S

NOV 19 1999 (4) STH# 4

ENGINEERING DATA TRANSMITTAL

1. EDT 628180

2. To: (Receiving Organization) WFD Projects Defintion	3. From: (Originating Organization) Project Definition, 82400	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: RPP/Retrieval Engineering	6. Design Authority/Design Agent/Cog. Engr.: M. W. Leonard	7. Purchase Order No.: N/A
8. Originator Remarks: This work plan is based upon, refines and provides further detail on the scope of work covered in Technical Basis Review (TBR) 120.015		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
		12. Major Assm. Dwg. No.: N/A
11. Receiver Remarks:	11A. Design Baseline Document? ◯ Yes ◉ No	13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	RPP-5351	-	0	Work Plan for Developing	NA	1	1	
				DST Sub-system				
				Specifications				
				(TBR 120.015)				

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority				1		W.T. Thompson			
		Design Agent									
1	1	Cog. Eng. M.W. Leonard	M.W. Leonard	11/8/99							
1	1	Cog. Mgr. T.J. Conrads	T.J. Conrads	11/9/99							
		QA									
		Safety									
		Env.									

18.	19.	20.	21. DOE APPROVAL (if required)
M.W. Leonard 11/8/99	W.T. Thompson 11/8/99	T.J. Conrads 11/10/99	Ctrl No. ____
M.W. Leonard — Signature of EDT Originator — Date	W.T. Thompson — Authorized Representative for Receiving Organization — Date	T.J Conrads — Design Authority/ Cognizant Manager — Date	◯ Approved ◯ Approved w/comments ◯ Disapproved w/comments

BD-7400-172-2 (10/97)

BD-7400-172-1

WORK PLAN FOR DEVELOPING DST SUB-SYSTEM SPECIFICATIONS (TBR-120.015)

Mike W. Leonard
Numatec Hanford Corporation
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 628180 UC: 721
Org Code: 82400 Charge Code: 110293
B&R Code: Total Pages: ~~58~~ 59
PF 11-19-99

Key Words: Plan, Schedule, DST, System, Subsystem, ICD, Major Facility, Double-Shell Tank, Level 2, Specification, Systems Engineering, Sampling, Confinement, Monitor and Control, Mainenance, Recovery.

Abstract: The DST System stores waste from the processing of nuclear material at the Hanford Nuclear Reservation. The program to dispose of this waste has been divided into several phases with Phase 1 being the demonstration of the waste disposal technology by a private contractor. Subsystem specifications are being prepared providing requirements for the subsystems that are necessary for the continued safe storage of waste in the DST System and the removal of selected waste for processing by the privatized facility during Phase 1. This document provides the detailed plans for developing subsystem specification not developed during FY99.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

NOV 19 1999 (4)
DATE HANFORD RELEASE ID:
STA: 4

11/19/1999
Release Approval Date Release Stamp

Approved For Public Release

RPP-5351
Revision 0

WORK PLAN FOR DEVELOPING DST SUB-SYSTEM SPECIFICATIONS (TBR 120.015)

November 1999

Approved by: _____
Manager, Project Definition, T.J. Conrads

Prepared for:
U.S. Department of Energy
Office of River Protection
Richland, Washington

This page intentionally left blank.

CONTENTS

1.0 INTRODUCTION 1
2.0 SCOPE 2
2.1 OBJECTIVES 2
2.2 DELIVERABLES 4
3.0 DESCRIPTION 5
3.1 PHYSICAL DESCRIPTION 5
3.2 ENGINEERING TASKS 5
3.2.1 Integrate Specification Development 5
3.2.2 Perform Speciation Analysis for DST Sub-system Specifications 5
3.2.3 Develop Functional Analysis for DST Sub-systems 5
3.2.4 Develop DST Monitor & Control (M & C) Sub-system Specification6
3.2.5 Develop DST Sampling Sub-system Specification 7
3.2.6 Develop DST Maintenance & Recovery (M&R) Sub-system Specification 9
3.2.7 Develop DST Confinement System Specification 10
3.2.8 Perform Baseline Comparison 10
3.3 VERIFICATION 11
3.4 PROCUREMENT TASKS 11
3.5 INSTALLATION 11
3.6 PRE-OPERATIONAL AND OPERATIONAL TESTS 11
4.0 ORGANIZATION 12
5.0 SCHEDULE 14
6.0 COST ESTIMATE 46
7.0 QUALITY ASSURANCE 47
8.0 SAFETY CLASS, HAZARD ANALYSIS 48
9.0 ENVIRONMENTAL 49
10.0 REFERENCES 50
11.0 APPROVALS AND DISTRIBUTION 51

FIGURES

Figure 1. Waste Feed Delivery (WFD) Program Organization. 12
Figure 2. River Protection Project (RPP) Technical Operations and Engineering Organization. 13
Figure 3. Retrieval Engineering Organization. 13
Figure 4. Integrated Schedule..... 15

TERMS

DST	Double Shell Tank
HLW	High-Level Waste
ICD	Interface Control Document
LAW	Low-Activity Waste
M & C	Monitor & Control
M & R	Maintenance & Recovery
O & M	Operations & Maintenance
ORP	Office of River Protection
PCS	Process Control Strategy
RAM	Reliability, Availability, Maintainability
RCR	Review Comment Record
RPP	River Protection Project
TBD	To Be Determined
TBR	Technical Basis Review (Context: Work plans, Logics)
TBR	To Be Refined (Context: Unknown requirements)
TFS	Tank Farm System
WFD	Waste Feed Delivery

This page intentionally left blank.

WORK PLAN FOR DEVELOPING DST SUB-SYSTEM SPECIFICATIONS

1.0 INTRODUCTION

The Retrieval Engineering organization has been tasked to establish the technical requirements baseline documentation for the Waste Feed Delivery (WFD) Program. The work to establish these technical requirements baseline documents is being done in accordance with the TWRS Systems Engineering Management Plan. The technical baseline documents developed under the scope of work defined herein include the Double-Shell Tank (DST) Sub-system Specifications, which establish the functional, performance, design, development, interface and test requirements for DST Sub-systems for the first phase (Phase 1) of Waste Feed Delivery (WFD).

Upon Rev. 0 release of the DST Sub-system specifications, a comparison of the requirements baselines associated with the existing Life Cycle Projects (e.g., W-211, W-314) with the WFD Program requirements baseline reflected in all eleven DST Sub-system specifications (those produced herein and TBR 120.020) will be conducted. This baseline comparison will identify areas where differences exist between the requirements baselines evolved by the Life Cycle Projects and those recently evolved by the WFD Program and documented in the DST Sub-system specifications.

This work plan is based upon, refines and provides further detail on the scope of work covered in Technical Basis Review (TBR) 120.015.

2.0 SCOPE

This work plan covers the development of four (4) specifications for DST Sub-systems and the supporting documentation required to document the analyses that provide the technical justification for the requirements included in these specifications. The DST Sub-systems for which specifications are being developed as part of this scope of work are listed below:

- DST Monitor & Control Sub-system
- DST Sampling Sub-system
- DST Maintenance & Recovery Sub-system
- DST Confinement Sub-system

This work plan also covers the comparison of all eleven (11) DST Sub-system Specifications—those listed above as well as those developed under TBR 120.020 (see RPP-5352)—to existing Life Cycle Project requirements baselines (e.g., W-211, W-314). Project direction that results from this baseline comparison is not part of this scope of work.

The work described herein will be executed based on the following technical baseline documentation:

- *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev. 1[1]
- *Waste Feed Delivery Flowsheet for Tank 241-AN-104*, HNF-1939, Vol. II, Addendum 3, Rev. 0c.
- *Waste Feed Delivery Flowsheet for Tank 241-AZ-101*, HNF-1939, Vol. II, Addendum 1, Rev. 0a.
- "Interim Guidance on LAW Retrieval Strategy", Letter No. 73600-99-006.
- *System Specification for the Double-Shell Tank System*, HNF-SD-WM-TRD-007, Rev. E.
- *Interface Control Document ICD-19 Between DOE and BNFL Inc. For Low-Activity Waste Feed*, BNFL-5193-ID-19, Rev. 3, June 1, 1999.
- *Interface Control Document ICD-20 Between DOE and BNFL Inc. For High-Level Waste Feed*, BNFL-5193-ID-20, Rev. 3, June 1, 1999.

2.1 OBJECTIVES

In conjunction with work being performed under other TBRs (e.g., 120.005, 120.010, 120.020), one of the objectives of this task is to provide the Life Cycle Projects supporting WFD with a consistent, integrated, "top-down derived" set of technical requirements to which DST Sub-systems can be designed (pre-conceptual and

[1] Note: Case 3 is the baseline case used for all specification and ICD development activities described in this work plan.

conceptual). Further, this scope of work also provides a direct comparison of the existing Life Cycle Projects' requirements baselines (e.g., W-314, W-211) to the technical requirements baseline developed under this task for the purposes of identifying disconnects between the needs of the WFD Program and the WFD Life Cycle Projects' scope.

2.2 DELIVERABLES

The major deliverables produced by the activities described in this work plan are listed below:

1. DST Monitor & Control Sub-system Specification, Rev. 0
2. DST Sampling Sub-system Specification, Rev. 0
3. DST Maintenance & Recovery Sub-system Specification, Rev. 0
4. DST Waste Speciation Report, Rev. 0
5. Baseline Comparison Report* for the Transfer System and Ventilation Sub-system, Rev. 0
6. Baseline Comparison Report* for the CDAS and Mixer Pump Sub-system, Rev. 0
7. Baseline Comparison Report* for the Utilities Sub-system, Rev. 0
8. Baseline Comparison Report* for the Maintenance & Recovery Sub-system, Rev. 0
9. Baseline Comparison Report* for the Monitor & Control Sub-system, Rev. 0

These major deliverables are supported by several supporting documents, point papers and briefings that are also generated as part of this work plan.

* All baseline comparison reports contain a comparison between the noted DST Sub-system Specifications and the requirements baselines reflected in the Project W-314 and W-211 design media.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION

The work scope defined herein consists of engineering analysis work primarily performed and managed in the 200 East Area of the Hanford Site.

3.2 ENGINEERING TASKS

The engineering tasks listed and described below are organized to match the organization of the integrated schedule given in Section 5.

3.2.1 Integrate Specification Development

Assist in the development of the DST Sub-system Specifications listed in Section 2.2. This activity includes participation in the creation and review of the above specifications as well as leading or assisting with activities that support the development of the component specifications (e.g., Process Control Strategy; performance, design, and test requirement development; architectural trade study [AGA] planning; baseline comparison activities; etc.) within a multi-contractor team. This activity also entails planning the specification development activities.

3.2.2 Perform Speciation Analysis for DST Sub-system Specifications

Perform Speciation Analysis for DST Component Specifications by: (a) determining the design requirements needs of designers/vendors with regards to chemical environments; and (b) performing the analysis that will determine the chemical environment in which WFD Sub-systems must operate, focusing on those families of chemical compounds detrimental to WFD Sub-systems. The DST Waste Speciation Report is a deliverable of this work plan (see Section 2.2).

3.2.3 Develop Functional Analysis for DST Sub-systems

Perform a functional analysis in support of the DST Sub-system Specifications listed in Section 2.2. The functional analysis will be performed in accordance with HNF-IP-0842, Vol. IV, Section 3.2. This activity shall incorporate traceability to the DST System-level functions. Results of this activity will be captured in *Functional Analysis for DST Sub-systems*, HNF-5136, Rev. 1. The actual revision of HNF-5136 is captured under TBR 120.020 for efficiency. Detailed activity descriptions, organized by DST Sub-system Specification, follow:

- <u>DST Monitor & Control Sub-system</u>: Organize and integrate the information in LAW & HLW Process Control Strategy documents within the overall DST

System functional analysis for inclusion in the DST Monitor & Control System Specification.

- DST Process Waste Sampling Sub-system: Perform the functional analysis required to define the functions of a DST Process Waste Sampling System that samples DST System waste for WFD. The samples are analyzed for satisfaction of DST WFD and tank farm waste transfer requirements.

- DST Confinement Sub-system: Further develop the "Store Waste" functional analysis in order to define the boundaries of the DST Confinement System. Explore the possibility that tank and waste temperature, level and pressure instrumentation is part of the DST Confinement Sub-system.

- DST Maintenance & Recovery Sub-system: Decompose DST System function "Support DST System" in accordance with the latest O&M Philosophy (HNF-4553, Rev. 0), O&M Concept (HNF-1939, Vol. IV, Rev. 0) and other source documentation pertaining to the operations and maintenance of the DST System. Fold this functional analysis into the effort of generating a specification for the DST Maintenance & Recovery System.

3.2.4 Develop DST Monitor & Control (M & C) Sub-system Specification

Develop the DST M & C Sub-system Specification for use in Life Cycle Project design activities. This specification will be written such that Life Cycle Projects supporting WFD can provide consistent, integrated, requirements driven DST M&C System designs that support the WFD mission. Detailed activity descriptions follow. The DST M & C Sub-system Specification is a deliverable of this work plan (see Section 2.2).

- Prepare DST M & C Engineering Study: An engineering study will be performed to identify the scope and system boundaries of the DST M & C Sub-system. This study will result in a top-level description of the DST M & C Sub-system so that activities to define functional and performance requirements, design constraints and test requirements will be appropriately bounded. The primary goal of this study is to clearly define the boundary between the Tank Farm or Master Monitor & Control System and the DST M & C Sub-system. To this end, all documents applicable to the Master and DST M&C Systems, including the current revisions of the DST Sub-system Specifications, past engineering studies, existing W-211 and W-314 drawings, descriptions of operation, and related project development specifications will be reviewed. This information will be considered in light of the WFD mission needs, which are framed by the DST System Specification.

- Prepare DST M&C Performance Requirements Analysis Report: The performance requirements analysis for the DST M & C Sub-system will consist of extracting performance requirements from the LAW and HLW Process Control Strategies. These performance requirements will be culled based upon the system definition arrived at in DST M & C Engineering Study. TBD & TBR M & C

performance requirements will be resolved through the LAW & HLW Process Control Strategies.

- Prepare DST M & C Sub-system Constraints Analysis Report: Design constraints applicable to the DST M & C Sub-system will be identified for inclusion into the DST M & C Sub-system Specification. These constraints will be derived from those in the DST System Specification and others that may arise from the Sub-system definition activity—Prepare DST M & C Sub-system Engineering Study. Rationale for including those constraints identified in the Sub-system Specification will be documented in the DST M & C Sub-system Constraints Analysis Report.

- Prepare DST M & C Sub-system Reliability, Availability & Maintainability (RAM) Analysis Table: RAM design requirements recommendations will be documented via a table that will tie the specific design requirement recommendation to: (a) failure modes of the DST M & C System; and (b) the failure rates for typical components used in the DST system-level RAM analysis. This table is integral to HNF-5147, *Reliability, Availability and Maintainability Recommendations for the Design of Double Shell Tank Sub-systems*, which will be updated to accommodate the information derived in this task.

- Prepare DST M & C Sub-system Specification: As DST M & C sub-system definition and requirements derivation activities are completed (e.g., Performance Requirements Analysis Report, Engineering Study, etc.), assemble the specification in the specification template produced in accordance with HNF-IP-0842, Vol. IV, Section 3.2, Rev. 1, *Functions & Requirements Analysis & Allocation and Development of Level 1 & 2 Specifications.*

Review & comment of the DST M & C Sub-system Specification are activities that must also be performed for the issuance of the specification. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

3.2.5 Develop DST Sampling Sub-system Specification

Develop the DST Sampling Sub-system Specification for use in Life Cycle Project design activities. This specification will be written such that Life Cycle Projects supporting WFD can provide consistent, integrated, requirements driven DST Sampling System designs that support the WFD mission. Detailed task descriptions follow. The DST Sampling Sub-system Specification is a deliverable of this work plan (see Section 2.2).

- Prepare DST Sampling System Engineering Study: An engineering study will be performed to identify the scope and system boundaries of the DST Sampling Sub-system. This study will result in a top-level description of the DST Sampling Sub-system so that activities to define functional and performance requirements,

design constraints and test requirements will be appropriately bounded. It is understood that the DST Sampling Sub-system will characterize the waste staged for delivery to the RPP Vitrification Plant in accordance with contract specifications and Interface Control Document (ICD) requirements. Other aspects of the DST Sampling Sub-system scope are less clearly defined. The Process Control Strategy will be examined to identify what data needs are anticipated to arise during retrieval, blending, and transfer of wastes to the staging tanks. Coordination with the DST Monitoring and Control task will be required to clarify what data needs are better addressed by in-situ instrumentation, and what data needs must be met by sample collection and analysis. The boundaries between the DST Sampling Sub-system and tank confinement, ventilation, transport, laboratory, and other systems will be defined.

- Prepare DST Sampling Sub-system Performance Requirements Analysis Report: The performance requirements analysis for the DST Sampling Sub-system will consist of determining the quantities and characteristics of the sample material to be obtained from the DST waste. Locations to be sampled, waste matrix characteristics, unique environmental conditions (e.g., mixer-pump-induced turbulence, radiation fields, etc), and special handling requirements (i.e., temperature control or radiological shielding) will be considered. These performance requirements will be derived based upon the system definition arrived at in DST Sampling Sub-system Engineering Study and the Functional Analysis for the Process Sampling of Waste Feed.

- Prepare DST Sampling Sub-system Constraints Analysis Report: Design constraints applicable to the DST Sampling Sub-system will be identified for inclusion into the DST Sampling Sub-system Specification. These constraints will be derived from those in the DST System Specification and others that may arise from the Sub-system definition activity—Prepare DST Sampling Sub-system Engineering Study (e.g., limited riser availability, laboratory capabilities, etc.). Rationale for including those constraints identified in the Sub-system Specification will be documented in the DST Sampling Sub-system Constraints Analysis Report.

- Prepare DST Sampling Sub-system Reliability, Availability & Maintainability (RAM) Analysis Table: RAM design requirements recommendations will be documented via a table that will tie the specific design requirement recommendation to: (a) failure modes of the DST Sampling System; and (b) the failure rates for typical components used in the DST system-level RAM analysis. This table is integral to HNF-5147, *Reliability, Availability and Maintainability Recommendations for the Design of Double Shell Tank Sub-systems*, which will be updated to accommodate the information derived in this task.

- Prepare DST Sampling Sub-system Specification: As DST Sampling sub-system definition and requirements derivation activities are completed (e.g., Performance Requirements Analysis Report, Engineering Study, etc.), assemble the

specification in the specification template produced in accordance with HNF-IP-0842, Vol. IV, Section 3.2, Rev. 1, *Functions & Requirements Analysis & Allocation and Development of Level 1 & 2 Specifications.*

Review & comment of the DST Sampling Sub-system Specification are activities that must also be performed for the issuance of the specification. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

3.2.6 Develop DST Maintenance & Recovery (M&R) Sub-system Specification

Develop the DST M & R Sub-system Specification for use in Life Cycle Project design activities. This specification will be written such that Life Cycle Projects supporting WFD can provide consistent, integrated, requirements driven DST M & R Sub-system designs that support the WFD mission. Detailed task descriptions follow. The DST M & R Sub-system Specification is a deliverable of this work plan (see Section 2.2).

- Prepare DST M & R Sub-system Engineering Study: An engineering study will be performed to identify the scope and system boundaries of the DST M & R Sub-system. This study will result in a top-level description of the DST M & R Sub-system so that activities to define functional and performance requirements, design constraints and test requirements will be appropriately bounded. The primary goal of this study is to clearly define the boundary and interactions between the Maintenance & Recovery Sub-system and the other DST Sub-systems. To this end, all current revisions of the DST Sub-system Specifications, DST O&M Concept and DST O&M Philosophy documents will be reviewed. Further, interviews/brainstorming sessions will be conducted with specification authors and DST O&M Concept/Philosophy authors. This information will be considered in light of the WFD mission needs, which are framed by the DST System Specification.

- Prepare DST M & R Sub-system Performance Requirements Analysis Report: The performance requirements analysis for the DST M & R Sub-system will consist of determining the performance characteristics of M & R Sub-system components. These performance requirements will be derived based upon the system definition arrived at in DST Sampling Sub-system Engineering Study, the Functional Analysis for the Support of DST Sub-systems, the WFD O&M Concept document and associated DST System RAM analysis.

- Prepare DST M & R Sub-system Constraints Analysis Report: Design constraints applicable to the DST M & R Sub-system will be identified for inclusion into the DST M & R Sub-system Specification. These constraints will be derived from those in the DST System Specification and others that may arise from the Sub-system definition activity—Prepare DST M & R Sub-system Engineering Study. Rationale for including those constraints identified in the Sub-system Specification will be documented in the DST M & R Sub-system Constraints Analysis Report.

- Prepare DST M & R Sub-system Reliability, Availability & Maintainability (RAM) Analysis Table: RAM design requirements recommendations will be documented via a table that will tie the specific design requirement recommendation to: (a) failure modes of the DST M & R Sub-system; and (b) the failure rates for typical components used in the DST system-level RAM analysis. This table is integral to HNF-5147, *Reliability, Availability and Maintainability Recommendations for the Design of Double Shell Tank Sub-systems*, which will be updated to accommodate the information derived in this task.

- Prepare DST M & R Sub-system Specification: As DST M & R sub-system definition and requirements derivation activities are completed (e.g., Performance Requirements Analysis Report, Engineering Study, etc.), assemble the specification in the specification template produced in accordance with HNF-IP-0842, Vol. IV, Section 3.2, Rev. 1, *Functions & Requirements Analysis & Allocation and Development of Level 1 & 2 Specifications.*

Review & comment of the DST M & R Sub-system Specification are activities that must also be performed for the issuance of the specification. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

3.2.7 Develop DST Confinement System Specification

Develop the DST Confinement Sub-system definition such that a determination can be made to pursue the development of such a specification. Given the current thinking on the definition of the DST Confinement System, no such specification would be needed for Life Cycle Project design development. This activity will document the definition of the DST Confinement Sub-system and integrate this definition with other DST Sub-system definitions.

3.2.8 Perform Baseline Comparison

Compare existing Life Cycle Projects' requirements baselines (e.g., W-314 and W-211) to the technical requirements baseline established in the eleven (11) DST Sub-system Specifications, as developed under this work plan and TBR 120.020 (see RPP-5352). This is done by first developing a database of Life Cycle Projects' requirements baselines from their design media. As revision 0 Sub-system specifications are completed, a comparison of the requirements contained therein to the requirements contained in this database can be made. Instances of agreement and disagreement between the requirements baseline will be documented along with the rationale and methodology used for the comparison.

The baseline comparison will be performed and documented in the following 5 separate segments:

1. Piping, Valving, Transfer Pump and Ventilation Sub-systems;
2. CDAS and Mixer Pump Sub-systems;
3. DST Utilities Sub-system;

4. DST Maintenance & Recovery Sub-system; and
5. DST Monitor & Control Sub-system.

A baseline comparison for the DST Sampling Sub-system is not currently planned for this scope of work due to our current understanding of existing Life Cycle Projects' scope.

3.3 VERIFICATION

The deliverables listed in Section 2.2 will be verified by review, as defined by LMH-PRO-1819. In general, document reviews will be conducted in several stages. An internal review, comment and comment incorporation activity is planned prior to an external review, comment and comment incorporation activity. The internal review team is comprised of individuals directly supporting the activities detailed in this work plan while the external review team is comprised of approval authorities for the document. The external review will use the Review Comment Record (RCR) method for commenting on this plan's major deliverables. Other review & comment cycles will be at the document author's discretion.

3.4 PROCUREMENT TASKS

Execution of this work plan requires the use of resources under task order contract to LMHC. Therefore, statement of work preparation, work scope negotiations and technical evaluations of proposals must be performed to obtain these resources.

3.5 INSTALLATION

N/A

3.6 PRE-OPERATIONAL AND OPERATIONAL TESTS

N/A

4.0 ORGANIZATION

The engineering tasks described in Section 3 will be managed and performed for the WFD Program, which is organized as shown in Figure 1. Coordination and approval of the deliverables of this work plan will be performed through the WFD Projects Definition organization (W.T. Thompson). The engineering tasks of this work plan will be performed by individuals within the River Protection Project Technical Operations and Engineering organization (see Figure 2). Thomas J. Conrads, Manager of the Project Definition organization within the Retrieval Engineering organization is responsible for the execution of the engineering tasks described in this work plan (see Figure 3). The Project Definition organization will draw upon the expertise of individual contributors within the Process Development (J.S. Garfield), Retrieval System Development (P.J. Certa), and Plant Engineering (H.R. Hopkins) organizations (see Figures 2 & 3). The resource loading of the work plan schedule (see Section 5) reflects these roles and responsibilities.

Figure 1. Waste Feed Delivery (WFD) Program Organization.

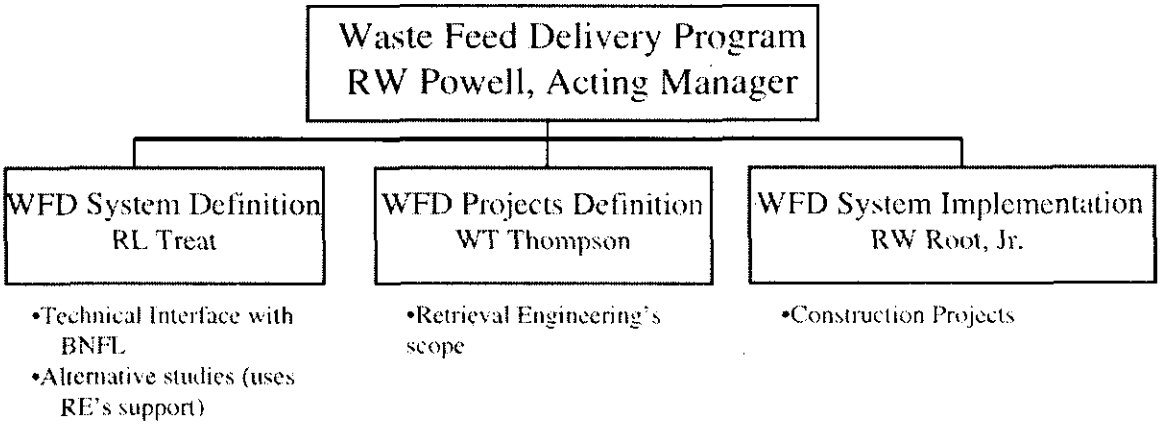


Figure 2. River Protection Project (RPP) Technical Operations and Engineering Organization.

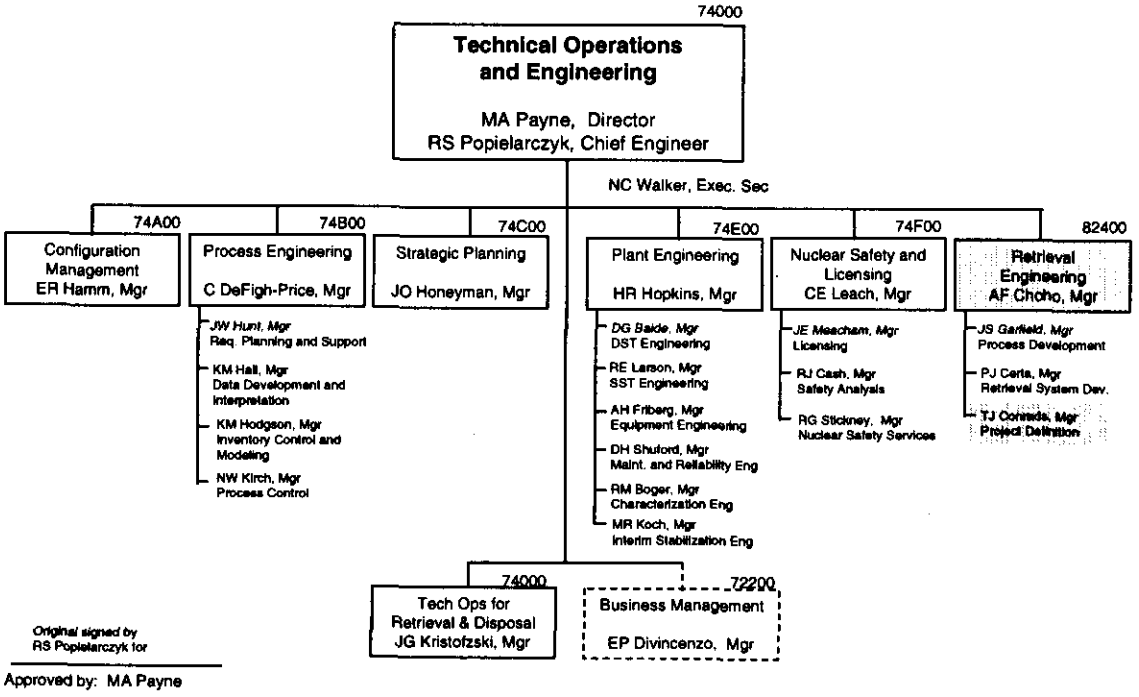
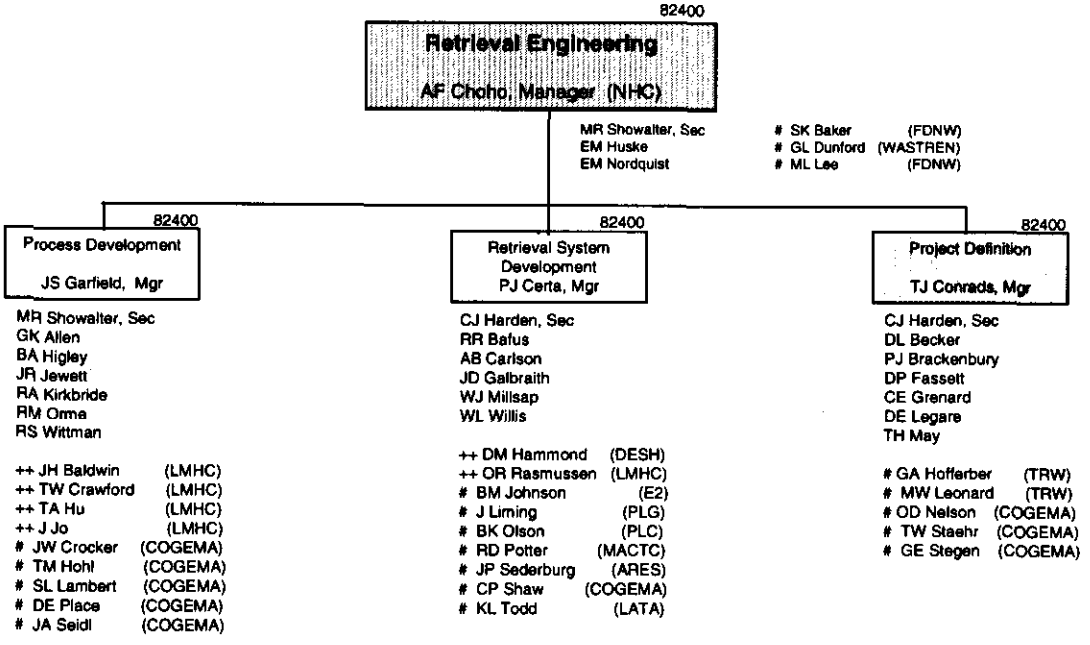


Figure 3. Retrieval Engineering Organization.



5.0 SCHEDULE

The schedule for the activities described in Section 3 are shown in Figure 4. The activities of TBRs 120.005, 120.010, 120.015 and 120.020 are highly inter-related; therefore, Figure 4 is shown as an integrated schedule with the activities associated with TBR 120.015, Develop DST Sub-system Specifications (i.e., those activities pertaining to this work plan) shown in detail beginning with Task ID number 141.

Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
1	**Project Milestones**	**73 days**	**$0.00**
2	W-521 30% Design Review	0 days	$0.00
3	W-521 90% Design Review	0 days	$0.00
4			
5	***WSU SE Training (Approximate Time)***	10 days	$19,200.00
6			
7	Issue Task Orders	12 days	$0.00
8			
9	**TBR 120.005 (Develop DST System Spec.)**	**65 days**	**$72,360.00**
10			
11	**Release DST System Specification, Rev. 0**	**65 days**	**$69,840.00**
12	Approve DST System Performance Reqmnts Doc, HNF-2168	31 days	$19,840.00
13	Identify Changes from Level 2 Spec Activity/Other Comments	6 days	$8,400.00
14	Approve DST Eng. Basis Doc Review, HNF-3350	15 days	$12,000.00
15	Identify Changes from FY 99 DST Sys ICDs	5 days	$4,000.00
16	Prepare Change Request	3 days	$4,800.00
17	Revise TWRS Developmental Database (RDD-100)	2 days	$1,600.00
18	Verify Data in TWRS Developmental Database	4 days	$9,600.00
19	Print Rev. 0 Specification from RDD-100	0 days	$0.00
20	Review & Approve Rev. 0 Specification	20 days	$9,600.00
21	*DST System Specification, HNF-SD-WM-TRD-007, Rev. 0*	0 days	$0.00
22			
23	**Release First Seven DST System ICDs**	**21 days**	**$2,520.00**
24	Obtain Approval from Facility Managers on First Seven ICDs	21 days	$2,520.00
25	*Tank Farm System Interface Summary, HNF-4500, Rev. 0*	0 days	$0.00
26	*Tank Farm System - 222-S Lab ICD, HNF-4483 Rev. 0*	0 days	$0.00
27	*DST System - 324 Bldg ICD, HNF-4489, Rev. 0*	0 days	$0.00
28	*DST System - 325 Bldg ICD, HNF-3404, Rev. 0*	0 days	$0.00
29	*Tank Farm System - CWC ICD, HNF-4482, Rev. 0*	0 days	$0.00
30	*DST System - PFP ICD, HNF-4486, Rev. 0*	0 days	$0.00
31	*DST System - SST System ICD, HNF-3339, Rev. 0*	0 days	$0.00
32	*DST System - T-Plant ICD, HNF-3394, Rev. 0*	0 days	$0.00
33			

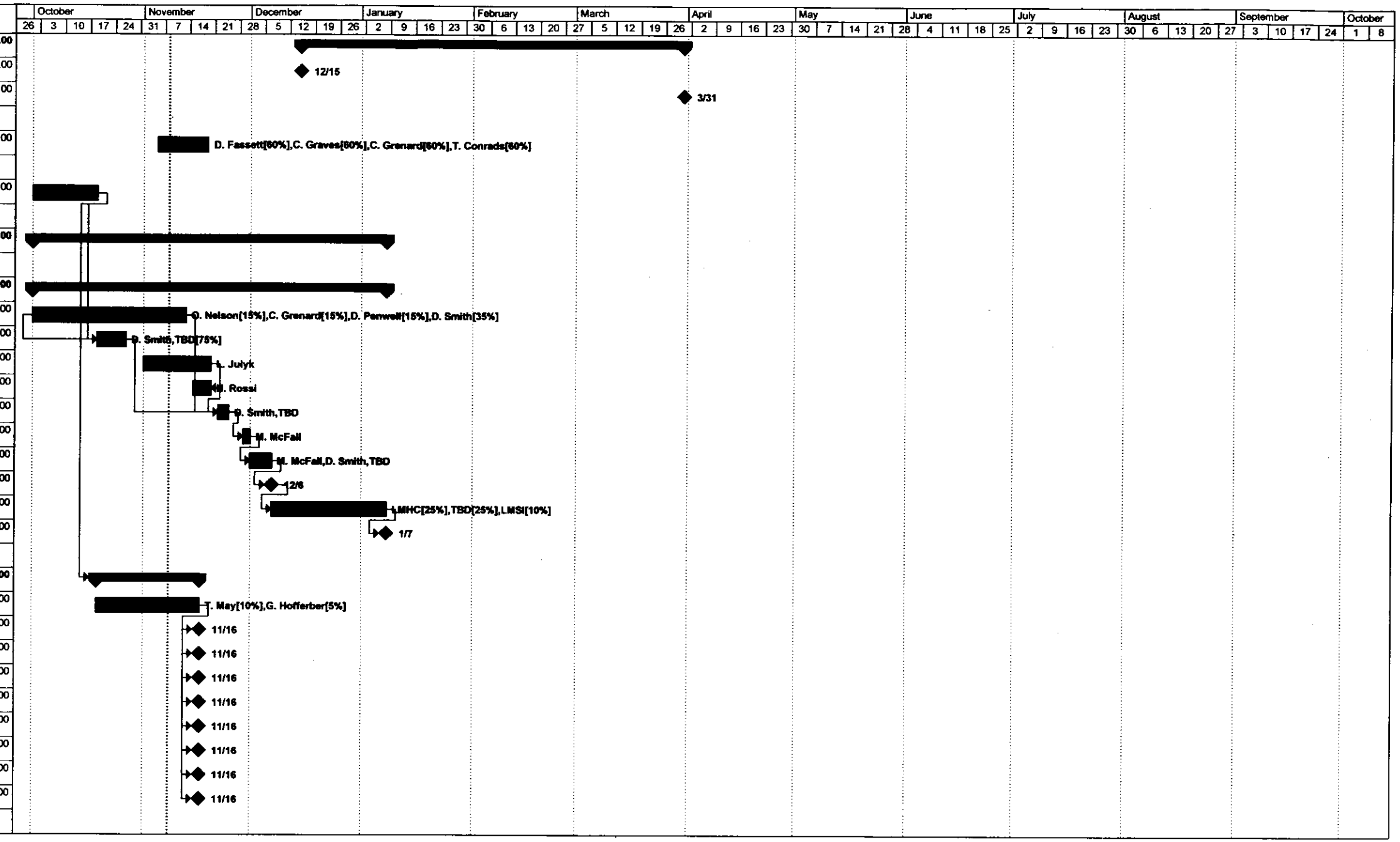


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
34	**TBR 120.010 (Update DST System Spec & ICDs)**	**263 days**	**$318,771.43**
35			
36	**Develop & Release DST System ICDs**	**259 days**	**$179,651.43**
37	Develop & Manage Interface Control for DST System	22 days	$4,400.00
38	Schedule Input to Grenard	0 days	$0.00
39	Work Plan for FY 00 ICD Updates	0 days	$0.00
40			
41	**Perform Interface Analysis (remaining MF ICDs)**	**135 days**	**$66,400.00**
42	**327 Building**	**35 days**	**$7,600.00**
43	B&W input on waste volume expected (external constraint)	0 days	$0.00
44	Develop ICD	10 days	$2,000.00
45	Complete Draft of ICD for Review	0 days	$0.00
46	Technical Editing	5 days	$4,000.00
47	Route for Review and Approval	20 days	$1,600.00
48	Release	0 days	$0.00
49	**100N Area**	**35 days**	**$6,400.00**
50	Develop ICD	10 days	$800.00
51	Complete Draft of ICD for Review	0 days	$0.00
52	Technical Editing	5 days	$4,000.00
53	Route for Review and Approval	20 days	$1,600.00
54	Release	0 days	$0.00
55	**WESF**	**65 days**	**$8,800.00**
56	Work resolution on Pool Water Emergency Purge	30 days	$2,400.00
57	Develop ICD	10 days	$800.00
58	Complete Draft of ICD for Review	0 days	$0.00
59	Technical Editing	5 days	$4,000.00
60	Route for Review and Approval	20 days	$1,600.00
61	Release	0 days	$0.00
62	**Evaporator**	**45 days**	**$9,600.00**
63	Resolution of I/F Boundary for the Evap. (Ext. Const.)	0 days	$0.00
64	Develop ICD	20 days	$4,000.00
65	Complete Draft of ICD for Review	0 days	$0.00
66	Technical Editing	5 days	$4,000.00
67	Route for Review and Approval	20 days	$1,600.00
68	Release	0 days	$0.00
69	**Electric Power**	**40 days**	**$8,600.00**
70	ARES Study Complete (external constraint)	0 days	$0.00
71	Develop ICD	15 days	$3,000.00
72	Complete Draft of ICD for Review	0 days	$0.00
73	Technical Editing	5 days	$4,000.00
74	Route for Review and Approval	20 days	$1,600.00
75	Release	0 days	$0.00

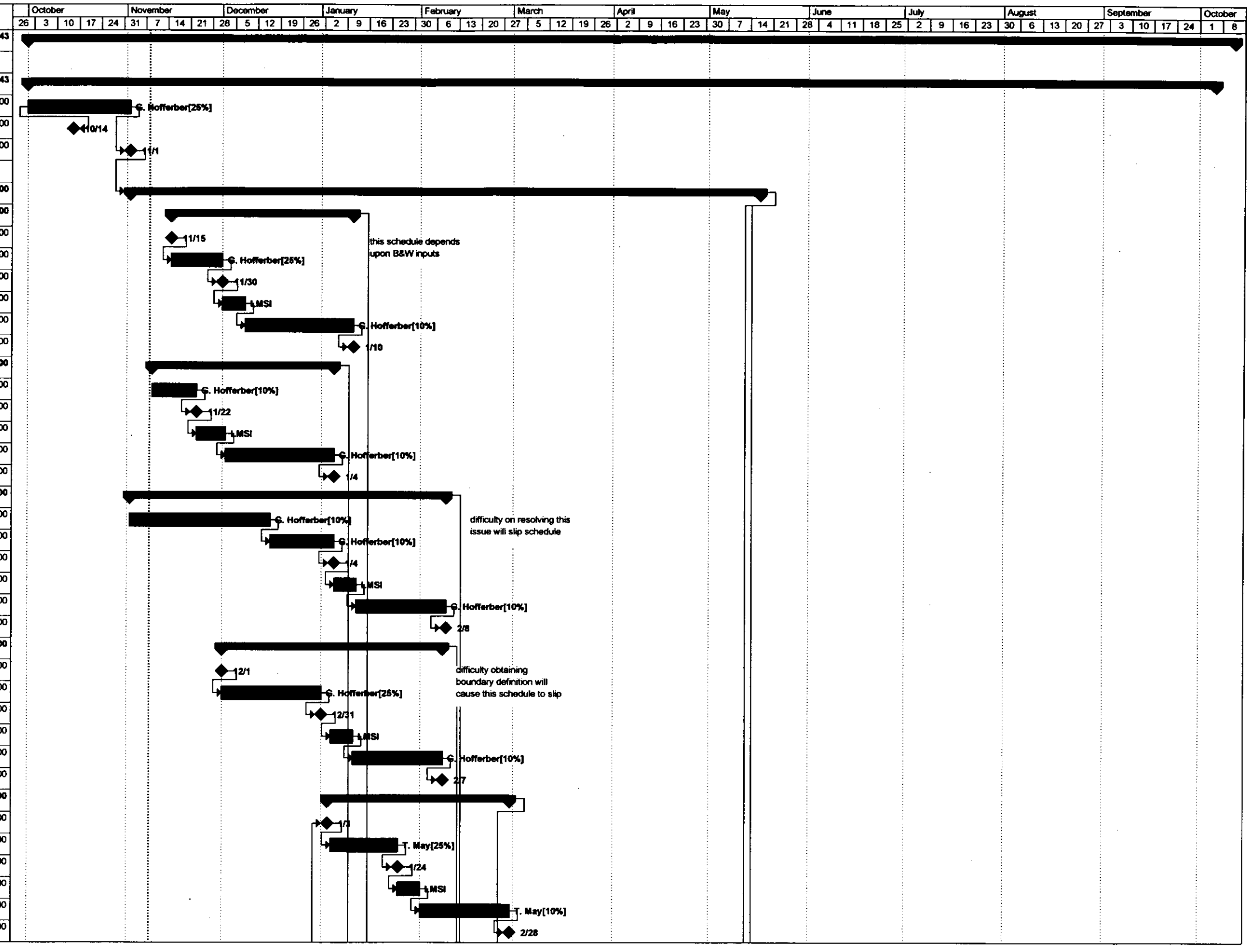


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
76	**Raw Water**	**40 days**	**$8,600.00**
77	ARES Study Complete (external constraint)	0 days	$0.00
78	Develop ICD	15 days	$3,000.00
79	Complete Draft of ICD for Review	0 days	$0.00
80	Technical Editing	5 days	$4,000.00
81	Route for Review and Approval	20 days	$1,600.00
82	Release	0 days	$0.00
83	**MM&C**	**55 days**	**$16,800.00**
84	Definition of MM&C versus DST M&C Systems (external constr	0 days	$0.00
85	Develop ICD	30 days	$12,000.00
86	Complete Draft of ICD for Review	0 days	$0.00
87	Technical Editing	5 days	$4,000.00
88	Route for Review and Approval	20 days	$800.00
89	Release	0 days	$0.00
90			
91	**Revision of Summary Document**	**41 days**	**$10,000.00**
92	Update and revise Tank Farm System I/Fs Doc., HNF-4500	21 days	$8,400.00
93	Circulate for review/approval	20 days	$1,600.00
94	Release Rev.1 of Tank Farm Sys. I/Fs Doc., HNF-4500	0 days	$0.00
95			
96	Establish relationship between OWVP and ICDs	50 days	$4,000.00
97	Decision on OWVP relationship	0 days	$0.00
98			
99	**UPDATE MF ICDS**	**74 days**	**$14,560.00**
100	Solicit inputs to MF ICDs from Others	5 days	$400.00
101	Revise/Update MF ICDs	30 days	$12,000.00
102	Circulate for Review/Approval	20 days	$800.00
103	Incorporate Comments	5 days	$800.00
104	Route for Signature	14 days	$560.00
105	*Release Rev. 1 of MF ICDs*	0 days	$0.00
106			
107	**Implement ICD data into RDD-100 (or DOORS)**	**62 days**	**$64,371.43**
108	Incorporate first 7	45 days	$41,400.00
109	Incorporate Remaining	45 days	$22,971.43
110			
111	**Coordinate Interface Process with Program office**	**91 days**	**$7,200.00**
112	Work integration of MF ICDs with contractual documentation	60 days	$4,800.00
113	Provide inputs to revision of 0842 procedure on ICDs	30 days	$2,400.00
114			
115	Prepare/Maintain/Present Training Briefings on MF ICDs	218 days	$8,720.00
116			

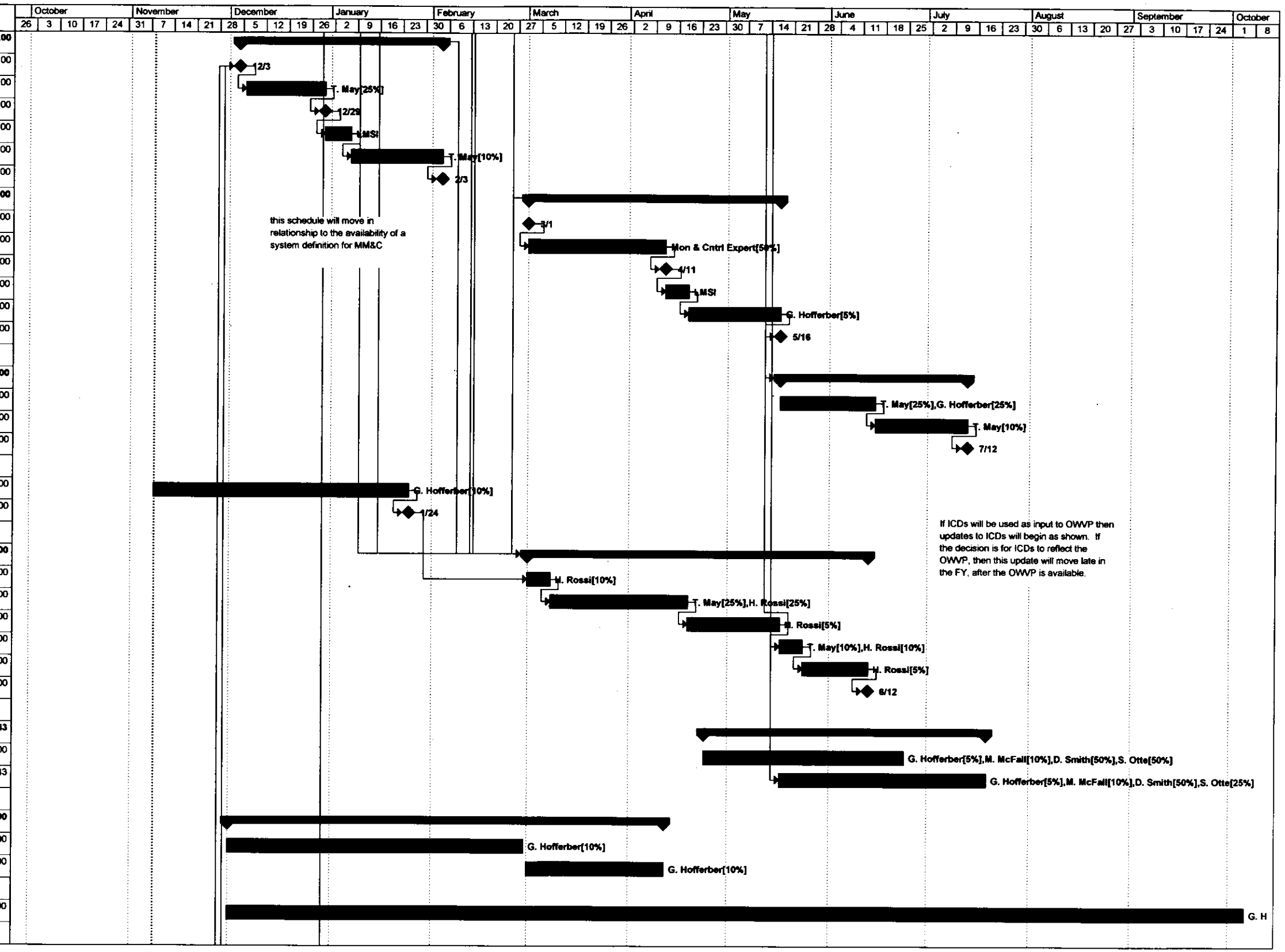


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
117	**Establish Process for Control of DST Sub-system Interfaces**	**263 days**	**$139,120.00**
118	**Near Term (1st Quarter)**	**56 days**	**$7,400.00**
119	Develop Lower Level Interface Control Philosopy	20 days	$4,000.00
120	Document Path Forward Concept	5 days	$1,000.00
121	Deliver Path Forward Plan	0 days	$0.00
122			
123	Present Path Forward Concept and Build Concensus	30 days	$2,400.00
124	Definition of Agreed-to Process (Schaus Responsibility)	0 days	$0.00
125			
126	**Master Interface Control Diagram**	**207 days**	**$102,480.00**
127	Develop Master Interface Control Diagram	60 days	$60,000.00
128	Release Draft Diagram for review	0 days	$0.00
129	Review/Resolution	30 days	$14,400.00
130	Release Rev. 0 Diagram	0 days	$0.00
131	Maintain Diagram	117 days	$28,080.00
132			
133	Assist Existing Projects to Implement Process	96 days	$11,520.00
134			
135	Assist New Project Definition to Implement Process	45 days	$5,400.00
136			
137	Prepare Revisions to 0842 Interface Control Procedure	45 days	$3,600.00
138			
139	Prepare/Maintain/Present Briefings on Lower level ICDs	218 days	$8,720.00
140			

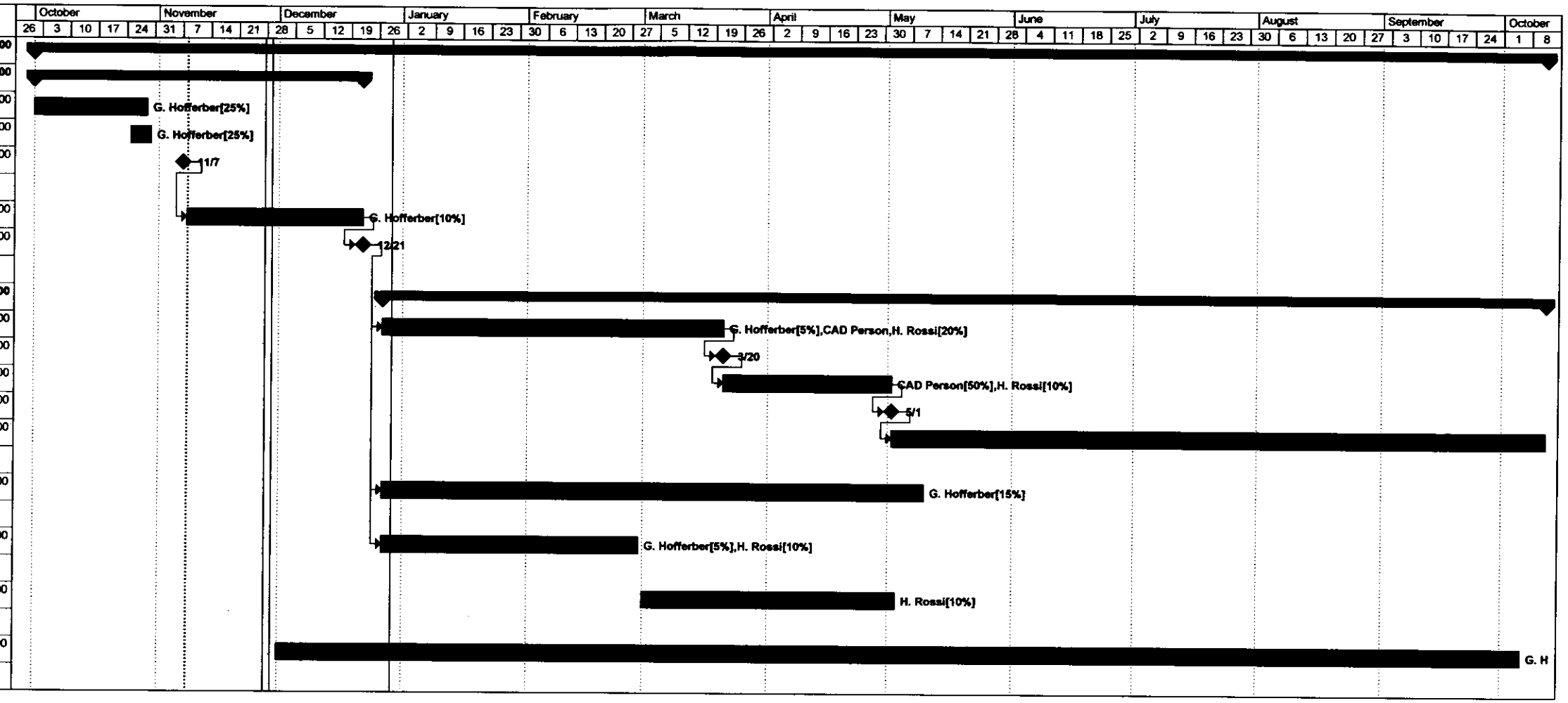


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
141	**TBR 120.015 (Develop DST Sub-system Specs)**	**261 days**	**$1,305,312.00**
142			
143	**Integrate Spec Development**	**261 days**	**$238,560.00**
144	Develop FY 00 Work Plan for Sub-system Spec. Development	31 days	$29,760.00
145	FY 00 Work Plan for Sub-system Spec. Development	0 days	$0.00
146	Spec Development Oversight and Leadership	261 days	$208,800.00
147			
148	**Speciation Analysis for DST Sub-system Specs**	**68 days**	**$38,560.00**
149	Plan Speciation Analysis for DST Sub-system Specs	22 days	$1,760.00
150	Updated Work Plan	0 days	$0.00
151	**Prepare Speciation Analysis Supporting Document**	**46 days**	**$36,800.00**
152	Perform Speciation Analysis for DST Sub-system Specs	21 days	$16,800.00
153	Prepare Draft Report	10 days	$9,600.00
154	Review & Comment on Draft Report	10 days	$2,400.00
155	Incorporate Comments & Issue Report	10 days	$8,000.00
156	DST Waste Speciation Report, Rev. 0	0 days	$0.00
157			
158	**Develop Functional Analy. For DST Sub-Systems**	**44 days**	**$64,160.00**
159	Develop Fn'l Analy. for the Monitor & Control of the DST System	21 days	$8,400.00
160	Develop Fn'l Analy. for the Process Sampling of Waste Feed	21 days	$11,760.00
161	Develop Fn'l Analy. For Waste Storage (Confinement)	21 days	$8,400.00
162	Develop Fn'l. Analy. for Support of DST Sub-systems	30 days	$18,000.00
163			
164	**Develop DST Monitor & Control Sub-system Spec**	**119 days**	**$266,280.00**
165	**Prepare DST Mon & Cntrl Eng. Study**	**30 days**	**$24,000.00**
166	Perform Analysis to Define DST Mon & Cntrl Sub-system	15 days	$15,600.00
167	Prepare Draft Mon & Cntrl Sub-system Definition Report	15 days	$0.00
168	Review & Comment on Draft Rept	5 days	$6,000.00
169	Incorporate Comments & Issue Report	5 days	$0.00
170	DST Monitor & Control Definition Rept, Rev. 0	0 days	$0.00
171			
172	Rebaseline Mon & Cntrl Sub-system Spec	10 days	$0.00
173			
174	**Prepare DST Mon & Cntrl System Perfmnc Reqmnts Analysis Rept**	**36 days**	**$65,800.00**
175	Analyze DST Mon & Cntrl Sub-system Perf Reqmnts	21 days	$0.00
176	Prepare Draft DST Mon & Cntrl Sub-system Perf. Reqmnts Rept	15 days	$0.00
177	Review & Comment on Draft DST M&R Sys Perf Reqmnts Rept	5 days	$1,000.00
178	Incorporate Comments & Issue Report	5 days	$0.00
179	DST Mon & Cntrl Sub-system Perfmnc Reqmnts Rept, Rev. 0	0 days	$0.00
180	**Prepare DST Mon & Cntrl Sub-system Constraints Analy Rept**	**36 days**	**$39,880.00**
181	Analyze DST Mon & Cntrl Sub-system Constraints	21 days	$0.00
182	Prepare Draft DST Mon & Cntrl Sub-system Constraints Rept	15 days	$0.00
183	Review & Comment on Draft Constraints Rept	5 days	$1,000.00
184	Incorporate Comments & Issue Report	5 days	$0.00
185	DST Mon & Cntrl Sub-system Constraints Rept	0 days	$0.00

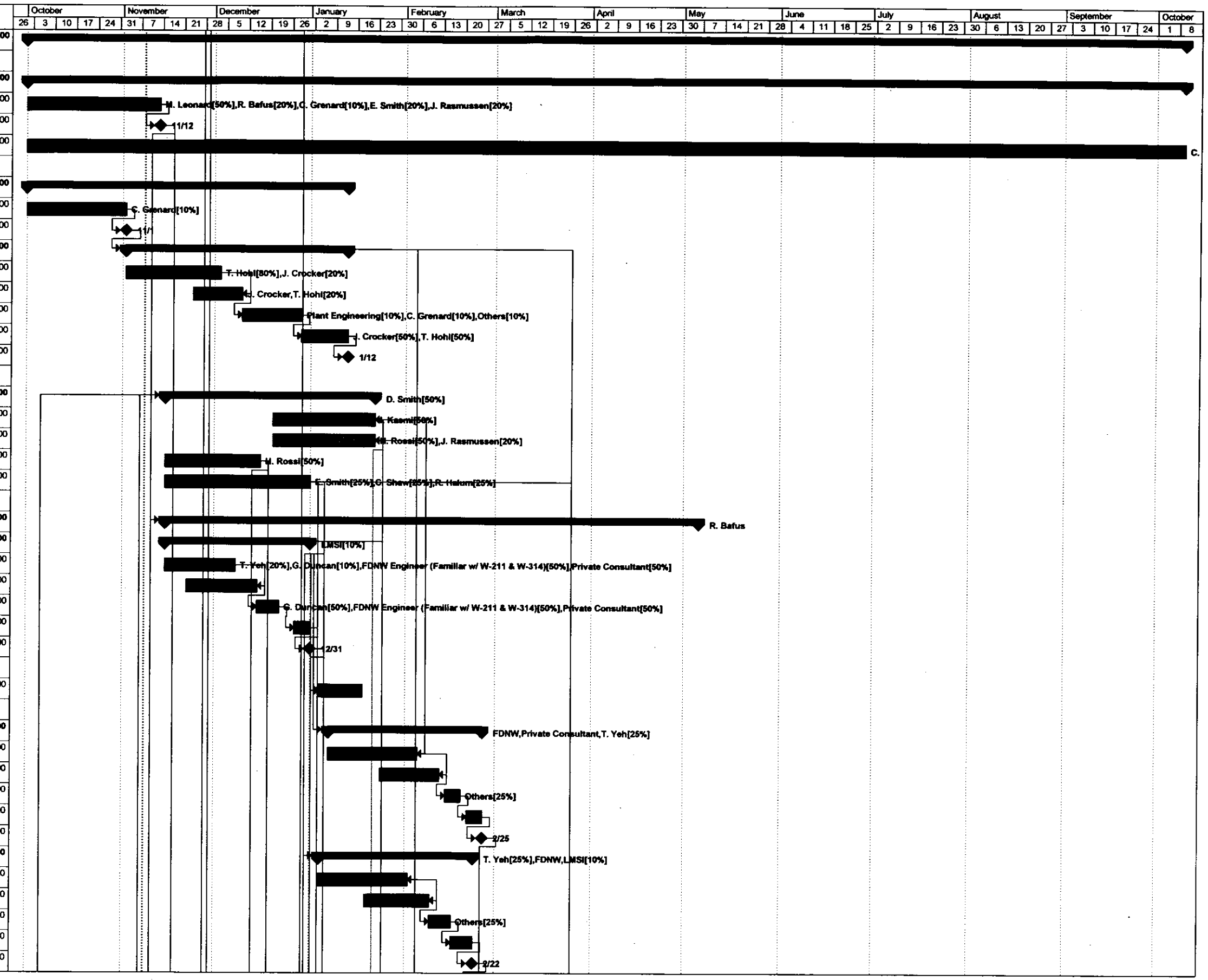


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
186	**Prepare DST Mon & Cntrl Sub-system RAM Analysis Table**	**31 days**	**$28,280.00**
187	Perform DST Mon & Cntrl RAM Analysis	21 days	$0.00
188	Prepare Draft DST Mon & Cntrl RAM Recommend. Table	10 days	$0.00
189	Review & Comment on Draft Mon & Cntrl RAM Table	5 days	$1,000.00
190	Incorporate Comments and Issue Report	5 days	$0.00
191	Updated RAM Recommendations for DST Sub-systems Doc	0 days	$0.00
192	**Prepare DST Mon & Cntrl System Spec**	**54 days**	**$4,320.00**
193	Assemble System Definition & Boiler Plate (Sections 1, 3.1)	3 days	$0.00
194	Assemble Fns & Perf Requirements (Section 3.2.1)	10 days	$0.00
195	Assemble Constraints (Sections 3.2.2-3.10)	10 days	$0.00
196	Prepare QA Matrix (Section 4)	5 days	$0.00
197	Assemble Appl. Docs, Notes & Refs (Sections 2, 6 & 7)	5 days	$0.00
198	Assemble Specification (Figures, etc.)	5 days	$0.00
199	*DST Mon & Cntrl Sub-system Spec, Rev. A*	0 days	$0.00
200	Review & Comment on DST Mon & Cntrl Spec, Rev. A	5 days	$1,600.00
201	Incorporate Comments and Issue for Wide Review	10 days	$1,600.00
202	*DST Mon & Cntrl Sub-System Spec, Rev. B*	0 days	$0.00
203	Review & Comment on DST Mon & Cntrl Spec, Rev. B	10 days	$4,000.00
204	Incorporate Comments and Issue for Approval	10 days	$1,600.00
205	*DST Monitor & Control Sub-system Spec, Rev. 0*	0 days	$0.00
206			
207	**Develop DST Sampling Sub-system Spec**	**125 days**	**$183,560.00**
208	**Prepare DST Sampling Sub-system Eng. Study**	**30 days**	**$6,400.00**
209	Perform Analysis to Define DST Sampling Sub-system	15 days	$0.00
210	Prepare Draft Sampling Sub-system Definition Report	15 days	$0.00
211	Review & Comment on Draft Rept	5 days	$4,000.00
212	Incorporate Comments & Issue Report	5 days	$0.00
213	DST Sampling Sub-system Definition Rept, Rev. 0	0 days	$0.00
214			
215	Rebaseline Sampling Sub-system Spec	10 days	$0.00
216			
217	**Prepare DST Sampling Sub-sys Perfmnc Reqmnts Analy Rept**	**36 days**	**$18,280.00**
218	Analyze DST Sampling Sub-system Perf Reqmnts	21 days	$0.00
219	Prepare Draft DST Sampling Sub-system Perf. Reqmnts Rept	15 days	$0.00
220	Review & Comment on Draft DST Sampling Perf Reqmnts Rept	5 days	$1,000.00
221	Incorporate Comments & Issue Report	5 days	$0.00
222	DST Sampling System Performance Reqmnts Rept	0 days	$0.00
223	**Prepare DST Sampling Sub-system Constraints Analy Rept**	**36 days**	**$18,280.00**
224	Analyze DST Sampling Sub-system Constraints	21 days	$0.00
225	Prepare Draft DST Sampling Sub-system Constraints Rept	15 days	$0.00
226	Review & Comment on Draft DST Sampling Sub-sys Constraints Re	5 days	$1,000.00
227	Incorporate Comments & Issue Report	5 days	$0.00
228	DST Sampling Sub-system Constraints Rept	0 days	$0.00

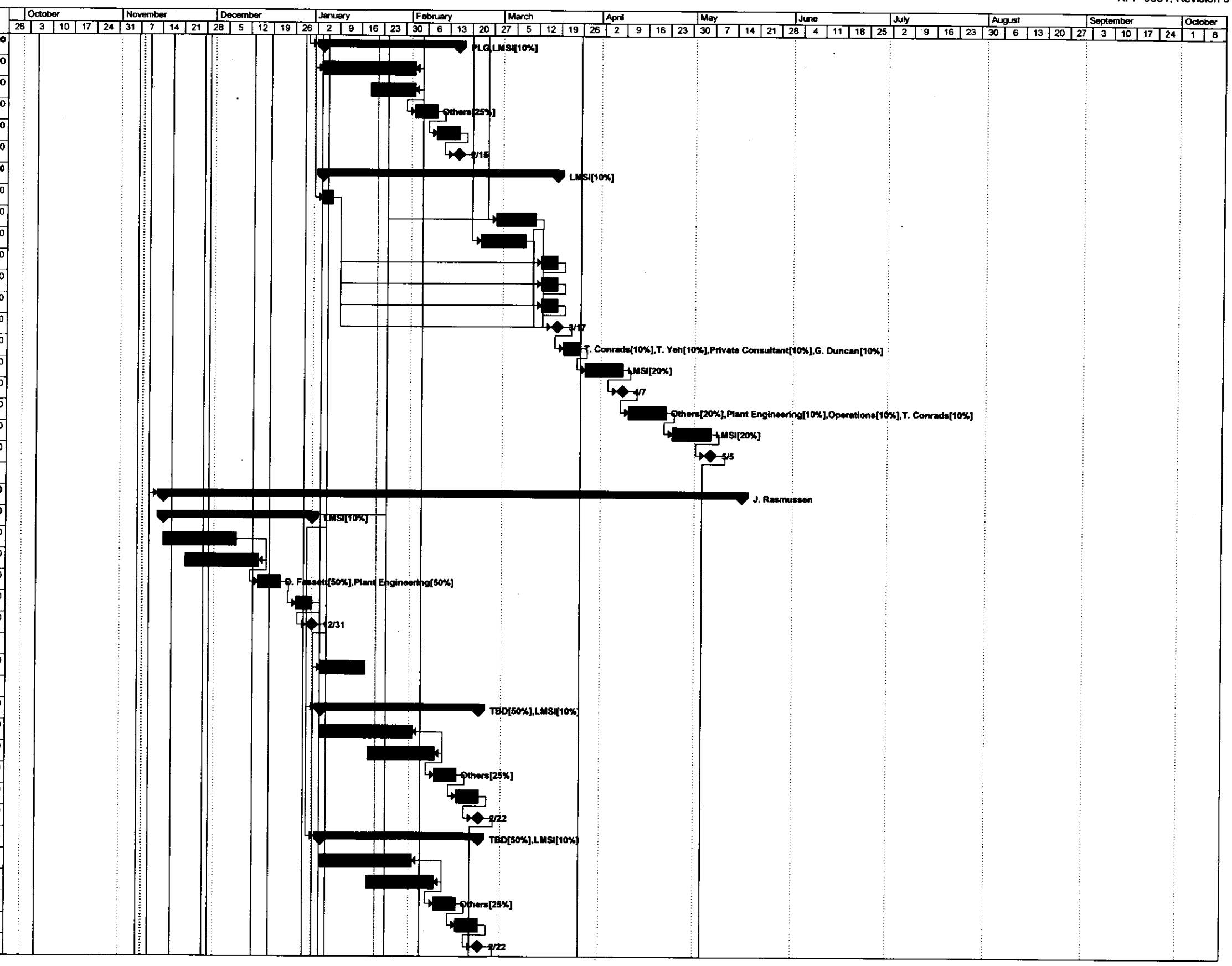


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
229	**Prepare DST Sampling Sub-system RAM Analysis Table**	**31 days**	**$28,280.00**
230	Perform DST Sampling Sub-system RAM Analysis	21 days	$0.00
231	Prepare Draft DST Sampling Sub-system RAM Recmnd. Table	10 days	$0.00
232	Review & Comment on Draft Sampling Sub-sys. RAM Table	5 days	$1,000.00
233	Incorporate Comments and Issue Report	5 days	$0.00
234	Updated RAM Recommendations for DST Sub-systems Doc	0 days	$0.00
235	**Prepare DST Sampling Sub-system Spec**	**60 days**	**$4,320.00**
236	Assemble System Definition & Boiler Plate (Sections 1, 3.1)	3 days	$0.00
237	Assemble Fns & Perf Requirements (Section 3.2.1)	10 days	$0.00
238	Assemble Constraints (Sections 3.2.2-3.10)	10 days	$0.00
239	Prepare QA Matrix (Section 4)	5 days	$0.00
240	Assemble Appl. Docs, Notes & Refs (Sections 2, 6 & 7)	5 days	$0.00
241	Assemble Specification (Figures, etc.)	5 days	$0.00
242	*DST Sampling Sub-system Spec, Rev. A*	0 days	$0.00
243	Review & Comment on DST Sampling Sub-system Spec, Rev. A	5 days	$800.00
244	Incorporate Comments and Issue for Wide Review	10 days	$1,600.00
245	*DST Sampling Sub-System Spec, Rev. B*	0 days	$0.00
246	Review & Comment on DST Sampling Sub-system Spec, Rev. B	10 days	$4,000.00
247	Incorporate Comments and Issue for Approval	10 days	$1,600.00
248	*DST Sampling Sub-system Spec, Rev. 0*	0 days	$0.00
249			
250	**Develop DST Maintenance & Recovery Sub-system Spec**	**152 days**	**$245,712.00**
251	**Prepare DST Main & Recorvery Eng. Study**	**30 days**	**$16,800.00**
252	Perform Analysis to Define DST M&R Sub-system	15 days	$12,000.00
253	Prepare Draft M&R Sub-system Definition Report	15 days	$2,400.00
254	Review & Comment on Draft Rept	5 days	$2,000.00
255	Incorporate Comments & Issue Report	5 days	$400.00
256	DST Maintenance & Recovery Definition Rept, Rev. 0	0 days	$0.00
257			
258	Rebaseline Spec Schedule	10 days	$0.00
259			
260	**Prepare DST M&R System Perfmnc Reqmnts Analysis Rept**	**36 days**	**$32,680.00**
261	Analyze DST M&R System Performance Reqmnts	21 days	$0.00
262	Prepare Draft DST M&R System Perf. Reqmnts Rept	15 days	$0.00
263	Review & Comment on Draft DST M&R Sys Perf Reqmnts Rept	5 days	$1,000.00
264	Incorporate Comments & Issue Report	5 days	$0.00
265	DST M&R System Performance Reqmnts Rept	0 days	$0.00
266	**Prepare DST M&R Sub-system Constraints Analy Rept**	**36 days**	**$32,680.00**
267	Analyze DST M&R System Constraints	21 days	$0.00
268	Prepare Draft DST M&R System Constraints Rept	15 days	$0.00
269	Review & Comment on Draft DST M&R Sys Constraints Rept	5 days	$1,000.00
270	Incorporate Comments & Issue Report	5 days	$0.00
271	DST M&R System Constraints Rept	0 days	$0.00

Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
272	**Prepare DST M&R System RAM Analysis Table**	**31 days**	**$28,280.00**
273	Perform DST M&R RAM Analysis	21 days	$0.00
274	Prepare Draft DST M&R System RAM Recommend. Table	10 days	$0.00
275	Review & Comment on Draft M&R RAM Table	5 days	$1,000.00
276	Incorporate Comments and Issue Report	5 days	$0.00
277	Updated RAM Recommendations for DST Sub-systems Doc	0 days	$0.00
278	**Prepare DST Maint & Recovery Sub-system Spec**	**87 days**	**$4,872.00**
279	Assemble System Definition & Boiler Plate (Sections 1, 3.1)	3 days	$0.00
280	Assemble Fns & Perf Requirements (Section 3.2.1)	10 days	$0.00
281	Assemble Constraints (Sections 3.2.2-3.10)	10 days	$0.00
282	Prepare QA Matrix (Section 4)	5 days	$0.00
283	Assemble Appl. Docs, Notes & Refs (Sections 2, 6 & 7)	5 days	$0.00
284	Assemble Specification (Figures, etc.)	5 days	$0.00
285	*DST Maint & Recovery Sub-system Spec, Rev. A*	0 days	$0.00
286	Review & Comment on DST M&R System Spec, Rev. A	5 days	$1,600.00
287	Incorporate Comments and Issue for Wide Review	10 days	$1,600.00
288	*DST Main & Rec. Sub-System Spec, Rev. B*	0 days	$0.00
289	Review & Comment on DST M&R System Spec, Rev. B	10 days	$4,000.00
290	Incorporate Comments and Issue for Approval	10 days	$1,600.00
291	*DST Main & Rec. Sub-system Spec, Rev. 0*	0 days	$0.00
292			
293	**Develop DST Confinement System Specification**	**30 days**	**$27,400.00**
294	**Prepare DST Confinement System Eng. Study**	**30 days**	**$27,400.00**
295	Perform Analysis to Define DST Confinement System	10 days	$0.00
296	Prepare Draft Confinement System Definition Report	10 days	$0.00
297	Review & Comment on Draft Confinement System Def. Rept	5 days	$1,000.00
298	Incorporate Comments & Issue Report	5 days	$0.00
299	DST Confinement System Definition Rept, Rev. 0	0 days	$0.00
300			

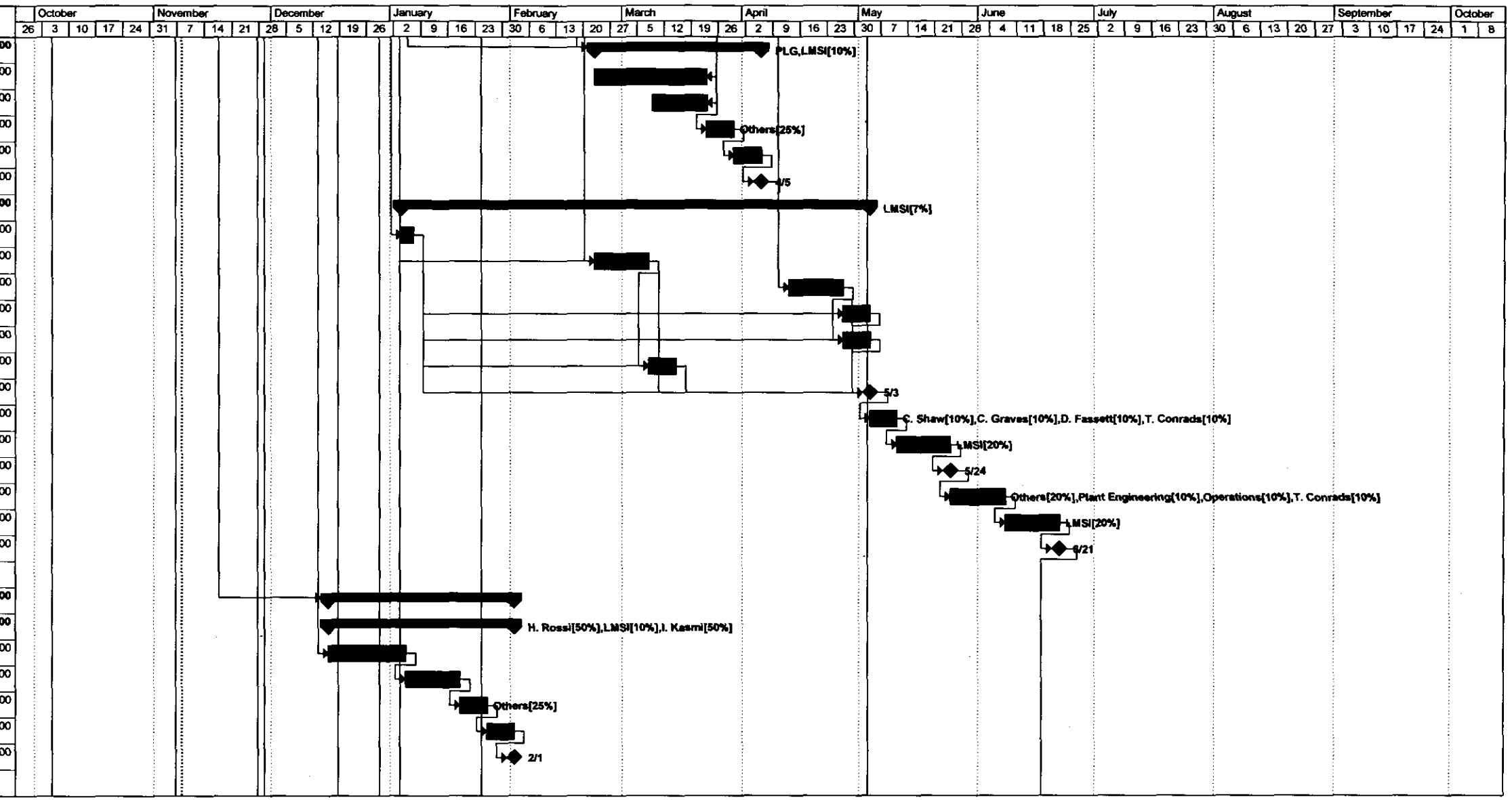


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
301	**Baseline Comparison**	**197 days**	**$241,080.00**
302	Develop Reqmnts db from W-314, W-211 Design Media	30 days	$36,000.00
303	MS Access Database Ready for Comparisons	0 days	$0.00
304	**Baseline Comparison--Piping, Valving, Transfer Pump, Vent**	**46 days**	**$33,680.00**
305	Compare Requirements/Build Database	15 days	$0.00
306	Prepare Draft Report	21 days	$0.00
307	*DST Transfer Sys/Vent Baseline Comparison Rept (Draft)*	0 days	$0.00
308	Review Baseline Comparison--Transfer Sys/Vent	10 days	$2,400.00
309	Revise Baseline Comparison Report/Database	10 days	$0.00
310	Approve Baseline Comparison Report--Transfer Sys/Vent	5 days	$0.00
311	*Baseline Comparison Report--Transfer System/Vent*	0 days	$0.00
312	**Baseline Comparison--Mixer Pump, CDAS**	**45 days**	**$33,000.00**
313	Compare Requirements/Build Database	15 days	$0.00
314	Prepare Draft Report	15 days	$0.00
315	*DST Mixer Pump/CDAS Baseline Comparison Rept (Draft)*	0 days	$0.00
316	Review Baseline Comparison--MixerPump/CDAS	10 days	$2,400.00
317	Revise Baseline Comparison Report/Database	10 days	$0.00
318	Approve Baseline Comparison Report--Mixer Pump/CDAS	5 days	$0.00
319	*Baseline Comparison Report--Mixer Pump/CDAS*	0 days	$0.00
320	**Baseline Comparison--Utilities**	**40 days**	**$29,600.00**
321	Compare Requirements/Build Database	10 days	$0.00
322	Prepare Draft Report	10 days	$0.00
323	*DST Utilities Baseline Comparison Rept (Draft)*	0 days	$0.00
324	Review Baseline Comparison--Utilities	10 days	$2,400.00
325	Revise Baseline Comparison Report/Database	10 days	$0.00
326	Approve Baseline Comparison Report--Utilities	5 days	$0.00
327	*Baseline Comparison Report--Utilities*	0 days	$0.00
328	**Baseline Comparison--DST Maintenance & Recovery**	**45 days**	**$33,000.00**
329	Compare Requirements/Build Database	15 days	$0.00
330	Prepare Draft Report	10 days	$0.00
331	*DST Maint & Recovery Baseline Comparison Rept (Draft)*	0 days	$0.00
332	Review Baseline Comparison--Maintenance & Recovery	10 days	$2,400.00
333	Revise Baseline Comparison Report/Database	10 days	$0.00
334	Approve Baseline Comparison Report--Maint & Recovery	5 days	$0.00
335	*Baseline Comparison Report--DST Maint & Recovery*	0 days	$0.00
336	**Baseline Comparison--DST Monitor & Control**	**50 days**	**$36,400.00**
337	Compare Requirements/Build Database	20 days	$0.00
338	Prepare Draft Report	10 days	$0.00
339	*DST Monitor & Control Baseline Comparison Rept (Draft)*	0 days	$0.00
340	Review Baseline Comparison--Monitor & Control	10 days	$2,400.00
341	Revise Baseline Comparison Report/Database	10 days	$0.00
342	Approve Baseline Comparison Report--Monitor & Control	5 days	$0.00
343	*Baseline Comparison Report--DST Monitor & Control*	0 days	$0.00
344			

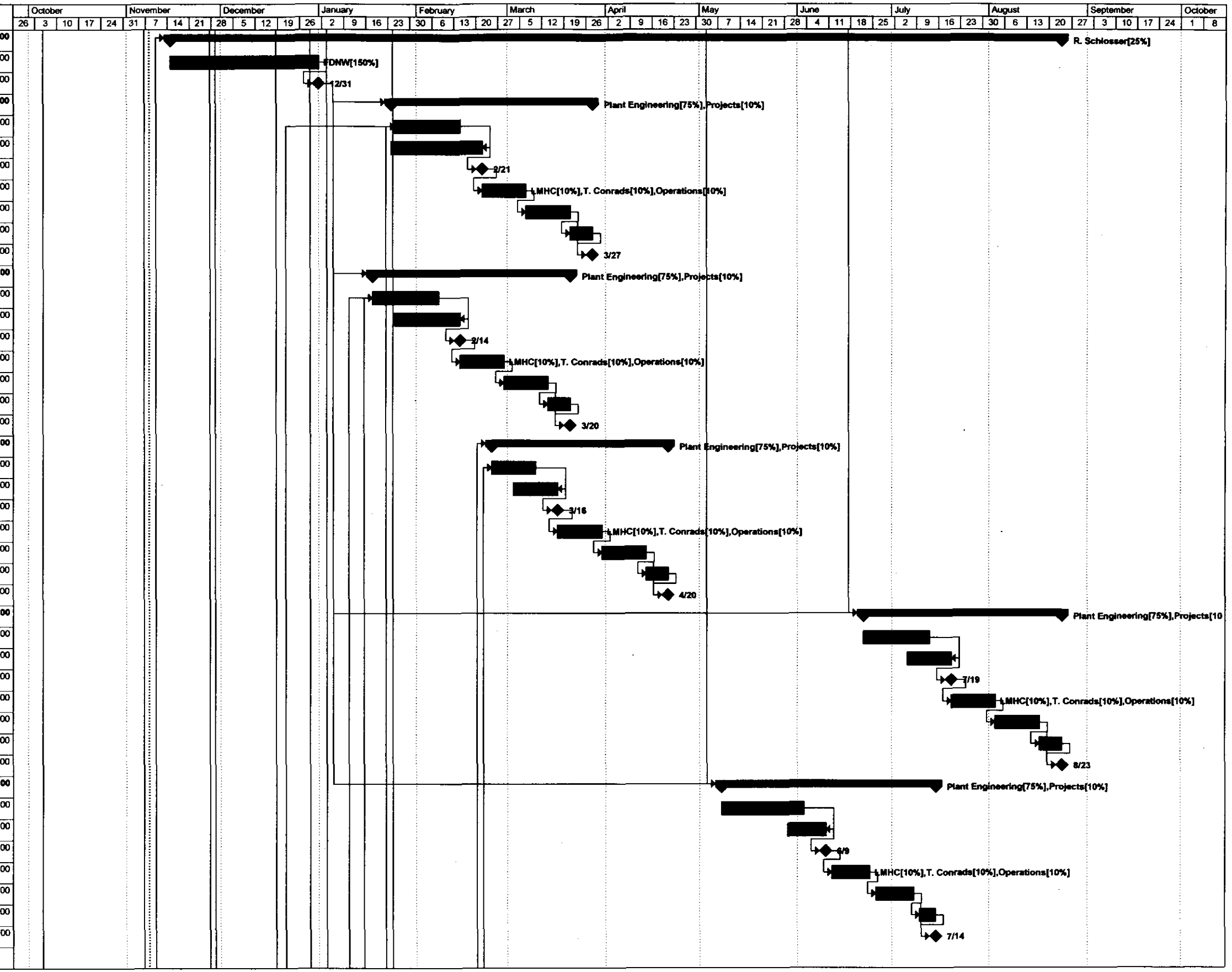


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
345	Functional Analysis for DST Sub-systems (HNF-5136, Rev. 0 Draft)	0 days	$0.00
346	DST Transfer Valving Sys Spec (HNF-4160, Rev. 0, Draft)	0 days	$0.00
347	DST Transfer Piping Sys Spec (HNF-4161, Rev. 0, Draft)	0 days	$0.00
348	DST Transfer Pump Sys Spec (HNF-4162, Rev. 0, Draft)	0 days	$0.00
349	DST Mixer Pump Sys Spec (HNF-4164, Rev. C)	0 days	$0.00
350	DST Caustic & Diluent Add Spec (HNF-4163, Rev. C)	0 days	$0.00
351	DST Ventilation Sys Spec (HNF-4158, Rev. C)	0 days	$0.00
352	DST Utility Sys Spec (HNF-4157, Rev. A)	0 days	$0.00
353			
354	FY99 LAW Process Control Strategy Document	0 days	$0.00
355	FY99 HLW Process Control Strategy Document	0 days	$0.00
356			
357	**TBR 120.020 (Update DST Sub-system Specs)**	**226 days**	**$1,514,024.00**
358			
359	**Integrate Spec Development**	**226 days**	**$199,400.00**
360	Develop FY 00 Work Plan for Sub-system Spec. Update	31 days	$18,600.00
361	FY 00 Work Plan for Sub-system Spec. Update	0 days	$0.00
362	Spec Update Oversight and Leadership	226 days	$180,800.00
363			
364	**Functional Analy. For DST Sub-systems**	**145 days**	**$62,000.00**
365	**Update Funct. Analy. for DST Sub-systems (1st 7 Specs)**	**22 days**	**$19,200.00**
366	Review per Latest Specs	10 days	$12,000.00
367	Create Master Mark-up	2 days	$2,400.00
368	Tech. Edit/Document Processing	4 days	$3,200.00
369	Get Signatures	4 days	$1,600.00
370	*Functional Analysis for DST Sub-systems, HNF-5136, Rev. 0*	*0 days*	$0.00
371			
372	Update Functional Analysis for Rev. 1 Spec U/Ds	84 days	$16,800.00
373			
374	**Update DST Sub-system Functional Analysis Document**	**30 days**	**$26,000.00**
375	Prepare Draft Update of HNF-5136, Rev. 0A	10 days	$0.00
376	Review & Comment on HNF-5136, Rev. 0A	10 days	$5,600.00
377	Incorporate Comments & Issue HNF-5136, Rev. 1	10 days	$0.00
378	*Functional Analysis for DST Sub-systems, Rev. 1*	0 days	$0.00
379			
380	**Update LAW PCS Document**	**69 days**	**$170,480.00**
381	**Revise Rev. B LAW PCS Document**	**16 days**	**$14,880.00**
382	Prepare 1st draft of revised LAW PCS Outline	5 days	$4,000.00
383	Receive comments on LAW PCS outline	0 days	$0.00
384	Prepare final LAW outline	1 day	$800.00
385	Discuss LAW PCS outline w/lead author	1 day	$800.00
386	Lead author draft Section 2.2.2.1 of LAW PCS	2 days	$1,600.00
387	Review draft Section 2.2.2.1	2 days	$480.00
388	Revise Section 2.2.2.1 to incorporate reviewer comments	2 days	$1,600.00
389	Reorganize existing LAW PCS Doc into new outline	7 days	$5,600.00
390	*LAW PCS Document, Rev. B'*	1 day	$0.00

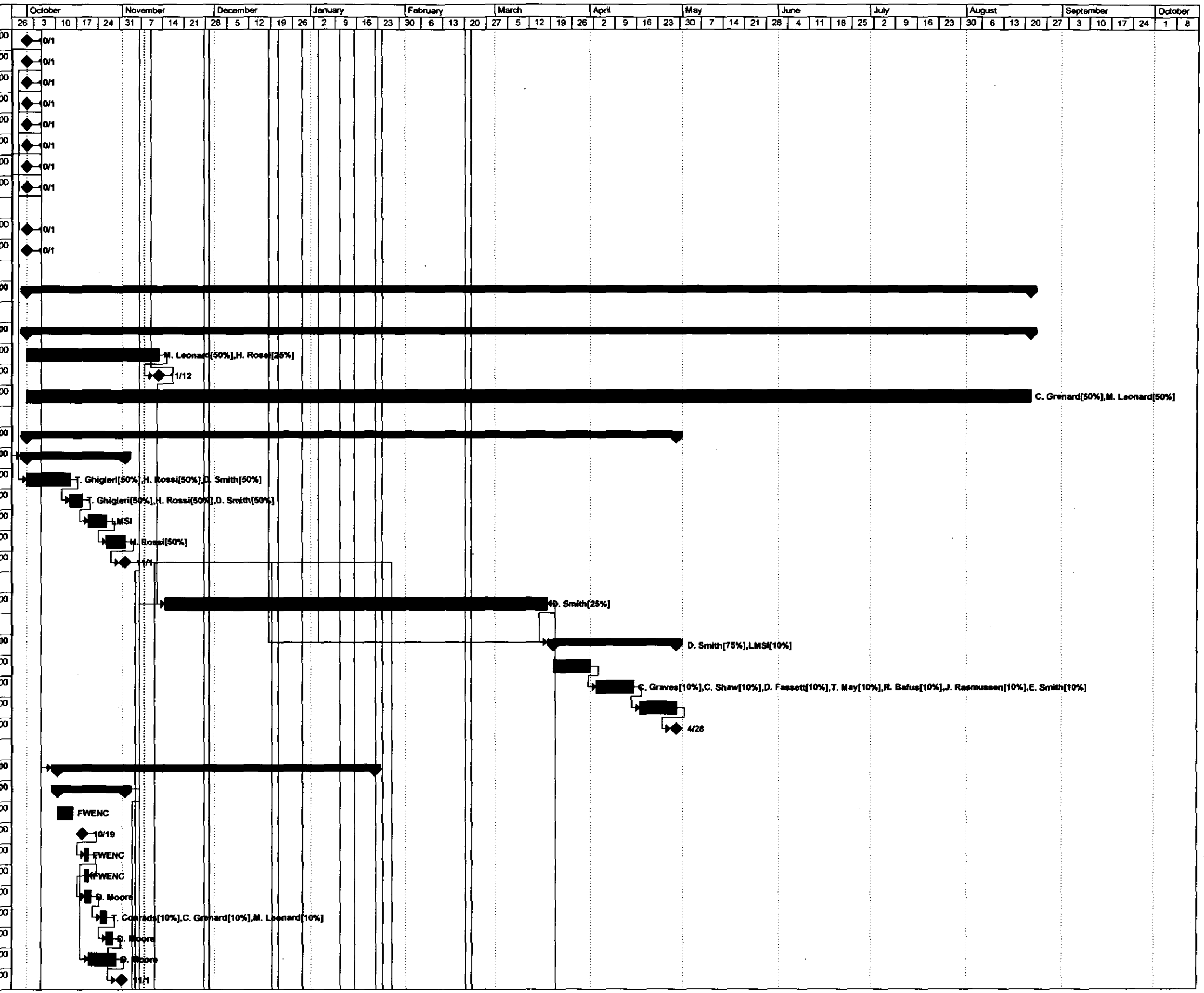


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
391	**Develop Resoponses to Comments on LAW PCS Doc**	**16 days**	**$10,400.00**
392	Prepare RCR Forms with Current Dispositions	5 days	$2,000.00
393	Identify open items for discussion/resolution	1 day	$400.00
394	Discuss open items; develop resolutions	4 days	$3,200.00
395	Discuss resolutions with commentors	6 days	$4,800.00
396	**Revise LAW PCS Document, Rev. B'**	**18 days**	**$13,600.00**
397	Lead authors prepare revised document text	12 days	$9,600.00
398	Produce document (e.g., technical editing, repro)	5 days	$4,000.00
399	*LAW PCS Document, Rev. C*	*1 day*	$0.00
400	**Develop Path Forward for LAW PCS Document, Rev. 0**	**17 days**	**$9,600.00**
401	Lead authors ID current TBD/TBR/Potential resolution	3 days	$2,400.00
402	Develop conceptual path forward for all TBDs/TBRs	4 days	$1,600.00
403	Prepare budgetary estimate of funding requirements	14 days	$5,600.00
404	**Resolve TBDs/TBRs & Issue LAW PCS Doc., Rev. 0**	**42 days**	**$122,000.00**
405	Complete development of TBD/TBR workplan	11 days	$4,400.00
406	Path Forward for TBD/TBR Resolution, LAW PCS	0 days	$0.00
407	Resolve TBRs/TBDs to extent possible, U/D Document	42 days	$117,600.00
408	*Process Control Strategy for LAW Feed Delievery, Rev. 0*	*0 days*	$0.00
409			
410	**Update HLW PCS Document**	**64 days**	**$166,800.00**
411	**Revise Rev. B HLW PCS Document**	**13 days**	**$9,600.00**
412	Prepare Draft HLW PCS Outline	2 days	$1,600.00
413	Discuss HLW PCS outline w/lead author	1 day	$800.00
414	Reorganize existing HLW PCS Doc into new outline	9 days	$7,200.00
415	*HLW PCS Document, Rev. B'*	1 day	$0.00
416	**Develop Responses to Comments on HLW PCS Doc**	**14 days**	**$12,000.00**
417	Prepare RCR Forms with Current Dispositions	5 days	$2,000.00
418	Identify open items for discussion/resolution	1 day	$400.00
419	Discuss open items; develop resolutions	4 days	$4,800.00
420	Discuss resolutions with commentors	4 days	$4,800.00
421	**Revise HLW PCS Document, Rev. B'**	**18 days**	**$13,600.00**
422	Lead authors prepare revised document text	12 days	$9,600.00
423	Produce document (e.g., technical editing, repro)	5 days	$4,000.00
424	*HLW PCS Document, Rev. C*	*1 day*	$0.00
425	**Develop Path Forward for HLW PCS Document, Rev. 0**	**17 days**	**$9,600.00**
426	**Lead authors ID current TBD/TBR/Potential resolution**	**3 day**	**$2,400.00**
427	**Develop conceptual path forward for all TBDs/TBRs**	**4 day**	**$1,600.00**
428	**Prepare budgetary estimate of funding requirements**	**14 day**	**$5,600.00**
429	**Resolve TBDs/TBRs & Issue HLW PCS Doc., Rev. 0**	**42 days**	**$122,000.00**
430	**Complete development of TBD/TBR workplan**	**11 day**	**$4,400.00**
431	**Path Forward for TBD/TBR Resolution, HLW PCS**	**0 day**	**$0.00**
432	**Resolve TBRs/TBDs to extent possible, U/D Document**	**42 day**	**$117,600.00**
433	**Process Control Strategy for HLW Feed Delievery, Rev. 0**	**0 day**	**$0.00**
434			

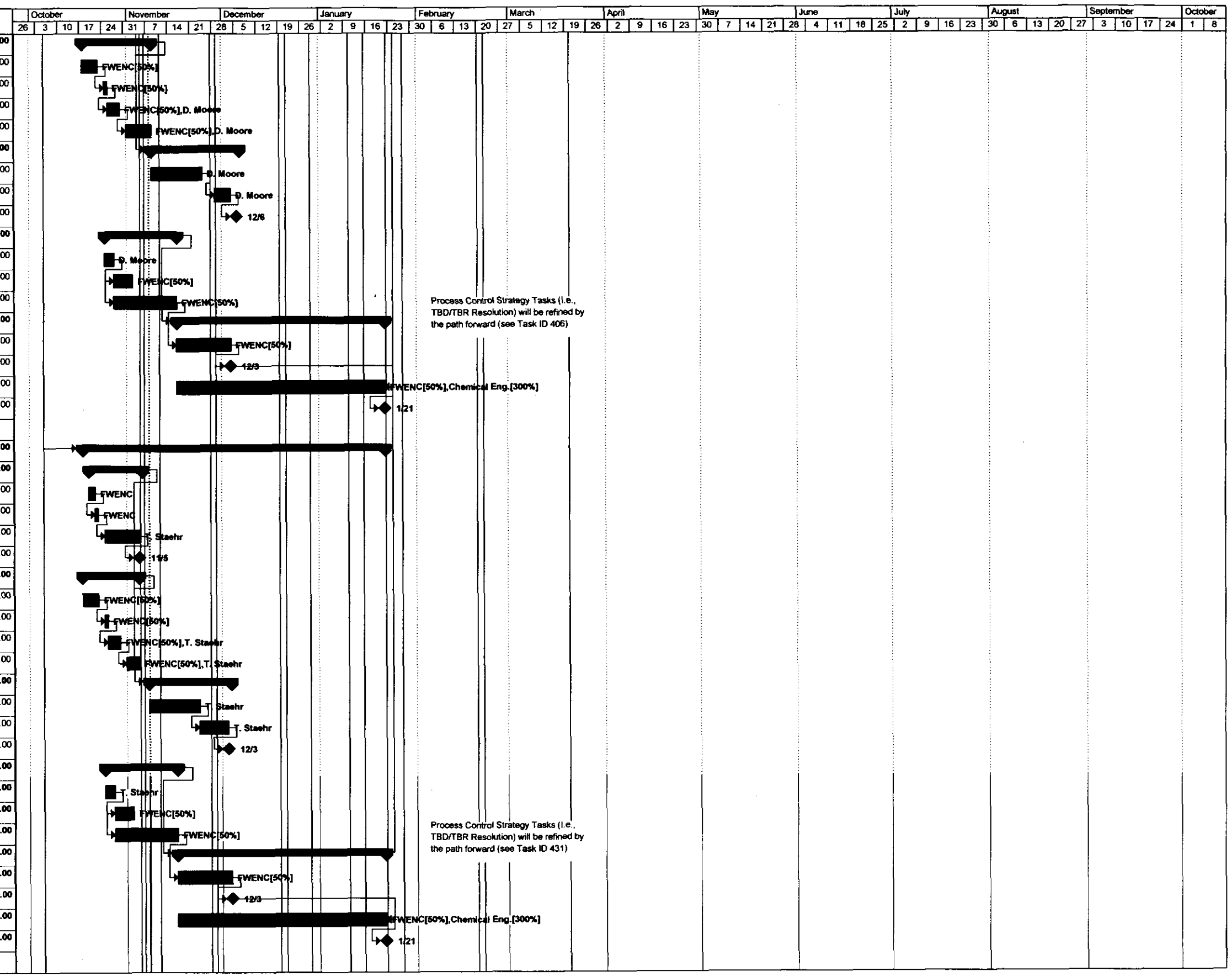


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
435	**Document Requirements Traceability for 1st 7 Sub-system Specs**	**41 days**	**$36,800.00**
436	Prepare Draft Requirements Traceability Doc.	21 days	$0.00
437	Review & Comment	10 days	$4,000.00
438	Incorporate Comments & Issue for Release	10 days	$0.00
439	Requirements Traceability Document for 1st 7 Sub-system Specs	0 days	$0.00
440			
441	**Update Piping/Valving Specifications**	**81 days**	**$193,736.00**
442	Plan Piping/Valving Spec Update	31 days	$0.00
443	Updated Work Plan	0 days	$0.00
444	**Release DST Transfer Piping Spec, Rev. 0**	**40 days**	**$21,600.00**
445	**Piping Heat Transfer Study (Resolve TBD/TBR)**	**20 days**	**$16,000.00**
446	Perform Heat Transfer Analysis	10 days	$0.00
447	Prepare Draft SD for Piping Heat Transfer Study	5 days	$0.00
448	Review & Incorporate Comments	5 days	$0.00
449	Issue Heat Transfer SD	0 days	$0.00
450			
451	Update DST Transfer Piping Specification	5 days	$0.00
452	Review Piping Spec for Signature	5 days	$2,400.00
453	Incorporate Comments from Review and Get Signatures	10 days	$0.00
454	*DST Transfer Piping Spec, HNF-4161, Rev. 0*	0 days	$0.00
455			
456	**Input DST Transfer Piping Spec in RDD-100**	**45 days**	**$16,368.00**
457	Assemble Piping Spec in RDD-100	21 days	$11,088.00
458	Validate Data, Produce Rev. 0A Piping Spec	10 days	$5,280.00
459	*DST Transfer Piping Spec, Rev. 0A*	0 days	$0.00
460			
461	**Release DST Transfer Valving Spec, Rev. 0**	**65 days**	**$42,200.00**
462	**Resolve TBD/TBR Requirements--DST Transfer Valving**	**40 days**	**$16,000.00**
463	Prepare & Document O&M Philosophy Agreement	5 days	$0.00
464	Memo of Understanding w/ O&M Philosophy Document	0 days	$0.00
465	**Valve Study**	**20 days**	**$16,000.00**
466	Perform Valve Analysis	10 days	$0.00
467	Prepare Draft SD	5 days	$0.00
468	Review & Incorporate Comments	5 days	$0.00
469	Issue Valve SD	0 days	$0.00
470			
471	Update DST Transfer Valving Specification	5 days	$0.00
472	Review Valving Spec for Signature	5 days	$2,400.00
473	Incorporate Comments from Review and Get Signatures	10 days	$5,600.00
474	*DST Transfer Valving Spec, HNF-4160, Rev. 0*	0 days	$0.00
475			
476	**Input DST Transfer Valving Spec. in RDD-100**	**50 days**	**$16,368.00**
477	Assemble Valving Spec in RDD-100	21 days	$11,088.00
478	Validate Data, Produce Rev. 0A Valving Spec	10 days	$5,280.00
479	*DST Transfer Valving Spec, Rev. 0A*	0 days	$0.00
480			

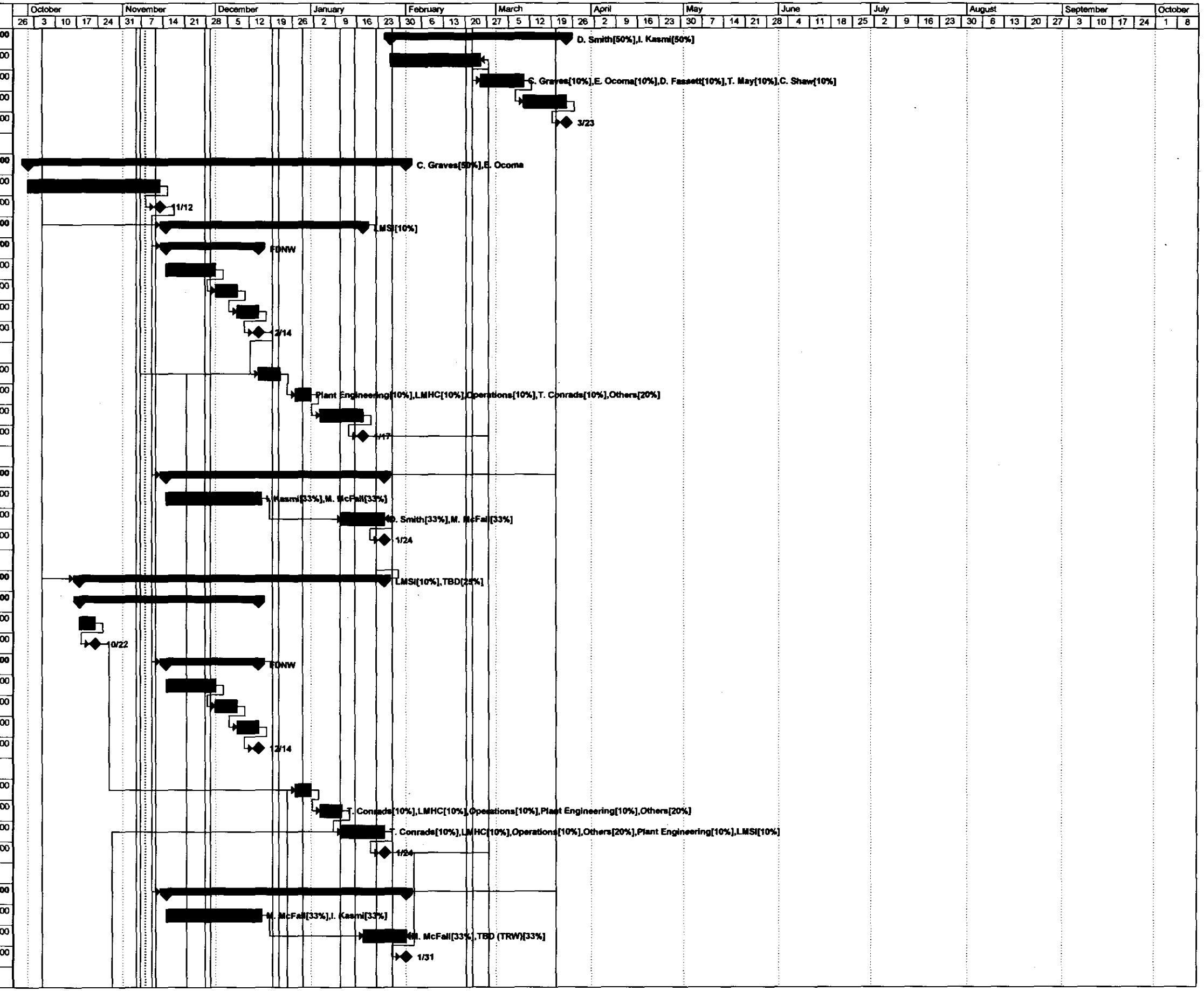


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
481	**Update Transfer & Mixer Pump Specs**	**77 days**	**$302,736.00**
482	Plan Transfer & Mixer Pump Spec Update	26 days	$0.00
483	Updated Work Plan	0 days	$0.00
484	**Release DST Transfer Pump Spec, Rev. 0**	**47 days**	**$90,060.00**
485	**Resolve TBD/TBR Requirements (Transfer Pump Spec)**	**27 days**	**$60,320.00**
486	**Prepare Pipe Roughness Report**	**27 days**	**$29,600.00**
487	Perform Document search/analysis	11 days	$0.00
488	Prepare Draft Report	11 days	$0.00
489	Perform Internal Review, Incorporate Comments	4 days	$0.00
490	Draft Supporting Document for Signature	0 days	$0.00
491	Conduct Review Mtg. & Incorporate Comments	10 days	$0.00
492	Independent Technical Review	10 days	$8,000.00
493	Approve & Issue Report	2 days	$0.00
494	Pipe Roughness Report, Rev. 0	0 days	$0.00
495	**Prepare Waste Velocity Supporting Doc.**	**27 days**	**$30,720.00**
496	Perform Waste Velocity Analysis	11 days	$0.00
497	Prepare Draft Report	11 days	$0.00
498	Perform Internal Review, Incorporate Comments	4 days	$320.00
499	Draft Supporting Document for Signature	0 days	$0.00
500	Conduct Review Mtg. & Incorporate Comments	10 days	$800.00
501	Independent Technical Review	10 days	$8,000.00
502	Approve & Issue Report	2 days	$0.00
503	Waste Velocity Supporting Document, Rev. 0	0 days	$0.00
504			
505	Update DST Transfer Pump Specification	5 days	$0.00
506	Review Transfer Pump Spec for Signature	5 days	$2,400.00
507	Incorporate Comments from Review and Get Signatures	10 days	$4,800.00
508	*DST Transfer Pump Spec, HNF-4162, Rev. 0*	0 days	$0.00
509			
510	**Input DST Transfer Pump Spec in RDD-100**	**32 days**	**$24,048.00**
511	Assemble Transfer Pump Spec in RDD-100	21 days	$11,088.00
512	Validate Data, Produce Rev. 0A Transfer Pump Spec	10 days	$5,280.00
513	*DST Transfer Pump Spec, Rev. 0A*	0 days	$0.00
514			
515	**Release DST Mixer Pump Spec, Rev. 0**	**45 days**	**$109,200.00**
516	Update DST Mixer Pump Specification (HNF-4164, Rev. C)	15 days	$0.00
517	Mixer Pump Spec, Rev. D	0 days	$0.00
518	Review Mixer Pump Spec Rev. D (Wide Review)	10 days	$4,800.00
519	**Resolve TBD/TBR Requirements (Mixer Pump Spec)**	**30 days**	**$98,400.00**
520	**Prepare Vapor Pressure vs. Temp. SD**	**30 days**	**$24,000.00**
521	Perform Vapror Pressure vs. Temp. Analysis	10 days	$0.00
522	Prepare Draft Report	10 days	$0.00
523	Review & Incorporate Comments	10 days	$0.00
524	Approve & Issue Report	5 days	$0.00
525	Vapor Pressure vs. Temp. SD, Rev. 0	0 days	$0.00

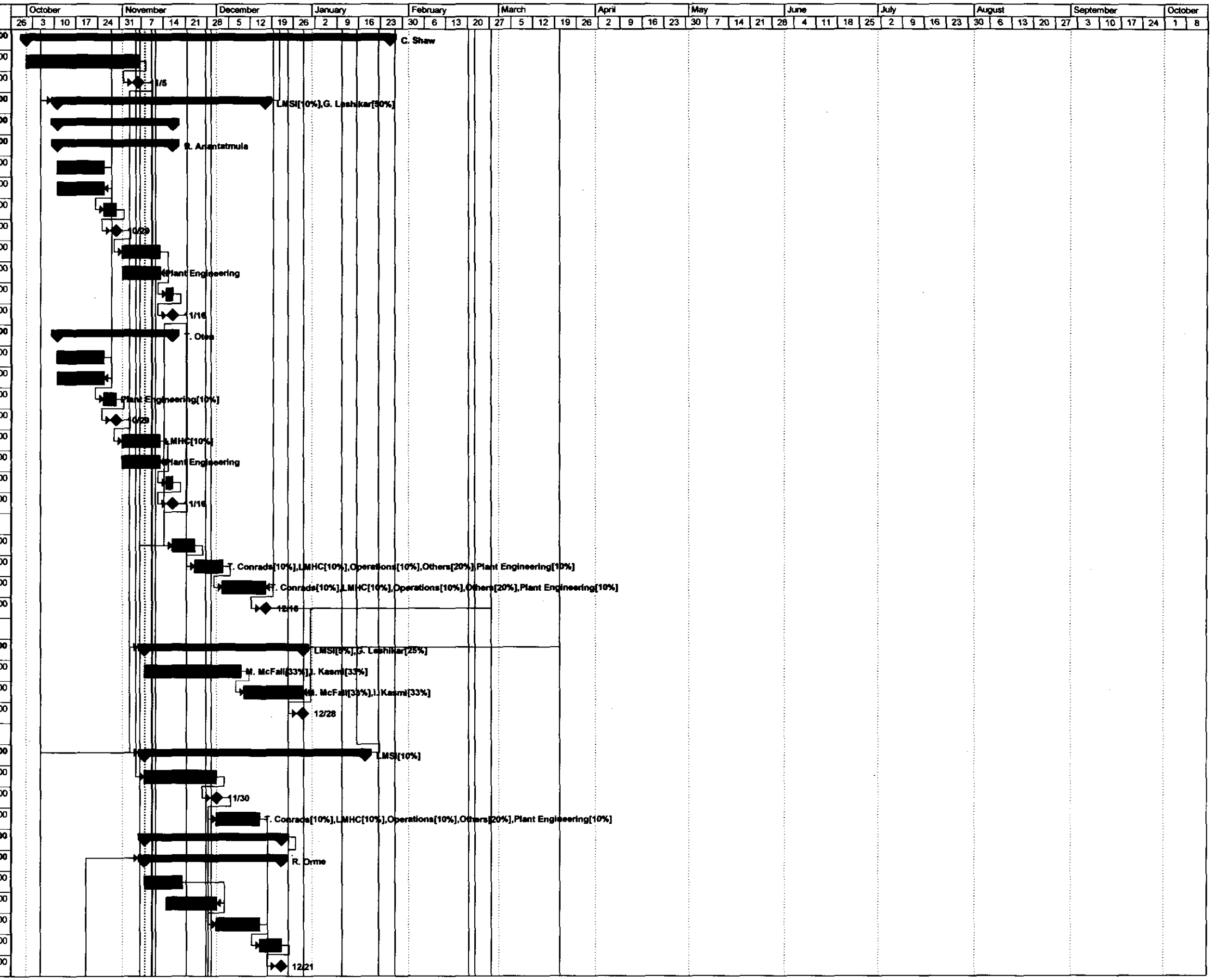


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
526	**Prepare Tank Yield Supporting Doc**	**30 days**	**$24,000.00**
527	Perform Tank Yield Analysis	10 days	$0.00
528	Prepare Draft Report	10 days	$0.00
529	Review & Incorporate Comments	10 days	$0.00
530	Approve & Issue Report	5 days	$0.00
531	Tank Yield Supporting Doc., Rev. 0	0 days	$0.00
532	**Prepare Waste Properties/Mixing Time SD**	**30 days**	**$24,000.00**
533	Perform Waste Properties/Mixing Time Analysis	10 days	$0.00
534	Prepare Draft Report	10 days	$0.00
535	Review & Incorporate Comments	10 days	$0.00
536	Approve & Issue Report	5 days	$0.00
537	Waste Properties/Mixing Time SD, Rev. 0	0 days	$0.00
538	**Prepare Waste Homogenaity Supporting Doc**	**30 days**	**$26,400.00**
539	Perform Waste Homogenaity Analysis	10 days	$0.00
540	Prepare Draft Report	10 days	$0.00
541	Review & Incorporate Comments	10 days	$0.00
542	Approve & Issue Report	5 days	$0.00
543	Waste Homogenaity Supporting Doc., Rev. 0	0 days	$0.00
544			
545	Incorporate Analyses Results and Comments from Review	10 days	$0.00
546	Issue for Approval & Get Signatures	5 days	$2,400.00
547	*DST Mixer Pump Spec, HNF-4164, Rev. 0*	0 days	$0.00
548			
549	**Input DST Mixer Pump Spec in RDD-100**	**36 days**	**$17,808.00**
550	Assemble Mixer Pump Spec in RDD-100	21 days	$11,088.00
551	Validate Data, Produce Rev. 0A Mixer Pump Spec	10 days	$5,280.00
552	*DST Mixer Pump Spec, Rev. 0A*	0 days	$0.00
553			
554			
555	**Update Caustic & Diluent Add Sys (CDAS) and Vent Sys Specs**	**97 days**	**$257,256.00**
556	Plan CDAS and Vent Spec Updates	31 days	$0.00
557	Updated Work Plan	0 days	$0.00
558			
559	**Release CDAS Spec, Rev. 0**	**63 days**	**$61,840.00**
560	**Resolve TBD/TBR Requirements (CDAS Spec)**	**53 days**	**$2,000.00**
561	Prepare Supporting Doc. For TBR Resolution	21 days	$0.00
562	TBR/TBD Supporting Doc--CDAS Spec	0 days	$0.00
563	Internal Review of CDAS Spec Supporting Doc	5 days	$1,200.00
564	Revise CDAS Supporting Doc. per Review Comments	9 days	$0.00
565	Wide Review of CDAS Spec Supporing Doc.	5 days	$800.00
566	Revise CDAS Supporting Doc. per Review Comments	8 days	$0.00
567	Issue CDAS Spec Supporting Doc.	5 days	$0.00
568	CDAS Spec Supporting Document, Rev. 0	0 days	$0.00
569			

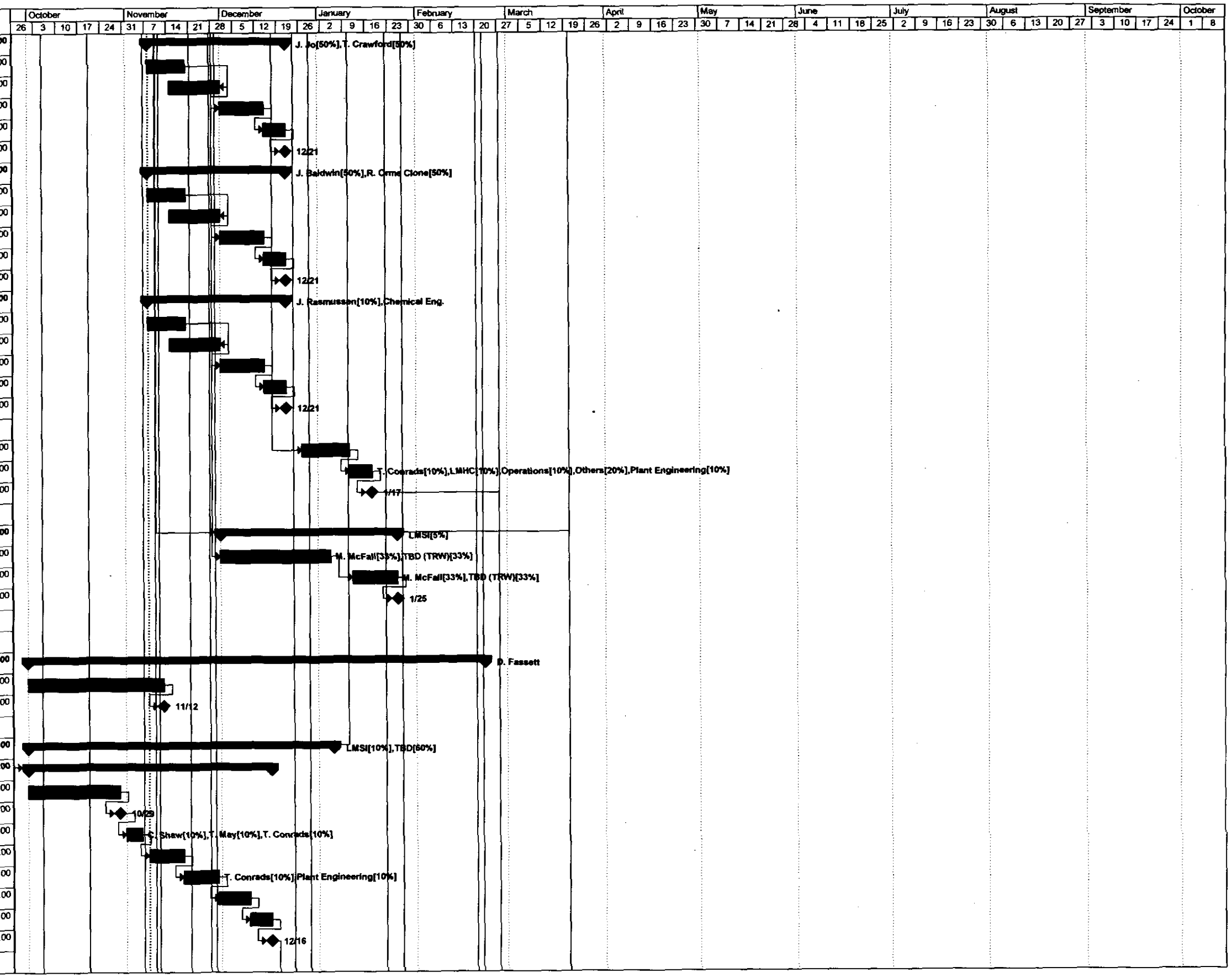


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
570	Prepare Resolutions to Comments	12 days	$5,760.00
571	Revise Rev. C/ Prepare Rev. 0	10 days	$4,800.00
572	Identify Issues on Comment Resolutions	15 days	$4,800.00
573	Resolve Issues on Comment Resolutions	15 days	$6,000.00
574	Issue CDAS Spec, HNF-4163, Rev. 0	10 days	$3,200.00
575	*Caustic & Diluent Add'n System Spec, HNF-4163, Rev. 0*	0 days	$0.00
576			
577	**Input Caustic & Diluent Add'n System Spec in RDD-100**	**31 days**	**$22,568.00**
578	Assemble CDAS Spec in RDD-100	21 days	$11,088.00
579	Validate Data, Produce Rev. 0A CDAS Spec	10 days	$5,280.00
580	Casutic & Diluent Add'n System Spec, Rev. 0A	0 days	$0.00
581			
582	**Release Vent System Specification, Rev. 0**	**76 days**	**$78,880.00**
583	Identify Issues on Comment Resolutions	10 days	$0.00
584	Resolve Issues on Comment Resolutions	7 days	$0.00
585	Match Spec to Rev. 0 Functional Analysis	10 days	$0.00
586	**Resolve TBD/TBR Requirements (Vent Spec)**	**40 days**	**$68,000.00**
587	**Prepare DST Heat Removal Study Support. Doc.**	**30 days**	**$24,000.00**
588	Perform Heat Removal Analysis	10 days	$0.00
589	Prepare Draft Report	10 days	$0.00
590	Review & Incorporate Comments	10 days	$0.00
591	Approve & Issue Report	5 days	$0.00
592	DST Heat Removal Supporting Document, Rev. 0	0 days	$0.00
593	**Prepare Flam. Gas Timeline Supporting Doc**	**30 days**	**$24,000.00**
594	Perform Flam. Gas Timeline Analysis	10 days	$0.00
595	Prepare Draft Report	10 days	$0.00
596	Review & Incorporate Comments	10 days	$0.00
597	Approve & Issue Report	5 days	$0.00
598	Flam. Gas Timeline Supporting Doc., Rev. 0	0 days	$0.00
599	**DST Source Term & Aerosol Generation Study**	**25 days**	**$20,000.00**
600	Perform Source Term and Aerosol Generation Analysis	10 days	$0.00
601	Prepare Draft SD	10 days	$0.00
602	Review & Incorporate Comments	5 days	$0.00
603	Issue Source Term and Aerosol Generation SD	0 days	$0.00
604			
605	Revise Rev. 0	10 days	$0.00
606	Approve & Issue Ventilation System Spec, HNF-5196, Rev. 0	10 days	$4,800.00
607	*Ventilation System Spec, HNF-5196, Rev. 0*	0 days	$0.00
608			
609	**Input Ventilation System Spec in RDD-100**	**31 days**	**$16,368.00**
610	Assemble Vent Spec in RDD-100	21 days	$11,088.00
611	Validate Data, Produce Rev. 0A Vent Spec	10 days	$5,280.00
612	*DST Ventilation System Spec, Rev. 0A*	0 days	$0.00
613			

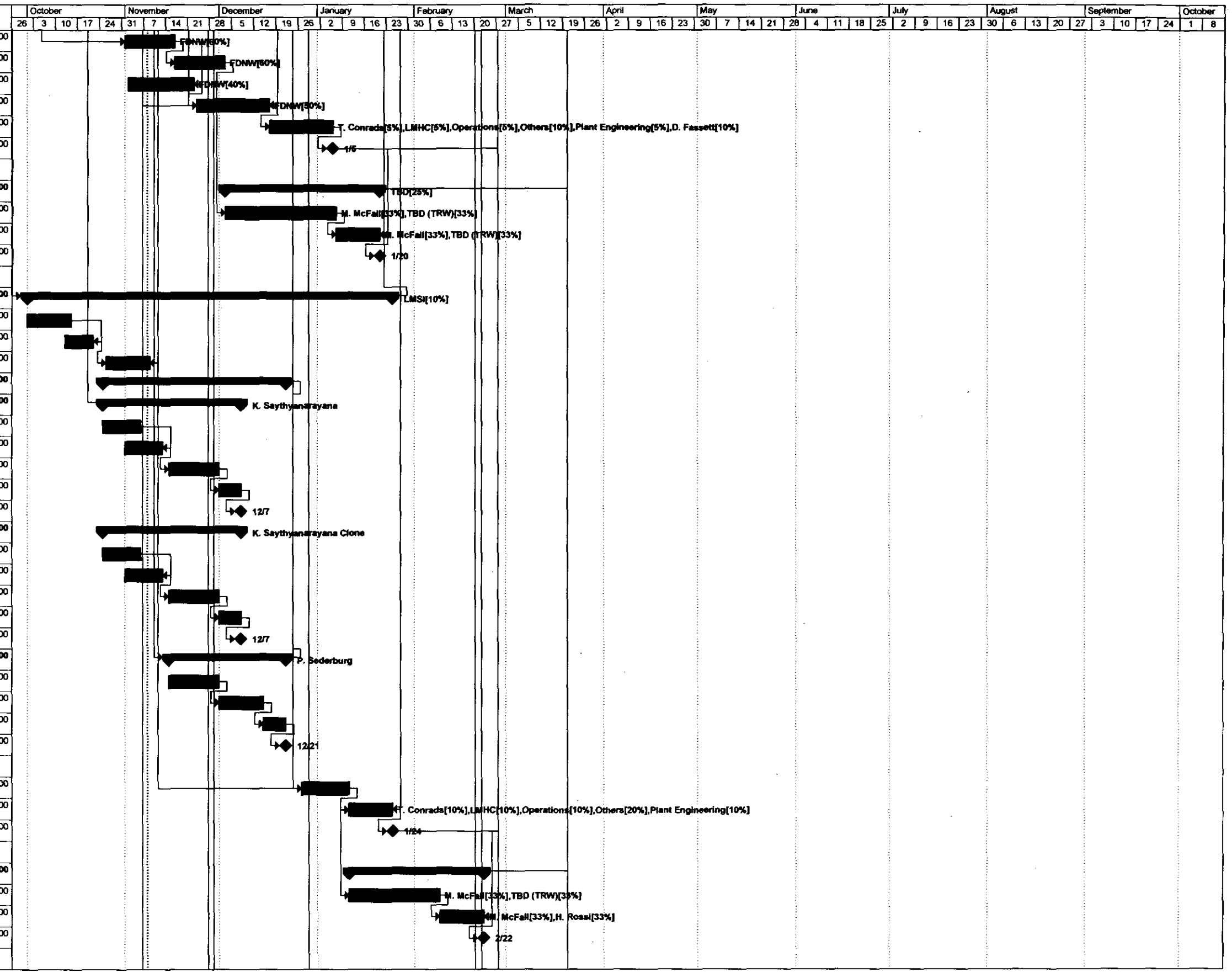
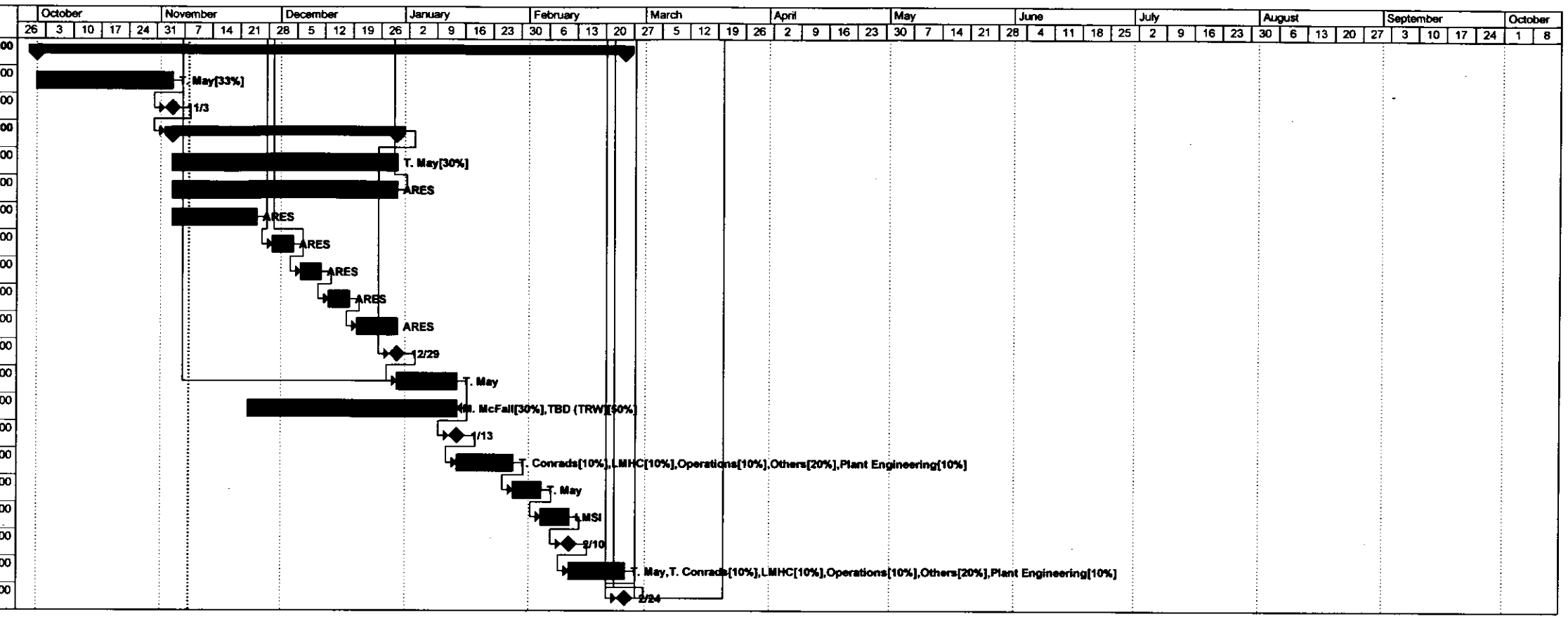


Figure 4. Integrated Schedule.

ID	Task Name	Duration	Cost
614	**Update Utility Specification**	**99 days**	**$124,816.00**
615	Plan Utility Spec Update	24 days	$6,336.00
616	Updated Work Plan	0 days	$0.00
617	**Resolve TBD/TBR Requirements**	**35 days**	**$64,400.00**
618	Update Specification Requirements	35 days	$8,400.00
619	Eng Study Electrical Demand & Distriution by Tank Farm	35 days	$28,000.00
620	Eng Study Raw Water Demand by Tank Farm	15 days	$12,000.00
621	Eng Study Filtered Water Demand by Tank Farm	5 days	$4,000.00
622	Eng Study Potable Water Demand by Tank Farm	5 days	$4,000.00
623	Identify Safety Class IA Service & Requirements	5 days	$4,000.00
624	Eng Study Instrument Air Demand by Tank Farm	5 days	$4,000.00
625	Issue Supporting Documents	0 days	$0.00
626	Update Utility Specification	10 days	$8,000.00
627	Assemble Utility Specs into RDD-100	32 days	$20,480.00
628	DST Utility Spec Rev. B	0 days	$0.00
629	Review and Comment on Utility Spec	10 days	$4,800.00
630	Incorporate Comments	5 days	$4,000.00
631	Technical Editing	5 days	$4,000.00
632	DST Utility Spec Rev. C	0 days	$0.00
633	Approve & Issue Spec Rev. 0	10 days	$12,800.00
634	*DST Utility System Spec Rev. 0*	0 days	$0.00



6.0 COST ESTIMATE

The detailed cost estimate of work described in Section 3.0 is shown, by activity, on the integrated schedule captured in Section 5.0. Execution of this work plan requires the use of both internal and external resources under task order contract to LMHC. For this estimate, an aggregate charge-out rate of $100.00/hr was used for all resources employed to execute this plan.

7.0 QUALITY ASSURANCE

Quality assurance will be performed in accordance with LMH-PRO-259, Graded Quality Assurance.

8.0 SAFETY CLASS, HAZARD ANALYSIS

Per HNF-PRO-704, Hazard and Accident Analysis Process, the activities described herein are non-safety class activities.

9.0 ENVIRONMENTAL

The EIS, NEPA, SEPA do not impact the activities described herein.

10.0 REFERENCES

- Grenard, C.E., et. al., 1998, *System Specification for the Double-Shell Tank System*, HNF-SD-WM-TRD-007, Rev. E, COGEMA Engineering Corporation, Richland, Washington.

- Johnson, M.E., 1999a, *Interface Control Document ICD-19 Between DOE and BNFL Inc. For Low-Activity Waste Feed*, BNFL-5193-ID-19, Rev. 3, June 1, 1999, BNFL Inc., Richland, Washington.

- Johnson, M.E., 1999b, *Interface Control Document ICD-20 Between DOE and BNFL Inc. For High-Level Waste Feed*, BNFL-5193-ID-20, Rev. 3, June 1, 1999, BNFL Inc., Richland, Washington.

- Kirkbride, R.A., et. al., 1999, *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev. 1, Numatec Hanford Corporation, Richland, Washington.

- Orme, R.M., 1999a, *Waste Feed Delivery Flowsheet for Tank 241-AZ-101*, HNF-1939, Vol. II, Addendum 1, Rev. 0a, Numatec Hanford Corporation, Richland, Washington.

- Orme, R.M., 1999b, *Waste Feed Delivery Flowsheet for Tank 241-AN-104*, HNF-1939, Vol. II, Addendum 3, Rev. 0c, Numatec Hanford Corporation, Richland, Washington.

- Peck, L.G., 1998, *Tank Waste Remediation System, System Engineering Management Plan*, HNF-SD-WM-SEMP-002, Lockheed Martin Hanford Corporation, Richland, Washington.

- Skriba, M.C., 1999, *PHMC Engineering Requirements*, LMH-PRO-1819, Rev. 0, Lockheed Martin Hanford Corporation Procedure.

- Treat, R.L., 1999, "Interim Guidance on LAW Retrieval Strategy", Letter No. 73600-99-006, Lockheed Martin Hanford Corporation, Richland, Washington.

11.0 APPROVALS AND DISTRIBUTION

Task Initiation

Customer _____ 11/9/99
Manager, WFD Projects Definition, W.T. Thompson

Performing Org. _____ 11/9/99
Manager, Project Definition, T.J. Conrads

Task Closure

Customer _____
Manager, WFD Projects Definition, W.T. Thompson

Performing Org. _____
Manager, Project Definition, T.J. Conrads

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	M.W. Leonard	Date 11/8/99
Project Title/Work Order		EDT No. 628180
Work Plan for Developing DST Sub-system Specifications (TBR 120.015)		ECN No. NA

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
R.R. Bafus	R3-73	X			
T.J. Conrads	R3-73	X			
D.P. Fassett	R3-73	X			
J.E. Ferguson	H7-06	X			
C.E. Graves	R3-73	X			
C.E. Grenard	R3-73	X			
B.J. Hendel	B1-45	X			
G.A. Hofferber	B1-45	X			
I. Kasmi	B1-45	X			
M.W. Leonard	R3-73	X			
T.H. May	R3-73	X			
D.J. Moore	H3-27	X			
J.H. Rasmussen	R2-12	X			
H. Rossi	B1-45	X			
R.L. Schlosser	R1-56	X			
C.P. Shaw	R3-74	X			
D.F. Smith	B1-45	X			
E.A. Smith	R3-73	X			
T.W. Steahr	R3-74	X			
D.M. Tulberg	R3-74	X			
C. Weingardt	R3-73	X			