

2. To: (Receiving Organization) WFD Projects Definition	3. From: (Originating Organization) Project Definition/82400	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: RPP/Retrieval Engineering	6. Design Authority/Design Agent/Cog. Engr.: CE Grenard	7. Purchase Order No.: NA
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) 120.005		9. Equip./Component No.: NA
11. Receiver Remarks:		10. System/Bldg./Facility: NA
11A. Design Baseline Document? <input type="radio"/> Yes <input checked="" type="radio"/> No		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: NA

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	RPP-5380		0	Work Plan for Develop DST System Specification and ICDs (TBR-120.005)	NA	1	1	

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, C, 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		WT Thompson			
		Design Agent									
1	1	Cog. Eng. CE Grenard	<i>CE Grenard</i>	11/17/99							
1	1	Cog. Mgr. TJ Conrads	<i>TJ Conrads</i>	11/9/99							
		QA									
		Safety									
		Env.									

18. <i>CE Grenard</i> 11/9/99 CE Grenard Signature of EDT Originator Date	19. <i>WT Thompson</i> 11/10/99 WT Thompson Authorized Representative for Receiving Organization Date	20. <i>TJ Conrads</i> 11/10/99 TJ Conrads Design Authority/Cognizant Manager Date	21. DOE APPROVAL (if required) Ctrl No. _____ <input type="radio"/> Approved <input type="radio"/> Approved w/comments <input type="radio"/> Disapproved w/comments
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WORK PLAN FOR UPDATING DST SUB-SYSTEM SPECIFICATIONS ICDS (TBR-120.005)

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

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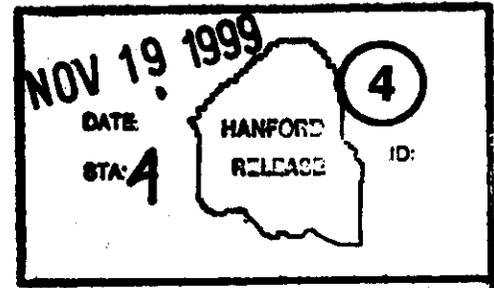
Key Words: Plan, Schedule, DST, System, ICD, Major Facility, Double-Shell Tank, Level 1, Specification, System Engineering.

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. A DST System specification is being prepared providing the top-level requirements 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 finalizing and issuing Rev. 0 of the DST System specification in FY-2000 and for the release of several interface control documents.

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Release Approval Date *11/19/99*



Release Stamp

Approved For Public Release

WORK PLAN FOR
DEVELOP DST SYSTEM SPECIFICATION AND ICDs
TBR 120.005

November 8, 1999

Approved:



11/9/99

Manager, Project Definition, T. J. Conrads

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

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TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 SCOPE	2
2.1 Objectives	2
2.2 Deliverables	3
3.0 DESCRIPTION.....	4
3.1 PHYSICAL DESCRIPTION.....	4
3.2 ENGINEERING TASKS.....	4
3.2.1 Release DST System Specification, Rev. 0	4
3.2.2 Release First Seven DST System ICDs	5
3.3 VERIFICATION.....	5
3.4 PROCUREMENT TASKS	5
3.5 INSTALLATION	5
3.6 PREOPERATIONAL AND OPERATIONAL TESTS.....	5
4.0 ORGANIZATION	6
5.0 SCHEDULE.....	8
6.0 Cost Estimate	25
7.0 Quality Assurance	26
8.0 Safety Class, Hazard Analysis	27
9.0 Environmental.....	28
10.0 References.....	29
11.0 Approvals and distribution.....	30

TERMS

DST	Double-Shell Tank
HSTD	Hanford Site Technical Database
ICD	Interface Control Document
ID	Identification
ORP	Office of River Protection
PFPP	Plutonium Finishing Plant
RPP	River Protection Project
SST	Single-Shell Tank
TBD	To Be Determined
TBR	Technical Basis Report
TBR	To Be Refined
TWRS	Tank Waste Retrieval System
WFD	Waste Feed Delivery

1.0 INTRODUCTION

Retrieval Engineering has been tasked with establishing the technical requirements, baseline documents for the Waste Feed Delivery (WFD) program. Preparation of these documents is being performed in accordance with the TWRS Systems Engineering Management Plan (Peck 1998) and the Waste Feed Delivery Systems Engineering Management Plan (O'Toole 1999). Technical baseline documents being developed per this work plan include the Double-Shell Tank (DST) System specification and the Major Facility Interface Control Documents (ICDs).

The DST System specification, which is being developed and issued by TBR 120.005, will establish system functional, performance, interface, and test requirements for both Safe Storage and Phase1 WFD. This specification will form the basis for the DST subsystem specifications being developed by TBRs 120.015 & 120.020. Updates of the system specification will be performed by TBR 120.010; however, no updates are planned in FY2000.

DST System/Major Facility ICDs are agreements between the DST System and other Major Facilities that define what products (e.g., waste, electrical power, and raw water) the DST System will be receiving from or sending to the Major Facilities. TBR 120.010 will develop and issue the remaining DST System/Major Facility ICDs. The ICDs will be used to manage the quantity and composition of waste coming into the DST System and to ensure utilities (e.g., electricity and raw water) will be sufficient to meet system needs.

TBR 120.010 will also develop a process for subsystem interface control. This process will establish how the subsystem ICDs will be used by the projects; thus, ensuring that the projects work to an agreed-to set of requirements.

1.0 INTRODUCTION

Retrieval Engineering has been tasked with establishing the technical requirements, baseline documents for the Waste Feed Delivery (WFD) program. Preparation of these documents is being performed in accordance with the TWRS Systems Engineering Management Plan (Peck 1998) and the Waste Feed Delivery Systems Engineering Management Plan (O'Toole 1999). Technical baseline documents being developed per this work plan include the Double-Shell Tank (DST) System specification and the Major Facility Interface Control Documents (ICDs).

The DST System specification will establish system functional, performance, interface, and test requirements for both Safe Storage and Phase1 WFD. This specification will form the basis for the DST subsystem specifications (See TBR 120.105 & 120.020 work plans).

The DST Major Facility ICDs are agreements between the DST System and other Major Facilities that define what the DST System will be receiving from or sending to the other facilities (e.g., waste, electrical power, and raw water).

2.0 SCOPE

This work plan includes the following tasks:

- Finalize updating of the DST System performance requirements document (HNF-2168) started in FY99.
- Update the requirements and other information in the Hanford Site Technical Database (HSTD), print the DST System specification from the HSTD database, and issue the document as a Rev. 0 specification.
- Obtain approval of the seven Major Facility ICDs started in FY99.
- Generate or update other supporting documents that support completion of the above work scope.

The tasks identified above will be based on the following technical baseline documentation:

- *Tank Waste Remediation System Mission Analysis Report*, HNF-SD-WM-MAR-008, Rev. 3
- *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev. 1 (Note: Case 3, as modified by the "Interim Guidance on LAW Retrieval Strategy" is the baseline case used for the specification and ICD development activities described in this work plan)
- "Interim Guidance on LAW Retrieval Strategy", Letter No. 73600-99-006.
- *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.
- *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

The objective of this task provide a DST System specification and Major Facility ICDs that provide the necessary and sufficient technical requirements to satisfy the DST System's Phase 1 WFD mission and the concurrent Safe Storage mission. The requirements shall be traceable to the requirements and constraints identified in the *TWRS Mission Analysis Report* or other constraints imposed by DOE and by federal and state laws and regulations.

2.2 Deliverables

The major deliverables for this work plan are as follows:

- Rev. 1 of the DST System requirements analysis document (HNF-2168)
- Rev. 0 of the DST System specification (HNF-SD-WM-TRD-007)
- Interface Control Documents with the following seven Major Facilities
 - ✦ The SST System,
 - ✦ The 222-S Laboratory,
 - ✦ The Plutonium Finishing Plant (PFP),
 - ✦ T-Plant,
 - ✦ The 324 Building,
 - ✦ The 325 Building,
 - ✦ The Central Waste Complex
- Rev. 0 of the Tank Farm Interface Summary document (HNF-4500)

Other supporting documents (e.g., change requests for updating the HSTD database) will be provided, as necessary, to support completion of these deliverables.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION

3.2 ENGINEERING TASKS

The engineering tasks described below are organized to match the organization of tasks on the integrated schedule provided in Section 5.0.

3.2.1 Release DST System Specification, Rev. 0

This task consists of performing the activities necessary to issue an approved Rev. 0 DST System specification. Descriptions of the detailed activities are as follows:

- 1) **Approve DST System Performance Requirements Doc. (HNF-2168)**
The performance requirements were analyzed during FY99 using data from the HTWOS model for Case 3 during FY99. This activity includes an independent review of the performance requirements analysis, review of the functional analysis bases, resolve comments, and issuing a Rev. 1 document.
- 2) **Update and Issue the DST Engineering Basis Document (HNF-3350)**
This activity will resolve comments and issue it as a Rev. 0 document
- 3) **Identify Changes from Subsystem Specification Activities/Other Comments**
This activity shall consist of reviewing the DST Subsystem specifications and their supporting documents to identify changes that need to be incorporated into the DST System specification. Recommended changes will be documented and approved on a Project Definition change request form.
- 4) **Identification of specification changes resulting from Major Facility ICD development**
This activity will review the DST/Major Facility ICDs to identify changes that need to be incorporated into the DST System specification. Recommended changes will be documented and approved on a Project Definition change request form.
- 5) **Incorporation of these changes into the HSTD (RDD-100) database**
This activity incorporates the approved change requests into the HSTD database. It includes verification that the changes have been correctly entered.
- 6) **Printing the specification from the database**
This activity will print the specification from the HSTD database, verify that the data printed correctly, and complete technical editing of the document before starting the approval process.
- 7) **Obtaining approval and issuing the specification**
This activity distributes the draft Rev. 0 document for approval. It includes the resolution of comments received during the approval process, revision of the database, and printing the document with comments incorporated.

3.2.2 Release First Seven DST System ICDs

This task will obtain approvals of the seven ICDs and HNF-4500, Rev. 0 developed during FY99. It includes the resolution of comments received during the approval process and updating the documents to incorporate the resolutions.

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 cycle is planned prior to an external review cycle. The internal review team is comprised of individuals directly supporting the activities detailed in this work plan. As a minimum, the external review team is comprised of approval authorities for the document.

3.4 PROCUREMENT TASKS

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

3.5 INSTALLATION

N/A

3.6 PREOPERATIONAL 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.

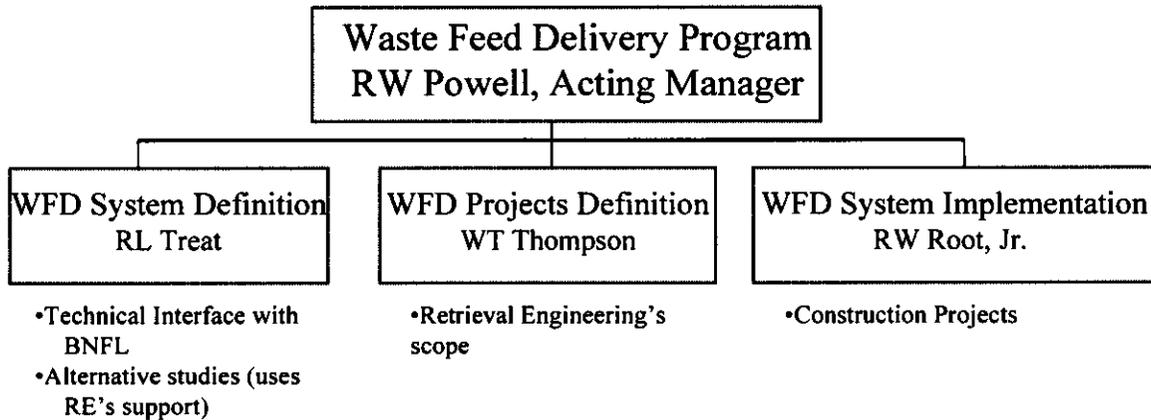


Figure 2. River Protection Project (RPP) Technical Operations and Engineering Organization.

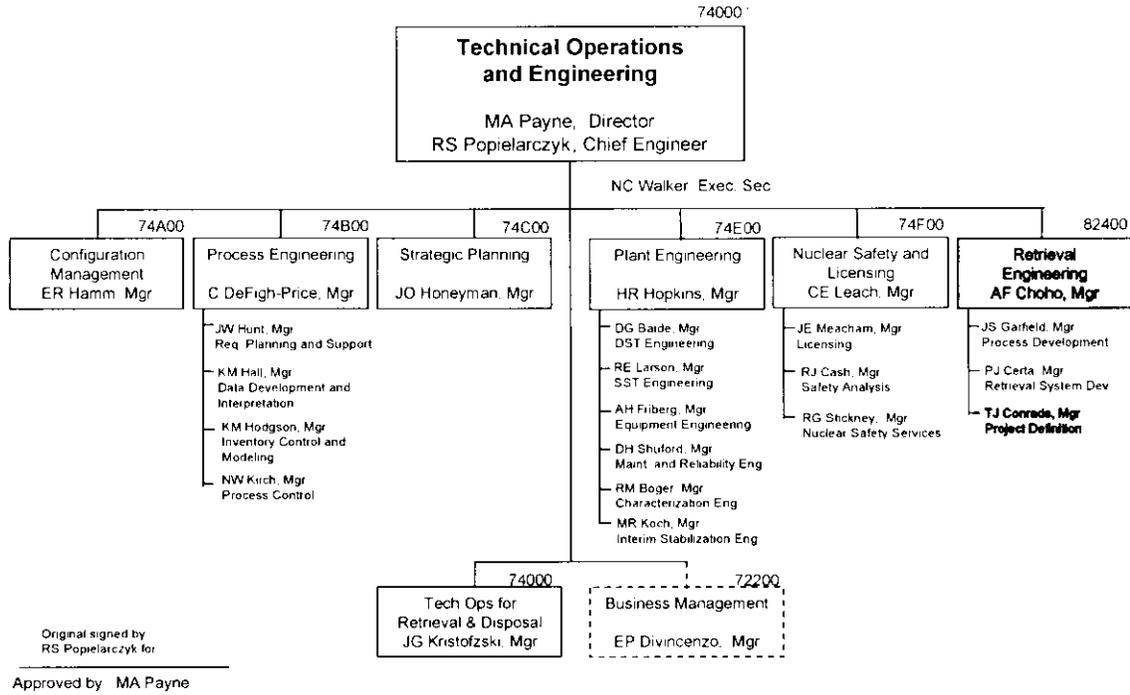
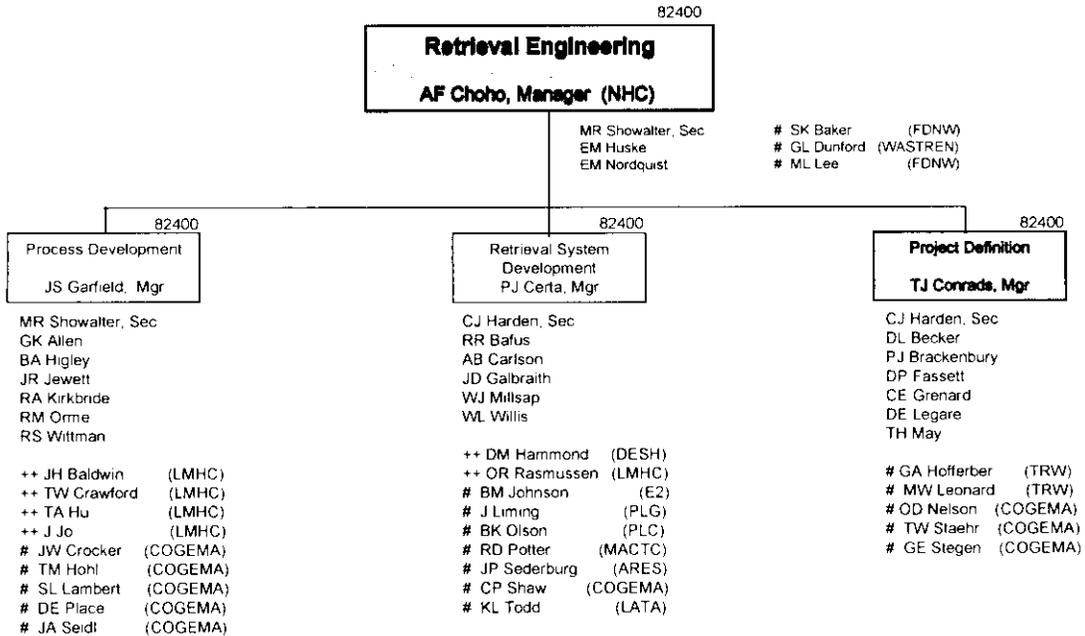


Figure 3. Retrieval Engineering Organization.



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 an integrated schedule with the activities associated with all four TBRs. TBR 120.005, Develop DST System Specifications (i.e., those activities pertaining to this work plan) are shown in detail beginning with Task ID number 9.

Figure 4. Integrated Schedule.

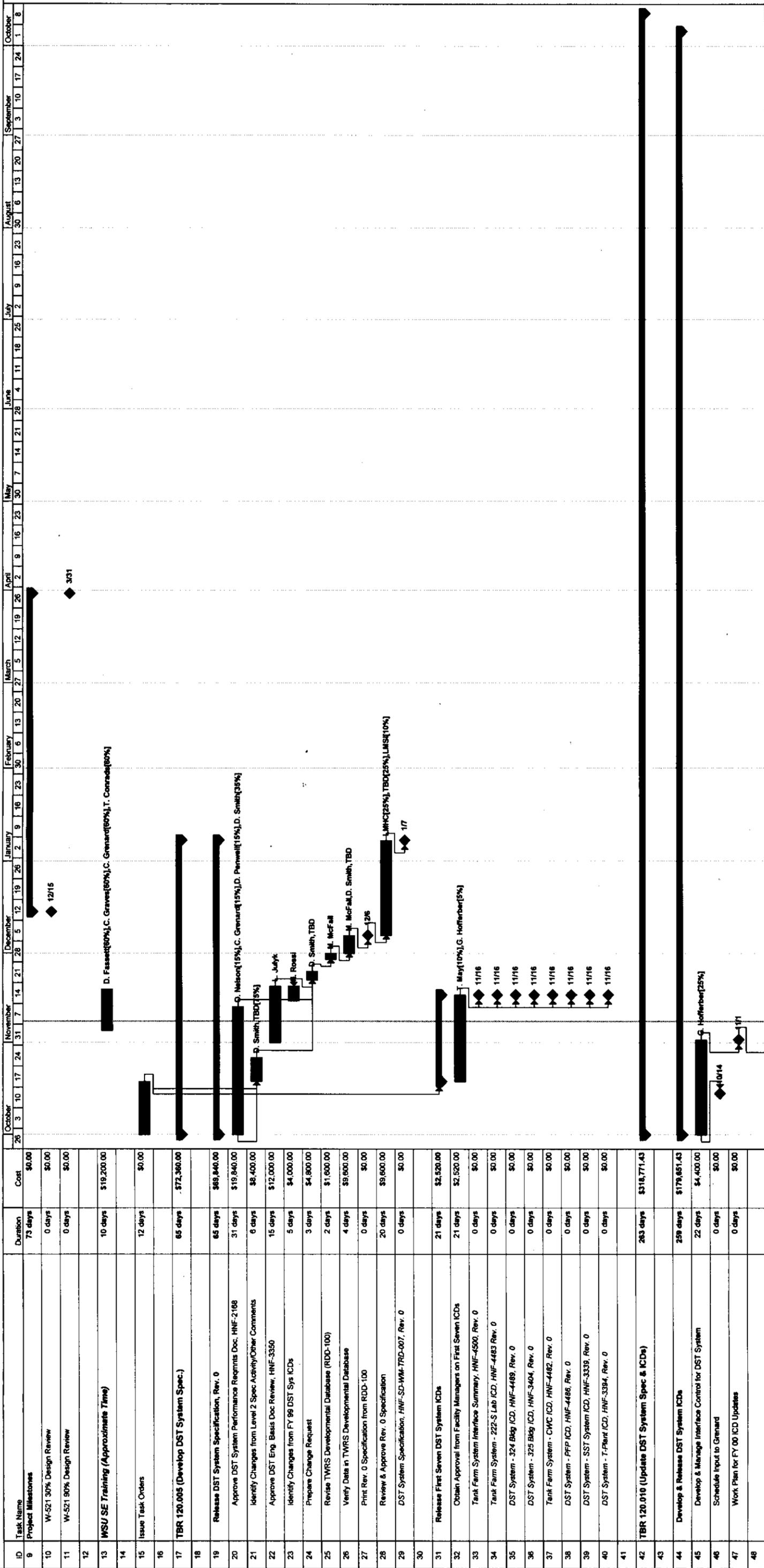


Figure 4. Integrated Schedule.

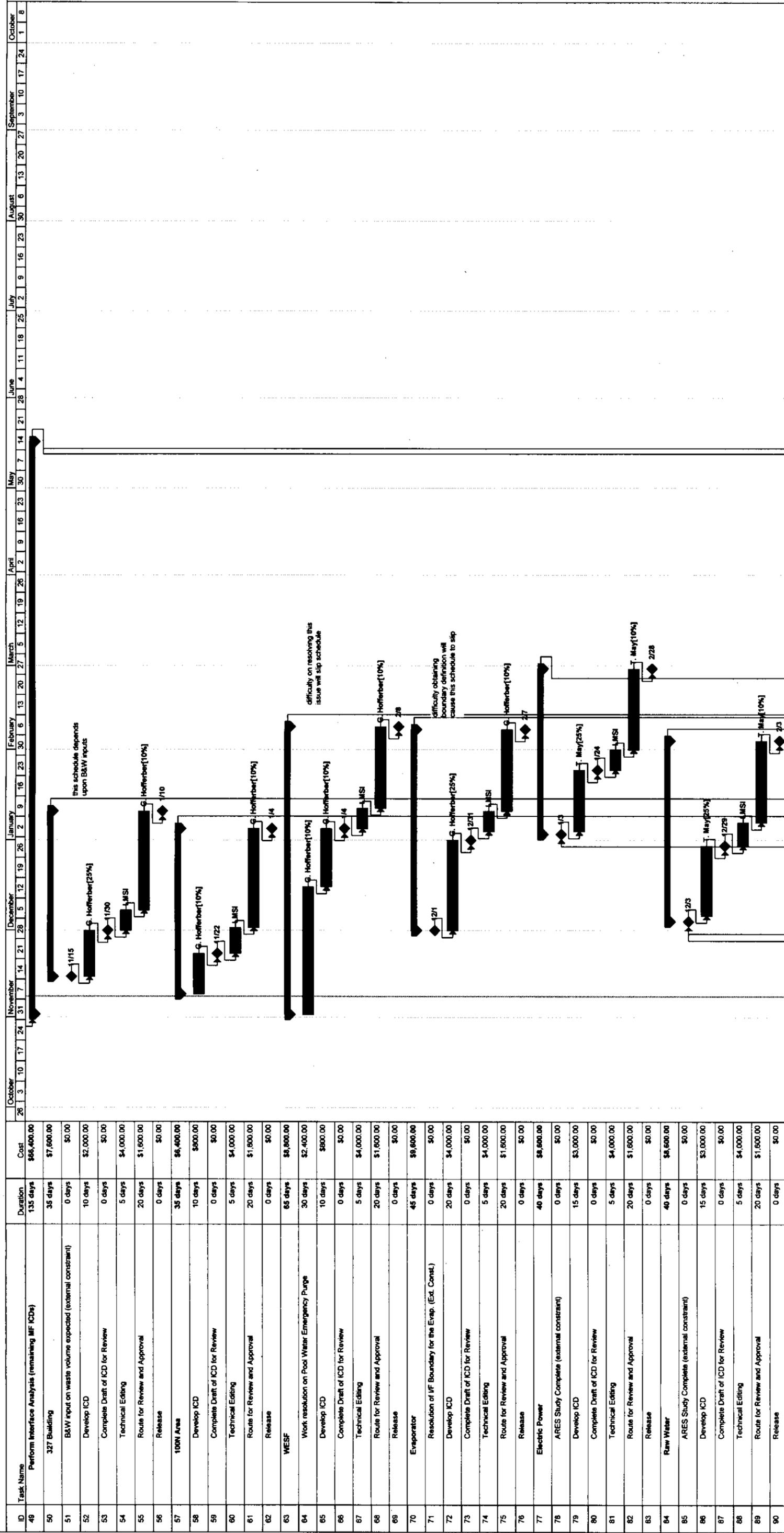
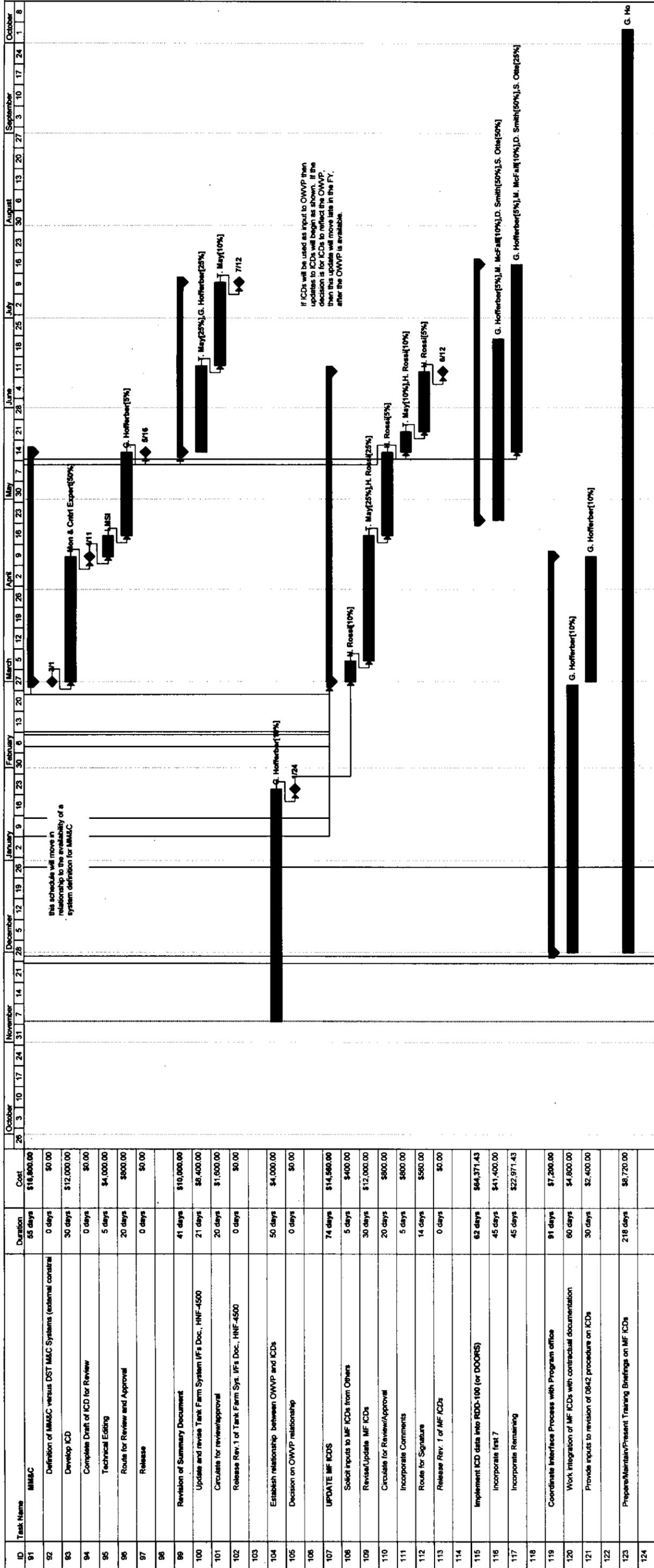


Figure 4. Integrated Schedule.



If ICDs will be used as input to OWVP then updates to ICDs will begin as shown. If the decision is for ICDs to reflect the OWVP, then this update will move later in the FY, after the OWVP is available.

this schedule will move in relationship to the availability of a system definition for IM&MC

Figure 4. Integrated Schedule.

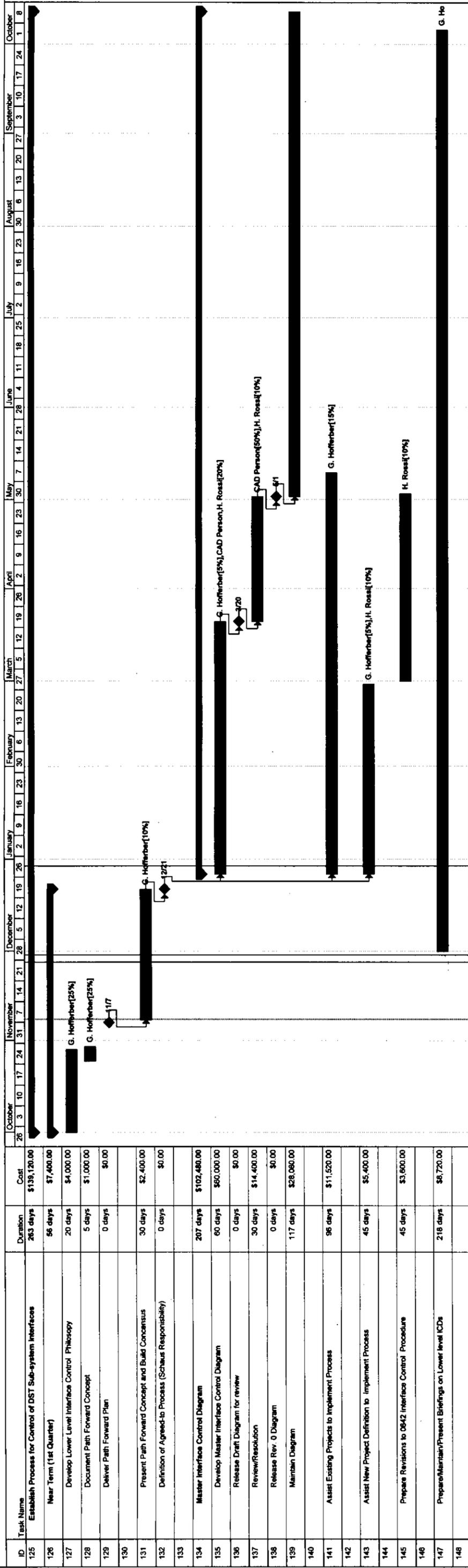


Figure 4. Integrated Schedule.

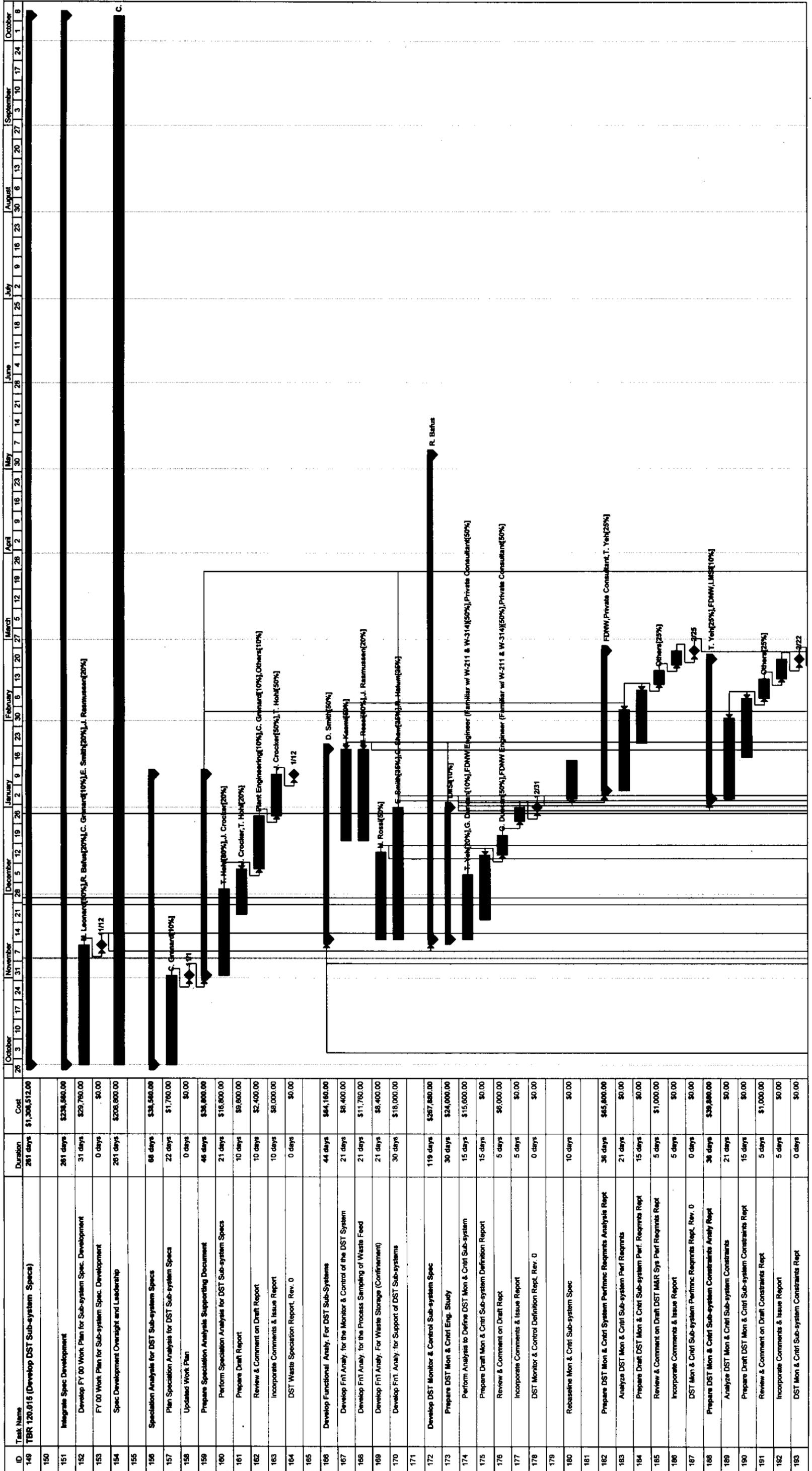
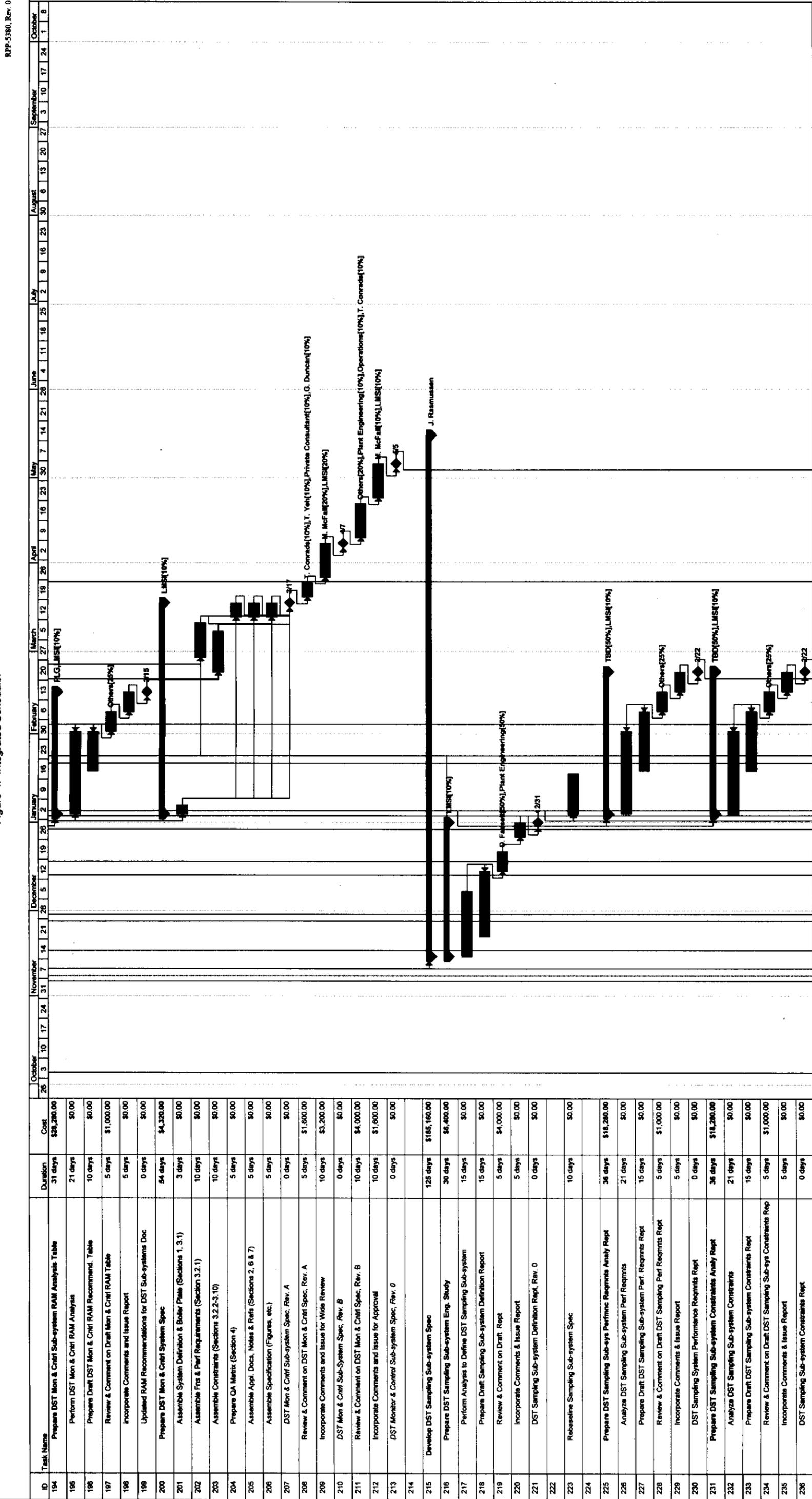


Figure 4. Integrated Schedule.



ID	Task Name	Duration	Cost
194	Prepare DST Mon & Critl Sub-system RAM Analysis Table	31 days	\$29,280.00
195	Perform DST Mon & Critl RAM Analysis	21 days	\$0.00
196	Prepare Draft DST Mon & Critl RAM Recommend. Table	10 days	\$0.00
197	Review & Comment on Draft Mon & Critl RAM Table	5 days	\$1,000.00
198	Incorporate Comments and Issue Report	5 days	\$0.00
199	Updated RAM Recommendations for DST Sub-systems Doc	0 days	\$0.00
200	Prepare DST Mon & Critl System Spec	54 days	\$4,320.00
201	Assemble System Definition & Boiler Plate (Sections 1, 3.1)	3 days	\$0.00
202	Assemble Fris & Perf Requirements (Section 3.2.1)	10 days	\$0.00
203	Assemble Constraints (Sections 3.2.2-3.10)	10 days	\$0.00
204	Prepare QA Matrix (Section 4)	5 days	\$0.00
205	Assemble Appl. Docs, Notes & Refs (Sections 2, 6 & 7)	5 days	\$0.00
206	Assemble Specification (Figures, etc.)	5 days	\$0.00
207	DST Mon & Critl Sub-system Spec. Rev. A	0 days	\$0.00
208	Review & Comment on DST Mon & Critl Spec. Rev. A	5 days	\$1,600.00
209	Incorporate Comments and Issue for Wide Review	10 days	\$3,200.00
210	DST Mon & Critl Sub-system Spec. Rev. B	0 days	\$0.00
211	Review & Comment on DST Mon & Critl Spec. Rev. B	10 days	\$4,000.00
212	Incorporate Comments and Issue for Approval	10 days	\$1,600.00
213	DST Monitor & Control Sub-system Spec. Rev. 0	0 days	\$0.00
214			
215	Develop DST Sampling Sub-system Spec	125 days	\$165,160.00
216	Prepare DST Sampling Sub-system Eng. Study	30 days	\$6,400.00
217	Perform Analysis to Define DST Sampling Sub-system	15 days	\$0.00
218	Prepare Draft Sampling Sub-system Definition Report	15 days	\$0.00
219	Review & Comment on Draft Rept	5 days	\$4,000.00
220	Incorporate Comments & Issue Report	5 days	\$0.00
221	DST Sampling Sub-system Definition Rept. Rev. 0	0 days	\$0.00
222			
223	Rebaseline Sampling Sub-system Spec	10 days	\$0.00
224			
225	Prepare DST Sampling Sub-sys Perf/mc Reqrmts Analy Rept	36 days	\$18,280.00
226	Analyze DST Sampling Sub-system Perf Reqrmts	21 days	\$0.00
227	Prepare Draft DST Sampling Sub-system Perf. Reqrmts Rept	15 days	\$0.00
228	Review & Comment on Draft DST Sampling Perf Reqrmts Rept	5 days	\$1,000.00
229	Incorporate Comments & Issue Report	5 days	\$0.00
230	DST Sampling System Performance Reqrmts Rept	0 days	\$0.00
231	Prepare DST Sampling Sub-system Constraints Analy Rept	36 days	\$18,280.00
232	Analyze DST Sampling Sub-system Constraints	21 days	\$0.00
233	Prepare Draft DST Sampling Sub-system Constraints Rept	15 days	\$0.00
234	Review & Comment on Draft DST Sampling Sub-sys Constraints Rept	5 days	\$1,000.00
235	Incorporate Comments & Issue Report	5 days	\$0.00
236	DST Sampling Sub-system Constraints Rept	0 days	\$0.00

Figure 4. Integrated Schedule.

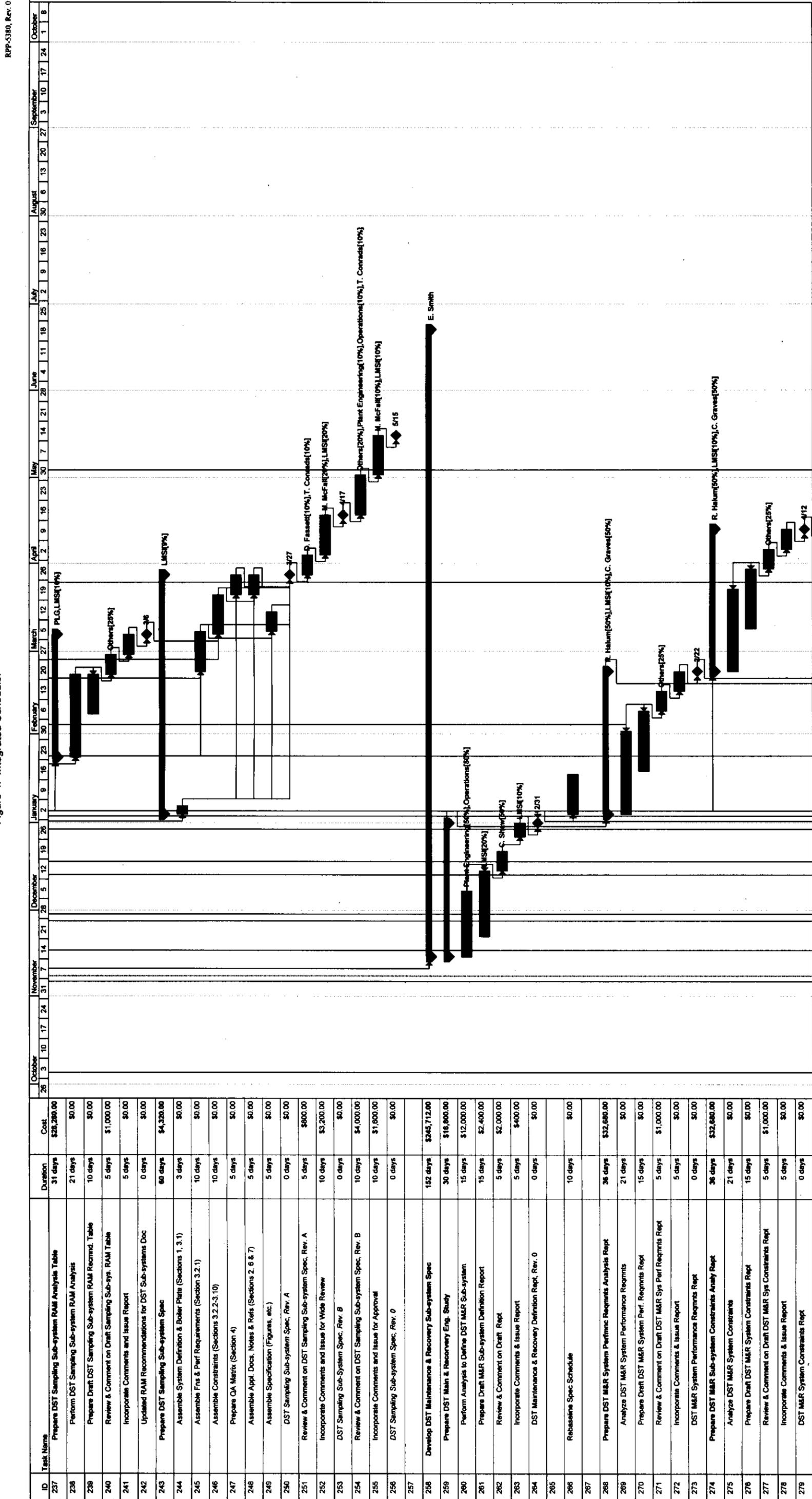


Figure 4. Integrated Schedule.

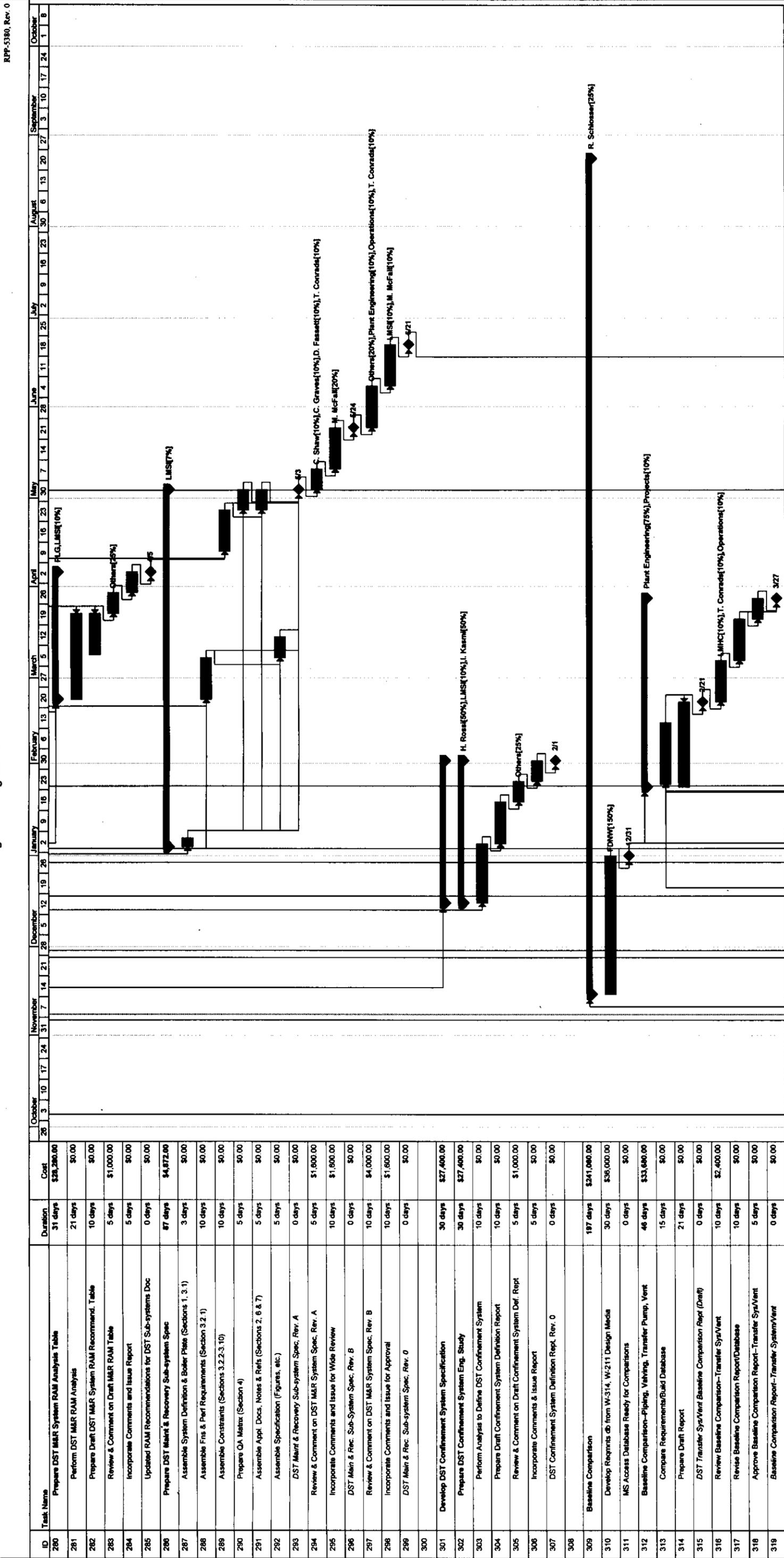


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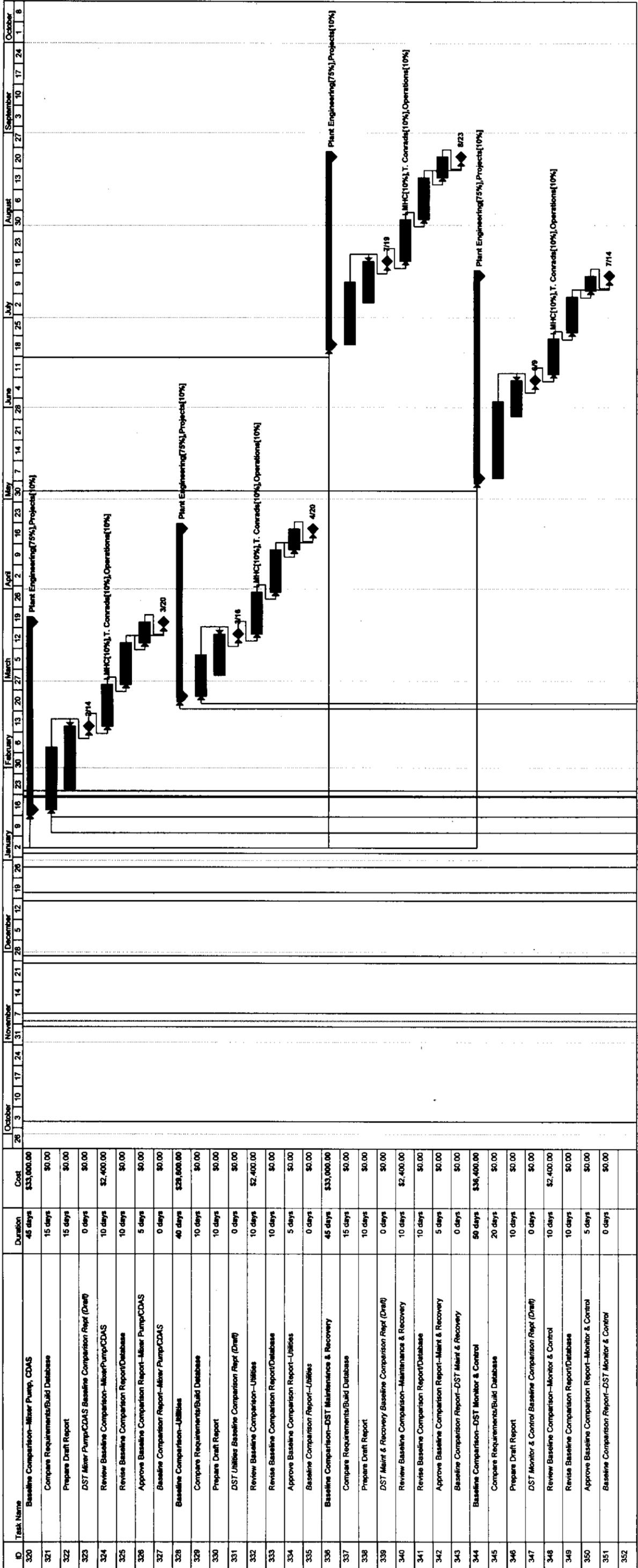


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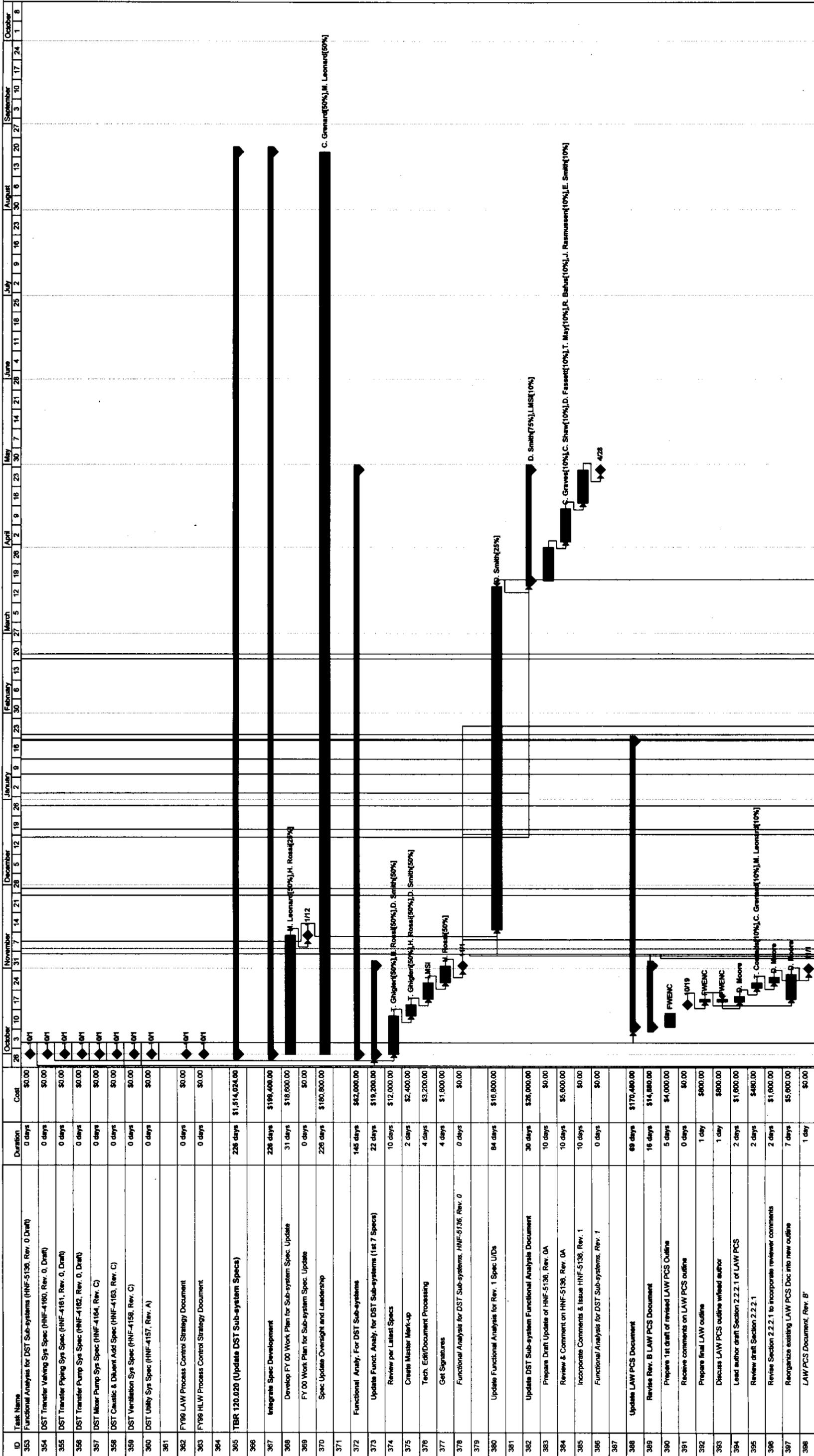


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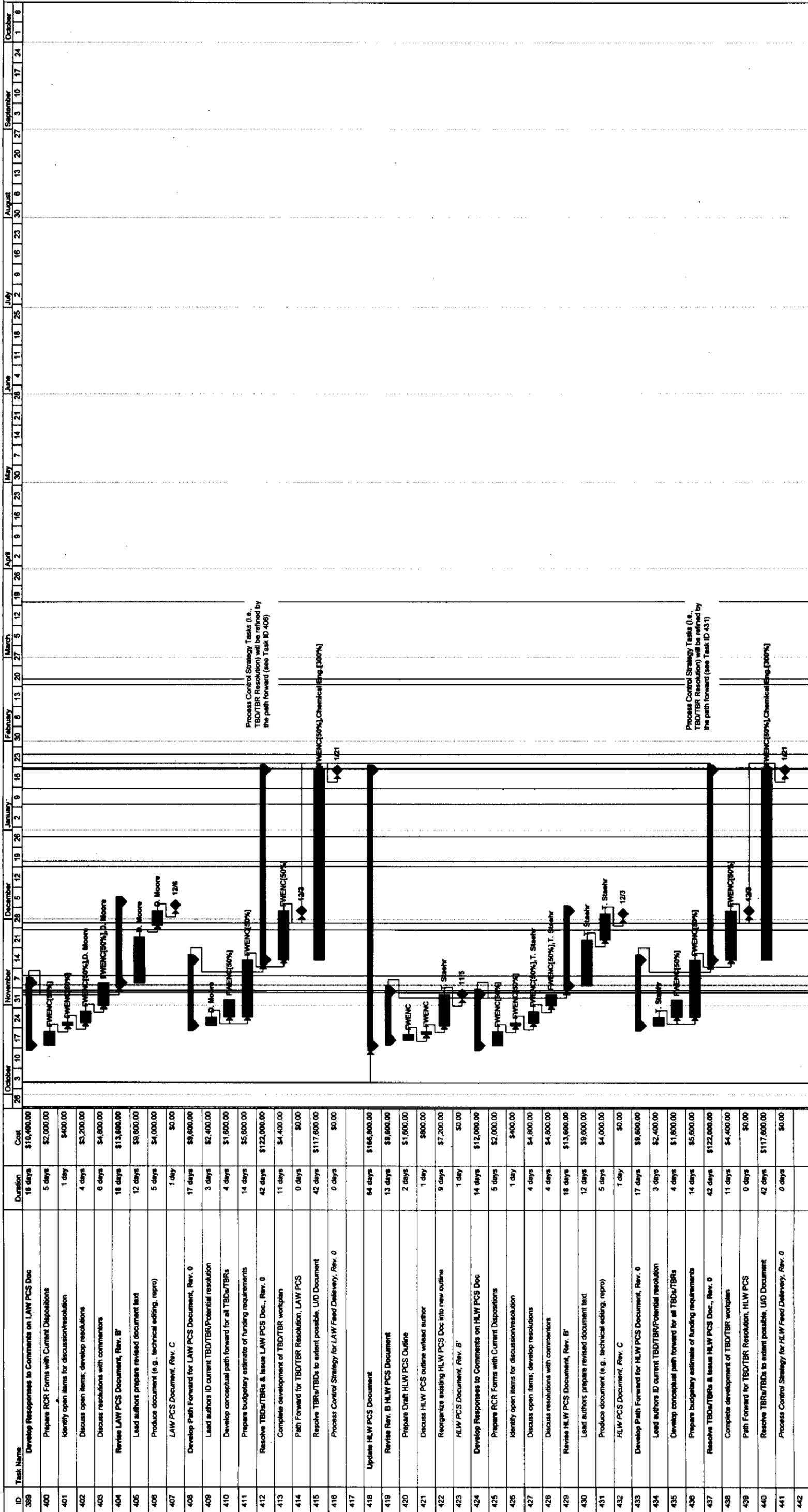


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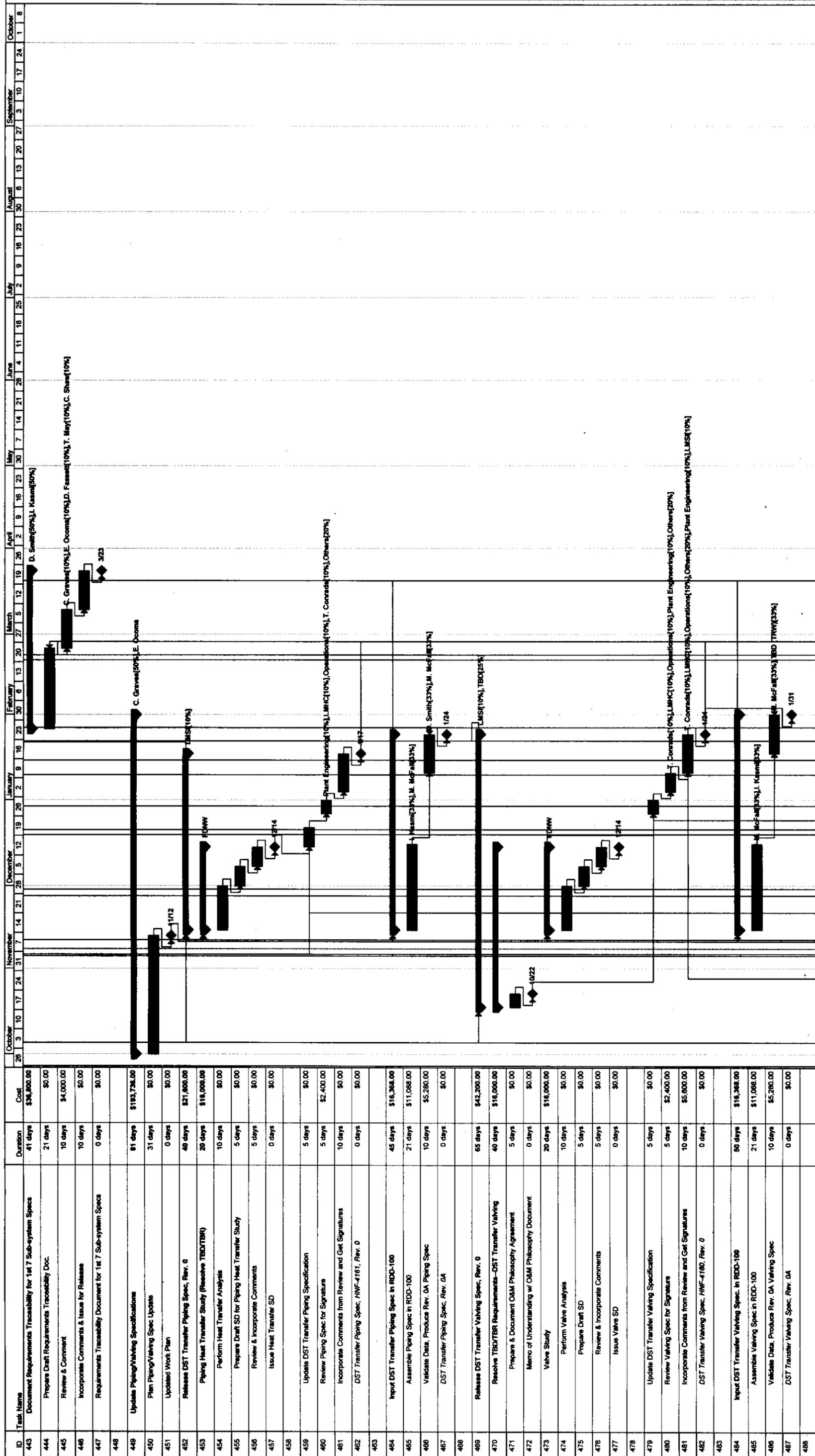


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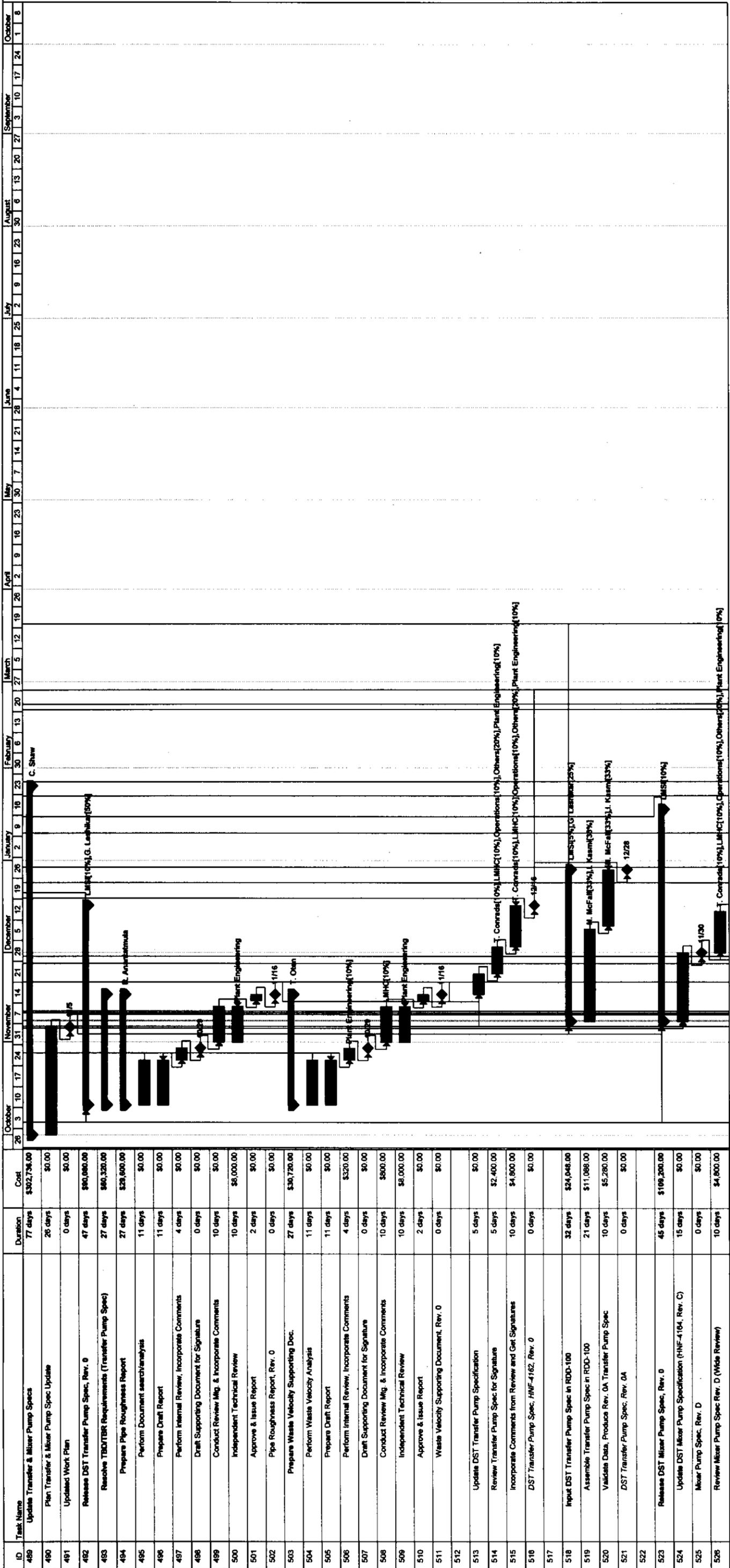


Figure 4. Integrated Schedule.

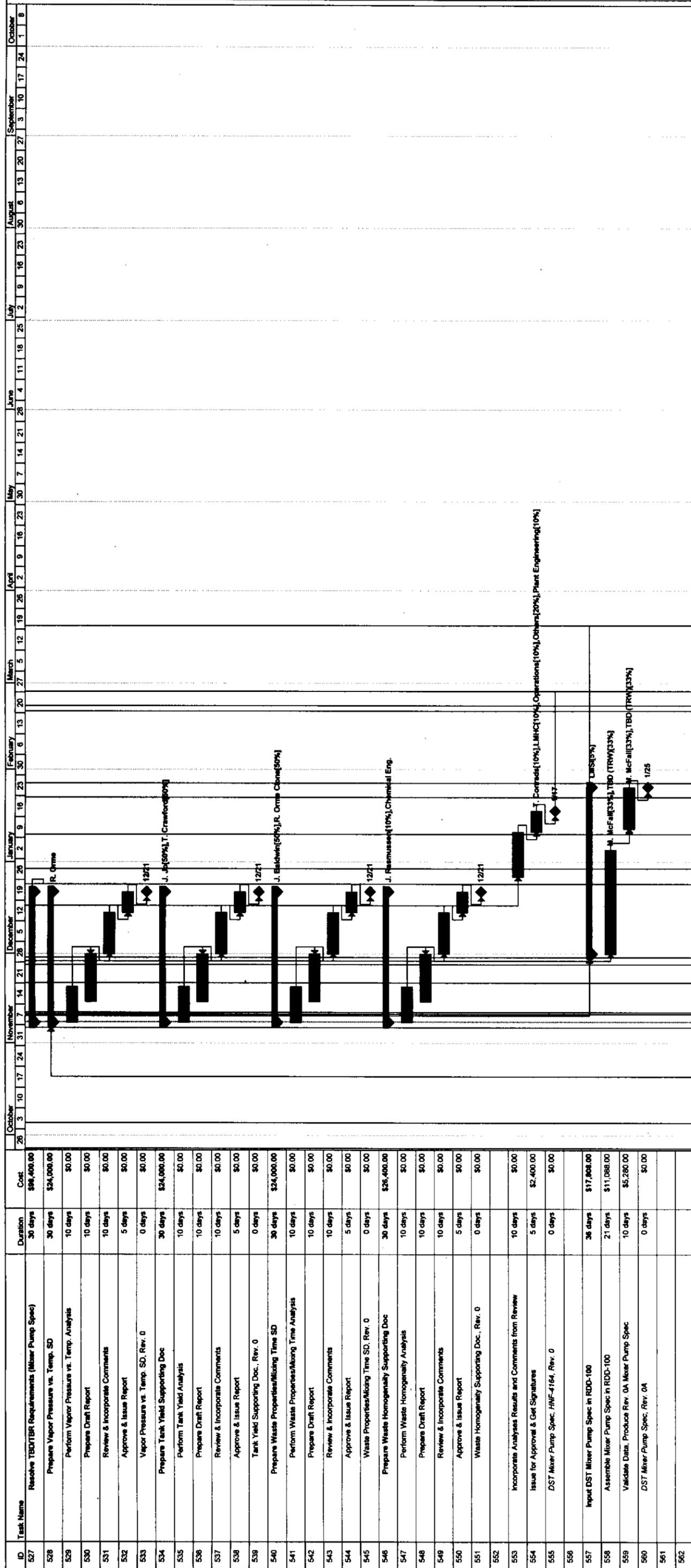


Figure 4. Integrated Schedule.

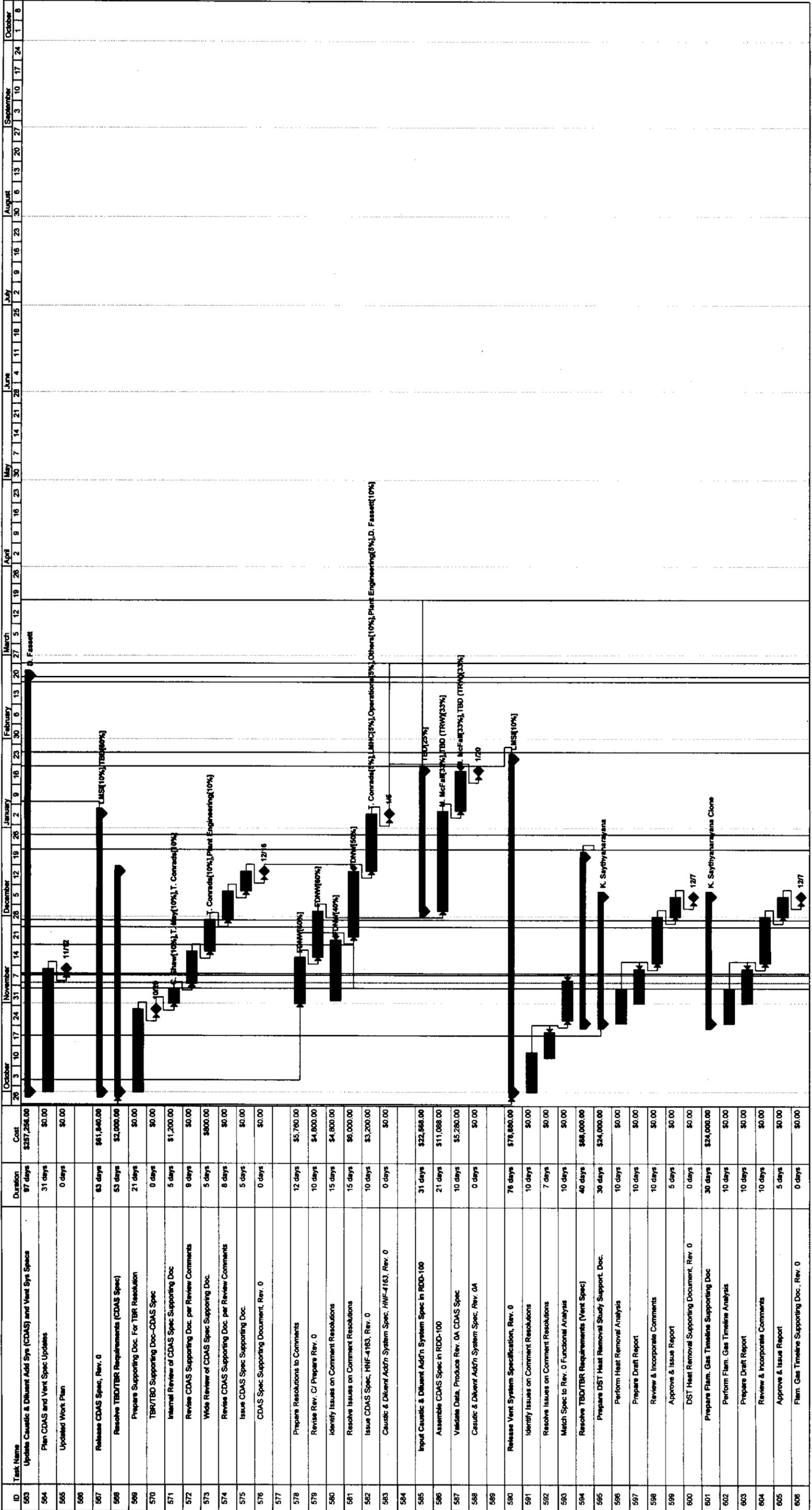
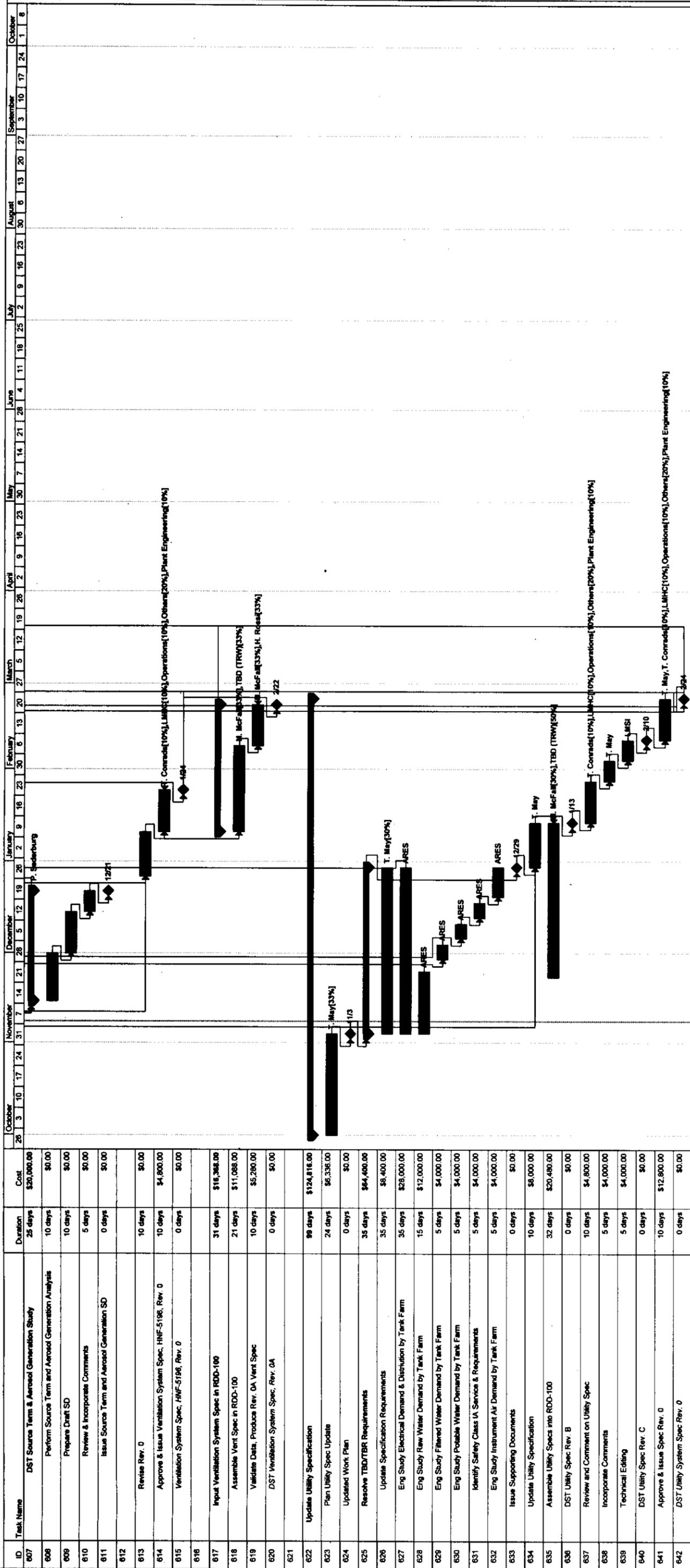


Figure 4. Integrated Schedule.



6.0 COST ESTIMATE

The detailed cost estimate of work described in Section 3.0 is shown by activity on the integrated schedule (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 rate of \$100.00/hr was used for all resources required 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

The activities described herein are non-safety class activities per HNF-PRO-704.

9.0 ENVIRONMENTAL

Environment protection laws and regulations (e.g., RCRA, NEPA, or SEPA) do not impact the activities described herein.

10.0 REFERENCES

Peck, L. G., 1998, *Tank Waste Remediation System Systems Engineering Management Plan*, HNF-SD-WM-SEMP-002, Rev. 1, Lockheed Martin Hanford Corporation , Richland, Washington.

O'Toole, S.M. and B.J. Hendel, 1999, *Waste Feed Delivery Program Systems Engineering Implementation Plan*, HNF-3384, Rev. 1, Lockheed Martin Hanford Corporation , Richland, Washington.

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

