP04
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.0.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - AW Farm				
3C5C1A	Design - AW	124	01OCT02	31MAR03
3C5C2A	Pre-Construction Planning - AW	130	23MAY03	25NOV03
3C5C3A	Procurement - AW	185	04JUN03	27FEB04
3C5C4A	During Construction - AW	177	26NOV03	10AUG04
Startup & Testing - Phase 2				
Startup & Testing - AW Farm				
3K5C3A1	Op's PRO'S for Vent	30	26NOV03	13JAN04
3K5C3A2	Op's PRO'S for Pit Work	30	14JAN04	25FEB04
3K5C3A3	Maint PRO'S for Vent	30	26NOV03	13JAN04
3K5C3A4	Maint PRO'S for Pits	30	14JAN04	25FEB04
3K5C3A5	Develop Training for Vent	30	14JAN04	25FEB04
3K5C3A6	Perform Training for Vent	30	26FEB04	07APR04
3K5C3A7	Develop Training for Pits	30	26FEB04	07APR04
3K5C3A8	Perform Training for Pits	30	08APR04	19MAY04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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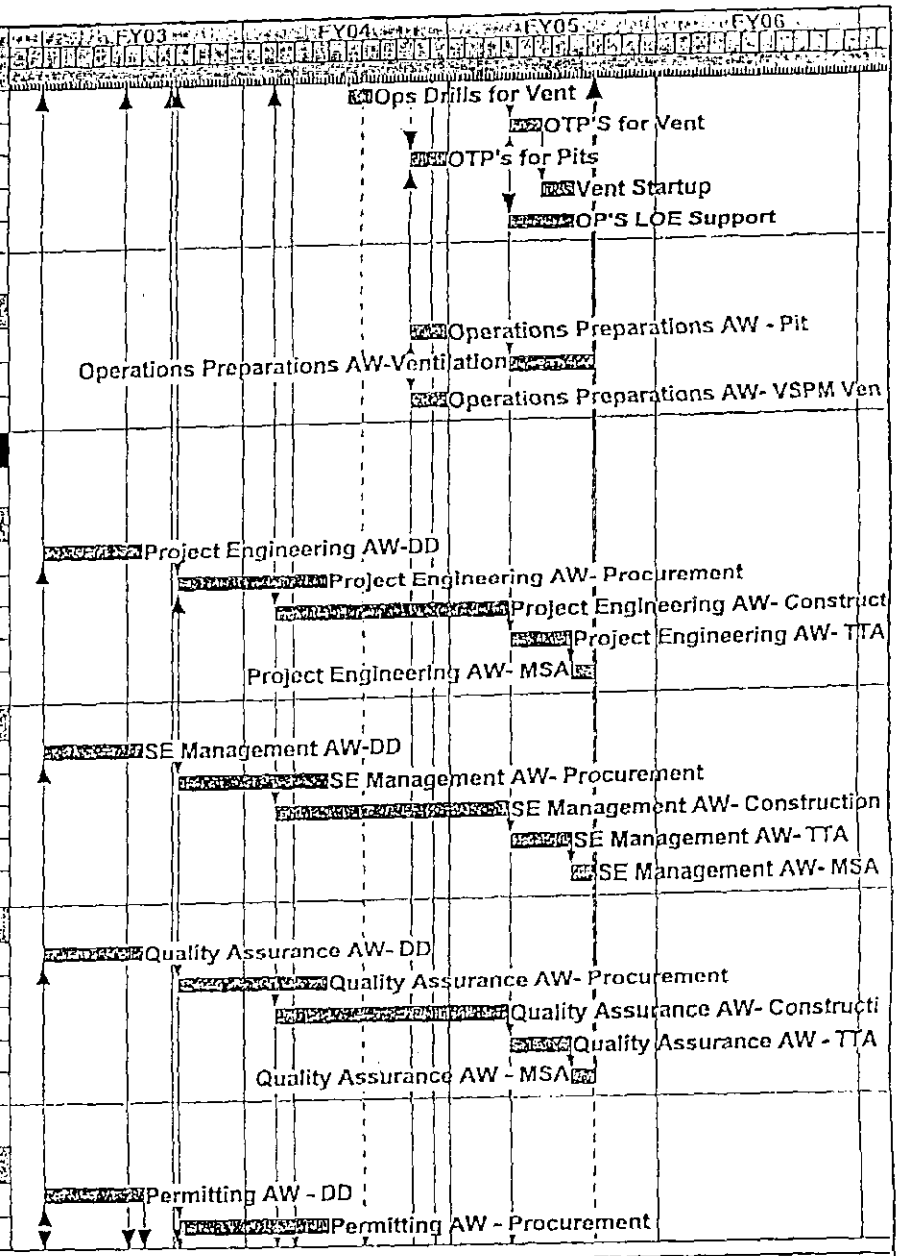
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3K5C3A9	Ops Drills for Vent	30	08APR04	19MAY04
3K5C3AA	OTP'S for Vent	40	17JAN05	14MAR05
3K5C3AB	OTP's for Pits	45	26JUL04	27SEP04
3K5C3AC	Vent Startup	40	15MAR05	09MAY05
3K5C3AE	OP'S LOE Support	80	17JAN05	09MAY05
Operations Preparation				
Ops Prep - MSA AW Farm				
3L5C1N	Operations Preparations AW - Pit	45	26JUL04	27SEP04
3L5C1O	Operations Preparations AW-Ventilation	105	17JAN05	14JUN05
3L5C1P	Operations Preparations AW- VSPM Ventilation	45	26JUL04	27SEP04
Capital- Phase 2				
Project Management				
Project Engineering				
1B5C1A	Project Engineering AW-DD	124	01OCT02	31MAR03
1B5C2A	Project Engineering AW- Procurement	185	04JUN03	27FEB04
1B5C3A	Project Engineering AW- Construction	284	26NOV03	14JAN05
1B5C4A	Project Engineering AW- TTA	75	17JAN05	02MAY05
1B5C5A	Project Engineering AW- MSA	30	03MAY05	14JUN05
Systems Engineering				
1C5C1A	SE Management AW-DD	124	01OCT02	31MAR03
1C5C2A	SE Management AW- Procurement	185	04JUN03	27FEB04
1C5C3A	SE Management AW- Construction	284	26NOV03	14JAN05
1C5C4A	SE Management AW- TTA	75	17JAN05	02MAY05
1C5C5A	SE Management AW- MSA	30	03MAY05	14JUN05
Quality Assurance				
1D5C1A	Quality Assurance AW- DD	124	01OCT02	31MAR03
1D5C2A	Quality Assurance AW- Procurement	185	04JUN03	27FEB04
1D5C3A	Quality Assurance AW- Construction	284	26NOV03	14JAN05
1D5C4A	Quality Assurance AW - TTA	75	17JAN05	02MAY05
1D5C5A	Quality Assurance AW - MSA	30	03MAY05	14JUN05
Permitting and Safety				
Permits				
2A5C2A	Permitting AW - DD	124	01OCT02	31MAR03
2A5C3A	Permitting AW - Procurement	185	04JUN03	27FEB04



Project Start	19JUL99	Early Bar
Project Finish	25APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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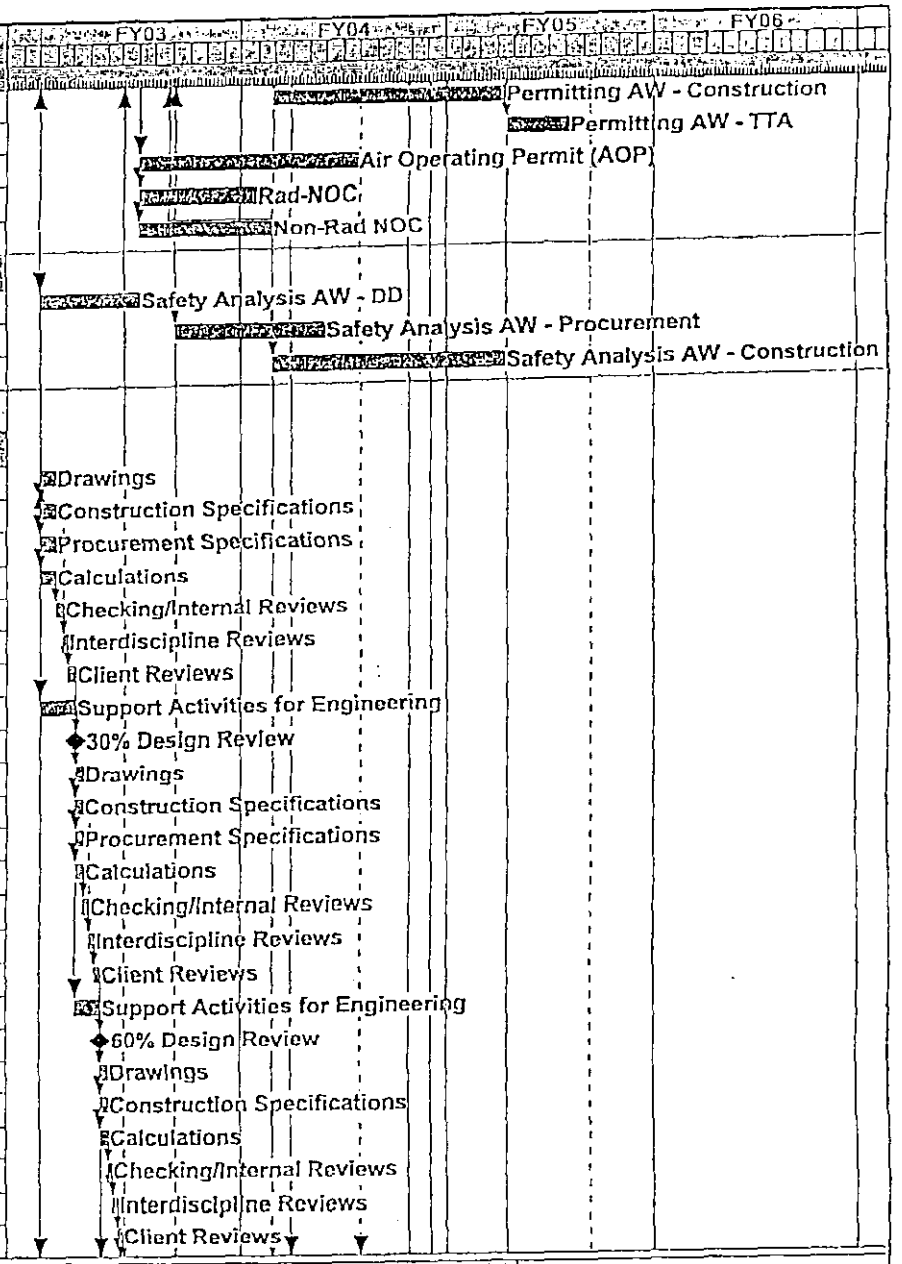
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
2A5C4A	Permitting AW - Construction	284	26NOV03	14JAN05
2A5C5A	Permitting AW - TTA	75	17JAN05	02MAY05
AW.AOP	Air Operating Permit (AOP)	273	01APR03	28APR04
AW.NOC1	Rad-NOC	147	01APR03	27OCT03
AW.NOC2	Non-Rad NOC	168	01APR03	25NOV03
Safety Analysis				
2B5C1A	Safety Analysis AW - DD	124	01OCT02	31MAR03
2B5C2A	Safety Analysis AW - Procurement	185	04JUN03	27FEB04
2B5C3A	Safety Analysis AW - Construction	284	26NOV03	14JAN05
AW Tank Farm				
AW Definitive Design				
5C1111	Drawings	20	01OCT02	28OCT02
5C1112	Construction Specifications	20	01OCT02	28OCT02
5C1113	Procurement Specifications	20	01OCT02	28OCT02
5C1114	Calculations	20	01OCT02	28OCT02
5C1115	Checking/Internal Reviews	10	29OCT02	11NOV02
5C1116	Interdiscipline Reviews	5	12NOV02	18NOV02
5C1117	Client Reviews	10	19NOV02	04DEC02
5C1118	Support Activities for Engineering	45	01OCT02	04DEC02
5C1119	30% Design Review	0		04DEC02
5C1121	Drawings	10	05DEC02	18DEC02
5C1122	Construction Specifications	10	05DEC02	18DEC02
5C1123	Procurement Specifications	10	05DEC02	18DEC02
5C1124	Calculations	10	05DEC02	18DEC02
5C1125	Checking/Internal Reviews	5	19DEC02	27DEC02
5C1126	Interdiscipline Reviews	5	30DEC02	06JAN03
5C1127	Client Reviews	10	07JAN03	20JAN03
5C1128	Support Activities for Engineering	30	05DEC02	20JAN03
5C1129	60% Design Review	0		20JAN03
5C1131	Drawings	10	21JAN03	03FEB03
5C1132	Construction Specifications	10	21JAN03	03FEB03
5C1134	Calculations	10	21JAN03	03FEB03
5C1135	Checking/Internal Reviews	5	04FEB03	10FEB03
5C1136	Interdiscipline Reviews	5	11FEB03	18FEB03
5C1137	Client Reviews	5	19FEB03	25FEB03



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	28SEP99	

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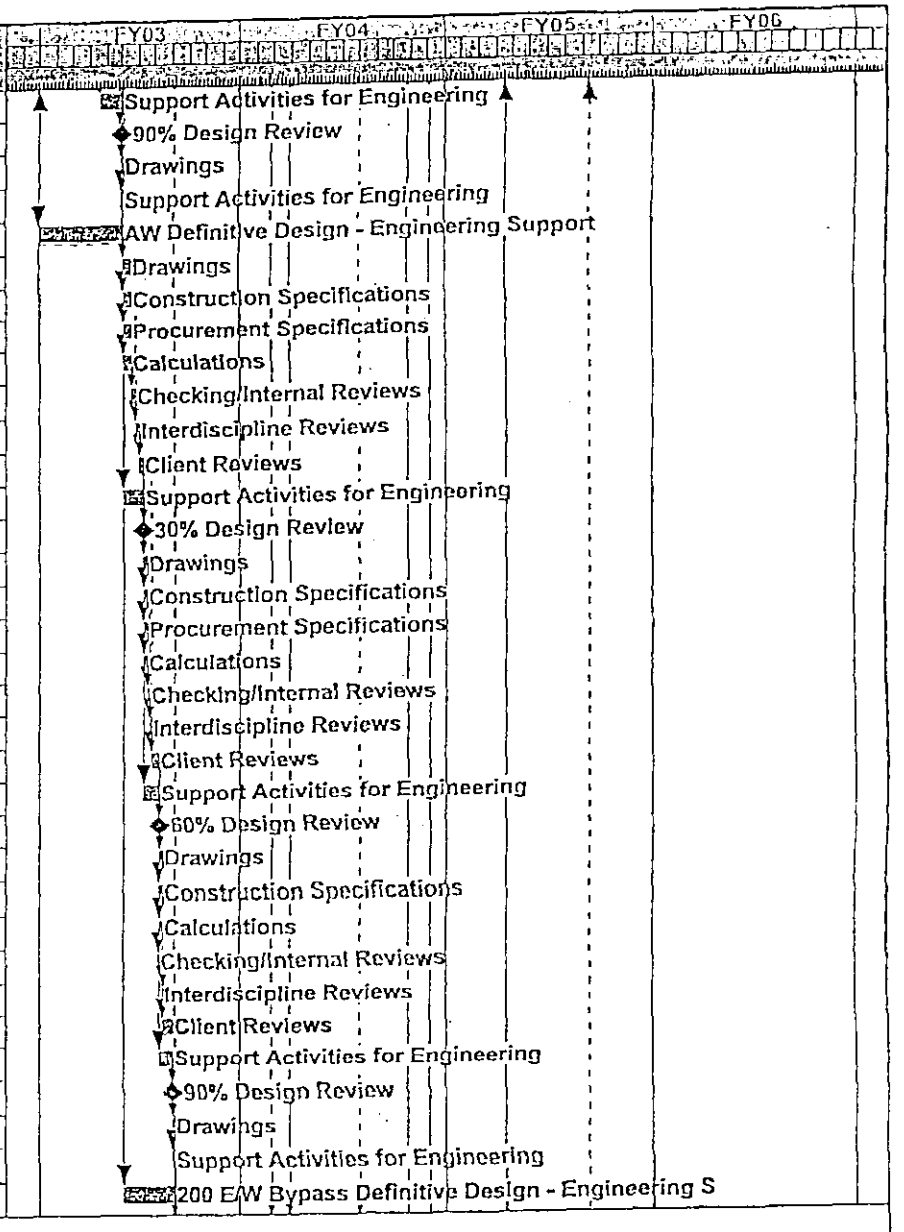
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C1138	Support Activities for Engineering	25	21JAN03	25FEB03
5C1139	90% Design Review	0		25FEB03
5C1141	Drawings	5	26FEB03	04MAR03
5C1142	Support Activities for Engineering	5	26FEB03	04MAR03
5C1201	AW Definitive Design - Engineering Support	105	01OCT02	04MAR03
5I1111	Drawings	10	05MAR03	18MAR03
5I1112	Construction Specifications	10	05MAR03	18MAR03
5I1113	Procurement Specifications	10	05MAR03	18MAR03
5I1114	Calculations	10	05MAR03	18MAR03
5I1115	Checking/Internal Reviews	5	19MAR03	25MAR03
5I1116	Interdiscipline Reviews	5	26MAR03	01APR03
5I1117	Client Reviews	5	02APR03	08APR03
5I1118	Support Activities for Engineering	25	05MAR03	08APR03
5I1119	30% Design Review	0		08APR03
5I1121	Drawings	5	09APR03	15APR03
5I1122	Construction Specifications	5	09APR03	15APR03
5I1123	Procurement Specifications	5	09APR03	15APR03
5I1124	Calculations	5	09APR03	15APR03
5I1125	Checking/Internal Reviews	2	16APR03	17APR03
5I1126	Interdiscipline Reviews	2	18APR03	21APR03
5I1127	Client Reviews	10	22APR03	05MAY03
5I1128	Support Activities for Engineering	19	09APR03	05MAY03
5I1129	60% Design Review	0		05MAY03
5I1131	Drawings	5	06MAY03	12MAY03
5I1132	Construction Specifications	5	06MAY03	12MAY03
5I1134	Calculations	5	06MAY03	12MAY03
5I1135	Checking/Internal Reviews	2	06MAY03	07MAY03
5I1136	Interdiscipline Reviews	2	13MAY03	14MAY03
5I1137	Client Reviews	10	15MAY03	29MAY03
5I1138	Support Activities for Engineering	17	06MAY03	29MAY03
5I1139	90% Design Review	0		29MAY03
5I1141	Drawings	3	30MAY03	03JUN03
5I1142	Support Activities for Engineering	3	30MAY03	03JUN03
5I1201	200 E/W Bypass Definitive Design - Engineering S	64	05MAR03	03JUN03



Project Start 19JUL99
Project Finish 26APR05
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AW Farm - Figure 7.1

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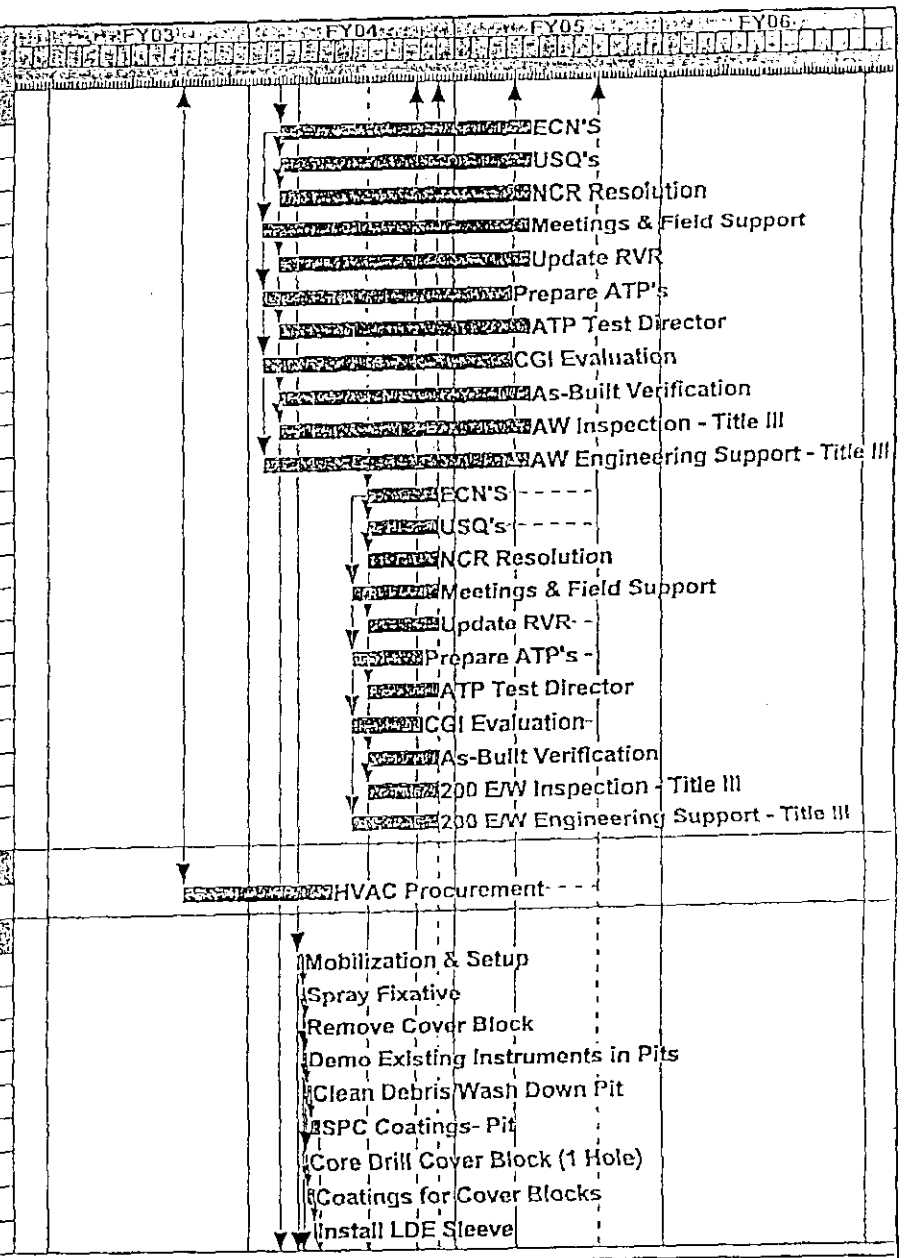
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
AW - E&I During Construction				
5C2111	ECN'S	306	26NOV03	15FEB05
5C2112	USQ's	306	26NOV03	15FEB05
5C2113	NCR Resolution	306	26NOV03	15FEB05
5C2114	Meetings & Field Support	328	27OCT03	15FEB05
5C2115	Update RVR	306	26NOV03	15FEB05
5C2116	Prepare ATP's	306	27OCT03	14JAN05
5C2117	ATP Test Director	306	26NOV03	15FEB05
5C2118	CGI Evaluation	306	27OCT03	14JAN05
5C2119	As-Built Verification	306	26NOV03	15FEB05
5C2121	AW Inspection - Title III	306	26NOV03	15FEB05
5C2131	AW Engineering Support - Title III	326	27OCT03	11FEB05
5I2111	ECN'S	88	03MAY04*	03SEP04
5I2112	USQ's	88	03MAY04	03SEP04
5I2113	NCR Resolution	88	03MAY04	03SEP04
5I2114	Meetings & Field Support	109	02APR04	03SEP04
5I2115	Update RVR	88	03MAY04	03SEP04
5I2116	Prepare ATP's	88	02APR04	05AUG04
5I2117	ATP Test Director	88	03MAY04	03SEP04
5I2118	CGI Evaluation	88	02APR04	05AUG04
5I2119	As-Built Verification	88	03MAY04	03SEP04
5I2121	200 E/W Inspection - Title III	88	03MAY04	03SEP04
5I2131	200 E/W Engineering Support - Title III	109	02APR04	03SEP04
AW - Procurement				
5C3B00	HVAC Procurement	185	04JUN03	27FEB04
AW - Construction				
5C4A021	Mobilization & Setup	6	30DEC03	07JAN04
5C4A022	Spray Fixative	2	08JAN04	09JAN04
5C4A023	Remove Cover Block	1	12JAN04	12JAN04
5C4A024	Demo Existing Instruments in Pits	1	13JAN04	13JAN04
5C4A025	Clean Debris/Wash Down Pit	5	14JAN04	20JAN04
5C4A026	SPC Coatings- Pit	10	21JAN04	03FEB04
5C4A027	Core Drill Cover Block (1 Hole)	2	13JAN04	14JAN04
5C4A028	Coatings for Cover Blocks	8	15JAN04	26JAN04
5C4A029	Install LDE Sleeve	2	27JAN04	28JAN04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	28SEP99	

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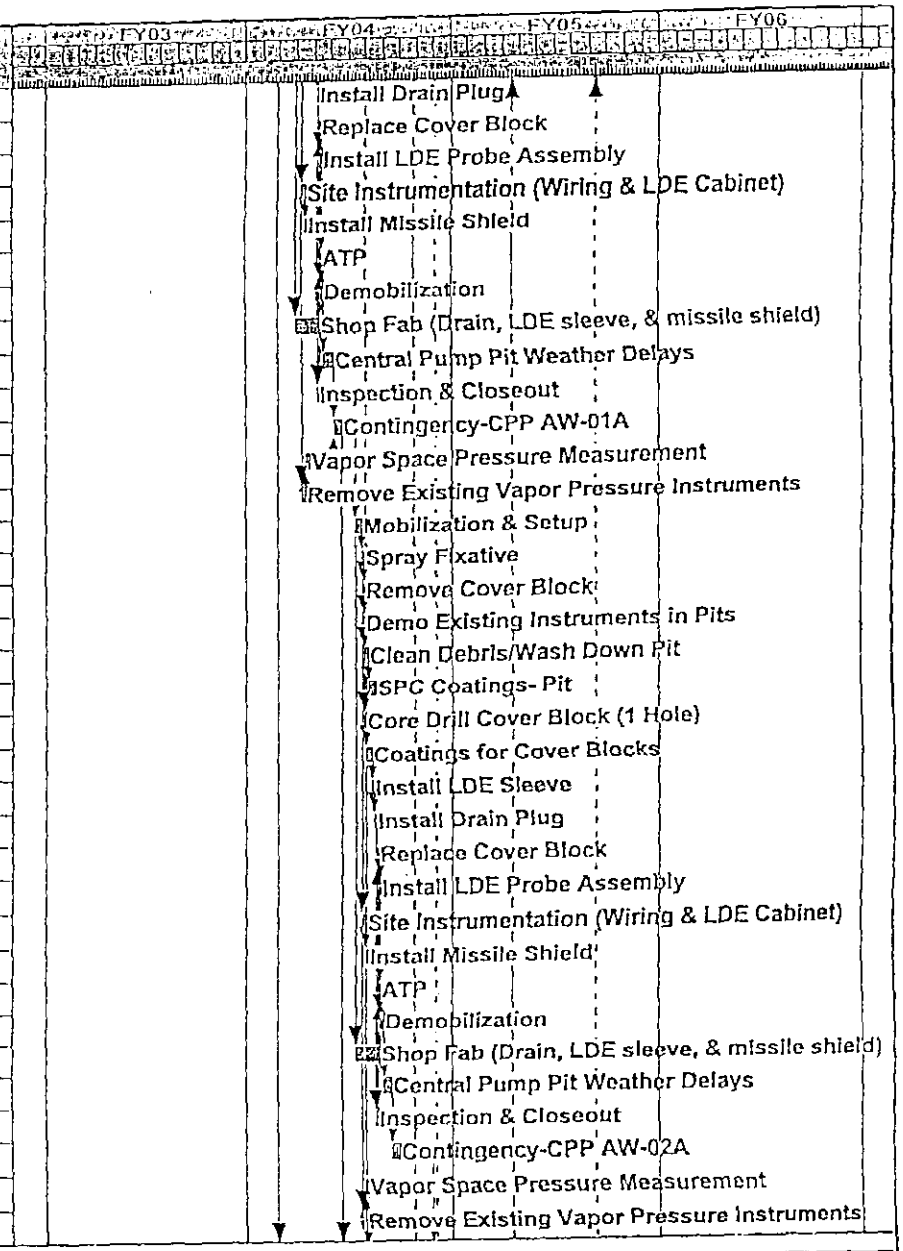
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C4A02A	Install Drain Plug	2	04FEB04	05FEB04
5C4A02B	Replace Cover Block	1	09FEB04	09FEB04
5C4A02C	Install LDE Probe Assembly	1	10FEB04	10FEB04
5C4A02D	Site Instrumentation (Wiring & LDE Cabinet)	5	08JAN04	14JAN04
5C4A02E	Install Missile Shield	3	15JAN04	19JAN04
5C4A02F	ATP	2	11FEB04	12FEB04
5C4A02G	Demobilization	2	13FEB04	17FEB04
5C4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	30DEC03	09FEB04
5C4A02J	Central Pump Pit Weather Delays	12	18FEB04	04MAR04
5C4A02M	Inspection & Closeout	1	06FEB04	06FEB04
5C4A02N	Contingency-CPP AW-01A	9	05MAR04	17MAR04
5C4A08A	Vapor Space Pressure Measurement	3	16JAN04	20JAN04
5C4A08B	Remove Existing Vapor Pressure Instruments	6	08JAN04	15JAN04
5C4B021	Mobilization & Setup	6	15APR04	22APR04
5C4B022	Spray Fixative	2	23APR04	26APR04
5C4B023	Remove Cover Block	1	27APR04	27APR04
5C4B024	Demo Existing Instruments in Pits	1	28APR04	28APR04
5C4B025	Clean Debris/Wash Down Pit	5	29APR04	05MAY04
5C4B026	SPC Coatings- Pit	8	06MAY04	17MAY04
5C4B027	Core Drill Cover Block (1 Hole)	2	28APR04	29APR04
5C4B028	Coatings for Cover Blocks	8	30APR04	11MAY04
5C4B029	Install LDE Sleeve	2	12MAY04	13MAY04
5C4B02A	Install Drain Plug	2	17MAY04	18MAY04
5C4B02B	Replace Cover Block	1	21MAY04	21MAY04
5C4B02C	Install LDE Probe Assembly	1	25MAY04	25MAY04
5C4B02D	Site Instrumentation (Wiring & LDE Cabinet)	5	23APR04	29APR04
5C4B02E	Install Missile Shield	3	30APR04	04MAY04
5C4B02F	ATP	2	26MAY04	27MAY04
5C4B02G	Demobilization	2	28MAY04	01JUN04
5C4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	15APR04	25MAY04
5C4B02J	Central Pump Pit Weather Delays	12	02JUN04	17JUN04
5C4B02M	Inspection & Closeout	1	20MAY04	20MAY04
5C4B02N	Contingency-CPP AW-02A	9	18JUN04	30JUN04
5C4B08A	Vapor Space Pressure Measurement	3	03MAY04	05MAY04
5C4B08B	Remove Existing Vapor Pressure Instruments	6	23APR04	30APR04



Project Start	19JUL99	Early Bar
Project Finish	28APR05	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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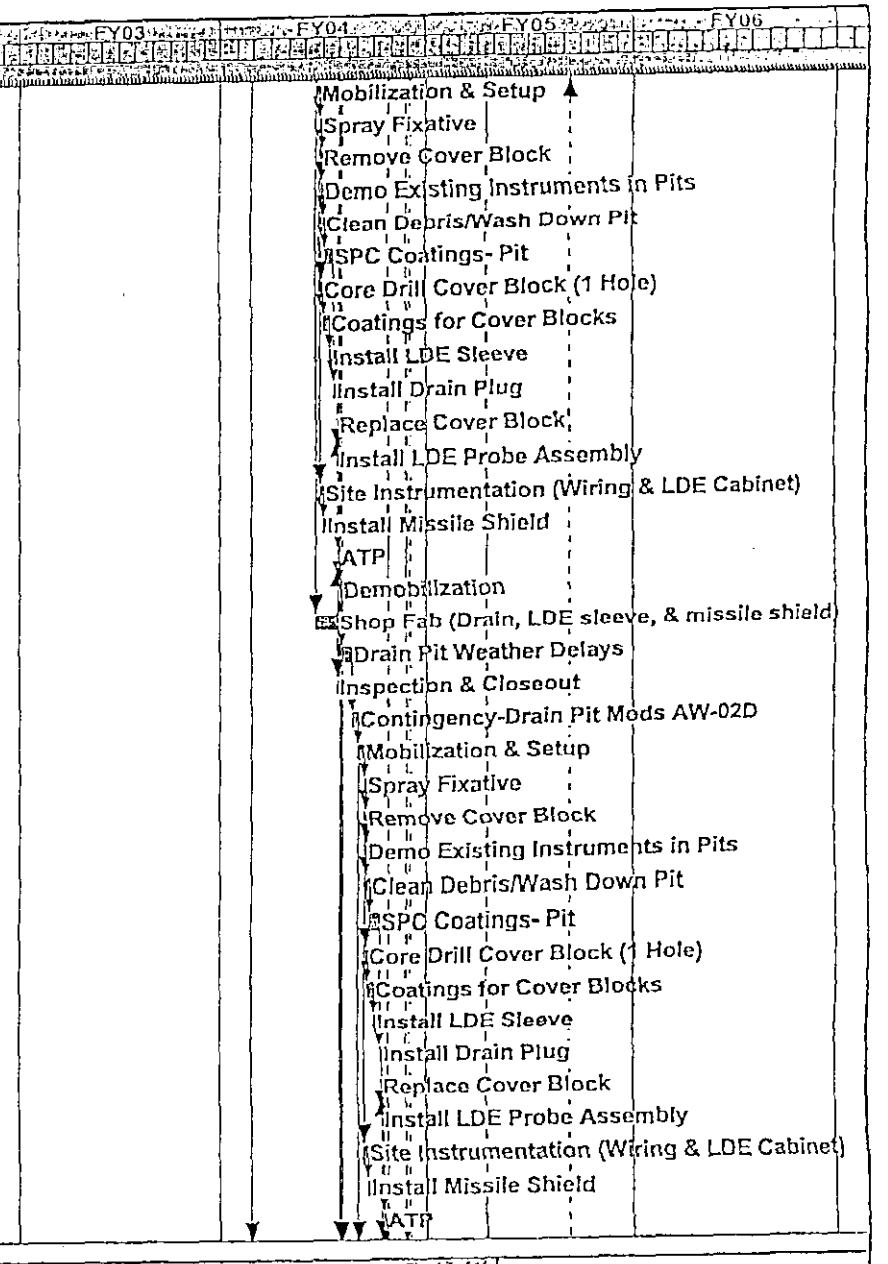
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C4B101	Mobilization & Setup	6	18MAR04	25MAR04
5C4B102	Spray Fixative	2	26MAR04	29MAR04
5C4B103	Remove Cover Block	1	30MAR04	30MAR04
5C4B104	Demo Existing Instruments in Pits	1	31MAR04	31MAR04
5C4B105	Clean Debris/Wash Down Pit	5	01APR04	07APR04
5C4B106	SPC Coatings- Pit	10	08APR04	21APR04
5C4B107	Core Drill Cover Block (1 Hole)	2	31MAR04	01APR04
5C4B108	Coatings for Cover Blocks	8	02APR04	13APR04
5C4B109	Install LDE Sleeve	2	14APR04	15APR04
5C4B10A	Install Drain Plug	2	22APR04	23APR04
5C4B10B	Replace Cover Block	1	27APR04	27APR04
5C4B10C	Install LDE Probe Assembly	1	28APR04	28APR04
5C4B10D	Site Instrumentation (Wiring & LDE Cabinet)	5	26MAR04	01APR04
5C4B10E	Install Missile Shield	3	02APR04	06APR04
5C4B10F	ATP	2	29APR04	30APR04
5C4B10G	Demobilization	2	03MAY04	04MAY04
5C4B10H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	18MAR04	27APR04
5C4B10J	Drain Pit Weather Delays	12	05MAY04	20MAY04
5C4B10M	Inspection & Closeout	1	26APR04	26APR04
5C4B10N	Contingency-Drain Pit Mods AW-02D	9	21MAY04	03JUN04
5C4B111	Mobilization & Setup	6	04JUN04	11JUN04
5C4B112	Spray Fixative	2	14JUN04	15JUN04
5C4B113	Remove Cover Block	1	16JUN04	16JUN04
5C4B114	Demo Existing Instruments in Pits	1	17JUN04	17JUN04
5C4B115	Clean Debris/Wash Down Pit	5	18JUN04	24JUN04
5C4B116	SPC Coatings- Pit	10	25JUN04	09JUL04
5C4B117	Core Drill Cover Block (1 Hole)	2	17JUN04	18JUN04
5C4B118	Coatings for Cover Blocks	8	21JUN04	30JUN04
5C4B119	Install LDE Sleeve	2	01JUL04	02JUL04
5C4B11A	Install Drain Plug	2	12JUL04	13JUL04
5C4B11B	Replace Cover Block	1	15JUL04	15JUL04
5C4B11C	Install LDE Probe Assembly	1	16JUL04	16JUL04
5C4B11D	Site Instrumentation (Wiring & LDE Cabinet)	5	14JUN04	18JUN04
5C4B11E	Install Missile Shield	3	21JUN04	23JUN04
5C4B11F	ATP	2	19JUL04	20JUL04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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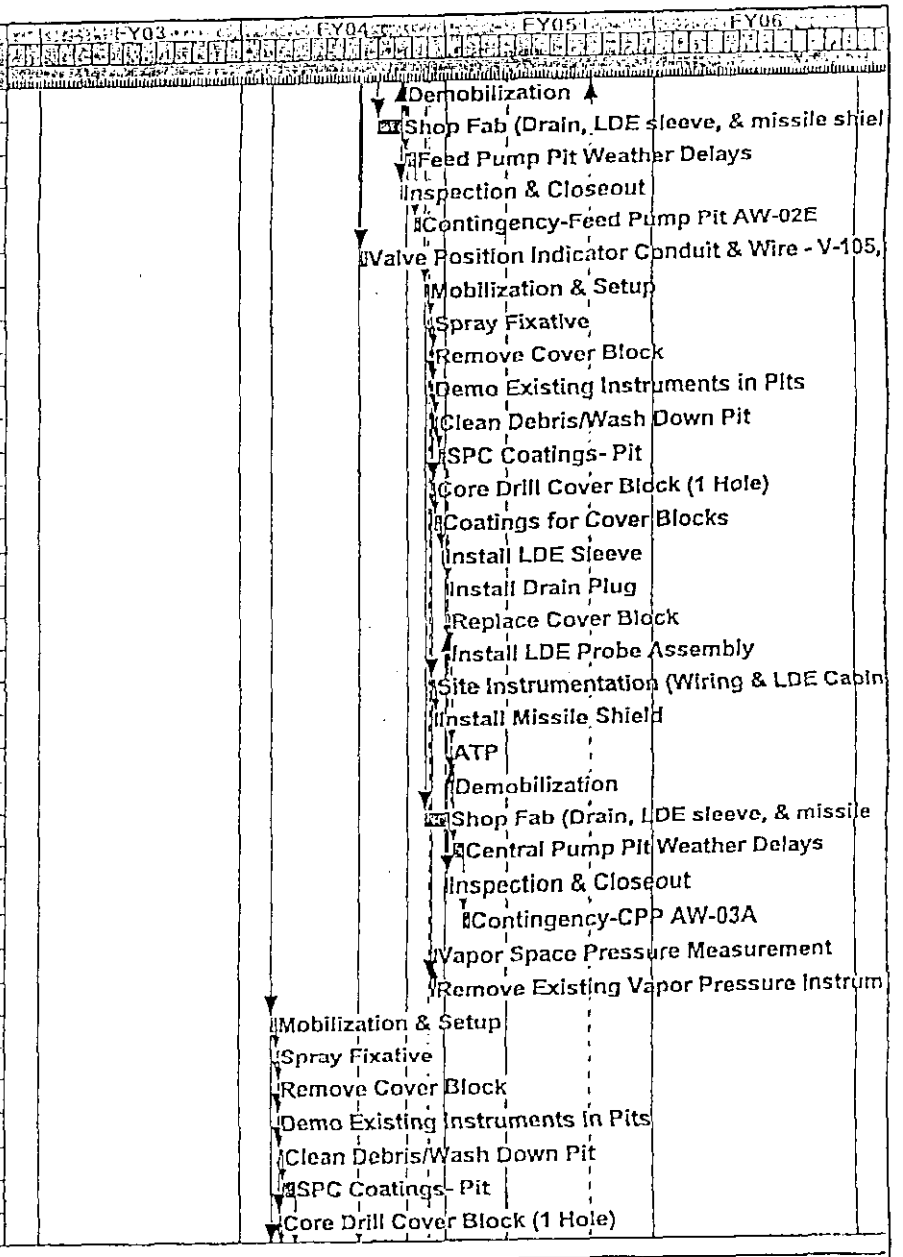
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C4B11G	Demobilization	2	21JUL04	22JUL04
5C4B11H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	04JUN04	15JUL04
5C4B11J	Feed Pump Pit Weather Delays	12	23JUL04	09AUG04
5C4B11M	Inspection & Closeout	1	14JUL04	14JUL04
5C4B11N	Contingency-Feed Pump Pit AW-02E	9	10AUG04	20AUG04
5C4B12	Valve Position Indicator Conduit & Wire - V-105,	6	06MAY04	13MAY04
5C4C021	Mobilization & Setup	6	27AUG04	03SEP04
5C4C022	Spray Fixative	2	07SEP04	08SEP04
5C4C023	Remove Cover Block	1	09SEP04	09SEP04
5C4C024	Demo Existing Instruments in Pits	1	10SEP04	10SEP04
5C4C025	Clean Debris/Wash Down Pit	5	13SEP04	17SEP04
5C4C026	SPC Coatings- Pit	10	20SEP04	01OCT04
5C4C027	Core Drill Cover Block (1 Hole)	2	10SEP04	13SEP04
5C4C028	Coatings for Cover Blocks	8	14SEP04	23SEP04
5C4C029	Install LDE Sleeve	2	24SEP04	27SEP04
5C4C02A	Install Drain Plug	2	04OCT04	05OCT04
5C4C02B	Replace Cover Block	1	07OCT04	07OCT04
5C4C02C	Install LDE Probe Assembly	1	08OCT04	08OCT04
5C4C02D	Site Instrumentation (Wiring & LDE Cabinet)	5	07SEP04	13SEP04
5C4C02E	Install Missile Shield	3	14SEP04	16SEP04
5C4C02F	ATP	2	11OCT04	12OCT04
5C4C02G	Demobilization	2	13OCT04	14OCT04
5C4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	27AUG04	07OCT04
5C4C02J	Central Pump Pit Weather Delays	12	15OCT04	01NOV04
5C4C02M	Inspection & Closeout	1	06OCT04	06OCT04
5C4C02N	Contingency-CPP AW-03A	9	02NOV04	12NOV04
5C4C08A	Vapor Space Pressure Measurement	3	15SEP04	17SEP04
5C4C08B	Remove Existing Vapor Pressure Instruments	6	07SEP04	14SEP04
5C4D021	Mobilization & Setup	6	26NOV03	05DEC03
5C4D022	Spray Fixative	2	08DEC03	09DEC03
5C4D023	Remove Cover Block	1	10DEC03	10DEC03
5C4D024	Demo Existing Instruments in Pits	1	11DEC03	11DEC03
5C4D025	Clean Debris/Wash Down Pit	5	12DEC03	18DEC03
5C4D026	SPC Coatings- Pit	10	19DEC03	06JAN04
5C4D027	Core Drill Cover Block (1 Hole)	2	11DEC03	12DEC03



Project Start	18JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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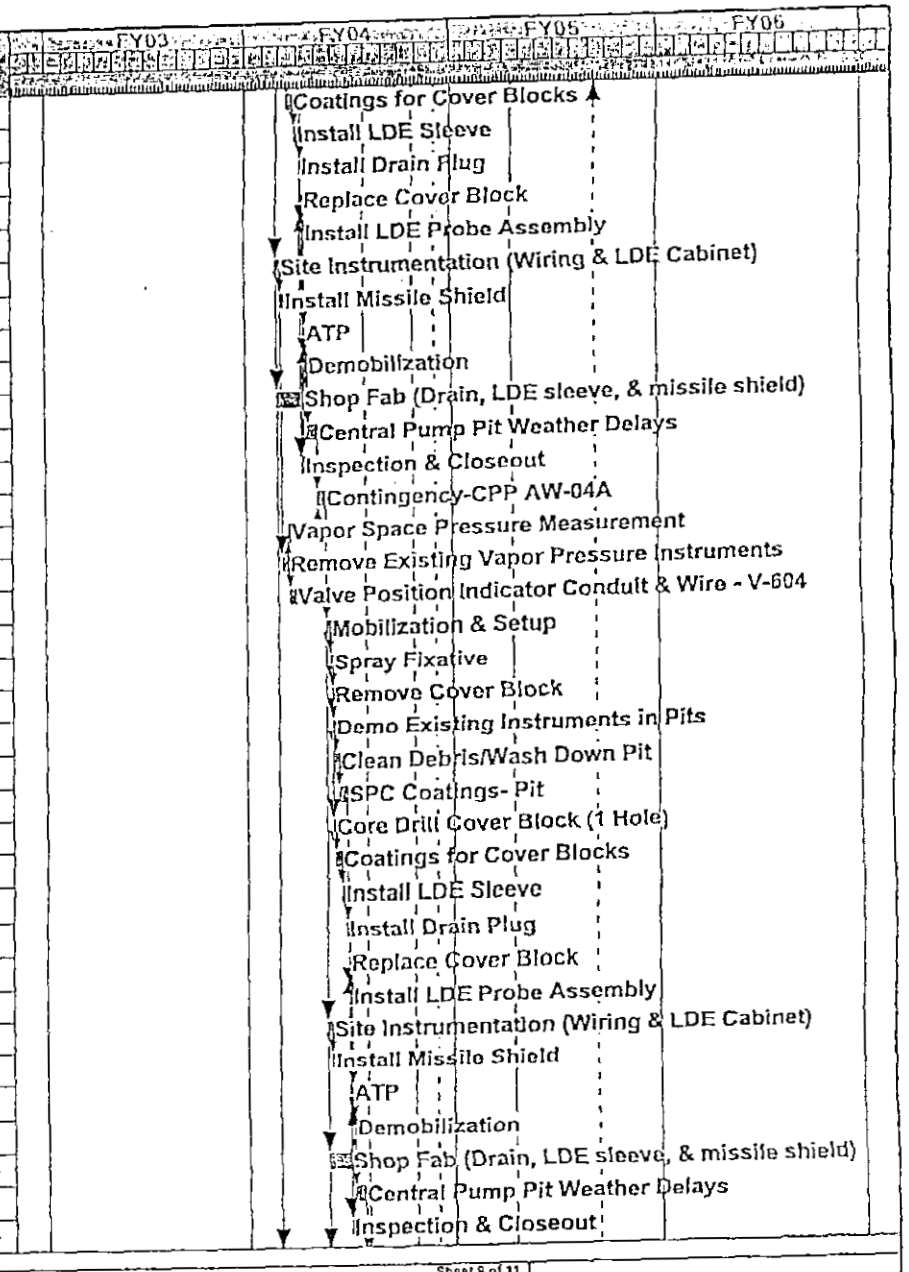
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C4D028	Coatings for Cover Blocks	8	15DEC03	24DEC03
5C4D029	Install LDE Sleeve	2	29DEC03	30DEC03
5C4D02A	Install Drain Plug	2	07JAN04	08JAN04
5C4D02B	Replace Cover Block	1	12JAN04	12JAN04
5C4D02C	Install LDE Probe Assembly	1	13JAN04	13JAN04
5C4D02D	Site Instrumentation (Wiring & LDE Cabinet)	5	26NOV03	04DEC03
5C4D02E	Install Missile Shield	3	05DEC03	09DEC03
5C4D02F	ATP	2	14JAN04	15JAN04
5C4D02G	Demobilization	2	16JAN04	19JAN04
5C4D02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	26NOV03	12JAN04
5C4D02J	Central Pump Pit Weather Delays	12	20JAN04	04FEB04
5C4D02M	Inspection & Closeout	1	09JAN04	09JAN04
5C4D02N	Contingency-CPP AW-04A	9	05FEB04	18FEB04
5C4D08A	Vapor Space Pressure Measurement	3	15DEC03	17DEC03
5C4D08B	Remove Existing Vapor Pressure Instruments	6	05DEC03	12DEC03
5C4D11	Valve Position Indicator Conduit & Wire - V-604	6	18DEC03	29DEC03
5C4E021	Mobilization & Setup	6	19FEB04	26FEB04
5C4E022	Spray Fixative	2	27FEB04	01MAR04
5C4E023	Remove Cover Block	1	02MAR04	02MAR04
5C4E024	Demo Existing Instruments in Pits	1	03MAR04	03MAR04
5C4E025	Clean Debris/Wash Down Pit	5	04MAR04	10MAR04
5C4E026	SPC Coatings- Pit	10	11MAR04	24MAR04
5C4E027	Core Drill Cover Block (1 Hole)	2	03MAR04	04MAR04
5C4E028	Coatings for Cover Blocks	8	05MAR04	16MAR04
5C4E029	Install LDE Sleeve	2	17MAR04	18MAR04
5C4E02A	Install Drain Plug	2	25MAR04	26MAR04
5C4E02B	Replace Cover Block	1	30MAR04	30MAR04
5C4E02C	Install LDE Probe Assembly	1	31MAR04	31MAR04
5C4E02D	Site Instrumentation (Wiring & LDE Cabinet)	5	19FEB04	25FEB04
5C4E02E	Install Missile Shield	3	26FEB04	01MAR04
5C4E02F	ATP	2	01APR04	02APR04
5C4E02G	Demobilization	2	05APR04	06APR04
5C4E02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	19FEB04	30MAR04
5C4E02J	Central Pump Pit Weather Delays	12	07APR04	22APR04
5C4E02M	Inspection & Closeout	1	29MAR04	29MAR04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AW Farm - Figure 7.1

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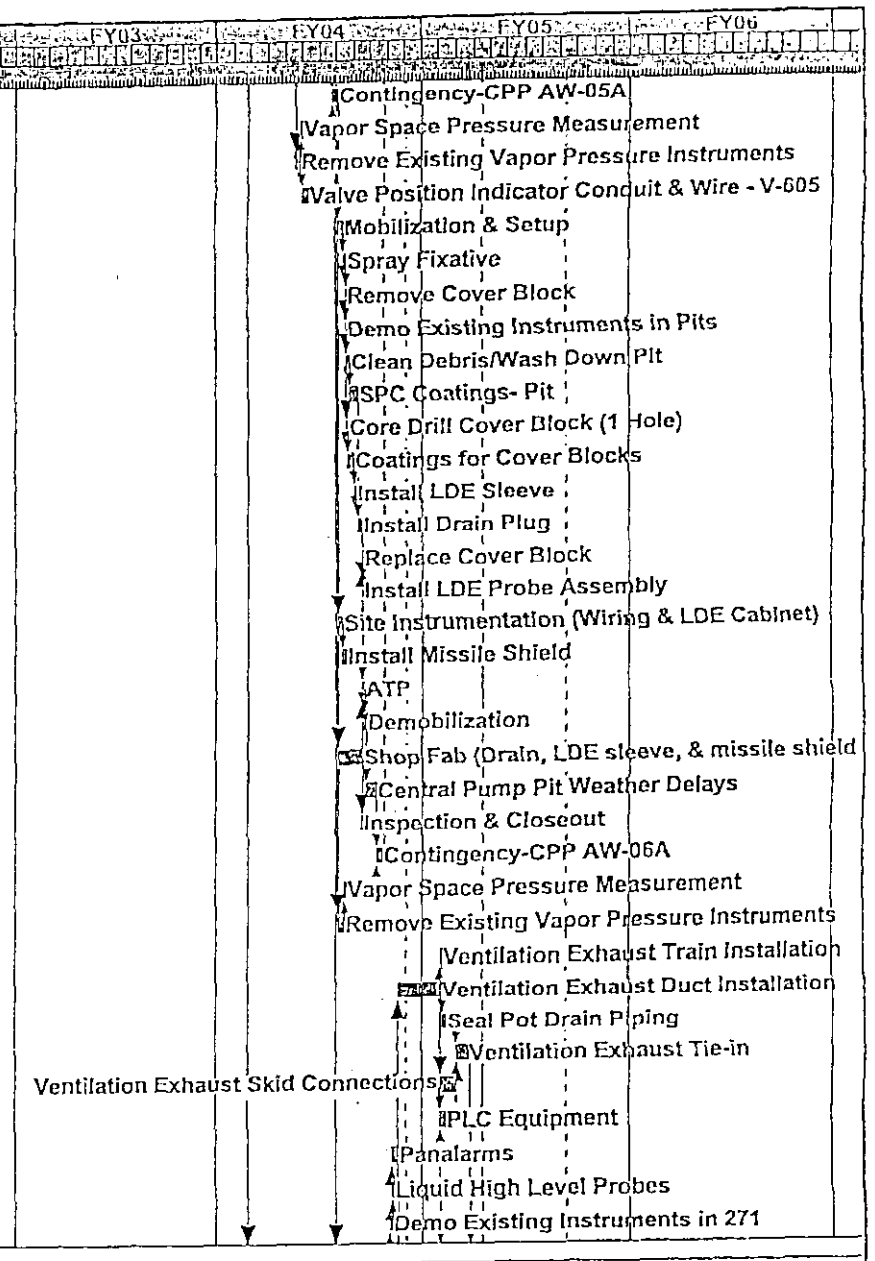
Activity ID	Activity Description	Orig. Dur	Early Start	Early Finish
5C4E02N	Contingency-CPP AW-05A	9	23APR04	05MAY04
5C4E08A	Vapor Space Pressure Measurement	3	27FEB04	02MAR04
5C4E08B	Remove Existing Vapor Pressure Instruments	6	19FEB04	26FEB04
5C4E11	Valve Position Indicator Conduit & Wire - V-605	6	03MAR04	10MAR04
5C4F021	Mobilization & Setup	6	06MAY04	13MAY04
5C4F022	Spray Fixative	2	14MAY04	17MAY04
5C4F023	Remove Cover Block	1	18MAY04	18MAY04
5C4F024	Demo Existing Instruments in Pits	1	19MAY04	19MAY04
5C4F025	Clean Debris/Wash Down Pit	5	20MAY04	26MAY04
5C4F026	SPC Coatings- Pit	10	27MAY04	10JUN04
5C4F027	Core Drill Cover Block (1 Hole)	2	19MAY04	20MAY04
5C4F028	Coatings for Cover Blocks	8	21MAY04	02JUN04
5C4F029	Install LDE Sleeve	2	03JUN04	04JUN04
5C4F02A	Install Drain Plug	2	11JUN04	14JUN04
5C4F02B	Replace Cover Block	1	16JUN04	16JUN04
5C4F02C	Install LDE Probe Assembly	1	17JUN04	17JUN04
5C4F02D	Site Instrumentation (Wiring & LDE Cabinet)	5	06MAY04	12MAY04
5C4F02E	Install Missile Shield	3	13MAY04	17MAY04
5C4F02F	ATP	2	18JUN04	21JUN04
5C4F02G	Demobilization	2	22JUN04	23JUN04
5C4F02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	06MAY04	16JUN04
5C4F02J	Central Pump Pit Weather Delays	12	24JUN04	12JUL04
5C4F02M	Inspection & Closeout	1	15JUN04	15JUN04
5C4F02N	Contingency-CPP AW-06A	9	13JUL04	23JUL04
5C4F08A	Vapor Space Pressure Measurement	3	14MAY04	18MAY04
5C4F08B	Remove Existing Vapor Pressure Instruments	6	06MAY04	13MAY04
5C4J02	Ventilation Exhaust Train Installation	3	02NOV04	04NOV04
5C4J05	Ventilation Exhaust Duct Installation	51	20AUG04	01NOV04
5C4J07	Seal Pot Drain Piping	6	05NOV04	12NOV04
5C4J09	Ventilation Exhaust Tie-in	17	01DEC04	23DEC04
5C4J22A	Ventilation Exhaust Skid Connections	19	02NOV04	30NOV04
5C4J22B	PLC Equipment	8	02NOV04	11NOV04
5C4J22C	Panalarms	8	10AUG04	19AUG04
5C4J22D	Liquid High Level Probes	3	10AUG04	12AUG04
5C4J22E	Demo Existing Instruments in 271	2	06AUG04	09AUG04



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	28SEP99	

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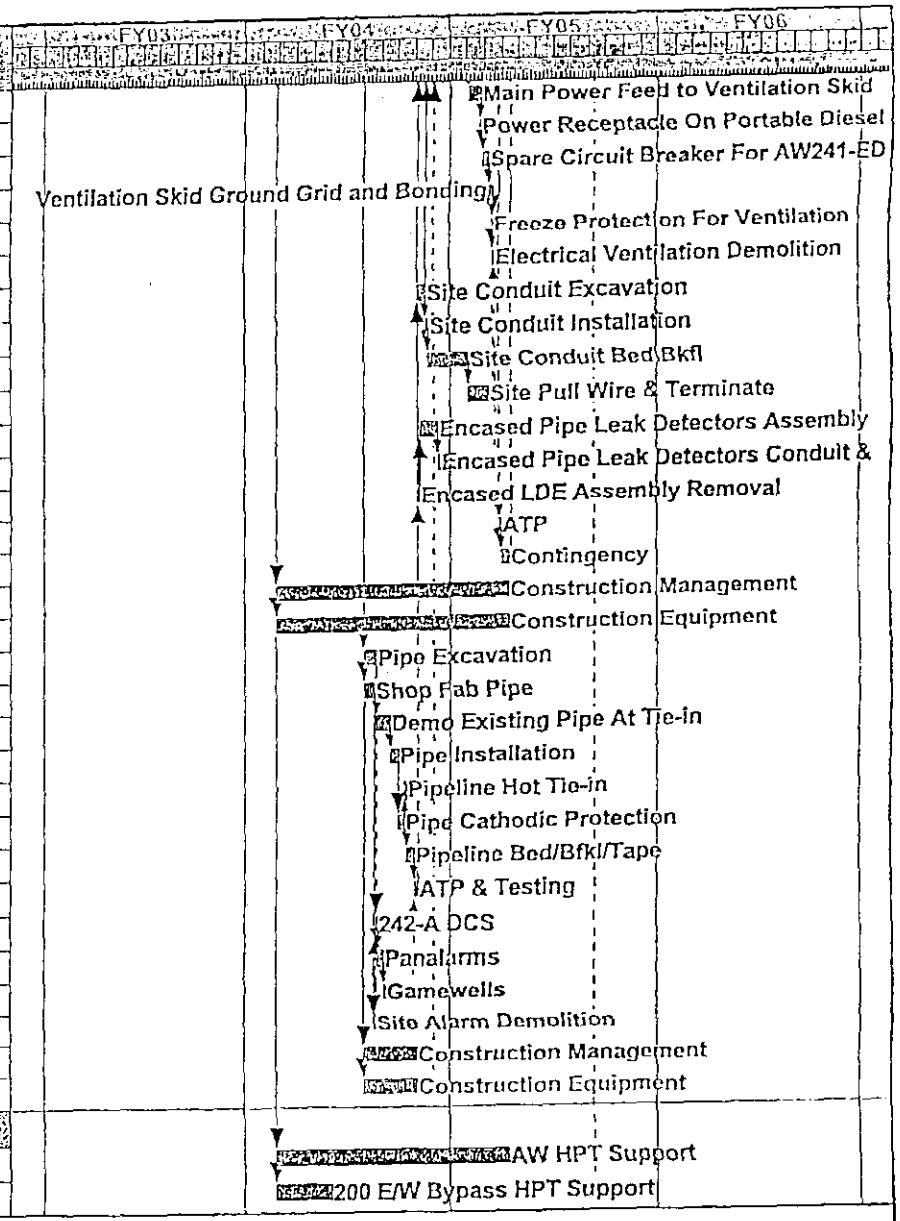
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5C4J26A	Main Power Feed to Ventilation Skid	15	02NOV04	22NOV04
5C4J26B	Power Receptacle On Portable Diesel Generator	2	23NOV04	24NOV04
5C4J26C	Spare Circuit Breaker For AW241-EDS-ENCL-100	7	29NOV04	07DEC04
5C4J26D	Ventilation Skid Ground Grid and Bonding	5	08DEC04	14DEC04
5C4J26E	Freeze Protection For Ventilation	2	15DEC04	16DEC04
5C4J26F	Electrical Ventilation Demolition	2	17DEC04	20DEC04
5C4J27A	Site Conduit Excavation	10	06AUG04	19AUG04
5C4J27B	Site Conduit Installation	2	20AUG04	23AUG04
5C4J27C	Site Conduit Bed\Bkfl	50	24AUG04	02NOV04
5C4J28	Site Pull Wire & Terminate	22	03NOV04	06DEC04
5C4J35A	Encased Pipe Leak Detectors Assembly	20	11AUG04	08SEP04
5C4J35B	Encased Pipe Leak Detectors Conduit & Wire	4	09SEP04	14SEP04
5C4J35C	Encased LDE Assembly Removal	3	06AUG04	10AUG04
5C4J43	ATP	3	28DEC04	30DEC04
5C4J44	Contingency	10	31DEC04	14JAN05
5C4N	Construction Management	284	26NOV03	14JAN05
5C4P	Construction Equipment	284	26NOV03	14JAN05
5I4E01	Pipe Excavation	15	03MAY04*	21MAY04
5I4E02	Shop Fab Pipe	12	03MAY04	18MAY04
5I4E03	Demo Existing Pipe At Tie-in	16	24MAY04	15JUN04
5I4E04	Pipe Installation	11	16JUN04	30JUN04
5I4E05	Pipeline Hot Tie-in	4	12JUL04	15JUL04
5I4E06	Pipe Cathodic Protection	6	01JUL04	09JUL04
5I4E07	Pipeline Bed/Bfkl/Tape	9	16JUL04	28JUL04
5I4E08	ATP & Testing	6	29JUL04	05AUG04
5I4F01	242-A DCS	2	21MAY04	24MAY04
5I4F02	Panalarms	8	25MAY04	04JUN04
5I4F03	Gamewells	2	07JUN04	08JUN04
5I4F04	Site Alarm Demolition	2	19MAY04	20MAY04
5I4N	Construction Management	67	03MAY04	05AUG04
5I4P	Construction Equipment	67	03MAY04	05AUG04
AW-HPT Support				
5C6100	AW HPT Support	284	26NOV03	14JAN05
5I6100	200 E/W Bypass HPT Support	67	26NOV03	05MAR04



Project Start	19JUL99	Early Bar
Project Finish	28APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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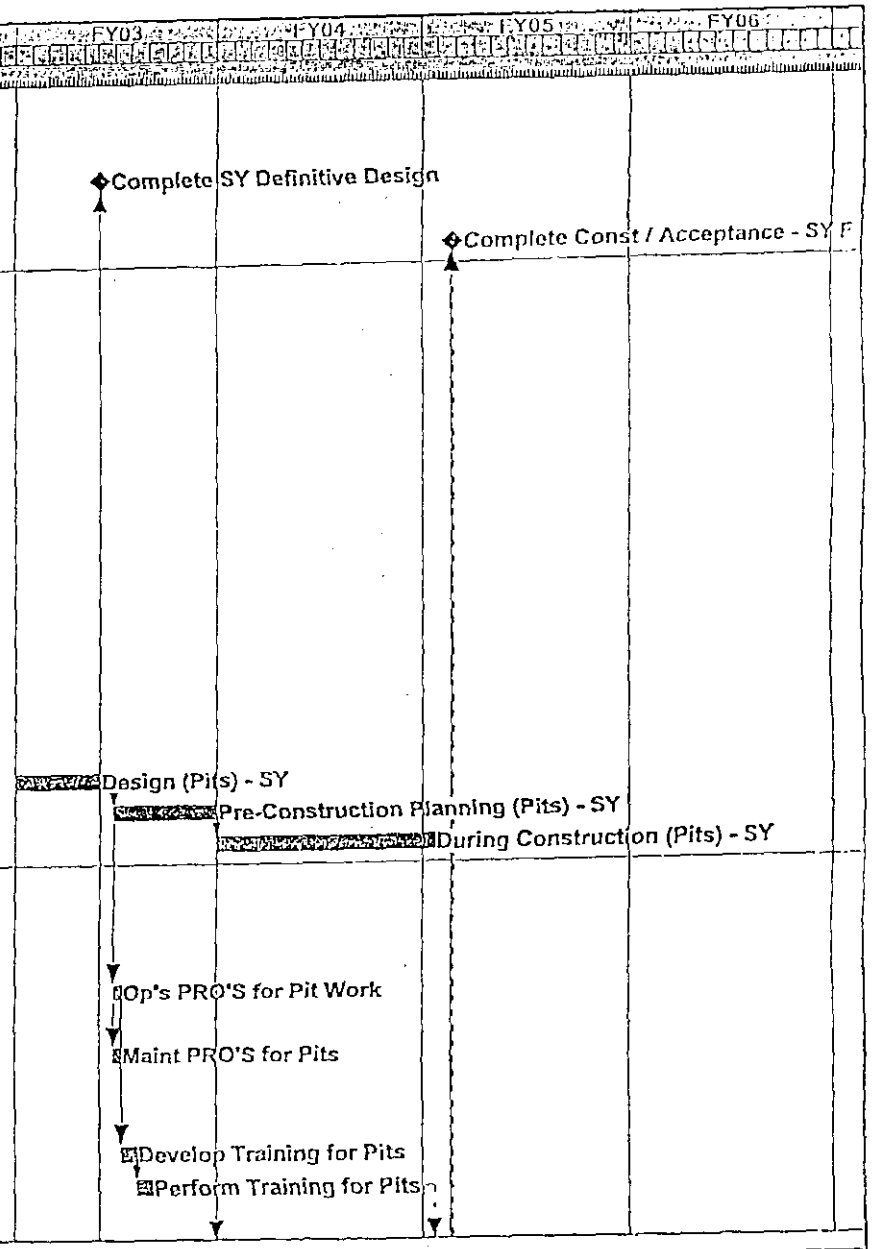
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AW Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F0050	Start SY Definitive Design	0	04OCT99*	
5F1202	Complete SY Definitive Design	0		04MAR03
5F1203	Start Construction - SY Farm Phase 2	0	28JUN00	
5F1204	Complete Const / Acceptance - SY Farm Phase 2	0		22NOV04
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.01.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - SY Farm				
3C5F1A	Design (Annulus Vent) - SY	60	04OCT99	30DEC99
3C5F2A	Pre-Construction Planning (Annulus Vent) - SY	130	22DEC99	27JUN00
3C5F3A	Procurement (Annulus Vent) - SY	125	03JAN00	27JUN00
3C5F4A	During Construction (Annulus Vent) - SY	60	28JUN00	21SEP00
3C5F5A	Design (Pits) - SY	105	01OCT02*	04MAR03
3C5F6A	Pre-Construction Planning (Pits) - SY	130	28MAR03	30SEP03
3C5F7A	During Construction (Pits) - SY	269	01OCT03	22OCT04
Startup & Testing - Phase 2				
Startup & Testing - SY Farm				
3K5F3A1	Op's PRO'S for Vent (Annulus Vent)	30	04APR00	15MAY00
3K5F3A2	Op's PRO'S for Pit Work	10	28MAR03	10APR03
3K5F3A3	Maint PRO'S for Vent (Annulus Vent)	30	04APR00	15MAY00
3K5F3A4	Maint PRO'S for Pits	10	28MAR03	10APR03
3K5F3A5	Develop Training for Vent (Annulus Vent)	30	16MAY00	27JUN00
3K5F3A6	Perform Training for Vent (Annulus Vent)	30	28JUN00	09AUG00
3K5F3A7	Develop Training for Pits	20	11APR03	08MAY03
3K5F3A8	Perform Training for Pits	20	09MAY03	06JUN03
3K5F3AA	OTP'S for Vent (Annulus Vent)	20	22SEP00	19OCT00



Project Start	19JUL99	Early Bar
Project Finish	28APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	28SEP99	

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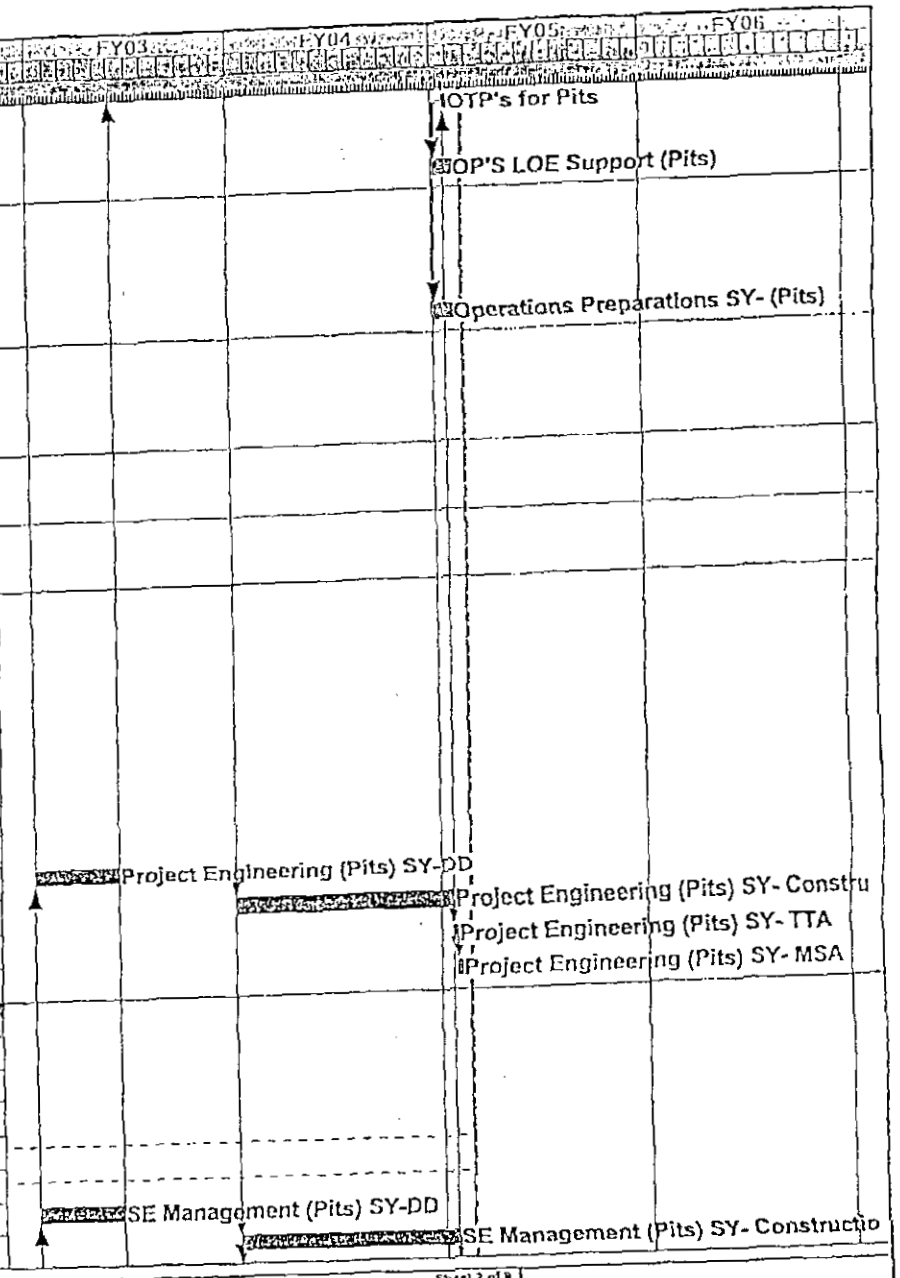
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
3K5F3AB	OTP's for Pits	5	25OCT04	29OCT04
3K5F3AC	Vent Startup (Annulus Vent)	20	20OCT00	16NOV00
3K5F3AE	OP'S LOE Support (Pits)	25	04OCT04	05NOV04
Operations Preparation				
Ops Prep - MSA SY Farm				
3L5F1O	Operations Preparations SY- (Annulus Vent)	40	20OCT00	18DEC00
3L5F1P	Operations Preparations SY- (Pits)	25	04OCT04	05NOV04
SY Tank Farm				
SY Definitive Design-Engineering				
3Q1100	SY Definitive Design - Engineering	60	04OCT99	30DEC99
SY Tank Farm - Procurement				
3Q3B00	HVAC Procurement	125	03JAN00	27JUN00
SY Tank Farm - Construction				
3Q4000	SY Tank Farm Construction	60	28JUN00	21SEP00
Capital- Phase 2				
Project Management				
Project Engineering				
1B5F1A	Project Engineering (Annulus Vent) SY-DD	60	04OCT99	30DEC99
1B5F2A	Project Engineering (Annulus Vent) SY-	125	03JAN00	27JUN00
1B5F3A	Project Engineering (Annulus Vent) SY- Construct	60	28JUN00	21SEP00
1B5F4A	Project Engineering (Annulus Vent) SY- TTA	40	22SEP00	16NOV00
1B5F5A	Project Engineering (Annulus Vent) SY- MSA	20	17NOV00	18DEC00
1B5F7A	Project Engineering (Pits) SY-DD	105	01OCT02	04MAR03
1B5F8A	Project Engineering (Pits) SY- Construction	269	01OCT03	22OCT04
1B5F9A	Project Engineering (Pits) SY- TTA	5	25OCT04	29OCT04
1B5FAA	Project Engineering (Pits) SY- MSA	5	01NOV04	05NOV04
Systems Engineering				
1C5F1A	SE Management (Annulus Vent) SY-DD	60	04OCT99	30DEC99
1C5F2A	SE Management (Annulus Vent) SY- Procurement	125	03JAN00	27JUN00
1C5F3A	SE Management (Annulus Vent) SY- Construction	60	28JUN00	21SEP00
1C5F4A	SE Management (Annulus Vent) SY- TTA	40	22SEP00	16NOV00
1C5F5A	SE Management (Annulus Vent) SY- MSA	20	17NOV00	18DEC00
1C5F7A	SE Management (Pits) SY-DD	105	01OCT02	04MAR03
1C5F8A	SE Management (Pits) SY- Construction	269	01OCT03	22OCT04



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Project Start	19JUL99	Early Bar
Project Finish	26APR08	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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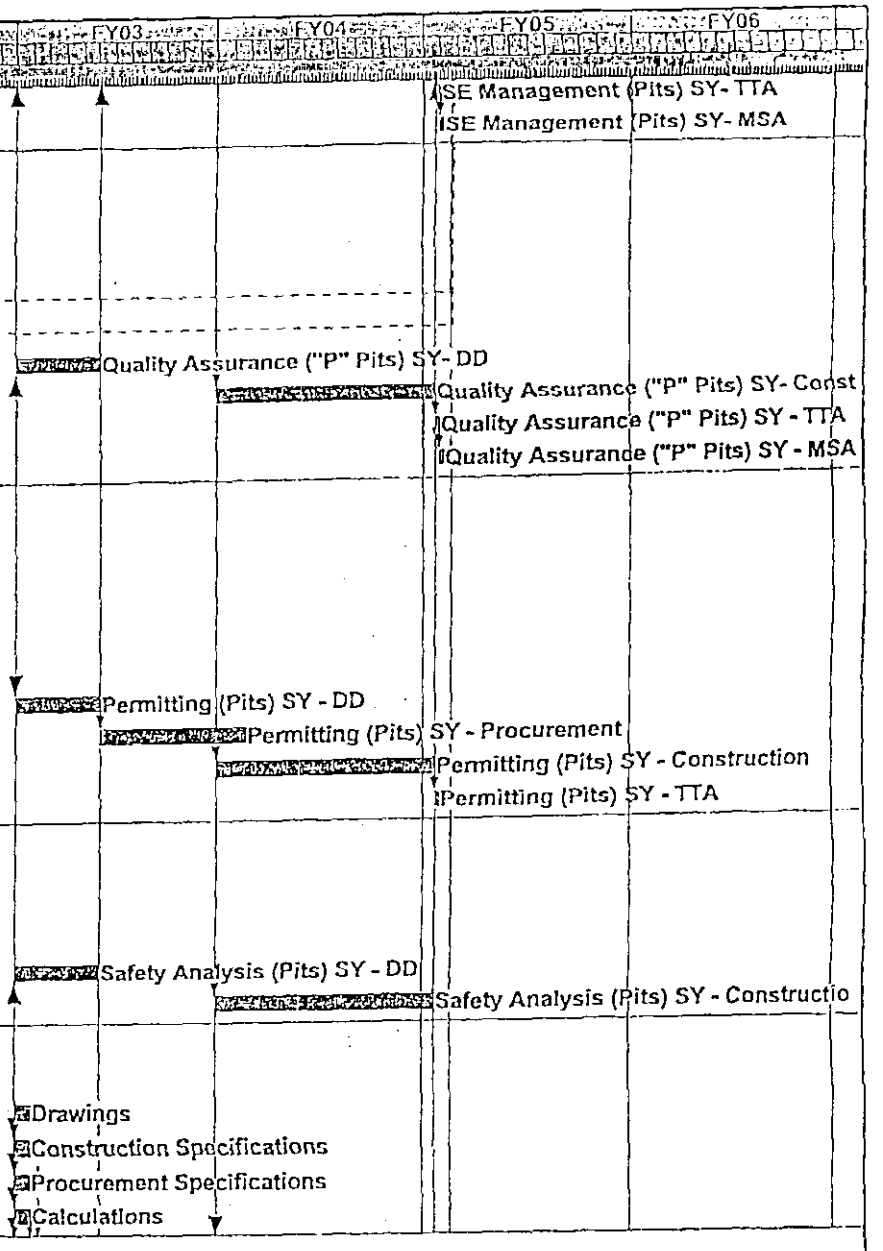
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
1C5F9A	SE Management (Pits) SY- TTA	5	25OCT04	29OCT04
1C5FAA	SE Management (Pits) SY- MSA	5	01NOV04	05NOV04
Quality Assurance				
1D5F1A	Quality Assurance (Annulus Vent) SY- DD	60	04OCT99	30DEC99
1D5F2A	Quality Assurance (Annulus Vent) SY-	125	03JAN00	27JUN00
1D5F3A	Quality Assurance (Annulus Vent) SY- Constructio	60	28JUN00	21SEP00
1D5F4A	Quality Assurance (Annulus Vent) SY - TTA	40	22SEP00	16NOV00
1D5F5A	Quality Assurance (Annulus Vent) SY - MSA	20	17NOV00	18DEC00
1D5F7A	Quality Assurance ("P" Pits) SY- DD	105	01OCT02	04MAR03
1D5F8A	Quality Assurance ("P" Pits) SY- Construction	269	01OCT03	22OCT04
1D5F9A	Quality Assurance ("P" Pits) SY - TTA	5	25OCT04	29OCT04
1D5FAA	Quality Assurance ("P" Pits) SY - MSA	5	01NOV04	05NOV04
Permitting and Safety				
Permits				
2A5F2A	Permitting (Annulus Vent) SY - DD	60	04OCT99	30DEC99
2A5F3A	Permitting (Annulus Vent) SY - Procurement	125	03JAN00	27JUN00
2A5F4A	Permitting (Annulus Vent) SY - Construction	60	28JUN00	21SEP00
2A5F5A	Permitting (Annulus Vent) SY - TTA	40	22SEP00	16NOV00
2A5F6A	Permitting (Pits) SY - DD	105	01OCT02	04MAR03
2A5F7A	Permitting (Pits) SY - Procurement	185	05MAR03	21NOV03
2A5F8A	Permitting (Pits) SY - Construction	269	01OCT03	22OCT04
2A5F9A	Permitting (Pits) SY - TTA	5	25OCT04	29OCT04
Safety Analysis				
2B5F1A	Safety Analysis (Annulus Vent) SY - DD	60	04OCT99	30DEC99
2B5F2A	Safety Analysis (Annulus Vent) SY - Procurement	125	03JAN00	27JUN00
2B5F3A	Safety Analysis (Annulus Vent) SY - Construction	60	28JUN00	21SEP00
2B5F7A	Safety Analysis (Pits) SY - DD	105	01OCT02	04MAR03
2B5F8A	Safety Analysis (Pits) SY - Construction	269	01OCT03	22OCT04
SY Tank Farm				
SY Definitive Design				
5F1111	Drawings	20	01OCT02*	28OCT02
5F1112	Construction Specifications	20	01OCT02	28OCT02
5F1113	Procurement Specifications	20	01OCT02	28OCT02
5F1114	Calculations	20	01OCT02	28OCT02



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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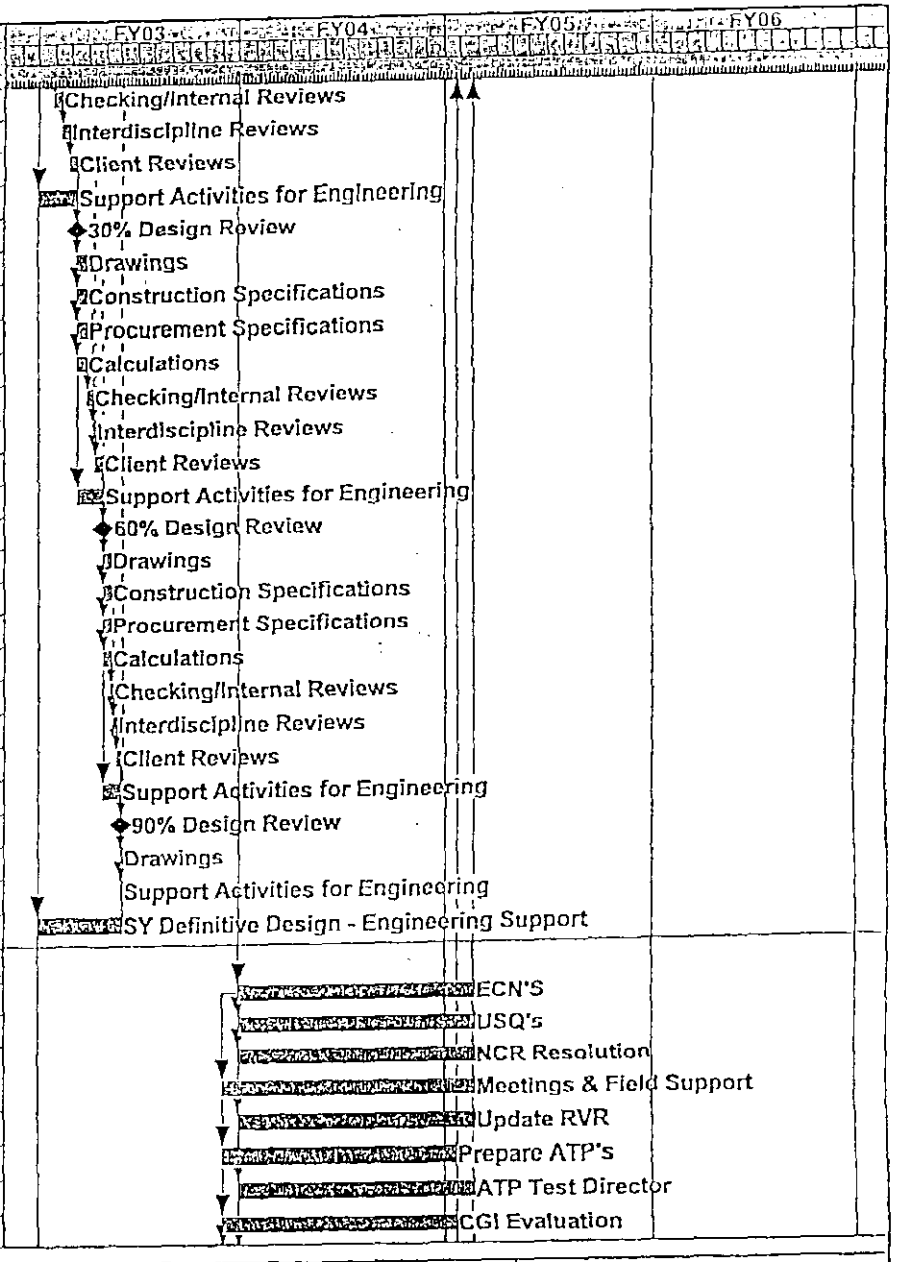
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F1115	Checking/Internal Reviews	10	29OCT02	11NOV02
5F1116	Interdiscipline Reviews	10	12NOV02	25NOV02
5F1117	Client Reviews	10	26NOV02	11DEC02
5F1118	Support Activities for Engineering	50	01OCT02	11DEC02
5F1119	30% Design Review	0		11DEC02
5F1121	Drawings	10	12DEC02	27DEC02
5F1122	Construction Specifications	10	12DEC02	27DEC02
5F1123	Procurement Specifications	10	12DEC02	27DEC02
5F1124	Calculations	10	12DEC02	27DEC02
5F1125	Checking/Internal Reviews	5	30DEC02	06JAN03
5F1126	Interdiscipline Reviews	5	07JAN03	13JAN03
5F1127	Client Reviews	10	14JAN03	27JAN03
5F1128	Support Activities for Engineering	30	12DEC02	27JAN03
5F1129	60% Design Review	0		27JAN03
5F1131	Drawings	10	28JAN03	10FEB03
5F1132	Construction Specifications	10	28JAN03	10FEB03
5F1133	Procurement Specifications	10	28JAN03	10FEB03
5F1134	Calculations	10	28JAN03	10FEB03
5F1135	Checking/Internal Reviews	3	11FEB03	13FEB03
5F1136	Interdiscipline Reviews	2	14FEB03	18FEB03
5F1137	Client Reviews	5	19FEB03	25FEB03
5F1138	Support Activities for Engineering	20	28JAN03	25FEB03
5F1139	90% Design Review	0		25FEB03
5F1141	Drawings	5	26FEB03	04MAR03
5F1142	Support Activities for Engineering	5	26FEB03	04MAR03
5F1201	SY Definitive Design - Engineering Support	105	01OCT02	04MAR03
SY - E&I During Construction				
5F2111	ECN'S	290	01OCT03	22NOV04
5F2112	USQ's	290	01OCT03	22NOV04
5F2113	NCR Resolution	290	01OCT03	22NOV04
5F2114	Meetings & Field Support	311	02SEP03	22NOV04
5F2115	Update RVR	290	01OCT03	22NOV04
5F2116	Prepare ATP's	290	02SEP03	22OCT04
5F2117	ATP Test Director	290	01OCT03	22NOV04
5F2118	CGI Evaluation	290	02SEP03	22OCT04



Project Start	19JUL99	Early Bar	
Project Finish	28APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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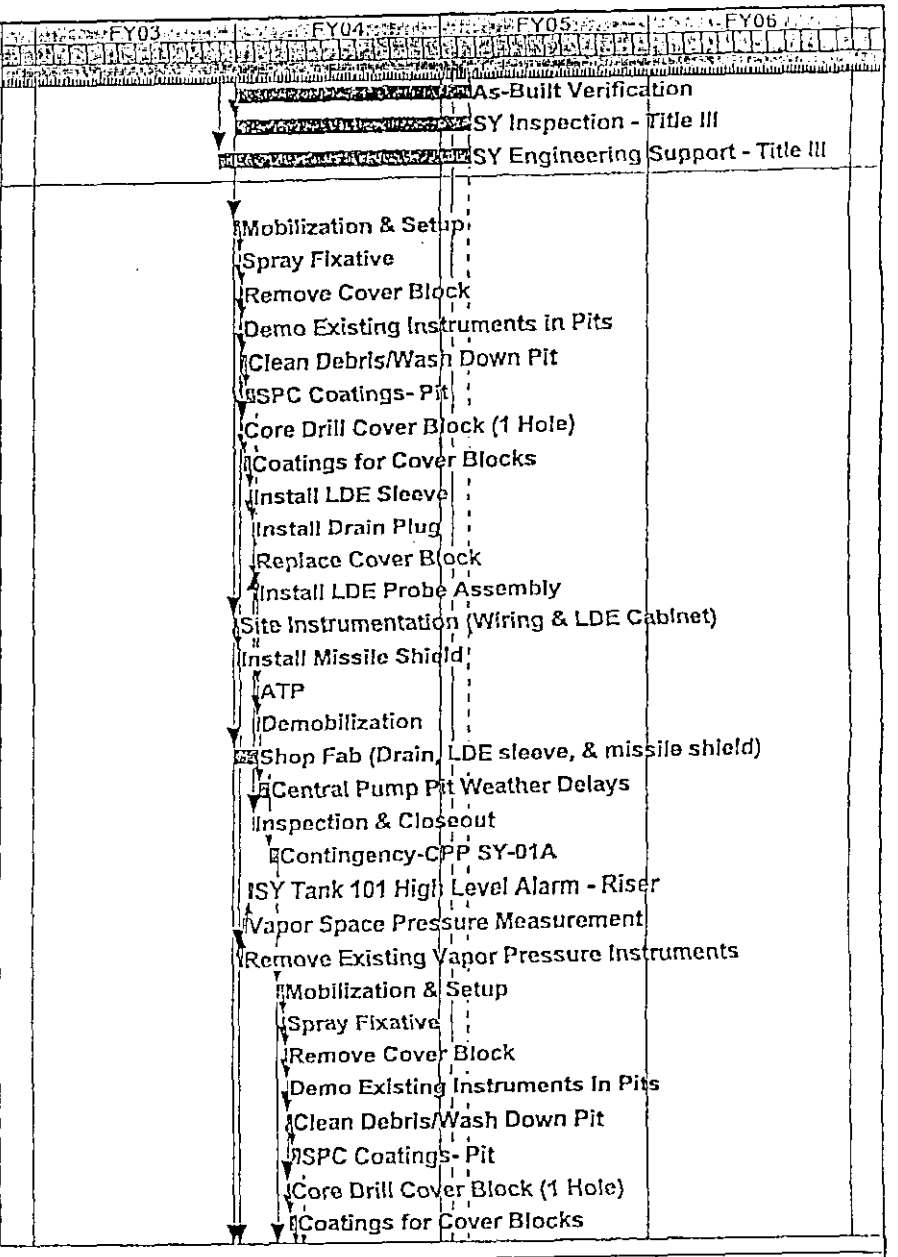
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F2119	As-Built Verification	290	01OCT03	22NOV04
5F2121	SY Inspection - Title III	290	01OCT03	22NOV04
5F2131	SY Engineering Support - Title III	311	02SEP03	22NOV04
SY Construction				
5F4A021	Mobilization & Setup	6	01OCT03	08OCT03
5F4A022	Spray Fixative	2	09OCT03	10OCT03
5F4A023	Remove Cover Block	1	13OCT03	13OCT03
5F4A024	Demo Existing Instruments in Pits	1	14OCT03	14OCT03
5F4A025	Clean Debris/Wash Down Pit	5	15OCT03	21OCT03
5F4A026	SPC Coatings- Pit	10	22OCT03	04NOV03
5F4A027	Core Drill Cover Block (1 Hole)	2	14OCT03	15OCT03
5F4A028	Coatings for Cover Blocks	8	17OCT03	28OCT03
5F4A029	Install LDE Sleeve	2	29OCT03	30OCT03
5F4A02A	Install Drain Plug	2	31OCT03	03NOV03
5F4A02B	Replace Cover Block	1	05NOV03	05NOV03
5F4A02C	Install LDE Probe Assembly	1	10NOV03	10NOV03
5F4A02D	Site Instrumentation (Wiring & LDE Cabinet)	5	01OCT03	07OCT03
5F4A02E	Install Missile Shield	3	08OCT03	10OCT03
5F4A02F	ATP	2	11NOV03	12NOV03
5F4A02G	Demobilization	2	13NOV03	14NOV03
5F4A02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	01OCT03	10NOV03
5F4A02J	Central Pump Pit Weather Delays	12	17NOV03	04DEC03
5F4A02M	Inspection & Closeout	1	04NOV03	04NOV03
5F4A02N	Contingency-CPP SY-01A	9	05DEC03	17DEC03
5F4A07	SY Tank 101 High Level Alarm - Riser	6	27OCT03*	03NOV03
5F4A08A	Vapor Space Pressure Measurement	6	17OCT03	24OCT03
5F4A08B	Remove Existing Vapor Pressure Instruments	6	09OCT03	16OCT03
5F4B021	Mobilization & Setup	6	18DEC03	29DEC03
5F4B022	Spray Fixative	2	30DEC03	31DEC03
5F4B023	Remove Cover Block	1	02JAN04	02JAN04
5F4B024	Demo Existing Instruments in Pits	1	05JAN04	05JAN04
5F4B025	Clean Debris/Wash Down Pit	5	06JAN04	12JAN04
5F4B026	SPC Coatings- Pit	10	13JAN04	26JAN04
5F4B027	Core Drill Cover Block (1 Hole)	2	05JAN04	06JAN04
5F4B028	Coatings for Cover Blocks	8	08JAN04	19JAN04



Project Start	19JUL99	Early Bar	
Project Finish	28APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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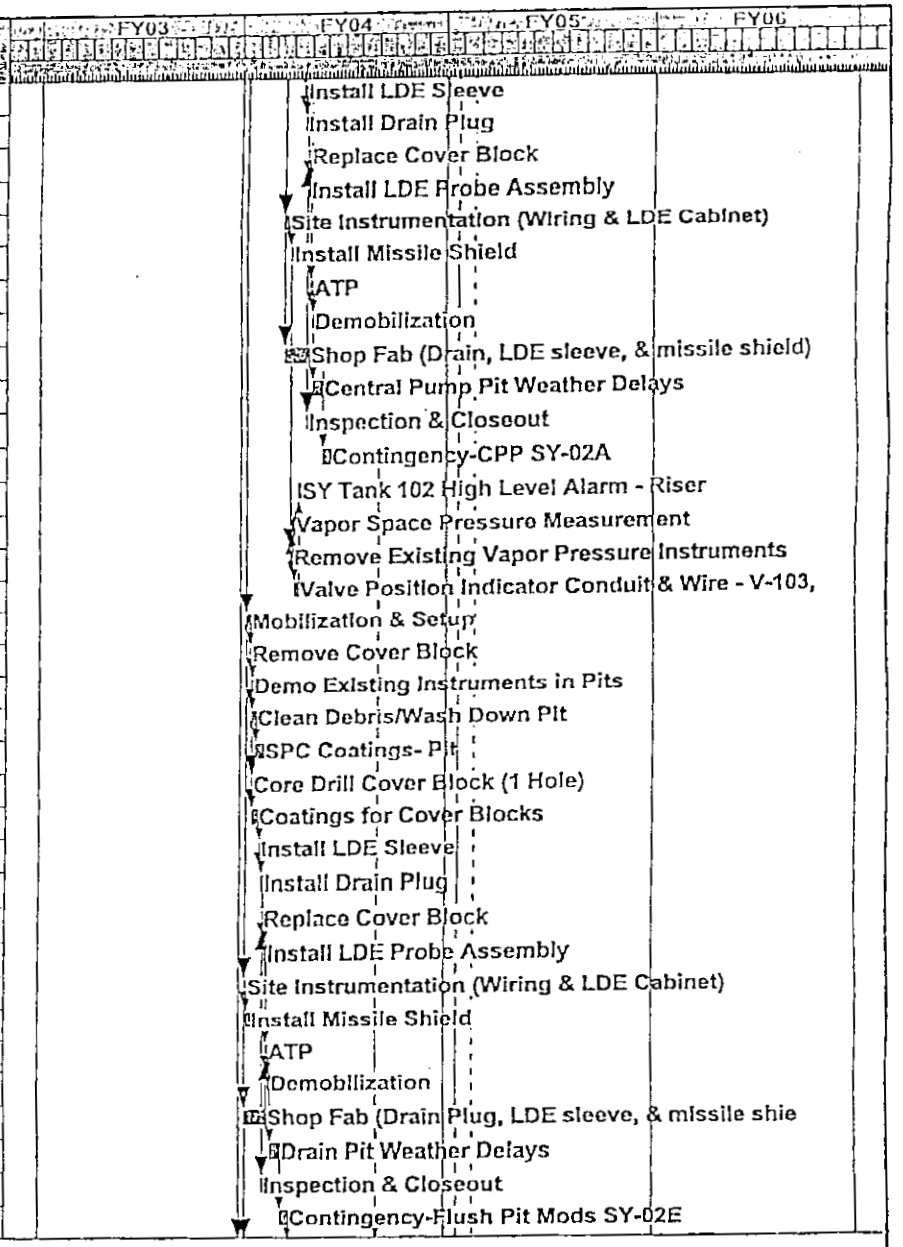
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F4B029	Install LDE Sleeve	2	20JAN04	21JAN04
5F4B02A	Install Drain Plug	2	22JAN04	23JAN04
5F4B02B	Replace Cover Block	1	27JAN04	27JAN04
5F4B02C	Install LDE Probe Assembly	1	30JAN04	30JAN04
5F4B02D	Site Instrumentation (Wiring & LDE Cabinet)	5	18DEC03	24DEC03
5F4B02E	Install Missile Shield	3	29DEC03	31DEC03
5F4B02F	ATP	2	02FEB04	03FEB04
5F4B02G	Demobilization	2	04FEB04	05FEB04
5F4B02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	18DEC03	30JAN04
5F4B02J	Central Pump Pit Weather Delays	12	06FEB04	24FEB04
5F4B02M	Inspection & Closeout	1	26JAN04	26JAN04
5F4B02N	Contingency-CPP SY-02A	9	25FEB04	08MAR04
5F4B07	SY Tank 102 High Level Alarm - Riser	3	12JAN04	14JAN04
5F4B08A	Vapor Space Pressure Measurement	2	31DEC03	02JAN04
5F4B08B	Remove Existing Vapor Pressure Instruments	2	29DEC03	30DEC03
5F4B11	Valve Position Indicator Conduit & Wire - V-103,	5	05JAN04	09JAN04
5F4B141	Mobilization & Setup	6	09OCT03	16OCT03
5F4B143	Remove Cover Block	1	17OCT03	17OCT03
5F4B144	Demo Existing Instruments in Pits	1	20OCT03	20OCT03
5F4B145	Clean Debris/Wash Down Pit	5	21OCT03	27OCT03
5F4B146	SPC Coatings- Pit	10	28OCT03	10NOV03
5F4B147	Core Drill Cover Block (1 Hole)	2	20OCT03	21OCT03
5F4B148	Coatings for Cover Blocks	8	22OCT03	31OCT03
5F4B149	Install LDE Sleeve	2	03NOV03	04NOV03
5F4B14A	Install Drain Plug	2	07NOV03	10NOV03
5F4B14B	Replace Cover Block	1	12NOV03	12NOV03
5F4B14C	Install LDE Probe Assembly	1	17NOV03	17NOV03
5F4B14D	Site Instrumentation (Wiring & LDE Cabinet)	5	09OCT03	15OCT03
5F4B14E	Install Missile Shield	3	16OCT03	20OCT03
5F4B14F	ATP	2	19NOV03	20NOV03
5F4B14G	Demobilization	2	21NOV03	24NOV03
5F4B14H	Shop Fab (Drain Plug, LDE sleeve, & missile shie	29	09OCT03	18NOV03
5F4B14J	Drain Pit Weather Delays	12	25NOV03	12DEC03
5F4B14M	Inspection & Closeout	1	11NOV03	11NOV03
5F4B14N	Contingency-Flush Pit Mods SY-02E	9	15DEC03	29DEC03



Project Start 19JUL99
Project Finish 26APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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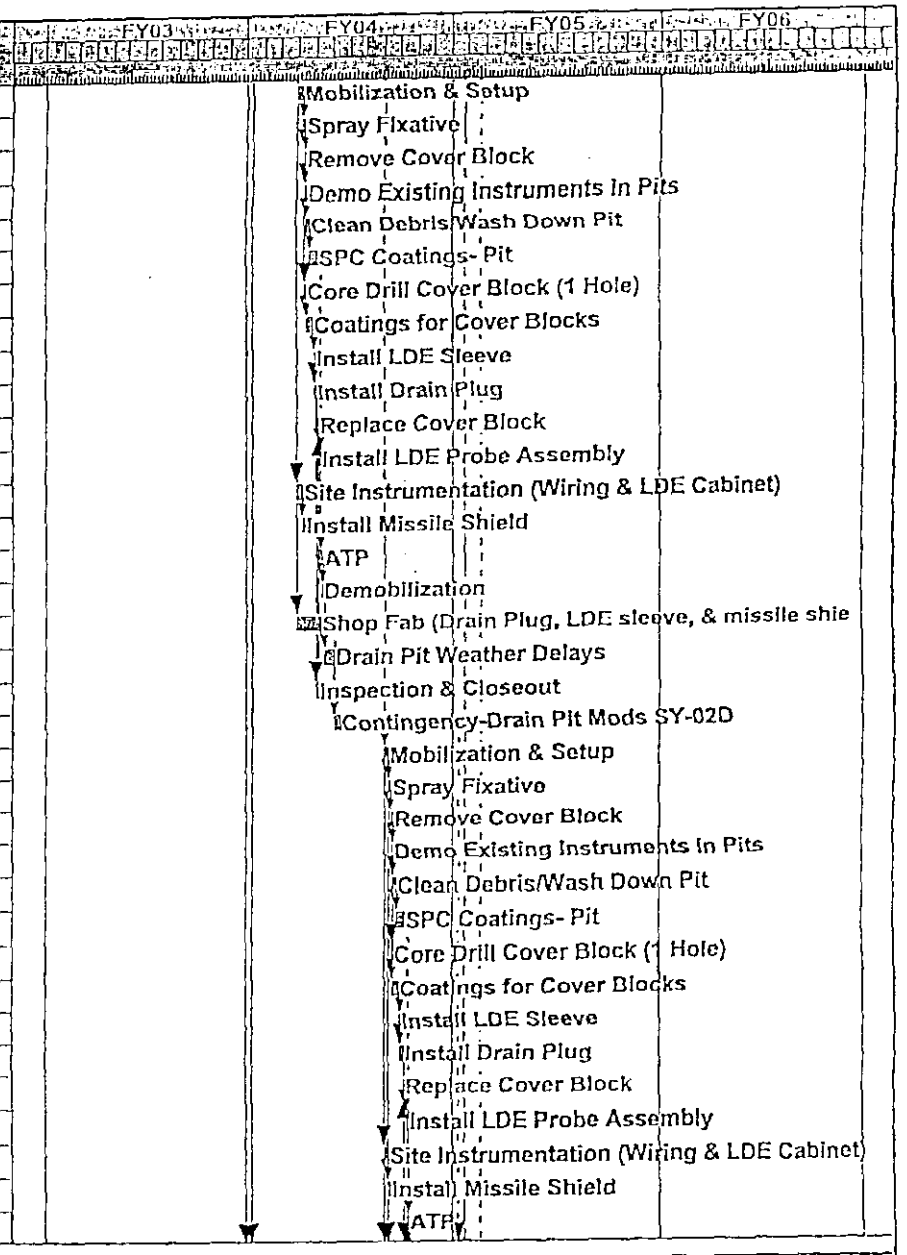
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F4B151	Mobilization & Setup	6	30DEC03	07JAN04
5F4B152	Spray Fixative	2	08JAN04	09JAN04
5F4B153	Remove Cover Block	1	12JAN04	12JAN04
5F4B154	Demo Existing Instruments in Pits	1	13JAN04	13JAN04
5F4B155	Clean Debris/Wash Down Pit	5	14JAN04	20JAN04
5F4B156	SPC Coatings- Pit	10	21JAN04	03FEB04
5F4B157	Core Drill Cover Block (1 Hole)	2	13JAN04	14JAN04
5F4B158	Coatings for Cover Blocks	8	15JAN04	26JAN04
5F4B159	Install LDE Sleeve	2	28JAN04	29JAN04
5F4B15A	Install Drain Plug	2	30JAN04	02FEB04
5F4B15B	Replace Cover Block	1	04FEB04	04FEB04
5F4B15C	Install LDE Probe Assembly	1	09FEB04	09FEB04
5F4B15D	Site Instrumentation (Wiring & LDE Cabinet)	5	30DEC03	06JAN04
5F4B15E	Install Missile Shield	3	07JAN04	09JAN04
5F4B15F	ATP	2	10FEB04	11FEB04
5F4B15G	Demobilization	2	12FEB04	13FEB04
5F4B15H	Shop Fab (Drain Plug, LDE sleeve, & missile shie	29	30DEC03	09FEB04
5F4B15J	Drain Pit Weather Delays	12	17FEB04	03MAR04
5F4B15M	Inspection & Closeout	1	03FEB04	03FEB04
5F4B15N	Contingency-Drain Pit Mods SY-02D	9	04MAR04	16MAR04
5F4C021	Mobilization & Setup	6	02JUN04	09JUN04
5F4C022	Spray Fixative	2	10JUN04	11JUN04
5F4C023	Remove Cover Block	1	14JUN04	14JUN04
5F4C024	Demo Existing Instruments in Pits	1	15JUN04	15JUN04
5F4C025	Clean Debris/Wash Down Pit	5	16JUN04	22JUN04
5F4C026	SPC Coatings- Pit	10	23JUN04	07JUL04
5F4C027	Core Drill Cover Block (1 Hole)	2	15JUN04	16JUN04
5F4C028	Coatings for Cover Blocks	8	17JUN04	28JUN04
5F4C029	Install LDE Sleeve	2	30JUN04	01JUL04
5F4C02A	Install Drain Plug	2	02JUL04	06JUL04
5F4C02B	Replace Cover Block	1	08JUL04	08JUL04
5F4C02C	Install LDE Probe Assembly	1	13JUL04	13JUL04
5F4C02D	Site Instrumentation (Wiring & LDE Cabinet)	5	02JUN04	08JUN04
5F4C02E	Install Missile Shield	3	09JUN04	11JUN04
5F4C02F	ATP	2	14JUL04	15JUL04



Project Start	19JUL99	Early Bar	
Project Finish	28APR05	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	28SEP99		

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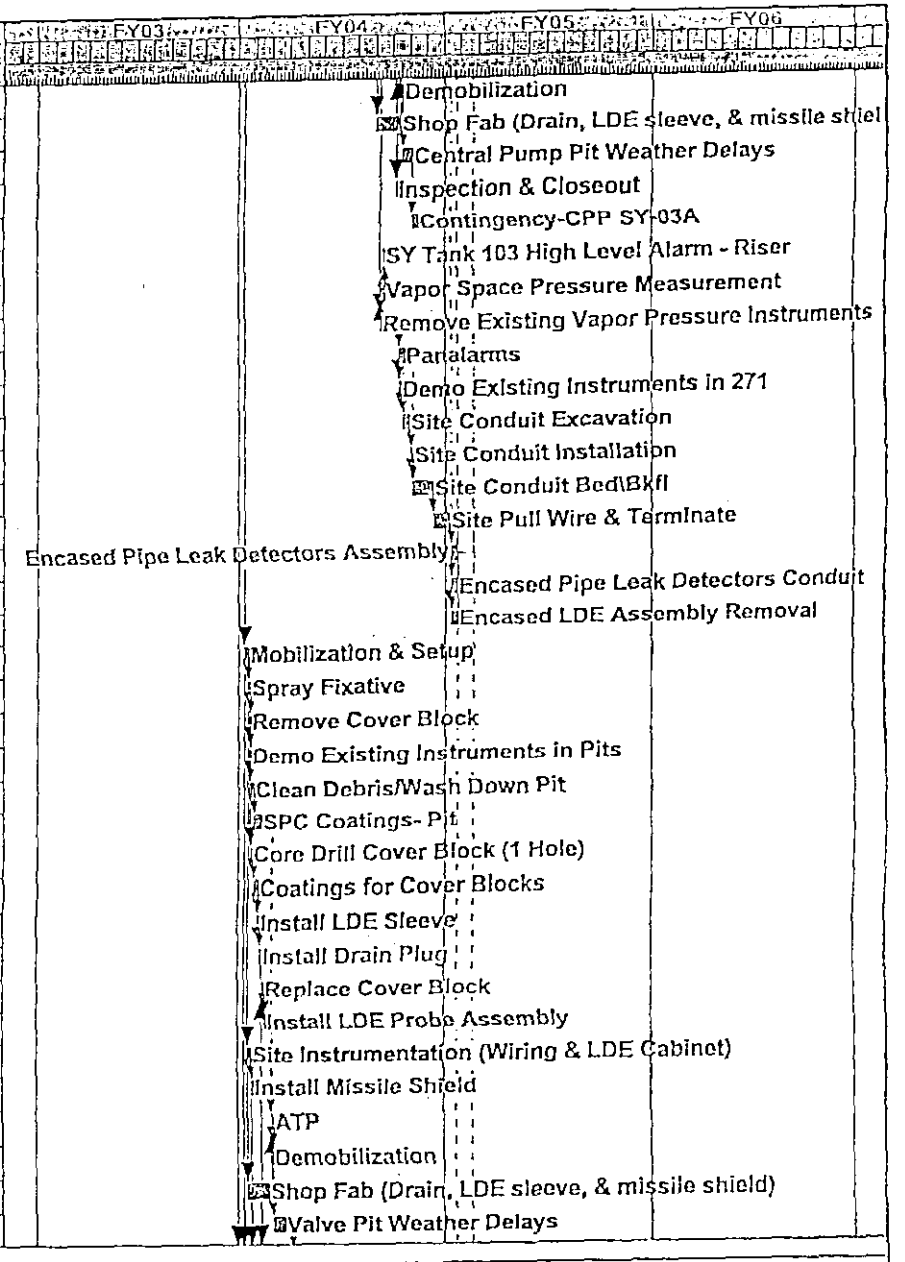
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F4C02G	Demobilization	2	16JUL04	19JUL04
5F4C02H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	02JUN04	13JUL04
5F4C02J	Central Pump Pit Weather Delays	12	20JUL04	04AUG04
5F4C02M	Inspection & Closeout	1	07JUL04	07JUL04
5F4C02N	Contingency-CPP SY-03A	9	05AUG04	17AUG04
5F4C07	SY Tank 103 High Level Alarm - Riser	2	15JUN04	16JUN04
5F4C08A	Vapor Space Pressure Measurement	2	11JUN04	14JUN04
5F4C08B	Remove Existing Vapor Pressure Instruments	1	10JUN04	10JUN04
5F4J22C	Panalarms	8	12JUL04	21JUL04
5F4J22E	Demo Existing Instruments in 271	5	12JUL04	16JUL04
5F4J27A	Site Conduit Excavation	10	19JUL04	30JUL04
5F4J27B	Site Conduit Installation	2	02AUG04	03AUG04
5F4J27C	Site Conduit Bed\Bkfl	25	04AUG04	08SEP04
5F4J28	Site Pull Wire & Terminate	22	09SEP04	08OCT04
5F4J35A	Encased Pipe Leak Detectors Assembly	10	11OCT04	22OCT04
5F4J35B	Encased Pipe Leak Detectors Conduit & Wire	10	11OCT04	22OCT04
5F4J35C	Encased LDE Assembly Removal	10	11OCT04	22OCT04
5F4K011	Mobilization & Setup	6	09OCT03	16OCT03
5F4K012	Spray Fixative	2	17OCT03	20OCT03
5F4K013	Remove Cover Block	1	21OCT03	21OCT03
5F4K014	Demo Existing Instruments in Pits	1	22OCT03	22OCT03
5F4K015	Clean Debris/Wash Down Pit	5	23OCT03	29OCT03
5F4K016	SPC Coatings- Pit	10	30OCT03	12NOV03
5F4K017	Core Drill Cover Block (1 Hole)	2	22OCT03	23OCT03
5F4K018	Coatings for Cover Blocks	8	27OCT03	05NOV03
5F4K019	Install LDE Sleeve	2	06NOV03	07NOV03
5F4K01A	Install Drain Plug	2	10NOV03	11NOV03
5F4K01B	Replace Cover Block	1	13NOV03	13NOV03
5F4K01C	Install LDE Probe Assembly	1	18NOV03	18NOV03
5F4K01D	Site Instrumentation (Wiring & LDE Cabinet)	5	17OCT03	23OCT03
5F4K01E	Install Missile Shield	3	24OCT03	28OCT03
5F4K01F	ATP	2	01DEC03	02DEC03
5F4K01G	Demobilization	2	03DEC03	04DEC03
5F4K01H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	17OCT03	26NOV03
5F4K01J	Valve Pit Weather Delays	12	05DEC03	22DEC03



Project Start 19JUL99
Project Finish 28APR06
Data Date 01SEP99
Run Date 29SEP99

Early Bar
Progress Bar
Critical Activity

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
SY Farm - Figure 7.1

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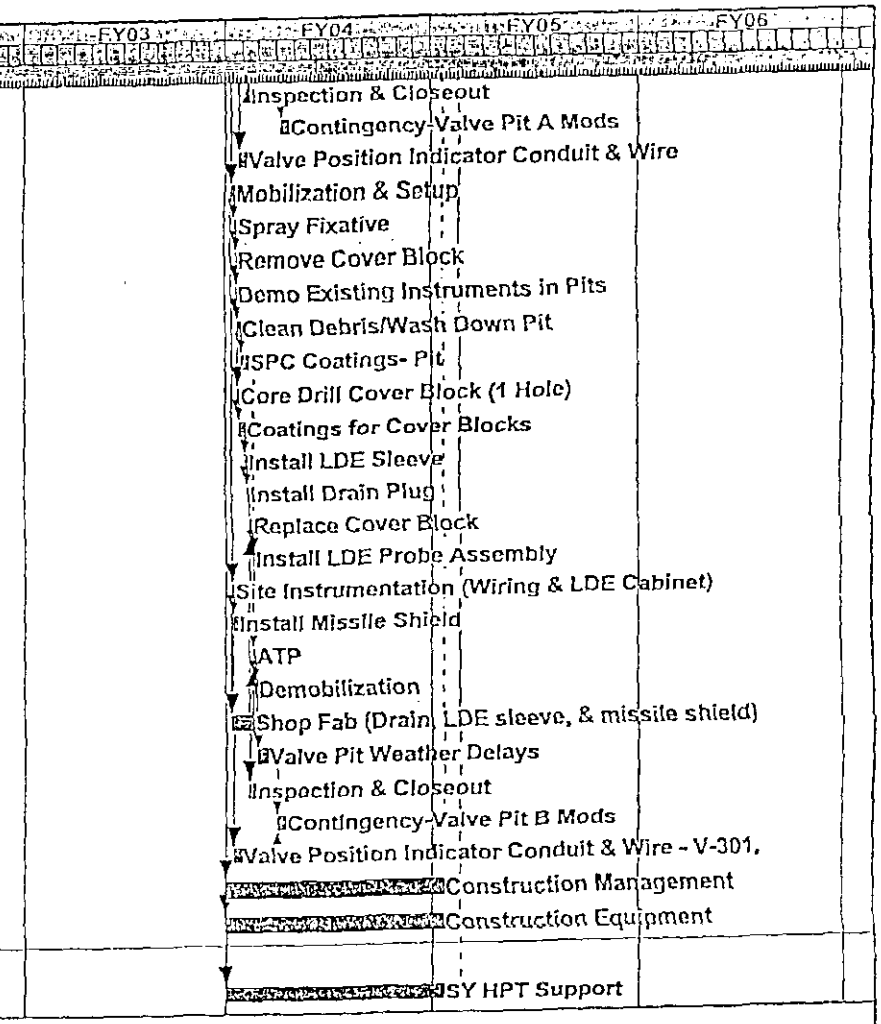
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5F4K01M	Inspection & Closeout	1	12NOV03	12NOV03
5F4K01N	Contingency-Valve Pit A Mods	9	09JAN04	21JAN04
5F4K11	Valve Position Indicator Conduit & Wire	10	24OCT03	06NOV03
5F4L011	Mobilization & Setup	6	09OCT03	16OCT03
5F4L012	Spray Fixative	2	17OCT03	20OCT03
5F4L013	Remove Cover Block	1	21OCT03	21OCT03
5F4L014	Demo Existing Instruments in Pits	1	22OCT03	22OCT03
5F4L015	Clean Debris/Wash Down Pit	5	23OCT03	29OCT03
5F4L016	SPC Coatings- Pit	10	30OCT03	12NOV03
5F4L017	Core Drill Cover Block (1 Hole)	2	22OCT03	23OCT03
5F4L018	Coatings for Cover Blocks	8	24OCT03	04NOV03
5F4L019	Install LDE Sleeve	2	05NOV03	06NOV03
5F4L01A	Install Drain Plug	2	10NOV03	11NOV03
5F4L01B	Replace Cover Block	1	13NOV03	13NOV03
5F4L01C	Install LDE Probe Assembly	1	18NOV03	18NOV03
5F4L01D	Site Instrumentation (Wiring & LDE Cabinet)	5	09OCT03	15OCT03
5F4L01E	Install Missile Shield	3	16OCT03	20OCT03
5F4L01F	ATP	2	19NOV03	20NOV03
5F4L01G	Demobilization	2	21NOV03	24NOV03
5F4L01H	Shop Fab (Drain, LDE sleeve, & missile shield)	29	09OCT03	18NOV03
5F4L01J	Valve Pit Weather Delays	12	25NOV03	12DEC03
5F4L01M	Inspection & Closeout	1	12NOV03	12NOV03
5F4L01N	Contingency-Valve Pit B Mods	9	31DEC03	13JAN04
5F4L11	Valve Position Indicator Conduit & Wire - V-301,	10	16OCT03	29OCT03
5F4N	Construction Management	269	01OCT03	22OCT04
5F4P	Construction Equipment	269	01OCT03	22OCT04
SY -HPT Support				
5F6100	SY HPT Support	269	01OCT03	22OCT04



Project Start	19JUL99	Early Bar	
Project Finish	26APR08	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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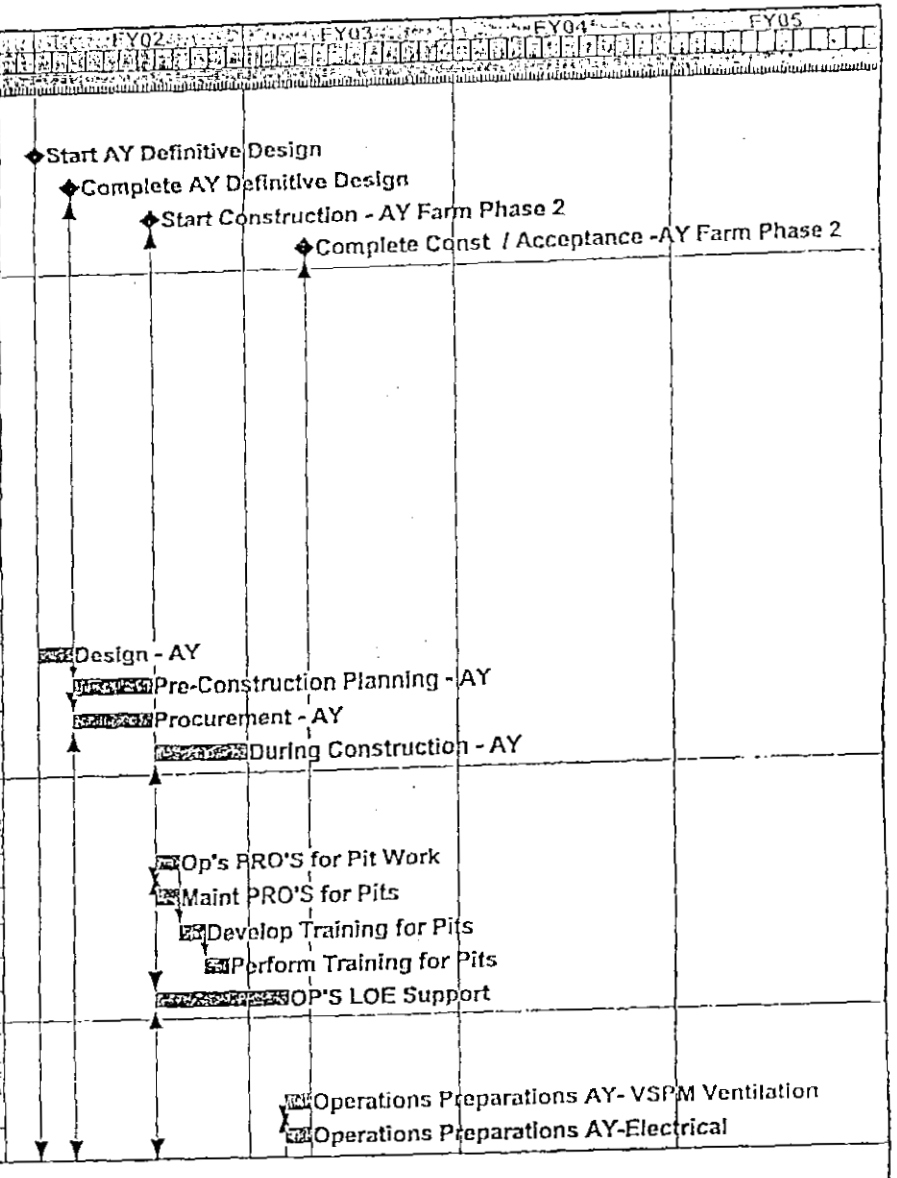
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

SY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5D0050	Start AY Definitive Design	0	01OCT01*	
5D1202	Complete AY Definitive Design	0		03DEC01
5D1203	Start Construction - AY Farm Phase 2	0	22APR02	
5D1204	Complete Const / Acceptance -AY Farm Phase 2	0		16JAN03
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.01.03.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - AY Farm				
3C5D1A	Design - AY	44	01OCT01*	03DEC01
3C5D2A	Pre-Construction Planning - AY	95	04DEC01	19APR02
3C5D3A	Procurement - AY	95	04DEC01	19APR02
3C5D4A	During Construction - AY	116	22APR02	03OCT02
Startup & Testing - Phase 2				
Startup & Testing - AY Farm				
3K5D3A2	Op's PRO'S for Pit Work	30	22APR02	03JUN02
3K5D3A4	Maint PRO'S for Pits	30	22APR02	03JUN02
3K5D3A7	Develop Training for Pits	30	04JUN02	16JUL02
3K5D3A8	Perform Training for Pits	30	17JUL02	27AUG02
3K5D3AE	OP'S LOE Support	161	22APR02	09DEC02
Operations Preparation				
Ops Prep - MSA AY Farm				
3L5D1N	Operations Preparations AY- VSPM Ventilation	30	03DEC02	16JAN03
3L5D1O	Operations Preparations AY-Electrical	30	03DEC02	16JAN03



Project Start 19JUL99
Project Finish 28APR06
Data Date 01SEP99
Run Date 20SEP99

Early Bar
Progress Bar
Critical Activity

ASHI

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Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AY Farm - Figure 7.1

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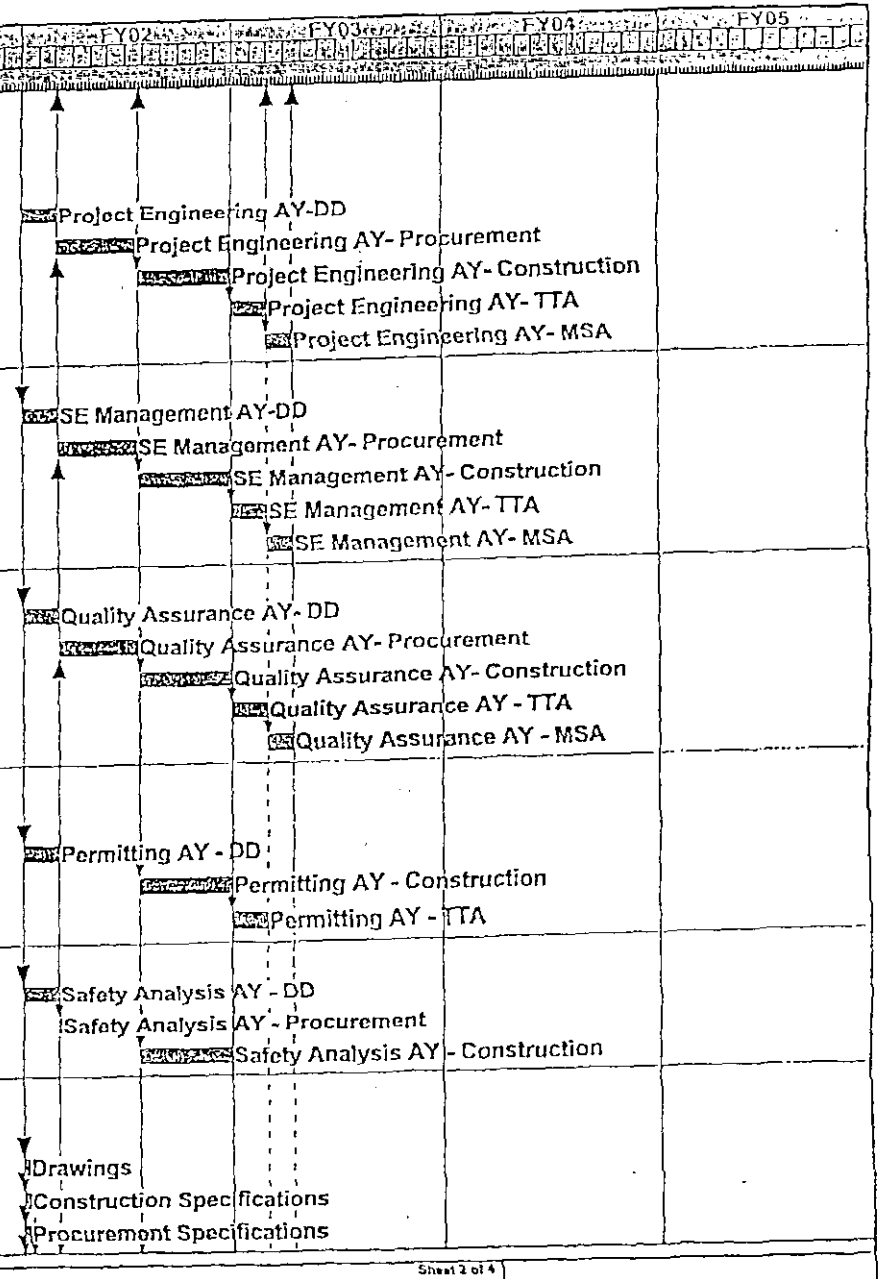
Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Capital- Phase 2				
Project Management				
Project Engineering				
1B5D1A	Project Engineering AY-DD	44	01OCT01*	03DEC01
1B5D2A	Project Engineering AY- Procurement	95	04DEC01	19APR02
1B5D3A	Project Engineering AY- Construction	116	22APR02	03OCT02
1B5D4A	Project Engineering AY- TTA	40	04OCT02	02DEC02
1B5D5A	Project Engineering AY- MSA	30	03DEC02	16JAN03
Systems Engineering				
1C5D1A	SE Management AY-DD	44	01OCT01	03DEC01
1C5D2A	SE Management AY- Procurement	95	04DEC01	19APR02
1C5D3A	SE Management AY- Construction	116	22APR02	03OCT02
1C5D4A	SE Management AY- TTA	40	04OCT02	02DEC02
1C5D5A	SE Management AY- MSA	30	03DEC02	16JAN03
Quality Assurance				
1D5D1A	Quality Assurance AY- DD	44	01OCT01	03DEC01
1D5D2A	Quality Assurance AY- Procurement	95	04DEC01	19APR02
1D5D3A	Quality Assurance AY- Construction	116	22APR02	03OCT02
1D5D4A	Quality Assurance AY - TTA	40	04OCT02	02DEC02
1D5D5A	Quality Assurance AY - MSA	30	03DEC02	16JAN03
Permitting and Safety				
Permits				
2A5D2A	Permitting AY - DD	44	01OCT01	03DEC01
2A5D4A	Permitting AY - Construction	116	22APR02	03OCT02
2A5D5A	Permitting AY - TTA	40	04OCT02	02DEC02
Safety Analysis				
2B5D1A	Safety Analysis AY - DD	44	01OCT01	03DEC01
2B5D2A	Safety Analysis AY - Procurement	1	04DEC01	04DEC01
2B5D3A	Safety Analysis AY - Construction	116	22APR02	03OCT02
AY Tank Farm				
AY - Definitive Design				
5D1111	Drawings	10	01OCT01	12OCT01
5D1112	Construction Specifications	10	01OCT01	12OCT01
5D1113	Procurement Specifications	10	01OCT01	12OCT01



Project Start	19JUL99	Early Bar	
Project Finish	26APR05	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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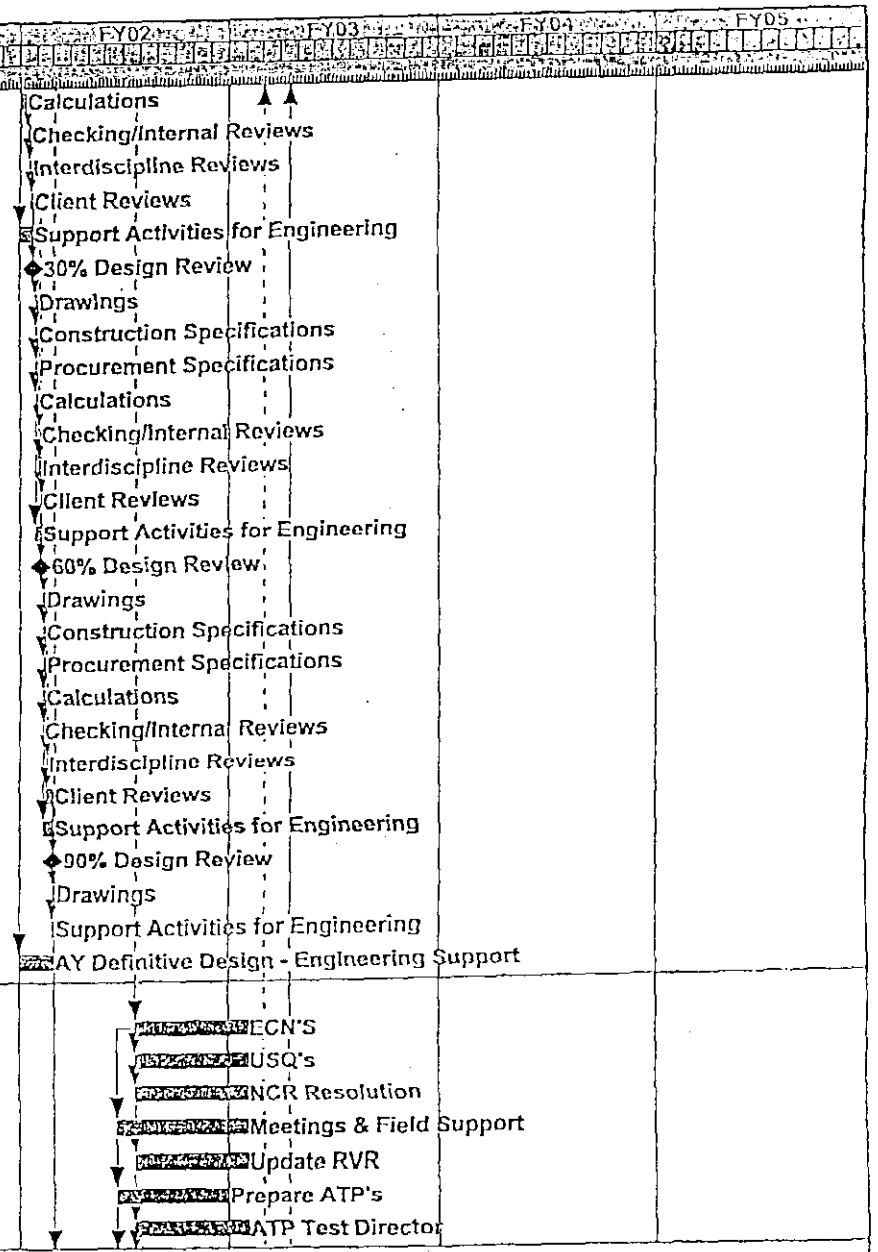
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5D1114	Calculations	10	01OCT01	12OCT01
5D1115	Checking/Internal Reviews	3	15OCT01	17OCT01
5D1116	Interdiscipline Reviews	3	18OCT01	22OCT01
5D1117	Client Reviews	4	23OCT01	26OCT01
5D1118	Support Activities for Engineering	20	01OCT01	26OCT01
5D1119	30% Design Review	0		26OCT01
5D1121	Drawings	5	29OCT01	02NOV01
5D1122	Construction Specifications	5	29OCT01	02NOV01
5D1123	Procurement Specifications	5	29OCT01	02NOV01
5D1124	Calculations	5	29OCT01	02NOV01
5D1125	Checking/Internal Reviews	2	05NOV01	06NOV01
5D1126	Interdiscipline Reviews	1	07NOV01	07NOV01
5D1127	Client Reviews	2	08NOV01	09NOV01
5D1128	Support Activities for Engineering	10	29OCT01	09NOV01
5D1129	60% Design Review	0		09NOV01
5D1131	Drawings	5	12NOV01	16NOV01
5D1132	Construction Specifications	5	12NOV01	16NOV01
5D1133	Procurement Specifications	5	12NOV01	16NOV01
5D1134	Calculations	5	12NOV01	16NOV01
5D1135	Checking/Internal Reviews	2	12NOV01	13NOV01
5D1136	Interdiscipline Reviews	2	19NOV01	20NOV01
5D1137	Client Reviews	3	21NOV01	27NOV01
5D1138	Support Activities for Engineering	10	12NOV01	27NOV01
5D1139	90% Design Review	0		27NOV01
5D1141	Drawings	4	28NOV01	03DEC01
5D1142	Support Activities for Engineering	4	28NOV01	03DEC01
5D1201	AY Definitive Design - Engineering Support	44	01OCT01	03DEC01
AY E&I During Construction				
5D2111	ECN'S	139	22APR02	05NOV02
5D2112	USQ's	139	22APR02	05NOV02
5D2113	NCR Resolution	139	22APR02	05NOV02
5D2114	Meetings & Field Support	159	25MAR02	05NOV02
5D2115	Update RVR	139	22APR02	05NOV02
5D2116	Prepare ATP's	136	25MAR02	03OCT02
5D2117	ATP Test Director	139	22APR02	05NOV02



Project Start	19JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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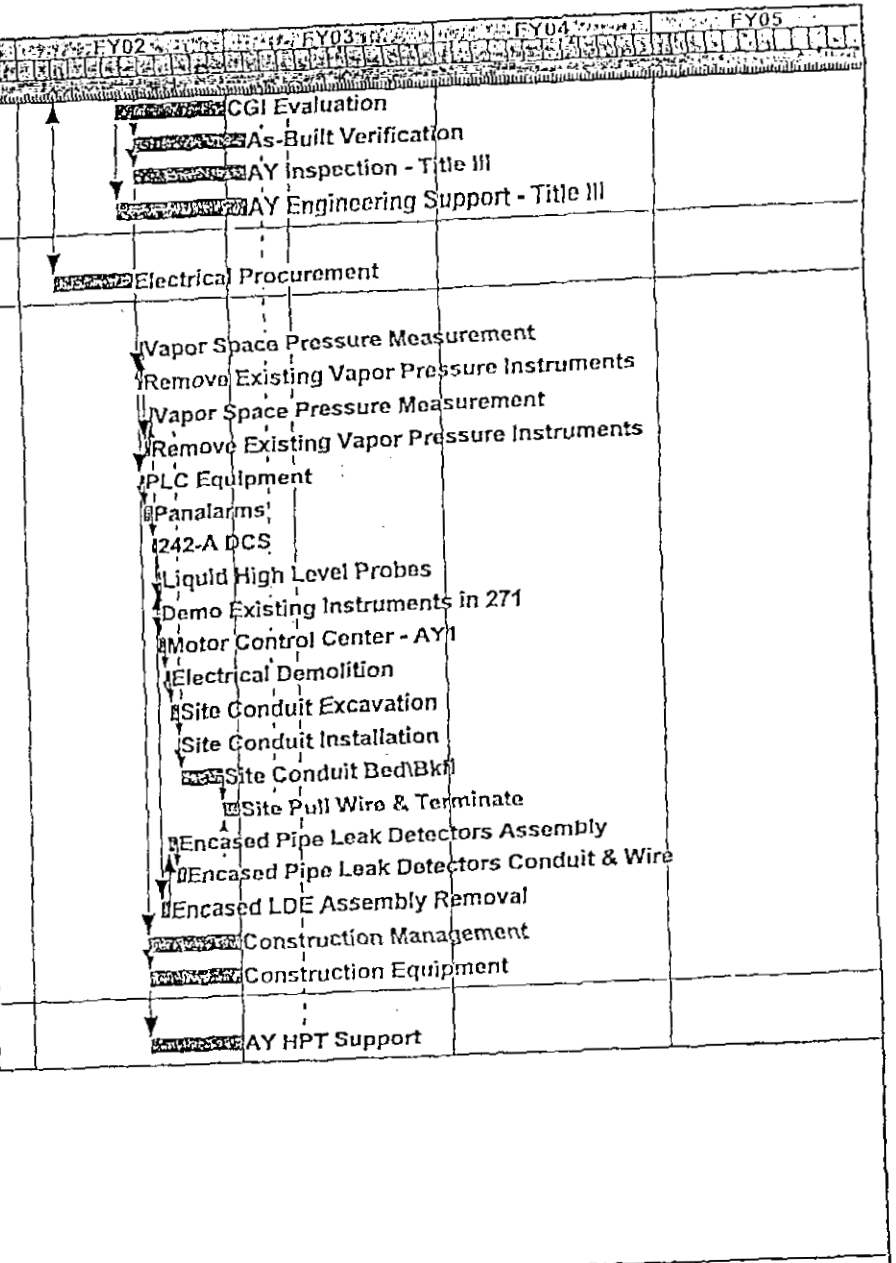
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5D2118	CGI Evaluation	136	25MAR02	03OCT02
5D2119	As-Built Verification	139	22APR02	05NOV02
5D2121	AY Inspection - Title III	139	22APR02	05NOV02
5D2131	AY Engineering Support - Title III	159	25MAR02	05NOV02
AY - Procurement				
5D3A00	Electrical Procurement	95	04DEC01	19APR02
AY - Construction				
5D4A08A	Vapor Space Pressure Measurement	3	30APR02	02MAY02
5D4A08B	Remove Existing Vapor Pressure Instruments	6	22APR02	29APR02
5D4B08A	Vapor Space Pressure Measurement	3	13MAY02	15MAY02
5D4B08B	Remove Existing Vapor Pressure Instruments	6	03MAY02	10MAY02
5D4J22B	PLC Equipment	8	22APR02	01MAY02
5D4J22C	Panalarms	8	02MAY02	13MAY02
5D4J22D	242-A DCS	5	14MAY02	20MAY02
5D4J22E	Liquid High Level Probes	2	22MAY02	23MAY02
5D4J22F	Demo Existing Instruments in 271	1	21MAY02	21MAY02
5D4J26A	Motor Control Center - AY1	5	22MAY02	29MAY02
5D4J26C	Electrical Demolition	5	30MAY02	05JUN02
5D4J27A	Site Conduit Excavation	10	06JUN02	19JUN02
5D4J27B	Site Conduit Installation	2	20JUN02	21JUN02
5D4J27C	Site Conduit Bed\Bkfl	50	24JUN02	03SEP02
5D4J28	Site Pull Wire & Terminate	22	04SEP02	03OCT02
5D4J29A	Encased Pipe Leak Detectors Assembly	10	31MAY02	13JUN02
5D4J29B	Encased Pipe Leak Detectors Conduit & Wire	10	14JUN02	27JUN02
5D4J29C	Encased LDE Assembly Removal	10	16MAY02	30MAY02
5D4N	Construction Management	116	22APR02	03OCT02
5D4P	Construction Equipment	116	22APR02	03OCT02
AY - HPT Support				
5D6100	AY HPT Support	116	22APR02	03OCT02



Project Start	18JUL99	Early Bar
Project Finish	26APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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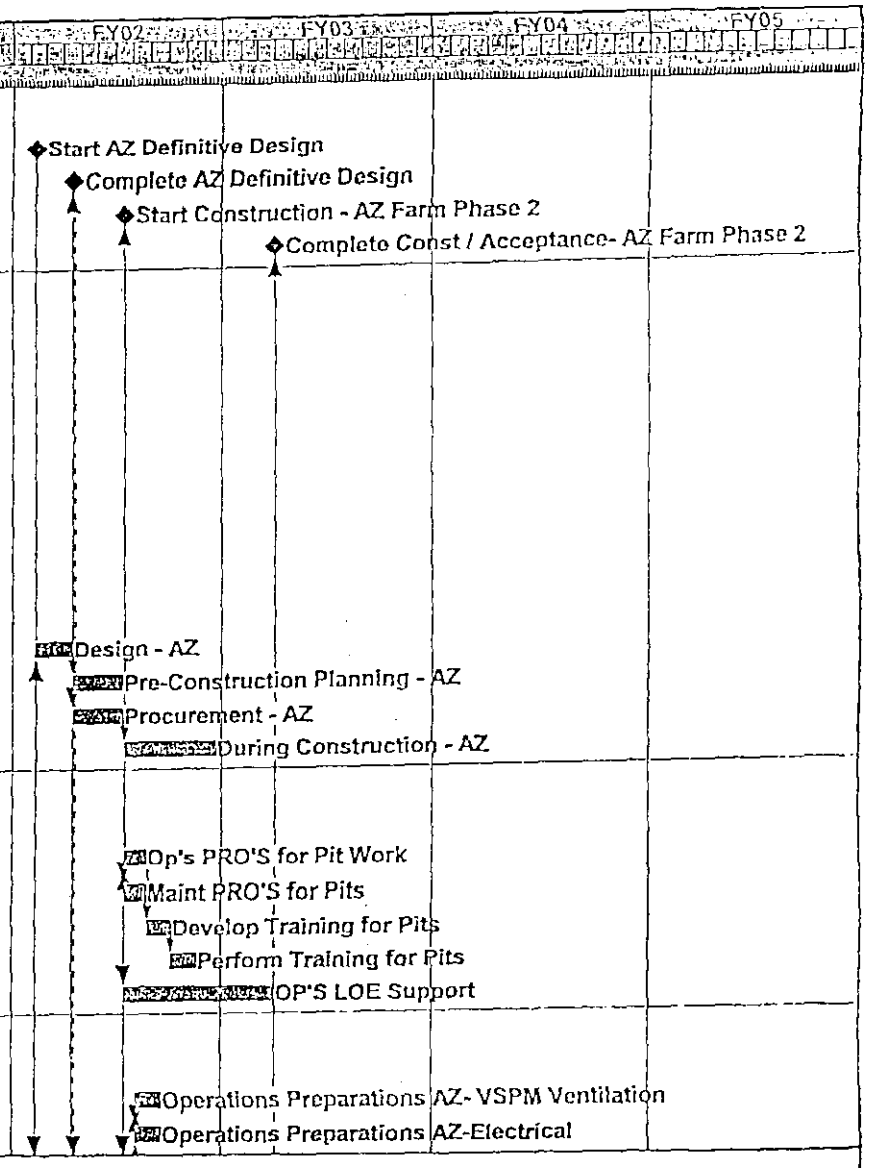
Cogema Engineering
W-314 Phase 2 -Detailed Schedule
AY Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5E0050	Start AZ Definitive Design	0	12NOV01	
5E1202	Complete AZ Definitive Design	0		17JAN02
5E1203	Start Construction - AZ Farm Phase 2	0	15APR02	
5E1204	Complete Const / Acceptance- AZ Farm Phase 2	0		03JAN03
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
101103.01.01				
Project W-314				
W314 Expense Phase 2				
Design & Construction Support-Phase 2				
Design & Construction Support - AZ Farm				
3C5E1A	Design - AZ	44	12NOV01*	17JAN02
3C5E2A	Pre-Construction Planning - AZ	60	18JAN02	12APR02
3C5E3A	Procurement - AZ	60	18JAN02	12APR02
3C5E4A	During Construction - AZ	112	15APR02	20SEP02
Startup & Testing - Phase 2				
Startup & Testing - AZ Farm				
3K5E3A2	Op's PRO'S for Pit Work	30	15APR02	24MAY02
3K5E3A4	Maint PRO'S for Pits	30	15APR02	24MAY02
3K5E3A7	Develop Training for Pits	30	28MAY02	09JUL02
3K5E3A8	Perform Training for Pits	30	10JUL02	20AUG02
3K5E3AE	OP'S LOE Support	182	15APR02	03JAN03
Operations Preparation				
Ops Prep - MSA AZ Farm				
3L5E1N	Operations Preparations AZ- VSPM Ventilation	30	09MAY02	20JUN02
3L5E1O	Operations Preparations AZ-Electrical	30	09MAY02	20JUN02



Project Start	19JUL99	Early Bar
Project Finish	28APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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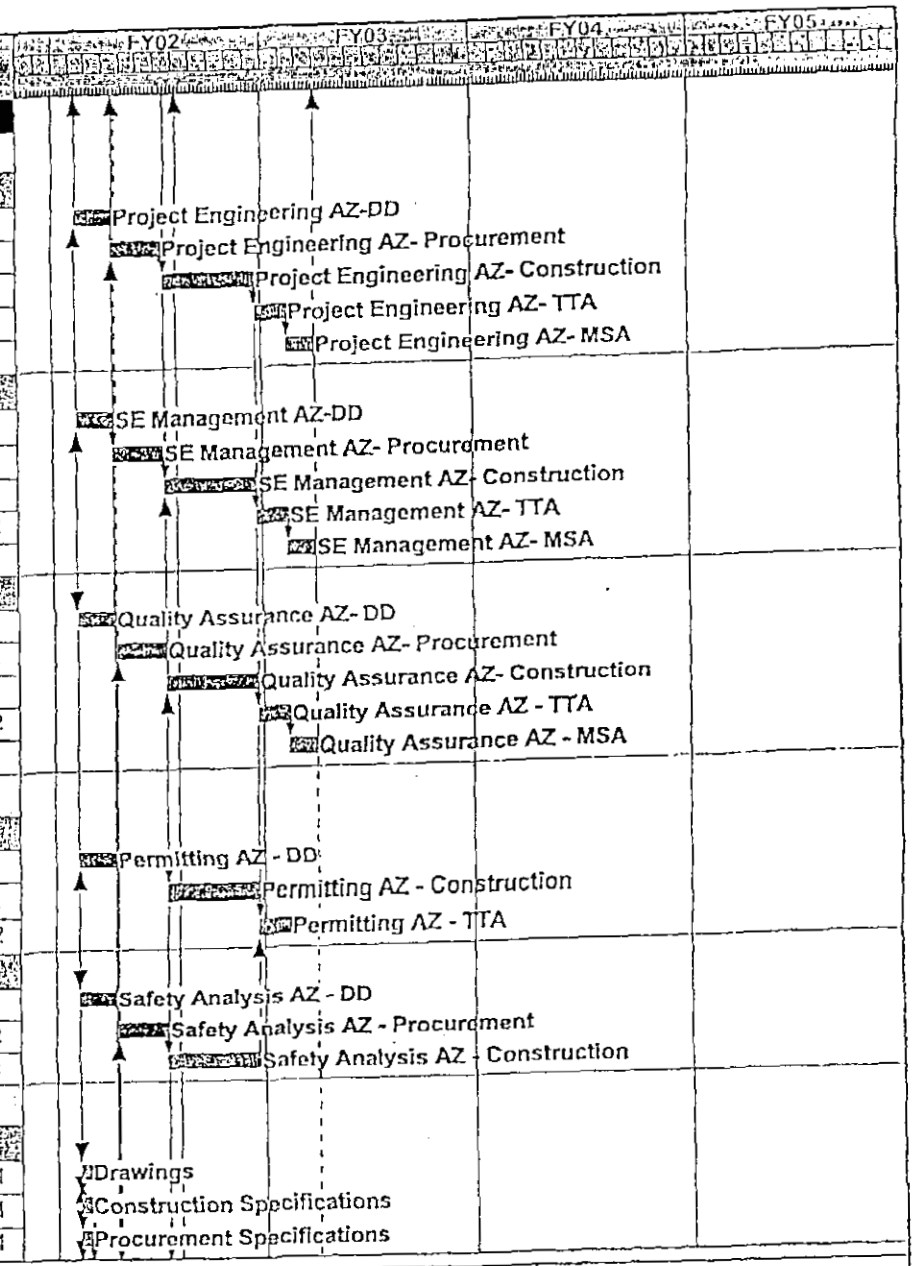
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AZ Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Capital- Phase 2				
Project Management				
Project Engineering				
1B5E1A	Project Engineering AZ-DD	44	12NOV01	17JAN02
1B5E2A	Project Engineering AZ- Procurement	60	18JAN02	12APR02
1B5E3A	Project Engineering AZ- Construction	112	15APR02	20SEP02
1B5E4A	Project Engineering AZ- TTA	40	23SEP02	15NOV02
1B5E5A	Project Engineering AZ- MSA	30	18NOV02	03JAN03
Systems Engineering				
1C5E1A	SE Management AZ-DD	44	12NOV01	17JAN02
1C5E2A	SE Management AZ- Procurement	60	18JAN02	12APR02
1C5E3A	SE Management AZ- Construction	112	15APR02	20SEP02
1C5E4A	SE Management AZ- TTA	40	23SEP02	15NOV02
1C5E5A	SE Management AZ- MSA	30	18NOV02	03JAN03
Quality Assurance				
1D5E1A	Quality Assurance AZ- DD	44	12NOV01	17JAN02
1D5E2A	Quality Assurance AZ- Procurement	60	21JAN02	15APR02
1D5E3A	Quality Assurance AZ- Construction	112	15APR02	20SEP02
1D5E4A	Quality Assurance AZ - TTA	40	23SEP02	15NOV02
1D5E5A	Quality Assurance AZ - MSA	30	18NOV02	03JAN03
Permitting and Safety				
Permits				
2A5E2A	Permitting AZ - DD	44	12NOV01	17JAN02
2A5E4A	Permitting AZ - Construction	112	15APR02	20SEP02
2A5E5A	Permitting AZ - TTA	40	23SEP02	15NOV02
Safety Analysis				
2B5E1A	Safety Analysis AZ - DD	44	12NOV01	17JAN02
2B5E2A	Safety Analysis AZ - Procurement	60	21JAN02	15APR02
2B5E3A	Safety Analysis AZ - Construction	112	15APR02	20SEP02
AZ Tank Farm				
AZ - Definitive Design				
5E1111	Drawings	10	12NOV01	27NOV01
5E1112	Construction Specifications	10	12NOV01	27NOV01
5E1113	Procurement Specifications	10	12NOV01	27NOV01



Project Start	19JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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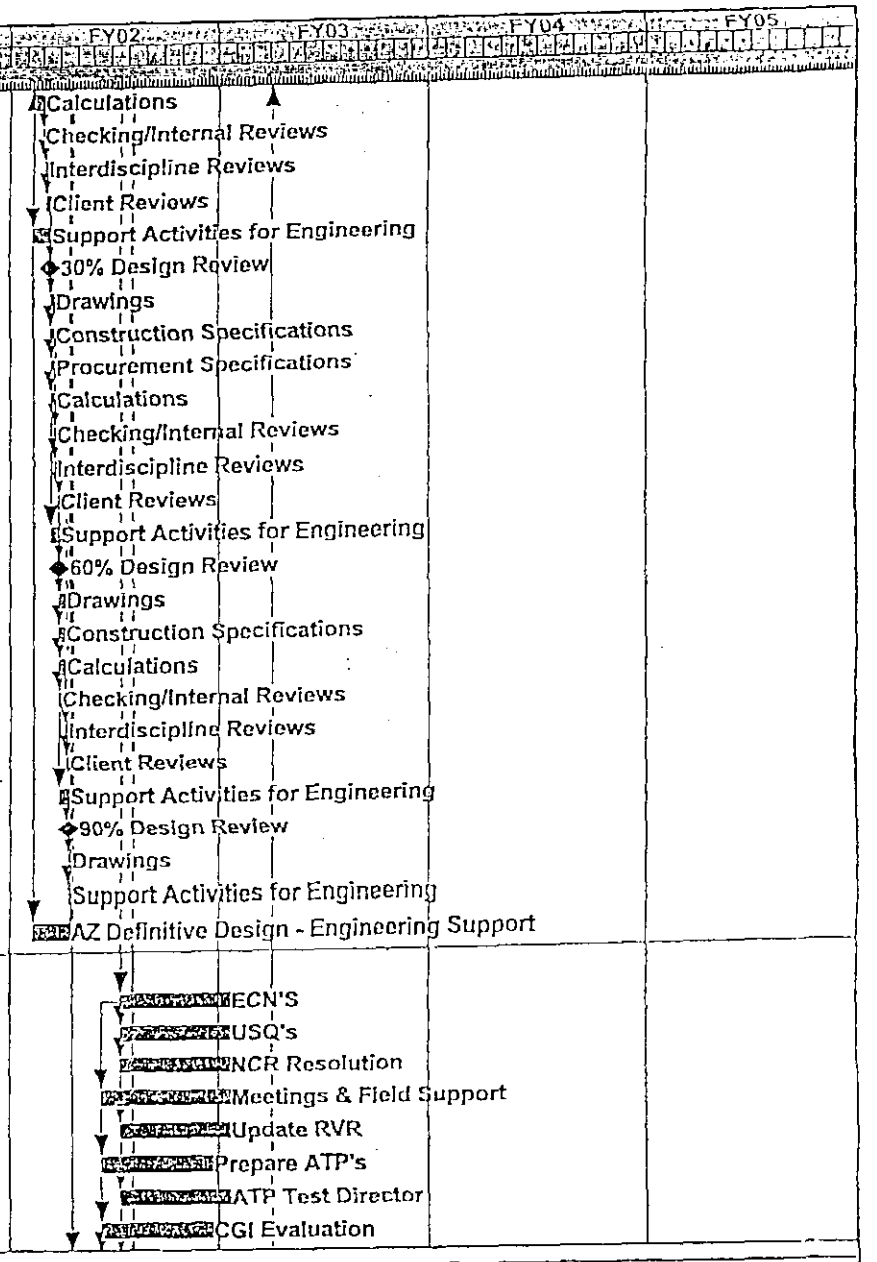
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AZ Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5E1114	Calculations	10	12NOV01	27NOV01
5E1115	Checking/Internal Reviews	3	28NOV01	30NOV01
5E1116	Interdiscipline Reviews	3	03DEC01	05DEC01
5E1117	Client Reviews	4	06DEC01	11DEC01
5E1118	Support Activities for Engineering	20	12NOV01	11DEC01
5E1119	30% Design Review	0		11DEC01
5E1121	Drawings	5	12DEC01	18DEC01
5E1122	Construction Specifications	5	12DEC01	18DEC01
5E1123	Procurement Specifications	5	12DEC01	18DEC01
5E1124	Calculations	5	12DEC01	18DEC01
5E1125	Checking/Internal Reviews	2	19DEC01	20DEC01
5E1126	Interdiscipline Reviews	1	21DEC01	21DEC01
5E1127	Client Reviews	2	26DEC01	27DEC01
5E1128	Support Activities for Engineering	10	12DEC01	27DEC01
5E1129	60% Design Review	0		27DEC01
5E1131	Drawings	5	28DEC01	04JAN02
5E1132	Construction Specifications	5	28DEC01	04JAN02
5E1134	Calculations	5	28DEC01	04JAN02
5E1135	Checking/Internal Reviews	2	28DEC01	31DEC01
5E1136	Interdiscipline Reviews	2	07JAN02	08JAN02
5E1137	Client Reviews	3	09JAN02	11JAN02
5E1138	Support Activities for Engineering	10	28DEC01	11JAN02
5E1139	90% Design Review	0		11JAN02
5E1141	Drawings	4	14JAN02	17JAN02
5E1142	Support Activities for Engineering	4	14JAN02	17JAN02
5E1201	AZ Definitive Design - Engineering Support	44	12NOV01	17JAN02
AZ - E&I During Construction				
5E2111	ECN'S	133	15APR02	21OCT02
5E2112	USQ's	133	15APR02	21OCT02
5E2113	NCR Resolution	133	15APR02	21OCT02
5E2114	Meetings & Field Support	155	14MAR02	21OCT02
5E2115	Update RVR	133	15APR02	21OCT02
5E2116	Prepare ATP's	134	14MAR02	20SEP02
5E2117	ATP Test Director	133	15APR02	21OCT02
5E2118	CGI Evaluation	134	14MAR02	20SEP02



Project Start	19JUL99	Early Bar
Project Finish	28APR06	Progress Bar
Data Date	01SEP99	Critical Activity
Run Date	29SEP99	

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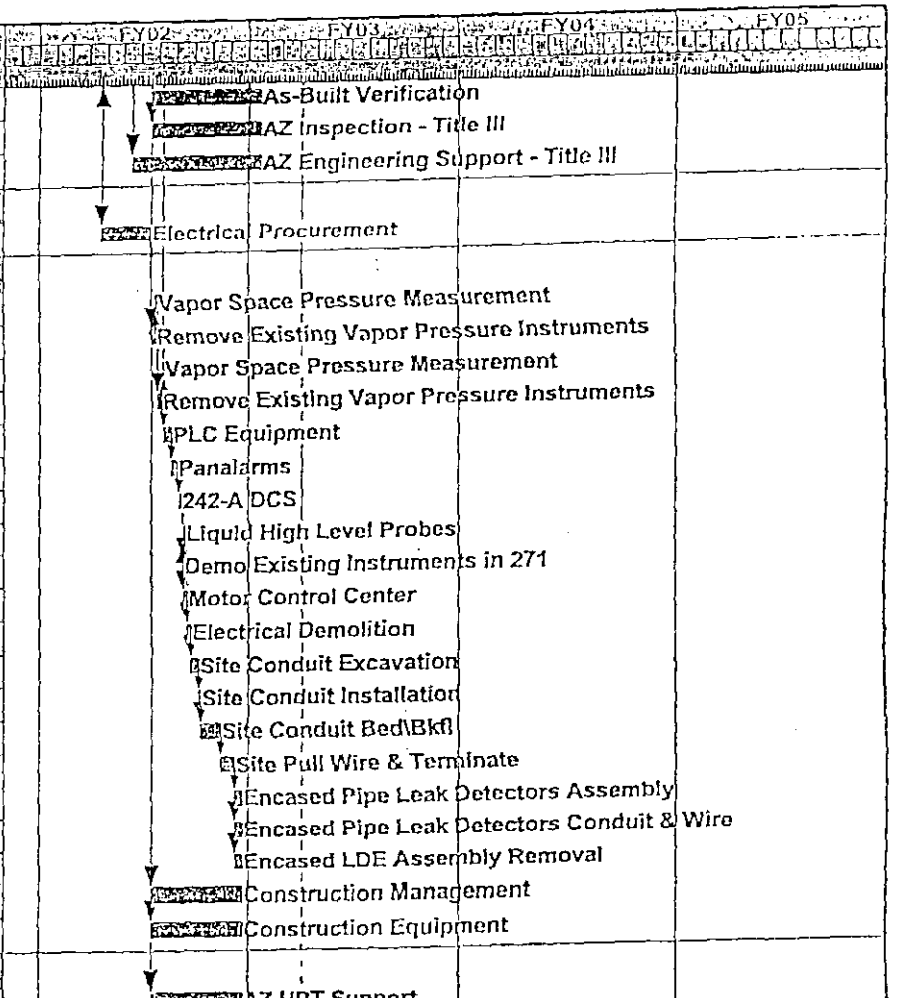
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AZ Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
5E2119	As-Built Verification	133	15APR02	21OCT02
5E2121	AZ Inspection - Title III	133	15APR02	21OCT02
5E2131	AZ Engineering Support - Title III	155	14MAR02	21OCT02
AZ - Procurement				
5E3A00	Electrical Procurement	60	21JAN02	15APR02
AZ - Construction				
5E4A08A	Vapor Space Pressure Measurement	3	23APR02	25APR02
5E4A08B	Remove Existing Vapor Pressure Instruments	6	15APR02	22APR02
5E4B08A	Vapor Space Pressure Measurement	3	06MAY02	08MAY02
5E4B08B	Remove Existing Vapor Pressure Instruments	6	26APR02	03MAY02
5E4J22B	PLC Equipment	8	09MAY02	20MAY02
5E4J22C	Panalarms	8	21MAY02	31MAY02
5E4J22D	242-A DCS	5	03JUN02	07JUN02
5E4J22E	Liquid High Level Probes	2	11JUN02	12JUN02
5E4J22F	Demo Existing Instruments in 271	1	10JUN02	10JUN02
5E4J26A	Motor Control Center	5	11JUN02	17JUN02
5E4J26C	Electrical Demolition	5	18JUN02	24JUN02
5E4J27A	Site Conduit Excavation	10	25JUN02	09JUL02
5E4J27B	Site Conduit Installation	2	10JUL02	11JUL02
5E4J27C	Site Conduit Bed\Bkfl	25	12JUL02	15AUG02
5E4J28	Site Pull Wire & Terminate	15	16AUG02	06SEP02
5E4J29A	Encased Pipe Leak Detectors Assembly	10	09SEP02	20SEP02
5E4J29B	Encased Pipe Leak Detectors Conduit & Wire	10	09SEP02	20SEP02
5E4J29C	Encased LDE Assembly Removal	10	09SEP02	20SEP02
5E4N	Construction Management	112	15APR02	20SEP02
5E4P	Construction Equipment	112	15APR02	20SEP02
AZ - HPT Support				
5E6100	AZ HPT Support	112	15APR02	20SEP02



Project Start	19JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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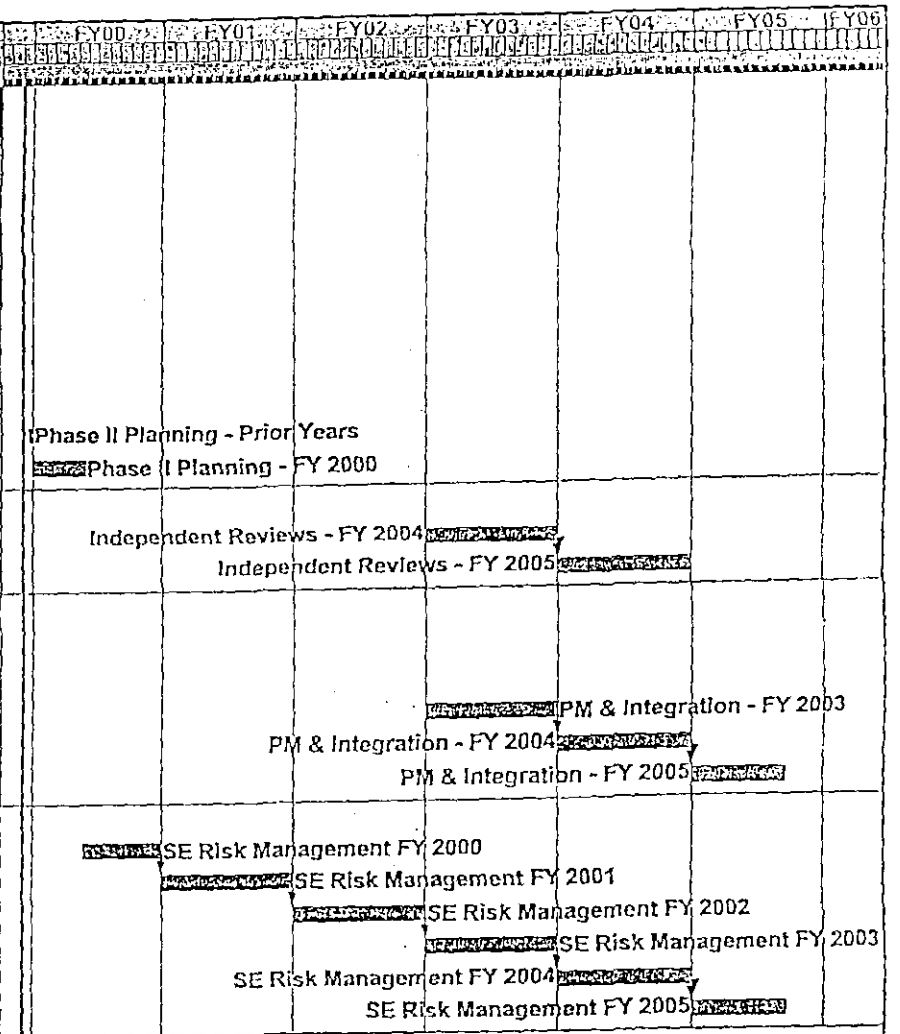
Cogema Engineering

W-314 Phase 2 -Detailed Schedule

AZ Farm - Figure 7.1

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Hanford Site				
Tank Waste Remediation System				
Tank Farm System (Ops)				
1.01.03.01.01				
Project W-314				
W314 Expense Phase 2				
Phase II Planning				
3P5000	Phase II Planning - Prior Years	10	17SEP99*	30SEP99
3P5001	Phase II Planning - FY 2000	100	01OCT99*	25FEB00
Independent Reviews				
3M5F00	Independent Reviews - FY 2004	252	01OCT02*	30SEP03
3M5G00	Independent Reviews - FY 2005	250	01OCT03	27SEP04
Capital- Phase 2				
Project Management				
Project Management and Integration				
1A0100	PM & Integration - FY 2003	252	01OCT02*	30SEP03
1A0101	PM & Integration - FY 2004	253	01OCT03	30SEP04
1A0102	PM & Integration - FY 2005	176	01OCT04	14JUN05
SE Risk Management				
1C5K1A	SE Risk Management FY 2000	155	23FEB00*	29SEP00
1C5K2A	SE Risk Management FY 2001	251	02OCT00	28SEP01
1C5K3A	SE Risk Management FY 2002	252	01OCT01	30SEP02
1C5K4A	SE Risk Management FY 2003	252	01OCT02	30SEP03
1C5K5A	SE Risk Management FY 2004	253	01OCT03	30SEP04
1C5K6B	SE Risk Management FY 2005	176	01OCT04	14JUN05



Project Start	18JUL99	Early Bar	
Project Finish	26APR06	Progress Bar	
Data Date	01SEP99	Critical Activity	
Run Date	29SEP99		

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Cogema Engineering

W-314 Phase 2 (Not Specific Farm)

Detailed Schedule - Figure 7.1

8.0 BUDGET AUTHORIZED/BUDGET OUTLAY SCHEDULE

(consisting of the following 3 pages)

PROJECT W-314 TANK FARM UPGRADES
BUDGET AUTHORIZED / BUDGET OUTLAY SCHEDULE (PHASE 2 TOTALS)

	TOTAL COST ($1000s)	Prior Cost	FY99 BA	FY2000 1	FY2000 2	FY2000 3	FY2000 4	FY2001 1	FY2001 2	FY2001 3	FY2001 4	FY2002 1	FY2002 2	FY2002 3	FY2002 4	FY2003 1	FY2003 2	FY2003 3	FY2003 4	FY2004 1	FY2004 2	FY2004 3	FY2004 4	FY2005 1	FY2005 2	FY2005 3	FY2005 4	FY2006 1	FY2006 2	FY2006 3	FY2006 4
CAPITAL FUNDED ACTIVITIES 1.1 PROJECT MANAGEMENT	14386				801 / 801				802 / 802				1868 / 1868				3493 / 3493				4021 / 4021				3401 / 3401						
1.2 PERMITTING AND SAFETY	1218				145 / 145				131 / 131				472 / 472				221 / 221				215 / 215				34 / 34						
AN FARM . 1.5.A.1 AN TANK FARM DESIGN	1500				1500 / 1500				0 / 0																						
1.5.A.2 AN TANK FARM E/I	924								65 / 65				283 / 283				283 / 283				283 / 283				10 / 10						
1.5.A.3 AN TANK FARM PROC	1853								1853 / 1853				0 / 0																		
1.5.A.4 AN TANK FARM CONST	8402				0 / 0				1048 / 1048				6133 / 6133				0 / 0				1221 / 1221				0 / 0						
1.5.A.5 AN TANK FARM HPT	920				0 / 0				54 / 54				293 / 293				293 / 293				280 / 280										
AP FARM 1.5.B.1 AP TANK FARM DESIGN	1748								552 / 552				1196 / 1196																		
1.5.B.2 AP TANK FARM E/I	1249												45 / 45				1037 / 1037				167 / 167				0 / 0						
1.5.B.3 AP TANK FARM PROC.	2256												0 / 0				2256 / 2256														
1.5.B.4 AP TANK FARM CONST	13417																12920 / 12920				497 / 497				0 / 0						
1.5.B.5 AP TANK FARM HPT	1649																1507 / 1507				142 / 142				0 / 0						
AW FARM 1.5.C.1 AW TANK FARM DESIGN	2773												0 / 0				2773 / 2773														
1.5.C.2 AW TANK FARM E/I	1277																0 / 0				980 / 980				297 / 297						
1.5.C.3 AW TANK FARM PROC.	1980																1980 / 1980														
1.5.C.4 AW TANK FARM CONST	14698																0 / 0				11613 / 11613				3085 / 3085						
1.5.C.5 AW TANK FARM HPT	1712																0 / 0				1313 / 1313				399 / 399						
AY FARM 1.5.D.1 AY TANK FARM DESIGN	649												649 / 649																		
1.5.D.2 AY TANK FARM E/I	315												261 / 261				54 / 54				0 / 0				0 / 0						
1.5.D.3 AY TANK FARMPROC.	52												52 / 52				0 / 0														
1.5.D.4 AY TANK FARM CONST	1753												1720 / 1720				33 / 33				0 / 0				0 / 0						
1.5.D.5 AY TANK FARM HPT	242												235 / 235				7 / 7				0 / 0				0 / 0						

PROJECT W-314 TANK FARM UPGRADES
BUDGET AUTHORIZED / BUDGET OUTLAY SCHEDULE (PHASE 2 TOTALS)

	TOTAL COST ($1000s)	Prior Cost	FY99 BA	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006
				1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
AZ FARM										
1.5.E.1 AZ TANK FARM DESIGN	654					654 / 654	0 / 0			
1.5.E.2 AZ TANK FARM E/I	312					281 / 281	31 / 31	0 / 0	0 / 0	
1.5.E.3 AZ TANK FARM PROC	92					92 / 92		0 / 0		
1.5.E.4 AZ TANK FARM CONST	1827					1827 / 1827	0 / 0	0 / 0	0 / 0	
1.5.E.5 AZ TANK FARM HPT	239					239 / 135		0 / 0	0 / 0	
SY FARM										
1.5.F.1 SY TANK FARM DESIGN	1695						1695 / 1695			
1.5.F.2 SY TANK FARM E/I	1073						50 / 50	896 / 896	127 / 127	
1.5.F.3 SY TANK FARM PROC	0							0 / 0		
1.5.F.4 SY TANK FARM CONST	12800			0 / 0	0 / 0	0 / 0	0 / 0	9428 / 9428	3372 / 3372	
1.5.F.5 SY TANK FARM HPT	1626							1529 / 1529	97 / 97	
244S-DCRT										
1.5.H.1 244-S DCRT DESIGN	1381			488 / 488	893 / 893	0 / 0				
1.5.H.2 244-S DCRT E/I	533					395 / 395	138 / 138	0 / 0		
1.5.H.3 244-S DCRT PROC	976					976 / 976	0 / 0			
1.5.H.4 244-S DCRT CONST	5958					5091 / 5091	867 / 867	0 / 0		
1.5.H.5 244-S DCRT HPT	749					590 / 590	159 / 159	0 / 0		
TOTAL CAPITAL BA/BO ($ x 1000)	104888	0	0	2936 / 2937	5400 / 5401	23354 / 23251	29799 / 29800	32587 / 32588	10824 / 10825	

PROJECT W-314 TANK FARM UPGRADES
BUDGET AUTHORIZED / BUDGET OUTLAY SCHEDULE (PHASE 2 TOTALS)

	TOTAL COST ($1000s)	Prior Cost	FY99 BA	FY2000				FY2001				FY2002				FY2003				FY2004				FY2005				FY2006			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EXPENSE FUNDED ACTIVITIES																															
1.3.C DESIGN/CONST SUPPORT	7536	0	0		455 / 455				470 / 470				3164 / 3164				1555 / 1555				1844 / 1844				48 / 48						
1.3.K STARTUP TESTING	8459				89 / 89				953 / 953				1949 / 1949				2163 / 2163				2348 / 2348				959 / 959						
1.3.L OPERATIONS PREP	2007								18 / 18				455 / 455				1088 / 1088				169 / 169				277 / 277						
1.3.M INDEPENDENT REVIEWS	217																107 / 107				110 / 110										
1.3.P PHASE 2 PLANNING	4013	0	2735		1278 / 1278												0 / 0				0 / 0				0 / 0						
1.3.SY TANK FARM	671				671 / 671																										
TOTALS EXPENSE BA/BO ($ x 1000)	22903	0	2735		2493 / 2493				1441 / 1441				5568 / 5568				4913 / 4913				4469 / 4469				1284 / 1284				0 / 0		
PHASE 2 CAPITAL	104900	0	0		2936 / 2937				5400 / 5401				23354 / 23251				29799 / 29800				32587 / 32588				10824 / 10825				0 / 0		
PHASE 2 EXPENSE	22903	0	2735		2493 / 2493				1441 / 1441				5568 / 5568				4913 / 4913				4469 / 4469				1284 / 1284				0 / 0		
TOTAL PHASE 2	127803	0	2735		5429 0 5430				6841 0 6842				28922 0 28819				34712 0 34713				37056 0 37057				12108 0 12109				0 / 0		

9.0 FIELD COORDINATION

A significant number of piping process pits, i.e., central pump pits, sluice pits, drain pits, pump pits, valve pits, will be entered and modified by several different projects. Each time a pit is entered, significant costs are incurred to open and close the pit. Pit opening activities include mobilizing construction and support crews and equipment, setting up a containment tent around the pit, flushing the pit and applying contaminant fixative to the pit interior walls and floor, removing the multi-ton concrete pit cover block (requires a crane), removing debris, and washing down the pit walls and floor. Pit closing activities include touching up the protective coating on the pit walls, floor and cover block bottom as necessary, replacing the cover block, removing the containment tent, and demobilizing construction and support crews and equipment. These pits are highly contaminated and require special work practices to protect workers during these activities. As a part of rebaselining Phase 2 of Project W-314, an attempt has been made to minimize the number of process pit entries in order to minimize costs.

Table 9.1 "Coordination of Pit Upgrades" identifies specific pits that will be modified and how. It identifies projects that will be performing pit modifications and when. It identifies what modifications will be made by each project. Finally, for those pits where multiple projects are planning modifications, it identifies which project will bear the cost of opening and closing the pit.

Table 9.1 indicates integration can be achieved with River Protection Projects W-211 and 521 to minimize Phase 2 pit upgrade costs, particularly four central pump pits, AN-102, AN-105, AN-106, and AN-107. W-314 Phase 2 plans to accomplish the installation of a leak detector and drain plug assembly, and repair of the SPC on the interior pit walls during the planned W-211 upgrade of central pump pit AN-105. Similarly, W-314 Phase 2 pit work will be coordinated during the planned W-521 upgrades of AN-102, 106, and 107. With this integrated approach as the planning basis, the W-314 Phase 2 cost estimate does not include the pit opening and closing costs for these four pits. These costs are borne by Project W-211 and W-521. The planned W-314 Phase 2 pit modifications for these four pits are scheduled coincidentally with the W-211 and W-521 schedules.

Table 9.1: Coordination of River Protection Projects' Pit Upgrades
(consisting of the following 6 pages)

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Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

Pit Type	Est. Type	W-521 Construction Start CY	W-521 Construction End CY	314-P2 Construction Start CY	314-P2 Construction End CY	W-211 Construction Start CY	W-211 Construction End CY	W-314-P1 Construction Start CY	W-314-P1 Construction End CY	W-522 Construction Start CY	W-522 Construction End CY	Pit Upgrade Modifications: Leak Detector	Drain Plug	Relieve/Pumps Mixer Pump	Special Protective Coating	Turbine Flow Meter	Jumped Valve Manifolds	Pit Nozzles	Valve Position Sensors	New Cover Blocks	Mod Of Cover blocks	For a list of acronyms and references, see last page. Pit Coordination
AN Farm																						
SP																						
WT-COB-501																						
WT-COB-502																						
WT-COB-503																						
WT-COB-504																						
WT-COB-505																						
WT-COB-506																						
WT-COB-507																						
WT-COB-508																						
WT-COB-509																						
FP																						Coordination between W-314 Phase 1 and W-211 complete.
VP-AN-A						10/98	9/99	10/98	9/99			314-P1	314-P1		314-P1		314-P1, 211	314-P1	314-P1, 211	314-P1		
VP-AN-B								10/98	9/99			314-P1	314-P1		314-P1		314-P1	314-P1	314-P1	314-P1		
241-AN-101																						
CPP-01A	CPP	11/02	4/06					10/00	6/02			314-P1	314-P1	521	314-P1		314-P1, 521	521	314-P1, 521		314-P1	Since flow meters & valve position indication is deleted from 314 P-2 (per H. Boslow), no other 314-P2 scope remains to be performed. (314 P-1 installs a leak detector, drain, & SPC).
APP-01B	ANN																					
CRP-01D	CPP																					
SRP-01E	CPP																					
241-AN-102																						
CPP-02A	CPP	10/03	9/05	10/01	10/02							314-P2	314-P2	521	314-P2		521	521	521			Assumes 521 validation. 521 opens, performs major mods, applies SPC, closes & turns over pit to Operations. 314-P2, retains estimate for drain & leak detector installation, & a portion of turnover costs (ATP, TTA, MSA, RA/ SSR). 521 allows time for 314-P2 activities.
APP-02B	ANN																					
241-AN-103																						
CPP-03A	CPP			10/01	10/02	6/08	6/10					314-P2	314-P2	211	314-P2		211	211	211	211		314-P2 to retain current scope. W-211 enters this pit several years after 314-P2. Both projects enter this pit.
APP-03B	ANN																					
241-AN-104																						
CPP-04A						7/01	6/03	10/00	6/02			314-P1	314-P1	211	314-P1		211	314-P1	314-P1, 211	211	314-P1	Possible coordination between W-314 Phase 1 and W-211.
APP-04B	ANN																			314-P1		
New Riser Pit								10/00	6/02			314-P1			314-P1							
241-AN-105																						
CPP-05A	CPP			10/01	10/02	4/04	3/06					314-P2	314-P2	211	314-P2		211	211	211	211		W-211 opens pit, performs major mods, provides time for 314-P2 to install drain & leak detector. 314-P2, retains estimate for drain & leak detector installation, & a portion of turnover costs (ATP, TTA, MSA, RA/ SSR). 211 allows time for 314-P2 activities.
APP-05B	ANN																					
241-AN-106																						
CPP-06A	CPP	2/02	2/04	10/01	10/02							314-P2	314-P2	521	314-P2		521	521	521			Assumes 521 validation. 521 opens, performs major mods, applies SPC, closes & turns over pit to Operations. 314-P2, retains estimate for drain & leak detector installation, & a portion of turnover costs (ATP, TTA, MSA, RA/ SSR). 521 allows time for 314-P2 activities.
APP-06B	ANN																					
241-AN-107																						
CPP-07A	CPP	4/02	4/04	10/01	10/02							314-P2	314-P2	521	314-P2		521	521	521			Assumes 521 validation. 521 opens, performs major mods, applies SPC, closes & turns over pit to Operations. 314-P2, retains estimate for drain & leak detector installation, & a portion of turnover costs (ATP, TTA, MSA, RA/ SSR). 521 allows time for 314-P2 activities.
APP-07B	ANN																					

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Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

Pit Type	Est. Type	W-521 Construction Start CY	W-521 Construction End CY	314-P2 Construction Start CY	314-P2 Construction End CY	W-211 Construction Start CY	W-211 Construction End CY	W-314-P1 Construction Start CY	W-314-P1 Construction End CY	W-522 Construction Start CY	W-522 Construction End CY	Pit Upgrade Modifications: Leak Detector	Drain Plug	Retrieval/Pumps Mixer Pump	Special Protective Coating	Turbine Flow Meter	Jumped Valve Manifolds	Pit Nozzles	Valve Position Sensors	New Cover Blocks	Mod Of Cover blocks	For a list of acronyms and references, see last page. Pit Coordination
AZ Farm																						
New AZ VP								6/00	6/02			314-P1	314-P1		314-P1		314-P1	314-P1	314-P1	314-P1		314-p1 provides stainless steel pit liner with SPC on new cover blocks.
241-AZ-101																						
CPP-01A	CPP	10/01	7/03					7/00	1/03			314-P1	314-P1	521	314-P1		314-P1, 521	314-P1, 521	314-P1, 521		314-P1	314-P1 Installs a flex jumper to meet programatic need date. 521 Installs a jumper manifold. Because 521 completion does not meet early programatic need date of this pit, both projects enter this pit.
APP-01F	ANN													521								Assumes 521 validation. 521 opens, performs major mods, applies SPC, closes & turns over pit to Operations.
SLU-01B	CPP	10/01	7/03											521								
SLU-01C	CPP	10/01	7/03																			
241-AZ-102																						
CPP-02A						6/02	4/04	7/00	1/03			314-P1	314-P1	211	314-P1		314-P1, 211	314-P1, 211	314-P1, 211		314-P1	314-P1 Installs a flex jumper to meet programatic need date. 211 removes this flex jumper and installs a jumper manifold. Because 211 completion does not meet early programatic need date of this pit, both projects enter this pit.
APP-02F	ANN																					
SLU-02B	CPP					4/02	4/04															
SLU-02C	CPP					4/02	4/04															
AY Farm																						
SP																						
241-AY-101																						
CPP-01A		10/03	10/06					10/00	1/03			314-P1	314-P1	521	314-P1		314-P1, 521	314-P1, 521	314-P1, 521		314-P1	Possible coordination between 314-P1 & 521 if Programatic need dates allow. For the moment, assume both projects must enter this pit.
APP-01F	ANN																					
SLU 01B		10/03	10/06									521	521	521	521							Confirmed with Phil Brackenberry Friday, August 6, 1999: The 521 scope document will include installing a leak detector, drain plug assembly, mixer pump, and special protective coating as required in the the four sluice pits.
SLU 01C		10/03	10/06									521	521	521	521							
SLU 01D		10/03	10/06									521	521	521	521							
SLU 01E		10/03	10/06									521	521	521	521							
241-AY-102																						
CPP-02A						1/03	12/04	10/00	1/03			314-P1	314-P1	211	314-P1		314-P1, 211	314-P1, 211	314-P1, 211	211	314-P1	Possible coordination between 314-P1 & 521 if Programatic need dates allow. For the moment, assume both projects must enter this pit.
APP-02F	ANN											211	211	211						211		
SLU 02B	CPP					7/02	7/04					211	211	211						211		
SLU 02C	CPP					7/02	7/04					211	211	211						211		
SLU 02D	CPP					7/02	7/04					211	211	211						211		
SLU 02E	CPP					7/02	7/04					211	211	211								

Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

Pit Type	Est.	W-521		314-P2		W-211		W-314-P1		W-522		Pit Upgrade Modifications										For a list of acronyms and references, see last page.
	Type	Construction		Construction		Construction		Construction		Construction				Retrieval/Pumps	Special	Turbine	Jumper/		Valve	New	Mod Of	
		Start	End	Start	End	Start	End	Start	End	Start	End	Leak	Drain	Mixer	Protective	Flow	Valve	Pit	Position	Cover	Cover	
		CY	CY	CY	CY	CY	CY	CY	CY	CY	CY	Detector	Plug	Pump	Coating	Meter	Manifolds	Nozzles	Sensors	Blocks	blocks	Pit Coordination
AW Farm																						
AW VP-A								10/00	10/02			314-P1	314-P1		314-P1		314-P1		314-P1	314-P1		
AW VP-B								10/00	10/02			314-P1	314-P1		314-P1		314-P1		314-P1	314-P1		
SP																						
FP																						
WT-COB-501																						
WT-COB-502																						
WT-COB-503																						
WT-COB-504																						
241-AW-101																						
CPP-01A	CPP	8/08	8/10	11/03	10/04							314-P2	314-P2	521	314-P2		521	521	521			Because the 521 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP01B	ANN																					
241-AW-102																						
CPP-02A	CPP			11/03	10/04							314-P2	314-P2		314-P2							
APP-02B	ANN																					
DP-02D				11/03	10/04							314-P2	314-P2		314-P2							
PPP-02E				11/03	10/04							314-P2	314-P2		314-P2							
241-AW-103																						
CPP-03A		8/08	8/10	11/03	10/04							314-P2	314-P2	521	314-P2		521	521	521			Because the 521 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP-03B	ANN																					
241-AW-104																						
CPP-04A	CPP			11/03	10/04					4/12	4/14	314-P2	314-P2	522	314-P2		522	522	522			Because the 522 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP-04B	ANN														314-P2							
241-AW-105																						
CPP-05A				11/03	10/04					4/12	4/14	314-P2	314-P2	522	314-P2		522	522	522			Because the 522 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP-05B	ANN																					
241-AW-106																						
CPP-06A	CPP			11/03	10/04							314-P2	314-P2		314-P2							
APP-06B	ANN																					

Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

For a list of acronyms and references, see last page.

Pit Type	Est. Type	W-521 Construction Start CY	W-521 Construction End CY	314-P2 Construction Start CY	314-P2 Construction End CY	W-211 Construction Start CY	W-211 Construction End CY	W-314-P1 Construction Start CY	W-314-P1 Construction End CY	W-522 Construction Start CY	W-522 Construction End CY	Pit Upgrade Modifications: Leak Detector	Drain Plug	Retrieval/Pumps Mixer Pump	Special Protective Coating	Turbine Flow Meter	Jumper/Valve Manifolds	Pit Nozzles	Valve Position Sensors	New Cover Blocks	Mod Of Cover blocks	Pit Coordination
AP Farm																						
Existing AP VP								3/01	6/02			314 P1			314 P1		314 P1	314-P1	314 P1		314 P1	
New AP VP		TBD	TBD					3/01	6/02			314-P1, 521	314-P1, 521		314-P1, 521		521	521	521	521		521 construction dates are unknow. Therefore assume both projects enter this pit.
FP																						
JSP																						
SP																						
241-AP-101																						
CPP-01A	CPP			10/02	10/03					7/11	7/13	314-P2	314-P2	522	314-P2		522	522	522			Because the 522 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, then, coordination would be possible, eliminating the pit entry by 314-P2.
APP-01B	ANN																					
241-AP-102																						
CPP-02A						10/00	9/02					211	211	211 Mixer			211			211		
APP-02B	ANN											314-P2	314-P2		314-P2							
PP-02D				10/02	10/03							314-P2	314-P2		314-P2		211		211	211		
241-AP-103																						
CPP-03A	CPP			10/02	10/03							314-P2	314-P2		314 P2							
APP-03B	ANN																					
DP-03D				10/02	10/03							314-P2	314-P2		314-P2							
241-AP-104																						
CPP-04A						10/00	9/02					211	211	211 Mixer			211		211	211		
APP-04B	ANN													211			211		211	211		
PP-04D																						
241-AP-105																						
CPP-05A	CPP			10/02	10/03					6/13	6/15	314-P2	314-P2	522	314-P2		522	522	522			Because the 522 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, then, coordination would be possible, eliminating the pit entry by 314-P2.
APP-05B	ANN																					
241-AP-106																						
CPP-06A	CPP			10/02	10/03							314-P2	314-P2		314-P2							
APP-06B	ANN																					
241-AP-107																						
CPP-07A	CPP			10/02	10/03							314-P2	314-P2		314-P2							
APP-07B	ANN																					
MPP-07D																						
MPP-07E																						
MPP-07F																						
241-AP-108																						
CPP-08A	CPP			10/02	10/03							314-P2	314-P2		314-P2							
APP-08B	ANN																					

Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

Pit Type	Est. Type	W-521 Construction Start CY	W-521 Construction End CY	314-P2 Construction Start CY	314-P2 Construction End CY	W-211 Construction Start CY	W-211 Construction End CY	W-314-P1 Construction Start CY	W-314-P1 Construction End CY	W-522 Construction Start CY	W-522 Construction End CY	Pit Upgrade Modifications: Leak Detector	Drain Plug	Retrieval Pumps Mixer Pump	Special Protective Coating	Turbine Flow Meter	Jumper/ Valve Manifolds	Pit Nozzles	Valve Position Sensors	New Cover Blocks	Mod Of Cover blocks	For a list of acronyms and references, see last page. Pit Coordination
SY Farm																						
WT-COB-501																						
WT-COB-502																						
WT-COB-503																						
WT-COB-504																						
WT-COB-505																						
WT-COB-506																						
WT-COB-507																						
241-SY-101																						
CPP-01A	CPP	6/06	6/08	10/03	12/04							314-P2	314-P2	521	314-P2		521	521	521			Because the 521 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP-01B	ANN																					
241-SY-102																						
CPP-02A	CPP			10/03	12/04	4/07	7/09					314-P2	314-P2	211	314-P2		211	211	211	211		Because W-211 dates are late, i.e., after the June, 2005 TPA Compliance milestone, it is assumed both projects will enter this pit.
APP-02B	ANN																					
DP-02D	CPP			10/03	12/04							314-P2	314-P2		314-P2							
FP 02E				3/09	7/09							314-P2	314-P2		314-P2							
241-SY-103																						
CPP-03A				10/03	12/04					10/06	10/08	314-P2	314-P2	522	314-P2		522	522	522			Because the 522 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, or, if, a later programatic need date can be established, than, coordination would be possible, eliminating the pit entry by 314-P2.
APP-03B	ANN																					
241-SY-A																						
VP		6/06	6/09	10/03	12/04							314-P2	314-P2		314-P2		211	211	211	211		Because the 521 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, than, coordination would be possible, eliminating the pit entry by 314-P2.
FP	CPP																					
241-SY-B																						
VP		6/06	6/09	10/03	12/04							314-P2	314-P2		314-P2		211	211	211	211		Because the 521 dates are so late, it is assumed the new leak detector, drain, and SPC would be required by 314-P2. However, if deferal of this requirement could be reached with the state, than, coordination would be possible, eliminating the pit entry by 314-P2.
FP	CPP																					
Flush Pit 02E				10/03	12/04							314-P2	314-P2		314-P2							
244S DCRT																						
PP				2/02	12/02							314-P2			314-P2							
Filter Pit				2/02	12/02												314-P2 Non Filtered Duct Jumper					The Filter Pit upgrade is part of the ventilation ductwork installation.

Table 9.1 "Coordination Of River Protection Projects' Pit Upgrades"

Pit Type	Est. Type	W-521 Construction Start CY	W-521 Construction End CY	314-P2 Construction Start CY	314-P2 Construction End CY	W-211 Construction Start CY	W-211 Construction End CY	W-314-P1 Construction Start CY	W-314-P1 Construction End CY	W-522 Construction Start CY	W-522 Construction End CY	Pit Upgrade Modifications: Leak Detector	Drain Plug	Retrievable Mixer Pump	Special Protective Coating	Turbine Flow Meter	Jumper/ Valve Manifolds	Pit Nozzles	Valve Position Sensors	New Cover Blocks	Mod Of Cover blocks	For a list of acronyms and references, see last page. Pit Coordination
Acronyms																						
APP	Annulus Pump Pit																					
COB	Clean Out Box																					
CPP	Central Pump Pit																					
CRP	Condensate Receiver Pit																					
DP	Drain Pit																					
ELDP	Encasement Leak Detection Pit																					
FP	Flush Pit																					
FPP	Feed Pump Pit																					
JSP	Jumper Storage Pit																					
LDP	Leak Detector Pit																					
MPP	Mixer Pump Pit																					
PP	Pump Pit																					
SLU	Sluiding Pit																					
SP	Service Pit																					
SRP	Supernate Receiver Pit																					
VP	Valve Pit																					
211	W-211																					
314-P1	W-314 Phase 1																					
314-P2	W-314 Phase 2																					
521	W-521																					
522	W-522																					
Note:	Construction dates are for "Farm Construction", not individual pits.																					

10.0 CRITICAL RESOURCES

(consisting of the following 29 pages)

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 08:35 RUN NO. 2783

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 28APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AN-02A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05	APR FY05
CCARP	CARPENTER	0.02				0.02					
CELEC	ELECTRICAN WIREMAN	1.13				1.13					
CGR	GENERAL REQUIREMENTS	5.76				5.76					
CLAB	LABORER III	0.97				0.97					
CPAINT	PAINTER	0.36				0.36					
CPF	PIPEFITTER	1.23				1.23					
OTHER1	Non-Resource Other1	0.00				0.00					
	REPORT TOTAL	9.46				9.46					

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2790
08:48

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AN-03A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY01	JAN FY01	APR FY01	JUL FY01	OCT FY02	JAN FY02	APR FY02	JUL FY02	OCT FY03
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.24				1.24					
CGR	GENERAL REQUIREMENTS	3.64				3.64					
CIW	IRONWORKER	1.34				1.34					
CLAB	LABORER III	3.82				3.82					
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42				1.42					
CPF	PIPEFITTER	1.45				1.45					
CTEAM	TEAMSTER VII	0.14				0.14					
	REPORT TOTAL	14.10				14.10					

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 08:47 RUN NO. 2791 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-2

Resource Loading-CPP AN-05A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05	APR FY05	JUL FY05
CCARP							0.02				
CELEC							1.14				
CGR							3.10				
CLAB							1.06				
CPAINT							0.36				
CPF							1.23				
GOT							3.88				
OTHER1							0.00				
							10.79				

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2792
08:48

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AN-06A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY01	JAN FY01	APR FY01	JUL FY01	OCT FY02	JAN FY02	APR FY02	JUL FY02	OCT FY03
CCARP	CARPENTER	0.02							0.02		
CELEC	ELECTRICAN WIREMAN	1.16							1.16		
CGR	GENERAL REQUIREMENTS	7.98							3.33	4.66	
CLAB	LABORER III	1.44							1.44		
CPAINT	PAINTER	0.36							0.36		
CPF	PIPEFITTER	1.23							1.23		
OTHER1	Non-Resource Other1	0.00							0.00		
	REPORT TOTAL	12.19							7.53	4.66	

Company

REPORT DATE 29SEP99 RUN NO. 2793
08:48

Resource Loading-CPP AN-07A (FTE's/451hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY01	JAN FY01	APR FY01	JUL FY01	OCT FY02	JAN FY02	APR FY02	JUL FY02	OCT FY03
CCARP	CARPENTER	0.02								0.02	
CELEC	ELECTRICAN WIREMAN	1.14								1.14	
CGR	GENERAL REQUIREMENTS	3.10								3.10	
CLAB	LABORER III	1.06								1.06	
CPAINT	PAINTER	0.36								0.36	
CPF	PIPEFITTER	1.23								1.23	
GOT	GENERAL OVERTIME FOR	3.88								3.88	
OTHER1	Non-Resource Other1	0.00								0.00	
	REPORT TOTAL	10.79								10.79	

Company

REPORT DATE 29SEP99 RUN NO. 2795
09:43

Resource Loading-Pump Pit 244S (FTE's/451Hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY01	APR FY01	JUL FY01	OCT FY02	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03
CCARP	CARPENTER	1.01								1.01	
CELEC	ELECTRICAN WIREMAN	1.21								1.21	
CGR	GENERAL REQUIREMENTS	1.86								1.86	
CIW	IRONWORKER	1.34								1.34	
CLAB	LABORER III	2.78								2.78	
COE	OPERATING ENGINEER V	0.04								0.04	
CPAINT	PAINTER	1.42								1.42	
CPF	PIPEFITTER	1.10								1.10	
CTEAM	TEAMSTER VII	0.14								0.14	
	REPORT TOTAL	10.91								10.91	

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:45 RUN NO. 2797 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AP-01A (FTE's/45thrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.25				1.25					
CGR	GENERAL REQUIREMENTS	2.31				2.31					
CIW	IRONWORKER	1.34				1.34					
CLAB	LABORER III	3.82				3.82					
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42				1.42					
CPF	PIPEFITTER	1.45				1.45					
CTEAM	TEAMSTER VII	0.14				0.14					
	REPORT TOTAL	12.78				12.78					

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:43 RUN NO. 2799 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 25APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Pump Pit AP-02D (FTE's/451Hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01		1.01							
CELEC	ELECTRICAN WIREMAN	1.28		1.28							
CGR	GENERAL REQUIREMENTS	4.97		4.97							
CIW	IRONWORKER	1.34		1.34							
CLAB	LABORER III	4.34		4.34							
COE	OPERATING ENGINEER V	0.04		0.04							
CPAINT	PAINTER	1.42		1.42							
CPF	PIPEFITTER	1.45		1.45							
CTEAM	TEAMSTER VII	0.14		0.14							
	REPORT TOTAL	15.99		15.99							

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:48 RUN NO. 2800 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 25APR05

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AP-03A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01					1.00	0.01			
CELEC	ELECTRICAN WIREMAN	1.23					0.22	1.01			
CGR	GENERAL REQUIREMENTS	2.31					0.09	2.22			
CIW	IRONWORKER	1.34					0.32	1.03			
CLAB	LABORER III	3.82					1.62	2.20			
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42						1.42			
CPF	PIPEFITTER	1.45					0.29	1.16			
CTEAM	TEAMSTER VII	0.14					0.14				
	REPORT TOTAL	12.76					3.71	9.05			

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2833
11:46

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Drain Pit AP-030 (FTE's/451Hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01		1.01							
CELEC	ELECTRICAN WIREMAN	1.22		0.81	0.40						
CGR	GENERAL REQUIREMENTS	4.97		0.09	4.88						
CIW	IRONWORKER	1.34		1.18	0.16						
CLAB	LABORER III	2.92		2.60	0.32						
COE	OPERATING ENGINEER V	0.04		0.04							
CPAINT	PAINTER	1.42		1.11	0.32						
CPF	PIPEFITTER	1.45		1.22	0.23						
CTEAM	TEAMSTER VII	0.14		0.14							
	REPORT TOTAL	14.51		8.20	6.31						

Company

REPORT DATE 29SEP99 RUN NO. 2801
09:49

Resource Loading-CPP AP-05A (FTE's/451hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 25APR05

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.26				1.26					
CGR	GENERAL REQUIREMENTS	2.31				2.31					
CIW	IRONWORKER	1.34				1.34					
CLAB	LABORER III	4.05				4.05					
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42				1.42					
CPF	PIPEFITTER	1.45				1.45					
CTEAM	TEAMSTER VII	0.14				0.14					
OTHER1	Non-Resource Other1	0.00				0.00					
	REPORT TOTAL	13.03				13.03					

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:43 RUN NO. 2802

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 28APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AP-06A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01					1.01				
CELEC	ELECTRICAN WIREMAN	1.24					1.24				
CGR	GENERAL REQUIREMENTS	4.97					4.97				
CIW	IRONWORKER	1.34					1.34				
CLAB	LABORER III	3.82					3.82				
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45					1.45				
CTEAM	TEAMSTER VII	0.14					0.14				
	REPORT TOTAL	15.43					15.43				

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:52 RUN NO. 2903 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 28APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AP-07A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01					1.00	0.01			
CELEC	ELECTRICAN WIREMAN	1.26					0.23	1.03			
CGR	GENERAL REQUIREMENTS	2.31					0.09	2.22			
CIW	IRONWORKER	1.34					0.32	1.03			
CLAB	LABORER III	4.05					1.71	2.34			
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42						1.42			
CPF	PIPEFITTER	1.45					0.29	1.16			
CTEAM	TEAMSTER VII	0.14					0.14				
	REPORT TOTAL	13.03					3.82	9.21			

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 09:53 RUN NO. 2304 | RESOURCE LOADING REPORT | START DATE 19JUL89 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AP-03A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY02	APR FY02	JUL FY02	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04
CCARP	CARPENTER	1.01						1.01			
CELEC	ELECTRICAN WIREMAN	1.24						0.82	0.42		
CGR	GENERAL REQUIREMENTS	2.31						0.09	2.22		
CIW	IRONWORKER	1.34						1.18	0.16		
CLAB	LABORER III	3.82						3.44	0.37		
COE	OPERATING ENGINEER V	0.04						0.04			
CPAINT	PAINTER	1.42						0.59	0.84		
CPF	PIPEFITTER	1.45						1.03	0.42		
CTEAM	TEAMSTER VII	0.14						0.14			
GOT	GENERAL OVERTIME FOR	1.94							1.94		
	REPORT TOTAL	14.71						8.35	6.37		

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2806
10:09

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AW-01A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01				0.33	0.68				
CELEC	ELECTRICAN WIREMAN	1.22				0.04	1.18				
CGR	GENERAL REQUIREMENTS	4.52				0.03	4.49				
CIW	IRONWORKER	1.34				0.11	1.24				
CLAB	LABORER III	3.39					3.39				
COE	OPERATING ENGINEER V	0.04				0.01	0.02				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45				0.09	1.36				
CTEAM	TEAMSTER VII	0.14				0.05	0.09				
	REPORT TOTAL	14.54				0.65	13.88				

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2807 10:10 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR05

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AW-02A (FTE's/45thrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01						1.01			
CELEC	ELECTRICAN WIREMAN	1.22						1.22			
CGR	GENERAL REQUIREMENTS	2.31						2.31			
CIW	IRONWORKER	1.34						1.34			
CLAB	LABORER III	3.11						3.11			
COE	OPERATING ENGINEER V	0.04						0.04			
CPAINT	PAINTER	1.42						1.42			
CPF	PIPEFITTER	1.45						1.45			
CTEAM	TEAMSTER VII	0.14						0.14			
	REPORT TOTAL	12.04						12.04			

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2809 10:12 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Drain Pit AW-020 (FTE's/451Hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01						1.01	0.00		
CELEC	ELECTRICAN WIREMAN	1.21						0.31	0.90		
CGR	GENERAL REQUIREMENTS	2.31						0.09	2.22		
CIW	IRONWORKER	1.34						0.47	0.87		
CLAB	LABORER III	3.39						1.70	1.69		
COE	OPERATING ENGINEER V	0.04						0.04			
CPAINT	PAINTER	1.42							1.42		
CPF	PIPEFITTER	1.45						0.74	0.71		
CTEAM	TEAMSTER VII	0.14						0.14			
MATERIAL	Non-Resource Materia	0.00							0.00		
	REPORT TOTAL	12.31						4.50	7.81		

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2810
19:13

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Feed Pit AW-02E (FTE's/451Hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01							1.01		
CELEC	ELECTRICAN WIREMAN	1.20							0.78	0.42	
CGR	GENERAL REQUIREMENTS	2.31							0.09	2.22	
CIW	IRONWORKER	1.34							1.18	0.16	
CLAB	LABORER III	3.39							3.08	0.32	
COE	OPERATING ENGINEER V	0.04							0.04		
CPAINT	PAINTER	1.42							0.79	0.64	
CPF	PIPEFITTER	1.45							1.04	0.41	
CTEAM	TEAMSTER VII	0.14							0.14		
	REPORT TOTAL	12.30							8.14	4.16	

Company

REPORT DATE 29SEP99 10:16 RUN NO. 2911

Resource Loading-CPP AW-03A (FTE's/451hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 25APR06

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01							1.01		
CELEC	ELECTRICAN WIREMAN	1.22							0.82	0.40	
CGR	GENERAL REQUIREMENTS	2.31							0.09	2.22	
CIW	IRONWORKER	1.34							1.18	0.16	
CLAB	LABORER III	3.01							2.70	0.32	
COE	OPERATING ENGINEER V	0.04							0.04		
CPAINT	PAINTER	1.42							1.32	0.11	
CPF	PIPEFITTER	1.45							1.24	0.21	
CTEAM	TEAMSTER VII	0.14							0.14		
	REPORT TOTAL	11.94							8.53	3.41	

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 10:17 RUN NO. 2812

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 25APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AW-04A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.22				0.82	0.40				
CGR	GENERAL REQUIREMENTS	4.52				0.09	4.43				
CIW	IRONWORKER	1.34				1.18	0.16				
CLAB	LABORER III	3.53				3.22	0.32				
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42				1.11	0.32				
CPF	PIPEFITTER	1.45				1.22	0.23				
CTEAM	TEAMSTER VII	0.14				0.14					
	REPORT TOTAL	14.69				8.82	5.86				

Company

REPORT DATE 29SEP99 RUN NO. 2813
10:18

Resource Loading-CPP AW-05A (FTE's/451hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR05

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01					1.01				
CELEC	ELECTRICAN WIREMAN	1.22					1.11	0.11			
CGR	GENERAL REQUIREMENTS	2.31					0.09	2.22			
CIW	IRONWORKER	1.34					1.34				
CLAB	LABORER III	2.97					2.97				
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45					1.45				
CTEAM	TEAMSTER VII	0.14					0.14				
	REPORT TOTAL	11.89					9.57	2.32			

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 10:20 RUN NO. 2313 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP AW-06A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01						1.01			
CELEC	ELECTRICAN WIREMAN	1.22						1.22			
CGR	GENERAL REQUIREMENTS	2.31						1.01	1.29		
CIW	IRONWORKER	1.34						1.34			
CLAB	LABORER III	3.53						3.53			
COE	OPERATING ENGINEER V	0.04						0.04			
CPAINT	PAINTER	1.42						1.42			
CPF	PIPEFITTER	1.45						1.45			
CTEAM	TEAMSTER VII	0.14						0.14			
	REPORT TOTAL	12.47						11.17	1.29		

Company | PRIMAVERA PROJECT PLANNER | W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 11:25 RUN NO. 2828 | RESOURCE LOADING REPORT | START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP SY-01A (FTE's/451hrs) | TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.23				1.23					
CGR	GENERAL REQUIREMENTS	2.31				2.31					
CIW	IRONWORKER	1.34				1.34					
CLAB	LABORER III	3.68				3.68					
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42				1.42					
CPF	PIPEFITTER	1.45				1.45					
CTEAM	TEAMSTER VII	0.14				0.14					
	REPORT TOTAL	12.62				12.62					

Company

REPORT DATE 29SEP99 RUN NO. 2330
11:30

Resource Loading-CPP SY-02A (FTE's/451hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR05

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01				1.01					
CELEC	ELECTRICAN WIREMAN	1.23				0.76	0.47				
CGR	GENERAL REQUIREMENTS	4.97				0.09	4.88				
CIW	IRONWORKER	1.34				0.32	1.03				
CLAB	LABORER III	3.63				2.07	1.56				
COE	OPERATING ENGINEER V	0.04				0.04					
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45				0.29	1.16				
CTEAM	TEAMSTER VII	0.14				0.14					
	REPORT TOTAL	15.23				4.71	10.52				

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 11:32 RUN NO. 2832

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 25APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Feed Pit SY-02E (FTE's/451Hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	0.28					0.28				
CELEC	ELECTRICAN WIREMAN	1.18					1.18				
CIW	IRONWORKER	1.34					1.34				
CLAB	LABORER III	0.96					0.96				
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.27					1.27				
	REPORT TOTAL	6.50					6.50				

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 RUN NO. 2933
11:34

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 28APR05

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-Drain Pit SY-02D (FTE's/451Hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01					0.34	0.67			
CELEC	ELECTRICAN WIREMAN	1.24					0.14	1.10			
CGR	GENERAL REQUIREMENTS	2.31					0.03	2.28			
CIW	IRONWORKER	1.34					0.11	1.24			
CLAB	LABORER III	3.01					0.10	2.91			
COE	OPERATING ENGINEER V	0.04					0.01	0.02			
CPAINT	PAINTER	1.42						1.42			
CPF	PIPEFITTER	1.45					0.09	1.36			
CTEAM	TEAMSTER VII	0.14					0.05	0.09			
	REPORT TOTAL	11.96					0.86	11.10			

Company

PRIMAVERA PROJECT PLANNER

W314 ASH1 (Use for Estimate Download

REPORT DATE 29SEP99 11:34 RUN NO. 2934

RESOURCE LOADING REPORT

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

Resource Loading-CPP SY-03A (FTE's/451hrs)

TOTAL USAGE FOR QUARTER

RESOURCE	RESOURCE DESCRIPTION	TOTAL	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05	JAN FY05
CCARP	CARPENTER	1.01						1.01			
CELEC	ELECTRICAN WIREMAN	1.22						0.81	0.41		
CGR	GENERAL REQUIREMENTS	2.31						0.09	2.22		
CIW	IRONWORKER	1.34						1.18	0.16		
CLAB	LABORER III	3.53						3.22	0.32		
COE	OPERATING ENGINEER V	0.04						0.04			
CPAINT	PAINTER	1.42						1.00	0.43		
CPF	PIPEFITTER	1.45						1.13	0.32		
CTEAM	TEAMSTER VII	0.14						0.14			
	REPORT TOTAL	12.47						8.63	3.84		

Company

REPORT DATE 29SEP99 RUN NO. 2836
11:36

Resource Loading-Valve Pit "A" (FTE's/451Hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01					1.01				
CELEC	ELECTRICAN WIREMAN	1.28					1.28				
CGR	GENERAL REQUIREMENTS	2.31					2.31				
CIW	IRONWORKER	1.34					1.34				
CLAB	LABORER III	3.53					3.53				
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45					1.45				
CTEAM	TEAMSTER VII	0.14					0.14				
GOT	GENERAL OVERTIME FOR	0.97					0.97				
	REPORT TOTAL	13.49					13.49				

Company

REPORT DATE 29SEP99 RUN NO. 2837
11:37

Resource Loading-Valve Pit "B" (FTE's/451Hrs)

PRIMAVERA PROJECT PLANNER

RESOURCE LOADING REPORT

TOTAL USAGE FOR QUARTER

W314 ASH1 (Use for Estimate Download

START DATE 19JUL99 FIN DATE 26APR06

DATA DATE 01SEP99 PAGE NO. 1-1

RESOURCE	RESOURCE DESCRIPTION	TOTAL	OCT FY03	JAN FY03	APR FY03	JUL FY03	OCT FY04	JAN FY04	APR FY04	JUL FY04	OCT FY05
CCARP	CARPENTER	1.01					1.01				
CELEC	ELECTRICAN WIREMAN	1.26					1.26				
CGR	GENERAL REQUIREMENTS	2.31					2.31				
CIW	IRONWORKER	1.34					1.34				
CLAB	LABORER III	3.68					3.68				
COE	OPERATING ENGINEER V	0.04					0.04				
CPAINT	PAINTER	1.42					1.42				
CPF	PIPEFITTER	1.45					1.45				
CTEAM	TEAMSTER VII	0.14					0.14				
	REPORT TOTAL	12.64					12.64				

11.0 CONTINGENCY

Contingency for Phase 2 totals $30.6 million, or a 32% of estimated costs. The new DOE guidance for Project Contingency, as noted in the draft *Waste Management Project Contingency Analysis* (Table 4 – Modifications Required to Existing Hardware), recommends a range of 30% to 40% in project contingency at the conceptual stage. Although 32% is on the lower end of the recommended range, this amount is reasonable considering the major work involved in Phase 2 (ventilation system, process pit, vapor space pressure monitoring, and electrical upgrades) has been performed numerous times on site before. A good historical basis is therefore available for this type of work.

The contingency amount was established using the DOE Order 430.1, Life-Cycle Asset Management (LCAM), GPG-FM-007 guidance. Functional subject matter experts performed a qualitative risk analysis using engineering judgement to establish the potential consequences and likelihood of risk events. Both technical and programmatic risks were analyzed. As a result of this analysis the major project risks are identified as:

- Possibility of project failure due to the lack of financial support to the end of the project;
- Potential for changes to the project due to changed or new technical requirements;
- Potential for changes to the project from various programmatic and project documents and analyses yet to be completed that contain technical data affecting the project;
- Potential changes in scope implementation and interface by operational requests and other projects;
- Potential changes in turnover activities – may be raised to a higher level of inquiry (e.g., Readiness Assessments);
- Potential changes in project scope due to inaccurate scoping/estimate assumptions and/or inaccurate, detailed, integrated planning; and
- Potential for qualified personnel or contractors to be unavailable when needed.

The risk analysis established the Phase 2 risks, and associated frequencies and potential consequences. Consequences were expressed in terms of cost and time impacts. Each of the risks were converted to contingency dollars by multiplying the most likely frequency times most likely consequence dollars. Finally, risk dollars were allocated to each of the project tasks. The allocation of contingency can be summarized as $3.1M to Project Management, $2.4M to Design, $22.6M to Procurement/Construction, $ 2.2M to Test and Turnover, and $0.4K to Management Self Assessment/Readiness.

A more detailed discussion of the risk analysis methodology can be found in the Project Execution Plan, HNF-SD-W-314-PMP-001, Rev 3, Appendix F, Risk Management Plan. Actual dollar values of the resultant contingencies at the project activity level can be found in the Phase 2 Rebaseline cost estimate, Section 6.0.

Table 11.1 Contingency Presents The Contingency Spread By Major WBS Element.

W-314 Phase 2 Contingency Allocation				
WBS #	WBS Title	Cost	Contingency $	Contingency %
1.1	Project Management	11,510,720	2,874,997	25.0%
1.2	Permitting & Safety	1,043,131	174,996	16.8%
1.3.C	Other Project Costs	6,021,695	1,514,662	25.2%
1.3.K	Startup & Testing	6,308,865	2,149,996	34.1%
1.3.L	Operations Preparations	1,581,754	424,995	26.9%
1.3.M	Independent Reviews	217,280	0	0.0%
1.3.P	Phase 2 Planning	3,963,300	49,994	1.3%
1.3.Q	SY Ventilation	509,902	160,853	31.5%
1.5.A	AN Tank Farm	10,011,189	3,586,750	35.8%
1.5.B	AP Tank Farm	14,933,353	5,387,235	36.1%
1.5.C	AW Tank Farm	14,981,378	5,274,142	35.2%
1.5.D	AY Tank Farm	2,296,485	713,804	31.1%
1.5.E	AZ Tank Farm	2,361,756	762,493	32.3%
1.5.F	SY Tank Farm	12,672,540	4,521,103	35.7%
1.5.H	244-S DCRT	7,094,331	2,502,663	35.3%
1.5.I	200E/W	1,657,526	526,293	31.8%
Totals		97,165,206	30,624,976	31.5%

Project Management (WBS 1.1): The 25% identified provides $2.9M contingency for Project Management and Integration, Project Engineering, Systems Engineering, and Quality Assurance. The contingency risks expressed in this area are programmatic and readiness risks. Programmatic risks (~$900K) include items, such as fluctuating funding, changes in DOE direction, Oversight group recommendations, and changes to project documentation. Phase 2 is currently planning a Readiness Assessment for AN Tank Farm Upgrades. If other Tank Farm upgrades require more than the ABU process, costs would increase to cover added readiness activities. This is contained in the Readiness portion of the risk (~$2M)

Permitting and Safety (WBS 1.2): The 17% identified provides $0.2M contingency for environmental support of design, construction, startup and testing, and readiness activities, as well as the obtaining of appropriate permits, including state air permits. This process is well understood and warrants a relatively low contingency.

OPC Activities (WBS 1.3.C): The 25% identified provides $1.5M contingency for Operations personnel support of design and construction. A historical basis for this familiar type of project work warrants a relatively moderate contingency.

Startup & Testing (WBS 1.3.K): The 34% identified provides $2.2M contingency for the Startup, and Testing and Turnover processes, including the ABU process. A historical basis for this familiar type of project work warrants a relatively moderate contingency.

Operations Preparations (WBS 1.3.L): The 27% identified provides $0.4M contingency for the Management Self Assessment processes and the Readiness Assessment for AN Tank Farm Upgrades. A historical basis for this familiar type of project work warrants a relatively moderate contingency.

Independent Reviews (WBS 1.3.M): The 0% identified provides $0M contingency for DOE independent reviews. This is a budget allocation and therefore does not require contingency.

Phase 2 Planning (WBS 1.3.P): The 1% identified provides $50K contingency for the remaining planning of Phase 2. Much planning was accomplished in 'FY99 and a little over the 50% of the cost aforementioned was spent in FY99. This process is well understood and warrants a very low contingency.

AN Farm (WBS 1.5.A): The 36% identified provides $3.6M contingency for the primary ventilation system upgrade, five process pit upgrades, and vapor space pressure monitoring upgrades. This farm warrants one of the highest % contingency because it is the first farm to be addressed. Subsequent farms should benefit from lessons learned and therefore warrant a slightly smaller % contingency.

AP Farm (WBS 1.5.B): The 36% identified provides $5.4M contingency for the primary ventilation system upgrade, eight process pit upgrades, and vapor space pressure monitoring upgrades. This will be the third ventilation system (second primary system) to be upgraded and therefore warrants one of the highest percentages of contingency.

AW Farm (WBS 1.5.C): The 35% identified provides $5.3M contingency for the primary ventilation system upgrade, eight process pit upgrades, and vapor space pressure monitoring upgrades. This will be the third primary ventilation system to be upgraded and therefore warrants a slightly smaller (than AP Farm) contingency.

AY Farm (WBS 1.5.D): The 31% identified provides $0.7M contingency for vapor space pressure monitoring and electrical upgrades. Because no ventilation upgrade is addressed in this farm, it warrants a relatively smaller contingency than those farms with ventilation upgrades.

AZ Farm (WBS 1.5.E): The 32% identified provides $0.8M contingency for vapor space pressure monitoring and electrical upgrades. Because no ventilation upgrade is addressed in this farm it, warrants a relatively smaller contingency than those farms with ventilation upgrades.

SY Farm (WBS 1.5.F): The 36% identified provides $4.15M contingency for the SY Annulus Ventilation System, six process pits, and vapor space pressure monitoring upgrades. Because of the ventilation upgrades, this system warrants one of the highest percentages of contingency.

244-S DCRT (WBS 1.5.H): The 35% identified provides $2.5M contingency for ventilation system upgrade, two process pits, and vapor space monitoring upgrades. This is the second

ventilation system to be upgraded following the AN Farm and therefore warrants one of the highest percentages of contingency.

200 E/W AREA (WBS 1.5.I): The 32% identified provides $0.5M contingency for installation of a bypass line around a process pit. Because a sound historical basis for this type of work exists, it warrants a relatively moderate contingency.

12.0 WBS DICTIONARY

The project's WBS was initially developed and approved during the conceptual phase based on the RPP technical objectives. The WBS provides the basis for organizing, planning, estimating, scheduling, and reporting performance for RPP work. A detailed WBS dictionary with definitions for each WBS element can be found in HNF-SD-W-314-PMP-001, Project Execution Plan for TFRSO Project W-314, Appendix A. This dictionary has been modified to add an additional expense funded activity (WBS 1.3.Q) for the SY Tank Farm annulus ventilation work. Additionally, the WBS element 1.5.I, 200 E/W Area, was modified to include work scope for the LIQW-701 to SN-220 transfer line connection and WBS element 1.5.J, Single-Shell Support System, was modified to delete Phase 2 work scope.