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		Safety									
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# WORK PLAN FOR UPDATING DST SUB-SYSTEM SPECIFICATIONS (TBR-120.020)

**Charles E. Grenard**

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Richland, WA 99352

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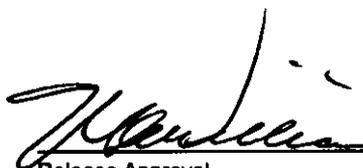
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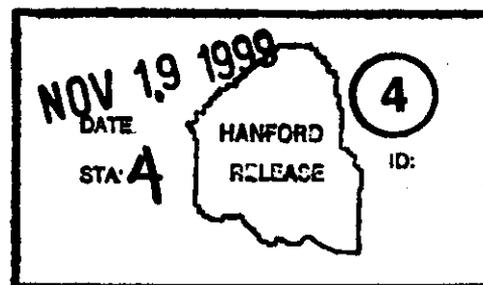
**Key Words:** Plan, Schedule, DST, System, Subsystem, ICD, Major Facility, Double-Shell Tank, Level 2, Specification, Systems, Engineering, Piping, Valving, Transfer Pump, Ventilation, Caustic Addition, Diluent.

**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 updating subsystem specifications developed during FY99.

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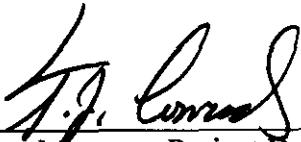
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RPP-5352  
Revision 0

**WORK PLAN FOR UPDATING DST SUB-SYSTEM  
SPECIFICATIONS  
(TBR 120.020)**

November 1999

Approved by:   
\_\_\_\_\_  
Manager, Project Definition, T.J. Conrads

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

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**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

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## WORK PLAN FOR UPDATING 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 are 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). This development entails updating letter revisions of seven DST Sub-system Specifications produced in FY 99 such that issues associated with technical requirements in the Specifications are resolved. These issues are flagged in the letter revisions of the Specifications with To Be Determined (TBD) or To Be Refined (TBR) values for requirements.

This work plan is based upon, refines and provides further detail on the scope of work covered in Technical Basis Review (TBR) 120.020.

## 2.0 SCOPE

This work plan covers the update of seven (7) 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 updated as part of this scope of work are listed below:

- DST Transfer Piping Sub-system
- DST Transfer Valving Sub-system
- DST Transfer Pump Sub-system
- DST Mixer Pump Sub-system
- DST Caustic & Diluent Addition (CDAS) Sub-system
- DST Ventilation Sub-system
- DST Utilities Sub-system

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<sup>1</sup>
- *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.

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<sup>1</sup> Note: Case 3 is the baseline case used for all specification and ICD development activities described in this work plan.

## **2.1 OBJECTIVES**

In conjunction with work being performed under other TBRs (e.g., 120.005, 120.010, 120.015), the main objective of this task is to provide the Life Cycle Projects supporting WFD a consistent, integrated, “top-down derived” set of technical requirements to which DST Sub-systems can be designed (pre-conceptual and conceptual).

## **2.2 DELIVERABLES**

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

1. Functional Analysis for DST Sub-systems, Rev. 0 and Rev. 1
2. Low Activity Waste Process Control Strategy Document, Rev. 0
3. High Level Waste Process Control Strategy Document, Rev. 0
4. DST Transfer Piping Sub-system Specification, Rev. 0
5. DST Transfer Valving Sub-system Specification, Rev. 0
6. DST Transfer Pump Sub-system Specification, Rev. 0
7. DST Mixer Pump Sub-system Specification, Rev. 0
8. DST Caustic and Diluent Addition (CDAS) Sub-system Specification, Rev. 0
9. DST Ventilation Sub-system Specification, Rev. 0
10. DST Utility Sub-system Specification, 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.

### **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**

Update and develop the DST Sub-system Specifications listed in Section 2.2. This includes participation in the creation and review of the above specifications as well as leading or assisting with activities that support the update of the sub-system specifications (e.g., Functional Analysis for DST Sub-systems; TBD/TBR requirement resolution; etc.) using a multi-contractor team. This activity also entails planning the specification update activities.

##### **3.2.2 Develop Functional Analysis for DST Sub-systems**

Perform a functional analysis in support of the DST Sub-system Specification updates 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. The results of this activity will be captured in two stages: 1) a Revision 0 release of *Functional Analysis for DST Sub-systems*, HNF-5136, to support Rev. 0 of the seven DST Sub-system Specifications listed in Section 2.2; and 2) a Revision 1 release of HNF-5136 that supports the release of the four Rev. 0 sub-system specifications released in TBR 120.015.

##### **3.2.3 Update Low Activity Waste (LAW) Process Control Strategy (PCS) Document**

Revise the LAW Process Control Strategy Document in response to comments received on Revision A of this document. Also, prepare a plan and then execute the plan to resolve To Be Determined (TBD)/To Be Refined (TBR) functions and requirements associated with monitoring and controlling LAW preparation and feed processes. Update and release the document for review and approval. Detailed activity descriptions follow. The LAW PCS Document is a deliverable of this work plan (see Section 2.2).

- Revise Rev. B LAW PCS Document: Revise Rev. B of the LAW PCS Document to discuss process objectives more clearly and explicitly. Develop an annotated outline for review and comment prior to revising the document. The existing LAW process control strategy text will be reorganized according to the outline and will include a section addressing the process control objectives. This is a new section that will be developed further as the document matures. The purpose of this revision is to demonstrate the intended format and content of the document and establish the model upon which further planning will be based. This effort will result in Revision B' of the LAW Process Control Strategy Document.
- Develop Responses to Comments on LAW PCS Document: A review comment record (RCR) will be prepared to document and disposition comments received from reviewers of the LAW process control strategy revision A. Open items will be identified, potential resolutions will be developed, and the resolutions will be discussed with the reviewers to ensure they are acceptable. The comment resolutions will be incorporated in Revision C of the LAW Process Control Strategy Document.
- Revise Rev. B' LAW PCS Document: Revision C of the LAW process control strategy will be developed according to the accepted outline and comment responses. The text will be revised and new sections created in accordance with the accepted outline. The new sections and the TBDs and TBRs will be resolved to the extent possible within schedule constraints. Efforts to completely resolve the new document sections and TBDs and TBRs will continue after revision C is issued.
- Develop Path Forward for LAW PCS Document, Rev. 0: The current revision of the LAW process control strategy contains open items that are designated as "to be developed (TBD)" or "to be refined (TBR)." A path forward will be developed to resolve the TBDs and TBRs in the document. Existing TBDs and TBRs will be identified and a resolution method for each will be suggested. The path forward will be developed from the resolution methods and a budget estimate will be prepared for resolving the TBDs and TBRs.
- Resolve TBDs/TBRs and Issue LAW PCS Document, Rev. 0: Resolve the TBDs/TBRs in the LAW PCS Document in accordance with the established path forward. This activity results in a Rev. 0 LAW PCS Document.

### **3.2.4 Update High Level Waste (HLW) Process Control Strategy (PCS) Document**

Revise the HLW Process Control Strategy Document in response to comments received on Revision A of this document. Also, prepare a plan and then execute the plan to resolve To Be Determined (TBD)/To Be Refined (TBR) functions and requirements associated with monitoring and controlling HLW preparation and feed processes. Update and release the document for review and approval. Detailed

activity descriptions follow. The HLW PCS Document is a deliverable of this work plan (see Section 2.2).

- Revise Rev. B HLW PCS Document: Revise Rev. B of the HLW PCS Document to discuss process objectives more clearly and explicitly. Develop an annotated outline for review and comment prior to revising the document. The existing HLW process control strategy text will be reorganized according to the outline. The purpose of this revision is to demonstrate the intended format and content of the document and establish the model upon which further planning will be based. This effort will result in Revision B' of the HLW Process Control Strategy Document.
- Develop Responses to Comments on HLW PCS Document: A review comment record (RCR) will be prepared to document and disposition comments received from reviewers of the HLW process control strategy revision A. Open items will be identified, potential resolutions will be developed, and the resolutions will be discussed with the reviewers to ensure they are acceptable. The comment resolutions will be incorporated in Revision C of the HLW Process Control Strategy Document.
- Revise Rev. B' HLW PCS Document: Revision C of the HLW process control strategy will be developed according to the accepted outline and comment responses. The text will be revised and new sections will be added to be consistent with the outline. The new sections and the TBDs and TBRs will be resolved to the extent possible within schedule constraints. Efforts to completely resolve the new document sections and TBDs and TBRs will continue after revision C is issued.
- Develop Path Forward for HLW PCS Document, Rev. 0: The current revision of the HLW process control strategy contains open items that are designated as "to be developed (TBD)" or "to be refined (TBR)." A path forward will be developed to resolve the TBDs and TBRs in the document. Existing TBDs and TBRs will be identified and a resolution method for each will be suggested. The path forward will be developed from the resolution methods and a budget estimate will be prepared for resolving the TBDs and TBRs.
- Resolve TBDs/TBRs and Issue HLW PCS Document, Rev. 0: Resolve the TBDs/TBRs in the HLW PCS Document in accordance with the established path forward. This activity results in a Rev. 0 HLW PCS Document.

### **3.2.5 Document Requirements Traceability for First Seven DST Sub-system Specifications**

Document the requirements traceability for the first seven DST Sub-system specifications (see Section 2.2 list) by compiling the traceability matrices in Appendix A of each of the Rev. 0 Specifications and expanding this information, as

needed, such that the technical justification for Rev. 0 specification requirements are adequately supported.

### **3.2.6 Update DST Transfer Piping & Valving Sub-system Specifications**

Update the DST Transfer Piping & Valving Sub-system Specifications for use on Life Cycle Project design activities. These specifications will be written such that Life Cycle Projects supporting WFD house consistent, integrated, requirements driven DST Transfer Piping and Valving Sub-system designs that support the WFD mission. Detailed task descriptions follow. The DST Transfer Piping Sub-system Specification (Revisions 0 and 1) and DST Transfer Valving Sub-system Specifications (Revisions 0 and 1) are deliverables of this work plan (see Section 2.2).

- **Release DST Transfer Piping Specification, Rev. 0:** Resolve outstanding TBD/TBR requirements pertaining to allowable heat loss per unit length of transfer piping. The waste velocity and pipe roughness studies being performed under the DST Transfer Pump Specification Rev. 0 release will also resolve TBD/TBR requirements (e.g., design pressure, allowable pipe roughness) and must be completed prior to the update and release of this specification.
- **Input DST Transfer Piping Specification in RDD-100:** Assemble the DST Transfer Piping Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. 0, Draft version of the DST Transfer Piping Specification and will continue to evolve with the Rev. 0 release and necessary updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.
- **Release DST Transfer Valving Specification, Rev. 0:** Resolve outstanding TBD/TBR requirements pertaining to the valve position indication accuracy, position switch accuracy and positions of mechanical stops on valves. The waste velocity and pipe roughness studies being performed under the DST Transfer Pump Specification Rev. 0 release will also resolve TBD/TBR requirements (e.g., design pressure) and must be completed prior to the update and release of this specification.
- **Input DST Transfer Valving Specification in RDD-100:** Assemble the DST Transfer Valving Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. 0, Draft version of the DST Transfer Valving Specification and will continue to evolve with the Rev. 0 release and necessary

updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.

Review and comment of the DST Transfer Piping and Valving Sub-system Specifications are activities that must also be performed before the issuance of these specifications. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

### **3.2.7 Update DST Transfer & Mixer Pump Sub-system Specifications**

Update the DST Transfer & Mixer Pump Sub-system Specifications for use on Life Cycle Project design activities. These specifications will be written such that Life Cycle Projects supporting WFD house consistent, integrated, requirements driven DST Transfer & Mixer Pump Sub-system designs that support the WFD mission. Detailed task descriptions follow. The DST Transfer Pump Sub-system Specification (Revisions 0 and 1) and DST Mixer Pump Sub-system Specifications (Revisions 0 and 1) are deliverables of this work plan (see Section 2.2).

- **Release DST Transfer Pump Specification, Rev. 0:** Resolve outstanding TBD/TBR requirements pertaining to: a) the minimum waste velocity required to maintain solids suspension; and b) the allowable pressure drop attributable to pipe roughness. This will allow for transfer pump head loss and waste critical velocity requirements to be specified. Update and release the Transfer Pump Specification to incorporate these TBD/TBR resolutions.
- **Input DST Transfer Pump Specification in RDD-100:** Assemble the DST Transfer Pump Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. 0, Draft version of the DST Transfer Pump Specification and will continue to evolve with the Rev. 0 release and necessary updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.
- **Release DST Mixer Pump Specification, Rev. 0:** Resolve outstanding comments on Rev. C of the Mixer Pump Sub-system Specification and create a Rev. D specification to initiate assembly of the specification in RDD-100. Also, resolve outstanding TBD/TBR requirements pertaining to the Net Positive Suction Head available (NPSHa) for the mixer pump operation and mixer pump cleaning effectiveness. Four studies will be completed to resolve TBD/TBR requirements in these areas as part of this activity:
  - 1) A vapor pressure verses temperature study for all wastes to be prepared. This study is critical to calculating NPSH available;

- 2) A study to define the needed yield from each source tank to meet the feed delivery schedule. This study will provide a basis upon which to evaluate  $U_0D$  or effective cleaning radius. The study may provide information that requires four mixer pumps per tank.
- 3) A study to define the initial in situ rheology of each source tank and receiver staging tank. This study will provide a basis upon which to evaluate  $U_0D$  requirements and the initial start up environment of each pump. This study will provide the basis to defend architectures that can start with several feet of solids in the tank or in highly viscous waste. Initial in situ rheology is very important in tanks with airlift circulators. This study may provide information that requires multiple mixer pumps per tank.
- 4) A study that specifies how well the waste must be homogenized prior to sampling and transfer and estimates the necessary and/or allowable time duration (hours, days, weeks) to Prepare Waste. This study will provide information on the duration of mixer pump operation and how this relates to waste temperature, which impacts the NPSH available. This study will also provide information to evaluate  $U_0D$ .

The above studies will be documented in supporting documents. The DST heat removal study being performed as part of the release of the Ventilation Sub-system Specification also has impacts on the NPSHa and must be completed prior to the update and release of the DST Mixer Pump Sub-system specification also.

- Input DST Mixer Pump Specification in RDD-100: Assemble the DST Mixer Pump Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. D version of the DST Mixer Pump Specification and will continue to evolve with the Rev. 0 release and necessary updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.

Review and comment of the DST Transfer and Mixer Pump Sub-system Specifications are activities that must also be performed before the issuance of these specifications. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

### **3.2.8 Update Caustic & Diluent Addition System (CDAS) and DST Ventilation Sub-system Specifications**

Update the CDAS and DST Ventilation Sub-system Specifications for use on Life Cycle Project design activities. These specifications will be written such that Life Cycle Projects supporting WFD house consistent, integrated, requirements driven CDAS and DST Ventilation Sub-system designs that support the WFD mission. Detailed task descriptions follow. The CDAS Specification (Revisions 0

and 1) and DST Ventilation Sub-system Specifications (Revisions 0 and 1) are deliverables of this work plan (see Section 2.2).

- Release CDAS Specification, Rev. 0: Resolve outstanding TBD/TBR requirements pertaining to the delivery of diluent and flush solutions to waste feed preparation and delivery processes in DSTs. Open issues needing resolution include the required maximum CDAS demand (flow rate & operating period) by tank farm; bulk chemical concentration limits and required CDAS chemical ranges; the required flow rate ranges to accommodate in line dilution, flush and bulk diluent additions; and diluent/flush solution routing requirements. A supporting document will be issued to document the resolution of CDAS TBD/TBR requirements resolution. Further, comments received from reviews on Rev. C of the CDAS specification will be resolved prior to issuance of the Rev. 0 specification.
- Input CDAS Specification in RDD-100: Assemble the CDAS Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. 0, Draft version of the CDAS Specification and will continue to evolve with the Rev. 0 release and necessary updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.
- Release DST Ventilation Sub-system Specification, Rev. 0: Resolve outstanding comments against Rev. C of the DST Ventilation Sub-system Specification. Also, resolve TBD/TBR requirements pertaining to: a) the amount of heat removal is required of the vent system given all heat sources in the DST (e.g., mixer pump(s) operation); b) the amount of time available to the ventilation system for clearing a flammable gas concentration problem; and c) the amount of aerosol generated in the vapor space as a result of waste processing within the tank. Upon completion of the comment and TBD/TBR resolution, the specification will be updated and released.
- Input DST Ventilation Sub-system Specification in RDD-100: Assemble the DST Ventilation Sub-system Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will commence with the Rev. C, version of the DST Ventilation Sub-system Specification and will continue to evolve with the Rev. 0 release and necessary updates subsequent to the Rev. 0 release. Rev. 1 and subsequent revisions of this specification will be output from the database.

Review and comment of the CDAS and Ventilation Sub-system Specifications are activities that must also be performed before the issuance of these specifications. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

### **3.2.9 Update DST Utilities Sub-system Specification**

Update the DST Utilities Sub-system Specification for use on Life Cycle Project design activities. These specifications will be written such that Life Cycle Projects supporting WFD house consistent, integrated, requirements driven Utilities Sub-system designs that support the WFD mission. Detailed task descriptions follow. The DST Utilities Specification, Rev. 0 is a deliverable of this work plan (see Section 2.2).

- **Resolve TBD/TBR Requirements:** Resolve outstanding TBD/TBR requirements in the DST Utilities Sub-system specification via the following studies:
  1. **Electrical Power Requirements** - The electrical demand and distribution study will extend ARES study 9905305-001, respond to review comments, and issue the combined study as a Supporting Document. The existing study lists overall electrical demand per farm in kVA. The study will review the 13.8kV system, considering other non-tank farm loads such as the Privatization Contractor. A supporting document will be issued to document the results of this study.
  2. **Raw Water/Potable Water** - This study will extend ARES Report 9905306-001 Waste Feed Delivery Raw Water Capability Evaluation, respond to review comments, and issue the combined study as a Supporting Document. The existing study provided raw water demand by tank farm grouping. The expanded study will identify raw water demand by tank farm. The new study will provide other requirements such as raw water pressures and temperatures. A supporting document will be issued to document the results of this study.
  3. **Service Air/Instrument Air** - This study will provide service air and instrument air usage by tank farm along with other requirements such as pressure, dew point, cleanliness, and temperature. Safety class uses will be identified and requirements listed. A supporting document will be issued to document the results of this study.

This activity also entails updating the DST Utilities Sub-system Specification requirements to incorporate the results of the TBR/TBD resolution activities outlined above.

- **Assemble Utilities Specification in RDD-100:** Assemble the DST Utilities Sub-system Specification in the TWRS developmental database (RDD-100) such that its functions, requirements and interfaces are integral to the other DST Sub-system specifications and the DST System Specification already in the TWRS developmental database (HNF-SD-WM-TRD-007, Rev. E). This activity will

commence with the Rev. 0, Draft version of the Utilities Specification, as produced from the above activity, and will continue to evolve culminating with the Rev. 0 release of the DST Utilities Sub-system Specification, as produced out of RDD-100.

Review & comment of the DST Utilities Sub-system Specification is an activity that must also be performed before the issuance of these specifications. See Section 3.3 for an explanation of the reviews to be performed on all deliverables.

### **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

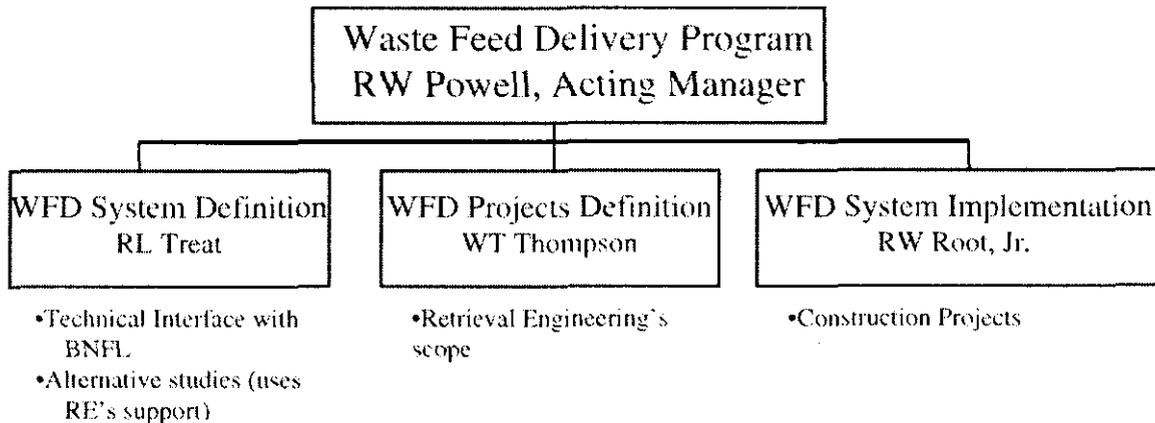
### **3.6 PRE-OPERATIONAL AND OPERATIONAL TESTS**

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.



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

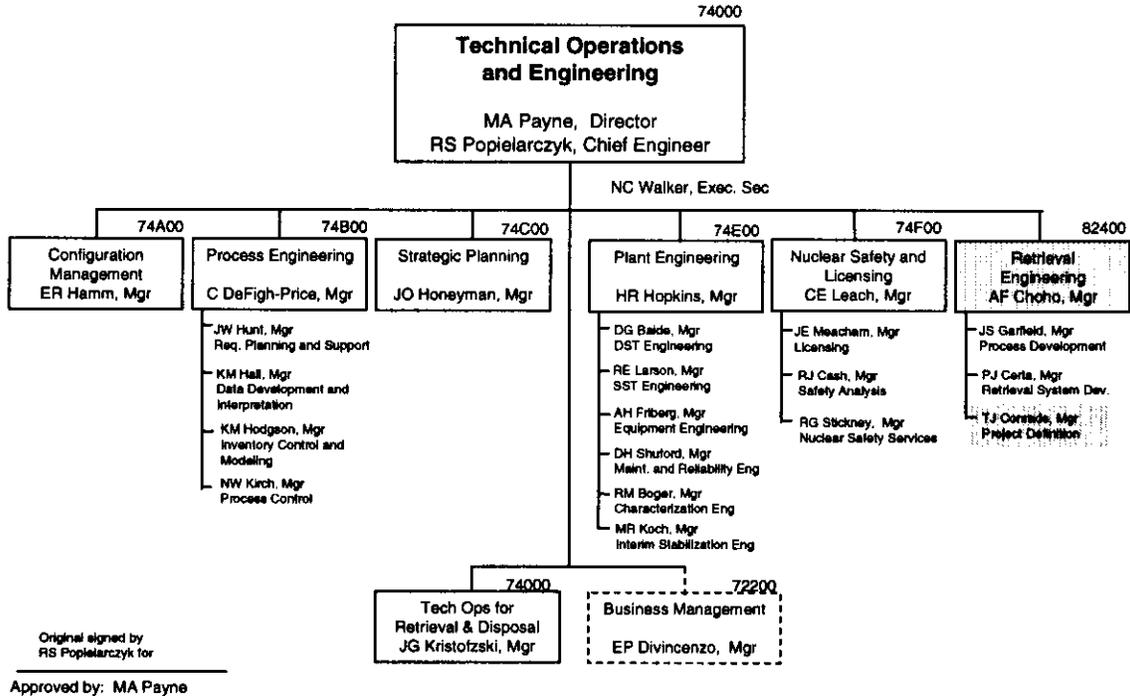
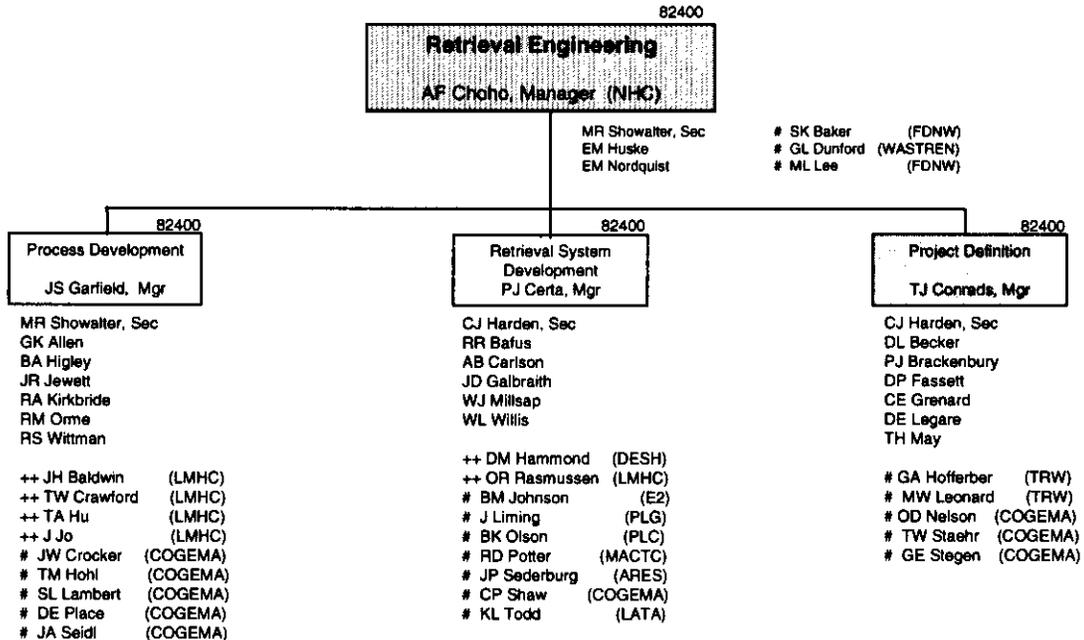


Figure 3. Retrieval Engineering Organization.



## **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 120.020, Update DST Sub-system Specifications (i.e., those activities pertaining to this work plan) shown in detail beginning with Task ID number 357.

Figure 4. Integrated Schedule.

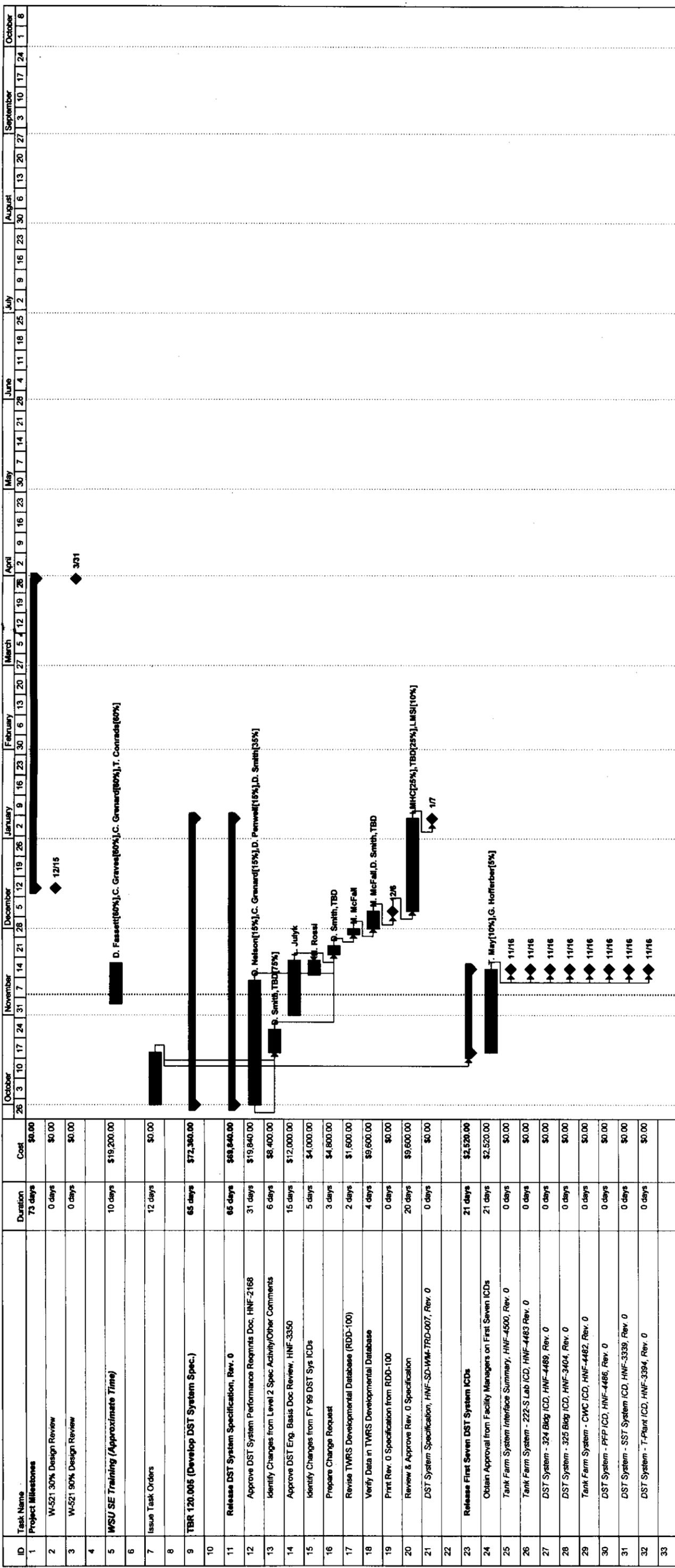


Figure 4. Integrated Schedule.

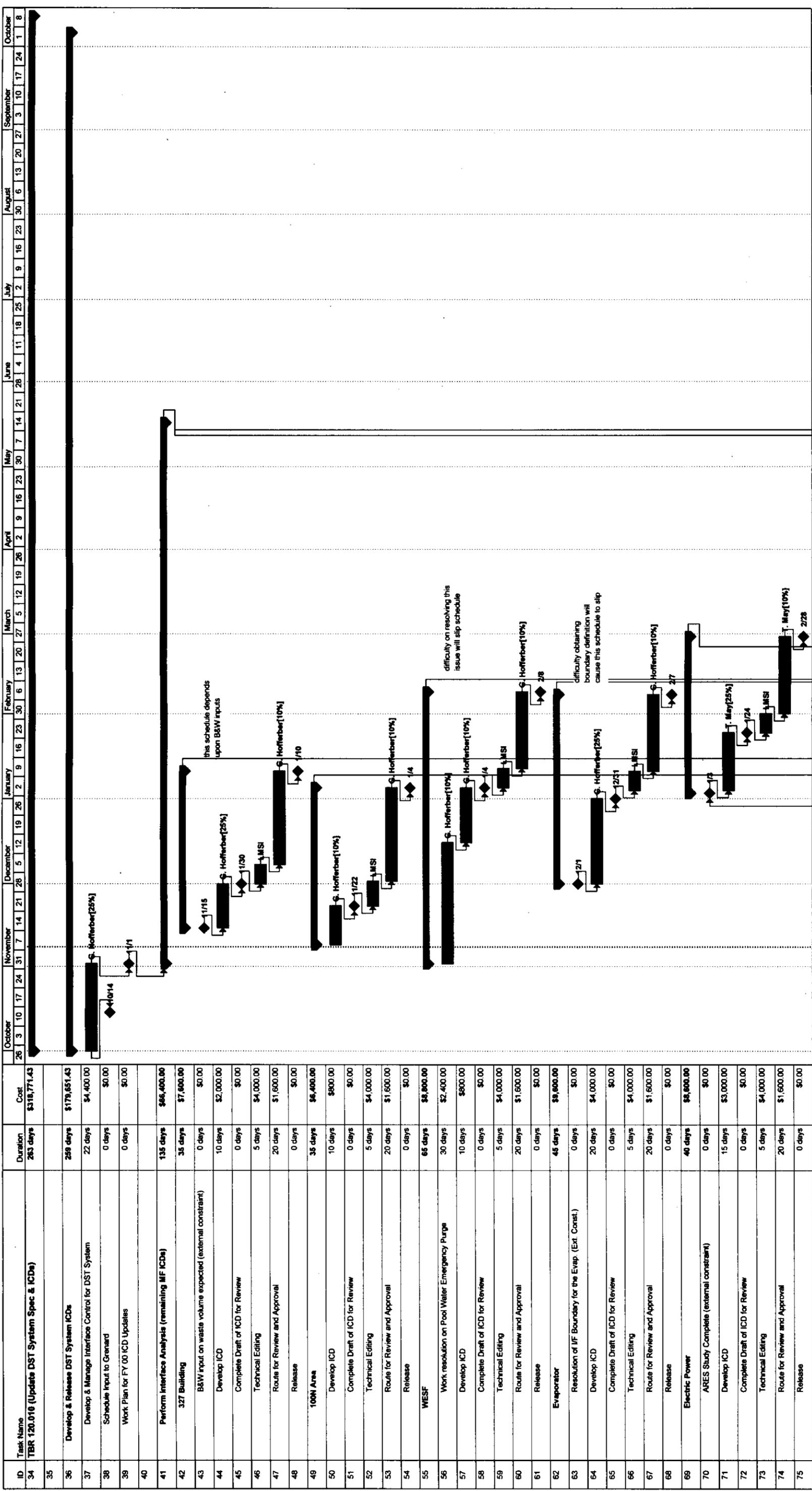
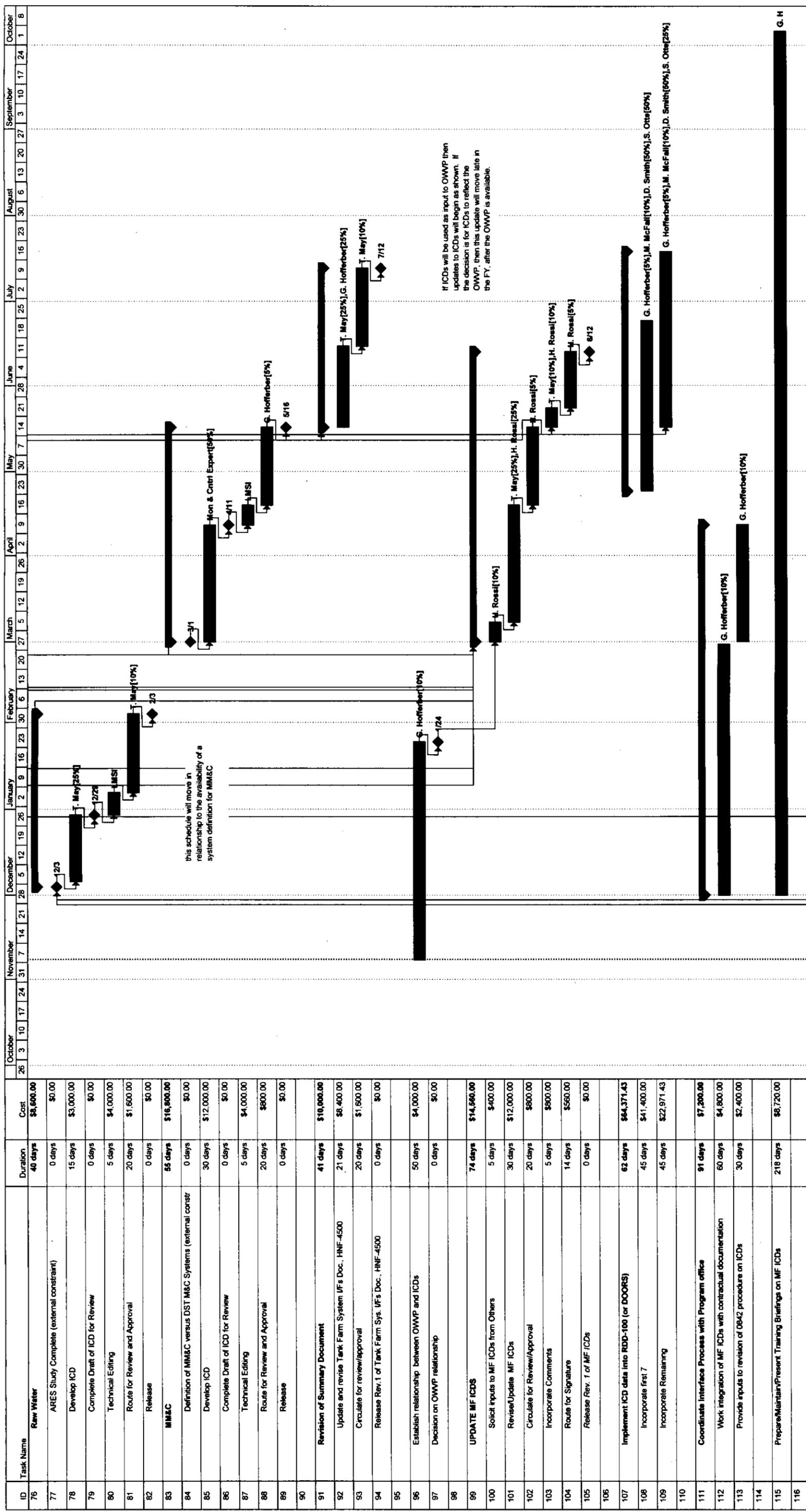


Figure 4. Integrated Schedule.



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

Figure 4. Integrated Schedule.

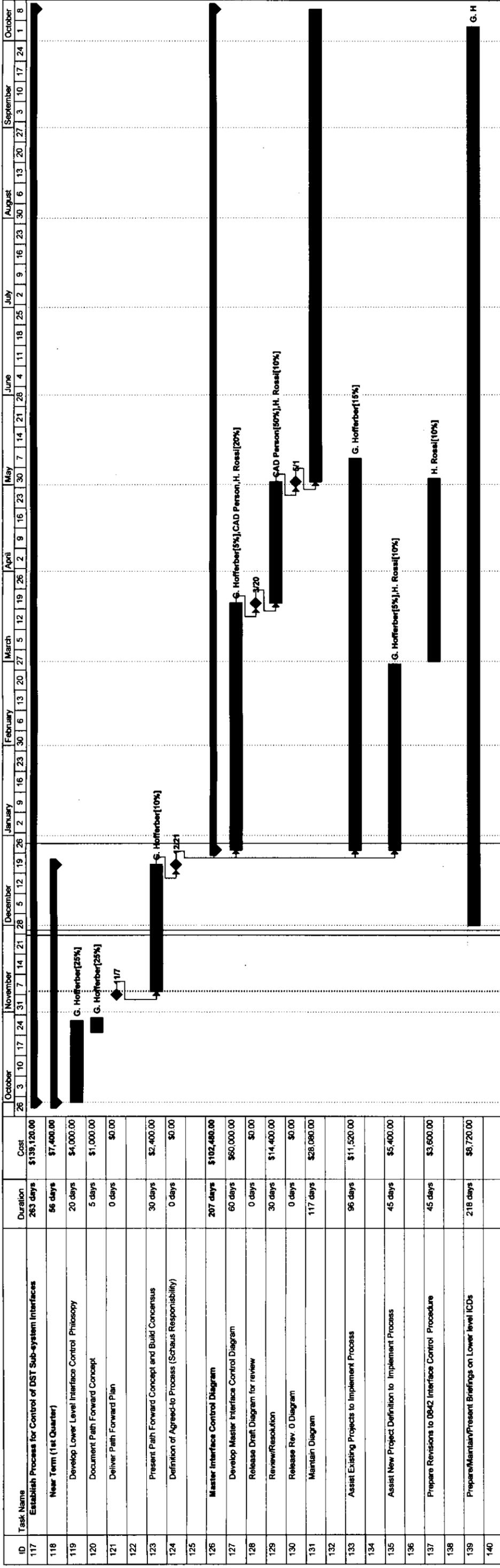
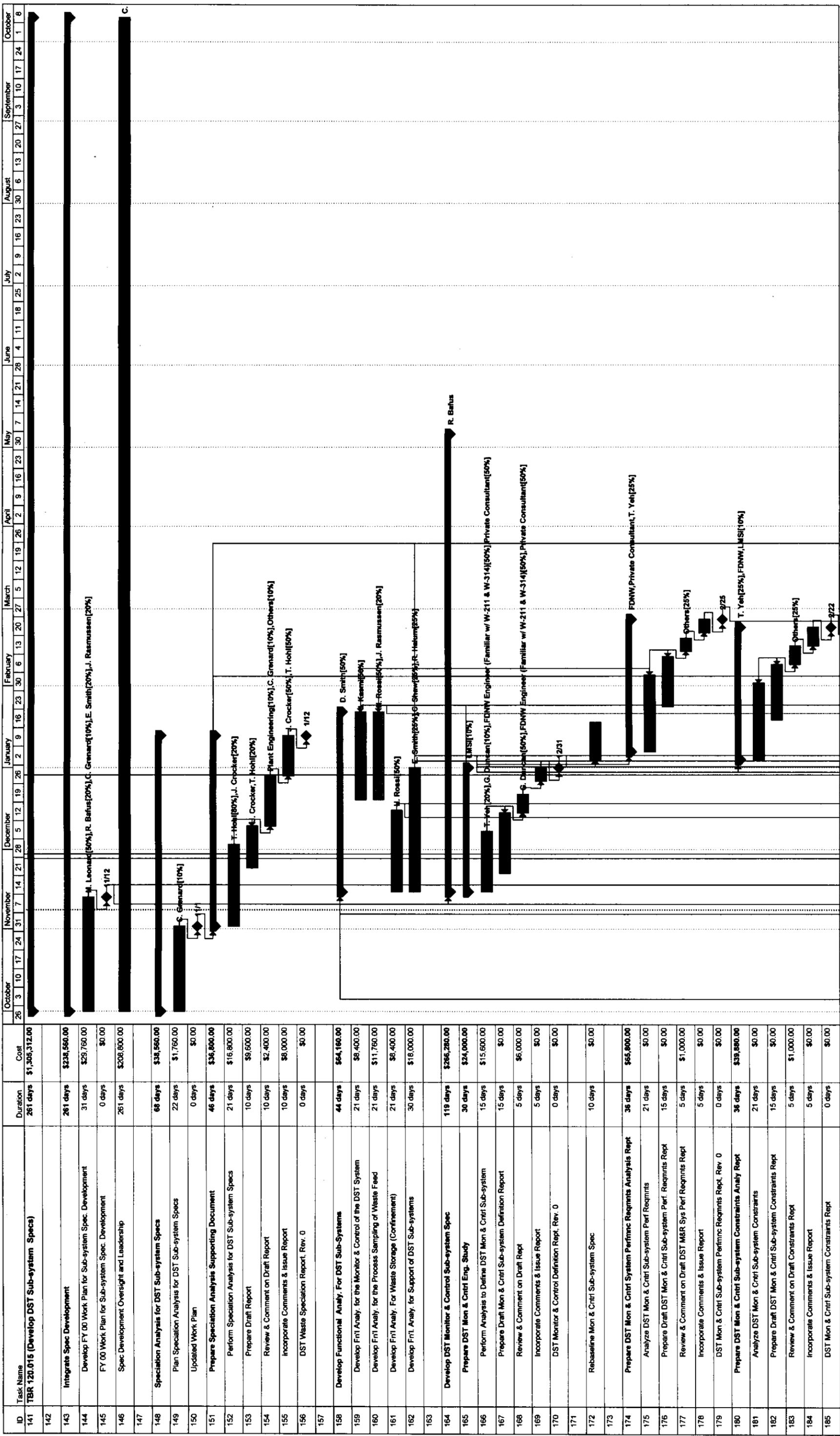


Figure 4. Integrated Schedule.



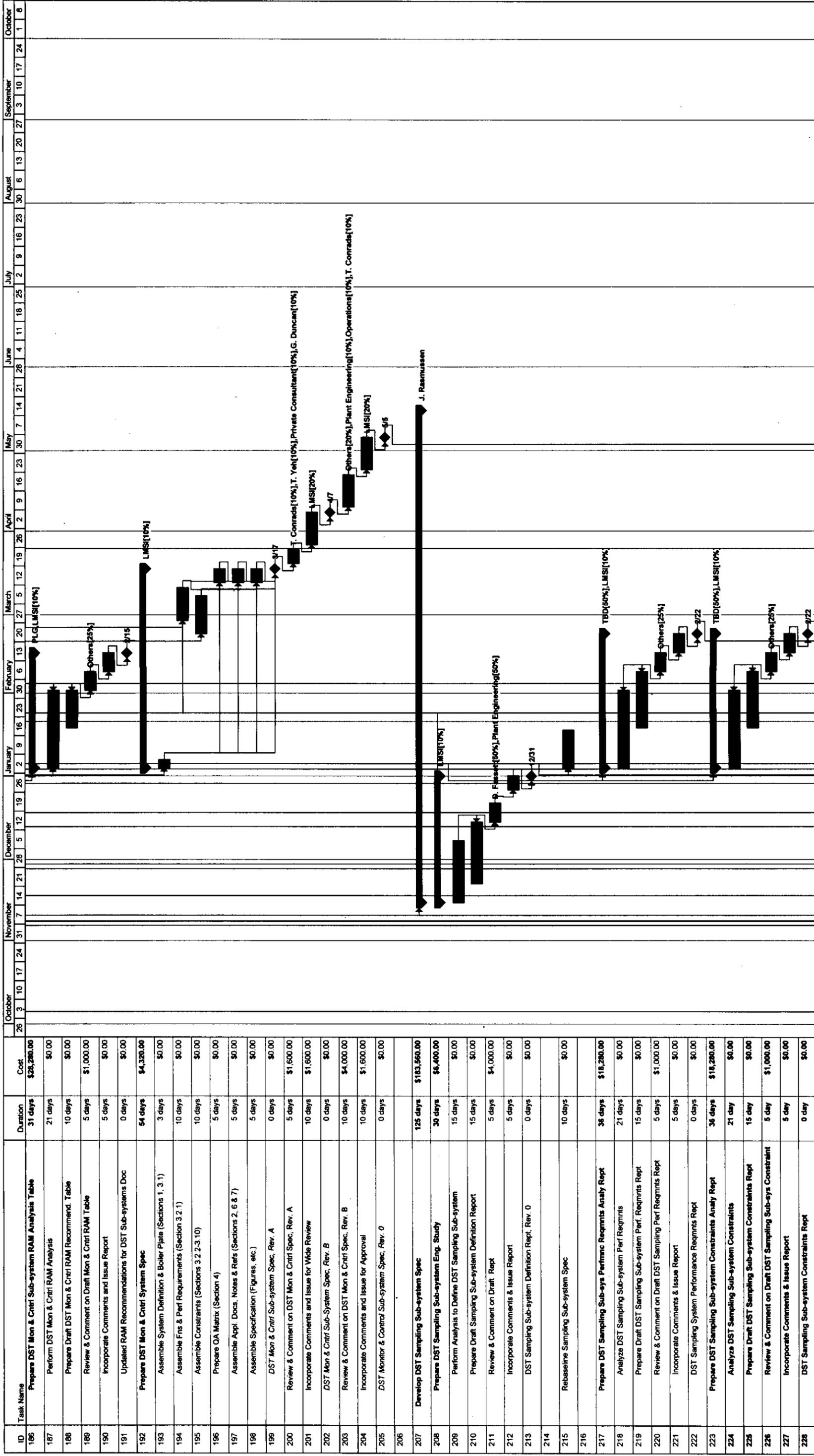


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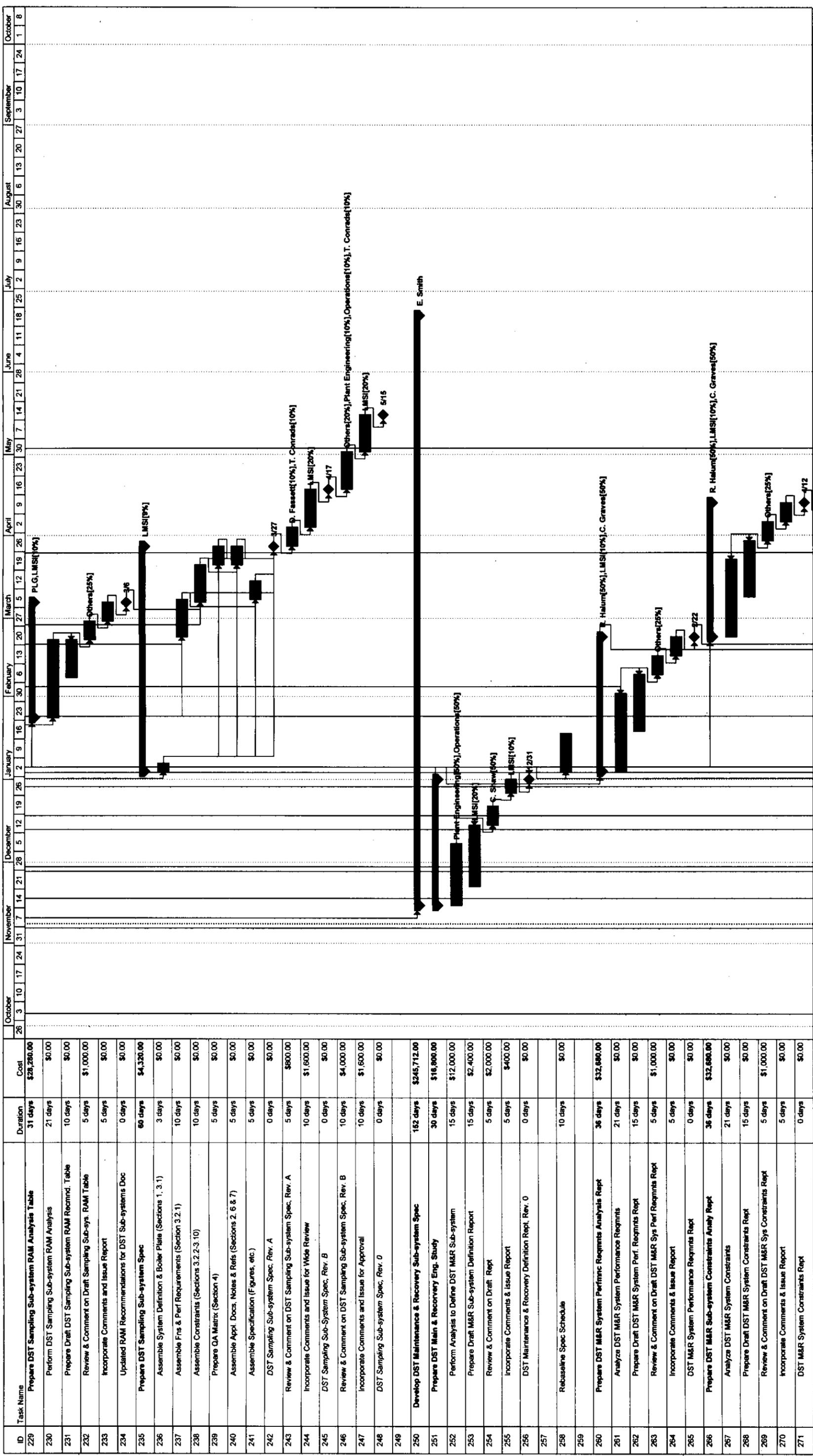


Figure 4. Integrated Schedule.

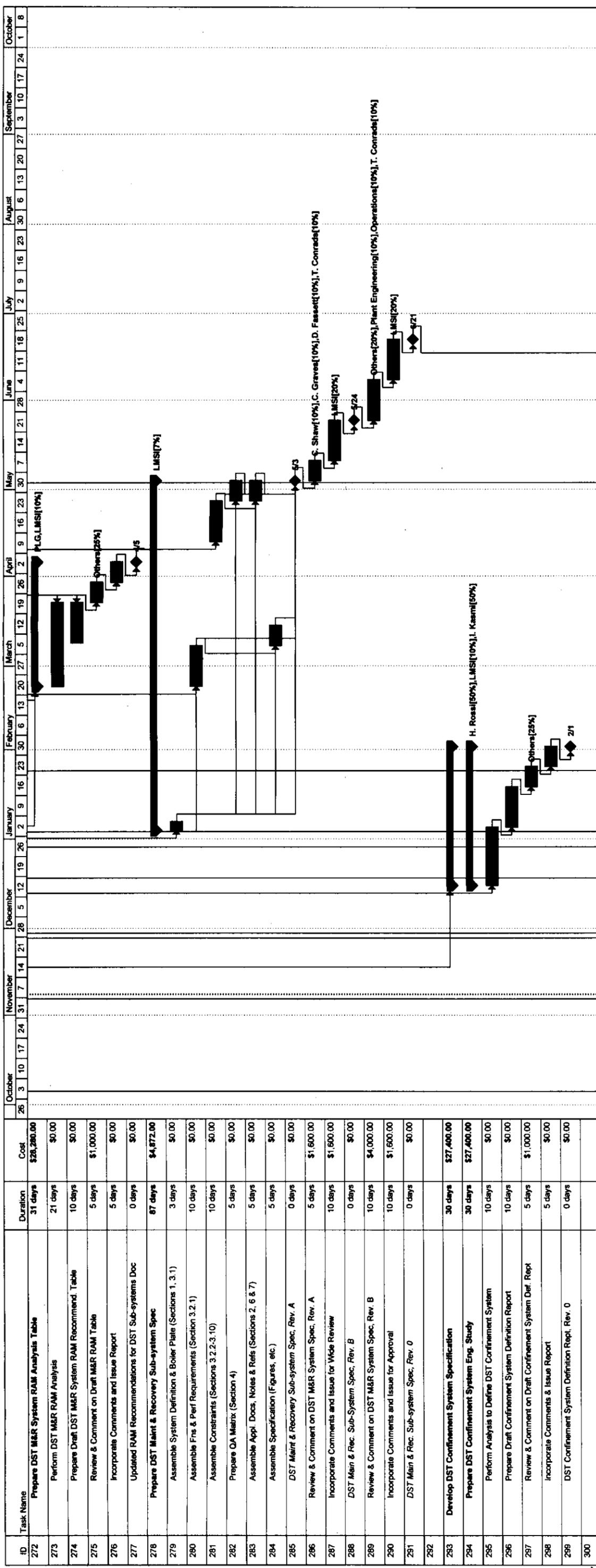


Figure 4. Integrated Schedule.

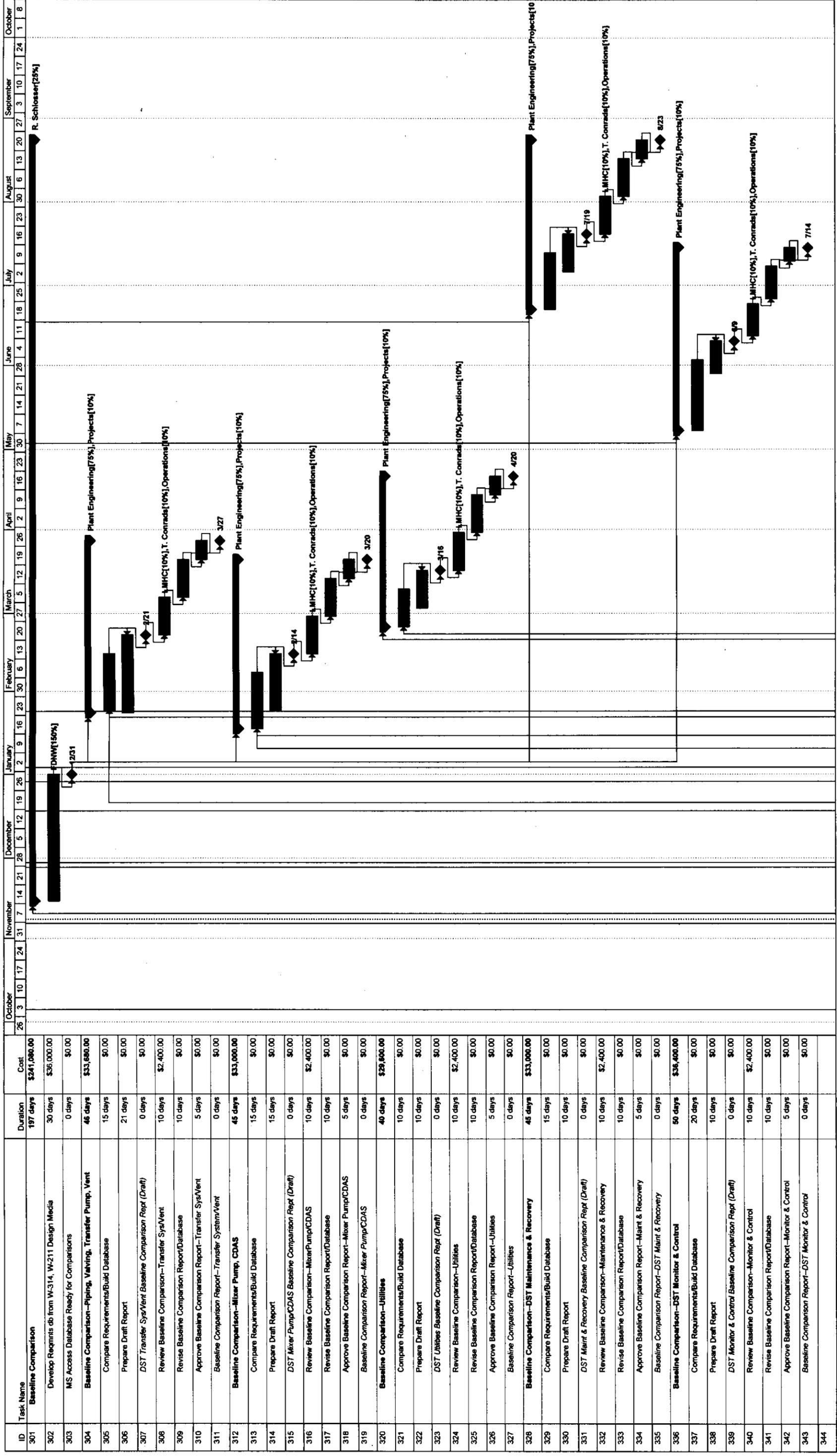


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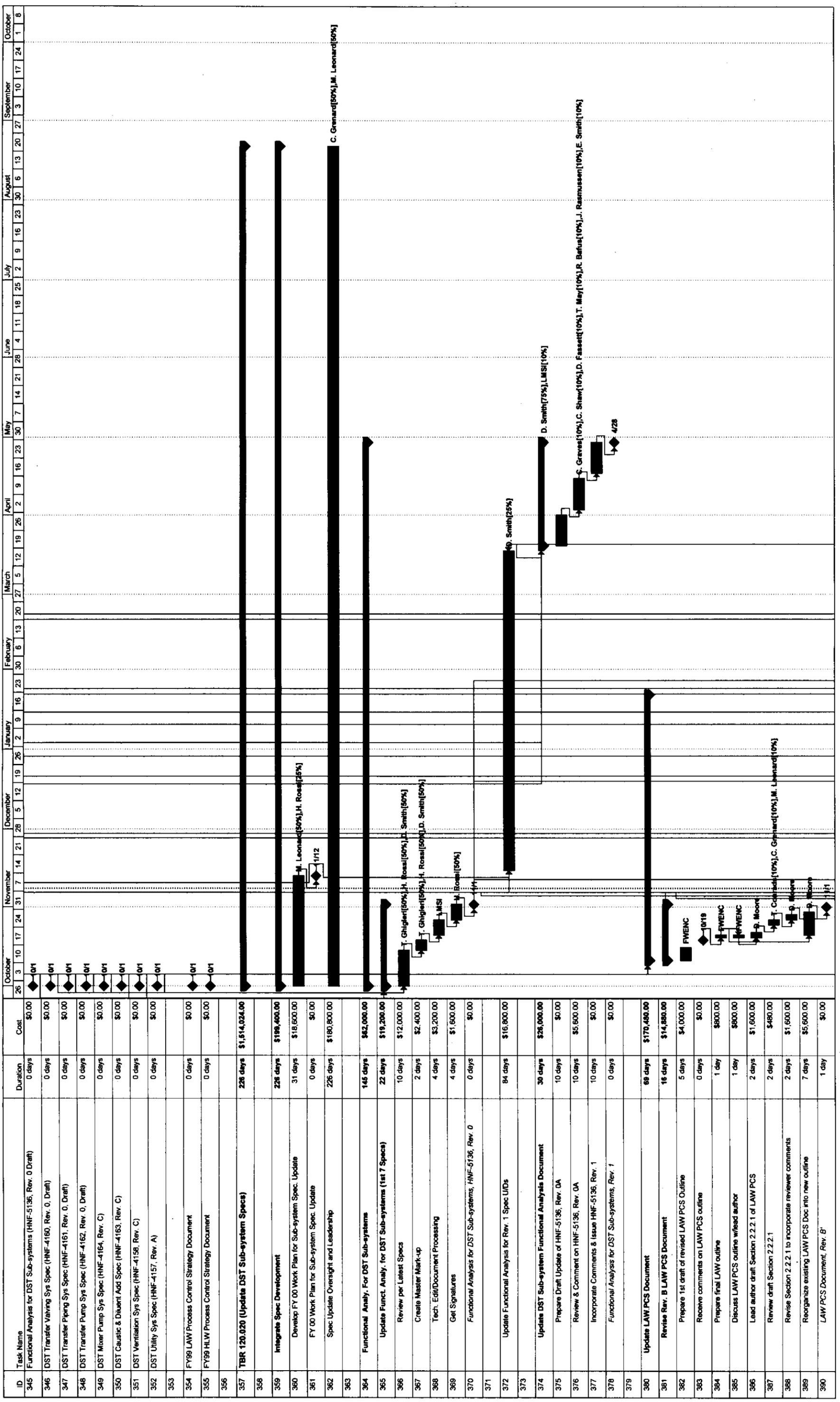




Figure 4. Integrated Schedule.

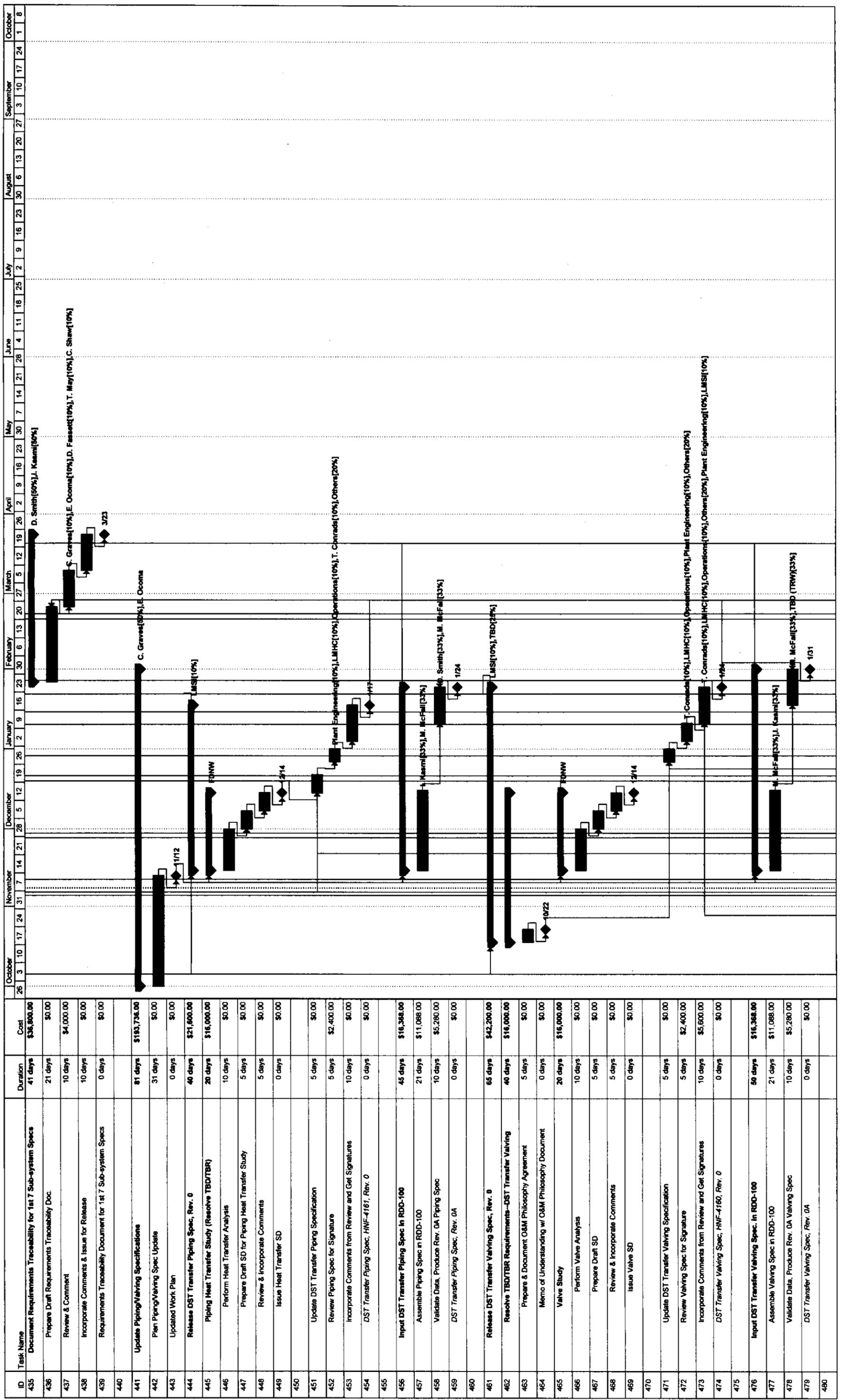


Figure 4. Integrated Schedule.

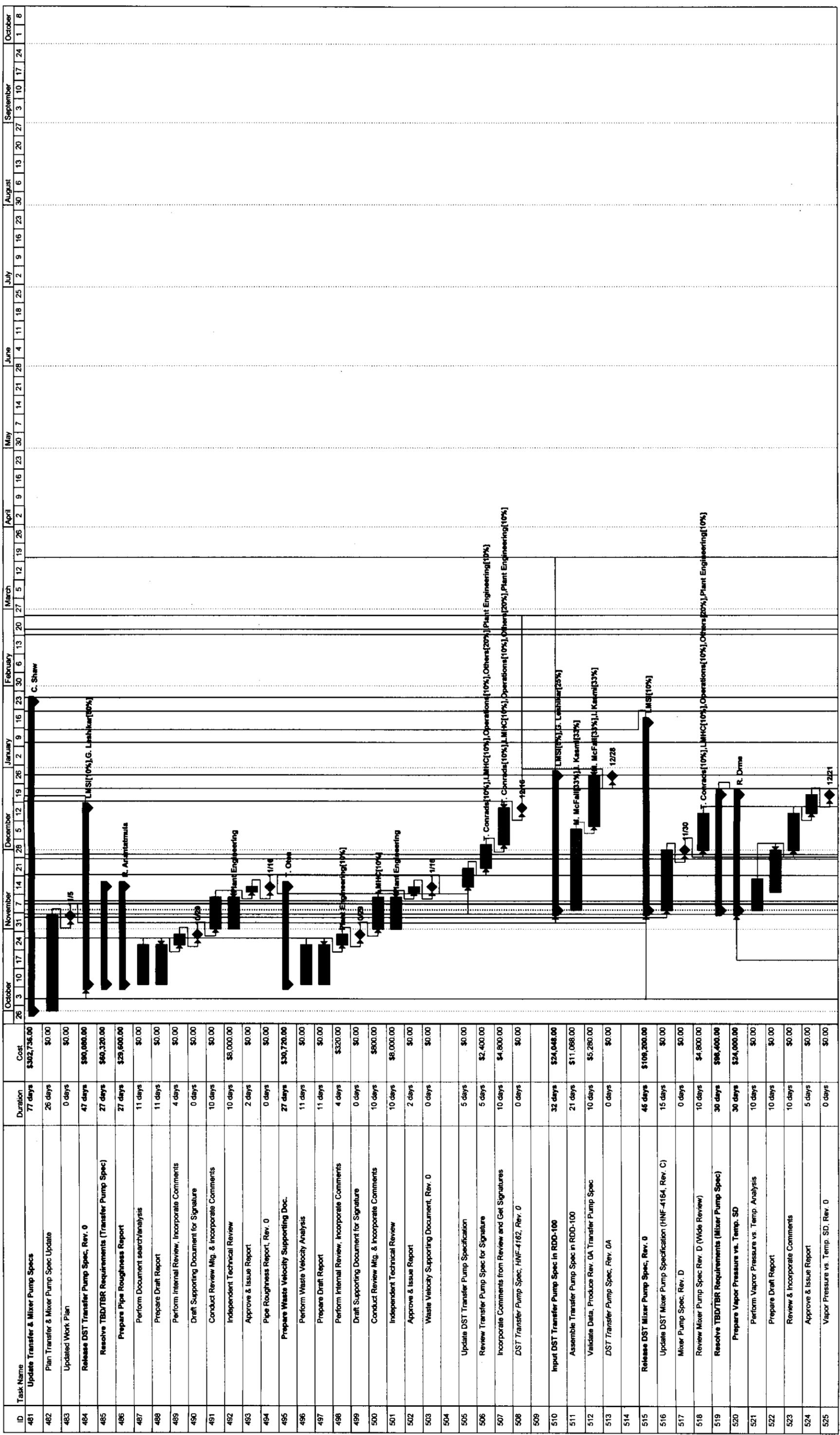


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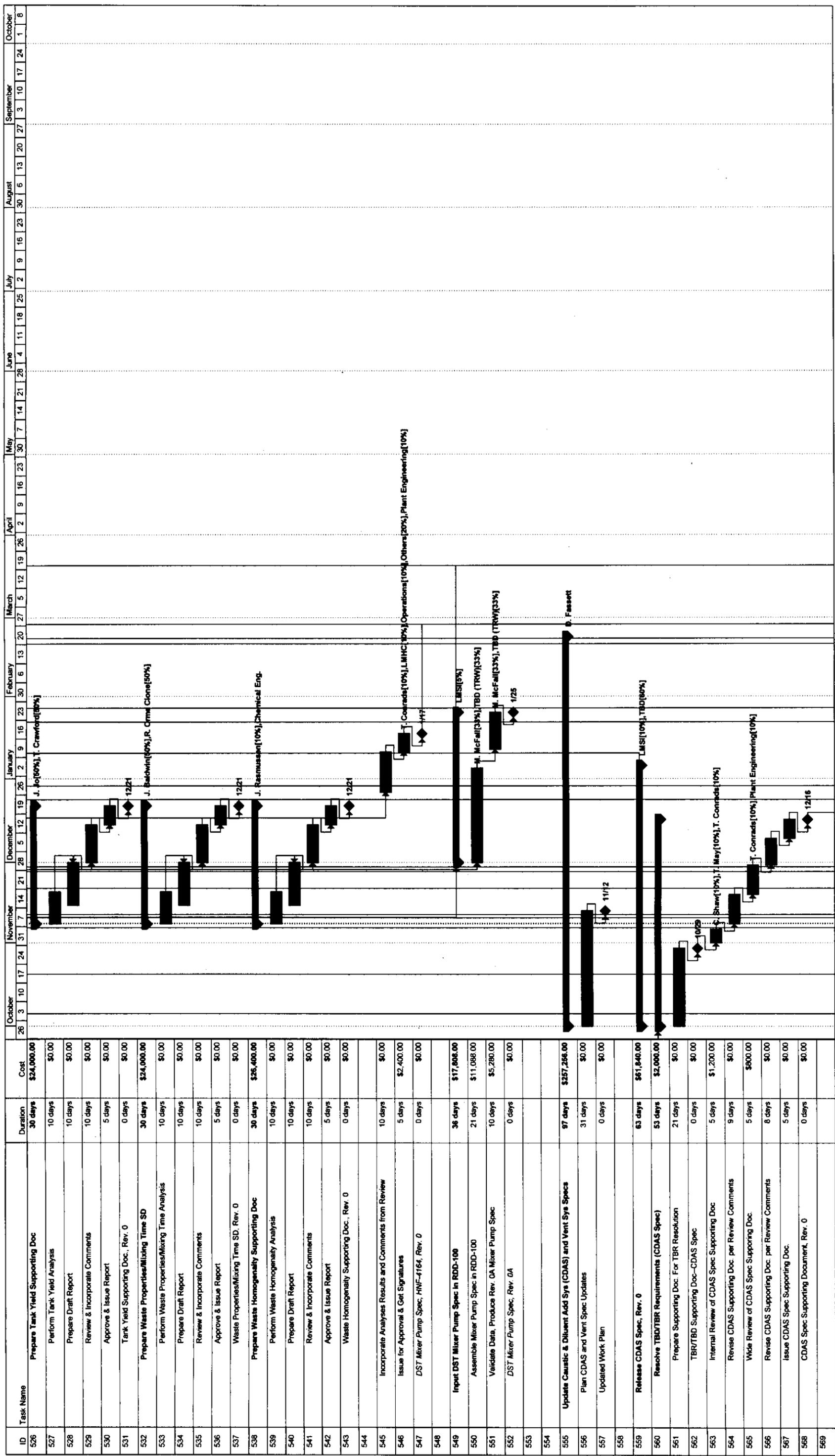


Figure 4. Integrated Schedule.

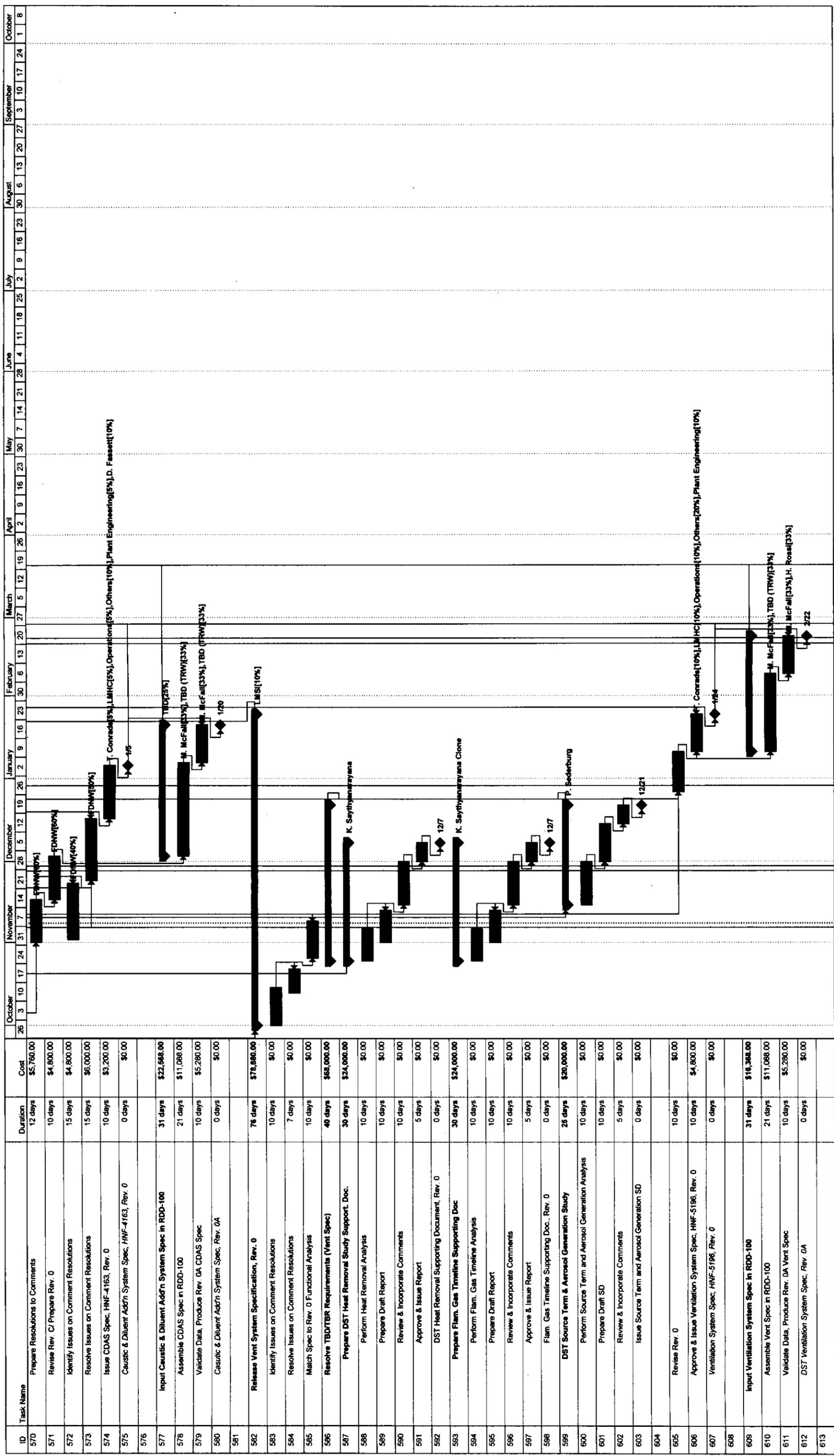
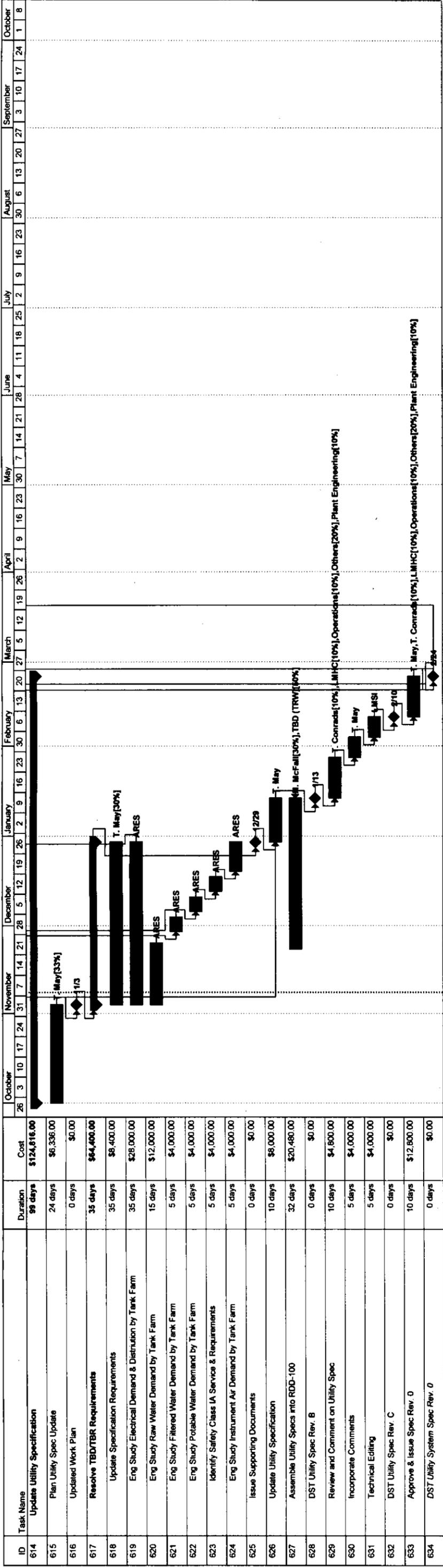


Figure 4. Integrated Schedule.



## **6.0 COST ESTIMATE**

The detailed cost estimate of work described in Section 3.0 is shown, by activity, on the integrated schedule 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 used 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

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- 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

