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		Design Agent									
1	1	Cog. Eng. W. L. Willis	<i>W. L. Willis</i>	12/30/97		H5	69				
1	1	Cog. Mgr. R. L. Treat	<i>R. L. Treat</i>	12/30/97							
		QA									
		Safety									
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Tank Waste Remediation System Retrieval and Disposal Mission Technical Baseline Summary Description

R. L. Treat

Lockheed Martin Hanford Company, Richland, WA 99352
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T. L. Berkland
Release Approval

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Date

Approved for Public Release

Tank Waste Remediation System Retrieval and Disposal Mission Technical Baseline Summary Description

T. J. McLaughlin
R. D. Potter
R. L. Treat
MACTEC

W. L. Willis
Numatec Hanford Corporation

P. Bartley
Foster Wheeler Environmental Corporation

R. E. Raymond
Lockheed Martin Hanford Corporation

Date Published
January 1998

Prepared by Lockheed Martin Hanford Corporation
Richland, Washington

Prepared for the U.S. Department of Energy

Fluor Daniel Hanford, Inc.
P.O. Box 1000
Richland, Washington

Hanford Management and Integration Contractor for the
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Document Title: Tank Waste Remediation System Retrieval and Disposal Mission
Technical Baseline Summary Description

Approved by:

H. L. Boston, Vice President
Tank Waste Retrieval
Lockheed Martin Hanford Corporation

1/6/98

Date

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EXECUTIVE SUMMARY

This document, the Tank Waste Remediation System Retrieval and Disposal Mission Technical Baseline Summary Description, is one of several documents prepared by Lockheed Martin Hanford Corporation to support the U.S. Department of Energy's evaluation of readiness-to-proceed for the Waste Retrieval and Disposal mission at the Hanford Site. The Waste Retrieval and Disposal Mission is one of three primary missions under the Tank Waste Remediation System (TWRS) Project. The other two include programs to characterize tank waste and to provide for safe storage of the waste while it awaits treatment and disposal. The Waste Retrieval and Disposal Mission includes the programs necessary to support tank waste retrieval, waste feed, delivery, storage and disposal of immobilized waste, and closure of tank farms. This mission will enable the tank farms to be closed and turned over for final remediation.

The Technical Baseline is defined as the set of science and engineering, equipment, facilities, materials, qualified staff, and enabling documentation needed to start up and complete the mission objectives. As shown in Figure ES-1, this document (and the set of technical information and other factors this document represents) is part of the readiness-to-proceed document hierarchy. The primary purposes of this document are (1) to identify the important technical information and factors that should be used by contributors to the mission and (2) to serve as a basis for configuration management of the technical information and factors.

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This document presently focuses on the Waste Retrieval and Disposal Mission portion of the TWRS Project; it will be incorporated into a similar document that will represent the entire TWRS Project. This document will be updated regularly to ensure that the Technical Baseline documents and source information identified herein are maintained current. Changes to this document will be consistent with applicable configuration management procedures.

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CONTENTS

1.0 INTRODUCTION	1
1.1 TECHNICAL BASELINE	2
1.2 STRUCTURE AND CONTENT OF DOCUMENT	7
2.0 WASTE RETRIEVAL AND DISPOSAL MISSION SCOPE AND REQUIREMENTS ...	9
3.0 WASTE FEED DELIVERY	13
3.1 PRIMARY WASTE DEFINITION	15
3.2 PROCESS DEFINITION	16
3.2.1 Low-Activity Waste Feed Delivery - Phase 1	16
3.2.2 High-Level Waste Feed Delivery - Phase 1	17
3.3 MISSION PLANNING	17
3.4 STRUCTURES, SYSTEMS, AND COMPONENTS	17
3.4.1 System and Project Definition	18
3.4.2 Project Records	19
3.4.3 Reliability, Availability, and Maintainability Risk Evaluation	19
3.4.4 Spare Equipment List	20
3.5 OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS	20
3.5.1 Operations and Maintenance Concept	20
3.5.2 Permits and Safety Authorizations	20
3.5.3 Process Limits	20
3.5.4 Safety Equipment List	21
3.5.5 Operations and Maintenance Environmental, Safety, and Health Plans	21
3.5.6 Operations and Maintenance Procedures	21
3.5.7 Training Certification	22
3.5.8 Operations and Maintenance Records	22
3.6 SECONDARY WASTE DEFINITION	22
3.7 PROGRAMMATIC INTERFACES	22
4.0 INFRASTRUCTURE SUPPORT	23
4.1 PRIVATE CONTRACTOR RECEIPT/LAG STORAGE TANKS	23
4.2 PROCESS DEFINITION	24
4.3 MISSION PLANNING	25
4.4 STRUCTURES, SYSTEMS, AND COMPONENTS	25
4.5 OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS	26
4.6 SECONDARY WASTE DEFINITION	26
4.7 PROGRAMMATIC INTERFACES	26
5.0 PRIVATIZATION CONTRACT INTERFACES	27
5.1 INPUT INTERFACE CONTROL DOCUMENTS	28
5.1.1 Low-Activity Waste Feed (ICD 19)	28
5.1.2 High-Level Waste Feed (ICD 20)	32

CONTENTS (Continued)

5.2	SUPPORTING SYSTEM INTERFACE CONTROL DOCUMENTS	32
5.2.1	Raw Water (ICD 01)	32
5.2.2	Potable Water (ICD 02)	33
5.2.3	Land for Siting (ICD 09)	33
5.2.4	Electricity (ICD 11)	33
5.2.5	Roads and Rails (ICD 12)	33
5.2.6	Non-Routine High-Level Solid Wastes (ICD 13)	33
5.2.7	Waste Feed Tanks (ICD 21)	34
5.3	OUTPUT INTERFACE CONTROL DOCUMENTS	34
5.3.1	Radioactive Solid Wastes (ICD 03)	34
5.3.2	Non-Radioactive, No Dangerous Liquid Effluent (ICD 05)	34
5.3.3	Radioactive, Dangerous Liquid Effluents (ICD 06)	34
5.3.4	Deactivated Facility and Site (ICD 10)	35
5.3.5	Immobilized High-Level Waste (ICD 14)	35
5.3.6	Immobilized Low-Activity Waste (ICD 15)	35
5.3.7	⁹⁰ Strontium/Transuranics/Entrained Solids (ICD 16)	35
5.3.8	¹³⁷ Cesium (ICD 17)	35
5.3.9	⁹⁹ Technetium (ICD 18)	36
6.0	PRODUCT STORAGE AND DISPOSAL	36
6.1	PRIMARY WASTE AND PRODUCT DEFINITIONS	38
6.2	PROCESS DEFINITION	39
6.2.1	Immobilized Low-Activity Waste	39
6.2.2	Immobilized High-Level Waste	40
6.2.3	Cesium/Strontium Capsules	40
6.3	MISSION PLANNING	41
6.4	SYSTEMS, STRUCTURES, AND COMPONENTS	41
6.4.1	System and Project Definition	41
6.4.2	Project Records	42
6.4.3	Reliability, Availability, and Maintainability Risk Evaluation	43
6.4.4	Spare Equipment List	43
6.5	OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS	43
6.5.1	Operations and Maintenance Concept	43
6.5.2	Permits and Safety Authorizations	44
6.5.3	Process Limits	44
6.5.4	Safety Equipment List	44
6.5.5	Operations and Maintenance Environmental, Safety and Health, and Quality Assurance Plans	45
6.5.6	Operations and Maintenance Procedures	45
6.5.7	Training Certifications	45
6.5.8	Operations and Maintenance Records	45

CONTENTS (Continued)

6.6 SECONDARY WASTE DEFINITION	46
6.7 PROGRAMMATIC INTERFACES	46
7.0 SECONDARY WASTE MANAGEMENT AND ANALYTICAL SUPPORT	47
7.1 ANALYTICAL SERVICES	47
7.1.1 Facility Description	47
7.1.2 Sample Receiving Capabilities and Limitations	49
7.1.3 Facility Discharges	49
7.1.4 Programmatic and Technical Interfaces	49
7.1.5 Additional Required and Supplemental Documentation	50
7.2 242-A EVAPORATOR	50
7.2.1 Facility Description	50
7.2.2 Waste Receiving Capabilities and Limitations	51
7.2.3 Facility Discharges	51
7.2.4 Programmatic and Technical Interfaces	51
7.2.5 Additional Required and Supplemental Documentation	52
7.3 EFFLUENT TREATMENT FACILITY/LIQUID EFFLUENT RETENTION FACILITY	52
7.3.1 Facility Description	52
7.3.2 Waste Receiving Capabilities and Limitations	52
7.3.3 Facility Discharges	53
7.3.4 Programmatic and Technical Interfaces	53
7.3.5 Additional Required and Supplemental Documentation	53
7.4 200 AREA TREATED EFFLUENT DISPOSAL FACILITY	54
7.4.1 Facility Description	54
7.4.2 Waste Receiving Capabilities and Limitations	54
7.4.3 Facility Discharges	54
7.4.4 Programmatic and Technical Interfaces	54
7.5 STATE-APPROVED LAND DISPOSAL SITES	55
7.6 CENTRAL WASTE COMPLEX	55
7.6.1 Facility Description	55
7.6.2 Waste Receiving Capabilities and Limitations	55
7.6.3 Facility Discharges	56
7.6.4 Programmatic and Technical Interfaces	56
7.6.5 Additional Required and Supplemental Documentation	56
8.0 UTILITY SUPPORT	56
9.0 CLOSURE	58
9.1 PRIVATE CONTRACTOR FACILITIES	58
9.2 IMMOBILIZED WASTE FACILITIES	59

CONTENTS (Continued)

9.2.1 Immobilized Low-Activity Waste Facilities	59
9.2.2 Immobilized High-Level Waste Facilities	59
9.3 TANK FARM SYSTEMS	59
9.4 OTHER PROJECT HANFORD MANAGEMENT CONTRACT TEAM SUPPORTING FACILITIES	60

APPENDICES

A	WASTE RETRIEVAL AND DISPOSAL MISSION SCOPE DOCUMENTS	A-i
B	WASTE FEED DELIVERY DOCUMENTS	B-i
C	INFRASTRUCTURE SUPPORT DOCUMENTS	C-i
D	PRIVATE CONTRACTOR INTERFACE DOCUMENTS	D-i
E	PRODUCT STORAGE AND DISPOSAL DOCUMENTS	E-i
F	SECONDARY WASTE MANAGEMENT AND ANALYTICAL SUPPORT DOCUMENTS	F-i
G	REFERENCES	G-i
H	GUIDANCE AND REQUIREMENTS TO DELIVERABLES CROSSWALK - TWRS RETRIEVAL AND DISPOSAL MISSION TECHNICAL BASELINE SUMMARY DESCRIPTION	H-i

LIST OF FIGURES

1. Relationship of Waste Retrieval and Disposal Mission Elements to the TWRS Project	1
2. Top-Level Summary of Technical Bases for Operations, Consistent with DOE Orders 425.1 and 430.1	3
3. Engineering Process Flow Diagram	4
4. General Configuration and Flow of Technical Baseline Information	5
5. Relationship of Contractors, Their Roles, and Location of Technical Baseline Information in this Document	8
6. Major Facilities and Process Flows for the Waste Retrieval and Disposal Mission	12

LIST OF TABLES

1. Cross-Cutting Waste Retrieval and Disposal Mission Technical Baseline Documents and Designated Source Information	11
2. Waste Feed Delivery System Documents and Designated Source Information	13
3. Infrastructure Support Documents and Designated Source Information	24
4. Interface Categories and Requirements of Privatization Contracts	29
5. Privatization Interface Control Documents and Designated Source Information	30
6. Summary of Source Product Storage and Disposal Documents	37
7. Technical Baseline Documents for Secondary Waste and Analytical Services and Designated Source Information	48
8. Utilities Support Documents and Designated Source Documents	57
9. Summary of Source Tank Closure/Other Interfaces	58

LIST OF TERMS

BIO	Basis for Interim Operation
CSB	Canister Storage Building
CWC	Central Waste Complex
DIMC	Document/Information Management Center
DOE	U.S. Department of Energy
DST	double-shell tank
DYN	DynCorp Tri-Cities Services, Inc.
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ES&H	environmental, safety, and health
ETF	Effluent Treatment Facility
FDH	Fluor Daniel Hanford, Inc.
FSAR	Final Safety Analysis Report
FY	fiscal year
HLW	high-level waste
HSTD	Hanford Site Technical Database
ICD	Interface Control Document
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
LAW	low-activity waste
LERF	Liquid Effluent Retention Facility
LLW	low-level waste
LMHC	Lockheed Martin Hanford Corporation
NEPA	<i>National Environmental Policy Act of 1969</i>
PHMC	Project Hanford Management Contract
RAM	reliability, availability, and maintainability
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
SALDS	State Approved Land Disposal Site
SNF	spent nuclear fuel
SSC	structures, systems, and components
SST	single-shell tank
TEDF	Treated Effluent Disposal Facility
Tri-Party Agreement	<i>Hanford Federal Facilities Agreement and Consent Order</i>
TRU	transuranic
TSR	technical safety requirement
TWR	Tank Waste Retrieval
TWRS	Tank Waste Remediation System
WBS	work breakdown structure
WMH	Waste Management Federal Services of Hanford, Inc.

TANK WASTE REMEDIATION SYSTEM RETRIEVAL AND DISPOSAL MISSION TECHNICAL BASELINE SUMMARY DESCRIPTION

1.0 INTRODUCTION

This document provides a summary description of the Technical Baseline for the Waste Retrieval and Disposal Mission, a major element of the Tank Waste Remediation System (TWRS) Project. The Waste Retrieval and Disposal Mission includes the programs necessary to support TWRS Project tank waste retrieval, delivery, storage, disposal, and tank farm closure. Treatment and disposal of tank wastes is currently planned to occur in two phases. Under Phase 1 (a demonstration phase), one or two private contractors will build, own, and operate facilities to verify that treatment and immobilization processes function effectively. Phase 2 (a full-scale production phase) will be developed using the information and results from Phase 1. Figure 1 depicts the relationship of the Waste Retrieval and Disposal Mission elements to the TWRS Project. The full range of TWRS Project missions and objective is discussed in more detail in HNF-SD-WM-MAR-008, *Tank Waste Remediation System Mission Analysis Report* (Acree 1998).

Figure 1. Relationship of Waste Retrieval and Disposal Mission Elements to the TWRS Project.

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The TWRS Project is operated by Lockheed Martin Hanford Corporation (LMHC) under the Project Hanford Management Contract (PHMC), which is managed by Fluor Daniel Hanford, Inc. (FDH). The TWRS Project includes operation and maintenance of the single-shell tanks (SST) and double-shell tanks (DST); retrieval of low-activity waste (LAW) and high-level waste (HLW) from the DSTs, SSTs, and miscellaneous underground storage tanks; delivery of the tank wastes to treatment and immobilization facilities; interim storage and disposal of immobilized LAW (ILAW); temporary storage and final disposition of immobilized HLW

(IHLW); management of secondary wastes and byproducts; and safe closure of the DSTs, SSTs, miscellaneous underground storage tanks, and tank farm facilities. The Technical Baseline for the Waste Retrieval and Disposal Mission provides the basis for planning and managing technical objectives over the life-cycle of the mission. This Technical Baseline summary description serves the following purposes.

- Identifies those documents that represent the Technical Baseline for the Waste Retrieval and Disposal Mission.
- Designates source information for technical bases.
- Defines the organization responsible for each Technical Baseline document.
- Identifies configuration information to be managed under graded configuration management requirements.

This document presently focuses on the Waste Retrieval and Disposal Mission portion of the TWRS Project; it will be incorporated into a similar document that represents the entire TWRS Project.

1.1 TECHNICAL BASELINE

The Technical Baseline is the set of science and engineering, equipment, facilities, materials, qualified staff, and enabling documentation needed to start up and complete mission objectives. The documents that represent the Technical Baseline include those necessary to support a successful Operational Readiness Review or Readiness Assessment in accordance with DOE Order 425.1, *Startup and Restart of Nuclear Facilities*. Figure 2 shows that the development of the Technical Baseline follows mission definition and planning, and is structured to satisfy the requirements for a successful Operational Readiness Review or Readiness Assessment and continued operations for the life cycle of the mission.

The Technical Baseline contains three parts: the requirements baseline, the design baseline, and the operational baseline. The *Tank Waste Remediation System Systems Engineering Management Plan*, HNF-SD-WM-SEMP-002 (Peck 1998), provides additional detail on the content of the Technical Baseline. Figure 3, which is contained in HCF-SD-WM-SEMP-002 (Peck 1998), shows examples of technical information included in each part of the Technical Baseline. The relationship of technical information included in the Technical Baseline is shown in Figure 4.

Figure 2. Top-Level Summary of Technical Bases for Operations, Consistent with DOE Orders 425.1 and 430.1.

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Note: The process of Reconciling new and changed baseline information with existing information may require reversing the information flow.

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The Technical Baseline is generated using the iterative systems engineering process, and it will mature over the life-cycle of the TWRS Project. The Technical Baseline has been planned to evolve with the TWRS Project in the succeeding years in accordance with the schedule and budget. The sequence of preparing Technical Baseline documents is generally consistent with the Technical Baseline information process outlined in Figure 4. The process for identifying, developing, and maintaining the TWRS Project Technical Baseline documents is described in more detail in HNF-1947, *Tank Waste Remediation System Engineering Plan* (Raymond 1998).

Technical Baseline documents serve as inputs to, or are products of, work scope activities. The durations and costs of the work scope activities, including development of Technical Baseline documents, are defined in the TWRS Retrieval Level 1 Logics (FDH 1998). Relating the mission's Technical Baseline documents to the Level 1 Logics (FDH 1998) ensures that correct technical information is identified for its required use and aids in the development of future Technical Baseline information.

In accordance with HNF-1947, *Tank Waste Remediation System Engineering Plan* (Rifaey 1998), and HNF-1900, *Tank Waste Remediation System Configuration Management Plan* (Vann et al. 1998), the TWRS Operations, Engineering and Nuclear Safety organization will be responsible for maintaining the Technical Baseline and this Technical Baseline summary description. Maintaining this summary description document includes:

- Reviewing new and revised Technical Baseline documents
- Assigning document categories (e.g., configuration information, requirement, source document) and identifying the source information for each document
- Preparing Technical Baseline document summaries for inclusion in the appendices of this summary description document
- Updating this summary description document at least semi-annually.

The TWRS Operations, Engineering and Nuclear Safety organization is also responsible for managing, consistent with HNF-1900 (Vann et al. 1998), the lists of configuration information provided in the source information tables in each section of this document, assessing the configuration impact of each document, and directing accordingly all owners of potentially impacted predecessor and successor Technical Baseline documents. Configuration items/information will be selected for control based upon importance to the TWRS Project and Waste Retrieval and Disposal Mission and risks that would result from inadequacy of the product. Once the item/information has been selected to be controlled and maintained current, it will be entered into an information system that will status the release and revision history of those items. This information system will be updated throughout the configuration item's life cycle and made accessible to users. Document control and configuration procedures will be implemented to ensure that only currently approved revisions of configuration documents are used to conduct work. Controlled documents will be processed and maintained current in accordance with HNF-PRO-224, *Document Control*.

Organizations that contribute to the TWRS Project are responsible for using designated source information as the basis for preparing and revising their work. These organizations are also responsible for submitting new and revised Technical Baseline documents to the TWRS Operations, Engineering and Nuclear Safety organization for assessment of configuration impacts and update and maintenance of the Technical Baseline. Contributing organizations will utilize satellite Document/Information Management Centers (DIMC) to receive and transmit documentation and information associated with the TWRS Project and Waste Retrieval and Disposal Mission. The DIMCs provide the technologies and services to manage both incoming and internally created documents, including Technical Baseline documents, so that information is accessible across the TWRS Project. The DIMC services include document scanning, indexing, document release, document clearance and distribution, storage, records disposition and transfer, commitment tracking, and similar services as required. Documents and media (including Technical Baseline documents) will be stored and/or accessible through the Records Management Information System. The TWRS Project programs and organizations will be responsible for identifying the documents and information systems that will be controlled and shared.

1.2 STRUCTURE AND CONTENT OF DOCUMENT

The TWRS Project contractor and other members of the PHMC team have specific roles in executing the Waste Retrieval and Disposal Mission. Technical Baseline information has been or will be developed by each PHMC team contractor. Figure 5 relates the Waste Retrieval and Disposal Mission contractors and their roles to Sections 2.0 through 9.0 of this document. The content of each of these sections, along with the lead responsible organization, is as follows.

- Section 2.0 provides a high-level summary of the background, decision documents, mission sources, and cross-cutting requirements information for the Waste Retrieval and Disposal Mission (responsible organization: LMHC).
- Section 3.0 addresses work and technical documents related to processing and retrieval of waste from the tanks and delivery of the waste feed to the private contractors (responsible organization: LMHC).
- Section 4.0 addresses work and technical documents related to turning over two waste tanks to private contractors and providing related infrastructure equipment and services (responsible organization: LMHC).
- Section 5.0 addresses work and Interface Control Documents (ICDs) related to the private contractors' work to treat and immobilize the tank waste (responsible organizations: private contractors and their interfacing PHMC team contractors, which include LMHC, Waste Management Federal Services of Hanford, Inc. [WMH], and DynCorp Tri-Cities Services, Inc. [DYN]).

Figure 5. Relationship of Contractors, Their Roles, and Location of Technical Baseline Information in this Document.

Note: Section numbers refer to sections in this document

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- Section 6.0 addresses work and technical documents related to the PHMC team's receipt and disposal of ILAW and IHLW and other products from the private contractors (responsible organization: LMHC).
- Section 7.0 addresses work and technical documents related to tank waste sample analysis and treatment, storage, and disposal of secondary wastes (responsible organization: WMH).
- Section 8.0 addresses work and technical documents related to provision of utility services (responsible organization: DYN).

- Section 9.0 addresses work and technical documents related to closing the tanks and associated facilities (responsible organizations: LMHC, WMH, and Bechtel Hanford, Inc.).

This document also contains seven appendices (A through G). Appendices A through F support the eight scope areas described in Sections 2.0 through 9.0. The following summary information for each technical document is included in the corresponding appendix:

- Assigned document number and title
- Configuration management designation (i.e., maintained current, or not)
- Responsible organization
- Status of preparation/revision
- Source information designation (i.e., the specific information that has been in the document designated to represent element(s) of the Technical Baseline)
- Brief summary of content of entire document or information set
- Inter-related documents (i.e., successor and predecessor documents impacted by the document, including changes to the document).

Appendix G provides a bibliography of the references cited in this summary description document.

2.0 WASTE RETRIEVAL AND DISPOSAL MISSION SCOPE AND REQUIREMENTS

This section identifies mission-related documents and other cross-cutting information that structures the development of the Technical Baseline for the Waste Retrieval and Disposal Mission. The Waste Retrieval and Disposal Mission is a major component of the TWRS Project. Both the mission and the TWRS Project are the results of a combination of strategic and technical decisions made by government agencies, stakeholders, and Hanford Site contractors. The materials involved in this decision making are discussed below. This section concludes with a brief introduction of the main elements of the retrieval and immobilization process, and where these are addressed in this document.

Agreements between DOE and the principal regulatory agencies (U.S. Environmental Protection Agency [EPA] and Washington State Department of Ecology [Ecology]) on Hanford Site compliance and remediation actions and milestones are set forth in the *Hanford Federal*

Facility Agreement and Consent Order (Tri-Party Agreement) (Ecology et al. 1996). In June 1996, DOE published DOE/EIS-0222D, *Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land Use Plan* (DOE 1996a), which described preliminary land use designations to be considered in making decisions about the Hanford Site. DOE's missions for the Hanford Site are established in DOE/RL 96-92, *Hanford Strategic Plan*, which sets specific goals for the retrieval and immobilization of the tank wastes (RL 1996b).

The documents identified above, as well as other strategic considerations, helped form the basis for the alternatives presented in DOE/EIS-0189, *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement* (DOE and Ecology 1996). Based on this environmental impact statement, DOE's selected approach and preferred alternatives for the TWRS Project were set forth in 62 FR 8693, "Record of Decision for the Tank Waste Remediation System" published in the February 26, 1997 *Federal Register*. The selected approach relies on private contractors for a technology demonstration period (Phase 1), followed by full-scale operations (Phase 2) for tank waste retrieval, immobilization, and disposal. Contracts have been established between DOE and two private contractors to conduct a preliminary technical phase (Phase 1A): DE-AC06-96RL13308, *British Nuclear Fuels Laboratory Privatization Contract* (RL 1996a); and DE-AC06-96RL13309, *Lockheed Martin Advanced Environmental Systems Privatization Contract* (RL 1996c). Contracting for Phase 1B (construction and operation of the test technologies) will be evaluated in 1998.

Overall workflow and sequence for the TWRS Project is depicted in the TWRS Level 0 Logic (Hanford Drawing No. H-2-829166) (FDH 1998) which shows approximately 100 sequentially linked, broadly scoped activities intended to satisfy DOE's mission objectives for the TWRS Project. In October 1996, DOE and FDH, leading a team of contractors that included LMHC, agreed to DE-AC06-96RL13200, *Project Hanford Management Contract (PHMC)* (RL 1996e), for Hanford Site Management and Integration work. In November 1996, subcontract number 80232764-9-K001 (FDH 1996c) was agreed to between FDH and LMHC; this contract includes requirements for LMHC's performance of the TWRS Project. Subcontracts were also established between FDH and the other PHMC team members: Babcock and Wilcox Hanford Company, Duke Engineering and Services Hanford Company; DYN, Numatec Hanford Company, and WMH (FDH 1996a,b,d,e).

Requirements for the TWRS Project and the Waste Retrieval and Disposal Mission are captured comprehensively in the Hanford Site Technical Database (HSTD), which is entered and maintained in a computer-based system called RDD-100. Enabling assumptions for the TWRS Project are captured in this database, and plans have been established to add risks, opportunities, and decisions to the HSTD as early as fiscal year 1998. In addition to the HSTD, the TWRS Standards/Requirements Information Documents, WHC-SD-MP-SRID-001, *High-Level Waste Storage Tank Farms 242-A Evaporator Standards/ Requirements Identification Document (S/RID)* (Biebesheimer 1996), identify federal, state, and professional technical requirements applicable to 20 functional areas (e.g., Operations, Maintenance, Environmental Protection) for performing work in the tank farms. Finally, HNF-SD-WM-MAR-008 (Acree 1998), integrates relevant policy, contractual, strategic, and other decisions with applicable requirements from the HSTD and Standards/Requirements Information Documents to describe the overall technical

basis for the TWRS Project and Waste Retrieval and Disposal Mission. Table 1 identifies these three cross-cutting documents (HSTD, Standards/Requirements Information Documents, and HNF-SD-WM-RPT-288, *Waste Management Project Technical Baseline Description* [Sederburg 1997]) as Technical Baseline documents (see Appendix A for detail).

Table 1. Cross-Cutting Waste Retrieval and Disposal Mission Technical Baseline Documents and Designated Source Information.

Documents title	Maintained current?*	Appendix number	Source information
<i>Tank Waste Remediation System Mission Analysis Report</i> (Acree 1998)	Y	A.1	Establishes TWRS Project requirements, including the problem definition, mission statement, initial state (current unacceptable) conditions, acceptable end state, major boundaries and interfaces, mission analysis level issues and assumptions, and the technical strategy basis. Also included are externally imposed requirements, including applicable federal, state, and local legislation, as well as associated statutes, regulations, codes, and standards.
Hanford Site Technical Database (HSTD)	Y	A.2	Defines site-wide technical requirements for conducting Hanford Site work.
Standards/Requirements Identification Documents	Y	A.3	Defines operating, maintenance, environmental, safety, and other requirements for conducting work in the Hanford tank farms.

*Is the document to be maintained current per HNF-1900? (Y=yes, N=no)
TWRS = Tank Waste Remediation System.

The TWRS Project will be responsible for separating waste from selected tanks into a LAW supernatant (i.e., liquid fraction containing a very low solids content) and delivering LAW feed to the private contractors. If DOE also authorizes one of the private contractors to proceed with HLW immobilization, the TWRS Project will be responsible for conditioning tank waste solids (e.g., sludge washing) and delivering the resulting HLW feed to the private contractor. Activities associated with delivery of these waste feeds are shown in Figure 6 and discussed in Section 3.0 of this document. Section 4.0 describes infrastructure support that will be provided to enable the private contractors to receive and manage the waste feed. The LAW and HLW streams will be immobilized by the private contractors in accordance with the contractual requirements of the future Phase 1B private contracts. Agreements on interfaces with the private contractors will be established in ICDs, as discussed in Section 5.0 of this document.

Several secondary products and waste streams will result from the waste feed and immobilization processes. Figure 6 shows these products and waste streams, along with their sources and expected destinations. The ILAW, IHLW, and separated solids and radionuclides will be transferred from the private contractors to the TWRS Project for management and disposal, as described in Section 6.0 of this document. Liquid effluent streams, samples, and

Figure 6. Major Facilities and Process Flows for the Waste Retrieval and Disposal Mission.

HNF-1901 Rev 0

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other secondary wastes will be received and dispositioned by WMH, as described in Section 7.0 of this document. Utility support (e.g., potable water, electricity) associated with the waste feed, immobilization, and management activities will be provided by DYN, as discussed in Section 8.0 of this document. Following successful retrieval, empty tanks and associated facilities will be closed and remediated as described in Section 9.0 of this document.

3.0 WASTE FEED DELIVERY

The Waste Feed Delivery Program is subordinate to the Tank Waste Retrieval (TWR) Organization and the TWRs Project. This section briefly summarizes the scope of the Waste Feed Delivery Program and, in this context, identifies Technical Baseline documents that will support startup and continued operations throughout the mission. Table 2 lists the Technical Baseline documents identified to date for the Waste Feed Delivery Program, along with each document's source information. A brief summary of each document and other pertinent information is contained in Appendix B.

Table 2. Waste Feed Delivery System Documents and Designated Source Information. (3 Sheets).

Document title	Maintained current?*	Appendix number	Source information
<i>FY 1997 - 1998 Waste Information Requirements Document</i> (Winkleman et al. 1997)	N	B.1	Annual plan for tank waste sampling activities, approved by DOE and Washington State Department of Ecology.
<i>Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes</i> (Kupfer et al. 1997)	Y	B.2	Best-basis inventory of the chemical and radiological contents of Tank Farm wastes.
Tank Characterization Reports (TCRs) (see Appendix B and Appendix G)	Y	B.3	Best-basis inventories for the 177 individual DSTs and SSTs.
<i>Tank Waste Remediation System Operation and Utilization Plan</i> (Kirkbride et al. 1997)	Y	B.4	The operating scenario and plans for the delivery of feed to the private contractors, retrieval of waste from single- and double-shell tanks, and the overall process flowsheets. The TWRs Operation and Utilization Plan is the source of the feed delivery system process.

Table 2. Waste Feed Delivery System Documents and Designated Source Information. (3 Sheets).

Document title	Maintained current?*	Appendix number	Source information
Waste Feed Delivery Technical Basis (document under preparation)	Y	B.5	Definition and description of the detailed flowsheets, system design concept, and the operations and maintenance concept for the waste feed delivery system.
<i>System Specification for the Double-Shell Tank System</i> (Grenard and Claghorn 1997)	Y	B.6	High-level definition of equipment specifications for the DST System.
Phase 1 Waste Feed Delivery Process Requirements (under preparation)	Y	B.7	Overall process design criteria for new and modified equipment supporting the waste feed delivery system.
Project W-314 Technical Baseline Documents	Y	B.8	Technical Baseline documents related to the W-314 Project, Tank Farm Restoration and Safe Operations.
Project W-211 Technical Baseline Documents	Y	B.9	Technical Baseline documents related to the W-211 Project, Initial Tank Retrieval System.
Project W-454 Technical Baseline Documents	Y	B.10	Technical Baseline documents related to the W-454 Project, AW Jumper Manifold Upgrade.
Project W-058 Technical Baseline Documents	Y	B.11	Technical Baseline documents related to the W-058 Project, Cross Site Transfer Line.
Project W-030 Technical Baseline Documents	Y	B.12	Technical Baseline documents related to the W-030 Project, Aging Waste Vent System.
Project W-320 Technical Baseline Documents	Y	B.13	Technical Baseline documents related to the W-320 Project, Tank C-106 Retrieval.
Project W-151 Technical Baseline Documents	Y	B.14	Technical Baseline documents related to the W-151 Project, AZ-101 Mixer Pumps.
Waste Feed Delivery Reliability, Availability, and Maintainability (under preparation)	N	B.15	Reliability, Availability, and Maintainability risk evaluation report
<i>Double-Shell Tank System Dangerous Waste Permit Application</i> (RL 1991b)	N	B.16	RCRA Part A Permit for the Tank Farms as a hazardous waste treatment storage and/or disposal facility.
Notices of Construction	N	B.17 Through B.23 (7 entries)	The Notices of Construction (one or more for each of the projects) are the air permits with the U. S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology

Table 2. Waste Feed Delivery System Documents and Designated Source Information. (3 Sheets).

Document title	Maintained current?*	Appendix number	Source information
<i>Tank Waste Remediation System Basis for Interim Operation</i> (FDH 1997a)	Y	B.24	Safety Authorization Basis for operation of the Tank Farms
<i>Tank Waste Remediation Technical Safety Requirements</i> (Noorani 1997)	Y	B.25	Technical safety requirements
<i>TWRS Facility Safety Equipment List</i> (Jensen 1997)	Y	B.26	Facility safety equipment

*Is the document to be maintained current per HNF-1900? (Y=yes, N=no).

FY = fiscal year.

RCRA = Resource Conservation and Recovery Act of 1976.

TWRS = Tank Waste Remediation System.

3.1 PRIMARY WASTE DEFINITION

Tank waste consists of byproducts from chemical separations processing of irradiated nuclear fuels. The waste is highly radioactive because it contains fission and activation products from the fuel as well as smaller amounts of uranium and other actinides. The waste also contains residuals of the chemicals used in various separations processes performed at the Hanford Site. Other chemical additions were made to the waste to minimize corrosion of the underground storage tanks. Although similarities exist between the wastes in the tanks, each tank contains waste with a unique composition.

A "best-basis" inventory has been developed on a total-tank basis and for each of the 177 underground storage tanks. The best-basis inventory is located in HNF-SD-WM-TI-740, *Standard Inventories of chemicals and Radionuclides in Hanford Site Tank Wastes* (Kupfer et al. 1997), and in 177 individual Tank Characterization Reports (see Appendix B and Appendix G). These documents report work performed to date to establish standard total-tank and tank-by-tank component inventory estimates. The TWRS Characterization Program establishes an annual plan for tank waste sampling activities. The plan is outlined in HNF-SD-WM-PLN-126, *FY 1997-1998 Waste Information Requirements Document* (Winkleman et al. 1997). The Tank Waste Retrieval Organization is developing Data Quality Objectives, which will be used to define further tank waste characterization efforts.

3.2 PROCESS DEFINITION

The privatization contracts (RL 1996a and RL 1996c) between DOE and the private contractors are source documents for defining end-point requirements for the waste feed delivery system. Under the DOE strategy, privatization will take place in two phases. In Phase 1 (demonstration phase) tank wastes will be retrieved and delivered to the private contractors by the TWRS Project. In Phase 2 (production phase), retrieval and delivery of the waste may be privatized as well. The waste feed delivery process will separate tank waste into a LAW fraction and a HLW fraction. The delivery of Phase 1 feed is planned to satisfy the compositional constraints of three LAW envelopes (A, B, and C) and one HLW envelope (D). These envelopes and the associated quantities of waste to be delivered are defined in the privatization contracts. Specifications in the privatization contracts were used to define planning assumptions for the Waste Feed Delivery program and other programs supporting the Retrieval and Disposal Mission.

The operating scenario and the sequence of waste retrieval and delivery to the private contractors based on planning assumptions and information on tank waste composition, existing or planned equipment and operational capabilities is defined in HNF-SD-WM-SP-012, *Tank Waste Remediation System Operation and Utilization Plan* (Kirkbride et al. 1997). The source of the process to be used for satisfying the envelope and delivery quantity requirements is HNF-SD-WM-SP-012 (Kirkbride et al. 1997). Except for the HLW in two SSTs, DSTs will be the sources of wastes delivered and immobilized during Phase 1. HNF-SD-WM-SP-012 (Kirkbride et al. 1997) references laboratory, testing, and modeling that serve to establish the basis of the unit processes. The detailed flowsheet for these processes will be defined in a waste feed delivery technical basis flowsheet (document being developed). The flowsheet will contain both mass and energy balances.

3.2.1 Low-Activity Waste Feed Delivery - Phase 1

In Phase 1, the TWRS Project will transfer LAW to tanks AP-102 and AP-104 to allow the Waste Feed Delivery Program to stage, sample, adjust if needed, and qualify waste to contractual requirements prior to delivery to the private contractors. After mixing, sampling, analysis, and confirmation that the LAW meets the envelope requirements, the waste will be transferred to the private contractors' feed tanks: AP-106 and AP-108. The private contractors will transfer waste to their immobilization facilities from these tanks. Activities and technical documents related to the turnover of these tanks to the private contractors are referenced in Section 4.0 of this document. Activities related to dissolution, dilution, and transfer of LAW to tanks AP-102 and AP-104, and subsequent mixing, sampling, and analysis are outlined in HNF-SD-WM-SP-012 (Kirkbride et al. 1997). Sources of LAW expected to satisfy envelopes A, B, and C are also defined in HNF-SD-WM-SP-012 (Kirkbride et al. 1997).

3.2.2 High-Level Waste Feed Delivery - Phase 1

High-level waste sludges will be washed to produce HLW feed that satisfies envelope D requirements. The HLW feed will contain a combination of transuranic (TRU) radionuclides and fission products in concentrations requiring permanent isolation in a federal repository. Sources of HLW expected to satisfy envelope D requirements are defined in HNF-SD-WM-SP-012 (Kirkbride et al. 1997).

3.3 MISSION PLANNING

Activities required to achieve the objectives of the TWRS Project are described in the TWRS Level 0 Logic (FDH 1998). The Level 0 logic (FDH 1998) depicts the activities that will satisfy TWRS Project mission objectives. The lower level logic diagrams (Level 1) (FDH 1998) are more specific to the Waste Feed Delivery Mission. The diagrams show detailed activities necessary to deliver feed to the private contractors during Phase 1B. Lower-level logic diagrams and supporting analyses are the bases for multi-year work planning. The current multi-year work plan, HNF-SP-1230, *Tank Waste Remediation System Fiscal Year 1998 Multi-Year Work Plan WBS 1.1* (Lenseigne 1997), will be updated in FY 1999 to incorporate the lower-level logic activities. Guidance for developing multi-year work plans will include specifications about which Technical Baseline documents to use, revise, and generate.

Many of the Technical Baseline documents identified in this summary description will serve as references or bases for completing logic activities; others will be products of the activities themselves. These product documents will usually serve as bases for planning subsequent activities. The logic diagrams and their supporting analyses are the bases for estimating costs and the schedule for the waste feed delivery system and other elements of the Waste Retrieval and Disposal mission. The development of Technical Baseline documents is (or will be) scheduled and costed with the other logic activities.

3.4 STRUCTURES, SYSTEMS, AND COMPONENTS

Structures, systems, and components (SSC) for waste feed delivery are defined as the hardware and software required to process and transfer feed to the private contractors. Existing and to-be-provided equipment used to transfer feed to the private contractors will be identified as part of a waste feed delivery technical basis system design concept (document being developed). This document will identify the specific tanks, associated piping and piping components, instrumentation and control systems, and ancillary equipment required to prepare and transfer the waste.

3.4.1 System and Project Definition

The waste feed delivery system includes existing equipment as well as equipment to be provided by several projects. Each of the projects identified below predates the current Waste Retrieval and Disposal Mission. The objectives of each of these projects, however, is consistent with needs of the mission and the Waste Feed Delivery Program. The functional requirements and technical specifics of each of these projects has been (or is being) evaluated and adjusted to support the current mission.

Top-level equipment and functional requirements for the overall DST system are defined in HNF-SD-WM-TRD-007, *System Specification for the double-Shell Tank System* (Grenard and Claghorn 1997). Specifications for the SST system and for individual components of the SST and DST systems will be developed when needed. Component specifications will be allocated to projects. An overarching functional requirements document, Phase 1 waste feed delivery process design requirements (document being developed), will include process design requirements for existing and future Phase 1 waste feed delivery system projects. After the Phase 1 waste feed delivery process design requirements document is completed, the functional design criteria for the waste feed delivery system projects will be reviewed and revised as needed to ensure compliance.

The following projects will provide equipment necessary to satisfy the Phase 1 requirements of the waste feed delivery system:

- Project W-314: Tank Farm Restoration and Safe Operations, provides new transfer piping, valving, and master-pump shutdown equipment
- Project W-211: Initial Tank Retrieval System, provides new pumps (mixer pumps, decant pumps, slurry pumps, and supernate pumps); electrical system upgrades; instrumentation and control system upgrades; chemical addition system; and valving upgrades
- Project W-454: AW Jumper Manifold Upgrade, provides jumper manifolds for use in connecting pipeline routings
- Project W-058: Cross Site Transfer Line, provides two new 3-in. transfer lines from the 200 West Area to the 200 East Area, booster pumps, master pump shutdown equipment, instrumentation and control upgrades, electrical system upgrades, and valve manifolds
- Project W-030: Aging Waste Vent System, provides new ventilation system, condensate collection and recirculation, control system in support of HLW sludge washing and HLW retrieval
- Project W-320: Tank C-106 Retrieval, provides sluicer system, slurry pump, SST instrumentation and control upgrades and SST heating, ventilation, and air

conditioning upgrades for tank C-106; and decant pump, slurry distributor and instrumentation upgrades for tank AY-102

- Project W-151: AZ-101 Mixer Pumps, provides two mixer pumps, instrumentation and control upgrades, and electrical system upgrades in tank AZ-101.

The Technical Baseline documents for each of the projects above are identified in Appendix B. Additional projects will be added to this document as they are defined.

3.4.2 Project Records

Project files will be developed and maintained in accordance with project configuration management plans and document management plans. The project document management plans will be consistent with the guidelines in HNF-PRO-563, *Project Management Plan*. Documents associated with projects (e.g., drawings, calculations, correspondence, tests, vendor information) will be maintained as records and processed through the DIMCs.

The project files will be complete, accurate, and made available to support projects that contribute to the Phase 1 and 2 waste feed delivery system. Information resources are managed throughout the information life-cycle, including information creation, collection, processing, distribution, management, and disposition or retirement. Life-cycle activities will be managed to make information useful, available, and effective in accomplishing project objectives.

The selection of controlled documents and information will be in accordance with HNF-1900 (Vann et al. 1998). Procedures for project records management include: HNF-PRO-232, *Project and Task Document Management*; HNF-PRO-208, *Records Management - General*; HNF-PRO-210, *Records Management Program*; HNF-PRO-222, *Quality Assurance Records*; and other related practices.

3.4.3 Reliability, Availability, and Maintainability Risk Evaluation

A waste feed delivery reliability, availability, and maintainability (RAM) risk evaluation will be generated for each tank and associated transfer system and documented in a waste feed delivery reliability, availability, and maintainability document (document being developed). The first RAM/risk evaluation will be produced during FY 1998. The document that contains the initial RAM/risk evaluation will be expanded to include Phase 1 tanks and will be updated as necessary with new and validated RAM/risk data. This RAM/risk evaluation will be used to confirm or revise each tank's operating and maintenance concept, and may also be used as a basis for revising design requirements and for developing the spare equipment list for the waste feed delivery system.

3.4.4 Spare Equipment List

The RAM/risk evaluation for the waste feed delivery system will serve as a basis for developing the waste feed delivery spare equipment list. Other bases for developing the list include vendor recommendations and reviews of historical maintenance records (available through the Hanford Site Job Control System [JCS]). Spares are controlled by procedure HNF-PRO-129, *Controlling Spare Parts and Spare Equipment Inventory*.

3.5 OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS

Operations, maintenance, and supporting Technical Baseline documents are those that are used to enable and control field activities. Related documents are described in the following subsections.

3.5.1 Operations and Maintenance Concept

A waste feed delivery technical basis operations and maintenance concept Technical Baseline document (document being developed), will be generated during FY 1998 as a basis for the waste feed delivery RAM/risk evaluation, and for developing waste feed delivery operating and maintenance procedures. The operations and maintenance concept for the waste feed delivery system will be derived from current operating and maintenance practices and from new equipment specification documents including HNF-SD-WM-TRD-007 (Grenard and Claghorn 1997), which establishes functional and performance requirements for DST equipment systems.

3.5.2 Permits and Safety Authorizations

Permitting activities related to the waste feed delivery system are identified in HNF-1773, *Tank Waste Remediation System Environmental Program Plan* (Borneman 1998), which addresses environmental policy requirements; permit and compliance responsibilities; planning; reports, notifications, and records; verification corrective actions; and preliminary PHMC team permit modification schedules. The safety Authorization Basis under which the TWRS Project currently operates is found in HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation* (BIO) (FDH 1997a). That document will be amended to allow for Phase 1 operations and related field activities.

3.5.3 Process Limits

Waste feed delivery process limits will include operating limits and technical safety requirements (TSRs). Operating limits will be imposed to ensure processing at an acceptably

low level of risk of failure to deliver on-specification waste on time to the private contractors. The TSRs are used to assure the safe operation of tank farm facilities. These requirements continue to evolve as tank farm missions change. The current TSRs for the TWRS Project are identified in HNF-SD-WM-TSR-006, *Tank Waste Remediation Technical Safety Requirements* (Noorani 1997). That document defines acceptable conditions, safe boundaries, bases thereof, and management or administrative controls required to assure safe operation. The TSRs are based on the preventive and mitigative features determined to be essential in the BIO (FDH 1997a). The TSRs will be augmented with tank-specific limits and guidance designed to assure adequate processing and maintenance rates. The limits and guidance will be derived from the tank-specific RAM/risk evaluation and latitudes allowed by the waste feed delivery operating and maintenance concept.

3.5.4 Safety Equipment List

The safety equipment list for the TWRS Project is identified in HNF-SD-WM-SEL-040, *TWRS Facility Safety Equipment List* (Jensen 1997). That document identifies the SSCs important to operations and maintenance safety, and provides the TWRS Project with the requirements to support occurrence reporting. The safety classifications provided in that document support the BIO (FDH 1997a). The barriers and administrative controls in the BIO help to prevent or mitigate the accidents analyzed and are the bases for the selected safety classifications described. HNF-SD-WM-SEL-040 (Jensen 1997) will be amended prior to operation of the waste feed delivery system to incorporate new safety class equipment installed during construction projects. HNF-SD-WM-SEL-040 (Jensen 1997) and the Spare Equipment List make up the Master Equipment List.

3.5.5 Operations and Maintenance Environmental, Safety, and Health Plans

The operations and maintenance environmental, safety, and health (ES&H) plans are located in HNF-IP-0842, *TWRS Administration*, Volume IX, "Safety," Section 1.1, "TWRS Safety Program Plan" (LMHC 1997) and in WHC-SD-WM-HSP-002, *Tank Farm Health and Safety Plan* (Mickle 1995). The Health and Safety Plan applies to the conduct of operations and work activities in the Hanford Site 200 Area tank farms and is used to minimize health and safety risks to workers and other onsite personnel. The Health and Safety Plan establishes requirements, provides general guidelines, and conveys tank farm- and facility-specific hazard information. Environmental requirements are identified in HNF-1773, *Tank Waste Remediation System Environmental Program Plan* (Borneman 1998).

3.5.6 Operations and Maintenance Procedures

Operations and maintenance procedures will be developed for the waste feed delivery system. Procedure development will occur after the project designs have been completed.

Procedures will be written in accordance with: HNF-IP-0842, *TWRS Administration* (LMHC 1997); HNF-PRO-229, *Technical Procedure Standard*; and verified and validated in accordance with HNF-PRO-431, *Verification and Validation*; HNF-PRO-491, *System Verification and Validation*; and HNF-PRO-556, *Verification and Validation Reports*.

3.5.7 Training Certification

Training and certification will occur after the specific procedures for operation and maintenance of the waste feed delivery system are in place. Shift supervisors, operating engineers, operators, craftsmen, and technicians will be trained to the procedures. Management, engineering, and other professional staff will receive specialized professional training and certification as necessary to assure proficiency. Training of personnel involved in tank farm operations and maintenance is planned to be accomplished using the existing training infrastructure. The training infrastructure is defined in HNF-IP-0842, *TWRS Administration*, Volume III, "Training" (LMHC 1997).

3.5.8 Operations and Maintenance Records

Operations and maintenance records include calibration, process performance, and system surveillance documents. As the waste feed delivery system is defined, operations and maintenance procedures will be written to govern record-keeping activities. These records will be developed, collected, and maintained consistent with the project records procedures discussed in Section 3.4.2.

3.6 SECONDARY WASTE DEFINITION

Operation of the waste feed delivery system will result in the generation of secondary wastes. Management of secondary waste is addressed in Section 7.0 of this document.

3.7 PROGRAMMATIC INTERFACES

The ICDs define the interfaces between the DOE/PHMC team and the private contractors. Specifically the ICDs will define materials, utilities, and services to be provided to the private contractors and will define products and wastes that will be returned to the DOE/PHMC team. These interface documents are described in Section 5.0 of this document.

The waste feed delivery system will be supported by utilities and other infrastructure services provided by DYN. An interface agreement between the TWRS Project and DYN is being prepared to ensure delivery of the required services (see Section 8.0 of this document). A similar interface agreement between the TWRS Project and WMH is being prepared to ensure

that the waste feed delivery system is supported with adequate secondary waste management and laboratory analytical services (see Section 7.0 of this document).

The waste feed delivery system may be impacted by two TWRS Project programs: the Tank Waste Storage Program and the Tank Waste Characterization Program. The Tank Waste Storage Program is responsible for managing tank wastes until they are retrieved and processed. Tank waste management includes transferring wastes between tanks using tanks, pipelines, and other equipment that will also be used in the waste feed delivery system. The Tank Waste Characterization Program is responsible for sampling and characterizing tank wastes. Sampling and characterization efforts in support of waste retrieval and feed delivery operations will be consistent with the activities and practices discussed in Section 3.1 of this document.

4.0 INFRASTRUCTURE SUPPORT

The current baseline plan is to transfer operational control of two DSTs, AP-106 and AP-108 (one each), to the two private contractors to stage LAW feed for treatment services (referred to as tank turnover). Except for the contracts with DOE, documents regarding private contractor plans for immobilization or use/operation of these tanks are not currently available. These documents and other information will not be available until DOE finalizes the privatization contracts and ICDs with the private contractors. Therefore, the information in this section is based on planning assumptions derived from existing information and will be updated as privatization proceeds.

This section briefly summarizes the tank turnover and infrastructure support issues and identifies Technical Baseline documents that support turnover and continued operations throughout Phase I of the Waste Retrieval and Disposal Mission. Table 3 lists the Technical Baseline documents identified to date for tank turnover and infrastructure support, along with each document's source information. A brief summary of each document and other pertinent information is contained in Appendix C.

4.1 PRIVATE CONTRACTOR RECEIPT/LAG STORAGE TANKS

Wastes will be transferred into DSTs AP-106 and AP-108 from AP-102 and/or AP-104 after sampling and analysis confirms that contents meet envelope specifications. Primary tank waste in these two tanks will be used, one per private contractor, as input into the private contractor separation/immobilization processes and systems. The waste contents will be consistent with the privatization contract envelope specifications.

Table 3. Infrastructure Support Documents and Designated Source Information.*

Document title	Maintained current?*	Appendix number	Source information
<i>Alternative Generation and Analysis for Phase 1 Privatization Transfer System Needs</i> (Galbraith 1996)	N	C.1	Piping system upgrades for AN, AW, and AP farms
<i>Decision Document: Phase 1 Intermediate Waste Feed Staging System Design Requirements</i> (Galbraith and Daling 1997)	N	C.2	Intermediate feed staging
Project W-519 Technical Baseline Documents	Y	C.3	Technical Baseline documents related to the W-519 Project, TWRS Privatization Phase 1, Infrastructure Support

*Is the document to be maintained current per HNF-1900? (Y=yes, N=no).
TWRS = Tank Waste Remediation System.

4.2 PROCESS DEFINITION

Decision documents that led to the turnover of DSTs AP-106 and AP-108 include WHC-SD-WM-TI-750, *Alternative Generation and Analysis for Phase 1 Privatization Transfer System Needs* (Galbraith 1996), and HNF-SD-WM-TI-800, *Decision Document: Phase 1 Intermediate Waste Feed Staging System Design Requirements* (Galbraith and Daling 1997). The former document (Galbraith 1996) provides input to the Phase 1B waste staging plans with emphasis on pipeline routing alternatives for supernatant waste transfers to AP-102 and AP-104 for LAW; it also provides information on the routing of slurries from AY and AZ tank farms for HLW waste feed. The latter document (Galbraith and Daling 1997) selects the "intermediate feed staging" strategy (i.e., use of AP-102/4 tanks) for preparing feed for transfer to the private contractors.

The private contractors will provide capability for emergency transfer of tank contents back to the government/government contractor. There will also need to be more detailed resolution of how the TWRS Project and the private contractors will share various operating responsibilities at the tank interfaces including: leak detection and monitoring, emergency response, nuclear safety, employee health and safety, and regulatory compliance (e.g., permits, record keeping, reporting). Most of these issues will be addressed through the privatization ICDs (see Section 5.0 of this document).

Project W-519 supports the private contractor infrastructure and replaces projects W-503 (Electrical Power System), W-504 (Raw and Potable Water), W-505 (Site Development and Roads), and W-506 (Liquid Effluent Transfer System). Specific project information is provided in HNF-SD-W519-CDR-001, *Summary Conceptual Design Report, TWRS Privatization Phase 1 Infrastructure Support Project* (Singh 1997d). The power system will provide up to

40 megawatts (MW) of electrical power by extending the existing 230 kilovolts (kV) distribution system, transform to 13.8 kV system, and extend distribution feeders to both Phase 1 private contractor site boundaries.

The site/utilities system will include preliminary site preparation for private contractor facilities and the electrical substation, establish transportation routes, construct/improve roads, develop utility corridors, provide construction electrical power and water, extend raw/potable waste distribution systems, and provide two liquid effluent transfer systems for the conveying of potentially radioactive dangerous liquid effluent and nonradioactive, dangerous liquid effluents to existing treatment and disposal facilities. The project will also relocate a 170,000 m³ excavated soil mound to the northeast to provide a more suitable lay down area for the private contractors and close/relocate several existing monitoring wells (Singh 1997c).

4.3 MISSION PLANNING

Activities required to achieve the objectives of tank turnover and infrastructure support are included in the infrastructure Level 1 Logics (FDH 1998) and in HNF-SP-1230 (Lenseigne 1997). These activities will be further refined as the infrastructure ICDs and privatization contracts are finalized. Guidance for developing multi-year work plans will address which Technical Baseline documents should be produced, used, revised, and deleted.

4.4 STRUCTURES, SYSTEMS, AND COMPONENTS

The SSCs currently in place in tanks AP-102, AP-104, AP-106, and AP-108 are established in TWRS Project design drawings, specifications, and other source documents. In addition, as-built drawings are being updated to reflect changes that occurred after construction. These SSC documents are being technically reviewed and will be incorporated into the Technical Baseline as they are validated. The TWRS Project will also document and include in the Technical Baseline those significant modifications that will prepare the tanks to support tank turnover and infrastructure support.

The private contractors will be responsible for design and construction of piping from AP-106 and AP-108 to their immobilization facilities. The private contractors will provide and install the needed tank/ancillary equipment, monitoring hardware, and control systems to operate and transfer waste from the two DSTs to their facilities. The private contractors must also provide and install ventilation and emissions monitoring systems and disconnect existing ventilation and instrumentation systems.

4.5 OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS

As discussed in Section 3.5.1 of this document, a waste feed delivery operations and maintenance concept will be generated during FY 1998. In conjunction with other tank system documents, such as HNF-SD-WM-TRD-007 (Grenard and Claghorn 1997), the operations and maintenance concept for the waste feed delivery system will set forth equipment specifications, functional requirements, and operating and maintenance procedures, including those for the transfer and turnover tanks (AP-102, AP-104, AP-106, and AP-108).

Upon turnover completion, the private contractors are expected to install their own operations and maintenance procedures for tanks AP-106 and AP-108. Interfaces relevant to these procedures will be addressed as discussed in Section 5.0 of this document. Documents related to these procedures will be added to the Technical Baseline.

4.6 SECONDARY WASTE DEFINITION

The private contractors are expected to generate radioactive, mixed, and solid wastes in the process of readying tanks AP-106 and AP-108 for their own use and operation, and for eventual return to DOE and the TWRS Project contractor (after completion of Phase 1). Sources of potential secondary waste generation include: cleanout (e.g., removal of residual tank heels prior to first batch receipt), site preparation (e.g., soils, demolition debris), construction (e.g., tank connections, retrofitting), and deactivation (e.g., tank decontamination). The types and volumes of these wastes will not be known until the private contractors have established their own modification plans for the two DSTs and until the plans have been agreed to with DOE through the privatization contracts and ICDs. Interfaces regarding secondary wastes are discussed further in Section 5.0 of this document.

4.7 PROGRAMMATIC INTERFACES

As part of the DST turnover process, DOE and the PHMC team will provide necessary as-built design information on waste feed tank and auxiliary systems. Because they are an integral portion of the AP tank farm (including the six other DSTs in the farm), the DOE/PHMC team will monitor and maintain the secondary containment tank leak detection system (i.e., leak pits) and cathodic protection systems, including those associated with AP-106 and AP-108. Other tank operational interfaces, including transferred and shared responsibilities, are being addressed through the privatization ICDs, discussed in Section 5.0 of this document.

In conjunction with the tank turnover and infrastructure support, DOE committed to provide selected ongoing infrastructure and utility support for operation of the private contractor facilities (Singh 1997). Secondary waste and waste management interfaces are addressed in Section 7.0 of this document. Interfaces related to utility support (e.g., power, water) are discussed in Section 8.0 of this document.

Upon the completion of Phase 1B (unless selected for Phase 2), the private contractors must return the waste feed tank to DOE and the PHMC team. The private contractors must also issue documents that describe the history of use of tanks AP-106 and AP-108 (including final as-built drawings of modifications).

5.0 PRIVATIZATION CONTRACT INTERFACES

In accordance with the privatization contracts (RL 1996a; RL 1996c), the private contractors will:

“Provide system capacity for waste treatment services for minimum order quantities to be processed in 5 years and maximum order quantities which may be processed in 9 years. For Waste Envelope A, the Contractor will demonstrate a minimum system capacity of 600 metric tons (MT) sodium (Na) over a 12-month period. For Waste Envelope D, the Contractor will demonstrate a minimum system capacity of 60 MT of waste oxides exclusive of Na and silicon (Si) over a 12-month period.”

The following LAW services will be provided by the private contractors.

- Receive batches of the three waste envelopes (A, B, and C) into an existing feedstaging DST (AP-106 or AP-108) provided by DOE/TWRS Contractor.
- Retrieve waste from the feedstaging DST and transfer to private contractor facilities in private contractor-provided transfer lines.
- Determine the degree of Entrained Solids, ^{137}Cs , ^{99}Tc , and ^{90}Sr and TRU removal required to comply with contractual requirements, and separate waste into LAW and HLW fractions.
- Treat and immobilize the LAW fraction and provide the final waste products for return to the DOE.
- Return the HLW fraction in the form of intermediate waste products as described in the contract to the DOE.
- Store ^{99}Tc as an intermediate waste product and return to DOE prior to deactivation.
- Protect materials from diversion, and the facilities and materials from sabotage or other acts that can result in wide-spread exposure of workers and the public.

- Deactivate private contractor facilities at the completion of waste treatment services.

If the private contractor will provide LAW and HLW services, additional services will include the following.

- Receive batches of HLW feed (envelope D) into a private contractor-provided transfer system, tank, and facility.
- Treat and immobilize the HLW feed and the ^{137}Cs , ^{99}Tc , and ^{90}Sr and TRU in the HLW fraction and deliver the final waste products.
- Return the Entrained Solids as an intermediate waste product and segregate/treat the other intermediate wastes products: ^{137}Cs , ^{99}Tc , and ^{90}Sr and TRU."

Contractual expectations of the government (and hence the PHMC team) and the private contractors are largely driven by Interface Descriptions identified in the privatization contracts. Three Interface Descriptions identify that the private contractor will be fully responsible for their generated Dangerous Waste (Interface Description 4), Non-Dangerous Solid Wastes (Interface Description 8), and Liquid Sanitary Waste (Interface Description 9). The Interface Descriptions are part of the privatization contracts and, as such, are not considered Technical Baseline documents.

Eighteen Interface Descriptions are further defined through privatization ICDs. The remainder of this Section 5.0 groups the 18 privatization ICDs into one of three categories for discussion purposes: (1) input (i.e., waste feed) ICDs; (2) supporting system (i.e., infrastructure support-related) ICDs; and (3) output (i.e., private contractor supplied products) ICDs.

The ICD subjects and categories are provided in Table 4. Table 4 also indicates the contractual performance agreement specifications as applicable. Table 5 provides the list of each ICD along with each document's source information and the applicable location in Appendix D to find other pertinent information.

5.1 INPUT INTERFACE CONTROL DOCUMENTS

The following subsections describe two ICDs that define inputs to the private contractors of LAW and HLW from the waste feed delivery system.

5.1.1 Low-Activity Waste Feed (ICD 19)

The delivery of LAW feed by DOE and the PHMC team is an important function of the waste feed delivery system managed under the TWRS Project (see Section 3.0 of this document).

Table 4. Interface Categories and Requirements of Privatization Contracts.^a

ICD no. ^b	ICD subject	ICD category			Privatization contractor performance agreement contract specification
		Input	Support	Output	
1	Raw Water		•		N/A
2	Potable Water		•		N/A
3	Radioactive Solid Waste			•	N/A
5	Non-Radioactive, No Dangerous Liquid Effluent			•	N/A
6	Radioactive, Dangerous Liquid Effluent			•	N/A
9	Land for Siting		•		N/A
10	Deactivated Facility and Site			•	N/A
11	Electricity		•		N/A
12	Roads and Rails		•		N/A
13	Non-Routine High-Level Solid Wastes		•		N/A
14	Immobilized High-Level Waste			•	Spec. 1
15	Immobilized Low-Activity Waste			•	Spec. 2
16	⁹⁰ Sr/TRU/Entrained Solids			•	Specs. 3, 6
17	¹³⁷ Cs			•	Spec. 4
18	⁹⁹ Tc			•	Spec. 9
19	Low-Activity Waste Feed	•			Spec. 7
20	High-Level Waste Feed	•			Spec. 8
21	Waste Feed Tanks		•		N/A

^aRL 1996a; RL 1996c.^bICD No. 4, 7, and 8 do not exist.

ICD = Interface Control Document.

N/A = not applicable.

TRU = transuranic.

Table 5. Privatization Interface Control Documents and Designated Source Information. (3 Sheets)

ICD no. ^a	ICD subject	Maintained current? ^b	Appendix number	Source information
1	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization - Raw Water (FDH 1997b)</i>	Y	D.1	Establishes interfaces with private contractors for the raw water delivery and use.
2	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization - Potable Water (FDH 1997c)</i>	Y	D.2	Establishes interfaces with private contractors for the delivery and use of potable water.
3	<i>Interface Control Document Between DOE and the PHMC – Radioactive Solid Wastes (FDH 1997d)</i>	Y	D.3	Establishes interfaces with private contractors for the handling and managing of radioactive solid waste.
5	<i>Interface Control Document Between DOE and the PHMC – Non-Radioactive, No Dangerous Liquid Effluent for Phase 1 Privatization (FDH 1997e)</i>	Y	D.4	Establishes interfaces with private contractors for the handling and managing of non-radioactive, non-dangerous liquid effluents.
6	<i>Interface Control Document Between DOE and the PHMC – Radioactive, Dangerous Liquid Effluents (FDH 1997f)</i>	Y	D.5	Establishes interfaces with private contractors for the handling and managing of radioactive, dangerous liquid effluents.
9	<i>Interface Control Document Between DOE and the PHMC – Land for Siting Part A Privatization (FDH 1997g)</i>	Y	D.6	Establishes interfaces with private contractors for land for siting Phase 1 privatization.
10	<i>Interface Control Document Between DOE and the PHMC – Deactivated Facility and Site for Phase 1 Privatization (FDH 1997h)</i>	Y	D.7	Establishes interfaces with private contractors for the facility deactivation and site turn-over to DOE following completion of Phase 1 privatization activities.
11	<i>Interface Control Document Between DOE and the PHMC – Electricity (FDH 1997i)</i>	Y	D.8	Establishes interfaces with private contractors with respect to electricity delivery to private contractor facilities during Phase 1 privatization activities.
12	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization – Roads and Rails (FDH 1997j)</i>	Y	D.9	Establishes interfaces with private contractors for road use during Phase 1 privatization activities and establish that there will be no direct rail.

Table 5. Privatization Interface Control Documents and
Designated Source Information. (3 Sheets)

ICD no. ^a	ICD subject	Maintained current? ^b	Appendix number	Source information
13	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization – Non-Routine High-Level Solid Wastes (FDH 1997k)</i>	Y	D.10	Establishes interfaces with private contractors for the handling and managing of non-routine high-level solid wastes.
14	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization Immobilized High-Level Waste Product (FDH 1997l)</i>	Y	D.11	Establishes interfaces with private contractors for the acceptance and delivery of the immobilized high-level waste product by and to the DOE/PHMC team during Phase 1 privatization activities.
15	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization Immobilized Low-Activity Waste Product (FDH 1997m)</i>	Y	D.12	Establishes interfaces with private contractors for the acceptance and delivery of the immobilized low-activity waste product by and to the DOE/PHMC team during Phase 1 privatization activities.
16	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization Strontium/Transuranic/Entrained Solids (FDH 1997n)</i>	Y	D.13	Establishes interfaces with private contractors for the return of ⁹⁰ Sr/TRU/Entrained Solids to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.
17	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization Cesium-137 Intermediate Product (FDH 1997o)</i>	Y	D.14	Establishes interfaces with private contractors for the return of the ¹³⁷ Cs intermediate product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.
18	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization - ⁹⁹Technetium Secondary Product (FDH 1997p)</i>	Y	D.15	Establishes interfaces with private contractors for the return of the ⁹⁹ Tc secondary product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.
19	<i>Interface Control Document Between DOE and the PHMC – Low-Activity Waste Feed (FDH 1997q)</i>	Y	D.16	Establishes interfaces with private contractors for the delivery of the low-activity waste feed.

Table 5. Privatization Interface Control Documents and Designated Source Information. (3 Sheets)

ICD no. ^a	ICD subject	Maintained current? ^b	Appendix number	Source information
20	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Privatization High-Level Waste Feed (FDH 1997r)</i>	Y	D.17	Establishes interfaces with private contractors for the delivery of the high-level waste feed.
21	<i>Interface Control Document Between DOE and the PHMC – Phase 1 Waste Feed Tank Support Systems Low-Activity Waste Product (FDH 1997s)</i>	Y	D.18	Establishes interfaces with private contractors for the turnover of double-shell waste feed tanks.

^aICDs No. 4, 7, and 8 do not exist.

^bIs the document to be maintained current per HNF-1900? (Y=yes, N=no).

DOE = U.S. Department of Energy.

PHMC = Project Hanford Management Contract.

TRU = transuranic.

Responsibilities of DOE and the PHMC team include: select waste envelopes and waste quantities consistent with the privatization contracts; and provide tank waste feed composition before transfer to the private contractors' waste feed tanks (AP-106 or AP-108).

5.1.2 High-Level Waste Feed (ICD 20)

The delivery of pre-treated HLW feed as defined in the privatization contracts is also an important function of the waste feed delivery system. Responsibilities of DOE and the PHMC team include transferring the HLW feed consistent with the specifications.

5.2 SUPPORTING SYSTEM INTERFACE CONTROL DOCUMENTS

The following subsections describe the seven privatization ICDs that define supporting systems and infrastructure support to the private contractors.

5.2.1 Raw Water (ICD 01)

The 200 East Area raw water system, managed by DYN (see Section 8.0 of this document) provides untreated Columbia River (raw water) for process use and fire suppression for 200 East Area facilities.

5.2.2 Potable Water (ICD 02)

The 200 East Area sanitary water system, managed by DYN (see Section 8.0 of this document), provides potable water for worker use.

5.2.3 Land for Siting (ICD 09)

Appropriate land required for private contractor waste treatment services will be provided in the southeastern portion of the 200 East Area. Land for facility siting will be provided to the private contractors under a no-cost lease that authorizes the private contractors to use the property for construction, operation, and deactivation. Baseline site and environmental conditions will be established by an independent third party.

5.2.4 Electricity (ICD 11)

The PHMC team contractors and the private contractors will consume electricity. On the Hanford Site, DYN is responsible for providing and maintaining this utility during construction and operation (see Section 8.0 of this document). The private contractors will specify their peak and steady-state power demands.

5.2.5 Roads and Rails (ICD 12)

The primary roads and government rail system provide access to and from the 200 East Area as well as to the rest of the Hanford Site. No direct rail link to the private contractors' sites will be provided. Hanford Site roads and the rail system are maintained by DYN (see Section 8.0 of this document). DOE and PHMC team responsibilities related to roads and rails include providing road access between the private contractors' site boundary and existing Hanford Site roads, and maintaining existing roads and rail system spurs in the vicinity of the private contractors' facilities.

5.2.6 Non-Routine High-Level Solid Wastes (ICD 13)

Processing of tank wastes by the TWRS Project and the private contractors will generate secondary non-routine high-level solid wastes during operations, particularly during facility deactivation. The private contractors are required to estimate their waste volumes and document that the waste meets, to the extent practical, the HLW acceptance criteria in DOE/EM-0093, *Waste Acceptance Project Specifications (WAPS) for Vitrified High-Level Waste Forms*. (DOE 1995), and DOE/RW-0351P, *Waste Acceptance System Requirements Document*, (DOE 1996b). The PHMC team will pick up and accept this waste, provided acceptance conditions are met.

5.2.7 Waste Feed Tanks (ICD 21)

The two DSTs, AP-106 and AP-108, will be provided to the private contractors to stage LAW feed for treatment services (see Section 4.0 of this document). The PHMC team will continue to monitor and maintain the secondary containment tank leak detection system (i.e., leak pits) and cathodic protection system.

5.3 OUTPUT INTERFACE CONTROL DOCUMENTS

The following subsections describe nine "output" interfaces (i.e., those that involve delivery or return of products and by-products by the private contractors).

5.3.1 Radioactive Solid Wastes (ICD 03)

Radioactive solid wastes are managed and disposed of by facilities in the 200 West Area of the Hanford Site by WMH (see Section 7.0 of this document). Low-level, low-level mixed, TRU, and TRU-mixed solid wastes may be generated by the private contractors. These wastes will be transferred to WMH for management and disposal. The PHMC team contractors will generate radioactive solid wastes that will also be managed and disposed of by WMH.

5.3.2 Non-Radioactive, No Dangerous Liquid Effluent (ICD 05)

Non-radioactive, non-dangerous liquid effluents generated by the private contractors and the PHMC team may be discharged directly to the 200 Area Treated Effluent Disposal Facility (TEDF) which is managed by WMH (see Section 7.0 of this document). Both the PHMC team and the private contractors are expected to generate non-radioactive, non-dangerous liquid effluents. DOE and the PHMC team responsibilities related to non-radioactive, non-dangerous liquid effluents include accepting liquid effluents per the ICD-established volumes and flow rates and providing and maintaining a transfer pipeline from the private contractors' site to the 200 Area TEDF.

5.3.3 Radioactive, Dangerous Liquid Effluents (ICD 06)

Dilute radioactive and/or dangerous liquid effluents may be generated by the PHMC team and/or the private contractors. These wastes will require treatment to meet acceptance criteria for discharge to the Liquid Effluent Retention Facility (LERF) and/or to the Effluent Treatment Facility (ETF) for subsequent treatment by WMH (see Section 7.0 of this document). DOE and PHMC team responsibilities related to radioactive, dangerous liquid effluents include accepting effluents per the ICD established volumes and flow rates, providing and maintaining a RCRA-compliant transfer pipeline between the private contractors' site boundaries and the ETF/LERF, and disposing of secondary solid wastes resulting from water treatment at the ETF/LERF.

5.3.4 Deactivated Facility and Site (ICD 10)

Facilities that have been deactivated will be transferred to DOE and DOE contractors for surveillance and maintenance, decontamination and decommissioning, and final closure. Typical facilities to be deactivated include the land; private contractor improvements to the land, government-furnished property and equipment; transfer pipelines and diversion boxes; nuclear processing facilities; and support buildings. The DOE and DOE contractors will authorize facility deactivation to be performed by the private contractors. The activities associated with DOE/DOE contractor-provided waste feed tanks (AP-106 and AP-108) and its associated upgrades are not included in ICD 10 (see Section 5.2.10).

5.3.5 Immobilized High-Level Waste (ICD 14)

The IHLW will be processed by one private contractor and sealed in canisters suitable for interim storage and future emplacement in a geologic repository. The TWRS Project manages the program that will provide the IHLW storage facility (See Section 6.0 of this document). DOE and the PHMC team responsibilities related to IHLW include providing clean, approved shipping containers and picking up and accepting loaded shipping containers from the private contractor facility.

5.3.6 Immobilized Low-Activity Waste (ICD 15)

The ILAW product suitable for disposal on the Hanford Site will be generated by the private contractors and further managed by the PHMC team. The TWRS Project manages the program to provide ILAW disposal facilities (see Section 6.0 of this document). DOE and the PHMC team responsibilities related to ILAW include providing clean, approved shipping containers and picking up and accepting the ILAW product.

5.3.7 ⁹⁰Strontium/Transuranics/Entrained Solids (ICD 16)

The ⁹⁰Sr, TRU, and entrained solids contained in LAW feed separated from tank waste by the private contractors will be transferred to the TWRS Project.

5.3.8 ¹³⁷Cesium (ICD 17)

The ¹³⁷Cs separated by the private contractors from LAW will be transferred to the TWRS Project, probably as a solid in a container (applicable to the private contractor who performs LAW treatment services only during Phase 1B). DOE and PHMC team responsibilities related to ¹³⁷Cs separation include providing clean, approved shipping containers and picking up and accepting the ¹³⁷Cs product.

5.3.9 ⁹⁹Techetium (ICD 18)

The ⁹⁹Tc separated from LAW feed will be returned to the TWRS Project as a liquid/slurry that meets pipeline or cask transportation criteria as defined in the privatization contracts (RL 1996a and RL 1996c). This interface applies to the private contractors who are performing LAW treatment services only during Phase 1B.

6.0 PRODUCT STORAGE AND DISPOSAL

The Immobilized Waste Storage and Disposal Program is responsible for ensuring the products from private contractor facilities will be received, transported, stored, and disposed of properly. The products that will be transferred back for management by the TWRS Project contractor include the following:

- The ILAW, which will be disposed of at Hanford in below-grade vaults
- The IHLW, which will be stored at Hanford and then shipped offsite for disposal later
- Entrained solids, ⁹⁰Sr, TRU elements, ¹³⁷Cs, and ⁹⁹Tc, which will be stored at Hanford pending future decision making about final disposition (e.g., recovery, use, immobilization).

Primary source documents regarding the scope and basis for product storage and disposal include: *Approval of Critical Decisions for Phase 1 Immobilized High-Level and Low-Activity Waste Interim Storage and Tank Farm Restoration and Safe Operations Projects (Projects W-W464, W-465, and W-314)* (Alm 1996); HNF-1517, *Tank Waste Remediation System Retrieval and Disposal Mission Immobilized Low-Activity Waste Disposal Plan* (Shade 1997a); and HNF-1751, *Tank Waste Remediation System Retrieval and Disposal Mission Immobilized High-Level Waste Storage Plan* (Calmus 1997). This section briefly summarizes the scope of the Immobilized Waste Storage and Disposal Program and identifies Technical Baseline documents that will support related startup and continued operations throughout the Waste Retrieval and Disposal Mission. This section does not address secondary wastes from the private contractors (see Section 7.0 of this document). Table 6 lists the Technical Baseline documents identified to date for the Immobilized Waste Storage and Disposal Program, along with summaries of the source information for each listed document. A brief summary of each listed document and other pertinent information is contained in Appendix E.

Table 6. Summary of Source Product Storage and Disposal Documents. (2 sheets)

Document title	Maintained current?1*	Appendix number	Source information
<i>Approval of Critical Decisions for Phase 1 Immobilized High-Level and Low-Activity Waste Interim Storage and Tank Farm Restoration and Safe Operations Projects (Projects W-464, W-465, and W-314) (Alm 1996)</i>	N	E.1	Identification of immobilized wastes to be stored.
<i>Tank Waste Remediation System Retrieval and Disposal Mission Immobilized Low-Activity Waste Disposal Plan (Shade 1997a)</i>	Y	E.2	Defines baseline program planning elements for immobilized LAW design, construction, and operation.
<i>Tank Waste Remediation System Retrieval and Disposal Mission Immobilized High-Level Waste Storage Plan (Calmus 1997)</i>	Y	E.3	Defines baseline program planning elements for immobilized HLW design, construction, and operation.
<i>Revised Interim Policy on Regulatory Structure for Low-Level Radioactive Waste Management and Disposal (Guimond and O'Toole 1996)</i>	N	E.4	Establishes request for NRC concurrence that immobilized LAW can be disposed of as "incidental waste".
<i>Alternatives Generation and Analysis Report for Immobilized Low-Level Waste Interim Storage Architecture (Burbank 1996)</i>	N	E.5	Establishes disposal options and facilities for immobilized LAW.
<i>Analysis of Alternatives for Immobilized Low-Activity Waste Disposal (Burbank and Klem 1997)</i>	N	E.6	Establishes disposal options and facilities for immobilized LAW.
<i>High-Level Waste Interim Storage Architecture Selection - Decision Report (Calmus 1996b)</i>	N	E.7	Establishes storage options and facilities for immobilized HLW.
<i>Decision Document for the Final Disposition of Cesium and Strontium Capsules (Claghorn 1997)</i>	N	E.8	Discusses how and when Hanford will prepare $^{137}\text{Cs}/^{90}\text{Sr}$ capsules for disposal.
<i>Contract Number DE-AC06-96-RL13200 - Decision Document for the Final Disposition of Cesium and Strontium Capsules (Taylor 1997)</i>	N	E.9	Establishes disposition basis for $^{137}\text{Cs}/^{90}\text{Sr}$ capsules.
<i>Project W-464 Technical Baseline Documents</i>	Y	E.10	Technical Baseline documents related to the W-464 Project, Immobilized Low-Activity Waste Interim Storage.

Table 6. Summary of Source Product Storage and Disposal Documents. (2 sheets)

Document title	Maintained current?1*	Appendix number	Source information
Project W-465 Technical Baseline Documents	Y	E.11	Technical Baseline documents related to the W-465 Project, Immobilized Low-Activity Waste Interim Storage.
<i>Performance Assessment of Grouted Double-Shell Tank Waste Disposal at Hanford</i> (Shade et al. 1994)	N	E.12	Discusses relationship of immobilized LAW to ongoing performance assessments and that existing grout vaults will be sufficient for first four years of operation.
<i>Hanford Low-level Tank Waste Interim Performance Assessment</i> (Mann et al. 1996)	N	E.13	Examines long-term health and environmental effects associated with disposal in the Hanford Site 200 East Area of LAW from single-shell and double-shell tanks.
<i>Permitting Plan for the Immobilized Low-Activity Waste Project</i> (Deffenbaugh et al 1997)	N	E.14	Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.
<i>Checklist for the High-level Waste Storage Project Canister Storage Building</i> (Deffenbaugh 1996)	N	E.15	Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.
<i>Permitting Plan for the High-Level Waste Interim Storage Project</i> (Deffenbaugh 1997)	N	E.16	Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.
<i>Memorandum of Agreement (MOA) - Utilization of Canister Storage Building (CSB) Vaults 2 and 3 for Immobilized High-Level Waste</i> (Hansen 1996)	N	E.17	Describes the attributes of Vaults 2 and 3 of the Canister Storage Building and discusses features to facilitate addition of more vaults later.

*Is the document to be maintained current per HNF-1900? (Y=yes, N=no).

HLW = high-level waste.

LAW = low-activity waste.

NRC = Nuclear Regulatory Commission.

6.1 PRIMARY WASTE AND PRODUCT DEFINITIONS

Tank waste definition is addressed in Section 3.1 of this document. The best-basis inventory (Kupfer et al. 1997) is the most current summary of tank waste composition. There currently are no basis for defining the products from the private contractors. This definition will be completed in accordance with the privatization ICDs established between the PHMC team and

the private contractors (see Section 5.0 of this document), and in accordance with the characterization requirements of Standard 3 (*Products and Secondary Wastes Plan*) and Specifications 1, 2, 3, 4, 5, and 6 of the privatization contracts (RL 1996a and RL 1996c).

6.2 PROCESS DEFINITION

During Phase 1, LAW from the equivalent of approximately 12 DSTs will be treated by the private contractors, and the resultant ILAW will be disposed of on site in below-grade vaults. This disposal option is predicated on assumed concurrence from the Nuclear Regulatory Commission that the ILAW can be disposed of as "incidental waste" (Guimond and O'Toole 1996). One of the private contractors may be selected to treat HLW, and the resultant IHLW will be stored onsite, in the Hanford Site Canister Storage Building (CSB), and eventually shipped offsite for disposal. At this time, the expected disposal facility for the IHLW is the geologic repository being developed by the Office of Civilian Radioactive Waste Management near Las Vegas, Nevada.

Product streams containing entrained solids, TRU elements, ^{90}Sr , and ^{99}Tc will be returned from the private contractors to the PHMC team. Negotiations between DOE and the private contractors will define return conditions for these product streams. Cesium-137 and ^{90}Sr capsules from previous Hanford Site operations are currently stored in the Waste Encapsulation and Storage Facility. The DOE may decide to open the capsules and immobilize the high-heat-generating ^{137}Cs and ^{90}Sr salts in the private contractor immobilization system. The current baseline plan is that the private contractor with the HLW option will incorporate ^{137}Cs , ^{99}Tc , and ^{90}Sr /TRU into the IHLW product. Technical Baseline information for these product streams cannot be further defined until final Phase 1B privatization contracts (in process) and ICDs (see Section 5.0 of this document) have been established.

6.2.1 Immobilized Low-Activity Waste

The Immobilized Waste Storage and Disposal Program's mission includes receiving ILAW packages produced by the private contractors, transporting the packages to a disposal site within the Hanford Site 200 Areas, and disposing of the packages in a manner that does not preclude retrieval. The selected facility for the initial (Phase 1) ILAW is the former unfilled grout vaults facility located in the 200 East Area with subsequent ILAW disposal to occur in a new facility. The alternatives and recommendations for the facility options are analyzed in WHC-SD-W465-AGA-001, *Alternatives Generation and Analysis Report for Immobilized Low-Level Waste Interim Storage Architecture* (Burbank 1996), and HNF-SD-TWR-AGA-004, *Analysis of Alternatives for Immobilized Low-Activity Waste Disposal* (Burbank and Klem 1997).

Packages of ILAW will be supplied by the private contractors to the PHMC team in accordance with contract specifications described in the privatization contracts. The ILAW disposal project includes activities and functions to provide and operate product transportation

and disposal facilities for ILAW packages and provide permanent disposal on the Hanford Site. Initial production will be managed in the existing four grout vaults as part of Project W-465. Later product will be disposed of in additional facilities in the 200 East Area in a separate LAW disposal complex under Project W-520. These permanent disposal systems will be designed to accommodate the complete inventory of ILAW packages produced during the treatment of Hanford Site tank waste, including Phase 2 packages.

6.2.2 Immobilized High-Level Waste

The Immobilized Waste Storage and Disposal Program's mission includes receiving IHLW produced by the private contractor, transporting the products to an acceptable Hanford Site interim storage facility, and storing the products safely and economically until they can be shipped to a permanent facility or returned to private contractor for further processing. The primary objective is to provide onsite transportation systems and interim storage facilities for Phase 1 and 2 HLW products, which will involve two primary projects. One project will provide an onsite HLW product transportation system and retrofit the Hanford Site CSB to accommodate Phase 1 HLW products. The other project will design and construct new facilities to accommodate Phase 2 HLW products. The selection bases for these projects are discussed in Calmus (1996b).

Phase 1 IHLW will be stored through a retrofit of the CSB (Project W-464, HLW Interim Storage Project). The CSB modifications include Vaults 2 and 3 retrofits for IHLW until the HLW can be transferred off site to a final Office of Civilian Radioactive Waste Management disposal facility. Project W-464 scope will include a transportation system for the shipment of IHLW from the private contractor to the CSB. The CSB will also be used to store separated ^{137}Cs intermediate products and IHLW from the private contractor during Phase 1.

6.2.3 Cesium/Strontium Capsules

A primary objective of the Immobilized Waste Storage and Disposal Program is to evaluate and select the path forward for disposal of the $^{137}\text{Cs}/^{90}\text{Sr}$ capsules located at the Hanford Site by the end of FY 1997 and, if appropriate, implement the selected option. A recommended approach, HNF-SD-WM-RPT-294, *Decision Document for the Final Disposition for Cesium and Strontium Capsules* (Claghorn 1997), has been submitted to DOE. DOE subsequently concurred with the recommendation in a letter to FDH, 97-WDD-058A, *Contract Number DE-AC06-96-RL13200 - Decision Document for the Final Disposition of Cesium and Strontium Capsules* (Taylor 1997), to blend the $^{137}\text{Cs}/^{90}\text{Sr}$ capsules into the Phase 2 HLW immobilization plant feed. Therefore, $^{137}\text{Cs}/^{90}\text{Sr}$ capsules are not included in the Phase 1 Immobilized Waste Storage and Disposal Program.

6.3 MISSION PLANNING

Activities required to achieve the objectives of the product storage and disposal mission are described in the TWRS Level 0 Logic (Hanford Drawing No. H-2-829166) (FDH 1998) and in HNF-SP-1230 (Lenseigne 1997). The Level 0 Logic (FDH 1998) depicts approximately 100 sequentially linked, broadly-scooped activities that, when completed, will satisfy the TWRS Project mission objectives. More detailed activities for Projects W-464, W-465, and W-520 and for other program tasks are developed and updated at the WBS 1.1.3.4 level in the TWRS Project multi-year work plan. Guidance for developing the multi-year work plans will include specification of which Technical Baseline documents to produce, use, revise, and delete.

6.4 SYSTEMS, STRUCTURES, AND COMPONENTS

The SSCs for product storage and disposal are defined to include the equipment and other systems required to transport, receive, store, and disposition products and wastes from the private contractors. Transportation systems and retrofitted/designed Phase 1 and 2 storage and disposal facilities will be in accordance with established ILAW design requirements found in HNF-SD-W465-DRD-001, *Design Requirements Document for Project W-465, Immobilized Low-Activity Waste Interim Storage* (Burbank 1997) and IHLW design requirements found in WHC-SD-WM-DRD-012, *Design Requirements Document for Interim Storage Phase 1 Solidification of High-Level Waste* (Calmus 1996a). These and other documents will identify specific facility components, instrumentation, control systems, and ancillary equipment required to receive and manage the private contractor products. The SSCs for receiving and managing these products will not be developed until FY 1998 and later because of the unresolved disposition status of the other private contractor product streams (e.g., $^{137}\text{Cs}/^{90}\text{Sr}$, TRU).

6.4.1 System and Project Definition

Four existing, empty, subsurface vaults in the 200 East Area, formerly planned to hold slurry wastes mixed with cement-based products, will be initially used as interim ILAW disposal facilities. These vaults will be modified to receive and dispose of approximately 5,000 packages of ILAW determined to be "incidental wastes" by the Nuclear Regulatory Commission (thereby excluding them from Nuclear Regulatory Commission licensing requirements). The ability of the existing vaults to perform adequately for disposal has been previously assessed in WHC-SD-WM-EE-004, *Performance Assessment of Granted Double-Shell Tank Waste Disposal at Hanford* (Shade et al. 1994), and disposal of LAW in the Hanford Site 200 East Area has been assessed in WHC-EP-0884, *Hanford Low-Level Tank Waste Interim Performance Assessment* (Mann et al. 1996).

Up to 18,000 packages may be produced during the Phase 1 privatization contract; therefore, additional disposal space is required. Additional facilities, designated as the LAW Disposal Complex, are planned for the south-central portion of the 200 East Area for Phase 1 production that exceeds the grout vault capacity and the ILAW production expected during

Phase 2. Depending on the level of package radioactivity, some ILAW packages may require remote handling (but can be disposed of commonly with contact-handled packages). The package activity level, combined with the package hazardous waste classification, is expected to allow both trench and vault disposal concepts to be used. The planned ILAW activities are outlined in Shade (1997a) and covered in other planning documents under Project W-465.

The CSB is located in the Hanford Site 200 East Area (Building 212-H) and is currently being constructed as part of the Spent Nuclear Fuel (SNF) Project (Project W-379). After the SNF CSB construction is finished, the IHLW Storage Line-Item Project (Project W-464) intends to outfit the CSB by installing new features to enable receipt and storage of Phase 1 IHLW. The SNF Project will use Vault 1 for interim storage of SNF; Project W-464 will retrofit Vaults 2 and 3 for interim storage of IHLW. Project W-464 also includes a system for transporting IHLW canisters from the private contractor facilities to the CSB.

Using the CSB for interim storage of Phase 1 IHLW will require installation of equipment and subsystems that are not needed for the SNF CSB design. The existing CSB facility may also need to be modified. The extent of CSB modifications will be determined in the conceptual and detailed design phases. Preliminary evaluations (letter FRF034, *Canister Storage Building (CSB) High-Level Waste (HLW) Implementation Study* [Jacobs 1996a]; letter FRF049, *Final CSB High-Level Waste Supplemental Report* [Jacobs 1996b]) have identified some potential needs, such as modifying the inlet plenum to allow louver installation and deepening the Hot Conditioning Annex pit to accommodate 4.5 m (14 ft 10 in.) IHLW canisters. In addition to the required CSB equipment, a new onsite transporter system, including a tractor/trailer and onsite shielded transport cask, will need to be specified and procured. To transport and handle ¹³⁷Cs canisters, the onsite shielded transport cask may need to be modified and a unique transport system and CSB handling equipment designed and fabricated.

6.4.2 Project Records

Project files will be developed and maintained in accordance with project configuration management plans. Documents associated with projects (i.e., drawings, calculations, correspondence, test, vendor information) will be maintained as records and processed through the DIMCs. The project files will be complete, accurate, and made available to support projects for the Phase 1 and 2 ILAW and IHLW product handling. Information resources are managed throughout the information life-cycle, including information creation, collection, processing, distribution, management, and disposition or retirement. Life-cycle activities will be managed toward making information useful, available, and effective in accomplishing project objectives.

The selection of controlled documents and information will be in accordance with HNF-1900 (Vann et al. 1998). Procedures for project record management include: HNF-PRO-232, *Project and Task Document Management*; HNF-PRO-208, *Records Management - General*; HNF-PRO-210, *Records Management Program*; HNF-PRO-222, *Quality Assurance Records*; and other related practices.

6.4.3 Reliability, Availability, and Maintainability Risk Evaluation

Risk planning, assessment, analysis, and management will be used throughout the product storage and disposal activities to identify significant risk factors and formulate mitigation plans. Risk management will be conducted in accordance with TWRS Project risk management programs (e.g., HNF-SD-WM-PMP-018, *Tank Waste Remediation System Risk Management Plan* [Zimmerman 1998]). In addition, RAM risk evaluations will be generated as major project phases are developed. Risk assessment will be an ongoing, iterative, integrated process providing information needed to manage technical, environmental, safety, and health risks. The RAM risk analyses will also provide basis for revising design requirements, anticipating spare equipment, training, and other project needs, and identifying potential programmatic impacts (e.g., scope, cost, schedule).

6.4.4 Spare Equipment List

With the exception of several line item projects, SSCs are in place. However, designs and engineering plans for storage/disposal projects are insufficiently complete at this time to prepare lists of project critical spare parts and equipment. The RAM evaluation, vendor recommendations, reviews of historical performance, and other assessments of the ILAW and IHLW management projects will provide the basis for the spare equipment list. Spares are controlled in accordance with HNF-PRO-129, *Controlling Spare Parts and Spare Equipment Inventory*.

6.5 OPERATIONS, MAINTENANCE, AND SUPPORTING DOCUMENTS

Operations, maintenance, and supporting documents are those that are used to enable and control field activities. The Immobilized Waste Storage and Disposal Program has recently initiated designs and engineering plans for the expected product storage and disposal activities. Thus, many of the following sections are only conceptual at this time or are intended to act as placeholders for future discussion and amendment of this document.

6.5.1 Operations and Maintenance Concept

Operations and maintenance concepts for product storage and disposal will be developed from a combination of sources including: derivation from existing practices or previous concepts (e.g., operating procedures for the grout vaults); adaptation of new procedures (e.g., CSB maintenance procedures developed under Project W-379); and independent development of new practices (e.g., for the new ILAW disposal facility). Documents specific to operations and maintenance for product storage and disposal systems will be added to and controlled under the Technical Baseline as they are completed.

6.5.2 Permits and Safety Authorizations

Environmental permit planning documents have been prepared for the product storage and disposal activities including: HNF-SD-ENV-EE-003, *Permitting Plan for the Immobilized Low-Activity Waste Project* (Deffenbaugh et al 1997); 70100-96-004, *Environmental Requirements Checklist for the High-Level Waste Storage Project Canister Storage Building* (Deffenbaugh 1996); and HNF-SD-ENV-EE-002, *Permitting Plan for the High-Level Waste Interim Storage Project* (Deffenbaugh 1997). For each applicable regulation, the permitting plans provide a summary of data requirements, a discussion of alternatives, a recommended implementation strategy, and an estimated cost of implementing the recommended alternative.

A comprehensive, graded approach to safety is being developed for the Immobilized Waste Storage and Disposal Program projects to integrate the appropriate safety inputs and requirements into the program's technical, cost, and schedule baselines. At this time, the TWRS Project Authorization Basis for the Hanford Site does not include Projects W-464 or W-465, nor does it include future Phase 2 ILAW or IHLW storage and disposal facilities. The Authorization Basis will be amended or another Authorization Basis will be developed to address these projects and interfaces with other Hanford Site projects and with the private contractors.

For ILAW, the general approach will be to develop a new set of safety requirements based on: preliminary safety evaluation studies performed during the conceptual design stage; detailed safety analysis to establish the basis of a preliminary safety analysis report and a final safety analysis report (FSAR); and TSRs to be addressed in the Project W-465 design package using the safety equipment list, specific procurement requirements, and specific testing during start up. A preliminary safety evaluation for Project W-465 is presented in Mouette (1997). For IHLW, the strategy is to develop an addendum to the FSAR prepared by Project W-379 (Canister Storage Building). This addendum will follow the existing CSB FSAR format and reflect only those activities specific to the IHLW storage mission. In addition, the addendum will identify interfaces with Project W-379 for design features, analysis, requirements, and controls specific to the IHLW mission. The HLW-specific TSRs and controls will be managed as part of the CSB safety basis.

6.5.3 Process Limits

Process limits cannot be established at this time for the product storage and disposal, primarily because the full characteristics, properties, and quantities of the ILAW and IHLW are not yet established. Process limits will be developed after the privatization contracts are finalized and more detailed designs completed.

6.5.4 Safety Equipment List

The safety equipment list for the TWRS Project is identified in HNF-SD-WM-SEL-040, (Jensen 1997). The document identifies the operating and maintenance SSCs important to safety

and provides the requirements to support occurrence reporting activities for TWRS Project operations. The facility safety equipment list will be augmented by the operator(s) of the ILAW and IHLW storage and disposal facilities. HNF-SD-WM-SEL-040 will be updated to cover facilities that support the transport and disposition of products delivered by the private contractor.

6.5.5 Operations and Maintenance Environmental, Safety and Health, and Quality Assurance Plans

The Immobilized Waste Storage and Disposal Program will establish the ES&H and quality assurance programs to ensure that product storage and disposal activities are carried out in compliance with federal, state, and local regulations, laws, and standards for the protection of the environment and the safety and health of employees and the public. Activities conducted in the TWRS Project will be in accordance with HNF-1773 (Borneman 1998); HNF-IP-0842, *TWRS Administration*, Volume IX, "Safety," Section 1.1, "TWRS Safety Program Plan" (LMHC 1997a); and HNF-IP-0842, Volume XI, "Quality Assurance," Section 1.1, "TWRS Quality Assurance Program Plan" (LMHC 1997a).

6.5.6 Operations and Maintenance Procedures

The Immobilized Waste Storage and Disposal Program will develop operations and maintenance procedures for the product storage and disposal system. Procedure development will occur after the projects have been completed and accepted by the TWRS Project. Operations and maintenance procedures are considered Technical Baseline documents.

6.5.7 Training Certifications

Training and certification will occur after the specific procedures for operation and maintenance of the product storage and disposal system are in place. Shift supervisors, operating engineers, operators, craftsmen, and technicians will be trained to the procedures. Management, engineering, and other professional staff may receive specific professional training and certification as necessary to assure proficiency. Training of personnel involved in ILAW and IHLW handling and disposition will likely be accomplished using the existing training infrastructure. Training certifications are considered Technical Baseline documents. Hanford Atomic Metals Trade Counsel personnel will be trained and certified by the TWRS Project contractor.

6.5.8 Operations and Maintenance Records

Operations and maintenance records include calibration, process performance, and system surveillance documents. After the product storage and disposal system has been defined, the

Immobilized Waste Storage and Disposal Program will develop procedures to govern record-keeping activities. These records are considered to be Technical Baseline documents, and they will be developed, collected, and maintained consistent with the project records procedures discussed in Section 6.4.2 of this document.

6.6 SECONDARY WASTE DEFINITION

The product storage and disposal program will not generate secondary radioactive and solid wastes in the near future. The secondary wastes expected under this program are operational in nature and include relatively small volumes of personal protective equipment, high-efficiency particulate air filters, and other material generated as a result of routine facility operations.

6.7 PROGRAMMATIC INTERFACES

The Immobilized Waste Storage and Disposal Program will prepare ILAW and IHLW project management plans (HNF-1517 [Shade 1997a] and HNF-1751 [Calmus 1997], respectively) that will include details on program interfaces. The program management plans will describe interactions between and responsibilities of DOE, the PHMC team, the engineer/constructor and the architect/engineer, the private contractors, and permitting authorities such as Ecology.

The functional elements of the transport systems, interim storage and final disposal facilities depend on the ILAW and IHLW products received from the private contractors. An interface process has been established to define responsibilities and resolve issues. This interface will be conducted in accordance with privatization ICDs specific to each LAW and HLW product (see Section 5.0 of this document). The privatization ICDs are to be issued by DOE and the private contractors in FY 1998. A memorandum of agreement (Hansen 1996) between the SNF project and IHLW storage subproject has been executed to reserve CSB Vaults 2 and 3 for storing Phase 1 IHLW products.

The product storage and disposal system will be supported by utilities and other infrastructure services provided by DYN. An interface agreement between LMHC and DYN will be executed to ensure delivery of the required services (see Section 8.0 of this document). Similar interface agreements between LMHC and WMH are being prepared to ensure that product storage and disposal is supported with adequate facilities, operations, management and laboratory analytical services, and other required support (see Section 7.0 of this document).

7.0 SECONDARY WASTE MANAGEMENT AND ANALYTICAL SUPPORT

Waste Management Federal Services of Hanford, Inc., is responsible for secondary waste management and analytical support. This section describes the overall scope of WMH's support to the Waste Retrieval and Disposal Mission and identifies Technical Baseline documents relative to WMH's scope. Also included in this section is a brief description of the primary facilities that will be involved with managing secondary waste and providing analytical support. Table 7 lists the Technical Baseline documents identified to date for secondary waste and analytical support, along with summaries of the source information for each listed document. These technical documents, particularly the identified ICDs, also indicate readiness-to-proceed elements. A brief summary of each listed document and other pertinent information is contained in Appendix F.

7.1 ANALYTICAL SERVICES

The WMH Analytical Services organization is currently responsible for analyzing and managing radioactive and non-radioactive Hanford samples. Hanford facilities that support this program include the 222-S Laboratory, the Waste Sampling and Characterization Facility, and Special Analytical Support. The 222-S Laboratory will provide the majority of the Waste Retrieval and Disposal Mission support, and is the primary focus of this section. Highly radioactive wastes, including HLW and LAW, are analyzed in the 222-S Laboratory. Not all interfaces regarding secondary wastes have been identified (i.e., requirements for the private contractors to use 222-S and the Waste Sampling and Characterization Facility laboratory services). As these interfaces are defined, ICDs or memoranda of understanding will need to be developed. Analysis of returned waste is assumed to be the responsibility of the private contractors (who may contract for analytical services through WMH). Costs associated with these analytical services are not included in the Readiness to Proceed. Important documents for laboratory analysis include HNF-SD-CP-ISB-002, *222-S Laboratory Interim Safety Basis* (Weaver 1997) and DOE/RL-91-27, *Dangerous Waste Part B Permit Application for the 222-S Laboratory Complex* (RL 1991a). Both of these documents are required documents in WHC-SD-WM-RPT-288, *Waste Management Project Technical Baseline Description* (Sederburg 1997).

7.1.1 Facility Description

The 222-S Laboratory, located in the 200 West Area, is a Category 3 non-reactor nuclear facility. This laboratory comprises the 222-S Building and auxiliary buildings. The 222-S Building contains the Hot Cell Facility for analyzing high-dose rate samples, a multi-curie section, and a section for analyzing general radioactive and/or toxic materials. New analytical methods and chemical standards are prepared in the 222-SA Laboratory. The 222-S Laboratory

Table 7. Technical Baseline Documents for Secondary Waste and Analytical Services and Designated Source Information.^a

Document title	Maintained current? ^b	Appendix number	Source information
<i>Waste Management Project Technical Baseline Description, "Waste Management Baseline" (Sederburg 1997)</i>	Y	F.1	Source for information relating to WMH activities, including ETF/LERF, 242-A Evaporator, Central Waste Complex, and 222-S Laboratory. ^b
<i>Solid Waste Integrated Forecast Technical (SWIFT) Report FY 1997 to FY 2070 (Valero 1997)</i>	Y	F.2	Source for future solid waste generation predictions.
<i>Interface Control Document Between DOE and the PHMC – Radioactive Solid Waste (FDH 1997d)</i>	Y	D.3	Establishes interfaces between the PHMC team and private contractors for the handling and managing of radioactive solid waste.
<i>Interface Control Document Between DOE and the PHMC – Non-Radioactive, No Dangerous Liquid Effluents (FDH 1997e)</i>	Y	D.4	Establishes interfaces between the PHMC team and private contractors for the handling and managing of non-radioactive, non-dangerous liquid effluents.
<i>Interface Control Document Between DOE and the PHMC – Radioactive, Dangerous Liquid Effluents (FDH 1997f)</i>	Y	D.5	Establishes interfaces between the PHMC team and private contractors for the handling and managing of radioactive, dangerous liquid effluents.
<i>Interface Control Document Between DOE and the PHMC – Low-Activity Waste Feed (FDH 1997g)</i>	Y	D.19	Establishes interfaces between the PHMC team and private contractors for the delivery of the low-activity waste feed.
<i>Interface Control Document Between DOE and the PHMC, Phase 1 Privatization – High-Level Waste Feed (FDH 1997r)</i>	Y	D.20	Establishes interfaces between the PHMC team and private contractors for the delivery of the high-level waste feed.

^aAnalytical services related interface documents have not been developed to address PC/WMH interfaces.

^bIs the document to be maintained current per HNF-1900? (Y=yes, N=no).

ETF = Effluent Treatment Facility.

LERF = Liquid Effluent Retention Facility.

PHMC = Project Hanford Management Contract.

WMH = Waste Management Federal Services of Hanford, Inc.

comprises three waste management units. Recent upgrades to the waste management units and facility, including upgraded and newly installed transfer lines, ensure compliance with Code of Federal Regulations 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," and DOE orders, and provide long-term capabilities for supporting new and expanded missions (WHC-SD-W041-FDC-001, *Environmental Hot Cell Expansion Project W-041* [McVey 1991]; WHC-SD-WM-ES-107,

Environmental Hot Cell Expansions Project W-041 [McVey 1992]; WHC-SD-W057-ES-001, Engineering Study 222-S High-Level Drain System Upgrade Project W-057 [LaBarge 1992]].

7.1.2 Sample Receiving Capabilities and Limitations

The analytical capacity of the 222-S Hot Cell Facility was previously estimated to be approximately 1,450 to 1,800 core segment samples per year (McVey 1991). The receiving capacity was limited during the estimation time frame by the number of extrusions. Current near-term sample projections are provided in HNF-SD-WM-TI-608, *Hanford Analytical Sample Projections FY 1997 – FY 2001* (Joyce 1997). Long-term projections and requirements (e.g., protocols) are not currently available. HNF-SD-WM-RPT-288 (Sederburg 1997) identifies this as "To Be Determined," but capacity to support the Waste Retrieval and Disposal Mission is not expected to be of concern according to 65450-87-016, *HWVP Analytical Hot Cells Time and Motion Study* (Stroup 1987); and 12000-94-005, *TWRS Minimum/Maximum Laboratory Capacity Strategy* (Bell 1994). Analytical sample analysis needs have been decreasing and this trend is expected to continue.

The type and magnitude of analytical support to the private contractors and the TWRS Project will depend on Data Quality Objectives for tank waste and immobilized waste analyses and further definition and revision of the ICDs described in Section 5.0 of this document. Permit impacts will also be evaluated.

7.1.3 Facility Discharges

The 222-S Laboratory generates the following waste streams: low-level waste (LLW), mixed LLW, and hazardous waste. The primary types and sources of the LLW are routine laboratory wastes, failed equipment, and lab packs. The analysis of tank farm core samples generates much of the mixed LLW. Hazardous waste is also generated in the 222-S Standards Laboratory. These waste streams are described in greater detail in WHC-SD-WM-PICD-005, *Interface Control Document Between Analytical Services and Solid Waste Disposal Division* (Greager 1996). Radioactive liquid wastes are discharged to the DST system. Currently unused samples are either archived or returned to the TWRS Project. Secondary waste from sample analysis is also currently returned to the source owner. An agreement will be developed for the archiving or returning of samples or secondary waste from private contractor-related analytical support.

7.1.4 Programmatic and Technical Interfaces

The *Waste Management Project Technical Baseline Description* (Sederburg 1997) contains a section devoted to interfaces. The ICD between the TWRS Project and WMH is WHC-SD-WM-PICD-003, *Interface Control Document Between the Tank Waste Remediation Division and the Solid Waste Disposal Division* (Duncan 1995). For the TWRS Privatization - Phase 1 effort, the Sederburg (1997) identifies the major interface activities between the private

contractors and WMH and indicates that specific ICDs will be developed. The ICDs important to WMH being developed are identified in Table 7 and described in Section 5.0 of this document. A memorandum of agreement regarding WMH support to the Waste Retrieval and Disposal Mission is planned. HNF-SD-SM-SD-023, *Fiscal Year 1997 Memorandum of Understanding for the TWRS Characterization Project* also serves as an interface document (Schreiber 1997a).

The 222-S Laboratory, as managed through Analytical Services, also has interfaces with onsite and offsite customers and offsite laboratories. As noted in Section 7.1 and 7.1.3, not all secondary waste interfaces have been completed. Analytical Services provides sampling, analysis, data management, and planning for other DOE sites and DOE complex-wide programs, other federal customers including the U.S. Department of Defense, and some non-government entities. Offsite laboratories are sometimes used to support analysis of low radiation level (<10 mR/hr) samples. Sample analysis includes environmental monitoring, bioassay, and routine *Resource Conservation and Recovery Act of 1976* (RCRA) mixed waste analysis.

7.1.5 Additional Required and Supplemental Documentation

The *Waste Management Project Technical Baseline Description* (Sederburg 1997) identifies several required and supplemental documents. These documents include plant operating and maintenance procedures, essential drawings, safety equipment lists, permits, and the interim safety basis.

7.2 242-A EVAPORATOR

The 242-A Evaporator is operated to reduce the volume of highly radioactive wastes requiring storage in the DST system. The 242-A Evaporator accepts aqueous waste from various generators on the Hanford Site through the tank farms system, and is also capable of processing private contractors' waste that meets waste acceptance criteria. Important documents for 242-A Evaporator include DOE/RL 90-42, *The Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator* (RL 1997a), and WHC-SD-WM-SAR-023, *242-A Evaporator/Crystallizer Safety Analysis Report* (Acquire 1995). These documents are not included in the current version of the HNF-SD-WM-RPT-288 (Sederburg 1997) but will be added to the required document list in the next revision.

7.2.1 Facility Description

The 242-A Evaporator is located in the 200 East Area and is used to treat dilute tank waste from the DST system by removing water and most volatile organics. The 242-A Evaporator process employs a conventional forced circulation, vacuum evaporation system to concentrate the DST system aqueous waste solution.

7.2.2 Waste Receiving Capabilities and Limitations

The mixed waste processed at the 242-A Evaporator is an aqueous solution containing dissolved cations and anions such as sodium, potassium, aluminum, hydroxides, nitrates, and nitrites. Small quantities of ammonia and organics also may be present. Evaporator feed specifications (Acquire 1995) have been established to:

- Maintain process operability and safety
- Ensure the process condensate meets LERF acceptance limits
- Limit volatile organic emissions to regulatory limits
- Limit the specific gravity of waste returned to the DSTs.

A process design capacity of 870,642 liters per day with total volume capacity of 170,597 liters is indicated in DOE/RL 90-42 (RL 1997a).

7.2.3 Facility Discharges

Two dilute tank waste streams are generated at the 242-A Evaporator--slurry and process condensate. The slurry stream contains finely divided solids comprised of insoluble solids and crystallized salts. Most of the volatile constituents are contained in the process condensate. Other wastes generated by the 242-A Evaporator operations include decontamination solution waste and solid secondary wastes. Water is normally used as the decontamination solution, but nitric or citric acid may also be used.

Secondary waste generated during operations and maintenance work is primarily comprised of, but not limited to, dry solid materials contaminated with dangerous and/or mixed waste. Radioactive and mixed radioactive solid wastes may be stored, processed, and/or disposed at the Central Waste Complex (CWC).

7.2.4 Programmatic and Technical Interfaces

The 242-A Evaporator processes highly radioactive aqueous wastes generated by Hanford Site facilities. The 242-A Evaporator could be used to process highly radioactive wastes returned by the private contractors but the evaporator Authorization Basis may need to be modified. Concentrated slurry waste is pumped to the DST system and process condensate is routed to the LERF. The Evaporator operations are expected to have little impact on Tank Waste Retrieval and private contractor operations. However, the Evaporator will be needed in the Phase 1 mission to reduce DST waste volume and, if necessary, to reprocess waste that fails to meet the envelope. Secondary waste from the private contractors will be fed directly to the ETF/LERF and or the Treated Effluent Disposal Facility (TEDF).

7.2.5 Additional Required and Supplemental Documentation

Table 7-24 of the HNF-SD-WM-RPT-288 (Sederburg 1997) will identify the primary required and supplemental documents when the document is next upgraded (scheduled for 1998). Section 7.3 of this Technical Baseline identifies those documents that should be part of the Technical Baseline including plant operating and maintenance procedures, equipment lists, safety basis, and certified vendor information.

7.3 EFFLUENT TREATMENT FACILITY/LIQUID EFFLUENT RETENTION FACILITY

The ETF/LERF is used to accumulate and treat low concentration radioactive mixed aqueous wastes generated at Hanford facilities. The required documents for the ETF and LERF are identified in HNF-SD-WM-RPT-288 (Sederburg 1997). These documents include DOE/RL 97-03, *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility* (RL 1997b). Waste acceptance is governed by WMH-9758688, *Liquid Effluent Retention Facility/Effluent Treatment Facility Treatability Envelope* (Lindsey 1997).

7.3.1 Facility Description

The ETF/LERF area is located in the northeast corner of the 200 East Area. The LERF provides interim storage and treatment of the 242-A Evaporator process condensate and dilute aqueous waste streams from other Hanford facility generating units until further treatment is conducted at the 200 Area ETF. Pipelines will be installed between the private contractors' facilities and the ETF/LERF (see Section 5.0 of this document). Treatment in the LERF comprises flow and pH equalization in accordance with the treatment surface impoundment exemption of Code of Federal Regulations 40 CFR 268, "Land Disposal Restrictions," Section 268.4, "Treatment surface impoundment exemption."

The 200 Area ETF is a flexible treatment system that provides treatment for contaminants anticipated in process condensate from the 242-A Evaporator and from other Hanford facility waste streams. The treatment process includes filtration, pH adjustment, ultraviolet oxidation, hydrogen peroxide decomposition, degasification, reverse osmosis, ion exchange, effluent quality verification in tanks, evaporation, concentration, and thin film drying. The treated effluent is stored in three verification tanks and sampled to determine if the effluent meets required discharge standards.

7.3.2 Waste Receiving Capabilities and Limitations

The ETF/LERF waste receiving capabilities and limitations for the private contractors are provided in Lindsey (1997), which is a required element in ICD-06 (see Section 5.0 of this

document). A description of the alternatives available for meeting waste acceptance requirements is provided in Lindsey (1997). For each private contractor, a waste profile must be developed and negotiated between the DOE/PHMC team and the private contractor. This ensures regulatory and process limits are met while providing maximum receipt composition flexibility. Total design and process capacity of the ETF/LERF are available in DOE/RL 97-03 (RL 1997b).

7.3.3 Facility Discharges

The LERF discharges to the ETF. The ETF generates a treated effluent stream that is accumulated in verification tanks. When the treated effluent meets the 'delisting' criteria of 40 CFR 261, "Identification and Listing of Hazardous Waste," Appendix IX, Table 2, WAC 173-216, "State Waste Discharge Permit Program," and Permit No. ST-4500, *State Waste Discharge Permit for the 200 Area Effluent Treatment Facility* (Ecology 1995a), it is released as a non-dangerous waste to the State Approved Land Disposal Site (SALDS) in the 200 West Area. If the sample analysis of the effluent in the verification tanks does not meet the discharge standards, the effluent is returned to the system for further treatment.

Two non-aqueous waste streams are generated during the operation of ETF: (1) a solid waste stream from the secondary treatment process, and (2) a solid waste stream comprised of general trash from maintenance and operations activities. The first solid waste stream includes contaminants removed from aqueous waste. The contaminants and treatment by-products are concentrated into a powder which is packaged and transferred to the CWC for storage at the Low-Level Burial Grounds or disposal at the Environmental Restoration Disposal Facility in accordance with applicable waste acceptance criteria.

7.3.4 Programmatic and Technical Interfaces

The ETF/LERF interfaces with the private contractors will be contained in ICD-06 (see Section 5.0 of this document). Other technical interfaces are contained in HNF-SD-SM-RPT-288 (Sederburg 1997).

7.3.5 Additional Required and Supplemental Documentation

A list of documents specific to the 200 Area Liquid Waste Processing Facility Complex, including the LERF and ETF is provided in HNF-SD-SM-RPT-288 (Sederburg 1997). These documents include permits, conduct of operations evaluations, Memoranda of Understanding, and general acceptance criteria.

7.4 200 AREA TREATED EFFLUENT DISPOSAL FACILITY

The 200 Area TEDF currently receives treated and/or innocuous non-radioactive, non-dangerous liquid effluent from several 200 Area generators. This type of waste will also be received from the private contractors in accordance with ICD-05. The ICD-05, which is a Technical Baseline document (see Section 5.0 of this document) requires the private contractor meet the requirements of HNF-SD-W049H-ICD-001, *200 Area Treated Effluent Disposal Facility Interface Control Document* (Crane 1997). The 200 Area TEDF ICD and ICD-05 are the primary sources of information for this section.

7.4.1 Facility Description

The 200 Area TEDF is comprised of disposal ponds and associated piping systems, supporting structures, components, and instrumentation. The disposal ponds are located east of the ETF/LERF in the 200 East Area. Because the 200 Area TEDF does not have any treatment or retention capacity, strict control at the generating facility interface is essential to operate in compliance with the requirements of the WAC 173-216, the State Waste Discharge Permit, and the Hanford Site requirements, and good engineering practices.

7.4.2 Waste Receiving Capabilities and Limitations

The 200 Area TEDF currently receives waste from several sources including the Plutonium Finishing Plant, 222-S Laboratory, T Plant, 284-W and 284-E Power Plants, B Plant, 241-A, 244-AR, and the 242-A Evaporator. Waste streams include facility wastewater, chemical sewers, cooling water, and steam condensate. Strict pH limits must be maintained. Each source also is limited in maximum flow rate. The 200 Area TEDF chemical concentrations must meet Permit No. ST-4502, *State Waste Discharge Permit 200 Area Treated Effluent Disposal Facility (Project W-049H)* limits (Ecology 1995b).

7.4.3 Facility Discharges

The 200 Area TEDF discharges to the SALDS in 200 East Area, which is discussed in Section 7.5.

7.4.4 Programmatic and Technical Interfaces

The primary interface document between this facility and Hanford source generators is HNF-SD-W049H-ICD-001 (Crane 1997). For the private contractors, the ICD-05 (HNF-SP-1211), regarding non-radioactive, non-dangerous liquid effluent for Phase 1 privatization, is the governing document and requires compliance with HNF-SD-W049H-ICD-001 (Crane 1997).

7.5 STATE-APPROVED LAND DISPOSAL SITES

The SALDS are rectangular drain fields that receive treated effluent in accordance with permit requirements. There are two SALDS in the 200 Areas that receive discharge liquid from the ETF and TEDF. The SALDS that receives liquids from the ETF is located north of the 200 West Area. Discharges to this SALDS are governed by Permit No. ST-4500 (Ecology 1995b). The SALDS that receives liquids from the TEDF is located in the east portion of 200 East Area. These discharges are governed by Permit No. ST-4502 (Ecology 1995a). Acceptance criteria for the ETF and TEDF are written, in part, to ensure these permit requirements are met.

7.6 CENTRAL WASTE COMPLEX

The CWC is an existing and planned series of facilities to centralize the management of solid waste operations at the Hanford Site. The CWC is managed as part of the Solid Waste Program. The Solid Waste Program also has its own Technical Baseline description, WHC-SD-WM-RPT-060, *Solid Waste Program Technical Baseline Description* (Sederburg 1996), which is included in HNF-SD-WM-RPT-288 (Sederburg 1997). (An additional important document is DOE/RL 91-17, *Hanford Central Waste Complex - Radioactive Mixed Waste Storage Facility Dangerous Waste Permit Application, Volumes I and II* [RL 1991c].) Interfaces with the private contractors will be controlled through ICD-03 (see Section 5.0 of this document).

7.6.1 Facility Description

The CWC comprises multiple facilities for storage of radioactive and mixed waste while the waste awaits processing or certification for final disposal. Treatment of waste at the CWC includes the absorption and solidification of free liquids and the neutralization of corrosive materials. As additional treatment processes and disposal facilities become available, WMH will treat and repackaged stored wastes as required for disposal. Treatment processes will include commercial thermal treatment as described in HNF-SD-WM-RPT-288 (Sederburg 1997). WMH will also enter into contracts for various commercial treatments and repackaging.

7.6.2 Waste Receiving Capabilities and Limitations

Waste acceptance criteria for the CWC are contained in WHC-EP-0063-04, *Hanford Site Solid Waste Acceptance Criteria* (Willis 1993). The ICD-03 will require compliance with these criteria. Waste packages are transported in trucks to the CWC directly from generating facilities. Incoming wastes destined for storage within the CWC are usually contained in 208-L (55-gal) drums. The CWC receives and inspects waste containers at the Waste Receiving and Staging Area or occasionally at the storage buildings.

To ensure that adequate long-term storage capacity exists, several solid waste generation studies have been performed including HNF-EP-0918, *Solid Waste Integrated Forecast Technical (SWIFT) Report: FY 1997 to FY 2070* (Valero 1997). This report estimates that the peak volume at CWC, and the peak volume from the HLW and LAW immobilization activities, will occur approximately in 2014. Peak volumes are below the rated maximum permitted capacity. The total required storage and process capacity for the CWC is identified in DOE/RL 91-17 (RL 1991c).

7.6.3 Facility Discharges

For all solid waste and mixed materials, it is estimated that some equipment and materials will be released for unrestricted use, TRU waste will be sent to the Waste Isolation Pilot Project, hazardous waste will either be sent to an offsite commercial facility for treatment and/or disposal, placed in long-term storage awaiting development of treatment systems, or will be otherwise disposed at Hanford (Sederburg 1997).

7.6.4 Programmatic and Technical Interfaces

The CWC interfaces between the private contractors and the government contractors will be defined in ICD-03 (see Section 5.0 of this document). Other interfaces are identified in HNF-SD-WM-RPT-288 (Sederburg 1997) and WHC-SD-WM-RPT-060 (Sederburg 1996). There is also WHC-SD-WM-PICD-003 (Duncan 1995).

7.6.5 Additional Required and Supplemental Documentation

A list of the primary required and supplemental documents applicable to the CWC is provided in HNF-SD-WM-RPT-288 (Sederburg 1997). This list includes plant operating and maintenance procedures, equipment lists, certified vendor information, criticality reports, permits, and safety bases.

8.0 UTILITY SUPPORT

DynCorp Tri-Cities Services, Inc., provides the infrastructure support (utilities, transportation, general purpose facilities, and sitewide services) for the Hanford Site, including the TWRS Project and the private contractors. This section briefly describes the scope of utility support to the Waste Retrieval and Disposal Mission. Table 8 lists the Technical Baseline documents identified to date for utility support, along with summaries of the source information for each listed document. Most of the information in this section is from these Technical

Baseline documents and FY 1998 Annual Work Plan for Infrastructure Programs WBS 6./7, DYNCorp Tri-Cities Services, Inc. (Dallas 1997).

Table 8. Utilities Support Documents and Designated Source Documents.

Document title	Maintained current?*	Appendix number	Source information
<i>Interface Control Document Between DOE and the PHMC – Phase I Privatization Raw Water</i> (FDH 1997b)	Y	D.1	Establishes interfaces between PHMC team and private contractors for the raw water delivery and use.
<i>Interface Control Document Between DOE and the PHMC – Phase I Privatization Potable Water</i> (FDH 1997c)	Y	D.2	Establishes interfaces between PHMC team and private contractors for the delivery and use of potable water.
<i>Interface Control Document Between DOE and the PHMC – Electricity</i> (FDH 1997i)	Y	D.8	Establishes interfaces between PHMC team and private contractors with respect to electricity delivery to private contractors' facilities during Phase I privatization activities.
<i>Interface Control Document Between DOE and the PHMC – Phase I Privatization Roads and Rails</i> (FDH 1997j)	Y	D.9	Establishes interfaces between PHMC team and private contractors for road use during Phase I privatization activities and establishes that there will be no direct rail.

*Is the document to be maintained current per HNF-1900? (Y=yes, N=no).

DOE = U.S. Department of Energy.

PHMC = Project Hanford Management Contract.

The DYN Site Infrastructure Mission is to provide safe, quality infrastructure services to the Hanford community that meet identified goals (Dallas 1997). Specific infrastructure services that DYN provides to the PHMC team include: site fabrication services; crane and rigging services; general purpose facility management and maintenance services; utilities maintenance and operations; materials management; laboratory operations support; calibration and nondestructive examinations services; transportation and non-radioactive and solid waste handling; ES&H and quality assurance support; emergency services including management of the Hanford Fire Department and Emergency Preparedness; and management of the Landlord Programs. Emergency services and Landlord Programs are covered by separate annual work plans.

Infrastructure support to the private contractors will be addressed in privatization ICDs (see Table 5 and Section 5.0 of this document). DYN is responsible for providing the utilities (e.g. water, electricity), but is not responsible for installing the infrastructure or private contractor roads.

9.0 CLOSURE

Dangerous waste and radiologically-contaminated treatment, storage, and disposal facilities supporting the Waste Retrieval and Disposal Mission will require closure following completion of their service. Closure is governed by DOE, state, and federal regulations, which in most cases require comprehensive closure plans. Future site usage plans and guidance have been developed to guide decision making about post-closure site conditions. Tank farm closure and the PHMC team facilities are outside the Phase 1 mission. For this Technical Baseline summary, the most important closure information relates to privatization efforts, ILAW and IHLW storage and disposal systems. Information on these items is provided first in this section. This section also provides information on general tank farm system closure and support facilities closure. Technical Baseline documents are provided in Table 9. No new Technical Baseline documents are identified in this section.

9.1 PRIVATE CONTRACTOR FACILITIES

The private contractors will be responsible for turning their facilities over to the DOE and DOE contractors after they have deactivated systems, as required in the privatization contracts (RL 1996a and RL 1996c). Deactivated private contractor facilities will be added to the inventory of Hanford facilities under transition and decontamination and decommissioning projects. Decisions regarding the final closure of private contractor facilities will be made once closure plans are developed and the DOE/EIS-0189 (DOE and Ecology 1996) is updated or a separate Environmental Impact Statement is written. The ICD-10, deactivated facility, and site (see Section 5.0) provides the interface requirements for this activity.

Table 9. Summary of Source Tank Closure/Other Interfaces.

Document title	Maintained current? ^a	Appendix	Source information
<i>Tank Waste Remediation System Mission Analysis Report</i> (Acree 1998)	Y	A.1	Establishes acceptable end state conditions for closure.
<i>Interface Control Document Between DOE and the PHMC - Deactivated Facility and Site for Phase 1 Privatization</i> (FDH 1997h)	Y	D.7	Establishes interfaces between PHMC team and private contractors for the facility deactivation and site turn-over to DOE following completion of Phase 1 privatization activities.
<i>Waste Management Project Technical Baseline Description</i> , "Waste Management Baseline" (Sederburg 1997)	Y	F.1	Source for information relating to WMH activities, including ETF/LERF, 242-A Evaporator, Central Waste Complex, and 222-S Laboratory ^b .

Table 9. Summary of Source Tank Closure/Other Interfaces.

Document title	Maintained current? ^a	Appendix	Source information
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^aIs the document to be maintained current per HNF-1900? (Y=yes, N=no).

^bAnalytical services related interface documents have not been developed to address PC/WMH interfaces.

DOE = U.S. Department of Energy.

ETF = Effluent Treatment Facility.

LERF = Liquid Effluent Retention Facility.

PHMC = Project Hanford Management Contract.

WMH = Waste Management Federal Services of Hanford, Inc.

9.2 IMMOBILIZED WASTE FACILITIES

It is anticipated that after completion of the Waste Retrieval and Disposal Mission, including Phases 1 and 2, surface facilities for storing ILAW and IHLW will be decontaminated (if necessary), razed, and/or filled to prevent subsidence. It is also assumed that a standard Hanford surface barrier will be used as cover for the ILAW disposal vaults and, if necessary, for the stabilized surface facilities (DOE 1996b).

9.2.1 Immobilized Low-Activity Waste Facilities

The ILAW facilities will be maintained until all ILAW is received for ultimate disposal. At least 30 years of post-closure monitoring will be provided. An approved closure plan and appropriate barriers will then be installed. Preparation of the ILAW facility closure plan and associated decision making (e.g., *National Environmental Policy Act of 1969* [NEPA]) documentation is at least seven years in the future.

9.2.2 Immobilized High-Level Waste Facilities

Because IHLW will be stored in the CSB which is managed by the SNF Project, the Tank Waste Retrieval Organization will be responsible as a "user" to ensure that the designated storage location (Vaults 2 and 3), once empty, are closed in a manner consistent with the CSB Closure Plan at the direction of the SNF Project. Preparation of the CSB closure plan and associated decision making documentation (e.g., NEPA) for closure of the CSB is at least seven years in the future.

9.3 TANK FARM SYSTEMS

A summary of tank farm closure requirements is contained in HNF-SD-WM-MAR-008 (Acree 1998). Information sources for these closure requirements include 62 FR 8693. Acceptable end state conditions for the tank farm systems include the following:

- Tank waste - LAW will be immobilized and disposed onsite
- Tank waste - HLW will be immobilized and safely stored onsite for eventual disposal at the HLW geologic repository
- Storage tank systems - SSTs, DSTs, miscellaneous underground storage tanks and associated systems will be closed in accordance with decisions on tank farm end state to be reached under a closure NEPA process. This will address final disposition of the tanks, associated equipment, soils, and groundwater and will integrate tank farm closure with tank waste remediation and other remedial action activities (62 FR 8693)
- ^{137}Cs and ^{90}Sr - the $^{137}\text{Cs}/^{90}\text{Sr}$ capsules will be either over packed and shipped to the high-level nuclear waste repository for disposal, or disassembled with the ^{137}Cs and ^{90}Sr salts then blended into the high-level waste stream for immobilization
- Facilities - Facilities will be decontaminated and decommissioned and closed by the TWRS Project or turned over to the Environmental Restoration Project
- Other - Several areas termed "non-facility" will be closed (e.g., cribs, unplanned release sites).

9.4 OTHER PROJECT HANFORD MANAGEMENT CONTRACT TEAM SUPPORTING FACILITIES

The other PHMC team supporting facilities include the 222-S Laboratory, 242-A Evaporator, the ETF/LERF, SALDS, CWC, Low-Level Waste Burial Grounds, and 200 Area TEDF. These facilities are operated by WMH and generally will be closed in accordance with closure plans, RCRA permits, and other documents established and identified in the HNF-SD-WM-RPT-288 (Sederburg 1997). In most cases, closure plans have not been definitively developed because of the long life expectancy of these facilities. Closure sections in existing RCRA permits generally identify the need for clean closure with respect to dangerous waste contamination that results from operation within a limited time unless additional regulatory approval is obtained.

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APPENDIX A

WASTE RETRIEVAL AND DISPOSAL MISSION SCOPE DOCUMENTS

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Assigned Document Number A.1	Maintained Current? Yes
Document Name HNF-SD-WM-MAR-008, <i>Tank Waste Remediation System Mission Analysis Report</i> (Acree 1997)	
Responsible Organization LMHC, TWRS Systems Engineering Author: Acree	
Status of Preparation/Revision Revision 2 in draft form	
Source Information Designation Establishes TWRS Project requirements.	
Brief Summary of Content Document includes the problem definition, mission statement, initial state (current unacceptable) conditions, acceptable end state, major boundaries and interfaces, mission analysis level issues and assumptions, and the technical strategy basis. Also included are the externally imposed requirements, including applicable Federal, state, and local legislation, as well as associated statutes, regulations, codes, and standards.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number A.2	Maintained Current? Yes
Document Name Hanford Site Technical Database, Database maintained by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Richland, Washington (HSTD)	
Responsible Organization LMHC, Systems Engineering	
Status of Preparation/Revision [To be completed]	
Source Information Designation Defines Sitewide technical requirements for conducting Hanford Site work.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number A.3	Maintained Current? Yes
Document Name Standards/Requirements Identification Documents	
Responsible Organization LMHC, TWRS Project	
Status of Preparation/Revision [To be completed]	
Source Information Designation Defines operating, maintenance, environmental, safety, and other requirements for conducting work in the Hanford tank farms.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

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APPENDIX B
WASTE FEED DELIVERY DOCUMENTS

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Assigned Document Number B.1	Maintained Current? No
Document Name HNF-SD-WM-PLN-126, FY 1997 - 1998 Waste Information Requirements Document (Winkleman et al. 1997)	
Responsible Organization LMHC, Technical Basis and Planning Authors: W.D. Winkleman, M.R. Adams, T.M. Brown, J.W. Hunt, D.J. McCain, Lockheed Martin Hanford Corporation, Richland, Washington, L.J. Fergestrom, Technical Resources International, Inc., Richland, Washington	
Status of Preparation/Revision Revision 0 was released September 1997. Document to be revised annually.	
Source Information Designation Annual plan for tank waste sampling activities with DOE and Ecology approval.	
Brief Summary of Content The <i>Waste Information Requirements Document</i> (formerly know as the Sample and Analysis Plan) describes the activities of the Tank Waste Remediation System (TWRS) Characterization Project that provides characterization information on Hanford Site waste tanks. The characterization information is required to perform operations and meet the commitments of TWRS end users. These commitments are derived from the <i>Hanford Federal Facility Agreement and Consent Order</i> (Ecology et. al. 1996), also known as the Tri-Party Agreement; the DOE/RL 94-0001, <i>Recommendation 93-5 Implementation Plan</i> (RL 1996g) to the Defense Nuclear Facilities Safety Board (DNFSB); and other directives.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number	Maintained Current?
B.2	Yes
Document Name HNF-SD-WM-TI-740, <i>Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes</i> (Kupfer et al. 1997)	
Responsible Organization LMHC, Technical Basis and Planning Authors: M.J. Kupfer, A.L. Boldt, M.K. Higley, K.M. Hodgson, L.W. Shelton, and R.A. Watrous (LMHC), S.L. Lambert and D.E. Place (SESC), R.M. Orme (NHC), G.L. Borsheim (Borsheim Associates), N.G. Colton (PNNL), M.D. LeClair (SAIC), R.T. Winward (Meier Associates), and W.W. Schulz (W ² S Corporation), Lockheed Martin Hanford Corporation, Richland, Washington	
Status of Preparation/Revision Revision 0A released August 28, 1997, the document to be revised as needed	
Source Information Designation Best-basis inventory of the chemicals and radiological contents of Tank Farm wastes	
Brief Summary of Content This report presents work performed to date to establish standard global and tank-by-tank component inventory estimates. This work includes: global inventory reconciliations for 26 nonradioactive components and 46 radionuclides that account for approximately 99 percent of the total tank waste inventory. To ensure that inventory values resulting from these evaluations are technically defensible and reproducible, every attempt is being made to document the basis, i.e., originating sources of assumptions, data, and background information that supports these values.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number	Maintained Current?
B.3	Yes
Document Name	
<p><i>Tank Characterization Report for Tank 241-XX-XXX (where X varies for each of the 177 underground tanks at Hanford): Best-Basis Inventory, HNF-SD-WM-ER-XXX, (where XXX = numbers shown in source information below. See APPENDIX G for complete reference information.</i></p>	
Responsible Organization	
<p>LMHC, Technical Basis & Planning Authors: vary by report</p>	
Status of Preparation/Revision	
<p>Varies by report</p>	
Source Information Designation	
<p>Best-basis inventories for the 177 individual DSTs and SSTs</p>	
Brief Summary of Content	
<p>(XXX in the document number = 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 382, 402, 405, 406, 407, 408, 409, 410, 411, 453, 454, 455, 466, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 488, 489, 503, 528, 533, 535, 539, 540, 541, 544, 545, 549, 550, 551, 552, 554, 558, 559, 566, 569, 570, 572, 581, 578, 582, 584, 587, 589, 591, 593, 596, 597, 598, 599, 600, 601, 602, 605, 608, 609, 611, 613, 614, 615, 616, 617, 618, 627, 630, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 677, 678, 679, 681, 682, 683, 684, 685, 686, 687, 689, 690, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 278, 729, 732)</p> <p>These documents report the effort to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities. As part of this effort, evaluations of the available information for all 177 tanks were performed, and a best-basis inventory for each tank was established. This work follows the methodology that was established by the standard inventory task identified in B.2-2 above.</p>	
Inter-related documents (successors and predecessors)	
<p>To be developed.</p>	

Assigned Document Number	Maintained Current?
B.4	Yes
Document Name	
HNF-SD-WM-SP-012, <i>Tank Waste Remediation System Operation and Utilization Plan</i> (Kirkbride et al. 1997) Readiness To Proceed Document # 9	
Responsible Organization	
LMHC, Process Development Authors: R.A. Kirkbride, G.K. Allen, P.J. Certa, A.F. Manuel, R.M. Orme, L.W. Shelton, E.J. Slaathaug, R.S. Wittman, Numatec Hanford Corporation, Richland, Washington, G.T. MacLean, D.L. Penwell, SGN Eurisys Services Corporation, Richland Washington	
Status of Preparation/Revision	
Revision 0, Volumes I and II, was released September 15, 1997. The document is to be revised initially on an annual basis.	
Source Information Designation	
The operating scenario and plans for the delivery of feed to the private contractors, retrieval of waste from single and double-shell tanks, and the overall process flowsheets. The TWRS OUP is the source of the waste feed delivery system process.	
Brief Summary of Content	
The Tank Waste Remediation System Operation and Utilization Plan establishes the operating scenario and plans for the delivery of feed to two private contractors, retrieval of waste from single-shell tanks, and the overall process flowsheets for Phases 1 and 2 of the privatization of the Tank Waste Remediation System. This document consolidates previous versions of the low-activity waste and high-level waste staging plans, the Tank Waste Remediation System Process Flowsheets, and the single-shell tank retrieval sequence. The existing plans and flowsheets are updated with the most recent inventory and sludge washing data and are integrated with the waste transfers projected by the Operational Waste Volume Projection.	
Inter-related documents (successors and predecessors)	
To be developed.	

Assigned Document Number B.5	Maintained Current? Yes
Document Name Waste Feed Delivery Technical Basis	
Responsible Organization LMHC, Tank Waste Retrieval Author: I.G. Papp	
Status of Preparation/Revision A task has been identified to develop this information and prepare the document. Work on the first three tanks to be retrieved is scheduled to be done in 1998.	
Source Information Designation Definition and description of the detailed flowsheets, system design concept, and operations and maintenance concept for the waste feed delivery system.	
Brief Summary of Content Definition and description of physical feed delivery system	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.6	Maintained Current? Yes
Document Name HNF-SD-WM-TRD-007, <i>System Specification for the Double-Shell Tank System</i> (Grenard and Claghorn 1997)	
Responsible Organization LMHC, Tank Waste Retrieval Authors: C. E. Grenard, SGN Eurisys Services Corporation, Richland, Washington, R. D. Claghorn, Numatec Hanford Corporation, Richland Washington	
Status of Preparation/Revision Draft Revision B, will become Revision 0 when released.	
Source Information Designation High-level definition of the specifications for equipment to be used in the double-shell tank system.	
Brief Summary of Content The specification document establishes the functional, performance, design, development, interface, and test requirements for the double-shell tank (DST) system segment of the Tank Waste Remediation System.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.7	Maintained Current? Yes
Document Name Phase 1 Waste Feed Delivery Process Requirements	
Responsible Organization LMHC, Tank Waste Retrieval Author: R. D. Claghorn	
Status of Preparation/Revision Work is under way per FY 1998 task plans	
Source Information Designation Overall process design criteria for new and modified equipment supporting the waste feed delivery system.	
Brief Summary of Content Overall process design criteria for new and modified equipment supporting the waste feed delivery system.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.8	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-314	
Responsible Organization LMHC, Project Development Project Engineer: K. A. Boes Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-314 Project, Tank Farm Restoration and Safe Operations.	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> 1. Functional Design Criteria WHC-SD-W314-DRD-001, <i>Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations</i> (Boes 1996b) 2. Conceptual Design Report WHC-SD-W314-CDR-001, Rev. 1, <i>Conceptual Design Report for Tank Farm Restoration and Safe Operations, Project W-314</i> (Boes 1996a) 3. Alternate Design Study HNF-SD-W314-AGA-007, <i>Alternative Generation and Analysis Report Tank Farm Monitoring and Master Pump Shutdown, Tank Farm Restoration and Safe Operation, W-314</i> (Jacobson 1997) 4. Final Design Report TBD 	

5. Acceptance Test Plan

HNF-SD-W314-TEP-001, *Test and Evaluation Plan* (Hays 1997b)

HNF-1733, *Project W-314 Specific Test and Evaluation Plan 241-AN-A Valve Pit* (Hays 1997a)

HNF-XXXX thru HNF-XXXX TBD (16 more STEPs are scheduled for release)

6. Operational Test Plan

HNF-SD-W314-TEP-001, *Test and Evaluation Plan*

HNF-1733, *Project W-314 Specific Test and Evaluation Plan 241-AN-A Valve Pit* (Hays 1997a)

HNF-XXXX thru HNF-XXXX TBD (16 more STEPs are scheduled for release)

7. Operational Readiness Review/Acceptance Beneficial Use

HFN-SD-W314-ABU-001, *Project W-314 Master Pump Shutdown Upgrade Acceptance for Beneficial Use* (Warnick 1997i)

HFN-SD-W314-ABU-002, *Project W-314 241-AN-A Valve Pit Upgrade Acceptance for Beneficial Use* (Warnick 1997a)

HFN-SD-W314-ABU-003, *Project W-314 AN-B Valve Pit Upgrade Acceptance for Beneficial Use* (Warnick 1997b)

HFN-SD-W314-ABU-004, *Project W-314 SN-630 Transfer Line AZ-02A to AN-B Acceptance for Beneficial Use* (Warnick 1997c)

HFN-SD-W314-ABU-005, *Project W-314 AX-B Valve Pit Upgrade Acceptance for Beneficial Use* (Warnick 1997d)

HFN-SD-W314-ABU-006, *Project W-314 SN-632 Transfer Line AX-B to AZ-02A Acceptance for Beneficial Use* (Warnick 1997e)

HFN-SD-W314-ABU-007, *Project W-314 AZ-02A Pump Pit Upgrade Acceptance for Beneficial Use* (Warnick 1997f)

HFN-SD-W314-ABU-008, *Project W-314 SN-634 Transfer Line A-B to AX-B Acceptance for Beneficial Use* (Warnick 1997g)

HFN-SD-W314-ABU-009, *Project W-314 AB Valve Pit Upgrade Acceptance for Beneficial Use* (Warnick 1997h)

8. Calculation/Analysis

TBD

9. Supporting Documents

TBD

10. Authorization Basis Changes

HNF-SD-WM-BIO-001 (FDH 1997a) and HNF-SD-WM-TSR-006 (Noorani 1997), the project upgrades are being performed under the existing AB via use of the USQ process

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

HNF-SD-WM-SEL-040 (Jensen 1997), Project will amend the existing SEL

18. Construction Specifications

TBD

19. Fabrications Specifications

TBD

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number	Maintained Current?
B.9	Yes
Document Name	
Technical Baseline Documents for Project W-211	
Responsible Organization	
LMHC, Project Development Project Engineer: C. A. Rieck Project Manager: TBD	
Status of Preparation/Revision	
Various	
Source Information Designation	
Technical Baseline documents related to the W-211 Project, Initial Tank Retrieval System.	
Brief Summary of Content	
<p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> 1. Functional Design Criteria HNF-SD-W211-FDC-001, Rev. 3A, <i>Functional Design Criteria, Project W-211, Initial Tank Retrieval Systems</i> (Rieck 1997c) 2. Conceptual Design Report WHC-SD-W211-CDR-001, Rev. 0, <i>Conceptual Design Report, Initial Tank Retrieval Systems for Project W-211</i> (Rieck 1994) 3. Alternate Design Study TBD 4. Final Design Review Report TBD W-211 is a phased project. Each phase will release a design report as completed. 5. Acceptance Test Plan TBD 	

6. Operational Test Plan

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

TBD Analysis is needed for each phase and the reports are to be issued as needed

9. Supporting Documents

TBD Documents will be released as needed for each phase

10. Authorization Basis Changes

HNF-SD-W211-PSAD-001, *Safety Assessment for Initial Tank Retrieval System - Project W-211* (draft in Tier III review)

HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation* (FDH 1997a)

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

Constructability is checked during drawing/design review.

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD The drawings will be listed in the final design report.

17. Safety Equipment List

TBD

18. Construction Specifications

TBD new specifications are needed for each phase of W-211 and will be issued as appropriate.

19. Fabrication Specifications

W211-AP24-P002, *Mobile Water Heater/Boiler Package* (Rieck 1997d)

W211-AP24-P003, *Controlled Volume Metering Pump* (Rieck 1997a)

W211-AP24-P004, *Steel Storage Tanks* (Rieck 1997e)

W211-AP24-P005, *Diluent/Flush Pump* (Rieck 1997b)

W211-P001, *Procurement Specification, Slurry Transfer Pump* (Rieck and McKinney 1997)

W211-P003, Rev. 0, *Retrieval Control System Enclosures* (Rieck and McKinney 1996a)

W211-P005, Rev. 0, *Waste Mobilization Mixer Pump* (Rieck and McKinney 1996b)

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number B.10	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-454	
Responsible Organization LMHC, Facility Construction Project Engineer: R. W. Mattichak Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-454 Project, AW Jumper Manifold Upgrade.	
Brief Summary of Content The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures. 1. Functional Design Criteria WHC-SD-W454-FDC-001, <i>Functional Design Criteria for AW Jumper Manifold Upgrade 241-AW Tank Farm Project W-454</i> (Mattichak 1996b) 2. Conceptual Design Report WHC-SD-W454-CDR-001, <i>Conceptual Design Letter Report for Project W-454, AW Jumper Manifold Upgrade</i> (Mattichak 1996a) 3. Alternative Design Study TBD 4. Final Design Review Report TBD 5. Acceptance Test Plan TBD	

6. Operational Test Plan

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

TBD

9. Supporting Documents

TBD

10. Authorization Basis Changes

TBD

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

TBD

18. Construction Specifications

TBD

19. Fabrication Specifications

TBD

Inter-related documents (successors and predecessors)

To be determined.

Assigned Document Number B.11	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-058	
Responsible Organization LMHC, TWRS Projects and Design Project Engineer: TBD Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-058 Project, Cross Site Transfer Line.	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> 1. Functional Design Criteria <i>WHC-SD-W058-FDC-001, Functional Design Criteria for Project W-058, Replacement of the Cross-Site Transfer System (Brantley 1996)</i> 2. Conceptual Design Report <i>WHC-SD-W058-CDR-001, Conceptual Design Report Replacement of the Cross-Site Transfer (Reep 1992)</i> 3. Alternate Design Study Not Applicable 4. Final Design Review Report Not Applicable 5. Acceptance Test Plan <i>HNF-SD-W058-SUP-002, Project W-058 Startup Test Plan (Howell 1997)</i> 	

6. Operational Test Plan

HNF-SD-W058-SUP-002, *Project W-058 Startup Test Plan* (Howell 1997)

7. Operational Readiness Review/Acceptance Beneficial Use

HNF-SD-W058-ABU-002, *Acceptance for Beneficial Use, Project W-058* (Parsons 1997)

8. Calculation/Analysis

Drawing # H-2-822200 *Drawing List*, Rev. 2, Sht. 2, for list of Calculations for Civil/Structural, Architectural, Mechanical, Instrumentation, and Electrical

9. Supporting Documents

TBD

10. Authorization Basis Changes

WHC-SD-W058-PSAR-001, *Replacement of the Cross-Site Transfer System Preliminary Safety Analysis Report* (Kidder 1996)

HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation* (FDH 1997a)

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

Constructability was checked per Drawing Review/Approval Traveler

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

Draft has been issued as: W-058 System Design Description, Final release: TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

TBD

18. Construction Specifications

W058-C001, *Technical Requirements Buried Pipeline for Replacement of the Cross Site Transfer Construction Specification*

W058-C002, *Construction Specification for Pipeline Tie-Ins for Replacement of the Cross Site Transfer System*

W058-C003, *Diversion Box/Vent Station*

W058-C004, *Sagebrush Mitigation 600 Area*

W058-C005, *C5 Flushing System Construction Specification*

19. Fabrication Specifications

W058-P001, *Procurement Specification Slurry Transfer Pump*

W058-P002, *Procurement Specification Process Monitor and Control System*

W058-P005, *Process Instruments*

W058-P006, *Horizontal End Suction Centrifugal Pump*

W058-P008, *Compressed Air System*

W058-P009, *Air Operated Ball Valves*

W058-P010, *Procurement Specification Rupture Disk/Relief Valve*

W058-P011, *Electric Circulation Heating System*

W058-P012, *Chemical Feed System*

W058-P013, *Calibration and Testing Laboratory Services Construction Specification for Tank AP-104 Upgrade*

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number B.12	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-030	
Responsible Organization LMHC Project Engineer: K. A. Colosi Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-030 Project, Aging Waste Vent System.	
Brief Summary of Content The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures. 1. Functional Design Criteria HNF-SD-600-FDC-001, <i>Functional Design Criteria for the Tank Farm Ventilation Upgrade, Project W-030</i> (Keller 1997) 2. Conceptual Design Report WHC-SD-W030-CDR-001, Rev. 0, <i>Conceptual Design Report for Project W-030, Tank Farm Ventilation Upgrade</i> (Nordquist 1989) 3. Alternate Design Study TBD 4. Final Design Review Report SD-W030-DRR-005	

5. Acceptance Test Plan

WHC-SD-W030-ATP-001, *Acceptance Test Procedure for Cathodic Protection, Rectifier 31* (Clifton 1995b)

WHC-SD-W030-ATP-002, *Acceptance Test Procedure for Cathodic Protection, Rectifier 41* (Clifton 1995c)

WHC-SD-W030-ATP-003, *Acceptance Test Procedure for Cathodic Protection, Rectifier 11* (Clifton 1995a)

WHC-SD-W030-ATP-004, *Acceptance Test Procedure - Tank Farm and Miscellaneous Instrumentation* (Clifton 1996a)

WHC-SD-W030-ATP-006, *Acceptance Test Procedure - Tank Farm Ventilation Upgrade W030: Primary Vent Filter Train* (Clifton 1996b)

WHC-SD-W030-ATP-007, *Acceptance Test Procedure Backup Power System* (Colosi 1995)

WHC-SD-W030-ATP-0011, *Acceptance Test Procedure for W030 Monitor and Control System Software* (Hill 1995)

6. Operational Test Plan

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

See Project/Calculation Master Index (Jim Collins)

9. Supporting Documents

TBD

10. PSAR and Authorization Basis

HNF-SD-WM-BIO-001 (FDH 1997a), Addendum 3

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

H-2-131000, *Drawing List*

14. System Design Description

TBD

15. Spare Parts List

HNF-1759, *Spare Parts List W-030 Tank Farm Ventilation Upgrade* (Castleberry 1997)

16. Control Drawings

H-2-131000, *Drawing List*

17. Safety Equipment List

ECN 642900, HNF-SD-WM-SEL-040 (Jensen 1997)

18. Construction Specifications

W030-C001, *Divisions 2 through 16 of Construction Specification-Site Preparation for Tank Farm Ventilation Upgrade*

W030-C002, *Construction Specification Tank Farm Ventilation Upgrade*

W030-C003, *Construction Specification for Tank Farm Ventilation Upgrade*

19. Fabrication Specifications

TBD

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number B.13	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-320	
Responsible Organization LMHC, Process Design Project Engineer: J. W. Bailey Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-320 Project, Tank C-106 Retrieval.	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> 1. Functional Design Criteria HNF-SD-W320-FDC-001, <i>Functional Design Criteria for Tank 241-C-106 Waste Retrieval, Project W-320</i> (Bailey 1997) 2. Conceptual Design Report WHC-SD-WM-ES-234 3. Alternate Design Study Not Applicable 4. Final Design Report Not Applicable 	

5. Acceptance Test Plan

WHC-SD-W320-TP001, *Project W-320 Tank 241-C-106 Waste Retrieval Sluicing System Testing Plan* (Bellomy 1995)

6. Operational Test Plan

WHC-SD-W320-TP001, *Project W-320 Tank 241-C-106 Waste Retrieval Sluicing System Testing Plan* (Bellomy 1995)

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

A listing of calculations for Civil/Structural, Architectural, Mechanical, Instrumentation, and Electrical are provided on a living informal draft master index, *W-320 Calculations, Master Index*. Contact Joseph M. Jones or Danny L. Evans for hard copy of current listing is required.

9. Supporting Documents

TBD

10. PSAR Authorization Basis

Project W-320, Tank 21-C-106 Sluicing; HNF-SD-WM-BIO-001, Addendum 1, *Tank Waste Remediation System Basis for Interim Operation* (FDH 1997a)

11. Reliability, Availability, Maintainability (RAM) Analysis

HNF-SD-W320-ER-005, *Severe Environmental Qualifications and Life Expectancy of Immersible Pump System* (Bevins 1997)

12. Constructability, Operability, and Implementability Analysis

Constructability was checked per drawing review/approval traveler

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

Drafts have been issued on form of HNF-SD-WM-PCP-013, *Waste Retrieval Sluicing System Process Control Plan* and HNF-SD-WM-DBD-001, *Project W-320 Design Basis Document*

15. Spare Parts List

TBD

16. Control Drawings

H-2-818423, *Project W-320 Drawing Index*

17. Safety Equipment List

HNF-1559, TBD

18. Construction Specifications

W320-C001, *Construction Specification-Tank 241-C-106 Sluicing Package
I-Sitework/Interfarm Piping System*

W320-C002, *Construction Specification Equipment Removal System*

W320-C005, *Construction Specification Tank 241-C-106 Sluicing Package for C-Tank Farm*

W320-C006, *Tank 241-C-106 Sluicing Package 5 - Process Building Skid Fabrication*

W320-C007, *Construction Specification Tank 241-C-106 Sluicing Package 3 - AY Tank Farm*

19. Fabrication Specifications

W320-P001, *Exhaust Skid Ventilation Air Cleanup Trains*

W320-P002, *Procurement Specification Liquid Chiller Skid Mounted*

W320-P003, *Procurement Specification Filter High Efficiency Metal*

W320-P004, *Procurement Specification Heat Exchanger*

W320-P005, *High Efficiency Mist Eliminator*

W320-P006, *Procurement Specification Fan Recirculation Cooling*

W320-P007, *Electric Heating Coil*

W320-P008, *Procurement Specification Moisture Separator*

W320-P0017, *Tank 241-C-106 Sluicing*

W320-P0018, *Pump, Centrifugal*

W320-P0020, *Procurement Specification Sluicer, Hydraulic Drive and Controls
Tank 241-C-106*

W320-P0022, *Air Compressor*

W320-P0023, *Air Drier* W320-P0024, *Procurement Specification Winch, Slurry/Sluice Pump*

W320-P0032, *Procurement Specification Distribution Power Panels*

W320-P0033, *Electrical Equipment Skid AY-Farm*

W320-P0034, *Electrical Equipment Skid C-Farm*

W320-P0035, *Procurement Specification Seismic Shutdown System* W320-P0036,

Procurement Specification Enclosure Environmental Control

W320-P0041, *Isokinetic Air Sampling System*

W320-P0044, *Seismic Detectors*

W320-P0045, *Seismic Skids*

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number B.14	Maintained Current? Yes
Document Name Technical Baseline Documents for Project W-151	
Responsible Organization LMHC, Process Design Project Engineer: E. M. Nordquist Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-151 Project, AZ-101 Mixer Pumps	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> 1. Functional Design Criteria HNF-SD-W151-FDC-001, Rev. 4, <i>Tank 101-AZ Waste Retrieval System Functional Design Criteria</i> (Nordquist 1997d) 2. Conceptual Design Report WHC-SD-W151-CDR-001, <i>Tank 101-AZ Waste Retrieval System Project W-151</i> (Lambert 1990) 3. Alternate Design Study None 4. Final Design Review Report HNF-SD-W151-DRR-002, Rev. 0, <i>Formal Design Review Report Project W-151 Mixer Pump Procurement</i> (Crass 1997) 5. Acceptance Test Plan WHC-SD-W151-TS-001, <i>Mixer Pump Test Specification Project W-151</i> (Nordquist 1995) 	

6. Operational Test Plan

WHC-SD-PTP-027, Rev. 1

7. Operational Readiness Review/Acceptance Beneficial Use

HNF-SD-WM-ABU-023, *Document Required for Acceptance for Beneficial Use of Project W-151, Tank 101-AZ Waste Retrieval System* (Nordquist 1997a)

8. Calculation/Analysis

WHC-SD-W151-DA-003, *Stress Analysis of 4- to 6-Inch and 42-Inch Flexible Receiver* (Ziada 1994)

WHC-SD-W151-DA-004, *W-151 Mixer Pump Energy Absorption Cylinder Analysis* (Ziada 1996)

WHC-SD-W151-DA-005, *241-AZ-101 Mixer Pump Support Assembly Extension Riser, and Spray Wash System Design Verification* (Moody 1996)

WHC-SD-W151-DA-006, *W-151 Steam Coil Fatigue Analysis for Mixer Pump Jetload* (Crass 1996a)

WHC-SD-W151-DA-007, *W-151 Transfer Pump Stress Analysis for Mixer Pump Jet Loads* (Crass 1996b)

HNF-SD-W151-DA-008, *Evaluation of the Effect of Project W-151 Mixer Pump Jets on In-Tank Equipment Considering Potential Sludge Buildup on Equipment in Waste Tank 241-AZ-101* (Juryk 1997)

Additional documentation to be determined.

9. Supporting Documents

WHC-SD-WM-ES-195, *Mixer Pump Study for Project W-151* (Shaw 1992)

HNF-SD-W151-FVP-001, *Project W-151 Project Field Verification Documentation* (Nordquist 1997c)

HNF-SD-W151-TRP-003, *Project W-151 Checkout - Testing Report* (Nordquist 1997b)

10. PSAR and Authorization Basis

WHC-SD-151-PSAR-001, *Preliminary Safety Analysis for Project W151 Tank 241-AZ-101 Waste Retrieval Systems* (Sabin 1993)

WHC-SD-WM-SARR-042, *Safety Analysis for Tank 241-AZ-101 Mixer Pump Process Test* (Milliken 1996)

HNF-SD-SM-BIO-01, Rev. 0-D, Addendum 4 (FDH 1997a)

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

H-2-78870, *TWRS Top Drawing Index* (CVI)

14. System Design Description

WHC-SD-W151-SDRD-001, *Project W-151 Supplemental Design Requirements* (Kohlman 1993)

15. Spare Parts List

HNF-SD-WM-ABU-023, *Document Required for Acceptance for Beneficial Use of Project W-151, Tank 101-AZ Waste Retrieval System* (Nordquist 1997a)

16. Control Drawings

See Drawing Index Drawings

H-2-78870, *TWRS Top Drawing Index*; H-2-79335, *TWRS - Drawing Index 4-6" Tank 101-AZ Waste Retrieval System*; H-2-79207, *TWRS Drawing Index Tank AZ-101 Drywell/Profile Thermocouple*; H-2-80936, *Area Map Drawing List*

17. Safety Equipment List

TBD

18. Construction Specifications

W151-C001, *Construction Specification 101-AZ Waste Retrieval System Cold Test Facility*

W151-C002, *Construction Specification Tank 101-AZ Waste Retrieval Systems*

W151-C003, *Construction Specification Tank 101-AZ Waste Retrieval Systems*

19. Fabrication Specifications

WHC-S-0037, *High Pressure Hot Waste System Project W151 Tank 101-AZ Waste Retrieval System*

WHC-S-0040, *Waste Mobilization Mixer Pump Project W151 Tank AZ-101 Waste Retrieval System*

WHC-S-0099, *Waste Tank Riser - Drywell Mapping Positioner*

WHC-S-0410, *Procurement Specification for the 241-AZ-101, W-151 Suspended Fixture and Weld Specification Camera System*

V-W151-0002, *101-AZ Mixer Pump Variable Speed Drive*

V-W151-0003, *Modifications for Grove Crane at 1100*

V-W151-0004, *101-AZ Sludge Mobilization Monitor Cable and Cable Reel*

Inter-related documents (successors and predecessors)

To be determined.

Assigned Document Number B.15	Maintained Current? No
Document Name <i>Reliability, Availability, and Maintainability (RAM) Risk Evaluation</i> , Number Not Yet Available	
Responsible Organization LMHC, Process Development	
Status of Preparation/Revision Task has been assigned and will be completed in 1998	
Source Information Designation Reliability, availability, and maintainability risk evaluation report	
Brief Summary of Content Initially, this RAM Evaluation will cover feed delivery only.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.16	Maintained Current? No
Document Name DOE/RL 90-39, <i>Double-Shell Tank System Dangerous Waste Permit Application</i> (RL 1991b)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Part A completed.	
Source Information Designation RCRA Part A Permit for the tank farms as a hazardous waste treatment storage and/or disposal facility.	
Brief Summary of Content Defines the acceptable waste codes, total volumes, and process volumes allowed for the DSTs.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.17	Maintained Current? No
Document Name DOE/RL-95-104, <i>Radioactive Air Emissions Notice of Construction Project W-211, Initial Tank Retrieval Systems</i> (RL 1995)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Document has been released and is approved by the Washington State Department of Health.	
Source Information Designation W-211 Project Air Permit with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document serves as a notice of construction (NOC), pursuant to the requirements of <i>Washington Administrative Code</i> (WAC) 246-247-060, and as a request for approval to construct pursuant to 40 <i>Code of Federal Regulations</i> (CFR) 61.96 for the installation and operation of two mixer pumps in the SY-102 DST. This documentation also is intended to provide adequate descriptions of the mixer pumps, installations, and mixing/retrieving operations for the remaining nine DSTs to preclude resubmittal of this information for each tank. Because of the extended schedule of pump installations and the unknowns concerning the contents of the tanks until installations, emissions estimates will be provided in the future for the remaining tanks to complete the approval process for those tanks. Approval for the transfer of the waste to another DST is not being requested as this is a routine activity performed to manage the waste within tank farms, for which approval was granted in April 1993.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.18	Maintained Current? No
Document Name 9761603, <i>Radioactive Air Emissions Notice of Construction (NOC) Project W-314, Tank Farm Restoration and Safe Operations</i> (RL 1997c)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Delivered to Washington State Department of Health and U.S. Environmental Protection Agency, December 1997. Awaiting approval.	
Source Information Designation W-314 Project Air Permit with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document serves as a notice of construction (NOC), pursuant to the requirements of <i>Washington Administrative Code</i> (WAC) 246-247-060, and as a request for approval to construct pursuant to 40 <i>Code of Federal Regulations</i> (CFR) 61.96 for the activities associated with Project W-314, Tank Farm Restoration and Safe Operation.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.19	Maintained Current? No
Document Name 9400852, <i>Notice of Construction Application Pursuant to Washington Administrative Code 246-247 for Ventilation Upgrades, 241-AY and 241-AZ Tank Farms</i> (Bauer 1994a)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Awaiting approval.	
Source Information Designation Air Permit for 241-AY and 241-AZ Ventilation Upgrade Project (includes Projects W-151 and W-030) with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document is a notice of construction (NOC) for Ventilation Upgrades, 241-AY and 241-AZ Tank Farms. This NOC was submitted pursuant to <i>Washington Administrative Code</i> (WAC) 246-247, "Radiation Protection--Air Emissions." The NOC includes two projects: Project W-151 and Project W-030.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.20	Maintained Current? No
Document Name 9400853, <i>Notice of Construction Application Pursuant to Washington Administrative Code 173-460 for Ventilation Upgrades, 241-AY and 241-AZ Tank Farms</i> (Bauer 1994b)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Submitted and approved by Washington State Department of Ecology	
Source Information Designation Toxic Air Permit for 241-AY and 241-AZ tank farms ventilation upgrades with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document is a notice of construction (NOC) for Ventilation Upgrades, 241-AY and 241-AZ Tank Farms. This NOC was submitted pursuant to <i>Washington Administrative Code</i> (WAC) 173-460, "Controls for New Sources of Toxic Air Pollutants," as revised effective February 14, 1994. The NOC includes two projects: Project W-151 and Project W-030.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.21	Maintained Current? No
Document Name DOE/RL 95-62, <i>Nonradioactive Air Emissions Notice of Construction Project W-320, 241-C-106 Tank Sluicing</i> (RL 1996d)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Revision 1 has been submitted and approved.	
Source Information Designation Toxic Air Permit for Project W-320, 241-C-106 tank sluicing with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document serves as a notice of construction for the Phase II activities of Project W-320, C-106 Tank Sluicing, pursuant to the requirements of <i>Washington Administrative Code</i> (WAC) 173-400, "General Regulations for Air Pollution Sources," and 173-460. Phased permitting for Project W-320 was discussed with the Washington State Department of Ecology (Ecology) on November 2, 1993. In April 1994, it was deemed unnecessary because the Phase I activities did not constitute a new source of emissions and therefore did not require approval from Ecology.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.22	Maintained Current? No
Document Name DOE/RL 95-45, <i>Radioactive Air Emissions Notice of Construction Project W-320, Tank 241-C-106 Sluicing</i> (RL 1996f)	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision Revision 1 has been submitted and approved.	
Source Information Designation Radioactive emissions Air Permit for Project W-320, 241-C-106 Tank Sluicing with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This document serves as a notice of construction (NOC) for the activities of Project W-320, pursuant to the requirements of <i>Washington Administrative Code</i> (WAC) 246-247-060.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.23	Maintained Current? No
Document Name <i>9752387, 80232764-9-K001-Additional Information to Support Modification of Permit Notice of Construction 94-07 Emissions Limit and Use of Environmental Protection Agency Reference Methods for Measurement (Mayer 1997)</i>	
Responsible Organization LMHC, Environmental Permits/Policy	
Status of Preparation/Revision This letter associated with Project W-030 has been delivered; permit modification is pending.	
Source Information Designation 94-07 Permit modification with the U.S. Environmental Protection Agency, Washington State Department of Health, and Washington State Department of Ecology.	
Brief Summary of Content This letter provides additional information to support modification of Permit Notice of Construction 94-07, on the impracticality of using the Environmental Protection Agency Method 206 for ammonia measurement.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.24	Maintained Current? Yes
Document Name HNF-SD-BIO-001, <i>Tank Waste Remediation System Basis for Interim Operation</i> (FDH 1997a)	
Responsible Organization LMHC, DESH, TWRS Operations, Engineering and Nuclear Safety	
Status of Preparation/Revision Approved by J. Wagoner, September 1997. Implemented September 29, 1997.	
Source Information Designation Safety Authorization Basis for operation of the tank farms	
Brief Summary of Content <p>The Basis for Interim Operation (BIO) provides a cohesive, integrated, and systematic interim safety basis. The BIO documents the basis for the conclusion that the authorized Tank Waste Remediation System facility operations can be conducted safely until approval of the Final Safety Analysis Report and associated Technical Safety Requirement document complying with the requirements of DOE 5480.23, <i>Nuclear Safety Analysis Reports</i>, and DOE 5480.22, <i>Technical Safety Requirements</i>.</p> <p>Implementation of the controls established by this Basis for Interim Operation enhances the safe operation of Tank Waste Remediation System facilities. It also provides a sound basis for conducting effective Unreviewed Safety Question evaluations to ensure continued safe operations.</p>	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.25	Maintained Current? Yes
Document Name HNF-SD-WM-TSR-006, <i>Tank Waste Remediation System Technical Safety Requirements</i> (Noorani 1997)	
Responsible Organization DESH, Operations and Project Safety support	
Status of Preparation/Revision Revision 0-D released October 1997	
Source Information Designation Technical Safety Requirements	
Brief Summary of Content The Tank Waste Remediation System (TWRS) Technical Safety Requirements (TSR) for the facilities within the scope of the TWRS Basis for Interim Operation (BIO) defines acceptable conditions, safe boundaries, basis thereof, and management or administrative controls required to ensure safe operation during waste storage, transfer, and characterization. The TSRs are based on the preventive and mitigative features determined to be essential in the BIO.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number B.26	Maintained Current? Yes
Document Name HNF-SD-WM-SEL-040, <i>TWRS Facility Safety Equipment List</i> (Jensen 1997)	
Responsible Organization LMHC, Equipment Engineering	
Status of Preparation/Revision Revision 0, released August 1997, will need to be revised again prior to start of Feed Delivery System operations.	
Source Information Designation Facility safety equipment	
Brief Summary of Content The safety classification in this document supports the TWRS Facility Basis for Interim Operation (BIO). The barriers and administrative controls in the BIO to prevent or mitigate the accidents analyzed are the basis for the selection of the safety classification described. This document provides the TWRS Project facility with the information requirements to support the occurrence reporting activities for operations and establishes the operating and maintenance systems, structures, and components important to safety.	
Inter-related documents (successors and predecessors) To be developed.	

APPENDIX C
INFRASTRUCTURE SUPPORT DOCUMENTS

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Assigned Document Number C.1	Maintained Current? No
Document Name WHC-SD-WM-TI-750, <i>Alternative Generation and Analysis for Phase 1 Privatization Transfer System Needs</i> (Galbraith 1996)	
Responsible Organization LMHC, Waste Feed Delivery	
Status of Preparation/Revision Completed September, 1996	
Source Information Designation Piping system upgrades for AN, AW, and AP farms.	
Brief Summary of Content <p>This decision document provides input for Phase 1 Privatization waste staging plans for the HLW and LLW Disposal Programs. This Alternative Generation and Analysis (AGA) report evaluates what infrastructure upgrades to existing 200 East waste transfer systems are necessary for delivery of HLW and LLW streams to the Phase 1 private contractor. The AGA identifies the transfer routing alternatives for supernatant waste transfers from the AN, AW, and AP Tank Farms to the AP-102 or AP-104 tanks. In addition, this report addresses the transfer of slurry waste from the AY and AZ Tank Farms to the Phase 1 private contractor's facilities for HLW immobilization.</p>	
Inter-related documents (successors and predecessors) To be developed	

Assigned Document Number C.2	Maintained Current? No
Document Name HNF-SD-WM-TI-800, <i>Decision Document: Phase I Intermediate Waste Feed Staging System Design Requirements</i> (Galbraith and Daling 1997)	
Responsible Organization LMHC, Waste Feed Delivery Authors: JD Galbraith and PM Daling (PNNL)	
Status of Preparation/Revision Issued in October, 1997	
Source Information Designation Intermediate feed staging	
Brief Summary of Content In FY 1996, a TWRS Project Decision Board was convened to select a strategy for preparing feed to transfer to the LAW private contractors. The Decision Board selected a strategy referred to as "Intermediate Feed Staging." In this strategy, the Hanford Site Management and Integration contractor would transfer LLW feed to an intermediate feed staging tank where it would be sampled to validate that the material is within the private contractor's feed specification. Once this is validated, the feed material would be transferred to the private contractors' feed tanks. This document provides design requirements for modification to tanks AP-102 and AP-104.	
Inter-related documents (successors and predecessors) To be developed	

Assigned Document Number C.3	Maintained Current? Yes
Document Name Various	
Responsible Organization LMHC Project Engineers: RJ Parazin and G. Singh	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-519 Project, TWRS Privatization Phase 1 Infrastructure Support	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <p>1. Functional Design Criteria</p> <p>HNF-SD-W519-CDR-001, <i>Summary Conceptual Design Report, TWRS Privatization Phase 1 Infrastructure Support, Project W-519</i> (Singh 1997d)</p> <p>WHC-SD-WM-DRD-014, <i>TWRS Phase 1 Privatization Liquid Effluent Transfer and Roads Design Requirements Document</i> (Parazin 1996b)</p> <p>WHC-SD-WM-DRD-015, <i>Phase 1 Privatization Raw and Potable Water Design Requirements Document</i> (Parazin 1996a)</p> <p>HNF-SD-WM-DRD-013, <i>TWRS Privatization Phase 1 Site Development Design Requirements Document</i> (Shord 1997)</p> <p>WHC-SD-WM-DRD-011, <i>Design Requirements Document, Design Requirements for the Phase 1 Privatization Facility Electrical Power</i> (Singh 1996)</p>	

2. Conceptual Design Report

HNF-SD-W503-CDR-001, *TWRS Privatization Phase 1, Electrical Power System* (Singh 1997e)

HNF-SD-W504-CDR-001, *Conceptual Design Report TWRS Privatization Phase 1 Raw and Potable Water, Subproject W-504* (Singh 1997b)

HNF-SD-W505-CDR-001, *Conceptual Design Report TWRS Privatization Phase 1 Site Development and Roads Subproject W-505* (Singh 1997c)

HNF-SD-W506-CDR-001, *Conceptual Design Report TWRS Privatization Phase 1 Liquid Effluent Transfer Systems Subproject W-506* (Singh 1997a)

3. Alternative Design Study

TBD

4. Final Design Review Report

TBD

5. Acceptance Test Plan

TBD

6. Operational Test Plan reports

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

TBD

9. Supporting Documents

WHC-SD-TWR-DSD-001, *TWRS Privatization Phase 1, Master Site Plan* (Parazin 1996c)

HNF-SD-TWR-EV-001, *TWRS Phase 1 Privatization Site Environmental Baseline and Characterization Plan* (Shade 1997b)

10. PSAR and Authorization Basis

TBD

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implement

TBD

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

TBD

18. Construction Specifications

TBD

19. Fabrication Specifications

TBD

Inter-related documents (successors and predecessors)

To be developed

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APPENDIX D
PRIVATE CONTRACTOR
INTERFACE DOCUMENTS

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Assigned Document Number	Maintained Current:
D.1	Yes
Document Name	
HNF-SP-1208-ICD-01, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization – Raw Water</i> (FDH 1997b)	
Responsible Organization	
LMHC	
Status of Preparation/Revision	
Draft. Work is continuing on final.	
Source Information Designation	
Establishes interfaces with private contractors for the raw water delivery and use	
Brief Summary of Content	
This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to Raw Water during Phase 1 privatization activities. Included is the PHMC team responsibility to install raw water piping to the private contractor fence and the amount of raw water to be delivered.	
Inter-related documents (successors and predecessors)	
To be developed	

Assigned Document Number D.2	Maintained Current? Yes
Document Name HNF-SP-1209-ICD-02, Interface Control Document Between DOE and the PHMC Phase 1 Privatization – Potable Water (FDH 1997c)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the delivery and use of potable water	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to potable water during Phase 1 privatization activities. Included is the PHMC team responsibility to install potable water piping to the private contractor fence and the amount of potable water to be delivered.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number	Maintained Current?
D.3	Yes
Document Name	
HNF-SP-1210-ICD-03, <i>Interface Control Document Between DOE and the PHMC Radioactive Solid Wastes</i> (FDH 1997d)	
Responsible Organization	
LMHC	
Status of Preparation/Revision	
Draft. Work is continuing on final.	
Source Information Designation	
Establishes interfaces with private contractors for the handling and managing of radioactive solid waste	
Brief Summary of Content	
This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to radioactive solid waste during Phase 1 privatization activities. Included is the estimation of radioactive solid volumes and the compliance with WHC-EP-0063-04, <i>Hanford Site Solid Waste Acceptance Criteria</i> (Willis 1996).	
Inter-related documents (successors and predecessors)	
To be developed.	

Assigned Document Number	Maintained Current?
D.4	Yes
Document Name	
HNF-SP-1211-ICD-05, <i>Interface Control Document Between DOE and the PHMC Non-Radioactive, No Dangerous Liquid Effluent</i> (FDH 1997e)	
Responsible Organization	
LMHC	
Status of Preparation/Revision	
Draft. Work is continuing on final.	
Source Information Designation	
Establishes interfaces with private contractors for the handling and managing of non-radioactive, non-dangerous liquid effluents	
Brief Summary of Content	
This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to non-radioactive, non-dangerous liquid effluents during Phase 1 privatization activities. Included are the acceptance volume and flow rates from the private contractors, the installation and maintenance of a receiving pipeline and regulator permit requirements.	
Inter-related documents (successors and predecessors)	
To be developed.	

Assigned Document Number D.5	Maintained Current? Yes
Document Name HNF-SP-1212-ICD-06, <i>Interface Control Document Between DOE and the PHMC Radioactive, Dangerous Liquid Effluents</i> , (FDH 1997f)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the handling and managing of radioactive, dangerous liquid effluents.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to handling and managing of radioactive, dangerous liquid effluents during Phase 1 privatization activities. Included are the acceptance volume and flow rates from the private contractors, the installation and maintenance of a receiving pipeline and regulator permit requirements.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.6	Maintained Current? Yes
Document Name HNF-SP-1213-ICD-09, <i>Interface Control Document Between DOE and the PHMC Land for Siting Part A Privatization</i> (FDH 1997g)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for land for siting Phase 1 privatization.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to for land for siting Phase 1 privatization activities. Included is the land location and size and no-cost lease.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.7	Maintained Current? Yes
Document Name HNF-SP-1214-ICD-10, <i>Interface Control Document Between DOE and the PHMC Deactivated Facility and Site for Phase 1 Privatization</i> (FDH 1997h)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the facility deactivation and site turn-over to DOE following completion of Phase 1 privatization activities.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to facility deactivation and site turnover to DOE following completion of Phase 1 privatization activities.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.8	Maintained Current? Yes
Document Name HNF-SP-1215-ICD-11, <i>Interface Control Document Between DOE and the PHMC – Electricity</i> (FDH 1997i)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors with respect to electricity delivery to private contractor facilities during Phase 1 privatization activities.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to electricity delivery during Phase 1 privatization. Included is the defined power supply and capacity. DYN will supply the power.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.9	Maintained Current? Yes
Document Name HNF-SP-1216-ICD-12, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization Roads and Rails</i> (FDH 1997j)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for road use during Phase 1 privatization activities and establish that there will be no direct rail.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to road and rail construction and use during Phase 1 privatization activities. Included is the government/government responsibility to supply roads to the boundary and the private contractors will build and maintain roads within the boundary. No direct rail line will be provided.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.10	Maintained Current? Yes
Document Name HNF-SP-1217-ICD-13, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization Non-Routine High-Level Solid Wastes</i> (FDH 1997k)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the handling and managing of non-routine high-level solid wastes.	
Brief Summary of Content This document defines the interfaces, responsibilities, and timeframes between the DOE/PHMC team and the private contractors with respect to nonroutine high-level solid wastes during Phase 1 privatization activities. Included is acceptance criteria, permit requirements, and waste minimization requirements.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number	Maintained Current?
D.11	Yes
Document Name	
HNF-SP-1218-ICD-14, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization Immobilized High-Level Waste Product (FDH 1997I)</i>	
Responsible Organization	
LMHC	
Status of Preparation/Revision	
Draft. Work is continuing on final.	
Source Information Designation	
Establishes interfaces with private contractors for the acceptance and delivery of the immobilized high-level waste product by and to the DOE/PHMC team during Phase 1 privatization activities.	
Brief Summary of Content	
This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to the acceptance and delivery of the immobilized high-level waste product by and to the DOE/PHMC team during Phase 1 privatization activities. Included are packaging and acceptance criteria and notification requirements.	
Inter-related documents (successors and predecessors)	
To be developed.	

Assigned Document Number D.12	Maintained Current? Yes
Document Name HNF-SP-1219-ICD-15, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization – Immobilized Low-Activity Waste Product</i> (FDH 1997m)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the acceptance and delivery of the immobilized low-activity waste product by and to the DOE/PHMC team during Phase 1 privatization activities.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to immobilized low-activity waste product by and to the DOE/PHMC team during Phase 1 privatization activities. Included are packaging and acceptance criteria and notification requirements.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.13	Maintained Current? Yes
Document Name HNF-SP-1220-ICD-16, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization Strontium/Transuranic/Entrained Solids</i> (FDH 1997n)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the return of strontium/transuranic/entrained solids to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to return of strontium/transuranic/entrained solids to the DOE/PHMC team from the private contractors during Phase 1 privatization activities. Included is transfer mechanism (pipeline) information and lag storage requirements.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.14	Maintained Current? Yes
Document Name HNF-SP-1221-ICD-17, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization – Cesium-137 Intermediate Product</i> (FDH 1997o)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the return of the cesium-137 intermediate product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to return of the cesium-137 intermediate product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities. Included are shipping container criteria, transportation requirements, and lag storage capacity.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number	Maintained Current?
D.15	Yes
Document Name	
HNF-SP-1222-ICD-18, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization – ⁹⁹Technetium Secondary Product</i> (FDH 1997p)	
Responsible Organization	
LMHC	
Status of Preparation/Revision	
Draft. Work is continuing on final.	
Source Information Designation	
Establishes interfaces with private contractors for the return of the technetium-99 secondary product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities.	
Brief Summary of Content	
This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to return of the technetium-99 secondary product to the DOE/PHMC team from the private contractors during Phase 1 privatization activities. Included are product volume limitations, storing requirements, and transfer requirements.	
Inter-related documents (successors and predecessors)	
To be developed.	

Assigned Document Number D.16	Maintained Current? Yes
Document Name HNF-SP-1223-ICD-19, <i>Interface Control Document Between DOE and the PHMC Low-Activity Waste Feed</i> (FDH 1997q)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the delivery of the low-activity waste feed.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to the delivery of the low-activity waste feed to the private contractors during Phase 1 privatization activities. Included is the selection of waste envelopes and waste quantity, provide waste feed composition, and provide samples to the private contractor for testing.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.17	Maintained Current? Yes
Document Name HNF-SP-1224-ICD-20, <i>Interface Control Document Between DOE and the PHMC Phase 1 Privatization – High-Level Waste Feed</i> (FDH 1997r)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors for the delivery of the high-activity waste feed.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to the delivery of the high-level waste feed to the private contractors during Phase 1 privatization activities. Included is the transfer of HLW feed consistent with specifications, and provide samples to the private contractor for testing.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number D.18	Maintained Current? Yes
Document Name HNF-SP-1225-ICD-21, <i>Interface Control Document Between DOE and the PHMC Phase 1 Waste Feed Tank Support System Low-Activity Waste Product</i> (FDH 1997s)	
Responsible Organization LMHC	
Status of Preparation/Revision Draft. Work is continuing on final.	
Source Information Designation Establishes interfaces with private contractors with respect to the turnover of existing double-shell tanks to the private contractors for low-activity waste receipt and staging.	
Brief Summary of Content This document defines the interfaces, responsibilities, and time frames between the DOE/PHMC team and the private contractors with respect to providing two DSTs for waste feed tanks for Phase 1 privatization activities. This includes the government/government contractor providing the tanks and necessary design information and maintaining leak detection. The private contractors activities include agreeing to acceptance of the tank conditions and operating the tanks in accordance with existing OSD and other requirements.	
Inter-related documents (successors and predecessors) To be developed.	

APPENDIX E
PRODUCT STORAGE AND DISPOSAL
DOCUMENTS

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Assigned Document Number E.1	Maintained Current? No
Document Name <i>Approval of Critical Decisions for Phase 1 Immobilized High-Level and Low-Activity Waste Interim Storage and Tank Farm Restoration and Safe Operations Projects (Projects W-464, W-465, and W-314) (Alm 1996)</i>	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Identification of immobilized wastes to be stored.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.2	Maintained Current? Yes
Document Name HNF-1517, <i>Tank Waste Remediation System Retrieval and Disposal Mission Immobilized Low-Activity Waste Disposal Plan</i> (Shade 1997a)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Defines baseline program planning elements for immobilized LAW design, construction, and operation.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.3	Maintained Current? Yes
Document Name <i>HNF-1751, Tank Waste Remediation System Retrieval and Disposal Mission Immobilized High-Level Waste Storage Plan (Calmus 1997)</i>	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Defines baseline program planning elements for immobilized HLW design, construction, and operation.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.4	Maintained Current? No
Document Name <i>Revised Interim Policy on Regulatory Structure for Low-Level Radioactive Waste Management and Disposal</i> (Guimond and O'Toole 1996)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes request for Nuclear Regulatory Commission concurrence that immobilized LAW can be disposed of as "incidental waste."	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.5	Maintained Current? No
Document Name WHC-SD-W465-AGA-001, <i>Alternatives Generation and Analysis Report for Immobilized Low-Level Waste Interim Storage Architecture</i> (Burbank 1996)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes disposal options and facilities for immobilized LAW.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.6	Maintained Current? No
Document Name HNF-SD-TWR-AGA-004, <i>Analysis of Alternatives for Immobilized Low-Activity Waste Disposal</i> (Burbank and Klem 1997)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes disposal options and facilities for immobilized LAW.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.7	Maintained Current? No
Document Name WHC-SD-WM-TA-183, <i>High-Level Waste Interim Storage Architecture Selection - Decision Report</i> (Calmus 1996b)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes disposal options and facilities for immobilized HLW.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.8	Maintained Current? No
Document Name HNF-SD-WM-RPT-294, <i>Decision Document for the Final Disposition of Cesium and Strontium Capsules</i> (Claghorn 1997)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Discuss how and when Hanford will prepare cesium-137/strontium-90 capsules for disposal.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.9	Maintained Current? No
Document Name <i>97-WDD-058A, Contract Number DE-AC06-96-RL13200 - Decision Document for the Final Disposition of Cesium and Strontium Capsules, HNF-SD-WM-294, Rev. 0 (Taylor 1997)</i>	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes disposition basis for cesium-137/strontium-90 capsules.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.10	Maintained Current? Yes
Document Identification Technical Baseline Documents for Project W-464	
Responsible Organization LMHC - Immobilized Waste Program Project Engineer: TBD Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-464 Project.	
Brief Summary of Content <p>The project Technical Baseline documents are divided into 19 Categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures.</p> <ol style="list-style-type: none"> Functional Design Criteria WHC-SD-WM-DRD-012, <i>Design Requirements Document for Interim Storage Phase I Solidification of High-Level Waste</i> (Calmus 1996a) Conceptual Design Report TBD Final Design Review Report TBD Alternative Design Study TBD Acceptance Test Plan reports (projects only) TBD 	

6. Operational Test Plan

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

TBD

9. Supporting Documents

70100-96-004, *Environmental Requirements Checklist for the High-Level Waste Storage Project Canister Storage Building* (Deffenbaugh 1996)

HNF-SD-ENV- EE-003, *Permitting Plan for the Immobilized Low-Activity Waste Project* (Deffenbaugh et al. 1997)

FRF049, *Final CSB High-level Waste Supplemental Report* (Jacobs 1996b)

10. PSAR and Authorization Basis

TBD

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

TBD

18. Construction Specifications

TBD

19. Fabrication Specifications

TBD

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number E.11	Maintained Current? Yes
Document Identification Technical Baseline Documents for Project W-465	
Responsible Organization LMHC, Immobilized Waste Program Project Engineer: TBD Project Manager: TBD	
Status of Preparation/Revision Various	
Source Information Designation Technical Baseline documents related to the W-465 Project, Immobilized Low-Activity Waste Interim Storage	
Brief Summary of Content The project Technical Baseline documents are divided into 19 Categories as identified below. The categories were developed in accordance with applicable engineering plans and procedures. 1. Functional Design Criteria <i>HNF-SD-W465-DRD-001, Design Requirements Document for Project W-465, Immobilized Low-Activity Waste Interim Storage (Burbank 1997)</i> 2. Conceptual Design Report TBD 3. Alternative Design Study TBD 4. Final Design Review Report TBD 5. Acceptance Test Plan TBD	

6. Operational Test Plan

TBD

7. Operational Readiness Review/Acceptance Beneficial Use

TBD

8. Calculation/Analysis

TBD

9. Supporting Documents

TBD

10. PSAR Authorization Basis

HD-SD-W465-PSE-001, *Preliminary Safety Evaluation for Project W-465, Immobilized Low-Activity Waste Interim Storage* (Mouette 1997).

11. Reliability, Availability, Maintainability (RAM) Analysis

TBD

12. Constructability, Operability, and Implementability Analysis

TBD

13. Vendor Drawings/Instruction Manuals

TBD

14. System Design Description

TBD

15. Spare Parts List

TBD

16. Control Drawings

TBD

17. Safety Equipment List

TBD

18. Construction Specifications

TBD

19. Fabrication Specifications

TBD

Inter-related documents (successors and predecessors)

To be developed.

Assigned Document Number E.12	Maintained Current? No
Document Name <i>WHC-SD-WM-EE-004, Performance Assessment of Grouted Double-Shell Tank Waste Disposal at Hanford (Shade et al. 1994)</i>	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Discusses relationship of immobilized LAW to ongoing performance assessments and confirms that existing grout vaults are sufficient for the first four years of operation.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.13	Maintained Current? No
Document Name WHC-EP-0884, <i>Hanford Low-Level Tank Waste Interim Performance Assessment</i> (Mann et al. 1996)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision Rev. 0 completed September 1996	
Source Information Designation Examines long-term health and environmental effects associated with disposal in the Hanford Site 200 East Area of LAW from SSTs and DSTs.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.14	Maintained Current? No
Document Name HNF-SD-ENV- EE-003, <i>Permitting Plan for the Immobilized Low-Activity Waste Project</i> (Deffenbaugh et al. 1997)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.15	Maintained Current? No
Document Name Correspondence No. 70100-96-004, <i>Environmental Requirements Checklist for the High-Level Waste Storage Project Canister Storage Building</i> (Deffenbaugh 1996)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.16	Maintained Current? No
Document Name HNF-SD-ENV-EE-002, <i>Permitting Plan for the High-Level Waste Interim Storage Project</i> (Deffenbaugh 1997)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Establishes requirements, alternatives, implementation strategy, and estimated costs for environmental permits and compliance.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number E.17	Maintained Current? No
Document Name SFD: KMS/96-SFD-104, <i>Memorandum of Agreement (MOA) - Utilization of Canister Storage Building Vaults 2 and 3 for Immobilized High-Level Waste</i> (Hansen 1996)	
Responsible Organization LMHC, Immobilized Waste Program	
Status of Preparation/Revision [To be completed]	
Source Information Designation Describes the attributes of Vaults 2 and 3 of the CSB and discusses features to facilitate addition of more vaults later.	
Brief Summary of Content [To be completed]	
Inter-related documents (successors and predecessors) To be developed.	

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APPENDIX F
SECONDARY WASTE MANAGEMENT
AND ANALYTICAL
SUPPORT DOCUMENTS

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Assigned Document Number F.1	Maintained Current? Yes
Document Name HNF-SD-WM-RPT-288, <i>Waste Management Project Technical Baseline Description</i> (Sederburg 1997)	
Responsible Organization WMH, Strategic Planning Author: P. Sederburg	
Status of Preparation/Revision Rev. 0 completed. New Revision planned for 1998	
Source Information Designation Official source for information relating to WMH activities, including ETF/LERF, 242-A Evaporator, CWC, and 222-S Laboratories	
Brief Summary of Content The <i>Waste Management Project Technical Baseline Description</i> uses a systems engineering approach to establish the Project's Technical Baseline. This document views the Project as a single system and documents the elements needed to successfully manage a project of this magnitude. By defining the Project's baseline, the effects of uncertainties and internally and externally driven changes to key Project elements can be understood. In turn, effects of these changes on the mission, function, interfaces, etc. can be assessed and controlled.	
Inter-related documents (successors and predecessors) To be developed.	

Assigned Document Number F.2	Maintained Current? Yes
Document Name HNF-EP-0918, <i>Solid Waste Integrated Forecast Technical (SWIFT) Report FY 1997 to FY 2070</i> (Valero 1997)	
Responsible Organization WMH	
Status of Preparation/Revision Rev. 2, Periodically Updated	
Source Information Designation Source for solid waste generation predictions.	
Brief Summary of Content Provides Hanford Site solid waste generation estimates based upon the type of waste, generating facility, and year. This document is currently available on the Internet at HTTP://W3.pnl.gov:2080/SWIFT/WELCOME.HTM .	
Inter-related documents (successors and predecessors) To be developed.	

APPENDIX G

REFERENCES

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APPENDIX G

REFERENCES

Acts

National Environmental Policy Act of 1969, as amended, 42 USC 4321 et seq.

Resource Conservation and Recovery Act of 1976, as amended, 42 USC 6901 et seq.

Code of Federal Regulations

40 CFR 261, "Identification and Listing of Hazardous Waste," *Code of Federal Regulations*, as amended.

40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, as amended.

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.

Federal Register

62 FR 8693, 1997, "Record of Decision for the Tank Waste Remediation System, Hanford Site, Richland, WA" *Federal Register*, Vol. 62, pp. 8693-8704 (February 26).

Washington Administrative Codes

WAC 173-216, "State Waste Discharge Permit Program," *Washington Administrative Code*, as amended.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

U.S. Department of Energy Orders

DOE Order, 425.1, *Startup and Restart of Nuclear Facilities*, U.S. Department of Energy, Washington, D.C.

DOE Order 5480.22, *Technical Safety Requirements*, U.S. Department of Energy,
Washington, D.C.

DOE Order 5480.23, *Nuclear Safety Analysis Reports*, U.S. Department of Energy,
Washington, D.C.

Databases

HSTD, n.d., Hanford Site Technical Database, database maintained by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

JCS, n.d., Hanford Site Job Control System, database maintained by Fluor Daniel Hanford, Inc., Richland, Washington.

Drawings

Fluor Daniel Hanford, Inc., Richland, Washington

- Drawing No. H-2-80936, Rev. 3, *Area Map Drawing List* (1997)
- Drawing No. H-2-78870, Rev. 3, *TWRS Top Drawing Index* (1997)
- Drawing No. H-2-79207, Rev. 2, *TWRS Drawing Index Tank AZ-101 Drywell/Profile Thermocouple* (1997)
- Drawing No. H-2-822200, Sheets 1 and 2, Rev. 0, *Drawing List* (1997)
- Drawing No. H-2-818423, Project W-320 Drawing List (1997)

Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington

- Drawing No. H-2-131000, Rev. 1, *Drawing List* (1997)

Westinghouse Hanford Company, Richland, Washington

- Drawing No. H-2-79335, Rev. 1, *TWRS - Drawing Index 4-6" Tank 101-AZ Waste Retrieval System* (1996)

Logic Diagrams

FDH, 1998, Logic Diagrams, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- H-2-823148, *TWRS Retrieval Level 1 Logic Immobilized Waste (ILAW)*
- H-2-829149, *TWRS Retrieval Level 1 Logic Immobilized Waste (IHLW)*
- H-2-829150, *TWRS Retrieval Level 1 Logic Infrastructure Phase 1 Privatization Support*
- H-2-892151, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 1st Feed Batches Tank 241-AN-105*

- H-2-829152, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 2nd Feed Batches Tank 241-AN-104*
- H-2-829153, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 3rd Feed Batches Tank 241-AW-101*
- H-2-829154, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 4th Feed Batches Tank 241-AN-103*
- H-2-829155, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 5th Feed Batches Tanks 241-AP-101 & 241-AW-104*
- H-2-829156, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 6th Feed Batches Tank 241-AY-101*
- H-2-829157, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 7th & 8th Feed Batches Tank 241-AN-107*
- H-2-829158, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 9th Feed Batches Tank 241-AN-102*
- H-2-829159, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 10th Feed Batches Tank 241-AN-106*
- H-2-829160, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 11th Feed Batches Tank 241-SY-101*
- H-2-829161, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 12th Feed Batches Tank 241-SY-103*
- H-2-829162, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 1st & 2nd Feed Batches First Tank, 241-AZ-101*
- H-2-829163, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 3rd & 4th Feed Batches Second Tank, 241-AZ-102*
- H-2-829164, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 5th - 9th Feed Batches Third Tank, 241-AY-102*
- H-2-829165, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 10th - 12th Feed Batches Fourth Tank, 241-C-104*
- H-2-829166, *TWRS Level 0 Logic (2 Sheets)*

Procedures

HNF-PRO-129, *Controlling Spare Parts and Spare Equipment Inventory*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-208, *Records Management-General*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-210, *Records Management Program*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-222, *Quality Assurance Records*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-224, *Document Control*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-229, *Technical Procedure Standard*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-232, *Project and Task Document Management*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-431, *Verification and Validation*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-491, *System Verification and Validation*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-556, *Verification and Validation Reports*, Fluor Daniel Hanford, Inc., Richland, Washington.

HNF-PRO-563, *Project Management Plan*, Fluor Daniel Hanford, Inc., Richland, Washington.

Specifications

Fluor Daniel Hanford, Inc., Richland, Washington

- Specification No. W320-P0018, *Pump, Centrifugal* (1997)
- Specification No. W320-P0022, *Air Compressor* (1997)
- Specification No. W320-P0023, *Air Drier* (1997)
- Specification No. W320-P0044, *Seismic Detectors* (1997)
- Specification No. W320-P0045, *Seismic Skids* (1997)
- Specification No. W058-P013, Rev. 0, *Calibration and Testing Laboratory Services Construction Specification for Tank AP-104 Upgrade* (1997)
- Specification No. W320-P007, Rev. 1, *Electric Heating Coil* (1997)

Westinghouse Hanford Company, Richland, Washington

- Specification No. V-W151-0002, Rev. 2, *101-AZ Mixer Pump Variable Speed Drive* (1996)
- Specification No. V-W151-0004, Rev. 1, *101-AZ Sludge Mobilization Monitor Cable and Cable Reel* (1996)
- Specification No. W058-P009, Rev. 1, *Air Operated Ball Valves* (1996)
- Specification No. W058-C005, Rev. 0, *C5 Flushing System Construction Specification* (1996)
- Specification No. W058-P012, Rev. 0, *Chemical Feed System* (1996)
- Specification No. W058-P008, Rev. 1, *Compressed Air System* (1996)
- Specification No. W058-C002, Rev. 1, *Construction Specification for Pipeline Tie-Ins for Replacement of the Cross Site Transfer System* (1996)
- Specification No. W151-C002, Rev. 1, *Construction Specification Tank 101-AZ Waste Retrieval Systems* (1996)
- Specification No. W151-C003, Rev. 1, *Construction Specification Tank 101-AZ Waste Retrieval Systems* (1996)

- Specification No. W151-C001, Rev. 1, *Construction Specification 101-AZ Waste Retrieval System Cold Test Facility* (1996)
- Specification No. W058-C003, Rev. 1, *Diversion Box/Vent Station* (1996)
- Specification No. W058-P011, Rev. 0, *Electric Circulation Heating System* (1996)
- Specification No. WHC-S-0037, Rev. 3, *High Pressure Hot Waste System Project W151 Tank 101-AZ Waste Retrieval System* (1996)
- Specification No. W058-P006, Rev. 1, *Horizontal End Suction Centrifugal Pump* (1996)
- Specification No. V-W151-0003, Rev. 1, *Modifications for Grove Crane at 1100* (1996)
- Specification No. W058-P005, Rev. 1, *Process Instruments* (1996)
- Specification No. WHC-5-0410, Rev. 2, *Procurement Specification for the 241-AZ-101, W-151 Suspended Fixture and Weld Specification Camera System* (1996)
- Specification No. W058-P002, Rev. 3, *Procurement Specification Process Monitor and Control System* (1996)
- Specification No. W058-P010, *Procurement Specification Rupture Disk/Relief Valve* (1996)
- Specification No. W058-C004, Rev. 0, *Sagebrush Mitigation 600 Area* (1996)
- Specification No. WHC-S-0040, Rev. 1, *Waste Mobilization Mixer Pump Project W151 Tank AZ-101 Waste Retrieval System* (1996)
- Specification No. W320-C007, Rev. 0, *Construction Specification Tank 241-C-106 Sluicing Package 3 - AY Tank Farm* (1995)
- Specification No. W320-C005, Rev. 0, *Construction Specification Tank 241-C-106 Sluicing Package for C-Tank Farm* (1995)
- Specification No. W320-P0033, Rev. 0, *Electrical Equipment Skid AY-Farm* (1995)
- Specification No. W320-P0034, Rev. 0, *Electrical Equipment Skid C-Farm* (1995)
- Specification No. W320-P001, *Exhaust Skid Ventilation Air Cleanup Trains* (1995)
- Specification No. W320-P005, Rev. 0, *High Efficiency Mist Eliminator* (1995)
- Specification No. W320-P0041, Rev. 0, *Isokinetic Air Sampling System* (1995)
- Specification No. W320-P0032, Rev. 0, *Procurement Specification Distribution Power Panels* (1995)
- Specification No. W320-P0036, Rev. 0, *Procurement Specification Enclosure Environmental Control* (1995)
- Specification No. W320-P006, Rev. 0, *Procurement Specification Fan Recirculation Cooling* (1995)
- Specification No. W320-P003, Rev. 0, *Procurement Specification Filter High Efficiency Metal* (1995)
- Specification No. W320-P004, Rev. 0, *Procurement Specification Heat Exchanger* (1995)
- Specification No. W320-P002, Rev. 1, *Procurement Specification Liquid Chiller Skid Mounted* (1995)
- Specification No. W320-P008, Rev. 0, *Procurement Specification Moisture Separator* (1995)

- Specification No. W320-P0035, Rev. 0, *Procurement Specification Seismic Shutdown System* (1995)
- Specification No. W320-P0020, Rev. 0, *Procurement Specification Sluicer, Hydraulic Drive and Controls Tank 241-C-106* (1995)
- Specification No. W058-P001, *Procurement Specification Slurry Transfer Pump* (1995)
- Specification No. W320-P024, Rev. 0, *Procurement Specification Winch, Slurry/Sluice Pump* (1995)
- Specification No. W320-P017, Rev. 1, *Tank 241-C-106 Sluicing* (1995)
- Specification No. W320-C006, Rev. 1, *Tank 241-C-106 Sluicing Package 5 - Process Building Skid Fabrication* (1995)
- Specification No. W058-C001, Rev. 0, *Technical Requirements Buried Pipeline for Replacement of the Cross Site Transfer Construction Specification* (1995)
- Specification No. W320-C002, Rev. 0, *Construction Specification Equipment Removal System* (1994)
- Specification No. W320-C001, Rev. 0, *Construction Specification-Tank 241-C-106 Sluicing Package 1-Sitework/Interfarm Piping System* (1994)
- Specification No. W030-C003, Rev. 0, *Construction Specification for Tank Farm Ventilation Upgrade* (1994)
- Specification No. W030-C002, Rev. 0, *Construction Specification Tank Farm Ventilation Upgrade* (1994)
- Specification No. WHC-S-0099, Rev. 2, *Waste Tank Riser - Drywell Mapping Positioner* (1994)
- Specification No. W030-C001, Rev. 0, *Divisions 2 through 16 of Construction Specification-Site Preparation for Tank Farm Ventilation Upgrade* (1992)

Documents

- Acquire Jr, H., 1995, *242-A Evaporator/Crystallizer Final Safety Analysis Report*, WHC-SD-WM-SAR-023, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Acree, C. D., 1998, *Tank Waste Remediation System Mission Analysis Report*, HNF-SD-WM-MAR-008, Rev. 2, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Alm, A. L., 1996, *Approval of Critical Decisions for Phase 1 Immobilized High-Level and Low-Activity Waste Interim Storage and Tank Farm Restoration and Safe Operations Projects (Projects W-464, W-465, and W-314)*, (letter to J. Wagoner, Manager, U.S. Department of Energy, Richland Operations Office, Richland, Washington, December 26), U.S. Department of Energy, Washington, D.C.

- Bailey, J. W., 1997, *Functional Design Criteria for Tank 241-C-106 Waste Retrieval, Project W-320*, HNF-SD-W320-FDC-001, Rev. 4, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Baldwin, J. H., 1995a, *Tank Characterization Report for Double-Shell Tank 241-AW-101*, WHC-SD-WM-ER-470, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1995b, *Tank Characterization Report for Single-Shell Tank 241-SX-113*, WHC-SD-WM-ER-480, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1996a, *Tank Characterization Report for Double-Shell Tank 241-AP-108*, WHC-SD-WM-ER-593, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BY-108*, WHC-SD-WM-ER-533, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1996c, *Tank Characterization Report for Single-Shell Tank 241-T-108*, WHC-SD-WM-ER-554, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1996d, *Tank Characterization Report for Single-Shell Tank 241-U-109*, WHC-SD-WM-ER-609, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Baldwin, J. H., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AP-102*, HNF-SD-WM-ER-358, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Baldwin, J. H., 1997b, *Tank Characterization Report for Single-Shell Tank 241-BY-112*, HNF-SD-WM-ER-701, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Baldwin, J. H., 1997c, *Tank Characterization Report for Single-Shell Tank 241-C-104*, HNF-SD-WM-ER-679, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Baldwin, J. H., 1997d, *Tank Characterization Report for Single-Shell Tank 241-T-102*, HNF-SD-WM-ER-700, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Bauer, J. D., 1994a, *Notice of Construction Application Pursuant to Washington Administrative Code 246-247 for Ventilation Upgrades, 241-AY and 241-AZ Tank Farms*, (Correspondence 9400852 to A. W. Conklin, Washington Department of Health, March 2), U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Bauer, J. D., 1994b, *Notice of Construction Application Pursuant to Washington Administrative Code 173-460 for Ventilation Upgrades, 241-AY and 241 AZ Tank Farms*, (Correspondence 9400853 to J. Stohr, Washington Department of Ecology, March 2), U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Bell, M. L., 1994, *TWRS Minimum/Maximum Laboratory Capacity Strategy*, (internal memorandum 12000-94-005 to C. DeFigh-Price, February 28), Westinghouse Hanford Company, Richland, Washington.
- Bell, K. E., 1995, *Tank Characterization Report for Single-Shell Tank 241-C-107*, WHC-SD-WM-ER-474, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Bell, K. E., 1996a, *Tank Characterization Report for Single-Shell Tank 241-BX-103*, WHC-SD-WM-ER-535, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Bell, K. E., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BY-106*, WHC-SD-WM-ER-616, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Bell, K. E., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AW-102*, HNF-SD-WM-ER-363, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Bell, K. E., 1997b, *Tank Characterization Report for Single-Shell Tank 241-U-108*, HNF-SD-WM-ER-639, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Bell, K. E., 1997c, *Tank Characterization Report for Single-Shell Tank 241-U-110*, HNF-SD-WM-ER-551, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Bellomy, J. R., 1995, *Project W-320 Tank 241-C-106 Waste Retrieval Sluicing System Testing Plan*, WHC-SD-W320-TP-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Benar, C. J., 1996a, *Tank Characterization Report for Double-Shell Tank 241-AN-101*, WHC-SD-WM-ER-578, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Benar, C. J., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BY-104*, WHC-SD-WM-ER-608, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Benar, C. J., 1997a, *Tank Characterization Report for Single-Shell Tank 241-B-109*, HNF-SD-WM-ER-677, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Benar, C. J., 1997b, *Tank Characterization Report for Single-Shell Tank 241-B-111*, HNF-SD-WM-ER-549, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Benar, C. J., 1997c, *Tank Characterization Report for Single-Shell Tank 241-C-110*, HNF-SD-WM-ER-367, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Bevins, R. R., 1997, *Severe Environmental Qualifications and Life Expectancy of Immersible Pump System*, HNF-SD-W320-ER-005, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Biebesheimer, E., 1996, *High-Level Waste Storage Tank Farms 242-A Evaporator Standards/Requirements Identification Document (S/RID)*, WHC-SD-MP-SRID-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Boes, K. A., 1996a, *Conceptual Design Report for Tank Farm Restoration and Safe Operations, Project W-314*, WHC-SD-W314-CDR-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Boes, K. A., 1996b, *Preliminary Design Requirements Document for Project W-314, Tank Farm Restoration and Safe Operations*, WHC-SD-W314-DRD-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Boldt, A. L., 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-112: Best-Basis Inventory*, HNF-SD-WM-ER-699, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Borneman, L. E., 1998, *Tank Waste Remediation System Environmental Program Plan*, HNF-1773, Rev. 0, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Brantley, W. M., 1996, *Functional Design Criteria for Project W-058 Replacement of the Cross-Site Transfer System*, WHC-SD-W058-FDC-001, Rev. 4, Westinghouse Hanford Company, Richland, Washington.
- Brown, T. M., 1995, *Tank Characterization Report for Single-Shell Tank 241-U-105*, WHC-SD-WM-ER-617, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Brown, T. M., 1996, *Tank Characterization Report for Single-Shell Tank 241-T-109*, WHC-SD-WM-ER-559, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Brown, T. M., 1997, *Tank Characterization Report for Single-Shell Tank 241-U-106*, HNF-SD-WM-ER-636, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Burbank, D.A., 1996, *Alternatives Generation and Analysis Report for Immobilized Low-Level Waste Interim Storage Architecture*, WHC-SD-W465-AGA-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Burbank, D.A., 1997, *Design Requirements Document for Project W-465, Immobilized Low-Activity Waste Interim Storage*, HNF-SD-W465-DRD-001, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Burbank, D. A. and M. J. Klem, 1997, *Analysis of Alternatives for Immobilized Low-Activity Waste Disposal*, HNF-SD-TWR-AGA-004, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Calmus, R. B., 1996a, *Design Requirements Document for Interim Storage Phase I Solidification of High-Level Waste*, WHC-SD-WM-DRD-012, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Calmus, R. B., 1996b, *High-Level Waste Interim Storage Architecture Selection - Decision Report*, WHC-SD-WM-TA-183, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Calmus, R. B., 1997, *Tank Waste Remediation System Retrieval and Disposal Mission Immobilized High-Level Waste Storage Plan*, HNF-1751, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Castleberry, J. L., 1997, *Spare Parts List W-030 Tank Farm Ventilation Upgrade*, HNF-1759, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Claghorn, R. D., 1997, *Decision Document for the Final Disposition for Cesium and Strontium Capsules*, HNF-SD-WM-RPT-294, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Clifton, F. T., 1995a, *Acceptance Test Procedure for Cathodic Protection, Rectifier 11*, WHC-SD-W030-ATP-003, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Clifton, F. T., 1995b, *Acceptance Test Procedure for Cathodic Protection, Rectifier 31*, WHC-SD-W030-ATP-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Clifton, F. T., 1995c, *Acceptance Test Procedure for Cathodic Protection, Rectifier 41*, WHC-SD-W030-ATP-002, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Clifton, F. T., 1996a, *Acceptance Test Procedure - Tank Farm and Miscellaneous Instrumentation*, WHC-SD-W030-ATP-004, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Clifton, F. T., 1996b, *Acceptance Test Procedure - Tank Farm Ventilation Upgrade W030; Primary Vent Filter Train*, WHC-SD-W030-ATP-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Colosi, K. A., 1995, *Acceptance Test Procedure Backup Power System*, WHC-SD-W030-ATP-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Conner, J. M., 1995, *Tank Characterization Report for Single-Shell Tank 241-B-103*, WHC-SD-WM-ER-488, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Conner, J. M., 1996a, *Tank Characterization Report for Double-Shell Tank 241-SY-103*, WHC-SD-WM-ER-471, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Conner, J. M., 1996b, *Tank Characterization Report for Single-Shell Tank 241-C-204*, WHC-SD-WM-ER-479, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Conner, J. M., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AP-101*, HNF-SD-WM-ER-357, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.

- Conner, J. M., 1997b, *Tank Characterization Report for Single-Shell Tank 241-B-201*, HNF-SD-WM-ER-550, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Conner, J. M., 1997c, *Tank Characterization Report for Single-Shell Tank 241-S-111*, HNF-SD-WM-ER-638, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Crane, A. F., 1997, *200 Area Treated Effluent Disposal Facility Interface Control*, HNF-SD-W049H-ICD-001, Rev. 4, prepared by Rust Federal Services Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.
- Crass, D. W., 1996a, *W-151 Steam Coil Fatigue Analysis for Mixer Pump Jetload*, WHC-SD-W151-DA-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Crass, D. W., 1996b, *W-151 Transfer Pump Stress Analysis for Mixer Pump Jet Loads*, WHC-SD-W151-DA-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Crass, D. W., 1997, *Formal Design Review Report Project W-151 Mixer Pump Procurement*, HNF-SD-W151-DRR-002, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Dallas, M. D., 1997, *FY 1998 Annual Work Plan for Infrastructure Programs WBS 6/7*, HNF-SP-1169-98, Rev. 0, prepared by DynCorp Tri-Cities Services, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.
- Deffenbaugh, M. L., 1996, *Environmental Requirements Checklist for the High-Level Waste Storage Project Canister Storage Building*, (correspondence 70100-96-004 to LAW IS Subproject, November 4), Lockheed Martin Hanford Corporation, Richland, Washington.
- Deffenbaugh, M. L., 1997, *Permitting Plan for the High-Level Waste Interim Storage Project*, HNF-SD-ENV-EE-002, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Deffenbaugh, M. L., J. D. Guberski, C. J. Grando, V. L. Armstrong, J. E. Mercado, and M. W. Cline, 1997, *Permitting Plan for the Immobilized Low-Activity Waste Project*, HNF-SD-ENV-EE-003, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland Washington.
- DOE, 1995, *Waste Acceptance Product Specifications (WAPS) for Vitrified High-Level Waste Forms*, DOE/EM-0093, Rev. 2, U.S. Department of Energy, Washington, D.C.

- DOE, 1996a, *Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land Use Plan*, DOE/EIS-0222D, U.S. Department of Energy, Washington, D.C.
- DOE, 1996b, *Waste Acceptance - Systems Requirements Document*, DOE/RW-0351P, Rev. 2, U.S. Department of Energy, Washington, D.C.
- DOE and Ecology, 1996, *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement*, DOE/EIS-0189, U.S. Department of Energy and Washington State Department of Ecology, Washington, D.C.
- Dougherty, L. F., 1995a, *Tank Characterization Report for Single-Shell Tank 241-B-202*, HNF-SD-WM-ER-371, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Dougherty, L. F., 1995b, *Tank Characterization Report for Single-Shell Tank 241-B-112*, WHC-SD-WM-ER-466, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Douglas, J. G., 1997, *Tank Characterization Report for Double-Shell Tank 241-AN-106*, WHC-SD-WM-ER-569, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Duncan, D. R. 1995, *Interface Control Document Between the Tank Waste Remediation System and the Solid Waste Disposal Division*, WHC-SD-WM-PICD-003, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Ecology, 1995a, *State Waste Discharge Permit 200 Area Effluent Treatment Facility (ETF)*, Permit No. ST-4500, Washington State Department of Ecology, Olympia, Washington.
- Ecology, 1995b, *State Waste Discharge Permit 200 Area Treated Effluent Disposal Facility (Project W-049H)*, Permit No. ST-4502, Washington State Department of Ecology, Olympia, Washington.
- Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
- Eggers, R. F., 1995, *Tank Characterization Report for Single-Shell Tank 241-S-102*, WHC-SD-WM-ER-611, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Eggers, R. F., 1996, *Tank Characterization Report for Single-Shell Tank 241-SX-108*, WHC-SD-WM-ER-582, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- FDH, 1996a, *Subcontract between Fluor Daniel Hanford Company and Duke Engineering and Services Hanford, Inc. Contract 80232764-9-K004*, Richland, Washington.
- FDH, 1996b, *Subcontract between Fluor Daniel Hanford Company and DynCorp Tri-Cities Services, Inc. Contract 80232764-9-K006*, Richland, Washington.
- FDH, 1996c, *Subcontract between Fluor Daniel Hanford Company and Lockheed Martin Hanford Corporation Contract 80232764-9-K001*, Richland, Washington.
- FDH, 1996d, *Subcontract between Fluor Daniel Hanford Company and Numatec Hanford Company Contract 80232764-9-K005*, Richland, Washington.
- FDH, 1996e, *Subcontract between Fluor Daniel Hanford Company and Waste Management Federal Services of Hanford, Inc. Contract 80232764-9-K003*, Richland, Washington.
- FDH, 1997a, *Tank Waste Remediation System Basis for Interim Operation*, HNF-SD-WM-BIO-001, Rev. 0, Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997b, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization-Raw Water*, HNF-SP-1208-ICD-01, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997c, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization-Potable Water*, HNF-SP-1209-ICD-02, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997d, *Interface Control Document Between DOE and the PHMC Radioactive Solid Waste*, HNF-SP-1210-ICD-03, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997e, *Interface Control Document Between DOE and the PHMC Non-Radioactive, No Dangerous Liquid Effluent for Phase 1 Privatization*, HNF-SP-1211-ICD-05, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997f, *Interface Control Document Between DOE and the PHMC Radioactive Dangerous Liquid Effluents*, HNF-SP-1212-ICD-06, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997g, *Interface Control Document Between DOE and the PHMC Land for Siting Part A Privatization*, HNF-SP-1213-ICD-04, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- FDH, 1997h, *Interface Control Document Between DOE and the PHMC Deactivated Facility and Site for Phase 1 Privatization*, HNF-SP-1214-ICD-10, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997i, *Interface Control Document Between DOE and the PHMC Electricity*, HNF-SP-1215-ICD-11, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997j, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization Roads and Rails*, HNF-SP-1216-ICD-12, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997k, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization Non-Routine High-Level Solid Wastes*, HNF-SP-1217-ICD-13, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997l, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization Immobilized High-Level Waste Product*, HNF-SP-1218-ICD-14, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997m, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization - Immobilized Low-Activity Waste Product*, HNF-SP-1219-ICD-15, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997n, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization Strontium/Transuranic/Entrained Solids*, HNF-SP-1220-ICD-16, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997o, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization - Cesium-137 Intermediate Product*, HNF-SP-1221-ICD-17, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- FDH, 1997p, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization - ⁹⁹Technetium Secondary Product*, HNF-SP-1222-ICD-18, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1997q, *Interface Control Document Between DOE and the PHMC Low-Activity Waste Feed*, HNF-SP-1223-ICD-19, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1997r, *Interface Control Document Between DOE and the PHMC Phase 1 Privatization - High-Level Waste Feed*, HNF-SP-1224-ICD-20, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1997s, *Interface Control Document Between DOE and the PHMC Phase 1 Waste Feed Tank Support Systems Low-Activity Waste Product*, HNF-SP-1225-ICD-21, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

Field, J. G., 1996a, *Tank Characterization Report for Single-Shell Tank 241-B-104*, WHC-SD-WM-ER-552, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Field, J. G., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BX-109*, WHC-SD-ER-572, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Field, J. G., 1996c, *Tank Characterization Report for Single-Shell Tank 241-BY-105*, WHC-SD-WM-ER-598, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Field, J. G., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AP-103*, HNF-SD-WM-ER-359, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.

Field, J. G., 1997b, *Tank Characterization Report for Double-Shell Tank 241-AP-107*, HNF-SD-WM-ER-362, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.

Field, J. G., 1997c, *Tank Characterization Report for Double-Shell Tank 241-AP-107*, HNF-SD-WM-ER-365, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.

Field, J. G., 1997d, *Tank Characterization Report for Single-Shell Tank 241-A-101*, HNF-SD-WM-ER-673, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

Field, J. G., 1997e, *Tank Characterization Report for Single-Shell Tank 241-B-110*, HNF-SD-WM-ER-368, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Field, J. G., 1997f, *Tank Characterization Report for Single-Shell Tank 241-S-104*, HNF-SD-WM-ER-370, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Field, J. G., 1997g, *Tank Characterization Report for Single-Shell Tank 241-S-109*, HNF-SD-WM-ER-627, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Field, J. G., 1997h, *Tank Characterization Report for Single-Shell Tank 241-T-105*, HNF-SD-WM-ER-369, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Field, J. G., 1997i, *Tank Characterization Report for Single-Shell Tank 241-T-111*, HNF-SD-WM-ER-540, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Galbraith, J. D., 1996, *Alternative Generation and Analysis for Phase 1 Privatization Transfer System Needs*, WHC-SD-WM-TI-750, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Galbraith, J. D. and P. M. Daling (PNNL), 1997, *Decision Document: Phase 1 Intermediate Waste Feed Staging System Design Requirements*, HNF-SD-WM-TI-800, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Greager, T. M., 1996, *Interface Control Document Between Analytical Services and Solid Waste Disposal Division*, WHC-SD-WM-PICD-005, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Grenard, C. E. and R. D. Claghorn, 1997, *System Specification for the Double-Shell Tank System*, HNF-SD-WM-TRD-007, DRAFT, prepared by SGN Eurisys Services Corporation and Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Guimond, R. J. and T. J. O'Toole, 1996, *Revised Interim Policy on Regulatory Structure for Low-Level Radioactive Waste Management and Disposal*, (memorandum to U.S. Department of Energy, Department EM-30, July 31), U.S. Public Health Service, Washington, D.C.
- Hall, B. W., 1995a, *Tank Characterization Report for Single-Shell Tank 241-BX-105*, WHC-SD-WM-ER-406, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Hall, B. W., 1995b, *Tank Characterization Report for Single-Shell Tank 241-C-101*, WHC-SD-WM-ER-473, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Hansen, C. A., 1996, *Memorandum of Agreement (MOA) - Utilization of Canister Storage Building (CSB) Vaults 2 and 3 for Immobilized High-Level Waste*, (memorandum SFD: KMS/96-SFD-104 to Jackson Kinzer, Assistant Manager, Office of Tank Waste Remediation System, April 18), U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Hays, W. H., 1997a, *Project W-314 Specific Test and Evaluation Plan 241-AN-A Valve Pit*, HNF-1733, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Hays, W. H., 1997b, *Test and Evaluation Plan*, HNF-SD-W314-TEP-001, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Hendrickson, D. W., 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-103: Best-Basis Inventory*, HNF-SD-WM-ER-704, Rev. 0, prepared by SGN Eurisys Services for Fluor Daniel Hanford, Inc., Richland, Washington.
- Herting, D. L., 1995, *Tank Characterization Report for Double-Shell Tank 241-SY-101*, WHC-SD-WM-ER-409, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Higley, B. A., 1997a, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-103: Best Basis Inventory*, HNF-SD-WM-ER-709, Rev. 0, prepared by Waste Management Federal Services of Hanford for Fluor Daniel Hanford, Inc., Richland, Washington.
- Higley, B. A., 1997b, *Preliminary Tank Characterization Report for Single-Shell Tank 241-B-105: Best-Basis Inventory*, HNF-SD-WM-ER-722, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Hill, L. F., 1995, *Acceptance Test Procedure for W030 Monitor and Control System Software*, WHC-SD-W030-ATP-0011, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Hodgson, K. M., 1995a, *Tank Characterization Report for Double-Shell Tank 241-AW-103*, WHC-SD-WM-ER-455, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Hodgson, K. M., 1995b, *Tank Characterization Report for Double-Shell Tank 241-AZ-101*, WHC-SD-WM-ER-410, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Hodgson, K. M., 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-104: Best Basis Inventory*, HNF-SD-WM-ER-666, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Hodgson, K. M. and J. G. Field, 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-105: Best Basis Inventory*, HNF-SD-WM-ER-667, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Howell, T. G., 1997, *Project W-058 Startup Test Plan*, HNF-SD-W058-SUP-002, Rev. 0, Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Hu, T. A., 1996, *Tank Characterization Report for Single-Shell Tank 241-BX-104*, WHC-SD-WM-ER-599, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Hu, T. A., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AP-105*, HNF-SD-WM-ER-360, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Hu, T. A., 1997b, *Tank Characterization Report for Single-Shell Tank 241-U-102*, HNF-SD-WM-ER-618, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Jacobs, E. R., 1996a, *Canister Storage Building (CSB) High-Level Waste (HLW) Implementation Study*, (letter FRF034 to J. J. Jones, Westinghouse Hanford Company, May 13), Fluor Daniel, Inc. Irvine, California.
- Jacobs, E. R., 1996b, *Final CSB High-Level Waste Supplemental Report*, (letter FRF049 to J. J. Jones, Westinghouse Hanford Company, September 19), Fluor Daniel, Inc., Irvine, California.
- Jacobson, R. W., 1997, *Alternative Generation and Analysis Report Tank Farm Monitoring and Master Pump Shutdown, Tank Farm Restoration and Safe Operation, W-314*, HNF-SD-W314-AGA-007, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Jensen, C. E., 1997, *TWRS Facility Safety Equipment List*, HNF-SD-WM-SEL-040, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Jo, J., 1995, *Tank Characterization Report for Single-Shell Tank 241-TY-106*, WHC-SD-WM-ER-482, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Jo, J., 1996a, *Tank Characterization Report for Single-Shell Tank 241-A-102*, WHC-SD-WM-ER-597, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1996b, *Tank Characterization Report for Double-Shell Tank 241-AN-102*, WHC-SD-WM-ER-545, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1996c, *Tank Characterization Report for Double-Shell Tank 241-AN-107*, WHC-SD-WM-ER-600, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1996d, *Tank Characterization Report for Single-Shell Tank 241-B-203*, WHC-SD-WM-ER-587, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1996e, *Tank Characterization Report for Single-Shell Tank 241-T-106*, WHC-SD-WM-ER-544, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1996f, *Tank Characterization Report for Single-Shell Tank 241-U-107*, WHC-SD-WM-ER-614, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Jo, J., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AN-105*, HNF-SD-WM-ER-678, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Jo, J., 1997b, *Tank Characterization Report for Single-Shell Tank 241-BY-111*, HNF-SD-WM-ER-687, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Jo, J., 1997c, *Tank Characterization Report for Single-Shell Tank 241-T-104*, HNF-SD-WM-ER-372, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Jo, J., 1997d, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-108: Best-Basis Inventory*, HNF-SD-WM-ER-717, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Joyce, S. M. 1997, *Hanford Analytical Sample Projections FY 1996 – FY 2001*, HNF-SD-WM-TI-608, Rev. 4, prepared by Waste Management Federal Service of Hanford for Fluor Daniel Hanford, Inc., Richland Washington.

- Julyk, L. J., 1997, *Evaluation of the Effect of Project W-151 Mixer Pump Jets on In-Tank Equipment Considering Potential Sludge Buildup on Equipemnt in Waste Tank 241-AZ-101*, HNF-SD-W151-DA-008, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Keller, C. M., 1997, *Functional Design Criteria for the Tank Farm Ventilation Upgrade, Project W-030*, HNF-SD-600-FDC-001, Rev. 4, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kidder, R. J., 1996, *Replacement of the Cross-Site Transfer System Preliminary Safety Analysis Report*, WHC-SD-W058-PSAR-001, Rev.1, Westinghouse Hanford Company, Richland, Washington.
- Kirkbride, R. A. 1997, *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev. 0, Volumes I and II, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Kirkbride, R. A., G. K. Allen, P. J. Certa, G. T. MacLean, A. F. Manuel, R. M. Orme, D. L. Penwell, L. W. Shelton, E. J. Slaathaug, R. S. Wittman, 1997, *Tank Waste Remediation System Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev. 0, Volumes I and II, prepared by Numatec Hanford Corporation and SUN Eurusys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kohlman, E. H., 1993, *Project W-151 Supplemental Design Requirements*, WHC-SD-W151-SDRD-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Kruger, A. A., 1996, *Tank Characterization Report for Single-Shell Tank 241-S-101*, WHC-SD-WM-ER-613, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Kupfer, M. J., 1997a, *Preliminary Tank Characterization Report for Single-Shell Tank 241-A-106: Best Basis Inventory*, HNF-SD-WM-ER-721, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997b, *Tank Characterization Report for Double-Shell Tank 241-AN-104*, HNF-SD-WM-ER-690, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Kupfer, M. J., 1997c, *Preliminary Tank Characterization Report for Single-Shell Tank 241-B-107: Best Basis Inventory*, HNF-SD-WM-ER-723, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Kupfer, M. J., 1997d, *Preliminary Tank Characterization Report for Single-Shell Tank 241-BX-102: Best-Basis Inventory*, HNF-SD-WM-ER-724, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997e, *Preliminary Tank Characterization Report for Single-Shell Tank 241-BX-111: Best-Basis Inventory*, HNF-SD-WM-ER-653, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997f, *Preliminary Tank Characterization Report for Single-Shell Tank 241-BY-101: Best-Basis Inventory*, HNF-SD-WM-ER-647, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997g, *Preliminary Tank Characterization Report for Single-Shell Tank 241-BY-103: Best-Basis Inventory*, HNF-SD-WM-ER-663, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997h, *Preliminary Tank Characterization Report for Single-Shell Tank 241-BY-109: Best-Basis Inventory*, HNF-SD-WM-ER-648, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997i, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-103: Best-Basis Inventory*, HNF-SD-WM-ER-668, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997j, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-105: Best-Basis Inventory*, HNF-SD-WM-ER-669, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997k, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-106: Best-Basis Inventory*, HNF-SD-WM-ER-714, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997l, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-108: Best-Basis Inventory*, HNF-SD-WM-ER-641, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997m, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-110: Best-Basis Inventory*, HNF-SD-WM-ER-642, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Kupfer, M. J., 1997n, *Preliminary Tank Characterization Report for Single-Shell Tank 241-S-112: Best-Basis Inventory*, HNF-SD-WM-ER-670, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997o, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-101: Best-Basis Inventory*, HNF-SD-WM-ER-660, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997p, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-102: Best-Basis Inventory*, HNF-SD-WM-ER-661, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997q, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-103: Best-Basis Inventory*, HNF-SD-WM-ER-662, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997r, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-104: Best-Basis Inventory*, HNF-SD-WM-ER-643, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997s, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-105: Best-Basis Inventory*, HNF-SD-WM-ER-644, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997t, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-106: Best-Basis Inventory*, HNF-SD-WM-ER-645, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997u, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-107: Best-Basis Inventory*, HNF-SD-WM-ER-671, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997v, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-109: Best-Basis Inventory*, HNF-SD-WM-ER-706, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Kupfer, M. J., 1997w, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-110: Best-Basis Inventory*, HNF-SD-WM-ER-681, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997x, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-111: Best-Basis Inventory*, HNF-SD-WM-ER-682, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997y, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-112: Best-Basis Inventory*, HNF-SD-WM-ER-683, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997z, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-114: Best-Basis Inventory*, HNF-SD-WM-ER-707, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997aa, *Preliminary Tank Characterization Report for Single-Shell Tank 241-SX-115: Best-Basis Inventory*, HNF-SD-WM-ER-684, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997bb, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-110: Best-Basis Inventory*, HNF-SD-WM-ER-686, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997cc, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-201: Best-Basis Inventory*, HNF-SD-WM-ER-726, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997dd, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-202: Best-Basis Inventory*, HNF-SD-WM-ER-727, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997ee, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-203: Best-Basis Inventory*, HNF-SD-WM-ER-728, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997ff, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-204: Best-Basis Inventory*, HNF-SD-WM-ER-729, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Kupfer, M. J., 1997gg, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-101: Best-Basis Inventory*, HNF-SD-WM-ER-689, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997hh, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-102: Best-Basis Inventory*, HNF-SD-WM-ER-654, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997ii, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-104: Best-Basis Inventory*, HNF-SD-WM-ER-672, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997jj, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-105: Best-Basis Inventory*, HNF-SD-WM-ER-655, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997kk, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-106: Best-Basis Inventory*, HNF-SD-WM-ER-656, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997ll, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-114: Best-Basis Inventory*, HNF-SD-WM-ER-708, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997mm, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-115: Best-Basis Inventory*, HNF-SD-WM-ER-657, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997nn, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-118: Best-Basis Inventory*, HNF-SD-WM-ER-718, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997oo, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TY-101: Best-Basis Inventory*, HNF-SD-WM-ER-646, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Kupfer, M. J., 1997pp, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TY-103: Best-Basis Inventory*, HNF-SD-WM-ER-703, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997qq, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TY-105: Best-Basis Inventory*, HNF-SD-WM-ER-652, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997rr, *Preliminary Tank Characterization Report for Single-Shell Tank 241-U-101: Best-Basis Inventory*, HNF-SD-WM-ER-732, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997ss, *Preliminary Tank Characterization Report for Single-Shell Tank 241-U-103: Best-Basis Inventory*, HNF-SD-WM-ER-712, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997tt, *Preliminary Tank Characterization Report for Single-Shell Tank 241-U-104: Best-Basis Inventory*, HNF-SD-WM-ER-650, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997uu, *Preliminary Tank Characterization Report for Single-Shell Tank 241-U-111: Best-Basis Inventory*, HNF-SD-WM-ER-713, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., 1997vv, *Preliminary Tank Characterization Report for Single-Shell Tank 241-U-112: Best-Basis Inventory*, HNF-SD-WM-ER-720, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Kupfer, M. J., A. L. Boldt, B. A. Higley, K. M. Hodgson, L. W. Shelton, R. A. Watrous, S. L. Lambert, D. E. Place, R. M. Orme, G. L. Borsheim, N. G. Colton, M. D. LeClair, R. T. Winward, and W. W. Schulz, 1997, *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes*, HNF-SD-WM-TI-740, Rev. 0A, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- LaBarge, M. J., 1992, *Engineering Study 222-S High-level Drain System Upgrade Project W-057*, WHC-SD-W057-ES-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Lambert, D. L., 1990, *Tank 101-AZ Waste Retrieval System Project W-151*, WHC-SD-W151-CDR-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Lambert, S. L., 1997a, *Preliminary Tank Characterization Report for Single-Shell Tank 241-C-102: Best-Basis Inventory*, HNF-SD-WM-ER-651, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lambert, S. L., 1997b, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-101: Best-Basis Inventory*, HNF-SD-WM-ER-710, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lambert, S. L., 1997c, *Preliminary Tank Characterization Report for Single-Shell Tank 241-T-103: Best-Basis Inventory*, HNF-SD-WM-ER-725, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lambert, S. L. and D. W. Hendrickson, 1997a, *Preliminary Tank Characterization Report for Single-Shell Tank 241-AX-103: Best-Basis Inventory*, HNF-SD-WM-ER-686, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lambert, S. L. and D. W. Hendrickson, 1997b, *Preliminary Tank Characterization Report for Single-Shell Tank 241-AX-104: Best-Basis Inventory*, HNF-SD-WM-ER-675, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lechelt, J. A., 1995, *Tank Characterization Report for Single-Shell Tank 241-C-203*, WHC-SD-WM-ER-478, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Lenseigne, D. L., 1997, *Tank Waste Remediation System Fiscal Year 1998 Multi-Year Work Plan WBS 1.1*, HNF-SP-1230, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Lindsey, D. W. 1997, *Liquid Effluent Retention Facility/Effluent Treatment Facility Treatability Envelope*, WMH-9758688, prepared by Waste Management Federal Services of Hanford for Fluor Daniel Hanford, Inc., Richland, Washington.
- LMHC, 1997, *TWRS Administration*, HNF-IP-0842, Fluor Daniel Hanford Inc., Richland, Washington.
- Mann, F. M., C. R. Eiholzer, A. H. Lu, P. D. Rittman, G. F. Williamson, N. W. Kline, Y. Chen, B. P. McGrail, N. R. Brown, 1996, *Hanford Low-Level Tank Waste Interim Performance Assessment*, WHC-EP-0884, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Mattichak, R. W., 1996a, *Conceptual Design Letter Report for Project W-454, AW Jumper Manifold Upgrade*, WHC-SD-W454-CDR-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Mattichak, R. W., 1996b, *Functional Design Criteria for AW Jumper Manifold Upgrade*, WHC-SD-W454-FDC-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Mayer, E. E., 1997, *80232764-9-K001 Additional Information to Support Modification of Permit Notice of Construction 94-07 Emissions Limit and Use of Environmental Protection Agency Reference Methods for Measurements*, (letter 9752387 to A. M. Umek, Fluor Daniel Hanford, Inc., March 19), Lockheed Martin Hanford Corporation, Richland, Washington.
- McCain, D. J., 1996a, *Tank Characterization Report for Single-Shell Tank 241-B-106*, WHC-SD-WM-ER-601, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- McCain, D. J., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BX-112*, WHC-SD-WM-ER-602, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- McCain, D. J., 1997, *Tank Characterization Report for Single-Shell Tank 241-BY-107*, HNF-SD-WM-ER-637, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- McVey, C. B. 1991, *Environmental Hot Cell Expansion Project W-041*, WHC-SD-W041-FDC-001, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- McVey, C. B. 1992, *Environmental Hot Cell Expansion - Project W-041*, WHC-SD-WM-ES-107, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Mickle, G. D., 1995, *Tank Farm Health and Safety Plan*, WHC-SD-WM-HSP-002, Rev. 2, Westinghouse Hanford Company., Richland, Washington.
- Milliken, N. J., 1995a, *Tank Characterization Report for Single-Shell Tank 241-BX-201*, WHC-SD-WM-ER-408, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Milliken, N. J., 1995b, *Tank Characterization Report for Single-Shell Tank 241-U-202*, WHC-SD-WM-ER-484, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Milliken, N. J., 1996, *Safety Analysis for Tank 241-AZ-101 Mixer Pump Process Test*, WHC-SD-WM-SARR-042, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Moody, D. A., 1996, *241-AZ-101 Mixer Pump Support Assembly Extension Riser, and Spray Wash System Design Verification*, WHC-SD-W151-DA-005, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Mouette, P., 1997, *Preliminary Safety Evaluation for Project W-465, Immobilized Low-Activity Waste Interim Storage*, HNF-SD-W465-PSE-001, Rev. 0, prepared by Numatec Hanford Company for Fluor Daniel Hanford, Inc., Richland, Washington.
- Noorani, Y. G., 1997, *Tank Waste Remediation System Technical Safety Requirements*, HNF-SD-WM-TSR-006, Rev. 0, prepared by DE&S Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.
- Nordquist, E. M., 1989, *Conceptual Design Report, Tank Farm Ventilation Upgrade Cathodic Protection System*, WHC-SD-W030-CDR-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Nordquist, E. M., 1995, *Mixer Pump Test Specification Project W-151*, WHC-SD-W151-TS-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Nordquist, E. M., 1997a, *Document Required for Acceptance for Beneficial Use of Project W-151, Tank 101-AZ Waste Retrieval System*, HNF-SD-WM-ABU-023, Rev. 1, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Nordquist, E. M., 1997b, *Project W-151 Checkout - Testing Report*, HNF-SD-W151-TRP-003, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Nordquist, E. M., 1997c, *Project W-151 Project Field Verification Documentation*, HNF-SD-W151-FVP-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Nordquist, E. M., 1997d, *Tank 101-AZ Waste Retrieval System*, HNF-SD-W151-FDC-001, Rev. 4, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Parazin, R. J., 1996a, *Phase 1 Privatization Raw and Potable Water Design Requirements Document*, WHC-SD-WM-DRD-015, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Parazin, R. J., 1996b, *TWRS Phase 1 Privatization Liquid Effluent Transfer and Roads Design Requirements Document*, WHC-SD-WM-DRD-014, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Parazin, R. J., 1996c, *TWRS Privatization Phase 1, Master Site Plan*, WHC-SD-TWR-DSD-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Parsons, G. L., 1997, *Acceptance for Beneficial Use, Project W-058*, HNF-SD-W058-ABU-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Peck, L.G., 1998, *Tank Waste Remediation System Systems Engineering Management Plan*, HNF-SD-WM-SEMP-002, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997a, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-109: Best-Basis Inventory*, HNF-SD-WM-ER-640, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997b, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-110: Best-Basis Inventory*, HNF-SD-WM-ER-658, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997c, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-111: Best-Basis Inventory*, HNF-SD-WM-ER-659, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997d, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-112: Best-Basis Inventory*, HNF-SD-WM-ER-715, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997e, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-113: Best-Basis Inventory*, HNF-SD-WM-ER-716, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997f, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-116: Best-Basis Inventory*, HNF-SD-WM-ER-705, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997g, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TX-117: Best-Basis Inventory*, HNF-SD-WM-ER-711, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., 1997h, *Preliminary Tank Characterization Report for Single-Shell Tank 241-TY-102: Best-Basis Inventory*, HNF-SD-WM-ER-719, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Place, D. E., and D. W. Hendrickson, 1997, *Preliminary Tank Characterization Report for Single-Shell Tank 241-AX-101: Best-Basis Inventory*, HNF-SD-WM-ER-649, Rev. 0, prepared by SGN Eurisys Services Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Raphael, G. F., 1995, *Tank Characterization Report for Single-Shell Tank 241-U-204*, WHC-SD-WM-ER-486, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Raymond, R. E., 1998, *Tank Waste Remediation System Technical Baseline Summary Description*, HNF-2016, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Reep, I. E., 1992, *Conceptual Design Report Replacement of the Cross-Site Transfer*, WHC-SD-W058-CDR-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Rieck, C. A., 1994, *Conceptual Design Report, Initial Tank Retrieval Systems for Project W-211*, WHC-SD-W211-CDR-001, Westinghouse Hanford Company, Richland, Washington.
- Rieck, C. A., 1997a, *Controlled Volume Metering Pump*, Specification W211-AP24-P003, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., 1997b, *Diluent/Flush Pump*, Specification W211-AP24-P005, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., 1997c, *Functional Design Criteria, Project W-211, Initial Tank Retrieval Systems*, HNF-SD-W211-FDC-001, Rev. 3, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., 1997d, *Mobile Water Heater/Boiler Package*, Specification W211-AP24-P002, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., 1997e, *Steel Storage Tanks*, Specification W211-AP24-P004, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., and M. E. McKinney, 1996a, *Retrieval Control System Enclosures*, Specification W211-P003, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., and M. E. McKinney, 1996b, *Waste Mobilization Mixer Pump*, Specification W211-P005, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Rieck, C. A., and M. E. McKinney, 1997, *Procurement Specification, Slurry Transfer Pump*, Specification W211-P001, Rev. 1, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Rifaey, S. H., 1998, *Tank Waste Remediation System Engineering Plan*, HNF-1947, Rev. 0, DRAFT, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- RL, 1991a, *Dangerous Waste Part B Permit Application for the 222-S Laboratory Complex*, DOE/RL 91-27, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1991b, *Double Shell Tank System Dangerous Waste Permit Application*, DOE/RL 90-39, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1991c, *Hanford Central Waste Complex - Radioactive Mixed Waste Storage Facility Dangerous Waste Permit Application Volumes I and II*, DOE/RL 91-17, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1995, *Radioactive Air Emissions Notice of Construction Project W-211, Initial Tank Retrieval Systems*, DOE/RL 95-104, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996a, *British Nuclear Fuels Laboratory Privatization Contract*, DE-AC06-96RL13308, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996b, *Hanford Strategic Plan*, DOE/RL 96-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996c, *Lockheed Martin Advanced Environmental Systems Privatization Contract*, DE-AC06-96RL13309, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996d, *Nonradioactive Air Emissions Notice of Construction Project W-320, 241-C-106 Tank Sluicing*, DOE/RL 95-62, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996e, *Project Hanford Management Contract (PHMC)*, DE-AC06-96RL13200, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996f, *Radioactive Air Emissions Notice of Construction Project W-320, Tank 241-C-106 Sluicing*, DOE/RL 95-45, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1996g, *Recommendation 93-5 Implementation Plan*, DOE/RL 94-0001, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1997a, *Hanford Facility Dangerous Waste Permit Application, 242-A Evaporator*, DOE/RL 90-42, Rev. 1, Richland Operations Office, Richland, Washington.

- RL, 1997b, *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility*, DOE/RL 97-03, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- RL, 1997c, *Radioactive Air Emissions Notice of Construction (NOC) Project W-314, Tank Farm Restoration and Safe Operations*, (letter 9761603 to A. W. Conklin, Washington Department of Health and J. Leitch, Environmental Protection Agency, December 8) U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Ryan, G. W., 1995a, *Tank Characterization Report for Double-Shell Tank 241-AY-102*, WHC-SD-WM-ER-454, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Ryan, G. W., 1995b, *Tank Characterization Report for Double-Shell Tank 241-AZ-102*, WHC-SD-WM-ER-411, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Ryan, G. W., 1995c, *Tank Characterization Report for Single-Shell Tank 241-TY-104*, WHC-SD-WM-ER-481, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sabin, J. C., 1995, *Preliminary Safety Analysis for Project W151 Tank 241-AZ-101 Waste Retrieval Systems*, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sasaki, L. M., 1996a, *Tank Characterization Report for Single-Shell Tank 241-B-204*, WHC-SD-WM-ER-581, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sasaki, L. M., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BX-106*, WHC-SD-WM-ER-570, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sasaki, L. M., 1996c, *Tank Characterization Report for Single-Shell Tank 241-TX-107*, WHC-SD-WM-ER-584, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sasaki, L. M., 1997a, *Tank Characterization Report for Double-Shell Tank 241-AW-105*, HNF-SD-WM-ER-364, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Sasaki, L. M., 1997b, *Tank Characterization Report for Single-Shell Tank 241-BY-102*, HNF-SD-WM-ER-630, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Sasaki, L. M., 1997c, *Tank Characterization Report for Single-Shell Tank 241-T-107*, HNF-SD-WM-ER-382, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Schreiber, R. D., 1995a, *Tank Characterization Report for Single-Shell Tank 241-C-201*, WHC-SD-WM-ER-476, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1995b, *Tank Characterization Report for Single-Shell Tank 241-C-202*, WHC-SD-WM-ER-477, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1995c, *Tank Characterization Report for Single-Shell Tank 241-U-201*, WHC-SD-WM-ER-483, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1995d, *Tank Characterization Report for Single-Shell Tank 241-U-203*, WHC-SD-WM-ER-485, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1996a, *Tank Characterization Report for Single-Shell Tank 241-B-101*, WHC-SD-WM-ER-528, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1996b, *Tank Characterization Report for Single-Shell Tank 241-BX-110*, WHC-SD-ER-566, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1996c, *Tank Characterization Report for Single-Shell Tank 241-BY-110*, WHC-SD-WM-ER-591, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1996d, *Tank Characterization Report for Single-Shell Tank 241-C-106*, WHC-SD-WM-ER-645, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Schreiber, R. D., 1997a, *Fiscal Year 1997 Memorandum of Understanding for the TWRS Characterization Project*, HNF-SD-SM-SD-023, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Schreiber, R. D., 1997b, *Tank Characterization Report for Single-Shell Tank 241-B-108*, HNF-SD-WM-ER-674, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Sederburg, J. P., 1995a, *Tank Characterization Report for Single-Shell Tank 241-AX-102*, WHC-SD-WM-ER-472, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sederburg, J. P., 1995b, *Tank Characterization Report for Single-Shell Tank 241-BX-108*, WHC-SD-WM-ER-407, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sederburg, J. P., 1995c, *Tank Characterization Report for Single-Shell Tank 241-C-108*, WHC-SD-WM-ER-503, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Sederburg, J. P. 1996, *Solid Waste Program Technical Baseline Description*, WHC-SD-WM-RPT-060, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Sederburg, J. P., 1997, *Waste Management Project Technical Baseline Description*, HNF-SD-WM-RPT-288, Rev. 0, prepared by Duke Engineering & Services, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.
- Shade, J. W., 1997a, *Tank Waste Remediation System Retrieval and Disposal Mission Immobilized Low-Activity Waste Disposal Plan*, HNF-1517, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Shade, J. W., 1997b, *TWRS Phase I Privatization Site Environmental Baseline and Characterization Plan*, HNF-SD-TWR-EV-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Shade, J. W., K. A. Blanchard, M. D. Freshley, C. T. Kincaid, B. G. Lauzon, M. G. Peipho, K. Rhoads, J. A. Voogd, J. H. Westsik, and G. A. Whyatt, 1994, *Performance Assessment of Grouted Double-Shell Tank Waste Disposal at Hanford*, WHC-SD-WM-EE-004, Rev. 1, Volume 1 and Volume 2, Westinghouse Hanford Company, Richland, Washington.
- Shaw, C. P., 1992, *Mixer Pump Study for Project W-151*, WHC-SD-WM-ES-195, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Shen, E. J., 1997, *Test Plan and Strategy for the Fuel Retrieval Subproject*, HNF-SD-SNF-TP-027, Rev. 1, prepared by DE&S Hanford, Inc., for Fluor Daniel Hanford, Inc., Richland, Washington.
- Shord, A. L., 1997, *TWRS Privatization Phase I Site Development Design Requirements Document*, HNF-SD-WM-DRD-013, Rev. 1, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Simpson, B. C., 1995, *Tank Characterization Report for Single-Shell Tank 241-C-111*, WHC-SD-WM-ER-475, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Simpson, B. C., 1996, *Tank Characterization Report for Single-Shell Tank 241-S-107*, WHC-SD-WM-ER-589, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Simpson, B. C., 1997a, *Tank Characterization Report for Single-Shell Tank 241-C-109*, HNF-SD-WM-ER-402, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Simpson, B. C., 1997b, *Tank Characterization Report for Single-Shell Tank 241-C-112*, HNF-SD-WM-ER-541, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Singh, G., 1996, *Design Requirements Document, Design Requirements for the Phase 1 Privatization Facility Electrical Power*, WHC-SD-WM-DRD-011, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Singh, G., 1997a, *Conceptual Design Report TWRS Privatization Phase 1 Liquid Effluent Transfer systems Subproject W0506*, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Singh, G., 1997b, *Conceptual Design Report TWRS Privatization Phase 1 Raw and Potable Water, Subproject W-504*, HNF-SD-W504-CDR-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Singh, G., 1997c, *Conceptual Design Report TWRS Privatization Phase 1 Site Development and Roads Subproject W-505*, HNF-SD-W505-CDR-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Singh, G., 1997d, *Summary Conceptual Design Report, TWRS Privatization Phase 1 Infrastructure Support Project W-519*, HNF-SD-W519-CDR-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Singh, G., 1997e, *TWRS Privatization Phase 1, Electrical Power System*, HNF-SD-W503-CDR-001, Rev. 0, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Stroup, C. R. 1987, *HWVP Analytical Hot Cells Time and Motion Study* (internal memorandum 65450-87-016 to D. F. Iwatate, Hanford Waste Vittrification Process Design, January 19), Rockwell Hanford Operations, Richland, Washington.

- Taylor, W. J., 1997, *Contract Number DE-AC06-96-RL13200 - Decision Document for the Final Disposition of Cesium and Strontium Capsules*, HNF-SD-WM-294, Rev. 0, (letter 97-WDD-058A to H. J. Hatch, Fluor Daniel Hanford Inc., April), U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Thompson, R. R., 1996, *Tank Characterization Report for Double-Shell Tank 241-AY-101*, WHC-SD-WM-ER-605, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Thompson, R. R., 1997, *Tank Characterization Report for Double-Shell Tank 241-AP-106*, HNF-SD-WM-ER-361, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Tusler, L. A., 1995a, *Tank Characterization Report for Double-Shell Tank 241-AW-104*, WHC-SD-WM-ER-453, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Tusler, L. A., 1995b, *Tank Characterization Report for Single-Shell Tank 241-C-105*, WHC-SD-WM-ER-489, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Valero, O. J., 1997, *Solid Waste Integrated Forecast Technical (SWIFT) Report: FY 1997 to FY 2070*, HNF-EP-0918, Rev. 1, provided by Waste Management Federal Services of Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.
- Vann, J. M., E. R. Hamm, and R. D. Crisp, 1998, *Tank Waste Remediation System Configuration Management Plan*, HNF-1900, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997a, *Project W-314 241-AN-A Valve Pit Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-002, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997b, *Project W-314 AN-B Valve Pit Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-003, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997c, *Project W-314 SN-630 Transfer Line AZ-02A to AN-B Acceptance for Beneficial Use*, HNF-SD-W314-ABU-004, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997d, *Project W-314 AX-B Valve Pit Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-005, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.

- Warnick, T. L., 1997e, *Project W-314 SN-632 Transfer Line AX-B to AZ-02A Acceptance for Beneficial Use*, HNF-SD-W314-ABU-006, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997f, *Project W-314 AZ-02A Pump Pit Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-007, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997g, *Project W-314 SN-634 Transfer Line A-B to AX-B Acceptance for Beneficial Use*, HNF-SD-W314-ABU-008, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997h, *Project W-314 AB Valve Pit Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-009, Rev. 0, prepared by Fluor Daniel Northwest for Fluor Daniel Hanford, Inc., Richland, Washington.
- Warnick, T. L., 1997i, *Project W-314 Master Pump Shutdown Upgrade Acceptance for Beneficial Use*, HNF-SD-W314-ABU-001, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Weaver, L. L. 1997, *222-S Laboratory Interim Safety Basis*, HNF-SD-CP-ISB-002, Rev. 2, prepared by Numatec Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Wilkins, N. E., 1997, *Tank Characterization Report for Double-Shell Tank 241-AN-103*, HNF-SD-WM-ER-702, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Willis, N. P., 1993, *Hanford Site Solid Waste Acceptance Criteria*, WHC-EP-0063-04, Westinghouse Hanford Company, Richland, Washington.
- Winkleman, W. D., 1996, *Tank Characterization Report for Double-Shell Tank 241-AP-104*, WHC-SD-WM-ER-596, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Winkleman, W. D., 1997, *Tank Characterization Report for Single-Shell Tank 241-BX-107*, HNF-SD-WM-ER-539, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Winkleman, W. D., M. R. Adams, T. M. Brown, J. W. Hunt, D. J. McCain, L. J. Fergestrom, Technical Resources International, Inc., 1997, *FY 1997 - 1998 Waste Information Requirements Document*, HNF-SD-WM-PLN-126, Rev. B, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- Winters, W. I., 1995, *Tank Characterization Report for Double-Shell Tank 241-SY-102*, WHC-SD-WM-ER-366, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Winters, W. I., 1996, *Tank Characterization Report for Single-Shell Tank 241-C-103*, WHC-SD-WM-ER-558, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Winters, W. I., 1997, *Tank Characterization Report for Single-Shell Tank 241-B-102*, WHC-SD-WM-ER-405, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Ziada, A. H., 1994, *Stress Analysis of 4- to 6-Inch and 42-Inch Flexible Receiver*, WHC-SD-W151-DA-003, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Ziada, A. H., 1996, *W-151 Mixer Pump Energy Absorption Cylinder Analysis*, WHC-SD-W151-DA-004, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Zimmerman, B. D., 1998, *Tank Waste Remediation System Risk Management Plan*, HNF-WM-PMP-018, Rev. 2, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

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APPENDIX H

**GUIDANCE AND REQUIREMENTS
TO DELIVERABLES CROSSWALK**

**TWRS Retrieval and Disposal Mission Technical
Baseline Summary Description**

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Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
A.1 DOE Letter to H. J. Hatch, FDH, from W. J. Taylor, DOE, dated August 8, 1997, #9757162A (36 ITEM CHECKLIST)		
2. Requirements are identified, validated, and documented.	I	Section 2.0
3. Requirements are allocated to functions.	I	Section 2.0
4. Each activity is tied to and necessary to support a contractual requirement.	I	Section 5.0, ICDs; Section 6.0, Product Return; Section 7.0, Secondary Waste
5. Architecture is defined based upon analyses of the mission and the functions and requirements.	I	Section 3.4 (SSCs); Section 6.4 (SSCs); Section 7.0; Section 4.0
8. Operations plans that describe how the PHMC team will execute the tech baseline have been prepared for all projects and are supported by lower-tier plans. The operation plans are consistent with MYWP and LCAM. Ops. and Maint. plans are integrated.	I	Section 3.2 (TWRS O&UP); Section 3.5 ; Section 6.5.5; Section 7.6.2 (SWIFT)
9. System boundaries and interfaces with other organizations and programs/projects are defined.	I	Sections 3.0, 5.0, 6.0, 7.0, and 8.0
13. Immobilized waste product project plans and implementing actions and procedures are on track.	I	Section 6.0
14. Plans and implementing actions that support privatization contract requirements for dealing with waste processing plan by-products including interfacing with other contractors are on track.	I	Section 7.0
16. The technical baseline is complete and defensible, and represents best value to the government.	I	Entire Document
17. The technical baseline under configuration control.	I	Entire Document
19. The physical integrity of existing systems, structures, and components has been verified.	I	Section 3
20. Waste has been characterized as necessary to satisfy all data quality objectives.	I	Section 3
27. Schedule risk has been identified and is being managed.	I	Sections 3.4.3 and Section 6.4.3

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
32. Environmental permits and safety authorization bases are in place as required for authorization-to-proceed decision.	I	Section 3
A.2 DOE Letter to H. J. Hatch, FDH, from W. J. Taylor, DOE, dated August 8, 1997, #9757162A (BODY OF TEXT)		
General PHMC Responsibilities from RL's 8/8/97 letter, Section 2.1	.	
1. Establish a sound technical baseline including ICDs	I	Entire Document; Section 5 includes the ICDs
4. Work in the technical baseline can be performed	I	Entire Document
7. The technical and programmatic baselines are under configuration management	I	Entire Document; Tables demonstrate items kept current
Specific Responsibility from RL's August 8, 1997 letter, Section 2.2	.	
1. Waste feed can be provided in the specified amount to the specified place at the specified time	I	Section 3
2. Infrastructure support can be provided to the private vendors as specified in the final privatization contract and ICDs	I	Sections 5 and 8
3. PHMC Team will be prepared for receiving, storing and disposing of immobilized waste products	I	Section 6
4. PHMC will be prepared for receiving, managing, treating and disposing of by-products from private contractors	I	Section 7
A.3 DOE Letter H. J. Hatch, FDH, from William J. Taylor, DOE, dated December 2, 1997, #9761291		
5. Provide specific information to address the ten areas in Paragraph 4.2.4 of the August 8 DOE letter of direction	.	
a. Explain FDH's willingness to receive radioactive waste	I	Section 5 - ICD, Section 6 - Product Receipt, and Section 7 - Secondary Waste
b. Explain FDH's willingness to receive radioactive dangerous liquid effluents	I	Section 5 - ICD and Section 7 - Secondary Liquid Waste

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
c. Explain FDH's willingness to receive non-routine high-level solid wastes.	I	Section 5 - ICD
i. Deliver to DOE or make available for DOE review, a Draft Technical Baseline Summary Description	I	Entire Document
6. RTP deliverables and their support must address the readiness of supporting facilities outside of TWRS, and understand FDH's readiness to receive secondary wastes.	I	Section 5 - ICDs, and Section 7 - Secondary Wastes
7. Establishment of sound technical baseline and update M&I TWRS Retrieval Baseline. Submit level 1 logic diagrams and documentation, an identified critical path, and a listing of documents that form the basis for the technical baseline for January RTP.	I	Entire Document
B.1 DOE Order 430.1, "Good Practice Guide," GPG-FM-002		
2.3.3 Baseline: Work Scope (Technical) Criteria	I	Section 7
C.1 Interface Control Documents		
3. Radioactive Solid Wastes	I	Sections 5 and 7
7. Non-Dangerous Solid Wastes	.	
1. Not accept non-radioactive, non-dangerous solid wastes.	I	Section 5
8. Liquid Sanitary Wastes	.	
1. Not accept liquid sanitary wastes.	I	Section 5
10. Deactivate Facility and Site	I	Sections 5 and 9
13. Non-Routine High-Level Solid Wastes	I	Sections 5 and 7 (CWC)
14. Immobilized High-Level Waste	I	Sections 5 and 6
15. Immobilized Low-Activity Waste	I	Sections 5 and 6
16. 90Strontium/Transuranics/Entrained Solids	I	Sections 5 and 6
17. 137Cesium	I	Sections 5 and 6
18. 99Technetium	I	Sections 5 and 6
19. Low-Activity Waste Feed	I	Sections 3 and 5
20. High-Level Waste Feed	I	Sections 3 and 5
21. Waste Feed Tanks	I	Sections 4 and 5

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
D.1 Detailed Instructions for Assessment of RTP - Appendix C, November 14, 1997		
1. Show the ability to provide HLW and LAW waste feed at the correct rate to the correct location with verified composition and carry out responsibilities per the following ICDs:		Section 3, TWRS O&UP is primary!
a. ICD-16 Sr/TRU/Entrained Solids	I	Sections 5 and 6
b. ICD-19 LAW Feed	I	Sections 3 and 5
c. ICD-20 HLW Feed	I	Sections 3 and 5
3. Provide validatable task duration estimates	I	Section 3 (only by reference to TWRS O&UP) information not directly in Baseline Summary
7. Show the ability of the PHMC Team to provide the infrastructure necessary to handle all by-products of the waste processing.	I	Section 5 ICDs and Section 7
8. Show the PHMC's ability to provide those functions and carry out those responsibilities described in the following ICDs:		
c. ICD-5 Non-Rad Non-Dangerous Liquid Effluents	I	Section 5 ICDs and Section 7
d. ICD-6 Rad Dangerous Liquid Effluents	I	Section 5 ICDs and Section 7
h. ICD-18 Technetium	I	Section 5 ICDs and Section 6
9. Show the ability of the PHMC Team to turnover waste feed tanks AP-106 and 108 to private contractors per ICD-21.	I	Section 4 and Section 5 ICDs
15. Show the PHMC Team's ability to receive, store and dispose of immobilized LAW and HLW and separated cesium from private contractor operations and to take the responsibilities described in the following ICDs:		Section 5 ICDs and Section 6
a. ICD-3 Radioactive Solid Waste	I	Section 5 ICDs and Section 7
b. ICD-13 Non-Routine High Level Solid Waste	I	Section 5 ICDs and Section 7 (CWC)
c. ICD-14 IHLW Product	I	Section 5 ICDs and Section 6
d. ICD-15 ILAW Product	I	Section 5 ICDs and Section 6
e. ICD-17 Cs-137 Intermediate Product	I	Section 5 ICDs and Section 6

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
16. Show an ability to meet all schedules needed by the private contractors for receiving immobilized LAW and HLW and separated cesium.	I	Section 5 ICDs and Section 6
D.2. Plan for Determining PHMC Team's RTP for Waste Feed Delivery (Table 2).		
PHMC provide deliverables necessary to support RTP, as follows:		
6. Technical Baseline	I	Entire Document
12. Draft TWD Master Blueprint	I	Entire Document now called Technical Baseline Summary Description
17. Waste Feed Transfer Procedure	I	Section 3, Reference to Technical Basis Document
18. M-50-03 Decision Report Sludge Washing (Milestone Completed, 1997)	I	Section 3, Reference to TWRS O&UP
19. S-107 Decant Testing	I	Section 3, Reference to TWRS O&UP
D.3. Plan for Determining PHMC Team's RTP for Waste Feed Delivery - Document Checklist (Table 3)		
2. Plans call for implementing sludge-washing capability to provide sludge to privatization contractor(s) in Phase 1B.	I	Section 3, Reference to TWRS O&UP
3. Plans call for retrieving DST waste to make room for SST waste, to optimize tank storage, and to stage waste.	I	Section 3, Reference to TWRS O&UP
4. Plans resolve tank 106-C high-heat safety issue.	I	Section 3, Reference to TWRS O&UP
5. Plans include demonstrating past-practice-sludging technology.	I	Section 3, Reference to TWRS O&UP
6. Plans call for providing high-level waste feed to the privatization contractor(s).	I	Section 3, Reference to TWRS O&UP
7. Plans call for retrieval of 99% tank inventory to support closure.	I	Section 3, Reference to TWRS O&UP
8. Plans include D&D of the retrieval project facilities.	I	Section 5 ICDs and Section 9
9. Plans support the HTI demo. of retrieval technologies, retrieval performance objectives, and risk performance assessments.	I	Section 3, Reference to TWRS O&UP

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
11. Plans support HTI demonstration of retrieval technologies.	I	Section 3, Reference to TWRS O&UP
15. Plans provide for closing all SST and DST farm and ancillary equipment.	I	Sections 5 and 9
19. Plans include tank sampling and analysis from 2003 through 2011.	I	Sections 3 and 7
20. Plans are to receive the Tc/Sr/TRU and entrained solids back from the single-LAW-processing-plant private contractor.	I	Sections 5 and 6
21. Plans are to perform acceptance testing of received Tc/Sr/TRU.	I	Sections 5 and 6
23. Plans are to store separated Tc, entrained HLW solids, and Sr/TRU products and collect costs of this transport and storage.	I	Sections 5 and 6
30. Plans are for the 242-A evaporator to be supplied by the Liquid Effluents Program to support ops until the immobilization facilities are in operation.	I	Sections 5 and 7
37. Plans assume residual waste in the tanks will be classified as "Incidental Waste" by the NRC to support closure plans and performance assessments.	I	Sections 1, 2, and 6
38. Plans are that waste will be retrieved only once from SSTs, to a level that will support closure.	I	Section 3, Reference to TWRS O&UP
44. Plans integrate the waste feed delivery technical baseline.	I	Entire Document
45. Plans define retrieval project requirements to interface w/ Hanford Tanks Initiative (HTI) & other EM-50 funded technology development projects.	I	Sections 1, 2, and 3
46. Plans describe completion of planning for tank-106 Heel removal using ACTR-defined technology.	I	Section 3, Reference to TWRS O&UP
49. Plans include establishing a long term strategy for waste retrieval and feed staging based on latest inventory assessment.	I	Section 3, Reference to TWRS O&UP
51. Plans describe completion of LAW feed definition and LAW process flowsheets.	I	Section 3, Reference to TWRS O&UP

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
56. Plans include resolving feed delivery/composition issues identified by the IP/Process Teams during development of the feed ICDs and specs.	I	Section 3, Reference to TWRS O&UP and Section 5
63. Plans include completion of the C-106 waste retrieval sufficient to satisfy the resolution of the high-heat tank waste safety issue. (See also HTI)	I	Section 3, Reference to TWRS O&UP
65. Plans include completing design activities and safety studies to support installation of the mixer pumps in AP-102, 104 and 105 and determine the needs for all tanks identified in the Phase 1 feed.	I	Section 3, Reference Technical Basis
D.6 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix A, Technical Baseline Checklist.		
18. Provide for infrastructure control systems to ensure safe construction, ops and maintenance. (4.1.5-4.1.8)	I	Section 3, Feed Delivery Systems; Section 5, ICDs; and Section 8, Utilities
21. Show interface desc. in ICDs, MOUs, funding, engineering, document sign-off, w/Safety, Emergency., Maintenance, LMHC internal, const. coordination, DOE interface, and configuration control of MYWP/ICDs has been covered. (5.1.1.-5.1.15; 5.2.1-5.2.6)	I	Section 5 and entire document
D.8 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix C, Infrastructure (Management Baseline) Checklist.		
46. Confirm that if USQs exist, strategy for resolving them is in the baselines, and strategy to implement Safety Authorization. Bases to get to hot start are in place. (1.3.3)	I	Section 3, Reference BIO
D.9 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix D, Feed Tank/Air Emissions (Technical Baseline Checklist).		
62. Provide for infrastructure control systems to ensure safe construction, ops and maintenance. (4.1.5-4.1.8)	I	Sections 3, 5, and 8

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
65. Show INTERFACE desc. in ICDs, MOUs, funding, engineering, document sign-off, w/Safety, Emergency., Maintenance, LMHC internal, const. coordination, DOE interface, and configuration control of MYWP/ICDs has been covered. (5.1.1.-5.1.15; 5.2.1-5.2.6)	I	Section 5 (all)
69. Provide the completed quantitative reliability/availability/maintainability analysis (6.4.1)	I	Sections 3.4.3 and 6.4.3
D.11 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix E, Infrastructure Feed Tank Transfer (Management Baseline) Checklist.		
90. Confirm that if USQs exist, strategy for resolving them is in the baselines, and strategy to implement Safety Authorization. Bases to get to hot start are in place. (1.3.3)	I	Section 3, Reference BIO
E.1 TWRS Waste Disposal Division Planning Guidance dated July 7, 1997 (Updated December 12, 1997)		
Division will prepare integrated plans consistent with the technical baseline and fully coordinated across projects.	I	Entire Document
PHMC develop sludge washing capability.	I	Section 3, Reference to TWRS O&UP
Retrieve and blend DST waste to make room for SST waste.	I	Section 3, Reference to TWRS O&UP
Waste Retrieval Project will plan for the 18 Phase 1 items in paragraph 3.2.1.	I	Section 3, Reference to TWRS O&UP
Waste Retrieval Project will assume the 11 items in paragraph 3.2.2.	I	Section 3, Reference to TWRS O&UP
Waste Feed Delivery will define feed process and retrieval systems, integrate the waste feed delivery technical baseline and define Retrieval Project requirements to interface with HTI and other EM-50 funded projects.	I	Section 3, Reference to Technical Basis Document
Complete LAW feed definition, staging plans, process flowsheets.	I	Section 3, Reference to TWRS O&UP

Table H-1. Guidance and Requirements to Deliverables Crosswalk - Retrieval and Disposal Mission Technical Baseline Summary Description.

Guidance or Requirement	Status	Implementing Location
Complete design activities and safety studies to support the installation of mixer pumps in AP-102, AP-104 and AN-105.	I	Section 3, Reference to Technical Basis Document
Waste Processing will prepare the 13 plans outline in paragraph 3.3.1.	I	Section 3, Reference to TWRS O&UP
Waste Processing will make the Phase 1 assumptions outlined in paragraph 3.3.2.1.	I	Section 3, Reference to TWRS O&UP
Decontaminate and decommission all infrastructure that provided services to the PC's and deactivate systems following D&D of the facilities.	I	Sections 5.0 and 9.0
Immobilized Tank Waste Storage and Disposal Project will use the items listed in paragraph 3.4.1 as a basis for planning.	I	Sections 1.0, 2.0, and 6.0
The Storage and Disposal project will ensure the requirements in paragraph 3.4.2 are met.	I	Entire Document
The storage and disposal project is responsible for the planning assumptions outlined in paragraph 3.4.3 for ILAW, IHLW and Cesium and Strontium Capsules.	I	Sections 1.0, 2.0, and 6.0
IHLW Storage will update the statement of work to prepare conceptual design for IHLW storage facilities and issue for review a conceptual design and preliminary safety evaluation.	I	Section 6.0
Cesium and Strontium Capsules project will update the Alternative Generation Analysis and Decision Analysis Report and the Cesium Strontium Capsule Disposition Decision Analysis.	I	Section 6.0
Retrieval will follow the special MYWP requirements outlined in paragraph 4.2.	I	Project will comply

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