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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

608182

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1,2	1	Cog.Eng. S. A. Brisbin	<i>S. A. Brisbin</i>	11/4/94	NT-21						
1,2	1	Cog. Mgr. C. J. Alderman	<i>C. J. Alderman</i>	11/4/94	NT-21						
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RELEASE AUTHORIZATION

Document Number: WHC-SD-SNF-WP-010, Revision 0

Document Title: Work Plan for Integrated Sludge Packaging Demonstration

Release Date: November 7, 1994

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

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11/7/94

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SUPPORTING DOCUMENT		1. Total Pages 9
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5. Key Words sludge, packaging, cold-testing, K-Basin, hot test	6. Author Name: S. A. Brisbin <div style="margin-top: 5px;"> Signature </div> <div style="margin-top: 5px;"> Organization/Charge Code 2C130/LL23A </div>	
7. Abstract <p style="margin-top: 10px;">This document describes the activities that will be performed in support of the integrated sludge packaging demonstration.</p> <div style="text-align: center; margin-top: 40px;"> DISCLAIMER </div> <p style="margin-top: 20px;">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, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness 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. 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>		
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WORK PLAN FOR INTEGRATED SLUDGE PACKAGING DEMONSTRATION

1.0 INTRODUCTION

This document describes the tasks which will be performed to support the hot demonstration of the integrated sludge packaging system.

2.0 SCOPE

This activity will be performed in three phases: Phase 1 will consist of testing component and sub-system performance using a surrogate sludge, Phase 2 will consist of cold testing the integrated sludge packaging system using a surrogate sludge, and Phase 3 will consist of the hot demonstration of the integrated sludge packaging system.

3.0 DESCRIPTION

3.1 PHASE 1 TESTING

3.1.1 Objectives

The objectives of Phase 1 testing include the following:

- Develop a method for determining when the sludge collection container is full.
- Define the sludge collection system.
- Determine the filterability of the "fine" fraction of the surrogate sludge. If the "fines" are not filterable, determine the appropriate flocculent or filter aid to allow the "fines" to be filtered, the efficiency of hydroclones in separating the "fines" and producing a "clear" overflow, and the efficiency of using "polishing filters" downstream of the hydroclones.
- Determine handling characteristics of the sludge.

3.1.2 Description

Various components including pumps, containers, hydroclones, vacuum heads, and filters will be used to meet the Phase 1 objectives identified above. Components will be connected in a manner which allows for addition of new equipment, removal or replacement of ineffective equipment, and

interchanging of components. The solids make-up of the surrogate sludge used during testing is as follows:

Pea Gravel: 35-45% weight/weight
Sandbox Sand: 50-60% weight/weight
Fly Ash: 5-10% weight/weight

Design/procurement of components for Phase 1 testing will be performed by the Scientific Ecology Group (SEG). System design will be performed by Equipment Engineering with technical assistance by SEG.

Phase 1 testing will be performed using the secondary test pools located outside the 305 Test Facility.

Phase 1 testing is considered "Development Testing" as defined in WHC-SD-SNF-TP-007, *Test Plan for Sludge Retrieval and Packaging*. As such, a 305 Work Plan (or Plans) will be completed for Phase 1 testing. Sketches will be developed as necessary. Data obtained during Phase 1 testing will be recorded in a controlled logbook.

3.2 PHASE 2 TESTING

3.2.1 Objectives

The objectives for Phase 2 testing include the following:

- Demonstrate that a surrogate sludge can be collected by the system derived from Phase 1 testing.
- Optimize the sludge collection system.
- Identify any secondary waste streams and estimate any secondary waste volume.
- Determine the optimum pulp density, if any, for sludge collection operations.
- Evaluate a potential sludge container for ease of operation (i.e., container transfer, head removal, and maximum collection volume).
- Establish the operating parameters that will be required for hot testing and use those parameters for acceptance testing the system at the cold test facility. This will allow for comparison of data generated during Phase 2 with data generated during Phase 3.
- Provide for training and qualification of operations personnel who will be hot testing the integrated sludge packaging system.

3.2.2 Description

The system developed during Phase 1 testing will be evaluated during

Phase 2 testing. Again, components will be connected in a manner which allows for system modification as required to optimize performance. Phase 2 testing will utilize the same surrogate sludge as used for Phase 1 testing.

Phase 2 testing will be performed using the main test pool located within the 305 Building.

Phase 2 testing is considered "Acceptance Testing" as defined in WHC-SD-SNF-TP-007, *Test Plan for Sludge Retrieval and Packaging*. For Phase 2 testing, WHC-SD-SNF-TC-001, *Test Procedure Forms for Sludge Retrieval and Packaging*, will be used. Acceptance test criteria will be defined by Equipment Engineering with input from SEG and K-Basin Operations.

Since modifications may be required to optimize system performance, sketches controlled in accordance with EP-2.4, "Development Control Requirements," will be used for Phase 2 Testing. Following Phase 2 testing, those sketches will be released as "SK drawings."

3.3 PHASE 3 TESTING

3.3.1 Objectives

The objectives for Phase 3 testing include the following:

- Demonstrate that the integrated sludge packaging system selected during Phase 2 will process the K-Basin sludge.
- Obtain operating data, including personnel exposure data. The system will be evaluated to maintain worker exposure as low as reasonably achievable (ALARA).
- Complete the necessary documentation to install the system in the K-Basin.

3.3.2 Description

The system cold tested in Phase 2 will be installed in the K-Basin and "hot tested" using actual sludge. An engineering study will be performed by SNF Engineering Support to determine the location within K-Basin to install the integrated sludge packaging system. Facility modifications will be performed as necessary to facilitate this "hot test." Facility modifications will likely include, but not be limited to, grating modifications to allow for installation and operation of the system, monorail modifications, and rerouting of power and building air.

Phase 3 testing and supporting facility modifications will be controlled in accordance with K-Basin Conduct of Operations.

3.4 EVALUATION OF INTEGRATED SLUDGE PACKAGING SYSTEM

Following Phase 3 testing, a final test report will be issued. The final test report will include a comparison of Phase 2 and Phase 3 test results as well as an evaluation of overall equipment performances. Data contained in the final test report will provide information for stimulant development and technical specifications for procurement.

4.0 ORGANIZATION

4.1 EQUIPMENT ENGINEERING

Cognizant Engineer: S. A. Brisbin
Cognizant Manager: C. J. Alderman

Equipment Engineering is responsible for the following:

- Providing overall direction concerning development and testing of the Integrated Sludge Packaging System.
- Providing acceptance criteria for test activities.
- Issuing work plans, test procedures, test reports, and other required documentation, as required.
- Interfacing with K-Basin Engineering, Operations, and training personnel, as required.
- Initiating documentation required for installation of the integrated sludge packaging system into the K-Basin.
- Ensuring facility modifications are completed prior to Phase 3 testing.
- Approving facility modifications which are performed in support of the integrated sludge packaging system demonstration.

4.2 SCIENTIFIC ECOLOGY GROUP (SEG)

Lead Engineer: Greg Wagner
Project Manager: C. D. May

The SEG is responsible for the following:

- Providing support for design and/or procurement of components which will be used for test activities.
- Assisting in defining acceptance criteria for each test phase.

- Providing technical support for the design of the Integrated Sludge Packaging System.

4.3 SNF ENGINEERING SUPPORT

Manager: J. I. Dearing

SNF Engineering Support is responsible for the following:

- Performing an engineering study to determine the best location within the K-Basin for installing the integrated sludge packaging system and providing a recommendation.
- Preparing designs for facility modifications and providing required change documentation.

5.0 SCHEDULE

The following assumptions were used for schedule development:

- Required components will be available for testing prior to 12/94.
- Environmental conditions will be suitable for outdoor testing during the scheduled Phase 1 test period.
- The 305 Test Facility main test pool will be available for Phase 2 testing by 12/5/94.
- K-Basin Training/Operations will provide training plans and support operator training during Phase 2.
- K-Basin Operations/Engineering will support Phase 3 testing and associated facility modifications.

11/09/94	Begin Phase 1 Testing
11/11/94	Identify Location for Phase 3 Testing
12/02/94	Complete Phase 1 Testing
12/08/94	Begin Phase 2 Testing
01/20/95	Complete Phase 2 Testing
03/03/95	Issue Acceptance Test Report
03/09/95	Begin Phase 3 Testing
04/30/95	Complete Phase 3 Testing
07/31/95	Issue Final Test Report

6.0 COST

Following are estimated costs for completing this activity:

\$60K	Materials/Equipment
\$148K	SEG Support (Labor)
\$50K	305 Support (Labor)
\$40K	Engineering Support (Labor)
\$75K	Project Management

\$373K Total Estimated Cost

7.0 QUALITY ASSURANCE

7.1 PHASE 1

The approval designator for documents generated during Phase 1 is "NA" based on WHC-CM-3-5, *Document Control and Records Management Manual*, Section 12.7, "Approval of Environmental, Safety, and Quality Affecting Documents," Criteria T7.1.

7.2 PHASE 2

The following approval designators will be used for documents generated during Phase 2 testing:

- Test Documentation (i.e., test procedure and associated test report)--Q based on Criteria T5.2.
- Training Program Plans--S based on Criteria T3.10

7.3 PHASE 3

As documentation requirements for Phase 3 are identified, approval designators will be assigned based on the criteria defined in WHC-CM-3-5, Section 12.7, Table 1.

8.0 REFERENCES

WHC-CM-3-5, *Document Control and Records Management Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-6-1, *Standard Engineering Practices*, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-SNF-TC-001, *Test Procedure Forms for Sludge Retrieval and Packaging*, 1994, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-SNF-TP-007, *Test Plan for Sludge Retrieval and Packaging*, 1994, Westinghouse Hanford Company, Richland, Washington.