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To	From	Page 1 of 1
Equipment Engineering	Equipment Engineering	Date 09/27/94
Project Title/Work Order		EDT No. 140357
SNFP/K Basin Engineering Project		ECN No.

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ENGINEERING DATA TRANSMITTAL

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2. To: (Receiving Organization) Equipment Engineering	3. From: (Originating Organization) Equipment Engineering	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: SNFP/K Basin Engineering Project	6. Cog. Engr.: L. V. Feigenbutz	7. Purchase Order No.: NA
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		14. Required Response Date: 09/23/94

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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-SNF-TP-007	A11	0	Test Plan for Sludge Retrieval and Packaging	Q	1,2	1	

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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1,2	1	Cog. Eng. L. V. Feigenbutz	<i>[Signature]</i>	9/23/94	N1-21						
1,2	1	Cog. Mgr. C. J. Alderman	<i>[Signature]</i>	9/23/94	N1-21						
1,2	1	QA J. I. Diehl	<i>[Signature]</i>	9/23/94	R3-85						
		Safety									
		Env.									
1,2	1	G. L. Neer	<i>[Signature]</i>	9/23/94	L6-13						

18. Signature of EDT Originator <i>[Signature]</i> Date: 9/23/94	19. Authorized Representative for Receiving Organization <i>[Signature]</i> Date: 9/23/94	20. Cognizant Manager <i>[Signature]</i> Date: 9/23/94	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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RELEASE AUTHORIZATION

Document Number: WHC-SD-SNF-TP-007, Revision 0

Document Title: Test Plan for Sludge Retrieval and Packaging

Release Date: September 26, 1994

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**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

M. Boston

M. N. Boston


9/26/94

(Signature)

(Date)

MASTER

SUPPORTING DOCUMENT		1. Total Pages 12
2. Title Test Plan for Sludge Retrieval and Packaging	3. Number WHC-SD-SNF-TP-007	4. Rev No. 0
5. Key Words Test Plan, Sludge Retrieval, Sludge Packaging	6. Author Name: L. V. Feigenbutz <i>L.V. Feigenbutz</i> 9-23-94 Signature Organization/Charge Code 2C130/KK5PR	
7. Abstract This test plan establishes the organizational responsibilities, control systems and procedures for testing of sludge retrieval and packaging equipment for the KE Basin Sludge Mitigation Project.		
<p>8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.</p> <p>PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.</p> <p>DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.</p>		<p>10. RELEASE STAMP</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>OFFICIAL RELEASE BY WHC DATE SEP 27 1994 43 <i>Stall</i></p> </div>
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M. Boston 9/26/94

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**TEST PLAN
FOR SLUDGE RETRIEVAL AND PACKAGING**

1.0 INTRODUCTION

1.1 PURPOSE

This document provides direction for the cold testing of tools, equipment and systems which will be installed and operated in K-East (KE) Basin in support of the sludge retrieval and packaging project. The technical uncertainties related to the effectiveness of sludge retrieval procedures and equipment require that cold testing be completed before installation in KE Basin to identify and resolve existing problems, and to optimize the efficiency of all equipment and systems used.

This plan establishes the responsibilities, test requirements, and documentation requirements necessary to complete cold tests of:

- 1) equipment with no potential for plant use; 2) prototype equipment and systems which may be upgraded for use in K-Basin; and 3) plant equipment and systems requiring cold acceptance testing prior to plant use. Some equipment and systems may have been subject to a formal design review and safety assessment; the results of which will be included as supporting documents to the operational readiness review (ORR).

1.2 SCOPE

This test plan is applicable to all development, feature, functional, and acceptance testing of equipment in various stages of design ranging from test articles with no potential for plant use through prototype equipment assemblies and systems which may be upgraded for installation and testing at the K-Basin; to final plant equipment assemblies and systems which require cold acceptance testing for design verification. This test plan is applicable to all testing of equipment and systems performed at Westinghouse Hanford Company (WHC) and at outside vendor facilities. Testing in some cases will be a two-phase process consisting of acceptance testing of selected components at outside vendor facilities and development, feature, functional, and acceptance testing at the WHC facility.

The 305 building Cold Test Facility will be the primary test facility. The main test pool located within the 305 building is 15 ft wide, 18 ft long and 15 ft deep, below floor level. A working grating is located approximately 6 ft above floor level, to simulate K-Basin grating. The pool's liquid volume is approximately 4000 cu ft or 30,000 gallons. This pool will be used for development, feature testing, functional and acceptance testing, and K-Basin operator training.

Two secondary test pools are located outside the 305 building. The first pool is a square steel open topped vessel measuring 16 ft by 16 ft by 16 in deep. The second pool is a round plastic pool 7 ft diameter by 5 ft high. These two pools will be used primarily for development tests.

2.0 APPLICABLE/REQUIRED DOCUMENTS

- WHC-SD-SNF-PCP-001, *305 Building Cold Test Facility Management Plan.*
- WHC-SD-SNF-FRD-005, *305 Building Cold Test Facility Functions and Requirements.*
- WHC-SD-SNF-FRD-003, *Functions and Requirements for 105-KE Basin Sludge Activities for Sludge Packaging Development.*
- WHC-SD-SNF-TC-001, *Test Procedure Forms for Sludge Retrieval and Packaging.*
- WHC-CM-6-1, *Standard Engineering Practices, EP-4.2, "Testing Requirements."*
- WHC-CM-3-5, *Document Control and Records Management, Section 12.7, "Approval of Environmental, Safety, and Quality-Affecting Documents."*
- WHC-CM-4-3, *Industrial Safety Manual, Section A-3, "Pre-Job Safety Planning/Job Hazard Analysis."*
- WHC-IP-1026, *Engineering Practice Guidelines, Appendix K, Test Plans, Specifications, Procedures and Reports.*
- WHC-SD-SNF-QAPP-001, *Quality Assurance Program Plan (QAPP) for 105KE Basin Spent Nuclear Fuel Pilot Run, D. W. Smith.*
- Test procedures and test documents as required by procurement contracts with outside vendors.
- Test reports verifying completion of all required tests.
- Applicable equipment installation/operation/removal procedures.

3.0 DEFINITIONS

Applicable definitions of testing categories are given in WHC-CM-6-1, EP-4.2, Section 2.2. Other specific definitions relative to this test plan are:

- Outside Vendor Acceptance Testing - Testing completed by vendors or non-WHC personnel which verifies the operation of components to perform intended function.
- Signature Verification - The act of acknowledging the completion of a step, response, action, data, recording, etc., by signature (or initial) as required by a test procedure.

- Development Testing - Development testing is performed to provide or develop ideas, concepts, design information, or criteria. Development testing shall require a work plan and a Job Hazard Analysis (JHA) if testing is beyond the normal routine of the facility.
- Feature Testing - Feature testing is performed to test certain features of a piece of equipment or system to demonstrate that fabrication, assembly, installation, and/or operation requirements have been met for that feature. Feature testing shall require a work plan and a JHA if testing is beyond the normal routine of the facility.
- Functional Test - Functional testing is performed to test the final equipment configuration or system of assembled equipment items in preparation for acceptance testing. During functional testing, all components of the equipment or system are operated as a whole to determine that the equipment or system satisfactorily meets the overall functional, operational, and design requirements. Functional testing is used to determine if final changes are required before acceptance testing. Functional testing shall utilize this test plan and require a test procedure.
- Acceptance Test - Acceptance testing is performed with the equipment or system in the final in-service configuration (in the Cold Test Facility) to verify that functional, operational, and design requirements have been met. Acceptance testing shall utilize this test plan and require a test procedure. This testing may be performed by cold test facility personnel or by KE Basin Operations. This acceptance testing may be performed in conjunction with operation training: For equipment destined for K Basins, the acceptance criteria for use in K Basins will be delineated and approved by K Basins Operations.
- Test Index Logbook - A controlled logbook for recording the test number, description, and date of each test or activity in sequence, whether controlled by a work plan or test procedure.
- Test Logbook - A logbook for recording all data and observations by the test performer which are not included in a test procedure.
- Test Control Copy - The single copy of all record documentation maintained at the test facility and used for all required signatures, approvals, and data recording.
- Work Plan - A document to control development and feature testing of equipment in the cold test facility. The document should include the following where applicable:
 - ◆ **Performance Criteria:** All functions, requirements and operating criteria for measuring the successful performance of test equipment.
 - ◆ **Work Instruction:** What is to be accomplished.
 - ◆ **Approvals:** Test engineer and building administrator approval is required on all work plans.

- ◆ **Restrictions/Conditions:** Any mechanical/electrical safety concern that may effect personnel. Equipment operating limitations.
- ◆ **Hold Points/Inspections/Verifications:** Test witnesses required, QA/AC involvement, material, drawing or dimensional checks.
- ◆ **Supporting Documents:** Drawings, procedures, vendor specifications, test plans, etc.
- ◆ **Materials Required:** Material for fabrication or testing.
- ◆ **Special Tools, Building Modifications:** Lifting or handling equipment or anything unique to the work requested.

4.0 MANAGEMENT/PERSONNEL RESPONSIBILITIES

Specific testing responsibilities are defined in the following sections.

4.1 SYSTEM MANAGER - EQUIPMENT ENGINEERING

- Approve the test plan, test procedure, and final report.

4.2 SYSTEM ENGINEER - EQUIPMENT ENGINEERING

Note: The system engineer may perform test engineer activities.

- Provide specific equipment for cold testing.
- Provide all documentation of equipment being tested.
- Provide a hazards list for equipment being tested.
- Prepare performance criteria for equipment.
- Prepare and approve test procedures/work plans.
- Review test results and prepare and issue test report.
- Review and approve outside vendor test procedures and test data.

4.3 TEST ENGINEER - EQUIPMENT ENGINEERING

- Overall responsibilities for maintaining and controlling testing.
- Provide liaison with facility used for testing.
- Provide liaison with Safety and Quality Assurance (QA) for testing activities and reviews of JHA related to testing, as required.

- Assist in preparing test procedures.
- Obtain test documentation identification numbers.
- Overall testing responsibilities and assignment of responsibilities.
- Monitor testing for compliance with the test procedures.

4.4 TEST PERFORMER

- Perform test in accordance with approved test plan and test procedure.
- Maintain a file of documented information pertinent to the tests.

4.5 QUALITY ASSURANCE ENGINEER

- Review and approve the test plan, test procedure, and test report for both WHC and outside vendor testing.
- Ensure that quality requirements are defined and satisfied for the test.
- Ensure that inspection planning is adequate for the test.

4.6 QUALITY CONTROL INSPECTORS

- Monitor test activities and provides signature verification as required at WHC and outside vendor facilities.

4.7 SAFETY

- Provides review of JHA per WHC-CM-4-3, *Industrial Safety Manual*, Standard A-3, "Pre-Job Planning/Job Hazard Analysis."
- Reviews and approves all test-related documents in accordance with WHC-CM-3-5, *Document Control and Records Management*, Section 12.7, "Approval of Environment, Safety, and Quality-Affecting Documents."

5.0 TESTING REQUIREMENTS

Testing will be a two-phase process consisting of acceptance testing of selected components at outside vendor facilities and development, feature, functional, and acceptance testing of the sludge retrieval and packaging equipment at the Cold Test Facility.

5.1 VENDOR TESTING OF SELECTED COMPONENTS

Verification of function performance of selected components or sludge removal systems may be required by testing at a vendor facility. Testing and procedure submittal requirements shall be in accordance with an approved procurement specification.

5.2 WHC TESTING OF THE SLUDGE RETRIEVAL AND PACKAGING EQUIPMENT

Testing will verify the performance of sludge retrieval and packaging equipment. The intended functional requirements are defined in WHC-SD-SNF-FRD-003, *Functions and Requirements for 105-KE Basin Sludge Activities for Sludge Packaging Development*. Specific performance criteria as detailed by the cognizant engineer will be documented in the test procedure.

Development, feature, functional, and acceptance testing will achieve the following:

- Basic equipment functions and mechanical interfaces will be verified.
- Installation and removal of equipment will be demonstrated to the degree possible.
- Performance of the equipment will be measured as required.
- Training objectives for the 105-KE operations personnel may be accomplished during the test procedure execution. Requirements for operator training are specified in the 305 Cold Test Facility Management Plan.

5.3 TEST DOCUMENTATION REQUIREMENTS

Specific test documentation requirements, in addition to the general test documentation requirements defined in WHC-CM-6-1, EP-4.2 and WHC-IP-1026, Appendix K, are defined in the following sections.

5.3.1 Development and Feature Tests

Development and feature testing supports the determination and adequacy of a particular idea or feature of equipment or components. Such testing may be conducted at any phase of the program. Descriptions and results of these tests will be appended to the test report, if appropriate.

Development and feature tests will be controlled by a work plan. If testing is beyond the normal routine of the facility, the job will be evaluated via a JHA and approved by Safety.

5.3.2 Functional and Acceptance Testing

A test procedure shall be prepared and approved for functional and acceptance testing. During testing, one master copy of the test procedure, clearly identified as TEST CONTROL COPY, will be maintained by the test performer. All data entries will be logged directly in the test control copy. The test procedure shall include, as required, the following:

- Performance criteria
- Signature identification page
- Description of test setup
- Test procedure steps with required signature verification spaces, as required.
- The test procedure shall use the test procedure forms of WHC-SD-SNF-TC-001.

5.3.3 Test Report

A test report shall be prepared, approved, and released. The test engineer shall decide the content of the test report. A related series of tests may be reported in one test report. The approved original of the test report shall be maintained as a QA record and a copy shall be filed in the WHC Equipment Engineering project files. The test report shall include, as required, the following:

- Table of Contents
- A list of documents including drawings, sketches, specifications, photographs, etc., which document the exact configuration of the item tested
- A qualification checklist
- The completed work plan or test procedure as applicable
- A list of equipment/procedural deficiencies or open items noted during conduct of test.
- All test results and analysis
- Comparison of test results to the performance requirements

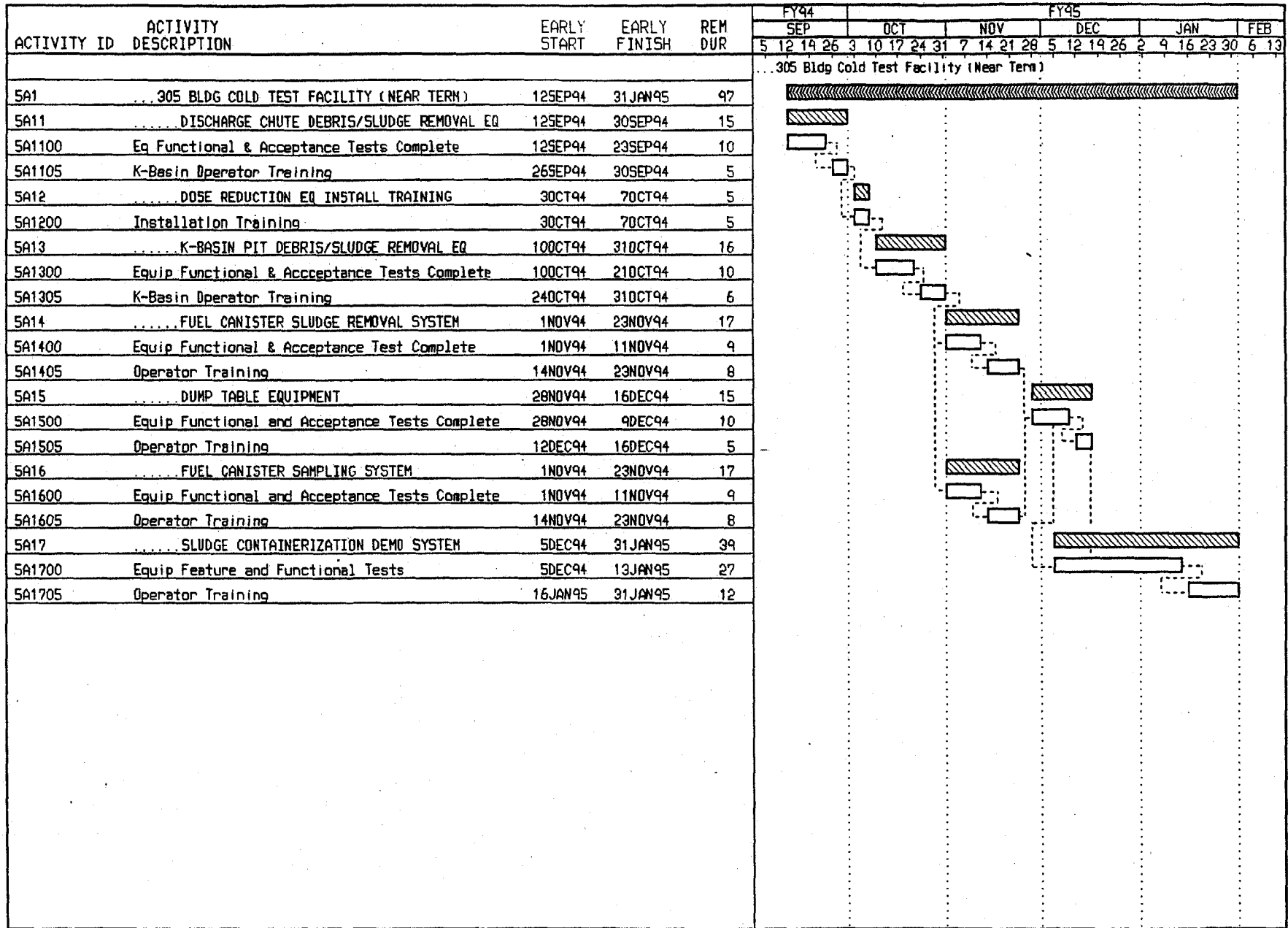
6.0 SCHEDULE

Figures 1 and 2 contain near- and long-term schedules which identify test milestones, hold points and the projected sequence of tasks to complete all known tests of sludge equipment.

7.0 QUALITY ASSURANCE

Interim guidance for quality assurance of testing sludge retrieval and packaging equipment is provided by WHC-SD-SNF-QAPP-001, *Quality Assurance Program Plan (QAPP) for 105KE Basin Spent Nuclear Fuel Pilot Run*. This is a plan to assure overall compliance with requirements applicable to the pilot run. A comprehensive QAPP for K Basins will be developed later. Upon release, the K Basins QAPP will supersede the pilot run QAPP for sludge testing activities.

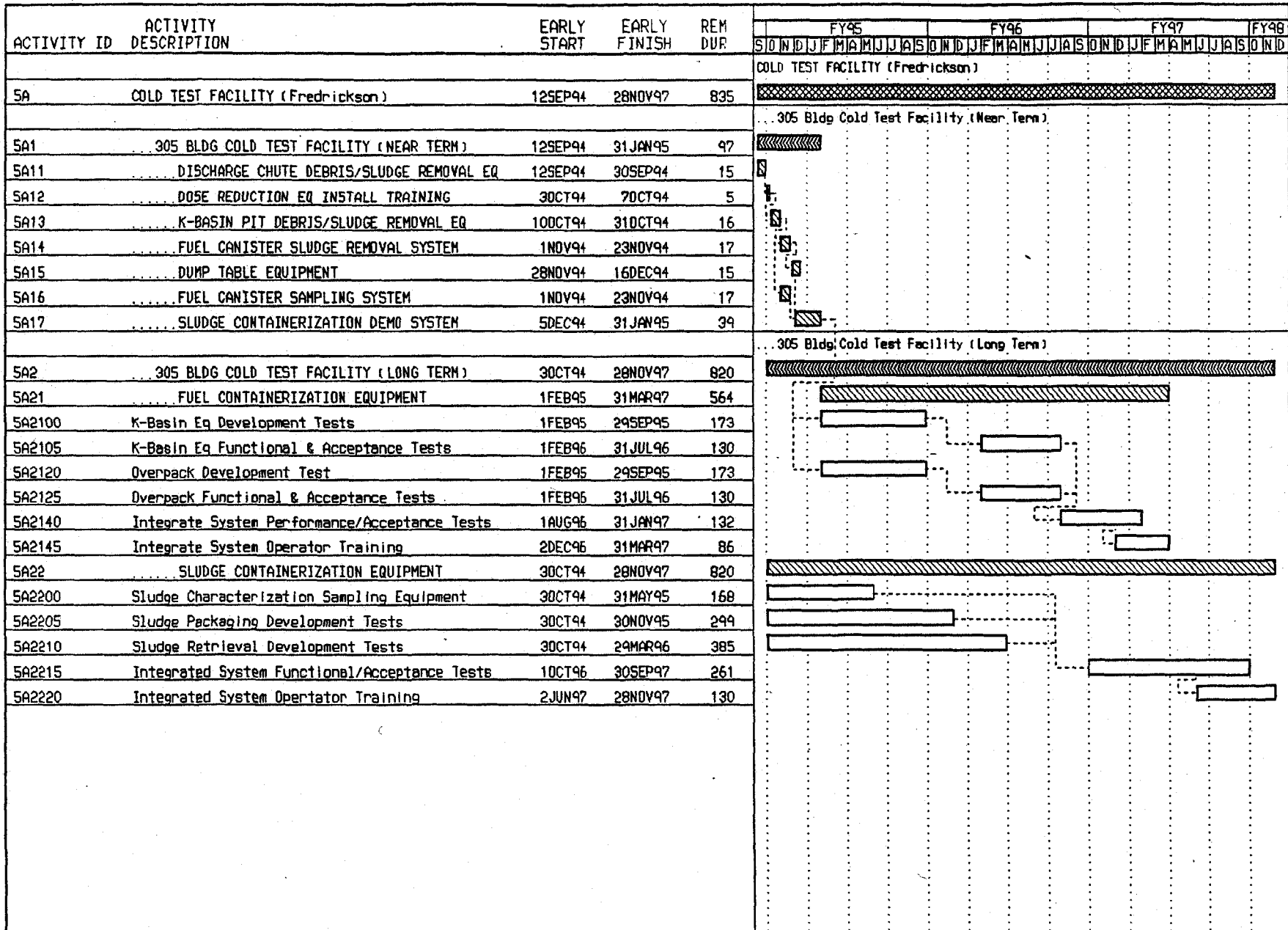
FIGURE 1



MHC-SD-SNF-TP-007, REV. 0

Activity Classification: SUMMARY LEVEL		COST ACCOUNT		WORK PACKAGE		TASK PACKAGE		DETAIL	
Plot Date	2SEP94	Activity Bar/Early Date	[Symbol]	COLD		Sheet 1 of 1		IMS1 (COLD) Update thru Sep 1, 1994	
Date Date	1SEP94	Critical Activity	[Symbol]	FUEL/SLUDGE RETRIEVAL/PKG (WIEMERS)		Cold Test Facility (Fredrickson)		Date	Revision
Project Start	1SEP94	Progress Bar	[Symbol]	Near Term Schedule Review				Checked	Approved
Project Finish	28NOV97	Milestone/Flag Activity	[Symbol]						
(c) Primavera Systems, Inc.									

FIGURE 2



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Activity Classification: SUMMARY LEVEL

■ COST ACCOUNT

▨ WORK PACKAGE

▩ TASK PACKAGE

▧ DETAIL

Plot Date 2SEP94
 Data Date 1SEP94
 Project Start 1SEP94
 Project Finish 28NOV97

Activity Bar/Early Dates
 Critical Activity
 Progress Bar
 Milestone/Flag Activity

COLD

Sheet 1 of 1

FUEL/SLUDGE RETRIEVAL/PKG (WIEMERS)
 Cold Test Facility (Fredrickson)
 Long Term Schedule Review

IMS1 (COLD) Update thru Sep 1, 1994

Date	Revision	Checked	Approved