ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 164788

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	KM Hodgson, R2-11, 70000 373-3513	[] Yes [X] No	10/28/96
	6. Project Title/No./Work Order No. Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks/N4G3A	7. Bldg./Sys./Fac. No. N/A	8. Approval Designator N/A
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13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

This is a complete replacement of the 1995 version of this work plan.

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[X]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

This is a planned update to the *Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks* to align it with current guidance in the areas of Standard Inventory policy and change control implementation.

15. Distribution (include name, MSIN, and no. of copies)

See distribution sheet.

RELEASE STAMP

OCT 30 1996

STA: 37

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16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[ ] Yes	Additional	[ ] $	Additional	[ ] $	Improvement	[ ]
[X] No	Savings	[ ] $	Savings	[ ] $	Delay	[ ]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[ ]	Seismic/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Physics Procedure	[ ]
Operating Specification	[ ]	Interface Control Drawing	[ ]	Spares Multiple Unit Listing	[ ]
Criticality Specification	[ ]	Calibration Procedure	[ ]	Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Index	[ ]
Equipment Spec.	[ ]	Maintenance Procedure	[ ]	ASME Coded Item	[ ]
Const. Spec.	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec.	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[ ]	Electric Circuit Schedule	[ ]
OM Manual	[ ]	Operational Safety Requirement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]	Cell Arrangement Drawing	[ ]	Process Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Material Specification	[ ]	Purchase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac. Proc. Samp. Schedule	[ ]	Tickler File	[ ]
Environmental Report	[ ]	Inspection Plan	[ ]	N/A	[X]
Environmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

Signature	Date	Signature	Date
Design Authority		Design Agent	
Cog. Eng. K. M. Hodgson K.M. Hodgson	10/28/96	PE	
Cog. Mgr. N. W. Kirch N.W. Kirch	10/28/96	QA	
QA		Safety	
Safety		Design	
Environ.		Environ.	
Other M. D. LeClair M.D. LeClair	10/28/96	Other	
Process Engineering, J. P. Sloughter J.P. Sloughter	10/28/96		
TWRS Characterization, J. W. Cammann J.W. Cammann	10/29/96		
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks

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U.S. Department of Energy Contract ~~DE-AC06-87RL10930~~ 80232764-9-K001

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Abstract: This work plan addresses the Standard Inventory task scope, deliverables, budget, and schedule for fiscal year 1997. The goal of the Standard Inventory task is to resolve differences among the many reported Hanford Site tank waste inventory values and to provide inventory estimates that will serve as Standard Inventory values for all waste management and disposal activities. These best-basis estimates of chemicals and radionuclides will be reported on both a global and tank-specific basis and will be published in the Tank Characterization Database.

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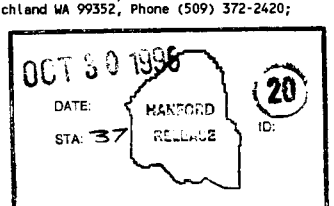

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Revision 1

WORK PLAN FOR DEFINING A STANDARD INVENTORY ESTIMATE FOR WASTES STORED IN HANFORD SITE UNDERGROUND TANKS

October 1996

K. M. Hodgson
M. D. LeClair

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Richland, Washington

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LIST OF TERMS

DNFSB	Defense Nuclear Facility Safety Board
DQO	Data quality objectives
DST	Double-shell tank
FY	Fiscal Year
HDW	Hanford Defined Waste
HLAN	Hanford Local Area Network
HTCE	Historical Tank Content Estimate
IDB	Integrated Database
LANL	Los Alamos National Laboratory
LDR	Land Disposal Restrictions
ORIGEN2	Oak Ridge Isotope Generation (computer code)
PNNL	Pacific Northwest National Laboratory
NEPA	*National Environmental Protection Act of 1969*
RCRA	*Resource Conservation and Recovery Act of 1976*
SORWT	Sort on Radioactive Waste Type
SST	Single-shell tank
TCD	Tank Characterization Database
TCR	Tank Characterization Report
TWRS	Tank Waste Remediation System
WSTRS	Waste Status and Transaction Record Summary

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WORK PLAN FOR DEFINING A STANDARD INVENTORY ESTIMATE FOR WASTES STORED IN HANFORD SITE UNDERGROUND TANKS

1.0 INTRODUCTION

Safe storage and eventual remediation of waste stored in Hanford Site underground tanks is a major function of the Tank Waste Remediation System (TWRS). Key waste management activities involve monitoring of the stored waste, management of tank farm operations, identification of potential safety issues associated with waste storage, resolution of already identified safety issues, and eventually retrieval and processing of the waste to a form suitable for long-term storage/disposal. Related safety analyses, engineering evaluations, risk assessments, and regulatory permitting activities require information about the chemical and radionuclide inventories of the tank wastes. These inventories are usually provided in the form of tank waste component inventories on a total (so-called "global") or tank-specific basis.

Global inventory information is reported in several sources including:

- *Estimated Inventory of Chemicals Added to Underground Waste Tanks, 1944 Through 1975* (Allen 1976)
- *Hanford Defense Waste Final Environmental Impact Statement* (DOE 1987)
- *Draft Environmental Impact Statement for the Tank Waste Remediation System* (DOE 1996a)
- *Chemical and Radionuclide Inventory for Single and Double-Shell Tanks* (Shelton 1996)
- *Hanford Tank Content Estimate* (HTCE) documents (Brevick 1995, Brevick et al. 1995a, Brevick et al. 1995b, and Brevick et al. 1996)
- *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 3* (Agnew 1996) which reports predictions of the Hanford Defined Waste (HDW) model developed by Los Alamos National Laboratory (LANL)
- National databases, such as the Federal Facility Compliance Act Database and *Integrated Database* (DOE 1994).

Each of the inventory reports listed above contains the best inventory knowledge available at the time of publication. Inventories reported in the *Hanford Defense Waste Final Environmental Impact Statement* (DOE 1987) are based on those established by Allen (1976) but also include those chemicals used in process operations after 1975. The inventories reported by Shelton (1996), in support of TWRS process flowsheet modeling work, correspond with *Hanford Defense Waste Final Environmental Impact Statement* (DOE 1987) values with two exceptions: (1) TWRS double-shell tank (DST) inventories were revised to reflect sampling data, and (2) TWRS single-shell tank (SST) component inventories for aluminum, chromium, phosphate, and chloride were revised as the result of a recent (1995) evaluation of these inventories. Finally, the HDW model predictions were based on historical data and do not directly correspond to any of the global inventory reports. Not surprisingly, the various global inventory sources provide inconsistent inventory values.

Tank-specific inventories are also contained in several sources including:

- *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 3* (Agnew 1996) which reports predictions of the HDW model developed by LANL
- Tank Characterization Reports (TCRs)
- *Hanford Tank Content Estimate* documents (Brevick 1995, Brevick et al. 1995a, Brevick et al. 1995b, and Brevick et al. 1996)
- *Radionuclide and Chemical Inventories for the Single Shell Tanks* (Van Vleet 1993a) and *Radionuclide and Chemical Inventories for the Double Shell Tanks* (Van Vleet 1993b)
- Multiple electronic databases, e.g., Tank Characterization Database (TCD) (PNL 1994), Braun Database (Forehand 1995), and ICF-Kaiser Hanford Company Database (Brevick 1995d).

Several attempts have been made over the years to distribute global component inventories among individual waste tanks. The distribution is performed by: (1) estimating component inventories using results from sample analyses, or (2) predicting component inventories using a model based on process knowledge and historical information. The result is that tank-specific inventory sources also report inconsistent inventory values.

Due to the existence of multiple inventory sources, component inventories used for one purpose often differ from inventories used for another purpose. Compounding this problem are uncertainties in the data that may arise from misinterpretation or omission of historical data, calculational errors, etc. Because of the differences among the many reported inventory values, the goal of the present task is to resolve these differences and to provide waste inventory estimates, both on a global and a tank-specific basis, that can serve as Standard Inventory values for all waste management and disposal activities.

Information presented in this work plan is as follows:

- Section 1.0 provides background information relating to tank inventories.
- Section 2.0 defines the scope, objectives and deliverables of the Standard Inventory task.
- Section 3.0 presents an overview of the task and provides the description, approach, responsibilities and deliverables for each of the task elements.
- Section 4.0 provides the schedule and budget profile for the Standard Inventory task.
- Section 5.0 lists the references used in this work plan.
- Appendix A presents a summary of data requirements initially used to define the scope of this task.
- Appendix B presents a discussion of content limitation and the resulting set of chemicals and radionuclides addressed by the Standard Inventory task.
- Appendix C contains an integrated schedule defining the best-basis and TCR preparation in FY 1997. Appendix C also contains a matrix of tank coordinator and Standard Inventory team member assignments by tank.

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2.0 SCOPE, OBJECTIVES, AND DELIVERABLES

This work plan defines the list of chemical and radionuclides for which Standard Inventory values will be developed and discusses the Standard Inventory development, publication and maintenance. Specific task scope items, objectives and deliverables are delineated in the following sections.

2.1 SCOPE

This task includes definition of the Standard Inventory data set, development of the initial Standard Inventory values and documentation of the pedigree and methodologies supporting these values. Also included in this scope of work are the TCD upgrades to facilitate Standard Inventory publication and the organizational/operational systems required to maintain/update both the Standard Inventory and the HDW model.

2.2 OBJECTIVES

The objectives of this task are as follows:

- Identify data user needs relative to Standard Inventory development.
- Document the methodologies used to generate the Standard Inventory values.
- Develop Standard Inventory values on both a global and a tank-specific basis by applying uniform methodologies and utilizing the best available data.
- Document the pedigree associated with the Standard Inventory values.
- Meet Defense Nuclear Facility Safety Board (DNFSB) commitments defined in the *Recommendation 93-5 Implementation Plan* (DOE 1996b).
- Publish the Standard Inventory and pedigree in a useable form.
- Establish the Standard Inventory as the "official" inventory reference for tank waste chemicals and radionuclides, and maintain change control on the Standard Inventory through a formal data review and incorporation process.
- Develop TCR best-basis section write-ups.

- Operate the HDW model including the identification and incorporation of appropriate modifications to the model.

- Integrate with the Inventory Estimate Resolution Task which will derive a statement of statistical variability to bound the Standard Inventory value with appropriate uncertainty and confidence intervals.

2.3 DELIVERABLES

The principal deliverable resulting from this effort is the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document which is to be issued as a supporting document to U.S. Department of Energy-Richland Operations Office by August 1997 and to the DNFSB by November 1997. This document will contain the Standard Inventory values and associated pedigree. The values will be reported on both a global and tank-specific basis for a set of chemicals and radionuclides. (See Section 3.1 for additional discussion of the Standard Inventory set.) Additional deliverables include the following:

- Documentation of methodologies utilized to derive Standard Inventories.

- Upgrade of the TCD to accommodate electronic storage and retrieval of the global and tank-specific Standard Inventories values and pedigree.

- Establishment of the policy and organizational approach to maintain change control on the Standard Inventory.

- Best-basis section write-ups in support of TCR issuance.

- Post deliverable documents electronically to a Hanford Local Area Network (HLAN) server to enable electronic access via TCR electronic template and technical data book.

- Maintenance/upgrade of the HDW model.

- Interface with Pacific Northwest National Laboratory (PNNL) on the Inventory Estimate Resolution Task.

3.0 TASK DESCRIPTION AND APPROACH

The following sections describe each of the task elements and the associated responsibilities and deliverable for each element. Interfaces with other activities is also described.

3.1 IDENTIFY USER NEEDS

In order to scope this task, existing Data Quality Objective (DQO) documents were reviewed and cognizant personnel were contacted to identify specific data requirements associated with: safety assessments, risk assessments, safety analyses, *National Environmental Policy Act of 1969* (NEPA) documentation, facility permits, waste treatment/disposal system design, development and implementation, etc. As a result of these efforts, a summary of data requirements was compiled and is included in Appendix A.

The data requirements defined in Appendix A are quite extensive and since available resources were limited, it was necessary to focus this task on a subset of the Appendix A data requirements. A discussion of the content limitations and the resulting set of chemical and radionuclides addressed by the Standard Inventory task is provided in Attachment B. This subset of chemicals and radionuclides was reviewed with users during the Standard Inventory User and Policy Workshops conducted in July 1996. Users emphasized the need for chemical compound inventories to support retrieval, disposal and closure activities. Since compound inventories cannot be obtained using the Standard Inventory methodologies, a Chemical Compound Modeling Task has been planned for Fiscal Year (FY) 1997. This task is directed at compound inventory definition and is described further in Section 3.10.

Responsibility: Standard Inventory Team

Deliverable: User Requirement Discussion to be issued as chapter of the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document

Status: Complete.

3.2 DEVELOP STANDARD INVENTORY VALUES

As discussed in Section 1.0, there are many sources of tank waste inventory data. In most cases these sources report inconsistent inventory values. This task element involves derivation of the standard chemical and radionuclide inventories, on both a global and tank-by-tank basis. This is done by compiling and evaluating existing inventory sources (i.e., sample-based inventories, HDW model projections and TWRS flowsheet inventories. [Shelton 1996]). Historical information (e.g., process flowsheets, fuel processing records,

purchase records and process facility logbooks, chemical usage records) and sample analysis data serve as a basis for reconciling the various inventory sources. Much of the information resulting from a PNNL task to statistically compare actual sample results to the HDW model predictions may also support this evaluation effort.

Such a reconciliation process aids in the identification of inventory source discrepancies and errors, and results in the preferred inventory value, referred to as the Standard Inventory value. This value serves as the official inventory value until which time additional data is made available to warrant another iteration of this process. Figure 3.2-1 provides an overview of the process for developing Standard Inventory values. (Note: the dashed box around the change control board indicates that this board is not currently in place. Transition to maintenance of Standard Inventory and the HDW model are further discussed in Sections 3.6 and 3.7, respectively.) The schedule for completing the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document is provided in Section 4.2.

Responsibility: Standard Inventory Team

Deliverable: The *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document with Standard Inventory values reported on a global and tank-specific basis; quarterly status reports

Status: In progress.

3.3 DOCUMENT THE PEDIGREE FOR STANDARD INVENTORY VALUES

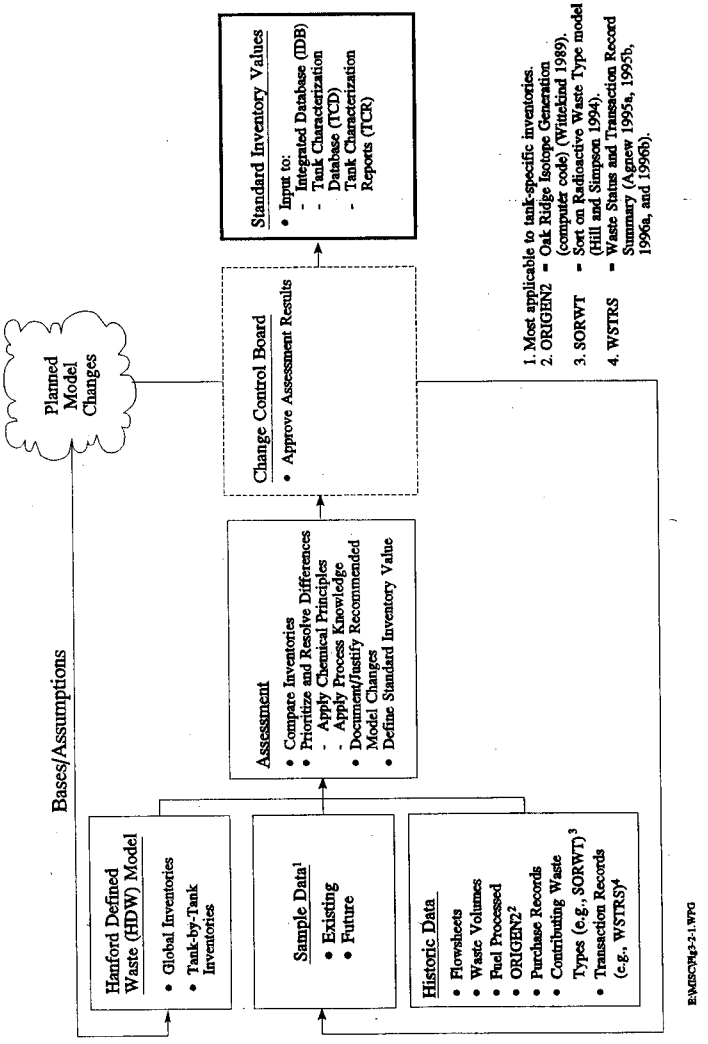
Full documentation of the calculations, references and supporting information used to derive each Standard Inventory value is required. This documentation serves as the pedigree on the Standard Inventory value and will be reported in sufficient detail to support defense of Standard Inventory values if such values are ever challenged. Such documentation also serves as a historical record to be used if detailed information relating to an inventory value is required. The schedule for issuing interim drafts for review and for publication of the final document is provided in Section 4.2.

Responsibility: Standard Inventory Team

Deliverable: Section in the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document for each global and tank-specific write-up

Status: In progress.

Figure 3.2-1. Development of Global and Tank-Specific Standard Inventory Values.



3.4 DOCUMENT THE METHODOLOGY USED TO DERIVE INVENTORIES

Within the Standard Inventory methodology, depending on the type and quality of information available to an author, various approaches can be used to derive Standard Inventory values. Details of the methodology and the various approaches may be thought of as something similar to desk instructions and will subsequently be referred to as "the methodology." At a later date, individuals not currently on the Standard Inventory Team may be tasked with maintenance of the Standard Inventory values. To aid this transition and to assure quality control on the Standard Inventory values, the methodology is to be documented and utilized. As new approaches are demonstrated, they may be added to the methodology.

Responsibility: Standard Inventory Team

Deliverable: Chapter of the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document

Status: In progress.

3.5 PUBLISH THE STANDARD INVENTORY AND PEDIGREE

During the course of this task, Standard Inventory best-basis write-ups will be accessible via an HLAN server. The Standard Inventory will be formally issued as a hard copy document in August 1997. However, to support future maintenance of the inventory, the intent is to publish the Standard Inventory on a media that is easily accessible by data users, capable of being readily updated and has the capacity to archive Standard Inventory values and pedigree. An electronic format has been selected for future storage and retrieval of the Standard Inventory, and the TCD has been recognized as an existing resource for providing these capabilities.

This task element involves the TCD modifications required to meet the Standard Inventory publication needs. These needs include mechanisms for loading the Standard Inventory values into the TCD, standard report generation, inventory archiving, hyperlinks to Standard Inventory pedigree and references, and mechanisms to support change control implementation and change control board operation. The TCD upgrades are to be implemented in four phases. Phase 1, which provided data structures for global and tank-by-tank inventory storage, data entry/loading mechanisms, user access to inventories via Web-based query and technical basis references as bibliographical entries, was completed in FY 1996. The remaining three phases will be implemented in FY 1997 per the schedule and are summarized below:

Phase 2, Data Loading and User Support: This phase will provide additional information reporting, including the ability to generate the information in the inventory summary tables based on date supplied by user. The data entry mechanism will also be improved.

Phase 3, Reference Text and Reporting: This phase of work will allow for storing and reporting of pedigree and bibliography text.

Phase 4, Change Control Implementation and Board Support: Implementation of the configuration change, pending change and revision tables will occur in this phase of work. Tools to support users in submitting changes to the change control board will also be developed.

Responsibility: Tank Characterization Database Administrators with direction and support from the Standard Inventory team

Deliverable: Standard Inventory publication, reporting, and change control support mechanisms

Status: In progress.

3.6 MAINTAIN CHANGE CONTROL ON THE STANDARD INVENTORY

Much of the work described in Section 3.5 will provide the architecture required to maintain change control on the Standard Inventory values. However, for the Standard Inventory values to remain useful, they must be periodically updated and modified to reflect current information available on tank contents. As sample analysis results, modeling data, and other information becomes available, it must be evaluated and reconciled with the existing data in much the same fashion that the initial Standard Inventory values were derived. Revised Standard Inventory values and associated pedigree must then be approved by the change control board and incorporated into the TCD. Figure 3.6-1 provides an overview of Standard Inventory change control operation developed during the Standard Inventory User and Policy Workshops conducted in July 1996. This figure will serve as the basis for the work under this task element and much of the work described in Section 3.5.

This task will define the details of the protocol to be followed for proposing and approving changes to the Standard Inventory and for updating the TCD to report revised Standard Inventory values. Responsibilities, authorities, methodology application, quality assurance practices, and database configuration control will also be addressed.

Responsibility: Standard Inventory Team

Deliverables: Draft Organization Charts and Charters,
Draft Procedures and Standards

Status: In progress.

3.7 OPERATE AND MAINTAIN THE TANK CONTENT MODELS

The ORIGEN2 model (Wittekind 1989) output serves as input to the HDW model (Agnew 1996) which in turn partitions the radionuclide inventory to the tank system and generates tank-specific radionuclide inventories. As currently conceived, the HDW model (Agnew 1996) and the ORIGEN2 model will play a significant role in the maintenance of Standard Inventory values. It is foreseen that the models will be tools to aid in making decisions regarding future changes to the Standard Inventory values. Figure 3.7-1 depicts the HDW model predictions serving as input to any assessment process aimed at evaluating and revising an existing Standard Inventory value.

Per the LANL schedule, the beta version of the user interface for the HDW model will be available by mid-July 1997. In this same time frame, control of the HDW model will be transferred to Hanford. No major revisions or upgrades to the model can be accomplished in the remainder of FY 1997, however, advanced copies of the model can be obtained for evaluation and assessment. Efforts in FY 97 will be directed at establishing an understanding of useful improvements which can be made to the model and the specific role the model will play once control of the model has been transferred to Hanford.

The ORIGEN2 model and associated codes were revised in 1996 to support the Standard Inventory task. Any model improvements, based on new information or the outcome of reconciling the HDW model predictions, will be identified. Such efforts will serve to scope tank content model work for FY 1998, including the completion of a DNFSB 93-5 milestone (5.6.3.1.i) to update the tank content models or define the limitations of the models (DOE 1996b).

Responsibility: Standard Inventory Team

Deliverables: Multi-Year Program Plan input for model improvements and operation

Status: FY 1997 task.

Figure 3.6-1. Standard Inventory Change Control Operation.

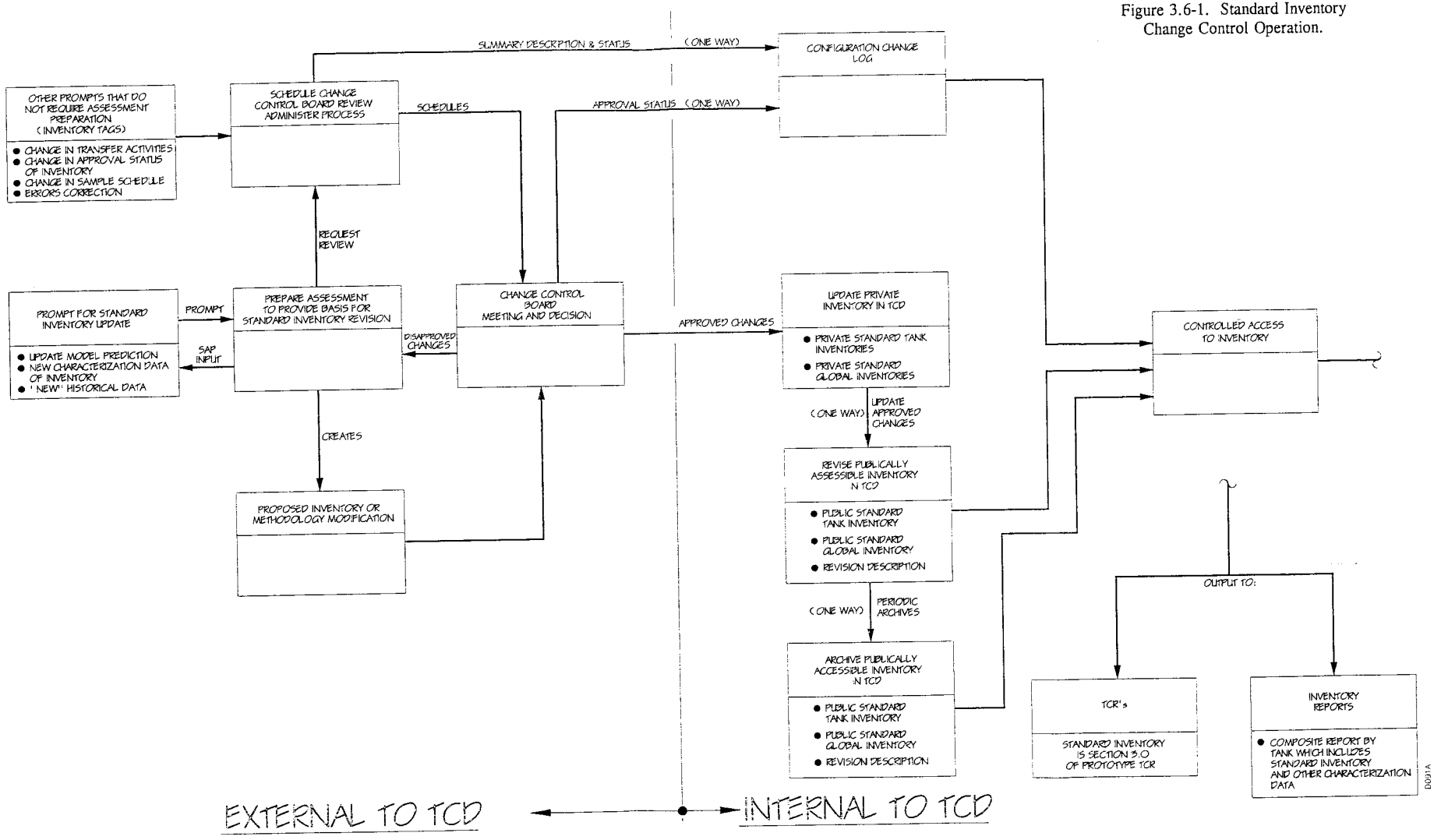
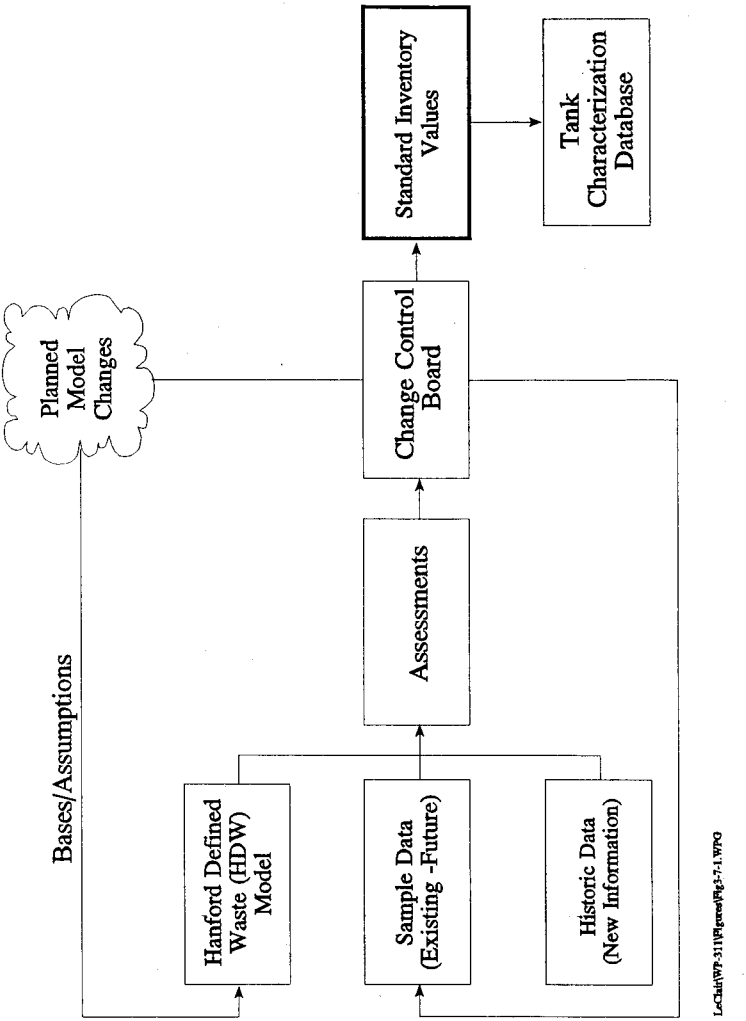


Figure 3.7-1. Maintenance of Standard Inventory Values.



3.8 INTEGRATE WITH TANK CHARACTERIZATION REPORT BEST-BASIS WRITE-UPS

In FY 1997, the TCRs are moving to a slightly revised format which includes a "best-basis" section. The content of this "best-basis" section is patterned after the tank-specific write-ups included in the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document. In recognition of this commonality, an integrated schedule has been developed which defines best-basis and TCR preparation in FY 97. This schedule is provided in Appendix C. A matrix defining the tank coordinators (TCR authors) and Standard Inventory team members (best-basis authors) by tank also is provided in Appendix C. The schedule is subject to revisions resulting from changes to tank priority, sampling schedule, TCR schedule, etc.

Responsibility: Standard Inventory Team

Deliverables: "Best-basis" section write-ups in support of TCR schedule. (See Appendix C)

Status: FY 1997 task.

3.9 INTEGRATE WITH THE INVENTORY ESTIMATE RESOLUTION TASK

By the end of FY 1997, a white paper is to be issued by representatives of PNNL which defines a standard method for estimating uncertainty in Standard Inventory values. This method is to take into account numerical modeling results, sampling analyses results and engineering analysis results. The Standard Inventory team will support this effort as necessary, especially with regard to the engineering analysis process utilized by the Standard Inventory team. Application of the methodology to develop uncertainty statements related to the Standard Inventory values will not occur until FY 1998.

Responsibility: Standard Inventory Team

Deliverables: Input as necessary to the Inventory Estimate Resolution task

Status: FY 1997 task.

3.10 INTEGRATE WITH THE CHEMICAL COMPOUND MODELING TASK

In FY 1997, representatives from PNNL will perform chemical compound modeling work directed at defining inventories of compounds within the tank waste. The primary drivers for this effort include the Retrieval Program's need for information to support retrieval equipment design and the Disposal/Closure Program's need for similar information to ensure compliance with Land Disposal Restrictions (LDR) requirements under *Resource*

Conservation and Recovery Act of 1976 (RCRA) closures. These compound inventories cannot be obtained using the Standard Inventory methodologies. (Note: Standard Inventory values are being derived for ionic species.) A representative of the Standard Inventory team will support this effort by providing necessary direction to the task and by making available any Standard Inventory values which may be needed as input to the model.

Responsibility: Standard Inventory Team

Deliverables: Input as necessary to the Chemical Compound Modeling task

Status: FY 1997 task.

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4.0 BUDGET AND SCHEDULE

The following sections provide budget and schedule details associated with the task elements described in Section 3.0.

4.1 BUDGET

The total budget allocated to the efforts described in this task plan is $972,000 (functional dollars). Figure 4.1-1 provides the predicted funding profile for this task. Costs throughout the fiscal year are expected to remain fairly constant. There is a slight ramping up in the first three quarters of the fiscal year which correspond to the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document preparation. Costs in the last quarter of the fiscal year are at nearly the same level due to focus on finalizing and issuing the document and transition to the Standard Inventory maintenance phase.

4.2 SCHEDULE

Figure 4.2-1 depicts the schedule associated with the work described in this plan. The schedule correlates with the task breakdown provided in Section 3.0. There are no schedule items related to any of the integration activities since these activities have no specific deliverables defined.

Figure 4.1-1. Standard Inventory Task Funding Profile--Fiscal Year 1997.

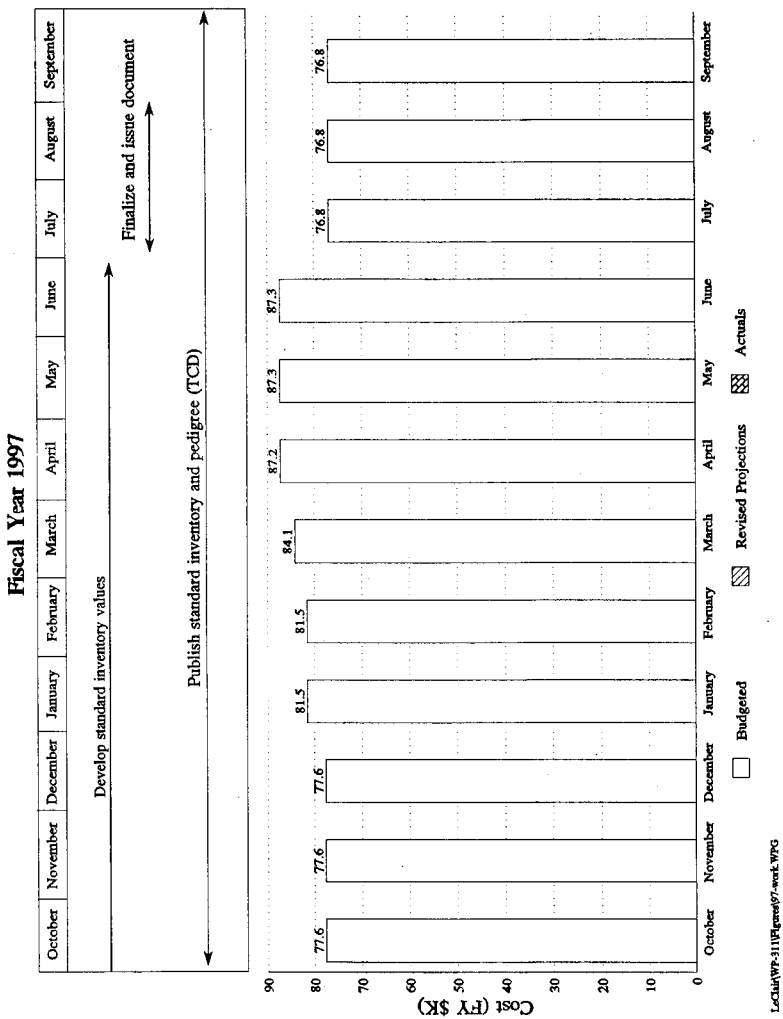
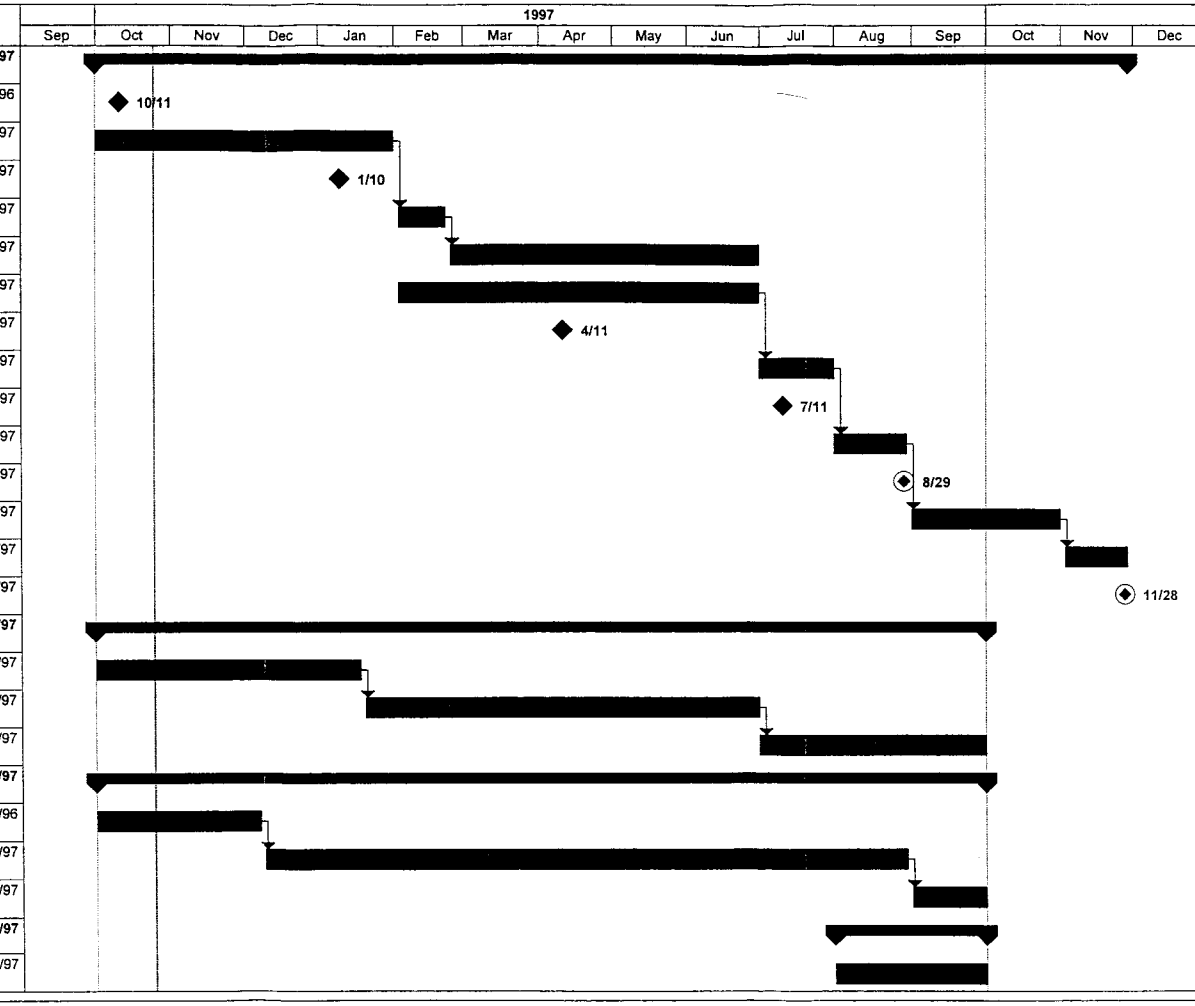


Figure 4.2-1. Standard Inventory Task Schedule--Fiscal Year 1997.

Standard Inventory Task Schedule

ID	Task Name	Start	Finish
1	**DEVELOP STANDARD INVENTORY VALUES/DOCUMENT METHODOLOGY AND PEDIGREES (Sections 3.2-3.4 of work plan)**	**10/1/96**	**11/28/97**
2	FY96 4th Quarter Status Report	10/11/96	10/11/96
3	Phase V: Develop 63 Tank-by-Tank Inventories (Refine global inventories as necessary)	10/1/96	1/31/97
4	FY97 1st Quarter Status Report	1/10/97	1/10/97
5	Review Phase V (Rev. E) Draft	2/3/97	2/21/97
6	Disposition Phase V (Rev. E) Draft Comments	2/24/97	6/30/97
7	Phase VI: Develop 70 Tank-by-Tank Inventories (Refine global inventories as necessary)	2/3/97	6/30/97
8	FY97 2nd Quarter Status Report	4/11/97	4/11/97
9	Review Phase VI (Rev. F) Draft	7/1/97	7/31/97
10	FY97 3rd Quarter Status Report	7/11/97	7/11/97
11	Disposition Phase VI (Rev. F) Draft Comments	8/1/97	8/29/97
12	Submit Final Document to DOE	8/29/97	8/29/97
13	DOE Review	9/1/97	10/31/97
14	Disposition Comments	11/3/97	11/28/97
15	Submit Document to DNFSB	11/28/97	11/28/97
16	**PUBLISH STANDARD INVENTORY AND PEDIGREE (Section 3.5 of work plan)**	**10/1/96**	**9/30/97**
17	TCD Phase 2: Data Entry/User Reports	10/1/96	1/17/97
18	TCD Phase 3: Reference/Pedigree Text and Reporting	1/20/97	6/30/97
19	TCD Phase 4: Change Control Support	7/1/97	9/30/97
20	**MAINTAIN CHANGE CONTROL ON THE STANDARD INVENTORY (Section 3.6 of work plan)**	**10/1/96**	**9/30/97**
21	Document Draft Chart and Charters of Standard Inventory Organization	10/1/96	12/6/96
22	Document Draft Change Control Procedures	12/9/96	8/29/97
23	Implement Change Control for Standard Inventory	9/1/97	9/30/97
24	**OPERATE AND MAINTAIN THE TANK CONTENT MODELS (Section 3.7 of work plan)**	**8/1/97**	**9/30/97**
25	Prepare and Submit Multi-Year Program Plan Input	8/1/97	9/30/97



Project: Standard Inventory Task Sch
Date: 10/25/96

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

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5.0 REFERENCES

Agnew, S. F., 1995a, *Waste Status and Transaction Record Summary for the Southeast Quadrant of the Hanford 200 East Area*, WHC-SD-WM-TI-689, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Agnew, S. F., 1995b, *Waste Status and Transaction Record Summary for the Northwest Quadrant of the Hanford 200 West Area*, WHC-SD-WM-TI-669, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Agnew, S. F., 1996a, *Waste Status and Transaction Record Summary for the Northeast Quadrant of the 200 East Area*, WHC-SD-WM-TI-615, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Agnew, S. F., 1996b, *Waste Status and Transaction Record Summary for the Southwest Quadrant of the 200 West Area*, WHC-SD-WM-TI-614, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Agnew, S. F., J. Boyer, R. Corbin, T. Duran, J. FitzPatrick, K. Jurgensen, T. Ortiz, and B. Young, 1996, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 3*, Draft, March 5, 1996, Los Alamos National Laboratory, Los Alamos, New Mexico.

Allen, G. K., 1976, *Estimated Inventory of Chemicals Added to Underground Waste Tanks, 1944 through 1975*, ARH-CD-610B, Atlantic Richfield Hanford Company, Richland, Washington.

Brevick, C. H., 1995, *Historical Tank Content Estimate for the Southwest Quadrant of the Hanford 200 West Area*, WHC-SD-WM-ER-352, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

Brevick, C. H., L. A. Gaddis, and E. D. Johnson, 1995a, *Historical Tank Content Estimate for the Northwest Quadrant of the Hanford 200 West Area*, WHC-SD-WM-ER-351, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Brevick, C. H., L. A. Gaddis, and W. W. Pickett, 1995b, *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 Areas*, WHC-SD-WM-ER-350, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Brevick, C. H., 1995c, *Tank Waste Source Term Inventory Validation*, WHC-SD-WM-ER-400, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Brevick, C. H., R. L. Newell, and J. W. Funk, 1996, *Historical Content Estimate for the Northeast Quadrant of the Hanford 200 East Area*, WHC-SD-WM-ER-349, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Brown, T. M., 1996, *Tank Waste Analysis Plan*, WHC-SD-WM-PLN-120, Rev. XX, Westinghouse Hanford Company, Richland, Washington.

DOE, 1987, *Final Environmental Impact Statement. Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes*, DOE/EIS-0113, U.S. Department of Energy, Washington, D.C.

DOE, 1994, *Integrated Data Base Report-1993: U.S. Spent Nuclear Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, DOE/RW-0006, Rev. 10, U.S. Department of Energy, Washington, D.C.

DOE, 1996a, *Draft Environmental Impact Statement for the Tank Waste Remediation System*, DOE/EIS-0189D, U.S. Department of Energy and Washington State Department of Ecology, Richland, Washington.

DOE, 1996b, *Recommendation 93-5 Implementation Plan*, DOE/RL-94-0001, Rev. 1, U.S. Department of Energy, Richland, Washington.

Forehand, G. D., 1995, *Characterization Data Catalog*, internal memo 71520-95-101, Westinghouse Hanford Company, Richland, Washington.

Hill, J. G. and B. C. Simpson, 1994, *The Sort on Radioactive Waste Type Model: A Method to Sort Single-Shell Tanks into Characteristic Groups*, PNL-9814, Rev. 1, Pacific Northwest Laboratory, Richland, Washington.

Homi, C. S., 1996, *Fiscal Year 1997 Tank Waste Analysis Plan*, WHC-SD-WM-PLN-120, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

PNL, 1994, *TWINS User Guide Tank Waste Characterization Information Network System Version 4.0,* PNL-8824-2, Pacific Northwest Laboratory, Richland, Washington.

Shelton, L. W., 1996, *Chemical and Radionuclide Inventory for Single and Double-Shell Tanks*, Internal Memo to D. J. Washenfelder, 74A20-96-30, dated February 28, 1996, Westinghouse Hanford Company, Richland, Washington.

Van Vleet, R. J., 1993a, *Radionuclide and Chemical Inventories for the Single Shell Tanks*, WHC-SD-WM-TI-565, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Van Vleet, R. J., 1993b, *Radionuclide and Chemical Inventories for the Double Shell Tanks*, WHC-SD-WM-TI-543, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Wittekind, W. D., 1989, *Software Certification Package for the ORIGEN2 Computer Code*, WHC-SD-NR-SWD-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A

SUMMARY OF DATA REQUIREMENTS

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APPENDIX A

SUMMARY OF DATA REQUIREMENTS

Table A-1. Summary of Data Requirements. (Sheet 1 of 4)

Analyte/ parameter	Function and operations			Safety/risk								Regulatory	
				Tank waste									
	(1) Transfer	(2) Retrieve	(3,4,5) Pretreat/ dispose	(6, 7, 8, 9) Resolution	(22) PA	(1) Transfer	(13-16) Inhalation	(12) Shielding/ direct dose	(15) External radiation hazard	(14-20) Long-term groundwater	(22) Volatile hazard	(10) Criti-cality	(11) Air	(21) Ground water
Al	x		P, H, L	x								x	B	
Ag			H										B	IA
As			H, L				x						A(I)	II
B			x	x									B	
Ba			P	x			x							IA
Be			H				x						A(I, II)	
Bi			P, H	x										
Ca			P, H, L	x			x			x			B (as OH)	
Ce			P, H				x							
Cd			L				x						A(I, II)	IA
Cl			P, L	x		x								IB
Co							x							
Cr			P, H, L	x										IA
Cr+3							x						B	
Cr+6				x						x			A(I, II)	
Cs			P										B(as OH)	
Cu			x											IB
F	x		P, L	x			x			x			B	IA
Fe			H, L	x						x		x	B	IB
FeCN/CN			x	x			x							
formate				x										
Hg			H				x						B	IA
K			P, H	x						x			B(as OH)	
La			H				x							
Li			x											
Mg			H, L											
Mn			P	x								x	B	IB
Mo			H											
Na			P, H, L	x			x			x		x	B(as OH)	
Nd			H				x							
NH4			H				x							
Ni			P, H	x								x	A(I)	
NO2	x		P, L	x		x								
NO3	x		P, L	x		x				x		x		IA
OH	x		P	x		x	NaOH							
oxalate				x			x							
Pb			H										A(I, III)	IA
Pd			H											
total P as PO4	x		P, H, L	x										
Pt			H										B	
Rh			H										B	
Ru			H											
Sb			H				x							
Se			H				x						B	IA
Si			P, H, L	x								x		
total S as SO4	x		P, H, L	x										IB
Sr			P, H											
Te			H				x						B	
TIC (CO3)	x		P, L	x										
Th			H											
Tl			H				x						B	
TOC	x		P, H, L	x			x							
U (total)			P, H	x		x	x			x			B	
V			H				x							
W													B	
Zn			H	x										IB
Zr			H, L	x									B	

Table A-1. Summary of Data Requirements. (Sheet 2 of 4)

Analyte/ parameter	Function and operations			Safety/risk									Regulatory	
						Tank waste								
	(1) Transfer	(2) Retrieve	(3, 4, 5) Pretreat/ dispose	(6, 7, 8, 9) Resolution	(22) PA	(1) Transfer	(13-16) Inhalation	(12) Shielding/ Direct Dose	(15) External Radiation Hazard	(14-20) Long-term Groundwater	(22) Volatile Hazard	(10) Criticality	(11) Air	(21) Groundwater
3-H			x	x							x			IC
14-C			H,L							x	x			
59-Ni										x				
60-Co			x	x			x	x						
63-Ni				x						x				
79-Se			x		x					x	x			
90-Sr/Y	x		P,H,L	x	x		x	x						IC
93-Zr/m-Nb			H		x					x				
99-Tc			P,L	x	x					x				
106-Ru							x				x			
113-Cd/m											x			
125-Sb			H								x			
126-Sn			H		x		x	x	x					
129-I			P,H,L	x	x					x	x		B	
134-Cs											x			
137-Cs/Ba	x		P,H,L	x	x		x	x					B(asOH)	
151-Sm					?									
152-Eu								x						
154-Eu			P,L	x			x	x						
155-Eu			P,L											
226-Ra					x					x				IC
227-Ac					x		x							
228-Ra					x					x				IC
229-Th					?									
231-Pa							x							
232-Th			P,H,L											
232-U					x					x				
233-U					x					x		x		
234-U					x					x				
235-U			x		x					x		x		
236-U					x					x				
237-Np			P,H,L	x			x			x				
238-Pu			P,H,L	x			x							
238-U			x							x		x		
239/240-Pu			P,H,L	x	x	x	x					x		
241-Am	x		P,H,L	x			x	x						
241-Pu			P.,H,L				x	x						
242-Pu			P,H,L											
242-Cm				x										
243-Am					?									
243-Cm			P,H,L	x										
244-Cm			P,H,L	x			x							
total alpha				x								x		IC
total beta				x										IC

Table A-1. Summary of Data Requirements. (Sheet 3 of 4)

Analyte/ parameter	Function and operations			Safety/risk									Regulatory	
				Tank waste										
	(1) Transfer	(2) Retrieve	(3, 4, 5) Pretreat/ dispose	(6, 7, 8, 9) Resolution	(22) PA	(1) Transfer	(13-16) Inhalation	(12) Shielding/ Direct Dose	(15) External Radiation Hazard	(14-20) Long-term Groundwater	(22) Volatile Hazard	(10) Critic-ality	(11) Air	(21) Ground water
Centrifuged solids				x										
Cooling Curve	x													
Corrosivity														IB
Crystalline Cmpds			x											
Density, bulk				x								x		
Density, liquid				x										
Density, slurry		x		x										
Density, solids														
DSC		x		x		x								
Enthalpy (bulk)				x										
Oxides, %			x											
Organic Complexants			x											
Organic separable				x		x								
Organic species				x										
Particle size				x										
pH		x	x			x						x		IB
Residual solids, wt%			x											
Settled solids, vol%												x		
Settling rate				x										
Shear strength		x		x										
Sludge height		x												
Sludge profile		x												
Solids, vol%	x	x				x								
Specific Gravity	x		x			x						x		
Statum I.D.				x										
Temperature		x												
Volatiles Content				x										
Viscosity	x	x		x										
Water, wt %	x		x	x								x		
CO				x										
CO, Vol%				x										
CO2				x										
Hydrogen, Vol%				x										
Methane, Vol%				x										
NH3				x									B	
NH3, Vol %				x										
NO				x										
NO2				x										
N2O				x			h							
n-Dodecane				x			h							
n-Tridecane				x			h							
TBP				x			h							
Acetonitrile							h							
Ammonia							x, h							
Benzene							h							
1,3-Butadiene							h							
Butanol							h							
2-Hexanone							h							
Methylene chloride							h							
Propane nitrile							h							

Table A-1. Summary of Data Requirements. (Sheet 4 of 4)

Analyte/ parameter	Function and operations			Safety/risk								Regulatory	
				Tank waste									
	(1) Transfer	(2) Retrieve	(3, 4, 5) Pretreat/ dispose	(6, 7, 8, 9) Resolution	(22) PA	(1) Transfer	(13-16) Inhalation	(12) Shielding/ direct dose	(15) External radiation hazard	(14-20) Long-term groundwater	(22) Volatile hazard	(10) Criticality	(11) Air	(21) Ground water
Endrin														IA
Methoxychlor														IA
1,1,1-Trichloroethane														IA
2-4 D														IA
2,4,5-TP Silvex														IA
Organic Compounds														
Carcinogens													x	x
Air Toxic Class A													x	
Air Toxic Class B													x	

Key

P = Pretreatment Concern
H = High-level Waste Concern
L = Low-level Waste Concern
B = Class B Toxic Air Pollutants, WAC 173-460-160
A(1, II, III) = Tables I, II, and III Class A Toxic Air Pollutants, WAC-173-460-150
IA, IB, IC: Table I, Parts I A, B, and C, Ground Water Quality Criteria, WAC 173-200-040
as OH: as hydroxide
h = headspace concern

Information Sources

(1) WHC-SD-WM-DQO-001, Rev. 1. Data Quality Objectives For Tank Farms Waste Compatibility Program
(2) WHC-SD-WM-DQO-008, Rev 0. Characterization Data Needs for Development, Design, and Operation of Retrieval Equipment Developed Through the DQO Process, Table 1-1 and Appendix B.
(3) WHC-SD-WM-DQO-011, Rev. 1. Interim Data Quality Objectives for Waste Pretreatment and Vitrification. Tables 2 and 3.
(4) WHC-SD-WM-DQO-023, Rev. 0 (Draft 10/17/95). Data Requirements for TWRS Privatization Waste Characterization.
(5) WHC-SD-DQO-022, Rev. 0. Data Needs and Attendant Data Quality Objectives for Tank Waste Pretreatment and Disposal.
(6) WHC-SD-WM-DQO-002, Rev. 1. Data Quality Objectives for Generic In-Tank Health and Safety Vapor Issue Resolution.
(7) WHC-SD-WM-DQO-004, Rev. 1. Flammable Gas Tank Safety Program: Data Requirements for Core Sample Analysis Developed through the DQO Process.
(8) WHC-SD-WM-DQO-006, Rev. 1. Data Quality Objective to Support Resolution of the Organic Fuel Rich Tank Safety Issue.
(9) WHC-SD-WM-DQO-007, Rev. 1. Ferrocyanide Data Quality Objectives Document.
(10) WHC-SD-WM-SP-004, Rev. 1 and WHC-SD-WM-DQO-012, Rev. 0. Tank Safety Screening Data Quality Objective, Rev. 1.
(11) WAC 173-460-150, Class A--Tables I, II, III and 173-460-160, Class B.
(12) LLW Vitrification: Contact Maintenance Viability Study (Draft).
(13) WHC-SD-WM-SAR-065, Rev. 0 (Draft). Interim Chapter 3.0, Hazard and Accident Analysis for the Hanford Tank Farms.
(14) PNL-10651 (Draft). Development of a Risk-Based Approach to Hanford Site Cleanup.
(15) WHC-SD-WM-TI-711 (Draft). Remediation and Cleanout Levels for Hanford Single-shell Tanks.
(16) (Draft) MacFarlane, et al. Probabilistic Safety Assessment for Hanford High-Level Waste Tanks.
(17) DOE/EIS-0189. DOE and WA State Department of Ecology Preliminary Draft EIS for the Tank Waste Remediation System.
(18) WHC-EP-0810, Rev. 1. Impacts of Disposal System Design Options on Low-Level Glass Waste Disposal Performance.
(19) PNL-10154 (Draft). Integrated Risk Assessment Program: Methodology and Results from Qualitative Evaluation of Current Hanford Site Risks to the Public.
(20) Boothe, G. F., Internal Memo (Predominant Radionuclides in Hanford Waste Tanks) 11/27/95
(21) WAC 173-200-040, Table 1. Ground Water Quality Criteria, Parts IA, IB, IC, and II.
(22) Boothe, G. F., 1996, *Predominant Radionuclides in Hanford Site Waste Tanks*, WHC-SD-WM-TI-731, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

APPENDIX B

STANDARD INVENTORY CONTENT LIMITATIONS

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APPENDIX B

STANDARD INVENTORY CONTENT LIMITATIONS

The following sections describe the justification for constituents included in the Standard Inventory.

B1.0 STANDARD INVENTORY CONTENT LIMITATIONS ON ANALYTES

This task focuses on providing standard inventory values for those analytes that comprise the bulk of the waste mass. As indicated in column 3 of Table B1.0-1, these 28 analytes account for 99.89 percent of the waste (less water) by mass (Shelton 1996). Table B1.0-1 primarily includes those components introduced from Hanford waste separation processes. The list is also influenced by safety, risk and regulatory needs, as well as disposal needs.

As depicted in column 5 of Table B1.0-1, inventory reconciliation will be conducted on both a global and tank-specific basis for analytes accounting for at least 0.02 weight percent of the waste (column 2). Inventories of analytes accounting for less than 0.02 weight percent will be reconciled on a tank-specific basis only if it is known that the inventory distribution is concentrated to a few of the 177 tanks (e.g., La, Hg). Global inventories for additional minor components (e.g., Cd, Ag, Cu, Se, Te, Co, Be, Ba, etc.) are to be identified through review of fuel fabrication and flowsheet records.

Table B1.0-1. Analytes Targeted by the Standard Inventory Task. (2 Sheets)

Column 1	Column 2	Column 3	Column 4		Column 5	
Analyte	%Δ Mass[a]	Σ% Mass	Standard inventory		Cited in	
			Global	Tank	HDW Model Rev. 3 (Agnew 1996)	Shelton 1996
NO_3	46.83	46.83	X	X	X	X
Na	29.96	76.78	X	X	X	X
OH	8.62	85.41	X	X	X	X
NO_2	4.12	89.53	X	X	X	X
PO_4	2.18	91.71	X	X	X	X
Al	2.05	93.76	X	X	X	X
CO_3	1.39	95.15	X	X	X	X

Table B1.0-1. Analytes Targeted by the Standard Inventory Task. (2 Sheets)

Column 1	Column 2	Column 3	Column 4		Column 5	
Analyte	%Δ Mass[a]	Σ% Mass	Standard inventory		Cited in	
			Global	Tank	HDW Model Rev. 3 (Agnew 1996)	Shelton 1996
SO_4	0.88	96.03	X	X	X	X
U	0.71	96.75	X	X	X	X
F	0.52	97.27	X	X	X	X
TOC	0.50	97.76	X	X	X	X
Fe	0.34	98.11	X	X	X	X
K	0.32	98.43	X	X	X	X
Zr	0.30	98.73	X	X	X	X
Si	0.30	99.03	X	X	X	X
Cl	0.30	99.32	X	X	X	X
Cr	0.15	99.48	X	X	X	X
Bi	0.11	99.59	X	X	X	X
Ni	0.09	99.68	X	X	X	X
Mn	0.08	99.76	X	X	X	X
Ca	0.07	99.83	X	X	X	X
Pb	0.02	99.85	X	X	X	X
Sr	0.02	99.87	X	X	X	X
La	0.01	99.88	X	X	X	X
Cd	0.01	99.89	X			X
Ce	0.00[b]	99.89	X			X
Ag	0.00	99.89	X			
Hg	0.00	99.89	X	X	X	X

[a]Shelton (1996).

[b]Ranking based on revised global inventory defined by the Standard Inventory effort (8.5 MT).

B2.0 STANDARD INVENTORY CONTENT LIMITATIONS ON RADIONUCLIDES

The *Predominant Radionuclides in Hanford Site Waste Tanks* document (Boothe 1996) provides the basis to consider 40 radionuclides as part of the Standard Inventory Estimate task. The predominant radionuclides defined by Boothe (1996) are radionuclides that are estimated to present over 99 percent of the inherent risks in each of five categories: (1) long-term or short-term inhalation hazards; (2) long-term groundwater hazards; (3) long-term external radiation hazards; (4) short-term shielding concerns; and (5) short-term volatile hazards. An additional six (6) radionuclides (Y-90, Ba-137m, Eu-155, Cm-242, Cm-243 and Pu-242) were added to the list of 40 due to their impact on source term. The resulting 46 radionuclides are listed in Table B2.0-1. As depicted in column 3 of Table B2.0-1, approximately 100 percent of the tank waste activity (DOE 1996) is associated with 16 of the 46 radionuclides.

As indicated in Table B2.0-1 (column 4), both global and tank-specific inventories will be developed for each of the 46 radionuclides. The ORIGIN2 model is utilized to generate the global values, and the HDW model (Rev. 4) will partition global inventories among the 177 tanks. The *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document will include an in-depth discussion of the methodology used to determine radionuclide inventories.

Table B2.0-1. Radionuclides Targeted by the Standard Inventory Task (2 Sheets)

Column 1	Column 2	Column 3	Column 4		Column 5		
Radionuclide	%Δ Activity[a]	Σ% Activity	Standard inventory		Cited in		
			Global	Tank	HDW model Rev. 4 (To be issued)	Boothe (1996)	Source term
Sr-90	30.39	30.39	X	X	X[b]	X	
Y-90	30.39	60.78	X	X	X[b]		X
Cs-137	19.75	80.53	X	X	X[b]	X	
Ba-137m	18.73	99.26	X	X	X		X
Sm-151	0.35	99.61	X	X	X	X	
Ni-63	0.15	99.76	X	X	X	X	
Am-241	0.06	99.82	X	X	X[b]	X	
Pu-241	0.04	99.66	X	X	X[b]	X	

Table B2.0-1. Radionuclides Targeted by the Standard Inventory Task (2 Sheets)

Column 1	Column 2	Column 3	Column 4		Column 5		
Radionuclide	%Δ Activity[a]	Σ% Activity	Standard inventory		Cited in		
			Global	Tank	HDW model Rev. 4 (To be issued)	Boothe (1996)	Source term
Eu-155	0.03	99.89	X	X	X		X
Eu-154	0.03	99.92	X	X	X[b]	X	
Sb-125	0.02	99.94	X	X	X	X	
Tc-99	0.02	99.96	X	X	X	X	
Pu-239	0.01	99.97	X	X	X[b]	X	
Cd-113m	0.01	99.98	X	X	X	X	
H-3	0.01	99.99	X	X	X	X	
Cs-134	0.01	100.00	X	X	X	X	
Co-60	0.00	100.00	X	X	X[b]	X	
Pu-240	0.00	100.00	X	X	X[b]	X	
C-14	0.00	100.00	X	X	X	X	
Ni-59	0.00	100.00	X	X	X	X	
Zr-93	0.00	100.00	X	X	X	X	
Nb-93m	0.00	100.00	X	X	X	X	
Eu-152	0.00	100.00	X	X	X	X	
Pu-238	0.00	100.00	X	X	X[b]	X	
Se-79	0.00	100.00	X	X	X	X	
Sn-126	0.00	100.00	X	X	X	X	
U-238	0.00	100.00	X	X	X	X	
Pa-231	0.00	100.00	X	X	X	X	
Cm-244	0.00	100.00	X	X	X[b]	X	
U-232	0.00	100.00	X	X	X	X	
Np-237	0.00	100.00	X	X	X[b]	X	
Cm-242	0.00	100.00	X	X	X		X

Table B2.0-1. Radionuclides Targeted by the Standard Inventory Task (2 Sheets)

Column 1	Column 2	Column 3	Column 4		Column 5		
Radionuclide	%Δ Activity[a]	Σ% Activity	Standard inventory		Cited in		
			Global	Tank	HDW model Rev. 4 (To be issued)	Boothe (1996)	Source term
Am-243	0.00	100.00	X	X	X	X	
I-129	0.00	100.00	X	X	X	X	
Cm-243	0.00	100.00	X	X	X		X
U-234	0.00	100.00	X	X	X	X	
U-235	0.00	100.00	X	X	X	X	
Ru-106	0.00	100.00	X	X	X	X	
Ac-227	0.00	100.00	X	X	X	X	
U-233	0.00	100.00	X	X	X	X	
U-236	0.00	100.00	X	X	X	X	
Pu-242	0.00	100.00	X	X	X		X
Th-229	0.00	100.00	X	X	X	X	
Ra-226	0.00	100.00	X	X	X	X	
Th-232	0.00	100.00	X	X	X	X	
Ra-228	0.00	100.00	X	X	X	X	

[a]DOE 1996 and Boothe 1996

[b]Final Safety Analysis Report (FSAR) radionuclides which will receive more in-depth treatment in HDW model, Rev. 4.

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B3.0 REFERENCES

Boothe, G. F., 1996, *Predominant Radionuclides in Hanford Site Waste Tanks*, WHC-SD-WM-TI-731, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

DOE, 1996, *Draft Environmental Impact Statement for the Tank Waste Remediation System*, DOE/EIS-0189D, U.S. Department of Energy and Washington State Department of Ecology, Richland, Washington.

Shelton, L. W., 1996, *Chemical and Radionuclide Inventory for Single and Double-Shell Tanks*, Internal Memo to D. J. Washenfelder, 74A20-96-30, dated February 28, 1996, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX C

STANDARD INVENTORY/TANK CHARACTERIZATION REPORT INTEGRATED SCHEDULE AND RESPONSIBILITIES

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APPENDIX C

STANDARD INVENTORY/TANK CHARACTERIZATION REPORT INTEGRATED SCHEDULE AND RESPONSIBILITIES

Figure C-1 presents the integrated schedule for the Standard Inventory and Tank Characterization Report (TCR) efforts in fiscal year 1997. Table C-1 defines the Tank Coordinator and Standard Inventory author assignments by tank. The Tank Coordinators are responsible for coordinating the TCR documentation, and the Standard Inventory authors are responsible for reconciling tank inventories and documenting the results for incorporation into both the *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes* document and the respective TCR.

Figure C-1. Integrated Standard Inventory/Tank Characterization Report Schedule.
(Sheet 1 of 3)

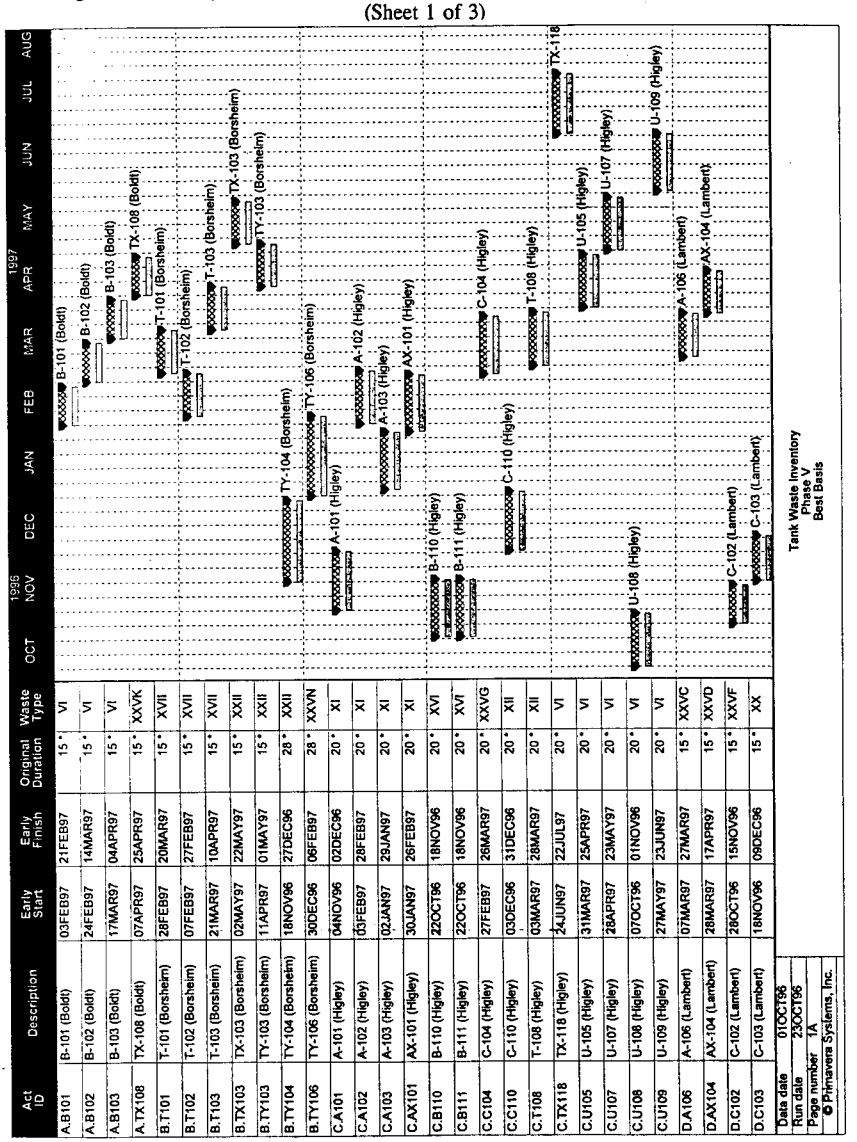

Figure C-1. Integrated Standard Inventory/Tank Characterization Report Schedule.
(Sheet 2 of 3)

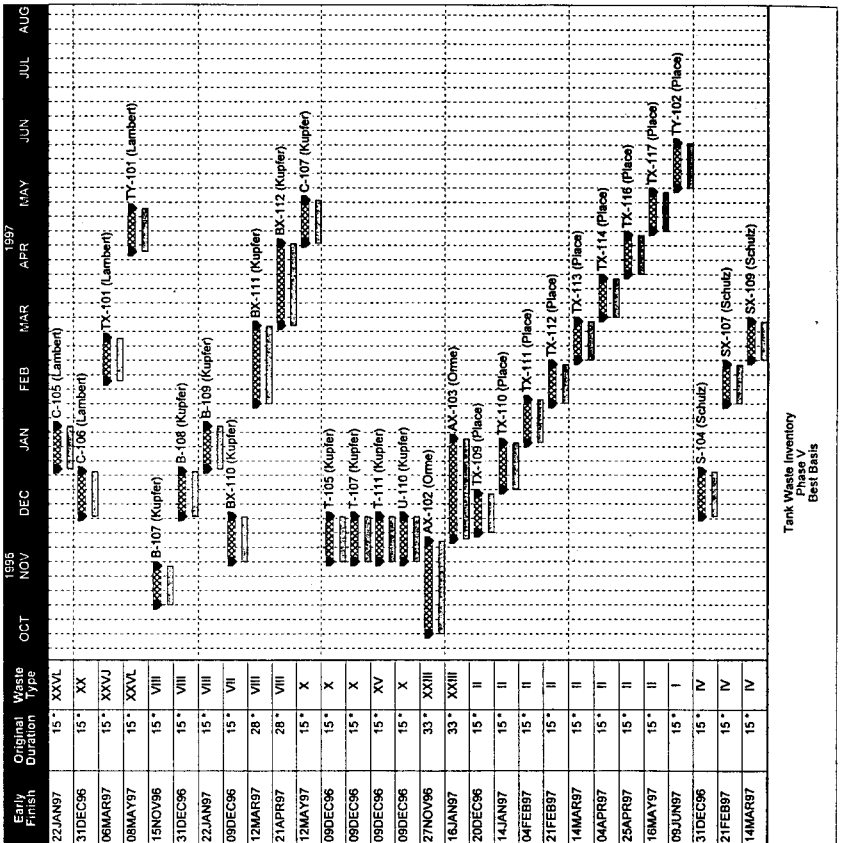

Figure C-1. Integrated Standard Inventory/Tank Characterization Report Schedule.
(Sheet 3 of 3)

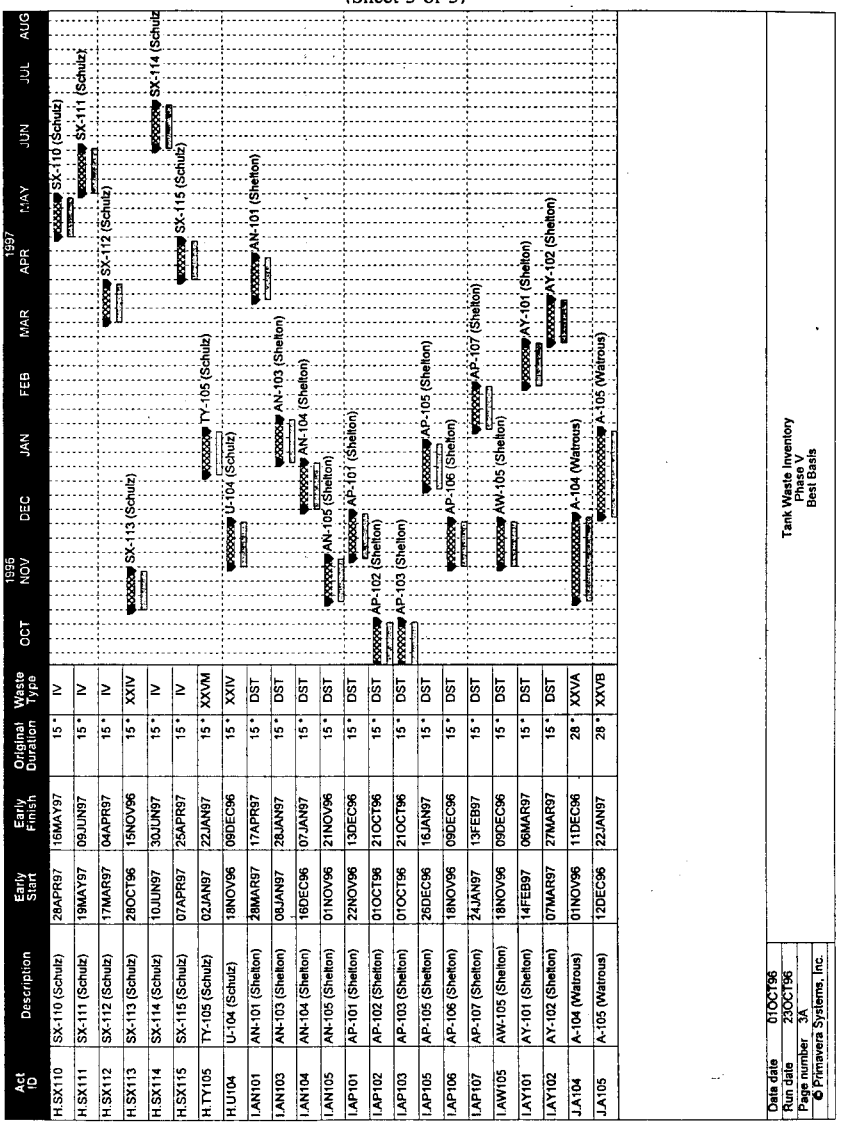

Table C-1. Tank Coordinator and Standard Inventory Author Assignments by Tank.
(Sheet 1 of 4)

TANK 241-	TANK COORDINATOR	BEST-BASIS AUTHOR
A-101	JIM FIELD	BRUCE HIGLEY
A-102	JAIDUK JO	BRUCE HIGLEY
A-103	DENNIS MCCAIN	BRUCE HIGLEY
A-104	RUTH SCHREIBER	BOB WATROUS
A-105	ALBERT HU	BOB WATROUS
A-106	REX THOMPSON	STEVE LAMBERT
AN-101	CHERYL BENAR	LOU SHELTON
AN-102	JAIDUK JO	LOU SHELTON
AN-103	AL KRUGER	LOU SHELTON
AN-104	ALBERT HU	WALLY SCHULZ
AN-105	JAIDUK JO	LOU SHELTON
AN-106	JOHN CONNER	TERRY WINWARD
AN-107	JAIDUK JO	TERRY WINWARD
AP-101	JOHN CONNER	LOU SHELTON
AP-102	JOHN BALDWIN	LOU SHELTON
AP-103	JIM FIELD	LOU SHELTON
AP-104	WAYNE WINKELMAN	LOU SHELTON
AP-105	RUTH SCHREIBER	LOU SHELTON
AP-106	REX THOMPSON	LOU SHELTON
AP-107	RUTH SCHREIBER	LOU SHELTON
AP-108	JOHN BALDWIN	TERRY WINWARD
AW-101	CHERYL BENAR	TERRY WINWARD
AW-102	KEVIN BELL	TERRY WINWARD
AW-103	CHERYL BENAR	LOU SHELTON
AW-104	KEVIN BELL	TERRY WINWARD
AW-105	LEELA SASAKI	LOU SHELTON
AW-106	JOHN CONNER	TERRY WINWARD
AX-101	AL KRUGER	BRUCE HIGLEY
AX-102	KEVIN BELL	RON ORME
AX-103	BRETT SIMPSON	RON ORME
AX-104	WAYNE WINKELMAN	STEVE LAMBERT
AY-101	REX THOMPSON	LOU SHELTON
AY-102	LEELA SASAKI	LOU SHELTON
AZ-101	JOHN BALDWIN	DAVE PLACE
AZ-102	RUTH SCHREIBER	DAVE PLACE
B-101	RUTH SCHREIBER	AL BOLDT
B-102	KEVIN BELL	AL BOLDT
B-103	JOHN CONNER	AL BOLDT
B-104	JAIDUK JO	BRUCE HIGLEY
B-105	JIM FIELD	BRUCE HIGLEY
B-106	JOHN CONNER	BRUCE HIGLEY
B-107	WAYNE WINKELMAN	MIKE KUPFER
B-108	RUTH SCHREIBER	MIKE KUPFER
B-109	CHERYL BENAR	MIKE KUPFER
B-110	CHERYL BENAR	BRUCE HIGLEY
B-111	CHERYL BENAR	BRUCE HIGLEY

Table C-1. Tank Coordinator and Standard Inventory Author Assignments by Tank. (Sheet 2 of 4)

TANK 241-	TANK COORDINATOR	BEST-BASIS AUTHOR
B-112	JOHN CONNER	BRUCE HIGLEY
B-201	JOHN CONNER	TERRY WINWARD
B-202	LUTHER BUCKLEY	TERRY WINWARD
B-203	JAIDUK JO	TERRY WINWARD
B-204	LEELA SASAKI	TERRY WINWARD
BX-101	LUTHER BUCKLEY	TERRY WINWARD
BX-102	ALBERT HU	TERRY WINWARD
BX-103	KEVIN BELL	TERRY WINWARD
BX-104	ALBERT HU	TERRY WINWARD
BX-105	KEVIN BELL	TERRY WINWARD
BX-106	LEELA SASAKI	TERRY WINWARD
BX-107	WAYNE WINKELMAN	TERRY WINWARD
BX-108	KEVIN BELL	TERRY WINWARD
BX-109	RUTH SCHREIBER	TERRY WINWARD
BX-110	RUTH SCHREIBER	MIKE KUPFER
BX-111	JOHN BALDWIN	MIKE KUPFER
BX-112	JOHN CONNER	MIKE KUPFER
BY-101	KEVIN BELL	TERRY WINWARD
BY-102	LEELA SASAKI	TERRY WINWARD
BY-103	RUTH SCHREIBER	TERRY WINWARD
BY-104	CHERYL BENAR	TERRY WINWARD
BY-105	BRETT SIMPSON	TERRY WINWARD
BY-106	KEVIN BELL	TERRY WINWARD
BY-107	DENNIS MCCAIN	TERRY WINWARD
BY-108	JOHN BALDWIN	TERRY WINWARD
BY-109	BRETT SIMPSON	TERRY WINWARD
BY-110	RUTH SCHREIBER	TERRY WINWARD
BY-111	AL KRUGER	TERRY WINWARD
BY-112	JOHN BALDWIN	TERRY WINWARD
C-101	LEELA SASAKI	TERRY WINWARD
C-102	ALBERT HU	STEVE LAMBERT
C-103	KEVIN BELL	STEVE LAMBERT
C-104	JOHN BALDWIN	BRUCE HIGELY
C-105	LEELA SASAKI	STEVE LAMBERT
C-106	RUTH SCHREIBER	STEVE LAMBERT
C-107	KEVIN BELL	MIKE KUPFER
C-108	JOHN BALDWIN	TERRY WINWARD
C-109	BRETT SIMPSON	TERRY WINWARD
C-110	CHERYL BENAR	BRUCE HIGLEY
C-111	JIM FIELD	TERRY WINWARD
C-112	BRETT SIMPSON	TERRY WINWARD
C-201	RUTH SCHREIBER	TERRY WINWARD
C-202	JOHN BALDWIN	TERRY WINWARD
C-203	JOHN CONNER	TERRY WINWARD
C-204	JOHN CONNER	TERRY WINWARD
S-101	AL KRUGER	TERRY WINWARD

Table C-1. Tank Coordinator and Standard Inventory Author Assignments by Tank. (Sheet 3 of 4)

TANK 241-	TANK COORDINATOR	BEST-BASIS AUTHOR
S-102	LUTHER BUCKLEY	TERRY WINWARD
S-103	AL KRUGER	TERRY WINWARD
S-104	JAIDUK JO	WALLY SCHULZ
S-105	WAYNE WINKELMAN	TERRY WINWARD
S-106	LUTHER BUCKLEY	TERRY WINWARD
S-107	BRETT SIMPSON	TERRY WINWARD
S-108	BRETT SIMPSON	TERRY WINWARD
S-109	JIM FIELD	TERRY WINWARD
S-110	LUTHER BUCKLEY	TERRY WINWARD
S-111	JOHN CONNER	TERRY WINWARD
S-112	TODD BROWN	TERRY WINWARD
SX-101	ALBERT HU	TERRY WINWARD
SX-102	KEVIN BELL	TERRY WINWARD
SX-103	AL KRUGER	TERRY WINWARD
SX-104	CHERYL BENAR	TERRY WINWARD
SX-105	BRETT SIMPSON	TERRY WINWARD
SX-106	REX THOMPSON	TERRY WINWARD
SX-107	DENNIS MCCAIN	WALLY SCHULZ
SX-108	JIM FIELD	WALLY SCHULZ
SX-109	TODD BROWN	WALLY SCHULZ
SX-110	ALBERT HU	WALLY SCHULZ
SX-111	REX THOMPSON	WALLY SCHULZ
SX-112	AL KRUGER	WALLY SCHULZ
SX-113	LEELA SASAKI	WALLY SCHULZ
SX-114	LUTHER BUCKLEY	WALLY SCHULZ
SX-115	BRETT SIMPSON	WALLY SCHULZ
SY-101	CHERYL BENAR	TERRY WINWARD
SY-102	RUTH SCHREIBER	TERRY WINWARD
SY-103	JOHN CONNER	TERRY WINWARD
T-101	JIM FIELD	GEORGE BORSHEIM
T-102	JAIDUK JO	GEORGE BORSHEIM
T-103	WAYNE WINKELMAN	GEORGE BORSHEIM
T-104	LEELA SASAKI	DAVE HEDENGREN
T-105	JIM FIELD	MIKE KUPFER
T-106	JAIDUK JO	MIKE KUPFER
T-107	LEELA SASAKI	MIKE KUPFER
T-108	JOHN BALDWIN	BRUCE HIGLEY
T-109	JOHN CONNER	PENNEY COLTON
T-110	DENNIS MCCAIN	MIKE KUPFER
T-111	JOHN BALDWIN	MIKE KUPFER
T-112	REX THOMPSON	TERRY WINWARD
T-201	ALBERT HU	TERRY WINWARD
T-202	REX THOMPSON	TERRY WINWARD
T-203	AL KRUGER	TERRY WINWARD
T-204	WAYNE WINKELMAN	TERRY WINWARD
TX-101	LUTHER BUCKLEY	STEVE LAMBERT

Table C-1. Tank Coordinator and Standard Inventory Author Assignments by Tank. (Sheet 4 of 4)

TANK 241-	TANK COORDINATOR	BEST-BASIS AUTHOR
TX-102	BRETT SIMPSON	TERRY WINWARD
TX-103	JAIDUK JO	GEORGE BORSHEIM
TX-104	DENNIS MCCAIN	TERRY WINWARD
TX-105	TODD BROWN	TERRY WINWARD
TX-106	ALBERT HU	TERRY WINWARD
TX-107	LEELA SASAKI	TERRY WINWARD
TX-108	REX THOMPSON	AL BOLDT
TX-109	AL KRUGER	DAVE PLACE
TX-110	WAYNE WINKELMAN	DAVE PLACE
TX-111	LUTHER BUCKLEY	DAVE PLACE
TX-112	BRETT SIMPSON	DAVE PLACE
TX-113	DENNIS MCCAIN	DAVE PLACE
TX-114	DENNIS MCCAIN	DAVE PLACE
TX-115	TODD BROWN	TERRY WINWARD
TX-116	ALBERT HU	DAVE PLACE
TX-117	DENNIS MCCAIN	DAVE PLACE
TX-118	AL KRUGER	BRUCE HIGLEY
TY-101	LUTHER BUCKLEY	STEVE LAMBERT
TY-102	BRETT SIMPSON	DAVE PLACE
TY-103	JAIDUK JO	GEORGE BORSHEIM
TY-104	JAIDUK JO	GEORGE BORSHEIM
TY-105	DENNIS MCCAIN	WALLY SCHULZ
TY-106	JAIDUK JO	GEORGE BORSHEIM
U-101	TODD BROWN	TERRY WINWARD
U-102	ALBERT HU	TERRY WINWARD
U-103	LEELA SASAKI	TERRY WINWARD
U-104	AL KRUGER	WALLY SCHULZ
U-105	TODD BROWN	BRUCE HIGLEY
U-106	TODD BROWN	TERRY WINWARD
U-107	JAIDUK JO	BRUCE HIGLEY
U-108	KEVIN BELL	BRUCE HIGLEY
U-109	JOHN BALDWIN	BRUCE HIGLEY
U-110	KEVIN BELL	MIKE KUPFER
U-111	JOHN BALDWIN	TERRY WINWARD
U-112	JIM FIELD	TERRY WINWARD
U-201	RUTH SCHREIBER	TERRY WINWARD
U-202	JAIDUK JO	TERRY WINWARD
U-203	RUTH SCHREIBER	TERRY WINWARD
U-204	KEVIN BELL	TERRY WINWARD

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