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1	1	Design Authority G. TARDIFF	<i>G. Tardiff</i>	3/30/00	55-05	1	1	J. E. ANDREWS	<i>J. Andrews</i>	3/30/00	55-04
		Design Agent N/A				1	1	J. BELLOMY	<i>J. Bellomy</i>	3/30/00	RS-83
1	1	Cog. Eng. D. BRAGG	<i>D. Bragg</i>	4/10/00	55-05	1	1	D. STENKAMP	<i>D. Stenkamp</i>	3/30/00	R2-88
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1	1	QA W. ADAMS	<i>W. Adams</i>	56-15	4/3/00						
1	1	Safety R. FOGG	<i>R. Fogg</i>	4/3/00	55-02						
		Env. N/A									

18. <i>D.M. Stenkamp</i> 3/30/00 D.M. STENKAMP Signature of EDT Originator Date	19. N/A Authorized Representative for Receiving Organization Date	20. <i>G. Tardiff</i> 3/30/00 G. TARDIFF Design Authority/Cognizant Manager Date	21. DOE APPROVAL (if required) Ctrl No. N/A <input type="radio"/> Approved <input type="radio"/> Approved w/comments <input type="radio"/> Disapproved w/comments
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Operational Test Report For The 241-AZ-101 Suspended Solids Profiler

Daniel M. Stenkamp, Maintenance Concepts

Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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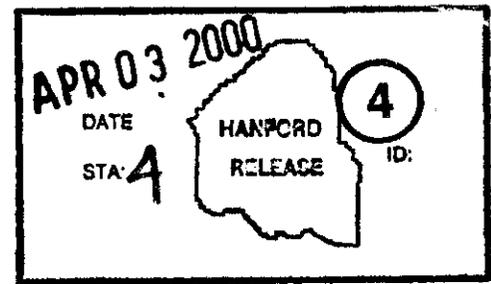
Key Words: Operational test report, Project W-151, RPP-6133, Suspended Solids Profiler

Abstract: This document comprises the Operational Test Report for the 241-AZ-101 Suspended Solids Profiler.

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Release Approval 4/3/00
Date



Release Stamp

Approved For Public Release

RPP-6133, Rev 0
Operational Test Report
For The 241-AZ-101
Suspended Solids Profiler

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ATTACHMENT 1

COMPLETED COPY OF OTP-260-005

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1.0 INTRODUCTION

This document presents the results of Operational Testing of the 241-AZ-101 Suspended Solids Profiler (SSP). Testing of the SSP was performed in accordance with OTP-260-005, "SUSPENDED SOLIDS PROFILER OPERATIONAL TEST PROCEDURE". The objective of the testing was to verify that all equipment and components functioned as designed, following construction completion and turnover to operations.

2.0 TEST DESCRIPTION

Testing of the SSP was accomplished in two days. Test procedure OTP-260-005 required four revisions prior to testing to incorporate Procedure Change Authorizations (PCA's) necessary to facilitate testing. Specific equipment tested by OTP-260-005 included the following:

- Suspended Solids Profiler
- SSP personnel computer and software
- One SSP control switch
- One SSP interlock/rake switch
- One SSP emergency stop switch

3.0 TEST RESULTS

All testing of the 241-AZ-101 SSP system was completed satisfactorily. No equipment operational or performance deficiencies were identified which would preclude safe operations.

During the course of testing, one test exception was identified. The problem identified on the test exception has been resolved and appropriately closed. The test exception is summarized on the next page.

Test Exception 1

Test exception 1 identified that the SSP computer did not save the data to a floppy disk.

Step 5.4.9.3 of the test procedure detailed the keystrokes required on the SSP computer for the SSP software program to "Send to Disk". This portion of the test was to verify that the data from the SSP could be saved electronically. Initial interpretation was that the "Send to Disk" statement on the SSP menu referred to a floppy disk. The vendor software "Send to Disk" statement refers to the computer hard disk. The data can then be copied from the hard disk to a floppy disk and printed as per step 5.4.10 of the test procedure. Therefore the system was accepted and no retest was required.

4.0 CONCLUSIONS

The test procedure is acceptable as written and performed. As a result of testing performed under OTP-260-005, it can be concluded that the SSP system is in a state of readiness that will support planned mixer pump test operations.

ATTACHMENT 1
COMPLETED COPY OF OTP-260-005

**SUSPENDED SOLIDS PROFILER
OPERATIONAL TEST PROCEDURE**

Last Full Revision: A-0
 Release Date: 03-16-2000
 USQ Screening Number: TF-00-010 R.0
 Approval Designator: ESQ

Current Modification: A-4
 USQ Screening Number: TF-00-0010, Rev 2
 Approval Designator: S
 PCA Incorporated: ETF-2000-118

POSITION/ORG	DELEGATE	DATE
NCO/Retrieval Ops	<u>S.R. Joseph</u>	<u>03-21-2000</u>
Manager/Retrieval Ops	<u>K.J. Anderson</u>	<u>03-21-2000</u>
Safety/CHG	<u>Kim Cutforth</u>	<u>03/21/2000</u>
Cog. Engineer	<u>David Braqq</u>	<u>03-21-2000</u>
Acceptance Review	<u>L. Ross</u>	<u>03-21-2000</u>
Approval Authority	<u>K.J. Anderson</u>	<u>03-21-2000</u>

Justification: Operations request for steps added to use water and a camera and step clarifications.

Summary of Changes:

Page 14, step 4.2: Added water and camera
 Page 16, step 5.1.1: Deleted steps performed by package
 Page 16, steps 5.1.2 and 5.1.4: Added steps for Raw Water
 Page 17, step 5.1.7: Added option to use installed camera
 Page 17, steps 5.1.9 and 5.1.10: Added initial electrical lineup
 Page 18, step 5.2.2: Added step to check water pressure
 Page 18, step 5.2.3: Added step
 Page 21, step 5.3.1: Added Warning and step to turn power off
 Page 22, steps 5.3.7 and 5.3.8: Added steps to restore power
 Page 23, step 5.4.1: Added option to use installed camera
 Page 23, step 5.4.4: Clarified Step
 Page 24, step 5.4.9: Added Step
 Page 24, step 5.4.10: Clarified Step
 Page 25, step 5.4.14: Clarified Step
 Page 25, steps 5.4.17, 5.4.21, 5.4.23 and 5.4.24: Added Steps
 Page 25, step 5.4.25: Clarified Step
 Page 26, Added valve RW-801-AZ-1 to Tables

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TEST EXECUTION SHEET

DATE: 3/24/00	DOCUMENT NUMBER: OTP-260-005	
DOCUMENT TITLE: SUSPENDED SOLIDS PROFILER OPERATIONAL TEST PROCEDURE		
TEST PERSONNEL (PRINT NAMES)		
TEST DIRECTOR: JE Andrews	RECORDER: JE Andrews	
OPERATIONS ENGINEER: JE Andrews		
TEST EXECUTION		
TEST DIRECTOR SIGNATURE/DATE: JE Andrews 3/24/00	TEST ENGINEER SIGNATURE/DATE: TW Staehr 3/24/00	
OPERATIONS ENGINEER SIGNATURE/DATE: JE Andrews 3/24/00	RECORDER SIGNATURE/DATE: JE Andrews 3/24/00	
APPROVAL AND ACCEPTANCE OF TEST RESULTS		
WITHOUT EXCEPTION ____ (✓)	WITH EXCEPTIONS RESOLVED ✓ (✓)	WITH EXCEPTIONS REMAINING ____ (✓)
TEST DIRECTOR SIGNATURE/DATE: JE Andrews 3/29/00	PROJECT MANAGER SIGNATURE/DATE: FOR TELECON ARB Ballantyne FOR. G. DUNNEAN	
TEST ENGINEER SIGNATURE/DATE: TW Staehr 3/24/00	QUALITY ASSURANCE SIGNATURE/DATE: WR Adams 3/29/00	
DESIGN AUTHORITY SIGNATURE/DATE: Serg R. Enloe 3/30/00	OPERATIONS ENGINEER SIGNATURE/DATE: Rich Stehney 3/30/00	
AUTHORIZED INSPECTOR SIGNATURE/DATE: S Enloe 3/30/00		

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

The purpose of this test is to provide a documented means of verifying that the functional components of the Suspended Solids Profiler operate properly.

1.2 SCOPE

The objective of the test is to verify the operation of the Suspended Solids Profiler using a manually controlled Rake Switch and to verify data collection using a stand alone software program.

2.0 INFORMATION

This procedure will be done in conjunction with an approved Job Control System Work Package. All limits and associated controls will be specified in the work package.

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2.1 RESPONSIBILITIES

2.1.1 Test Engineer is responsible for the following:

- Ensuring all preparations for this Test have been completed
- Support Test Director and Test Personnel with the technical information and support necessary to complete this procedure.

2.1.2 Test Director has the option to assign a designated Recorder to fulfill the following recording criteria.

- Record, check off, initial, enter N/A, and ensure verification signatures are obtained as each step and section completes.

2.1.3 Operation Personnel are responsible for operating the equipment per the Test Engineer and Test Directors direction.

2.1.4 QC Inspector is responsible for witnessing test execution and signing the completed sections of the test.

2.1.5 The Authorized Inspector is responsible for the following:

- Witnessing test execution
- Approval and signature of acceptance upon completion of this procedure.

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2.1 RESPONSIBILITIES (Cont).

2.1.6 Test Director is responsible for the following:

- The safe, efficient, and productive performance of the test
- Coordination of all testing activities
- Scheduling and conducting a pre-job meeting with test participants
- Notification of the persons performing and witnessing the test prior to the start of testing
- Notification of all involved test personnel when a change is made in the testing schedule
- Acting as liaison between the participants involved with the testing
- Stopping any test or section which may cause damage to the system
- Obtaining revisions to the Test Procedure, to comply with authorized field changes or to accommodate existing field conditions
- Taking actions to resolve exceptions to the Test Procedure
- Signing the Operational Test Procedure Exception Record when a test exception has been resolved
- Evaluating recorded data, discrepancies, and exceptions
- Signing Test Execution Sheet when this Test Procedure has been performed
- Signing Exception Record when a retest to clear an exception has been executed and accepted
- Obtaining required signatures on the Test Procedure Working Copy prior to reproduction and distribution
- Preparing and issuing an Operational Test Report for the approved, accepted and completed Test Procedure

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2.2 REFERENCES

Drawings

- H-2-68423, Sh. 1 Tank Riser Air Lift Circulator Details
- H-2-78948, Sh. 7-9 Elec./Inst. Equipment Interconnection Diagram
- H-2-78981, Sh. 3 Tank AZ-101 Junction Box JB156-01 Wiring diagram
- H-2-78982, Sh. 2 Control Console AZ-101-156 Assembly
- H-2-78983, Sh. 3,4 Console AZ-101-156 Wiring Diagram
- H-2-78984, Sh. 1,2 Console AZ-101-156 Cable Assemblies
- H-2-79212, Sh. 1,4,7,9 Elec/Instr/JB/Cnd Installation Tank AZ-101
- H-2-822934, Sh. 1-11 Suspended Solids Monitor Assembly
- H-2-825974, Sh. 1,2,3 Junction Box JB156-02 Assembly
- H-2-825882, Sh. 1,2 INSTM Junction Box Assemblies
- H-14-021807, Sh. 2 Raw water System RW O&M System P&ID

ECN # 710457

TO-040-540 Water Surveillance And Usage

Vendor Information

- Mt. Fury Company, *PROFILER SLUDGE BLANKET LEVEL DETECTOR & SUSPENDED SOLIDS MONITOR Installation, Operation and Maintenance Instructions*, Issaquah, Washington. VIN 0022515, Supp. 041

Other

- Procedure TO-020-265 latest revision
- USQ TF-97-0155 Rev. 1, *Installation of Suspended Solids Profiler Monitor on Aging Waste Tank AZ-101*
- *Flammable Gas Equipment Advisory Board Interpretation/ Recommendation Report*, FGEAB-97-038
- Staehr, T. W., 1996, *Decant Pump Assembly and controls Qualification Testing Test Report*, WHC-SD-ER3297-TRP-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington

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2.3 GENERAL INFORMATION

SUSPENDED SOLIDS PROFILER

- 2.3.1 The Mt. Fury Suspended Solids Profiler (SSP) is a microprocessor based suspended solids sensor with a stepping motor driven cable reel. The Suspended Solids Profiler is used commercially for the control of clarifiers and thickeners in waste treatment facilities by measuring the turbidity versus depth and also for determining the depth of the sludge blanket. The sensor uses a reflectance measurement principle to determine suspended solids concentrations. The Suspended Solids Profiler has been mounted in an enclosure assembly that was specially designed and fabricated for use on Hanfords underground storage tanks. The Suspended Solids Profiler was originally to be used to measure supernatant clarity during a decant and refill demonstration test in 1994, however the test was canceled. The Suspended Solids Profiler is currently planned to be used during mixer pump testing to provide data for determining sludge mobilization uniformity and settling rates.
- 2.3.2 The Suspended Solids Profiler system consists of two major components: (1) The Suspended Solids Profiler Assembly, and the Monitoring and Control System.
- 2.3.3 Suspended Solids Profiler Assembly
- Suspended Solids Profiler enclosure and shielding ball valve
 - Electronics box
 - Suspended solids sensor and motor driven cable reel
- 2.3.4 Monitoring and Control System
- Personal computer
 - External Rake Switch
 - Power and signal cables

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2.3 GENERAL INFORMATION (Cont).PROCEDURAL INFORMATION

- 2.3.5 All entries recorded in this procedure shall be made in black ink.
- 2.3.6 Procedural and technical requirement changes must be processed by Procedure Change Authorization in accordance with approved procedures. If a need for such a change is discovered in the course of running the test, the applicable portion of the test shall be stopped, and the test equipment shall be placed in a safe configuration, until the Procedure Change Authorization is approved. However, this does not prevent the running of another portion of the test unaffected by the change.
- 2.3.7 Operational Test steps detailed in individual Tests in Section 5.0 shall be performed sequentially, unless otherwise noted or as directed by the Test Director.
- As each step is completed, each step will be checked off (or enter "N/A" for), as required in the spaces provided on the Working Copy of this Operational Test Procedure
 - Any step that requires verification of data must include recording data on the Working Copy.
- 2.3.8 Any non-conformance of the instrumentation, unexpected results or exceptions during testing shall be sequentially numbered and recorded in the Operational Test Procedure Exception Log and on individual Operational Test Procedure Exception Records. Thus, case-by-case resolution, recording, approval, and distribution of each exception will be achieved.

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2.4 GENERAL INFORMATION (Cont).

2.3.9 Resolve test exceptions in the following manner:

- Record the action taken to resolve each exception in the "Resolution of Exception" section of the Operational Test Procedure Exception Record.
- When the action taken results in an acceptable retest, initial and date the Correction Approval section of the Exception Sheet
- When the action taken does not result in an acceptable retest, provide a detailed explanation of why the retest action was not acceptable, and what additional plans are required. The Test Engineer then signs and dates the Resolution of Exception section of the Operational Test Procedure Exception Record, and obtains any other approvals required.

2.3.10 Upon completion of the Operational Test Procedure, obtain approval of the test performance. Each Test Execution Sheet will stand alone as approval for the system under test. The Operational Test will be complete when all the outstanding tests have been performed and the Operational Test Report is prepared. The test will be approved by checking the proper response, with or without exceptions, on the Test Execution Sheet under the "Approval and Acceptance of Test Results" section of the Test Execution Sheet.

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2.4 GENERAL INFORMATION (Cont).

2.3.11 The following steps detail the possible conditions that may exist at the completion of the Operational Test Procedure, and the steps necessary to complete acceptance in those conditions.

2.3.11.1 The completed test may be approved without test exceptions:

- Check applicable space on Test Execution Sheet to show that the Operational Test Procedure has been performed and no exceptions have been recorded
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Operational Test Procedure to the client.

2.3.11.2 The completed test may be approved with exceptions resolved:

- Check applicable space on Test Execution Sheet to show that this procedure has been performed with exceptions recorded and resolved
- Appropriate individual Test Performers will sign and date the Test Execution Sheet in the spaces provided
- Distribute requisite copies as directed by the client
- Send the Master Copy of the completed Operational Test Procedure to the client.

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2.4 RECORDS

- 2.4.1 All personnel involved in the performance of this test shall sign in Procedure Signature Sheet.
- 2.4.2 Test results shall be recorded. Unless specific data is required, the signature or initials as applicable, of the person accepting the item will be entered in the blank provided to indicate compliance with the stated requirements or the successful completion of the given test step. Errors shall be corrected by crossing out the incorrect data with a single line and the correct response shall be written in the direct vicinity of the original item. The person making the correction shall initial and date the correction. A complete working copy of this procedure and any exception records generated shall be maintained as a permanent record.
- 2.4.3 An Exception Log and Exception Record sheet is attached in the event exceptions to the test are made when the test is being performed. All exceptions to the test are to be dispositioned and agreed to by all witnesses. Actions taken regarding disposition are noted on the exception sheet. During the performance of this test, errors in test may be encountered which require correction or adjustment to complete the test. Such corrections are to be noted in the Operational Test Procedure and listed as an exception.
- 2.4.4 All profiles taken in this test procedure are to be maintained by Test Engineer.

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3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

- 3.1.1 Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment.
- 3.1.2 Test Director shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation.
- 3.1.3 Any hazard identified during the performance of the procedure shall be reported to the Test Director IMMEDIATELY.
- 3.1.4 A daily shift safety briefing will be held with all test participants.
- 3.1.5 Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the Test Director.

3.2 RADIATION AND CONTAMINATION CONTROL

- 3.2.1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by a general radiation work permit.
- 3.2.2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactive area, then an approved Job Control System work package must be developed which is reviewed by Radiological Control per the ALARA procedure HNF-IP-0842, Volume VII, Section 17.1.

3.3 LIMITS

This procedure will be done in conjunction with an approved Job Control System Work Package. All limits and associated controls will be specified in the work package.

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4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

Items Provided:

- Suspended Solids Profiler assembly
- Operator PC and monitor
- DATA_PRO Software program

Procured Items

- Electrical 2 position Rake Switch (Ref. ECN-629838 pg 10, dwg. H-2-78982, sh 2, Items 85 & 86)
- Signal cable assembly, 50 feet (Ref. ECN-629838 pg 14, dwg. H-2-78984, sh 2, Item 12)
- Power cable assembly, 50 feet (Ref. ECN-629838 pg 14, dwg. H-2-78984, sh 2, Item 13)
- Computer cable assembly, 50 feet (Ref. ECN-629838 pg 13, dwg. H-2-78984, sh 1, Item 11)
- Electrical insulating putty (Ref. ECN-629838 pg 21, dwg. H-2-822934, sh 1, See note 12)

4.2 PERFORMANCE DOCUMENTS

The following procedures may be needed to perform this procedure:

- TO-020-265 "PERFORM MCCS SURVEY OF SINGLE SHELL OR DOUBLE SHELL WASTE STORAGE TANKS EAST AREA".
- TO-040-540 "WATER SURVEILLANCE AND USAGE".
- TO-260-210 "OPERATE 241-AZ-101, WASTE TANK COLOR VIDEO SYSTEM"

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5.0 PROCEDURE

CAUTION

Care should be taken to not damage the flush spray ring. Do not step on, lean equipment or tools on, or in any way damage the spray ring.

5.1 TEST SET UP

NOTE - Installation of Suspended Solids Profiler is accomplished in an approved Job Control System work Package.

Jg 5.1.1 ENSURE the following items have been accomplished.

- ~~• Installation of Suspended Solids Profiler assembly on tank 101 AZ riser 24 A.~~
- ~~• Power cables installed to power source.~~
- ~~• Signal cable wires to Rake Switch and to computer cable have been installed.~~
- Computer cable to Personal computer has been installed.
- ~~• Power and instrument cables to the Suspended Solids Profiler have been installed.~~

~~NOTE - Water supply must be a minimum of 4 gpm at 40-100 psi.~~

- Water supply to the Suspended Solids Profiler spray wash ring assembly has been installed including all necessary hoses from 801 AZ bldg. to the SSP Unit.

Jg 5.1.2 ENSURE Raw water is lined up to 801-AZ per procedure TO-040-540.

Jg 5.1.3 RECORD initial flow meter reading from AZ-101-SSP-FM-1, Located at 801 AZ Bldg.

000000.2 gal.

Jg 5.1.4 RECORD the initial water reading on the RAW WATER USAGE DATA SHEET(s) from procedure TO-040-540.

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5.1 TEST SET UP (Cont).

Ja 5.1.5 ENSURE the DATA PRO software program is loaded in the Personal computer.

Ja 5.1.6 TAKE liquid level reading from Enraf located on riser 22A AND

RECORD liquid level reading below.

309.12"
Liquid Level Reading

Ja 5.1.7 ENSURE temporary camera system is installed in location per Test Directors direction using the latest rev. of procedure TO-020-265 "PERFORM MCCS SURVEY OF SINGLE SHELL OR DOUBLE SHELL WASTE STORAGE TANKS EAST AREA"

OR

ENSURE the 241-AZ-101 Waste Tank Color Video System is operating per TO-260-210.

Ja 5.1.8 ENSURE valve AZ101-SSP-5 is OPEN

Ja 5.1.9 ENSURE the "AUTO RAISE STOP LOWER" switch is in the "STOP" position.

Ja 5.1.10 ENSURE BREAKER #5, SUSPENDED SOLIDS CABINET, located in PANELBOARD EDS-DP-706 on AZ101 Mixer Pump Pad in the ON position.

*Section 5.1 acceptable
PAW 3-24-00*

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5.2 TEST E-STOP AND STOP FUNCTIONS

NOTES - The camera may be used to watch the probe lower, stop, and raise during this section.

- The probe should begin to lower after performing the following step.

- ja* 5.2.1 ENSURE Valve Line-Up is complete per Table I.
- je* 5.2.2 ENSURE 40-100 psi is indicated on PRESSURE INDICATOR, at downstream side of PRESSURE REGULATOR AZ-101-SSP-PR-1, located inside of BUILDING 241-AZ-801A.
- ja* 5.2.3 ENSURE the "E-STOP" button (AZ101-WST-PB-101) located on the stand next to SSP is "PULLED OUT".
- ja* 5.2.4 POSITION the "AUTO RAISE STOP LOWER" switch to the "LOWER" position.
- ja* 5.2.5 ALLOW the probe to lower into tank dome space AND PUSH in the "E-STOP" button (AZ101-WST-PB-101) located on the stand next to SSP.
- je* 5.2.6 ENSURE the probe has stopped.
- je* 5.2.7 POSITION the "AUTO RAISE STOP LOWER" switch to the "RAISE" position.
- ja* 5.2.8 PULL out the "E-STOP" button (AZ101-WST-PB-101) located on the stand next to SSP.
- je* 5.2.9 ENSURE the probe has begun to "RAISE" AND The Flush system flow meter is indicating flow.
- je* 5.2.10 WHEN the probe reaches a point just prior to its entry into the housing box, PUSH in "E-STOP" button.
- ja* 5.2.11 ENSURE the probe has stopped.
- ja* 5.2.12 POSITION the "AUTO RAISE STOP LOWER" switch to the "STOP" position.
- ja* 5.2.13 PULL out "E-STOP" button.
- ja* 5.2.14 REPEAT steps 5.2.4 - 5.2.13 one time AND CONTINUE in this procedure.

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5.2 TEST E-STOP AND STOP FUNCTIONS (Cont).

NOTE - The probe should begin to lower after performing the following step.

- Ja* 5.2.15 POSITION the "AUTO RAISE STOP LOWER" switch to the "LOWER" position.
- Ja* 5.2.16 ALLOW the probe to lower into tank dome space AND POSITION the "AUTO RAISE STOP LOWER" switch to the "STOP" position.
- Ja* 5.2.17 ENSURE the probe has stopped.
- Ja* 5.2.18 POSITION the "AUTO RAISE STOP LOWER" switch to the "RAISE" position.
- Ja* 5.2.19 ENSURE the probe has begun to "RAISE" AND The Flush system flow meter is indicating flow.
- Ja* 5.2.20 WHEN the probe reaches a point just prior to its entry into the housing box, POSITION the "AUTO RAISE STOP LOWER" switch to the "STOP" position.
- Ja* 5.2.21 ENSURE the probe has stopped.
- Ja* 5.2.22 REPEAT steps 5.2.15 - 5.2.21 one time AND CONTINUE in this procedure.
- Ja* 5.2.23 POSITION the "AUTO RAISE STOP LOWER" switch to the "RAISE" position.
- Ja* 5.2.24 ENSURE When Probe is returned to the fully retracted position, it automatically stops.
- Ja* 5.2.25 With the probe in the fully retracted position, SWITCH the Motor Control Switch to the " STOP" position.

*Section 5.2 acceptable
PAW 3-24-00*

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5.3 OPERATION TEST SET UP

NOTE - Calculation information:

Top of flange on riser 24A elevation = 672.66
(Ref Dwg.H-2-687372)

Bottom of tank elevation = 616.54 (Ref.Dwg. H-2-67317)
Profiler plate and spool piece length = 3.83'
(Ref Dwg.H-2-822934)

Probe length = .7' (Ref Dwg.822934)

- For Bottom calculation subtract 3' to stay approximately 36" off bottom of tank.

SEE FIGURE II

Distance to bottom = 58.75'

Distance to water = 59.95' - (Enraf level Reading)

Distance To Water = $\frac{59.95' - \text{ENRAF Reading}}{25.76} = 34.2$

Depth Of Water = $\frac{\text{ENRAF reading} - 3'}{25.76 - 3} = \frac{31.25}{22.8} = 22.8$

Handwritten calculation:
12 $\overline{) 309.12}$
24
69
60
9.1
84
12

Handwritten notes:
12
7
84

Handwritten calculation:
 $\frac{59.95}{25.76} = 34.19$

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5.3 OPERATION TEST SET UP (Cont).

NOTE - When setting the dials for distance and depth parameters, the places are tens, ones and tenths. Therefore a setting of 99.9 feet would be dialed in as 999 on profiler dials.

WARNING

Suspended Solids Profiler main power is supplied from Panelboard EDS-DP-706 Ckt. # 5 Located at 241-AZ-101. This controls the 110 V Power to the Suspended Solids Profiler. There is still the potential for low voltage signal circuits to be energized in the cabinet.

- Ja 5.3.1 PLACE BREAKER #5, SUSPENDED SOLIDS CABINET, located in PANELBOARD EDS-DP-706 on AZ101 Mixer Pump Pad in the OFF position.
- Ja 5.3.2 On Suspended Solids Profiler, SET applicable dials to the above calculated level settings. (Ref Figure 2)
- Ja 5.3.3 ENSURE dip switches S2 are configured in the following positions:

Switch	Position	Description
1	Closed	Profiler is communicating with a supervisory computer and has the Profilers address set on the rotary switch.
2	Open	Relay contact configured for SSP Failure Alarm
3	Closed	Relay contact configured for SSP Failure Alarm
4	Closed	Relay contact configured for SSP Failure Alarm
5	Open	4-20mA output is internally controlled
6	Open	4-20mA output is proportional to sludge blanket depth as a percentage of the range set on WATER DEPTH. The output is 100% (20 Ma) if the sludge blanket is at the deepest point measured, equal to DISTANCE TO WATER added to WATER DEPTH.
7	Open	"Rake Switch" close/open sequence is necessary to start profiles.
8	Closed	4-20mA output is proportional to sludge blanket depth, with no sludge blanket generating a 4mA output and a sludge blanket depth equal to WATER DEPTH generating a 20mA output.

5.3 OPERATION TEST SET UP (Cont).

- JK* 5.3.4 SET the TIME rotary dial to ~~09-8.5~~ mins. This is the minimum time required for the profiler to complete its measurement cycle.
- JK* 5.3.5 SET the SETPOINT rotary dial to ~~99-0~~. This setting will allow the profiler to read suspended solids concentration of up to a maximum of approximately 6%.
- JK* 5.3.6 SET the ADDRESS rotary dial to ~~50-0~~. This is the default setting that is used when the profiler is used in the failure alarm configuration.
- JK* 5.3.7 ENSURE the "AUTO RAISE STOP LOWER" switch is in the "STOP" position.
- JK* 5.3.8 ENSURE BREAKER #5, SUSPENDED SOLIDS CABINET, located in PANELBOARD EDS-DP-706 on AZ101 Mixer Pump Pad in the ON position.

*Section 5.3 acceptable
PAW 3-24-00*

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5.4 SUSPENDED SOLIDS PROFILER OPERATION TEST

WARNING

Suspended Solids Profiler main power is supplied from Panelboard EDS-DP-706 Ckt. # 5 Located at 241-AZ-101. This controls the 110 V Power to the Suspended Solids Profiler. There is still the potential for low voltage signal circuits to be energized in the cabinet.

ja 5.4.1 ENSURE temporary camera system is installed per procedure TO-020-265 "PERFORM MCCS SURVEY OF SINGLE SHELL OR DOUBLE SHELL WASTE STORAGE TANKS EAST AREA"

OR

ENSURE the 241-AZ-101 Waste Tank Color Video System is operating per TO-260-210.

ja 5.4.2 ENSURE valve LINE UP is complete per Table I.

ja 5.4.3 ENSURE the software program is running on the Operators Computer.

ja 5.4.4 ~~With the probe in the fully retracted position, SWITCH~~ the Motor Control Switch to the "AUTO" position.

- NOTE -
- The probe spray wash should automatically activate as the probe is being raised.
 - The probe should raise to the fully retracted position.
 - If profiler is left in auto position then operation of Rake Switch is not necessary. If control switches have been switched to anything other than auto since the last run of the profiler then the Rake Switch must be operated twice to start the sequence.

ja 5.4.5 INITIATE the operation of the profiler by CLOSING AND OPENING (Activating) the Rake Switch located on Mixer Pump Control Console, in AZ-156 building, twice.

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5.4 SUSPENDED SOLIDS PROFILER OPERATION TEST (Cont)..

NOTE - Test Engineer may choose to change the parameters of the software at any time during this procedure to determine the amount, duration, and frequency of profile data collection.

Ja 5.4.6 IF tank conditions permit, USE camera system to visually ensure probe is submerged in waste. (Ref. Figure 1)

Ja 5.4.7 IF probe is NOT submerged OR submerged too deep then MAKE appropriate adjustments to depth settings per Test Engineer direction.

NOTE - The probe should continue to automatically lower and stop to make measurements until a total of 20 measurements are taken.

Ja 5.4.8 ENSURE that profile readings are displayed at the Suspended Solids Profiler Personal computer monitor using the alphanumeric screen and graphics screen in AZ-156 building.

Ja 5.4.9 SAVE SUSPENDED SOLIDS PROFILER system data, as follows:

5.4.9.1 PRESS <Esc> key AND
CHECK that the "Type a Number" menu is displayed.

5.4.9.2 PRESS <3> key (View Data File) AND
CHECK that the "RISER 24 A SSP" screen is displayed.

5.4.9.3 PRESS the <2> key (Send to Disk) on the "RISER 24 A SSP" menu.

Ja 5.4.10 REQUEST Test Engineer retrieve ~~RECORD~~ electronically and hard copy of all profile data taken.

NOTE - After the final measurement has been taken, the probe should automatically begin to raise. The probe should raise to the fully retracted position and stop when it touches the contact plate. The probe spray wash should automatically activate as the probe is being raised.

Ja 5.4.11 ENSURE the flushing system activates as probe starts to raise.

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5.4 SUSPENDED SOLIDS PROFILER OPERATION TEST (Cont).

- JG* 5.4.12 WHEN probe has raised above the waste level, AND entered into dome space, POSITION the "AUTO RAISE STOP LOWER" switch to the "STOP" position.
- JG* 5.4.13 PERFORM steps 5.2.15 - 5.2.21 in any order, as many times as necessary per Test Director or HPT, to FLUSH cable and probe.
- JG* 5.4.14 POSITION the "AUTO RAISE STOP LOWER" switch to the "RAISE" "AUTO" position.
- JG* 5.4.15 ENSURE the probe stops raising when it touches the contact plate.
- JG* 5.4.16 ENSURE the flush system deactivates after probe stops on contact plate.
- JG* 5.4.17 POSITION the "AUTO RAISE STOP LOWER" switch to the "STOP" position.
- JG* 5.4.18 BLEED OFF flush system pressure, in accordance with Valve Line-Up Table II.
- JG* 5.4.19 ENSURE Valve Line-Up is complete per Table III.
- JG* 5.4.20 RECORD flow meter reading from AZ-101-SSP-FM-1, located at 801 AZ Bldg.
90.3 gal.
- JG* 5.4.21 RECORD the final water reading on the RAW WATER USAGE DATA SHEET(s) from procedure TO-040-540.
- JG* 5.4.22 ENSURE hoses are disconnected.
- JG* 5.4.23 PLACE BREAKER #5, SUSPENDED SOLIDS CABINET, located in PANELBOARD EDS-DP-706 on AZ101 Mixer Pump Pad in the OFF position.
- JG* 5.4.24 IF directed, SECURE raw water to 801-AZ per procedure TO-040-540.
- JG* 5.4.25 VERIFY Section 5.4-5.2 is completed satisfactorily.

JG Andrews 3/28/00
 Test Director Signature Date

JE Andrews
 Test Director Print Name

Paul A. Werner 3-29-00
 QA/QC Signature Date

Paul A. Werner
 QA/QC Print Name

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TABLES I, II, III

TABLE I VALVE LINE-UP FOR FLUSH

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.2.1.	INITIAL / DATE
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	OPEN	TKW 1 3/28/00
AZ101-SSP-1 At 801-AZ Bldg	OPEN	TKW 1 3/28/00
AZ101-SSP-2 At 801-AZ Bldg	OPEN	TKW 1 3/28/00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	TKW 1 3/28/00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	CLOSED	TKW 1 3/28/00

TABLE II VALVE LINE-UP FOR FLUSH SYSTEM VENTING

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.4.18.	INITIAL / DATE
AZ101-SSP-2 At 801-AZ Bldg	OPEN	SKJ 1 3/28/00
AZ101-SSP-1 At 801-AZ Bldg	OPEN	SKJ 1 3/28/00
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	CLOSED	SKJ 1 3/28/00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	SKJ 1 3/28/00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	OPEN	SKJ 1 3/28/00

TABLE III VALVE LINE-UP FOR FLUSH SYSTEM SHUTDOWN

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.4.19.	INITIAL / DATE
AZ-101-SSP-2 At 801-AZ Bldg	CLOSED	SKJ 1 3/28/00
AZ-101-SSP-1 At 801-AZ Bldg	CLOSED	SKJ 1 3/28/00
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	CLOSED	SKJ 1 3/28/00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	SKJ 1 3/28/00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	CLOSED	SKJ 1 3/28/00

TABLES I, II, III

TABLE I VALVE LINE-UP FOR FLUSH

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.2.1.	INITIAL / DATE
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	OPEN	ja 13/24/00
AZ101-SSP-1 At 801-AZ Bldg	OPEN	ja 13/24/00
AZ101-SSP-2 At 801-AZ Bldg	OPEN	ja 13/24/00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	ja 13/24/00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	CLOSED	ja 13/24/00

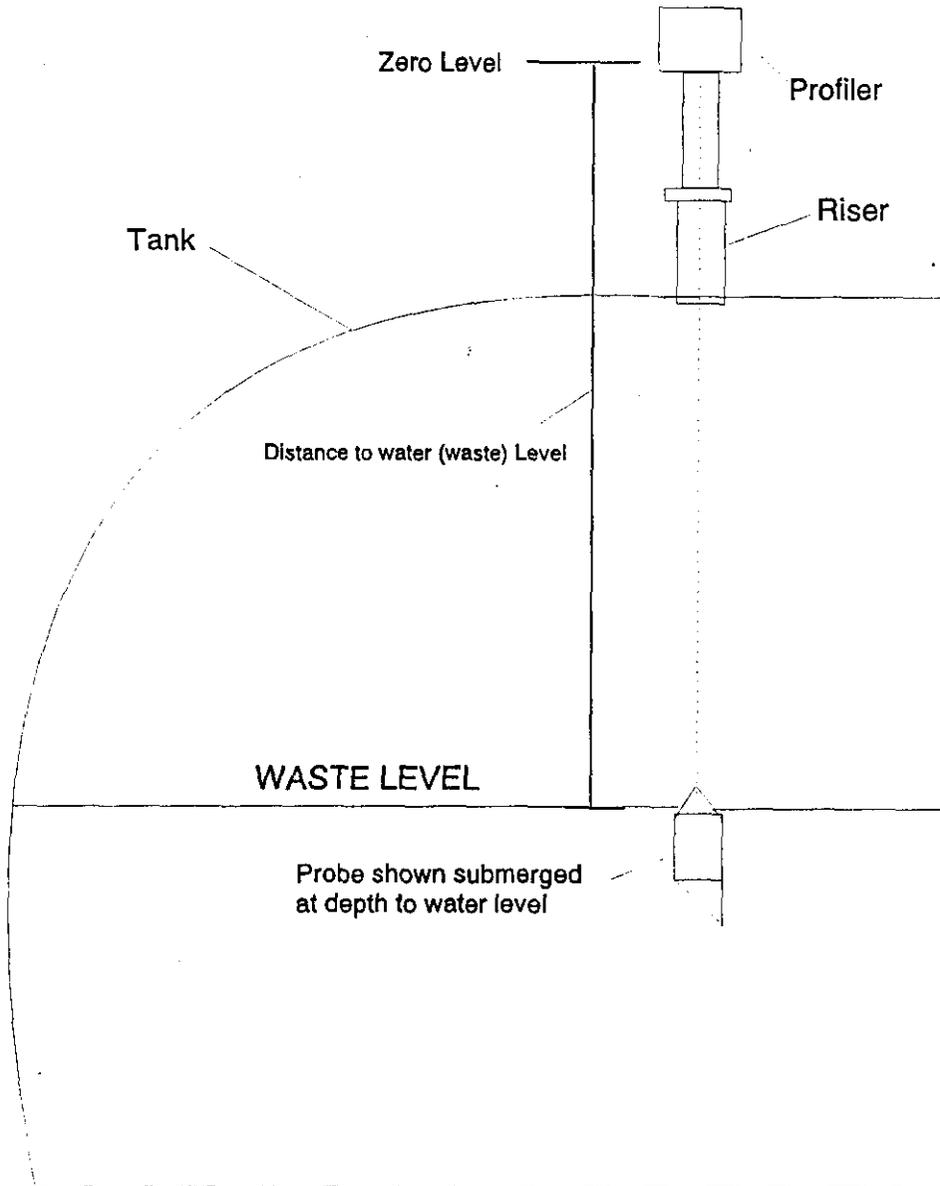
TABLE II VALVE LINE-UP FOR FLUSH SYSTEM VENTING

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.4.18.	INITIAL / DATE
AZ101-SSP-2 At 801-AZ Bldg	OPEN	DE 13-24-00
AZ101-SSP-1 At 801-AZ Bldg	OPEN	DE 13-24-00
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	CLOSED	DE 13-24-00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	DE 13-24-00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	OPEN	DE 13-24-00

TABLE III VALVE LINE-UP FOR FLUSH SYSTEM SHUTDOWN

VALVE ID. NUMBER	VALVE POSITION FOR STEP 5.4.19.	INITIAL / DATE
AZ-101-SSP-2 At 801-AZ Bldg	CLOSED	DE 13-24-00
AZ-101-SSP-1 At 801-AZ Bldg	CLOSED	DE 13-24-00
2" Gate Valve Inside 801-AZ Bldg. AZ801A-RW-V-103	CLOSED	DE 13-24-00
RW-801-AZ-1 at 801-AZ Bldg	CLOSED	DE 13-24-00
3/4" Gate Valve at hose connector 801-AZ Bldg. AZ801A-RW-V-104	CLOSED	DE 13-24-00

FIGURE 1

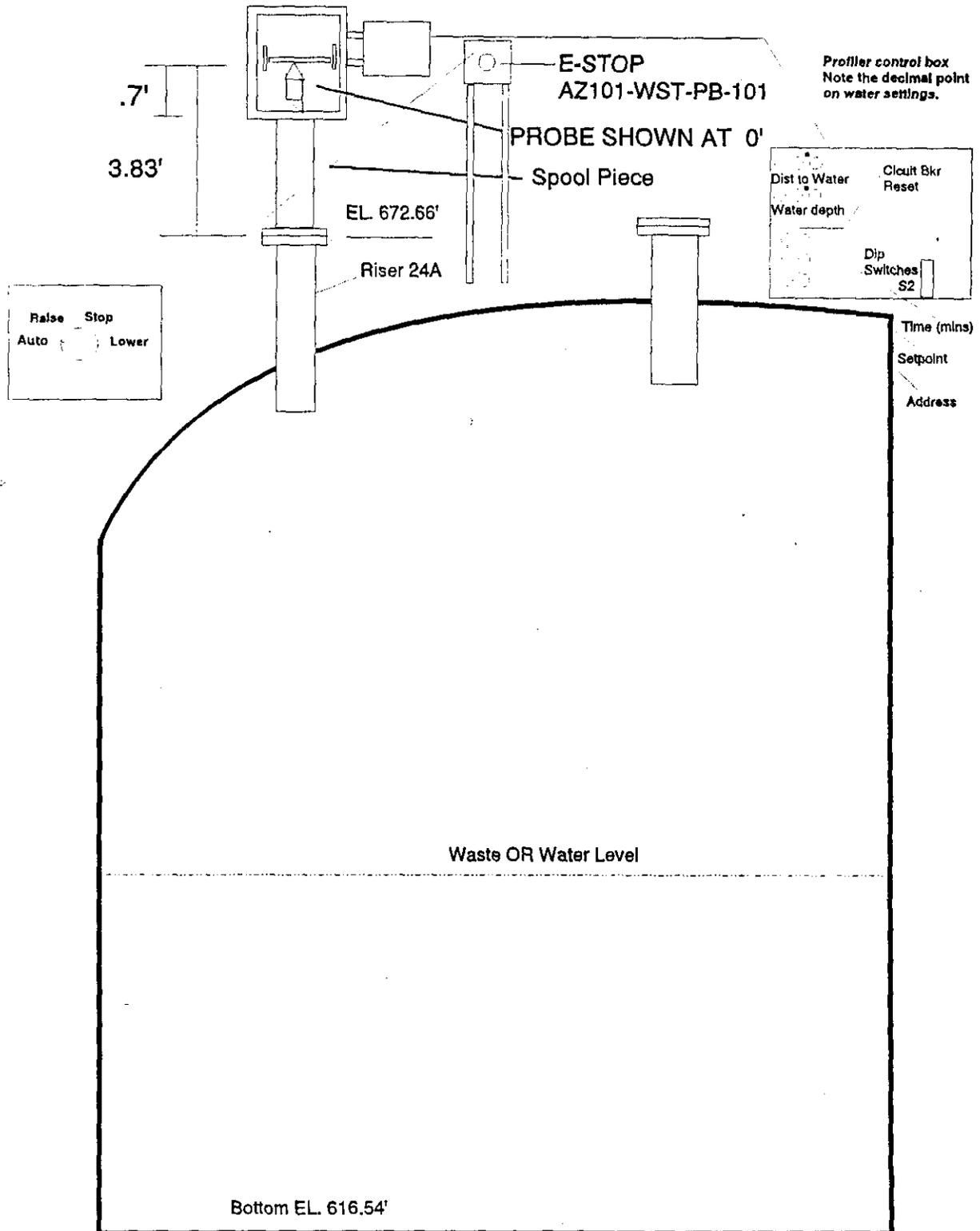


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FIGURE II



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OPERATIONAL TEST PROCEDURE PERFORMANCE LOG

This page may be reproduced as necessary. Page 1 of

OTP PERFORMANCE EVENT	DATE	INITIALS
Conducted Pre-job. Started OTP, completed sections 5.1, 5.2 and 5.3 with no exceptions	3/24/00	je
I witnessed steps 4.3.1 through 5.4.4.	3-24-00	PAW
Conducted Pre-Job. Commenced section 5.4 of test. During Lowering of probe in Auto it was noted that the flush system operated on the way down to waste surface. Once the probe reached the surface, the flush stopped. The flush did operate properly on the way up. One test exception was generated ^{3/28/00} One test exception was generated during the saving of the data in section 5.4.9 ^{5.4.9} 3/28/00 5.4.9. The data was not saved to a floppy disk as was originally planned, and then printed via computer and printer. The data	3/29/00	je

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OPERATIONAL TEST PROCEDURE EXCEPTION RECORD

This page may be reproduced as necessary. Page 1 of 1

OTP STEP NUMBER: <i>5.4.9</i>	OTP EXCEPTION LOG#: <i>1</i>
DESCRIPTION OF EXCEPTION: <i>Data Not saved to floppy disk per procedure</i>	
NAME / ORGANIZATION OF INITIATOR: <i>Jeff Andrews / ops</i>	
<i>Data was not copied to floppy disk as was expected. Data was saved to hard drive and then transferred to a floppy disk</i>	
DATE OF EXCEPTION: <i>3/28/00</i>	
RESOLUTION OF EXCEPTION: <i>SEE ATTACHED SHEET E-1</i>	
DATE OF RESOLUTION:	
TEST DIRECTOR SIGNATURE: <i>jeandh</i>	DATE: <i>3/29/00</i>
TEST ENGINEER SIGNATURE: <i>M Steele</i>	DATE: <i>3/29/00</i>
QUALITY ASSURANCE SIGNATURE: <i>W Adams</i>	DATE: <i>3/29/00</i>

Profiler #50
3/28/10 10:00
0Depth 0.00
Clarity 10720
Sta.0 10912
Sta.1 10720
Sta.2 1752
Sta.3 283
Sta.4 254
Sta.5 171
Sta.6 260
Sta.7 257
Sta.8 270
Sta.9 211
Sta.10 297
Sta.11 310
Sta.12 306
Sta.13 237
Sta.14 300
Sta.15 260
Sta.16 267
Sta.17 247
Sta.18 224
Sta.19 224

OTP-260-005 EXCEPTION #1

Resolution of Exception, Discussion

Test exception 1 identified that the SSP computer did not save the data to a floppy disk.

Step 5.4.9.3 of the test procedure detailed the keystrokes required on the SSP computer for the SSP software program to "Send to Disk". This portion of the test was to verify that the data from the SSP could be saved electronically. Initial interpretation was that the "Send to Disk" statement on the SSP menu referred to a floppy disk. The vendor software "Send to Disk" statement refers to the computer hard disk. The data can then be copied from the hard disk to a floppy disk and printed as per step 5.4.10 of the test procedure. Therefore the system was accepted and no retest was required.

E-1