Concentrate Tank System Operation

Tank Farm Plant Operating Procedure Effluent Treatment Facility

USQ Not Required – EFT is a < Hazard Category 3 Radiological Facility

<table>
<thead>
<tr>
<th>CHANGE HISTORY (≤ LAST 5 REV-MODS)</th>
</tr>
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<tbody>
<tr>
<td>Rev/Mod</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for operating the Concentrate Tank system at the ETF.

1.2 Scope

This procedure provides instructions for operating concentrate tanks in startup, receiving, pH adjustment, ready (feeding), flushing, and layup modes.

2.0 INFORMATION

2.1 Terms and Definitions

- AOV – Air-Operated Valve
- CT – Concentrate Tank
- EDTA – Ethylenediaminetetraacetic Acid
- gph – Gallons per Hour.

2.2 General Information

2.2.1 When switching from Manual to Auto, control valve setpoints will take on the current process value (i.e., equal to output value) of the controller while the system is in Manual. After returning the controller to Auto, it is necessary to re-enter the normal operating setpoint for Auto operation.

2.2.2 Dash placement in valve numbers is not consistent and may differ dependent on whether the user is looking at the valve in the field or on the MCS. See approved deviations in TFC-ENG-STD-12, Tank Farm Equipment Identification Numbering and labeling Standard.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - CT solution can be corrosive, and may cause chemical burns if personnel contact CT solution during sampling activity.

**WARNING** - Chemicals used for flushing operations may cause eye, skin, and respiratory tract irritation.

**WARNING** - Air pressure may be trapped in air line so caution must be exercised when disconnecting the line from the pump and air supply.

3.1.1 Upon completion of any portion of this procedure which requires PPE, personnel must inspect their PPE for caustic residue or other contaminates. If caustic residue or other contaminates are found or suspected, dispose of the PPE compliant with ETF waste management processes in accordance with ETF-65D-003, Package Waste.

3.1.2 All work will be performed in accordance with DOE 0359, Hanford Site Electrical Safety Program.

3.1.3 Operation of Circuit Breakers, Electrical disconnect Switches, and Similar Switching Equipment shall be performed by a qualified person.

3.1.4 Component operation requires completion of an Electrical Risk Assessment (ERA).

3.1.5 When the clean and inspects are current on the electrical equipment (breaker, switchgear, disconnects, motor starters, etc.), the ERA for normal operating condition is applicable, for those workers interacting with electrical equipment.

3.1.6 Use safety glasses and leather gloves when manipulating electrical components per the normal ERA.

3.1.7 When the clean and inspects are delinquent, the ERA for non-normal operating condition is applicable, for those workers interacting with electrical equipment.
3.2 Equipment Safety

CAUTION - Turning off the tank mixer when suspended solids are present in the brine can result in an excessive buildup of solids, which will cause corrosion and damage to equipment.

CAUTION - Placing the interlock in bypass with CT-A/B pH out of the required range may cause:
- Plugging of the dryer feed line and eventual bridging
- Release of ammonia to the environment.

CAUTION - Although unlikely, as the rad waste is added, heat may be generated due to heat of solution (with water) and/or heat of reaction (with concentrate).

CAUTION - The heat generated can raise the average solution temperature by as much as 90°F; it can raise the temperature much higher locally at the point of addition.

CAUTION - Excessive localized boiling and vaporization can result in instrument malfunction and tank corrosion.

CAUTION - If spray condenser level exceeds 100%, water may overflow into the VOG System.

3.2.1 Concentrate tank contents high in chlorides (such as groundwater) should be kept above pH 7.0 to prevent excessive corrosion. Periodically, when in receiving mode, the recirculation pump must be started and the pH adjusted.
3.3 Radiation and Contamination Control

3.3.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure, TFC-ESHQ-RP_RWP-C-03.

3.3.2 Rad risk screening and development of appropriate controls are performed in accordance with TFC-OPS-MAINT-C-01 and TFC-ESHQ-RP_RWP-C-03.

3.3.3 When disconnecting, breaching or opening systems or system components that currently contain or previously contained radioactive material, the following actions apply:

- HPT coverage is required
- Pre-job and post-job HPT surveys are required
- Contamination controls shall be implemented in accordance with ETF-02-001, until radiological verifications have been performed.

3.4 Environmental Compliance

3.4.1 In the event of a spill/leak/release, notify the SOM/FWS and respond per ETF-ERP-85B-003, Emergency Spill or Release at ETF.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Tetra-sodium EDTA (MSDS/SDS #060663)
- Tri-Sodium Phosphate (MSDS/SDS #068252)

For Sections 5.18 and 5.19, the following minimum PPE is required for IH:

- Laboratory coat
- Chemical boots.
- Rubber gloves
- Face shield
- Tight-fitting chemical goggles
- Chemical protective apron.

4.2 Performance Documents

The following documents may be needed to perform this document:

- A-6007-595, Hanford Site Electrical Risk Assessment
- ETF-05-002, ETF Field Sample Processing
- ETF-60I-008, Secondary Waste Receiving Tank Operation
- ETF-65D-003, Package Waste.
- ETF-65J-002, Sampling and Packaging
- ETF-95B-001, Seal Water System Operation
- TFC-ENG-STD-12, Tank Farm Equipment Identification Numbering and labeling Standard.
5.0 PROCEDURE

Special Instructions

Sections 5.3 through 5.35 may be performed in any logical order, concurrently and repeated as needed.

At direction of SOM, any equipment identified in this procedure may be placed in MANUAL and Setpoints/Outputs adjusted to facilitate system operation.

Sections of this procedure may be performed or omitted per process memo.

SOM determines component lineup requirements.

pH value range will be dictated by process memo.

The use of ( ) and [ ] represents (CT-A) and [CT-B].

Record any SOM direction in Control Room Logbook.

5.1 Valve Lineup Determination

5.1.1 (SOM) **DETERMINE** which valve lineup Checklists/Data sheets need to be performed.

5.1.2 (SOM) **IF** valves are known to be in the required position and do not require verification, **INITIAL/DATE AND DOCUMENT** reason in the comments section of the Checklist/Data Sheet.

5.1.3 (SOM) **IF** valves are not in the required position because of an existing process (i.e., LOTO, Caution Tag, Work Package, Administrative Lock, Facility Tag or Status Seals), **MARK N/A on the Checklist/Data Sheet AND** **INITIAL/DATE AND DOCUMENT** reason in the comments section of the Checklist/Data Sheet.
5.2 System Startup Alignments

5.2.1 DON PPE per appropriate ERA listed in Section 3.1.

5.2.2 ENSURE breaker alignment per Data Sheet 1.

5.2.3 ENSURE valve alignment per Data Sheet 2.

5.2.4 ENSURE AOV alignment per Data Sheet 3.

5.2.5 ENSURE circulation pumps (60J-P-1A), [60J-P-1B] in Auto.

5.2.6 ENSURE seal water is in operation and valved to CT recirculation pump to be operated per ETF-95B-001.
5.3 System Operation

NOTE - CT in steady READY feeds Thin Film Dryer. CT in RECEIVING receives Evaporator waste.

- CT in Feed and Receive simultaneously receives Evaporator waste and feeds the Thin Film Dryer. The CT in FEED AND RECEIVE will show as steady READY on the graphic. The CT not chosen for FEED AND RECEIVE may be placed in READY or SHUTDOWN mode as needed.

- Circulation pump will not operate if CT liquid level is less than or equal to 2.3%.

- CT operations are performed on graphic Conc unless otherwise indicated.

- Blinking Ready light indicates CT pH is outside range prescribed in process memo.

5.3.1 IF CT-A is to receive evaporator waste, PERFORM the following:

5.3.1.1 PLACE CT-A in RECEIVING.

5.3.1.2 PLACE CT-B in READY.

5.3.2 IF CT-B is to receive evaporator waste, PERFORM the following:

5.3.2.1 PLACE CT-B in RECEIVING.

5.3.2.2 PLACE CT-A in READY.

5.3.3 IF CT-A is to be operated in FEED AND RECEIVE mode, PERFORM the following:

5.3.3.1 SELECT HS FEED & RECEIVE USING TANK A (VD435329).

5.3.3.2 PLACE CT-B in READY or SHUTDOWN mode.

5.3.4 IF tank level additions are to be made through the tank spraying, PERFORM the following:

5.3.4.1 ENSURE (60H-089) [60H-091] is CLOSED.

5.3.4.2 OPEN (60H-033) [60H-032].

5.3.4.3 WHEN desired level is achieved per the process memo or SOM, CLOSE (60H-033) [60H-032].
5.3 System Operation (Cont.)

5.3.5 IF CT-B is to be operated in FEED AND RECEIVE mode, PERFORM the following:

5.3.5.1 SELECT HS FEED AND RECEIVE USING TANK B (VD435330).

5.3.5.2 PLACE CT-A in READY or SHUTDOWN mode.

5.3.6 WHEN level (LI-60J001A) [LI-60J001B] for CT feeding dryer reaches 6%, SWITCH the receiving CT to Ready AND ADJUST pH as needed per Section 5.10.

5.4 Mixer Operation

NOTE - The CT mixers (60J-BL-1A) [60J-BL-1B] are to be used when:

- The brine contains suspended solids such as gypsum [CaSO₄·2H₂O] and magnesium hydroxide [Mg(OH)₂], and/or
- Chemical reagents are being added and mixing better than what can be achieved with the eductor alone is needed.

- The mixers can be operated with or without tank recirculation pump (60J-P-1A), [60J-P-1B] ON.

5.4.1 CONFIRM the tank liquid level as indicated by (LI-60J001A), [LI-60J001B] is 39%.

5.4.2 START mixer (60J-BL-1A), [60J-BL-1B].

CAUTION

Turning off the tank mixer when suspended solids are present in the brine can result in an excessive buildup of solids, which will cause corrosion and damage to equipment.

5.4.3 IF suspended solids are present in the brine, DO NOT turn off tank mixer.

5.4.4 WHEN mixer operation is needed, MAINTAIN liquid level 39%.
5.5  Purge 60J P 1A, 1B Pumps Seal Water (After Maintenance)

CAUTION
Failure to expel trapped air when pump is brought on line may result in bearing damage to 60J-P-1A, -1B.

NOTE - The seal water to the CT brine circulation pumps is used to flush a front radial bearing on the pump to prevent solids accumulation in the bearing. Seal water fed to the pumps will flow into the process and into the CT. A flow rate of 1 gph of seal water will add about 0.5% of level to a CT per day; a flow rate of 2 gph will add about 1% of level to a CT per day.

5.5.1  IF the 60J-P-1A pump seal water cavity is empty or partially empty, PURGE the seal water line AND PURGE pump cavity with seal water as the pump is being brought online, as follows:

5.5.1.1  CLOSE 60J-035.

5.5.1.2  OPEN the following valves:
- 60J-029
- 60J-040
- 60J-043.

5.5.1.3  INITIATE seal water flow to 60J-P-1A per ETF-95B-001.

5.5.1.4  INCREASE flow on FIC-95B-003 to 2 gph.

5.5.1.5  PLACE a catch container under 95B-122.

5.5.1.6  CLOSE 95B-121.

5.5.1.7  OPEN 95B-122.

5.5.1.8  CONTINUE flowing water into the catch container until all air is removed from the pipe.

5.5.1.9  CLOSE 95B-122.
5.5  Purge 60J P 1A, 1B Pumps Seal Water (After Maintenance) (Cont.)

5.5.1.10  OPEN 95B-121.

5.5.1.11  MAINTAIN seal water flow at 2 gph for at least one hour, THEN REDUCE the seal water flow on FIC-95B-003 back to the setpoint specified in ETF-95B-001.

5.5.1.12  BACKFLUSH the 60J-P-1A pump suction line per Section 5.23 of this procedure.

5.5.1.13  FLUSH pump 60J-P-1A per Section 5.20 of this procedure.

5.5.2  IF the 60J-P-1B pump seal water cavity is empty or partially empty, PURGE the seal water line AND

PURGE pump cavity with seal water as the pump is being brought online, as follows:

5.5.2.1  CLOSE 60J-046.

5.5.2.2  OPEN the following valves:
  • 60J-047
  • 60J-049
  • 60J-056.

5.5.2.3  INITIATE seal water flow to 60J-P-1B per ETF-95B-001.

5.5.2.4  INCREASE flow on FIC-95B-002 to 2 gph.

5.5.2.5  PLACE a catch container under 95B-119.

5.5.2.6  CLOSE 95B-118.

5.5.2.7  OPEN 95B-119.

5.5.2.8  CONTINUE flowing water into the catch container until all air is removed from the pipe.
5.5 Purge 60J P 1A, 1B Pumps Seal Water (After Maintenance) (Cont.)

5.5.2.9 CLOSE 95B-119.

5.5.2.10 OPEN 95B-118.

5.5.2.11 MAINTAIN seal water flow at 2 gph for at least one hour, THEN REDUCE the seal water flow on FIC-95B-002 back to the setpoint specified in ETF-95B-001.

5.5.2.12 BACKFLUSH the 60J-P-1B pump suction line per Section 5.23 of this procedure.

5.5.2.13 FLUSH pump 60J-P-1B per Section 5.22 of this procedure.

5.5.2.14 DISPOSE of any liquid contents from catch container into Sump 1 or Sample Prep Room sink.

5.6 (CT-A) and/or [CT-B] System Shutdown

5.6.1 SELECT (CT-A) and [CT-B] Shutdown.

5.6.2 CHECK (60J-P-1A) [60J-P-1B] circulation pump stopped.

5.6.3 CLOSE seal water valve 95B-118 at 60J-P-1B pump.

5.6.4 CLOSE seal water valve 95B-121 at 60J-P-1A pump.
5.7 (CT A) or [CT B] System Layup

NOTE - (CT A) [CT B] contents will be drained to Sump Tank 1 then the tank will be flushed with verification water.

- Approximately 6000 gallons of flush water will be pumped to Surge or SWRT via Sump Tank 1.
- Data Sheet 4 has calculations for CT-A/CT-B drain operations to SWRT.

5.7.1 DRAIN (CT-A) [CT-B] to Sump 1 per Section 5.16.

5.7.2 OPEN (60H-033) [60H-032] verification water spray valve.

5.7.3 MONITOR (LI-60J001A) [LI-60J001B] CT level rising.

5.7.4 WHEN (LI-60J001A) [LI-60J001B] indicates 93%, CLOSE (60H-033) [60H-032] verification water spray valve.

5.7.5 PLACE (60J-P-1A) [60J-P-1B] in MANUAL/RUN.

5.7.6 START mixer (60J-BL-1A) [60J-BL-1B].

5.7.7 WAIT ten minutes.

5.7.8 PLACE (60J-P-1A) [60J-P-1B] in MANUAL/OFF.

5.7.9 CLOSE seal water valve (95B-121) [95B-118].

5.7.10 STOP mixer (60J-BL-1A) [60J-BL-1B].

5.7.11 DRAIN (CT-A) [CT-B] to Sump 1 per Section 5.16.

5.7.12 FLUSH (CT-A) [CT-B] with verification water spray per Section 5.16.

5.7.13 NOTIFY SOM that layup is complete.
5.8 pH Assessment

NOTE - pH is manually adjusted based on laboratory waste sample determination or past experience.

5.8.1 IF directed by process memo, GO TO pH adjustment section indicated below (as appropriate):

<table>
<thead>
<tr>
<th>Ready Tank and Condition</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-A pH greater than directed by process memo</td>
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<tr>
<td>CT-A pH less than directed by process memo</td>
<td>5.11</td>
</tr>
<tr>
<td>CT-B pH greater than directed by process memo</td>
<td>5.10</td>
</tr>
<tr>
<td>CT-B pH less than directed by process memo</td>
<td>5.11</td>
</tr>
</tbody>
</table>

5.8.2 IF CT-A/CT-B pH is not available due to pH line plugging, GO TO Section 5.9.

5.9 CT A/B pH Line Plugging

NOTE - CT-A/B pH line plugs up at times due to high solids level in the brine. The CT-A/B pH interlock bypass can be used if pH is known to be in range by sampling or if tank was in range and lines are confirmed to be plugging as evidenced by decreased pH line temperatures.

CAUTION

Placing the interlock in bypass with CT-A/B pH out of the required range may cause:

- Plugging of the dryer feed line and eventual bridging
- Release of ammonia to the environment.

5.9.1 IF pH line was known to be in range prior to evidence of line plugging and directed by SOM, PLACE applicable CT-A/B pH interlock bypass to ON.

5.9.2 IF pH of tank was not established before plugging takes place, OBTAIN grab sample of applicable tank.
5.9 CT A/B pH Line Plugging (Cont.)

**WARNING**
CT solution can be corrosive, and may cause chemical burns if personnel contact CT solution during sampling activity.

5.9.2.1 **DON** the following PPE:
- Rubber gloves
- Face shield
- Tight-fitting chemical goggles
- Chemical protective apron.

5.9.2.2 **ENSURE** emergency shower and eye wash station are identified and available.

5.9.2.3 **OBTAIN** 500-mL beaker and yellow bucket.

5.9.2.4 **PLACE** yellow bucket under (V-PT60J011A-A), [V-PT60J011B-A].

5.9.2.5 **SLOWLY OPEN** valve (60J-039), [60J-072] AND **SLOWLY OPEN** instrument valve (V-PT60J011A-A), [V-PT60J011B-A].

5.9.2.6 **PURGE** sample line into a yellow bucket for a minimum of 30 seconds.

5.9.2.7 **OBTAIN** approximately 100 to 200 mL of sample.

5.9.2.8 **CLOSE** (V-PT60J011A-A), [V-PT60J011B-A].

5.9.2.9 **CHECK** pH of solution with a hand-held pH meter or litmus paper.

5.9.2.10 **RECORD** the pH results into the ETF Lab Logbook AND **NOTIFY** the CRO.
5.9  CT A/B pH Line Plugging (Cont.)

5.9.3  IF pH of tank is not in the required range, ADJUST pH to the desired range per applicable Section 5.10 or 5.11 AND

REPEAT Step 5.9.2.

5.9.4  IF pH of tank is within required range, PLACE CT-A/B pH interlock bypass to ON.

5.9.5  WHEN pH line obstruction is cleared, PLACE CT-A/B pH interlock bypass to OFF.

5.9.6  DISPOSE of concentrate liquid in sump.

5.10  Adjust pH (CT-A) or [CT-B] Down

5.10.1  ENSURE chemical system in OPERATION.

5.10.2  ADD sulfuric acid (H₂SO₄) to lower (CT-A) [CT-B] pH per the following:

5.10.2.1  SELECT H₂SO₄.

5.10.2.2  ON group display 41, SET FQ65C145SP setpoint to reagent gallons required.

5.10.2.3  SELECT (pH control Tk A) [pH control Tk B].

5.10.2.4  ON group display 41, MONITOR FI65C145, H₂SO₄ flow.

NOTE - Recirculation mixing may require a few minutes to stabilize pH following chemical addition.

5.10.3  IF (CT-A) [CT-B] is still above range prescribed in process memo, REPEAT Step 5.10.2 until range is acceptable.
5.11 Adjust pH (CT-A) [CT-B] Up

5.11.1 **ADD** sodium hydroxide (NaOH) to raise (CT-A) [CT-B] pH per the following:

**NOTE** - Normally, 50% NaOH is supplied to the CTs when processing groundwater, and 4% NaOH is supplied to the CTs when processing process condensate.

5.11.1.1 **IF** 50% NaOH is to be used to adjust the pH of a CT, **ENSURE** the following:
- 65C-320 is OPEN
- 65C-083 is CLOSED
- Pump 65C-P-2 is ON.

5.11.1.2 **IF** 4% NaOH is to be used to adjust the pH of a CT, **ENSURE** the following:
- 65C-320 is CLOSED
- 65C-083 1/2 to 2 turns OPEN
- Pump 65C-P-4 is ON.

5.11.1.3 **SET** FQ65C245SP to reagent gallons required.

5.11.1.4 **SELECT** NaOH.

5.11.1.5 **SELECT** (pH control Tk A) [pH control Tk B].

5.11.1.6 **MONITOR** flow on FI65C245.

**NOTE** - Mixing may require a few minutes to stabilize pH following chemical addition.

5.11.2 **IF** (CT-A) [CT-B] pH is still below range prescribed in process memo, **REPEAT** Step 5.11.1 until range is acceptable.
5.12 Transfer CT-A Contents to CT-B Using Pump 60J-P-1A

5.12.1 **ENSURE** pumps (60J-P-1A) and [60J-P-1B] in MANUAL/OFF.

5.12.2 **ENSURE** the following manual valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-043</td>
<td>CT-A Recirc Isolation (top of tank)</td>
</tr>
<tr>
<td>60J-025</td>
<td>Concentrate Tank to SWRT Isolation</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>

5.12.3 **PLACE** the following AOVs in MANUAL/CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
</tbody>
</table>

5.12.4 **ENSURE** the following manual valves OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-035</td>
<td>60-P-1A Suction Isolation</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-A Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-029</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-056</td>
<td>CT-B Recirc Isolation (top of CT-B)</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
</tbody>
</table>

5.12.5 **PLACE** AOV-60J044, CT-A Outlet, in MANUAL/OPEN.
5.12 Transfer CT-A Contents to CT-B Using Pump 60J-P-1A (Cont.)

5.12.6 **PLACE** pump 60J-P-1A in **RUN**.

5.12.7 **MONITOR** levels (decreasing in CT-A and increasing in CT-B).

5.12.8 **WHEN** transfer is complete, **PERFORM** the following:

5.12.8.1 **PLACE** pump 60J-P-1A in **STOP**.

5.12.8.2 **CLOSE** AOV-60J044, CT-A Outlet.

5.12.8.3 **OPEN** AOV-60H024, CT-A Verification Water Flush.

5.12.8.4 **SLOWLY OPEN** 60H-234 to allow PCV-60H237 to maintain water pressure at 25psig as indicated by PI-60H200.

5.12.8.5 **WHEN** CT-B level, as indicated by LI-60J-001B, has increased 0.5%, **CLOSE** valve 60H-234.

5.12.8.6 **CLOSE** valve 60J-054, CT-B Pump Discharge to SWRT Isolation.

5.12.8.7 **CLOSE** valve 60J-073, CT-A Pump Discharge to SWRT Isolation.

5.12.8.8 **CLOSE** valve 60H-235.

5.12.9 **PLACE** the following AOVs in **AUTO**:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
<tr>
<td>AOV-60H024</td>
<td>CT-A Verification Water Flush</td>
</tr>
</tbody>
</table>

5.12.10 **OPEN** manual valve 60J-043, CT-A Recirc Isolation (top of tank).

5.12.11 **OPEN** manual valve 60J-049, 60J-P-1B Discharge Isolation.

5.12.12 **PLACE** pump 60J-P-1B in recirculation per SOM direction.
5.13 Transfer of CT-A Contents to CT B Using Pump 60J-P-1B

5.13.1 **ENSURE** the following pumps are in **MANUAL/OFF**:
- 60J-P-1A
- 60J-P-1B.

5.13.2 **PLACE** the following AOVs in **MANUAL/CLOSED**:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
</tbody>
</table>

5.13.3 **ENSURE** the following manual valves **CLOSED**:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>

5.13.4 **ENSURE** the following manual valves **OPEN**:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-047</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-046</td>
<td>60J-P-1B Suction Isolation</td>
</tr>
<tr>
<td>60J-056</td>
<td>CT-B Recirc Isolation (top of CT-B)</td>
</tr>
</tbody>
</table>

5.13.5 **PLACE** the following AOVs in **MANUAL/OPEN**:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60H024</td>
<td>CT-A Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
</tbody>
</table>

5.13.6 **PLACE** pump 60J-P-1B in **RUN**.

5.13.7 **MONITOR** levels (decreasing in CT-A and increasing in CT-B).
5.13 Transfer of CT-A Contents to CT B Using Pump 60J-P-1B (Cont.)

5.13.8 WHEN transfer is complete, PERFORM the following:

5.13.8.1 PLACE pump 60J-P-1B in STOP.

5.13.8.2 PLACE AOV-60H024 in AUTO.

5.13.8.3 PLACE AOV-60H025 in AUTO.

5.13.9 PLACE the following AOVs in AUTO:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Concentrate Feed to Dryer</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
</tbody>
</table>

5.13.10 PERFORM Section 5.23 to backflush line.

5.14 Transfer of CT-B Contents to CT-A Using Pump 60J-P-1A

5.14.1 ENSURE the following pumps are in MANUAL/OFF:

- 60J-P-1A
- 60J-P-1B.

5.14.2 PLACE the following AOVs in MANUAL/CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
</tbody>
</table>

5.14.3 ENSURE the following manual valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>
5.14 Transfer of CT-B Contents to CT-A Using Pump 60J-P-1A (Cont.)

5.14.4 ENSURE the following manual valves OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-029</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-035</td>
<td>60J-P-1A Suction Isolation</td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-043</td>
<td>CT-A Recirc Isolation (top of tank)</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>

5.14.5 PLACE the following AOVs in MANUAL/OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60H024</td>
<td>CT-A Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
</tbody>
</table>

5.14.6 PLACE pump 60J-P-1A in RUN.

5.14.7 MONITOR levels (decreasing in CT-B and increasing in CT-A).

5.14.8 WHEN transfer is complete, PERFORM the following:

5.14.8.1 PLACE pump 60J-P-1A in STOP.

5.14.8.2 PLACE AOV-60H024 in AUTO.

5.14.8.3 PLACE AOV-60H025 in AUTO.

5.14.9 PLACE the following AOVs in AUTO:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Concentrate Feed to Dryer</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
</tbody>
</table>

5.14.10 PERFORM Section 5.23 to backflush line.
5.15 Transfer of CT-B Contents to CT-A Using Pump 60J-P-1B

5.15.1 **ENSURE** the following pumps are in MANUAL/OFF:
- 60J-P-1A
- 60J-P-1B.

5.15.2 **ENSURE** the following manual valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-025</td>
<td>CT to SWRT Isolation</td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-056</td>
<td>CT-B Recirc Isolation (top of CT-B)</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>

5.15.3 **PLACE** the following AOVs in MANUAL/CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
</tbody>
</table>

5.15.4 **ENSURE** the following manual valves OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-046</td>
<td>60J-P-1B Suction Isolation</td>
</tr>
<tr>
<td>60J-043</td>
<td>CT-A Recirc Isolation (top of CT-A)</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-A Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-047</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>

5.15.5 **PLACE** AOV-60J045, CT-B Outlet, in MANUAL/OPEN.

5.15.6 **PLACE** pump 60J-P-1B in RUN.
5.15 Transfer of CT-B Contents to CT-A Using Pump 60J-P-1B (Cont.)

5.15.7 MONITOR levels (decreasing in CT-B and increasing in CT-A).

5.15.8 WHEN transfer is complete, PERFORM the following:

5.15.8.1 PLACE pump 60J-P-1B in STOP.

5.15.8.2 CLOSE AOV-60J-045.

5.15.8.3 OPEN AOV-60H-025.

5.15.8.4 SLOWLY OPEN verification water valve 60H-234 to allow PCV-60H-237 to maintain water pressure at 25psig as indicated by PI-60H200.

5.15.8.5 WHEN CT-A level, as indicated by LI-60J-001A, has increased 0.5%, CLOSE valve 60H-234.

5.15.8.6 CLOSE 60J-054, CT-B Pump Discharge to SWRT Isolation.

5.15.8.7 CLOSE 60J-073, CT-A Pump Discharge to SWRT Isolation.

5.15.8.8 CLOSE 60H-235, PCV-60H-237 Outlet Isolation.

5.15.9 PLACE the following AOVs in AUTO:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
</tr>
</tbody>
</table>
5.16 Draining CT to Sump 1

NOTE - The CTs and lines can be drained to Sump 1 by connecting a 1-\(\frac{1}{2}\) -inch hose to the 4-inch Sump 1 header pipe at a connector located under the grating behind concentrate tank B.

- The pump for tank to be drained must be shut down before draining begins.

5.16.1 **ENSURE** (60J-P-1A) [60J-P-1B] is in MANUAL/OFF.

5.16.2 **ENSURE** drain hose from 60J-021 to duplex strainer 60J-S-3 and from strainer to 20B-069 (under grating) are connected.

5.16.3 **ENSURE** 20B-069 is OPEN.

NOTE - The valve(s) that is to be used depends on the tank to be drained.

- 3-way valve 60J-020 has three different flow paths:
  - Flow straight through the valve (south port to north port), used when flowing CT-B to 60J-P-1B or backflushing line into CT-B
  - Flow from the CT-B side to Sump 1 (south port to east port), used when draining CT-B to Sump 1
  - Flow from the 60J-P-1B side to Sump 1 (north port to east port), used when draining CT-A to Sump 1 or backflushing hose to Sump 1.

5.16.4 **DETERMINE** valve(s) that is to be used from the following table:

<table>
<thead>
<tr>
<th>Tank to be drained</th>
<th>Valves to CLOSE</th>
<th>Valves to OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-A</td>
<td>60J-035</td>
<td>60J-020 (CT-A to Sump 1)</td>
</tr>
<tr>
<td></td>
<td>60J-046</td>
<td>AOV-60J044</td>
</tr>
<tr>
<td></td>
<td>AOV-60J045</td>
<td>AOV-60H024</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOV-60H025</td>
</tr>
<tr>
<td>CT-B</td>
<td>60J-046</td>
<td>60J-020 (CT-B to Sump 1)</td>
</tr>
<tr>
<td></td>
<td>AOV-60H025</td>
<td>AOV-60J045</td>
</tr>
</tbody>
</table>

5.16.5 **OPEN** 60J-021 to begin draining to Sump 1.

5.16.6 **WHEN** the equipment has been sufficiently drained, **CLOSE** 60J-021.
5.16 Draining CT to Sump 1 (Cont.)

NOTE - The valve(s) that is to be used depends on the piping to be flushed.

5.16.7 IF CT piping and/or drain hose is to be flushed with verification water, **DETERMINE** valve(s) that is to be used from the following table:

<table>
<thead>
<tr>
<th>Flush Path</th>
<th>Valves to CLOSE</th>
<th>Valves to OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through 60J-020 to Sump 1</td>
<td>60H-230</td>
<td>60J-020 (CT-A to Sump 1)</td>
</tr>
<tr>
<td></td>
<td>60H-231</td>
<td>60J-021</td>
</tr>
<tr>
<td></td>
<td>60H-234</td>
<td>AOV-60H025</td>
</tr>
<tr>
<td></td>
<td>60H-235</td>
<td>60H-075</td>
</tr>
<tr>
<td></td>
<td>60J-046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOV-60H024</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOV-60J045</td>
<td></td>
</tr>
<tr>
<td>Through Piping to CT-A</td>
<td>60H-230</td>
<td>AOV-60H024</td>
</tr>
<tr>
<td></td>
<td>60J-035</td>
<td>AOV-60J044</td>
</tr>
<tr>
<td></td>
<td>60H-231</td>
<td>60H-075</td>
</tr>
<tr>
<td></td>
<td>60H-234</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60H-235</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOV-60H025</td>
<td></td>
</tr>
<tr>
<td>Through 60J-020 to CT-B</td>
<td>60H-230</td>
<td>60J-020 (CT-B to 60J-P-1B)</td>
</tr>
<tr>
<td></td>
<td>60H-231</td>
<td>AOV-60H025</td>
</tr>
<tr>
<td></td>
<td>60H-234</td>
<td>AOV-60J045</td>
</tr>
<tr>
<td></td>
<td>60H-235</td>
<td>60H-075</td>
</tr>
<tr>
<td></td>
<td>60J-021</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60J-046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOV-60H024</td>
<td></td>
</tr>
</tbody>
</table>

5.16.8 **OPEN** 60H-233 to begin flushing.

5.16.9 **WHEN** flushing is complete, **CLOSE** 60H-233.
5.16 Draining CT to Sump 1 (Cont.)

NOTE - The valve(s) that is to be used depends on the tank to be flushed.

5.16.10 IF CT-A or CT-B is to be flushed with verification water from spray ring, DETERMINE valve(s) that is to be used from the following table.

<table>
<thead>
<tr>
<th>Tank to be flushed</th>
<th>Valves to CLOSE</th>
<th>Valves to OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-A</td>
<td>60J-035, 60J-046, AOV-60J045</td>
<td>60J-020 (CT-A to Sump 1), 60J-021, AOV-60J044, AOV-60H024, AOV-60H025</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT-B</td>
<td>60J-046, AOV-60H025</td>
<td>60J-020 (CT-B to Sump 1), 60J-021, AOV-60J045</td>
</tr>
</tbody>
</table>

5.16.11 OPEN (60H-033) [60H-032] verification water spray valve.

5.16.12 WHEN one minute has elapsed, CLOSE (60H-033) [60H-032] verification water spray valve.

5.16.13 WAIT five minutes.

5.16.14 CLOSE 60J-021.

5.16.15 POSITION 3-way valve 60J-020 for flow from CT-B to 60J-P-1B (South port to North port).

5.16.16 PLACE the following AOVs in AUTO:
- AOV-60J044
- AOV-60J045
- AOV-60H024
- AOV-60H025.

5.16.17 OPEN valves 60J-035 and 60J-046.

5.16.18 INSPECT drain hose and duplex strainer 60J-S-3 for leaks AND ADDRESS issues per SOM direction.

5.16.18.1 IF SOM direction provided, RECORD in ETF Control Room Logbook.
5.17 (CT-A) or [CT-B] Transfer to SWRT

5.17.1 CHECK (LT-60J001A) [LT-60J001B] liquid level.

5.17.2 IF directed by SOM or process memo, ADD verification water to level specified by SOM or process memo AND PERFORM the following:

5.17.2.1 OPEN (60H-033) [60H-032] verification water spray valve.

5.17.2.2 MONITOR (LT-60J001A) [LT-60J001B] CT level rising.

5.17.2.3 RECORD directions in ETF Control Room Logbook.

5.17.3 WHEN level specified by SOM or process memo has been reached, CLOSE (60H-033) [60H-032] verification water spray valve.

5.17.4 CONVERT (LT-60J001A) [LT-60J001] indication (%) to volume (gal) per Table 1–CT Level (%) to Volume (gal) Conversion Chart.

5.17.5 RECORD CT volume in gallons on Data Sheet 4.

5.17.6 CHECK (LT-60I001A, SWRT-A) [LT-60I001B, SWRT-B] receiving SWRT liquid level.

5.17.7 CONVERT (LT-60I001A, SWRT-A) [LT-60I001B, SWRT-B] indication (%) to volume (gal) per ETF-60I-008 AND USE Data Sheet 4 for calibration table.

5.17.8 RECORD SWRT volume in gallons on Data Sheet 4.

5.17.9 CALCULATE available SWRT volume on Data Sheet 4.

5.17.10 IF (CT-A) [CT-B] volume is greater than available SWRT volume, NOTIFY SOM that (CT-A) [CT-B] cannot be emptied.
5.17 (CT-A) or [CT-B] Transfer to SWRT (Cont.)

5.17.11 IF SWRT can accept (CT-A) [CT-B] volume, PERFORM the following:

5.17.11.1 PLACE (AOV-60J-044) [AOV-60J-045] in MANUAL/OPEN.

5.17.11.2 PLACE (60J-P-1A) [60J-P-1B] in MANUAL/START.

5.17.11.3 OPEN 60J-025.

5.17.11.4 OPEN (60J-073) [60J-054].

5.17.11.5 THROTTLE CLOSED (60J-043) [60J-056] to maintain pump discharge pressures in desired range.

5.17.11.6 PLACE AOV-60F-013 to the desired SWRT tank A or B.

5.17.12 CHECK the following:

5.17.12.1 (LT-60J001A) [LT-60J001B] level is lowering.

5.17.12.2 (LT-60I001A) [LT-60I001B] level is increasing.

5.17.13 WHEN (LT-60J001A) [LT-60J001B] has reached level specified by SOM or process memo, PLACE (60J-P-1A) [60J-P-1B] in MANUAL and STOP.

5.17.14 REPEAT Steps 5.17.1 through 5.17.13 as directed by SOM or process memo.

5.17.14.1 IF SOM direction provided, RECORD in ETF Control Room Logbook.

5.17.15 WHEN transfer is complete, PLACE (AOV-60J–044) [AOV-60J-045] in AUTO/CLOSE.

5.17.16 IF directed by SOM, FLUSH transfer line per Section 5.26 (CT-A to SWRT) or Section 5.27 [CT-B to SWRT].

5.17.17 CLOSE (60J-073, CT-A) [60J-054, CT-B].

5.17.18 CLOSE 60J-025.
5.18 Add Rad Waste to CT Using Pogo Pump

**Special Instructions**

Customer rad waste is to be added per process memo. The customer rad waste destination CT will be specified in the process memo.

The minimum PPE ensemble is required for working Section 5.18. Additional PPE will be specified in the RWP and process memo.

Communication (radio) is required between CRO monitoring tank level and pH, and operator at the rad waste drum.

5.18.1 **ENSURE** the following rad waste valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
</tr>
</tbody>
</table>

5.18.2 **ENSURE** the following 4% H$_2$SO$_4$ valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65C-020</td>
<td>4% Acid to CT-A</td>
</tr>
<tr>
<td>AOV-65C-041</td>
<td>4% Acid to CT-A</td>
</tr>
</tbody>
</table>

5.18.3 **ENSURE** the following valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-243</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-244</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-248</td>
<td>Interconnection Isolation Valve</td>
</tr>
</tbody>
</table>

5.18.4 **SELECT** receiving CT.

5.18.5 **OPEN** valve 60J-254 to feed CT-A,

OR

**OPEN** valve 60J-255 to feed CT-B.
5.18 Add Rad Waste to CT Using Pogo Pump (Cont.)

5.18.6 CONTACT IH for specific monitoring requirements.

5.18.7 MONITOR LT-60J001A [LI-60J001B] tank level indication.


5.18.9 DON PPE.

5.18.10 CONFIRM CT level is greater than 39%, or as directed by process memo.

5.18.11 IF CT level is greater than 39%, ENSURE CT mixer 60J-BL-1A [60J-BL-1B] is ON.

Special Instructions

At discretion of SOM, based on plant conditions, receiving CT pump may be left OFF as long as agitator is in operation.

5.18.12 ENSURE CT pump (60J-P-1A) [60J-P-1B] is ON, or as directed by SOM.

5.18.12.1 IF SOM direction provided, RECORD in ETF Control Room Logbook.

5.18.13 ENSURE drum pump toggle switch OFF.

5.18.14 CONNECT hose between pogo pump and outlet of valve 60J-253.

5.18.15 CONNECT the power line of the drum pump to the electrical outlet.
5.18 Add Rad Waste to CT Using Pogo Pump (Cont.)

CAUTION

Although unlikely, as the rad waste is added, heat may be generated due to heat of solution (with water) and/or heat of reaction (with concentrate).

The heat generated can raise the average solution temperature by as much as 90°F; it can raise the temperature much higher locally at the point of addition.

Excessive localized boiling and vaporization can result in instrument malfunction and tank corrosion.

5.18.16 DO NOT ALLOW CT tank temperature to exceed 176°F.

5.18.16.1 IF rad waste is expected to generate a heat of solution/reaction, ADD to a CT where mixing via pump recirculation and or/operation of the agitator is available.

5.18.16.2 IF excessive heat is generated as determined by the SOM, ADD rad waste at a rate of approximately one drum per hour using valve 60J-253 to control the rate.

5.18.17 ENSURE drum vent bunghole OPEN.

5.18.18 INSERT drum pump suction pipe in drum pump out hole of waste drum.

5.18.19 PLACE drum pump toggle switch ON.

5.18.20 PROMPTLY AND SLOWLY OPEN valve 60J-253.

5.18.21 THROTTLE valve 60J-253 per SOM's direction.

5.18.22 MONITOR CT temperature reading (TI-60J002A) [TI-60J002B].

5.18.23 IF CT temperature is greater than 71°C (160°F), NOTIFY SOM.
5.18 Add Rad Waste to CT Using Pogo Pump (Cont.)

5.18.24 IF CT tank temperature exceeds 125°F, ISOLATE tank area with yellow caution tape until temperature drops below 125°F.

5.18.25 WHEN liquid level in drum reaches the pump suction, TILT drum to allow for as much liquid as possible to be pumped, AND

CLOSE valve 60J-253.

5.18.26 PROMPTLY PLACE the drum pump toggle to OFF.

5.18.27 REPLACE the emptied rad waste drum with a new one.

5.18.28 REPEAT Steps 5.18.15 through 5.18.27 for the remainder of the rad waste drums.

NOTE - Step 5.18.29 may be omitted at SOM discretion, based on plant conditions.

5.18.29 FLUSH transfer line with water until one of the following has occurred:
- Level indicator (LI-60J001A) [LI-60J001B] has risen about 0.5 level %.

OR
- Prescribed amount from process memo has been added.

5.18.30 CLOSE valve 60J-253.

5.18.31 CLOSE valve 60J-254 [60J-255].

5.18.32 OPEN valve 65C-020.

5.18.33 UNPLUG the drum pump from the electrical outlet.

5.18.34 DISCONNECT hose between pogo pump and outlet of valve 60J-253.

5.18.35 PLACE camlock plugs on both camlock fittings on the pogo pump and on the outlet of valve 60J-253.
5.18 Add Rad Waste to CT Using Pogo Pump (Cont.)

**Special Instructions**

An “EMPTY” sticker may be used for the required marking, but a DOT “Empty” label shall not be used.

5.18.36 **MARK/LABEL** empty drums as follows:

5.18.36.1 **REMOVE** hazardous waste (yellow sticker) label from wastewater drum.

5.18.36.2 **REMOVE** Class 9 label, “Non-DOT Radioactive” and any existing weight stickers.

5.18.36.3 **MARK** drum(s) “EMPTY”.

5.18.36.4 **PLACE** a “Radioactive Material” sticker on the drum if one is not present.

5.18.37 **PROVIDE** the CRO the package identification drum number(s) for the emptied drum(s) for recording on the process memo.

5.18.38 *(SOM/FWS) **NOTIFY*** waste technical services, with the specific drum number(s), that the drum(s) are empty, for status update of SWITS.

5.18.39 **WHEN** pH has stabilized, **BRING** receiving CT pH into specification per Section 5.8.
5.19 Add Rad Waste to CT Using Flexible Impeller Pump

**Special Instructions**

Customer rad waste is to be added per process memo. The customer rad waste destination CT will be specified in the process memo.

The minimum PPE ensemble is required for working Section 5.19. Additional PPE will be specified in the RWP and process memo.

Communication (radio) is required between CRO monitoring tank level and pH, and operator at the rad waste drum.

5.19.1 **ENSURE** the following rad waste valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
</tr>
</tbody>
</table>

5.19.2 **ENSURE** the following 4% H$_2$SO$_4$ valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65C-020</td>
<td>4% Acid to CT-A</td>
</tr>
<tr>
<td>AOV-65C-041</td>
<td>4% Acid to CT-A</td>
</tr>
</tbody>
</table>

5.19.3 **ENSURE** the following 93% H$_2$SO$_4$ valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-243</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-244</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-248</td>
<td>Interconnection Isolation Valve</td>
</tr>
</tbody>
</table>

5.19.4 **SELECT** receiving CT.

5.19.4.1 **OPEN** valve 60J-254 to feed CT-A,

**OR**

**OPEN** valve 60J-255 to feed CT-B.

5.19.5 **CONTACT** IH for specific monitoring requirements.
5.19  Add Rad Waste to CT Using Flexible Impeller Pump (Cont.)

5.19.6  **MONITOR** (LT-60J001A) [LI-60J001B] tank level indication.

5.19.7  **MONITOR** (AIT-60J012A) [AIT-60J002B] pH indication.

5.19.8  **DON** PPE per process memo.

5.19.9  **CONFIRM** CT level is greater than 39%, or as directed by process memo.

5.19.10  **IF** CT level is greater than 39%, **ENSURE** CT mixer (60J-BL-1A) [60J-BL-1B] is ON.

**NOTE** - At discretion of SOM, based on plant conditions, receiving CT pump may be left OFF as long as agitator is in operation.

5.19.11  **ENSURE** CT pump (60J-P-1A) [60J-P-1B] is ON, or as directed by SOM.

5.19.11.1  **IF** SOM direction provided, **RECORD** in ETF Control Room Logbook.

5.19.12  **ATTACH** transfer hose (preferably the shortest acceptable) on the camlock fitting downstream of 60J-253 and to one side of the waste transfer pump.

5.19.13  **ATTACH** the other transfer hose to the other side of waste transfer pump and to drum pumping tool.

5.19.14  **ENSURE** drum pump switch is in the “0” position.

5.19.15  **ENSURE** switch on outlet is OFF.

**NOTE** - Power plug is a twist lock plug.

5.19.16  **CONNECT** power cord of the waste transfer pump to the electrical outlet.

5.19.17  **ENSURE** drum vent bunghole is OPEN.

5.19.18  **INSERT** drum pumping tool into drum pump out hole of waste drum.

5.19.19  **ENSURE** drum pumping tool valve DR-1 is OPEN.
5.19 Add Rad Waste to CT Using Flexible Impeller Pump (Cont.)

**CAUTION**

Although unlikely, as the rad waste is added, heat may be generated due to heat of solution (with water) and/or heat of reaction (with concentrate).

The heat generated can raise the average solution temperature by as much as 90°F; it can raise the temperature much higher locally at the point of addition.

Excessive localized boiling and vaporization can result in instrument malfunction and tank corrosion.

**NOTE** - The waste transfer pump is capable of pumping in either direction depending on the switch direction. There are arrows above the “1” and “2” on the waste transfer pump switch showing which way the pump will pump when the switch is in that position. When transferring waste from a drum, the switch shall be placed in the position where the arrow points toward 60J-253 and away from the drum pumping tool.

5.19.20 **DO NOT ALLOW** CT tank temperature to exceed 176°F.

5.19.20.1 **IF** rad waste is expected to generate a heat of solution/reaction, **ADD** to a CT where mixing via pump recirculation and or/operation of the agitator is available.

5.19.20.2 **IF** excessive heat is generated as determined by the SOM, **ADD** rad waste at a rate of approximately one drum per hour using valve 60J-253 to control the rate.

5.19.21 **DEPENDING** on which direction the pump is to pump, **PLACE** the waste transfer pump to either “1,”

**OR**

**PLACE** the waste transfer pump to “2.”

5.19.22 **OPEN** valve 60J-253.
5.19 Add Rad Waste to CT Using Flexible Impeller Pump (Cont.)

NOTE - On the pump head of the waste transfer pump is a valve that will bypass the pump itself. The valve is OPEN (i.e., pump bypassed) when the handle is parallel to the pump head. The valve is CLOSED (i.e., pump not bypassed) when the handle is perpendicular to the pump head.

5.19.23 OPEN bypass valve on waste transfer pump head until fluid is seen entering the pump from the waste transfer line.

5.19.24 WHEN fluid is seen at the pump in the hose, CLOSE pump bypass valve on waste transfer pump head.

NOTE - Occasionally the pump will not start when the switch on the outlet is turned ON. This will occur when the flexible impeller becomes bound up in the pump head. Usually the flexible impeller can be freed by reversing the flow direction and “bumping” (quickly turning ON then OFF) the pump.

5.19.25 TURN outlet switch to ON.

5.19.26 IF pump does not start, TURN outlet switch to OFF AND PERFORM the following:

5.19.26.1 PLACE waste transfer pump to opposite direction setting to reverse flow.

5.19.26.2 QUICKLY TURN the pump ON and OFF.

5.19.26.3 RETURN to Step 5.19.25.

5.19.27 DEPENDING on which direction the pump is to pump, PLACE the waste transfer pump to either “1,”

OR

PLACE the waste transfer pump to “2.”

5.19.28 THROTTLE valve 60J-253 per SOM’s direction.

5.19.29 MONITOR CT temperature reading (TI-60J002A) [TI-60J002B].

5.19.30 IF CT temperature is greater than 71°C (160°F), NOTIFY SOM.

5.19.31 REPLACE emptied rad waste drum with a new one.
5.19 Add Rad Waste to CT Using Flexible Impeller Pump (Cont.)

5.19.32 **REPEAT** Steps 5.19.1 through 5.19.31 for remainder of waste drums.

5.19.33 **IF** CT tank temperature exceeds 125°F, **ISOLATE** tank area with yellow caution tape until temperature drops below 125°F.

5.19.34 **WHEN** the liquid level in the drum reaches the pump suction, **TILT** drum to allow for as much liquid as possible to be pumped.

5.19.35 **PLACE** the waste transfer switch to “0.”

**NOTE** - Step 5.19.36 may be omitted at SOM discretion, based on plant conditions.

5.19.36 **FLUSH** transfer line with water until one of the following has occurred:

- Level indicator (LI-60J001A) [LI-60J001B] has risen about 0.5 level %.

  **OR**

- Prescribed amount from process memo has been added.

5.19.36.1 **ROTATE** pump bypass valve several times from OPEN to CLOSE while flushing pump system to flush bypass line.

5.19.36.2 **LEAVE** bypass valve CLOSED.

5.19.37 **CLOSE** valves 60J-253, 60J-254 [60J-255].

5.19.38 **OPEN** 65C-020.

5.19.39 **ENSURE** outlet switch is OFF AND **UNPLUG** drum waste pump from electrical outlet.

5.19.40 **DISCONNECT** hoses from the following:

- Valve 60J-253
- Waste drum pump
- Drum pumping tool.
5.19 Add Rad Waste to CT Using Flexible Impeller Pump (Cont.)

5.19.41 DRAIN hoses into a catch container.

5.19.42 PLACE camlock caps on the outlet from valve 60J-253, both the inlet and outlet of the waste drum pump and the outlet of the drum pumping tool.

5.19.43 BAG drum pumping tool end AND STORE both in an RMA.

**Special Instruction**

An “EMPTY” sticker may be used for the required marking, but a DOT “Empty” label shall not be used.

5.19.44 MARK/LABEL empty drums as follows:

5.19.44.1 REMOVE hazardous waste (yellow sticker) label from wastewater drum.

5.19.44.2 REMOVE Class 9 label, “Non-DOT Radioactive” and any existing weight stickers.

5.19.44.3 MARK drum(s) “EMPTY.”

5.19.44.4 PLACE a “Radioactive Material” sticker on the drum if one is not present.

5.19.45 PROVIDE the CRO the package identification number(s) for the emptied drum(s) for recording on the process memo.

5.19.46 (SOM/FWS) NOTIFY technical waste service, with the specific drum number(s), that the drum(s) are empty, for status update of SWITS.

5.19.47 WHEN pH has stabilized, BRING receiving CT pH into specification per Section 5.8.

5.19.48 DISPOSE of any liquid contents from catch container into Sump 1 or Sample Prep Room sink.
5.20 Flush Circulation Pump 60J-P-1A

NOTE - Verification water pressure is approximately 90 psig. PCV-60H237 will maintain the verification water pressure at 25 psig as indicated by PI-60H200.

5.20.1 PLACE circulation pump 60J-P-1A in STOP.

5.20.2 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60J-022</td>
<td>60J-P-1A Suction Flush Connection</td>
</tr>
<tr>
<td>60J-038</td>
<td>CT-A Recirc Line Drain/Flush Connection</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-A Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
</tbody>
</table>

5.20.3 ENSURE the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-035</td>
<td>60J-P-1A Suction Isolation</td>
</tr>
<tr>
<td>60J-029</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-043</td>
<td>CT-A Recirc Isolation (top of CT-A)</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>

5.20.4 PLACE valve AOV-60H024, CT-A Verification Water Flush, in MANUAL/OPEN.
5.21 Flush Circulation Pump 60J P 1A

5.21.1 SLOWLY OPEN verification water valve 60H-234 to allow PCV-60H-237 to maintain water pressure at 25 psig as indicated by PI-60H200.

5.21.2 WHEN CT-A level, as indicated by LI-60J001A, has increased by 0.5%, OR

IF directed by SOM, CLOSE valve 60H-234.

5.21.3 CLOSE 60H-235, PCV-60H-237 Outlet Isolation.

5.21.4 PLACE valve AOV-60H024, CT-A Verification Water Flush, to AUTO/CLOSE.

5.21.5 IF 60J-P-1A will not be restarted within 24 hours, CLOSE seal water valve 95B-121.

5.22 Flush Circulation Pump 60J-P-1B

NOTE - Verification water pressure is approximately 90 psig. PCV-60H237 will maintain the verification water pressure at 25 psig as indicated by PI-60H200.

5.22.1 PLACE circulation pump 60J-P-1B in STOP.

5.22.2 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60J-027</td>
<td>60J-P-1B Suction Flush Connection</td>
</tr>
<tr>
<td>60J-051</td>
<td>CT-B Recirc Line Drain/Flush Connection</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>AOV-60H-024</td>
<td>CT-A Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
</tbody>
</table>
5.22 Flush Circulation Pump 60J-P-1B (Cont.)

5.22.3 ENSURE the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-046</td>
<td>60J-P-1B Suction Isolation</td>
</tr>
<tr>
<td>60J-047</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-056</td>
<td>CT-B Recirc Isolation (top of CT-B)</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>

5.22.4 PLACE valve AOV-60H025, CT-B Verification Water Flush, in MANUAL/OPEN.

5.22.5 SLOWLY OPEN verification water valve 60H-234 to allow PCV-60H273 to maintain water pressure at 25 psig as indicated by PI-60H200.

5.22.6 WHEN the CT-B level, as indicated by LI-60J001B, has increased by 0.5%,

OR

IF directed by SOM, CLOSE valve 60H-234.

5.22.7 CLOSE 60H-235, PCV-60H-237 Outlet Isolation.

5.22.8 PLACE AOV-60H025, CT-B Verification Water Flush, to AUTO/CLOSE.

5.22.9 IF 60J-P-1B will not be restarted within 24 hours, CLOSE seal water valve 95B-118.
5.23 Backflush Concentrate Pump Suction Lines to Tank

5.23.1 BACKFLUSH 60J-P-1A through PCV-60H-237:

5.23.1.1 ENSURE 60J-P-1A is OFF.

5.23.1.2 ENSURE AOV-60H-025, CT-B Verification Water Flush, is CLOSED.

5.23.1.3 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isol to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isol to AE60J012B</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60J-036</td>
<td>CT-A Drain Valve</td>
</tr>
</tbody>
</table>

5.23.1.4 ENSURE 60H-075, Verification Water to CTs, is OPEN.

5.23.1.5 CLOSE 60J-035, 60J-P-1A Suction Isolation.

5.23.1.6 OPEN 60H-234, PCV-60H-237 Inlet Isolation.

5.23.1.7 OPEN 60H-235, PCV-60H-237 Outlet Isolation.

5.23.1.8 PLACE AOV-60H-024, CT-A Verification Water Flush, in MANUAL/OPEN.

5.23.1.9 PLACE AOV-60J-044, CT-A Outlet, in MANUAL/OPEN.

5.23.1.10 MONITOR CT-A level using LT60J001A for increase.

5.23.1.11 WHEN CT-A level increases 0.5 to 1.0%,

OR

IF directed by SOM, PLACE AOV-60J-044, CT A Outlet, in AUTO/CLOSE.

5.23.1.12 PLACE AOV-60H-024, CT A verification water flush, to AUTO/CLOSE.
5.23 Backflush Concentrate Pump Suction Lines to Tank (Cont.)

5.23.1.13 **CLOSE** 60H-234, PCV-60H-237 Inlet Isolation.

5.23.1.14 **CLOSE** 60H-235, PCV-60H-237 Outlet Isolation.

5.23.1.15 **OPEN** 60J-035, 60J-P-1A Suction Isolation.

5.23.1.16 **IF** 60J-P-1A will not be restarted within 24 hours, **CLOSE** seal water valve 95B-121.

5.23.2 **BACKFLUSH** 60J-P-1A Bypassing PCV-60H-237:

5.23.2.1 **ENSURE** 60J-P-1A is OFF.

5.23.2.2 **ENSURE** AOV-60H-025, CT-B Verification Water Flush, is CLOSED.

5.23.2.3 **ENSURE** the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-036</td>
<td>CT-A Drain Valve</td>
</tr>
</tbody>
</table>

5.23.2.4 **ENSURE** 60H-075, Verification Water to CTs, is OPEN.

5.23.2.5 **CLOSE** 60J-035, 60J-P-1A Suction Isolation.

5.23.2.6 **OPEN** 60H-233, PCV-60H-237 Bypass.

5.23.2.7 **PLACE** AOV-60H-024, CT-A Verification Water Flush, in MANUAL/OPEN.

5.23.2.8 **PLACE** AOV-60J-044, CT-A Outlet, in MANUAL/OPEN.

5.23.2.9 **MONITOR** CT-A level using LT60J001A for increase.
5.23 Backflush Concentrate Pump Suction Lines to Tank (Cont.)

5.23.2.10 **WHEN** CT-A level increases 0.5 to 1.0%,

**OR**

**IF** directed by SOM, **PLACE** AOV-60J-044, CT-A Outlet, in AUTO/CLOSE.

5.23.2.11 **PLACE** AOV-60H-024, CT-A Verification Water Flush, in AUTO/CLOSE.

5.23.2.12 **CLOSE** 60H-233, PCV-60H-237 Bypass.

5.23.2.13 **OPEN** 60J-035, 60J-P-1A Suction Isolation.

5.23.2.14 **IF** 60J-P-1A will not be restarted within 24 hours, **CLOSE** seal water valve 95B-121.

5.23.3 **BACKFLUSH** 60J-P-1B through PCV-60H-237:

5.23.3.1 **ENSURE** 60J-P-1B is OFF.

5.23.3.2 **ENSURE** AOV-60H-024, CT-A Verification Water Flush, is CLOSED.

5.23.3.3 **ENSURE** the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60J-064</td>
<td>CT-B Drain Valve</td>
</tr>
</tbody>
</table>

5.23.3.4 **ENSURE** the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
</tbody>
</table>
5.23 Backflush Concentrate Pump Suction Lines to Tank (Cont.)

5.23.3.5 **CLOSE** 60J-046, 60J-P-1B Suction Isolation.

5.23.3.6 **ENSURE** 60J-020, CT-A and CT-B 3-way Drain Valve to Sump 1, is positioned CT-B to 60J-P-1B.

5.23.3.7 **ENSURE** 60J-021, CT to Sump 1 Isolation, is CLOSED.

5.23.3.8 **OPEN** 60H-234, PCV-60H-237 Inlet Isolation.

5.23.3.9 **PLACE** AOV-60H-025, CT-B Verification Water Flush, in MANUAL/OPEN.

5.23.3.10 **PLACE** AOV-60J-045, CT-B Outlet, in MANUAL/OPEN.

5.23.3.11 **MONITOR** CT-B level using LT60J001B for increase.

5.23.3.12 **WHEN** CT-B level increases 0.5 to 1.0%,

**OR**

**IF** directed by SOM, **PLACE** AOV-60J-045, CT B Outlet, in AUTO/CLOSE.

5.23.3.13 **PLACE** AOV-60H-025, CT B Verification Water Flush, in AUTO/CLOSE.

5.23.3.14 **CLOSE** 60H-234, PCV-60H-237 Inlet Isolation.

5.23.3.15 **CLOSE** 60H-235, PCV-60H-237 Outlet Isolation.

5.23.3.16 **OPEN** 60J-046, 60J-P-1B Suction Isolation.

5.23.3.17 **IF** 60J-P-1B will not be restarted within 24 hours, **CLOSE** seal water valve 95B-118.
5.23 Backflush Concentrate Pump Suction Lines to Tank (Cont.)

5.23.4 **BACKFLUSH** 60J-P-1B bypassing PCV-60H-237:

5.23.4.1 **ENSURE** 60J-P-1B is OFF.

5.23.4.2 **ENSURE** AOV-60H-024, CT-A Verification Water Flush, is CLOSED.

5.23.4.3 **ENSURE** the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-064</td>
<td>CT-B Drain Valve</td>
</tr>
</tbody>
</table>

5.23.4.4 **ENSURE** the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
</tbody>
</table>

5.23.4.5 **CLOSE** 60J-046, 60J-P-1B Suction Isolation.

5.23.4.6 **ENSURE** 60J-020, CT-A and CT-B 3-way Drain Valve to Sump 1, is positioned CT-B to 60J-P-1B (South port to North port).

5.23.4.7 **ENSURE** 60J-021, CT to Sump 1 Isolation, is CLOSED.

5.23.4.8 **PLACE** AOV-60H-025, CT B Verification Water Flush, in MANUAL/OPEN.
5.23 Backflush Concentrate Pump Suction Lines to Tank (Cont.)

5.23.4.9 PLACE AOV-60J-045, CT B Outlet, in MANUAL/OPEN.

5.23.4.10 MONITOR CT-B level using LT60J001B for increase.

5.23.4.11 WHEN CT-B level increases 0.5 to 1.0%,

OR

IF directed by SOM, PLACE AOV-60J-045, CT B Outlet, in AUTO/CLOSE.

5.23.4.12 PLACE AOV-60H-025, CT B Verification Water Flush, in AUTO/CLOSE.

5.23.4.13 PLACE AOV-60J-045, CT B Outlet, in AUTO/CLOSE.

5.23.4.14 CLOSE 60H-233, PCV-60H-237 Bypass.

5.23.4.15 OPEN 60J-046, 60J-P-1B Suction Isolation.

5.23.4.16 IF 60J-P-1B will not be restarted within 24 hours, CLOSE seal water valve 95B-118.
5.24 Flushing CT-A pH Probe and Bypass Line with Verification Water

NOTE - The pH probe and bypass line may be flushed through the inlet and outlet valves (60J-059 and 60J-058) with the pump operating or shut down.

5.24.1 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>V-AIT60J012A-A</td>
<td>CT-A pH Loop Vent</td>
</tr>
<tr>
<td>V-AIT60J012A-D</td>
<td>CT-A pH Loop Drain</td>
</tr>
<tr>
<td>V-AIT60J012A-E</td>
<td>CT-A pH Probe Bypass</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-A Pump Discharge to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.24.2 ENSURE the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-043</td>
<td>CT-A Recirc Isolation (top of tank)</td>
</tr>
<tr>
<td>60J-058</td>
<td>CT-A pH Loop Outlet Isolation</td>
</tr>
<tr>
<td>60J-059</td>
<td>CT-A pH Loop Inlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012A-B</td>
<td>CT-A pH Probe Outlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012A-C</td>
<td>CT-A pH Probe Inlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012A-F</td>
<td>CT-A pH Loop Inlet Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>
5.24 Flushing CT-A pH Probe and Bypass Line with Verification Water (Cont.)

5.24.3 **FLUSH** inlet to CT-A pH loop as follows:

5.24.3.1 **ENSURE** 60J-029, 60J-P-1A Discharge Isolation, is OPEN.

5.24.3.2 **IF** directed by SOM, **PLACE** pump 60J-P-1A to OFF.

5.24.3.3 **CLOSE** 60J-058, CT-A pH Loop Outlet Isolation.

5.24.3.4 **SLOWLY OPEN** valve 60H-230, Verification Water Inlet Isolation to AE60J012A.

5.24.3.5 **WHEN** level in CT-A increases 0.2 level %,

**OR**

**IF** directed by SOM, **CLOSE** valve 60H-230.

5.24.3.6 **OPEN** 60J-058, CT-A pH Loop Outlet Isolation.

**CAUTION**

Flushing the probe with the pump shut down and the pump discharge isolation valve open can damage the pump.

5.24.4 **IF** directed by SOM, **PLACE** pump 60J-P-1A to OFF.

5.24.5 **IF** pump 60J-P-1A is OFF, **CLOSE** 60J-029, 60J-P-1A Discharge Isolation.
5.24 Flushing CT-A pH Probe and Bypass Line with Verification Water (Cont.)

5.24.6 **FLUSH** CT-A pH probe as follows:

5.24.6.1 **CLOSE** 60J-059, CT-A pH Loop Inlet Isolation.

5.24.6.2 **SLOWLY OPEN** valve 60H-230, Verification Water Inlet Isolation to AE60J021A.

5.24.6.3 **WHEN** level in CT-A increases 0.2 level %,

   **OR**

   **IF** directed by SOM, **CLOSE** valve 60H-230.

5.24.6.4 **OPEN** 60J-059, CT-A pH Loop Inlet Isolation.

5.24.7 **FLUSH** CT-A pH bypass line as follows:

5.24.7.1 **CLOSE** valve V-AIT60J012A-B, CT-A pH Probe Outlet Isolation.

5.24.7.2 **OPEN** valve V-AIT60J012A-E, CT-A pH Probe Bypass.

5.24.7.3 **CLOSE** 60J-059, CT-A pH Loop Inlet Isolation.

5.24.7.4 **SLOWLY OPEN** valve 60H-230, Verification Water Inlet Isolation to AE60J012A.

5.24.7.5 **WHEN** level in CT-A rises up 0.2 level %,

   **OR**

   **IF** directed by SOM, **CLOSE** valve 60H-230.

5.24.7.6 **CLOSE** valve V-AIT60J012A-E, CT-A pH Probe Bypass.

5.24.7.7 **OPEN** valve V-AIT60J012A-B, CT-A pH Probe Outlet Isolation.

5.24.7.8 **OPEN** 60J-059, CT-A pH Loop Inlet Isolation.

5.24.8 **WHEN** flushing is complete, **OPEN** 60J-029, 60J-P-1A Discharge Isolation.

5.24.9 **PLACE** pump 60J-P-1A to ON per SOM direction.
5.25 Flushing CT-B pH Probe and Bypass Line with Verification Water

NOTE - The pH probe and bypass line may be flushed through the inlet and outlet valve (60J-061 and 60J-060) with the pump operating or shutdown.

5.25.1 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet Isolation to AE60J012A</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet Isolation to AE60J012B</td>
</tr>
<tr>
<td>V-AIT60J012B-A</td>
<td>CT-B pH Loop Vent</td>
</tr>
<tr>
<td>V-AIT60J012B-D</td>
<td>CT-B pH Loop Drain</td>
</tr>
<tr>
<td>V-AIT60J012B-E</td>
<td>CT-B pH Probe Bypass</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.25.2 ENSURE the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-056</td>
<td>CT-B Recirc Isolation (top of tank)</td>
</tr>
<tr>
<td>60J-060</td>
<td>CT-B pH Loop Outlet Isolation</td>
</tr>
<tr>
<td>60J-061</td>
<td>CT-B pH Loop Inlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012B-B</td>
<td>CT-B pH Probe Outlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012B-C</td>
<td>CT-B pH Probe Inlet Isolation</td>
</tr>
<tr>
<td>V-AIT60J012B-F</td>
<td>CT-B pH Loop Inlet Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>
5.25 Flushing CT-B pH Probe and Bypass Line with Verification Water (Cont.)

5.25.3 FLUSH through CT-B pH loop inlet valve 60J-061 as follows:

5.25.3.1 ENSURE 60J-047, 60J-P-1B Discharge Isolation, is OPEN.

5.25.3.2 IF directed by SOM, PLACE pump 60J-P-1B to OFF.

5.25.3.3 CLOSE 60J-060, CT-B pH Loop Outlet Isolation.

5.25.3.4 SLOWLY OPEN valve 60H-231, Verification Water Inlet Isolation to AE60J012B.

5.25.3.5 WHEN level in CT-B increases 0.2 level %,

OR

IF directed by SOM, CLOSE valve 60H-231.

5.25.3.6 OPEN 60J-060, CT B pH Loop Outlet Isolation.

CAUTION

Flushing the probe with the pump shut down and the pump discharge isolation valve open can damage the pump.

5.25.4 IF directed by SOM, PLACE pump 60J-P-1B to OFF.

5.25.5 IF pump 60J-P-1B is OFF, CLOSE 60J-047, 60J-P-1B Discharge Isolation.
Concentrate Tank System Operation

5.25 Flushing CT-B pH Probe and Bypass Line with Verification Water (Cont.)

5.25.6 **FLUSH** CT-B pH loop through loop outlet valve 60J-060 as follows:

5.25.6.1 **CLOSE** 60J-061, CT-B pH Loop Inlet Isolation.

5.25.6.2 **SLOWLY OPEN** valve 60H-231, Verification Water Inlet Isolation to AE60J012B.

5.25.6.3 **WHEN** level in CT-B increases 0.2 level %,

**OR**

**IF** directed by SOM, **CLOSE** valve 60H-231.

5.25.6.4 **OPEN** 60J-061, CT-B pH Loop Inlet Isolation.

5.25.7 **FLUSH** CT-B pH bypass line as follows.

5.25.7.1 **CLOSE** valve V-AIT60J012B-B, CT-B pH Probe Outlet Isolation.

5.25.7.2 **OPEN** valve V-AIT60J012B-E, CT-B pH Probe Bypass.

5.25.7.3 **CLOSE** 60J-061, CT-B pH Loop Inlet Isolation.

5.25.7.4 **OPEN** (slowly) valve 60H-231, Verification Water Inlet Isolation to AE60J012B.

5.25.7.5 **WHEN** level in CT-B rises up to 0.2 level %,

**OR**

**IF** directed by SOM, **CLOSE** valve 60H-231.

5.25.7.6 **CLOSE** valve V-AIT60J012B-E, CT-B pH Probe Bypass.

5.25.7.7 **OPEN** valve V-AIT60J012B-B, CT-B pH Probe Outlet Isolation.

5.25.7.8 **OPEN** 60J-061, CT-B pH Loop Inlet Isolation.

5.25.8 **WHEN** flushing is complete, **OPEN** 60J-047, 60J-P-1B Discharge Isolation.

5.25.9 **PLACE** pump 60J-P-1B to ON per SOM direction.
5.26 Flush Transfer Line from CT-A to SWRT A/SWRT B

NOTE - Verification water pressure is approximately 90 psig. PCV-60H237 will maintain the verification water pressure at 25 psig as indicated by PI-60H200.

5.26.1 **PLACE** pump 60J-P-1A in STOP.

5.26.2 **CLOSE** 60J-043, CT-A Recirc Isolation (top of CT-A).

5.26.3 **ENSURE** the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>AOV-60J044</td>
<td>CT-A Outlet</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>

5.26.4 **OPEN** following valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-073</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>AOV-60H024</td>
<td>CT-A Verification Water Flush</td>
</tr>
<tr>
<td>60J-025</td>
<td>CT to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.26.5 **ENSURE** the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-029</td>
<td>60J-P-1A Discharge Isolation</td>
</tr>
<tr>
<td>60J-035</td>
<td>60J-P-1A Suction Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>
5.26 Flush Transfer Line from CT-A to SWRT A/SWRT B (Cont.)

5.26.6 ENSURE 3-way valve AOV-60F013 is routed to SWRT A/SWRT B.

5.26.7 SLOWLY OPEN verification water valve 60H-234 to maintain water pressure at 25 psig indicated on PI-60H-200.

5.26.8 WHEN SWRT A/SWRT B level, as indicated by LI-60I001A/LI-60I001B, has increased by 1%,

OR

IF directed by SOM, CLOSE valve 60H-234.

5.26.9 CLOSE the following valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-025</td>
<td>CT to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.26.10 OPEN valve 60J-043, CT-A Recirc Isolation (top of tank).

5.26.11 PLACE AOV-60H024 in AUTO/CLOSE.
Concentrate Tank System Operation

5.27 Flush Transfer Line from CT-B to SWRT A/SWRT B

NOTE - Verification water pressure is approximately 90 psig. Throttling valve 60H-075 to keep the verification water pressure at 25 psig as indicated by PI-60H200.

5.27.1 PLACE pump 60J-P-1B in STOP.

5.27.2 CLOSE 60J-056, CT-B, Recirc Isolation (Top of CT-B).

5.27.3 ENSURE the following valves are CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-233</td>
<td>PCV-60H-237 Bypass</td>
</tr>
<tr>
<td>AOV-60J045</td>
<td>CT-B Outlet</td>
</tr>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>60J-073</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60H-234</td>
<td>PCV-60H-237 Inlet Isolation</td>
</tr>
<tr>
<td>60H-230</td>
<td>Verification Water Inlet to pH A Probe</td>
</tr>
<tr>
<td>60H-231</td>
<td>Verification Water Inlet to pH B Probe</td>
</tr>
</tbody>
</table>

5.27.4 OPEN the following valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
</tr>
<tr>
<td>60J-025</td>
<td>CT to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.27.5 ENSURE the following valves are OPEN:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-046</td>
<td>60J-P-1B Suction Isolation</td>
</tr>
<tr>
<td>60J-047</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
</tr>
<tr>
<td>60H-075</td>
<td>Verification Water to CTs</td>
</tr>
</tbody>
</table>

5.27.6 ENSURE 3-way valve AOV-60F013 is routed to SWRT A/SWRT B.
5.27 Flush Transfer Line from CT-B to SWRT A/SWRT B (Cont.)

5.27.7 SLOWLY OPEN verification water valve 60H-234 to allow PCV-60H237 to control and maintain water pressure at 25 psig as indicated on PI-60H200.

5.27.8 WHEN SWRT A/SWRT B level, as indicated by LI-60I001A/LI-60I001B, has increased by 1%, CLOSE valve 60H-234.

5.27.9 CLOSE the following valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60H-235</td>
<td>PCV-60H-237 Outlet Isolation</td>
</tr>
<tr>
<td>60J-054</td>
<td>CT-B Pump Discharge to SWRT Isolation</td>
</tr>
<tr>
<td>60J-025</td>
<td>CT to SWRT Isolation</td>
</tr>
</tbody>
</table>

5.27.10 OPEN 60J-056, CT-B Recirc Isolation (top of CT-B).

5.27.11 PLACE AOV-60H025, CT-B Verification Water Flush, in AUTO/CLOSE.

5.28 Backflush Thin Film Dryer Feed Line to CT-A Using Pump 60J-P-3

NOTE - Section 5.28 can be used for flushing the feed line to prepare for a long-term shutdown or when the feed line is suspected of being plugged.

5.28.1 ENSURE Thin Film Dryer is in SHUTDOWN.

5.28.2 ENSURE pump 60J-P-1A is in SHUTDOWN.

5.28.3 ENSURE the following valves are CLOSED:

- AOV-60H040, Dryer Feed Line Verification Water Flush
- AOV-60J053, CT-B to Dryer
- Level Control Valve, LIC60J036 in MANUAL at 0%.

5.28.4 ENSURE the following valves are OPEN:

- AOV-60J058, CT-A to Dryer
- AOV-60J156, Distillate Recycle Valve
- AOV-60J154, Dryer Feed Inlet Valve.
5.28 Backflush Thin Film Dryer Feed Line to CT-A Using Pump 60J-P-3 (Cont.)

**CAUTION**

If spray condenser level exceeds 100%, water may overflow into the VOG System.

5.28.5 IF LIC60J036, spray condenser level, indicates less than 70%, **FILL** spray condenser as follows:

5.28.5.1 **OPEN** AOV-60J158, spray condenser fill valve.

5.28.5.2 **WHEN** LIC60J036 indicates between 65 to 70%, **CLOSE** AOV-60J158.

5.28.6 **PLACE** pump 60J-P-3 on MANUAL/START.

5.28.7 **REPEAT** Step 5.28.5 as necessary to maintain LIC60J036 between 30% and 80%.

5.28.8 IF distillate is leaking through 60J-P-2, **CLOSE** 60J-123.

5.28.9 **CONTINUE** flush until CT-A level, LI-60J01A has increased 0.5%, or amount designated by SOM.

5.28.10 **RETURN** the following AOVs to AUTO condition:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J053</td>
<td>CT-B dryer feed valve</td>
</tr>
<tr>
<td>AOV-60J156</td>
<td>Distillate recycle valve</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Dryer feed inlet valve</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A dryer feed valve</td>
</tr>
</tbody>
</table>

5.28.11 **RETURN** LIC60J036 to 50% (Auto).

5.28.12 IF 60J-123 was closed in Step 5.28.8, **OPEN** 60J-123.

5.28.13 **RETURN** 60J-P-3 to AUTO.

5.28.14 **ENSURE** 60J-P-1A is in AUTO.

5.28.15 **RETURN** CT-A to READY or READY/RECEIVE mode.
5.29 Backflush Thin Film Dryer Feed Line to CT-B Using Pump 60J-P-3

NOTE - Section 5.29 can be used for flushing the feed line to prepare for a long-term shut down or when the feed line is suspected of being plugged.

5.29.1 ENSURE Thin Film Dryer is in SHUTDOWN.

5.29.2 ENSURE pump 60J-P-1B is in SHUTDOWN.

5.29.3 ENSURE the following valves are CLOSED:
- AOV-60H040, Dryer Feed Line Verification Water Flush
- AOV-60J058, CT-A to Dryer
- LCV-60J-036, Level Control Valve for Spray Condenser.

5.29.4 ENSURE the following valves are OPEN:
- AOV-60J053, CT-B to Dryer
- AOV-60J156, Distillate Recycle Valve
- AOV-60J154, Dryer Feed Inlet Valve.

CAUTION
If spray condenser level exceeds 100%, water may overflow into the VOG System.

5.29.5 IF LIC60J036, spray condenser level indicates less than 70%, FILL spray condenser as follows:

5.29.5.1 OPEN AOV-60J158, spray condenser fill valve.

5.29.5.2 WHEN LIC60J036 indicates 65% to 70%, CLOSE AOV-60J158.

5.29.6 PLACE pump 60J-P-3 on MANUAL/START.

5.29.7 REPEAT Step 5.29.5 as necessary to maintain LIC60J036 between 30% and 80%.

5.29.8 IF distillate is leaking through 60J-P-2, CLOSE 60J-123.

5.29.9 CONTINUE flush until CT-B level, LI-60J01B has increased 0.5%, or amount designated by SOM.
Concentrate Tank System Operation

5.29 Backflush Thin Film Dryer Feed Line to CT-B Using Pump 60J-P-3 (Cont.)

5.29.10 **RETURN** the following AOVs to AUTO:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>AOV-60J156</td>
<td>Distillate recycle valve</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Dryer feed inlet valve</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
</tbody>
</table>

5.29.11 **RETURN** LIC60J036 to 50% AUTO.

5.29.12 **IF** 60J-123 was closed in Step 5.29.8, **OPEN** 60J-123.

5.29.13 **RETURN** 60J-P-3 to AUTO.

5.29.14 **ENSURE** 60J-P-1B is in AUTO.

5.29.15 **RETURN** CT-B to READY or READY/RECEIVE mode.

5.30 Transfer of CT-A Contents to SWRT-B Using 60J-P-1B

5.30.1 **ENSURE** Thin Film Dryer is in SHUTDOWN.

5.30.2 **ENSURE** the following pumps are in MANUAL/OFF:
- 60J P 1A
- 60J P 1B.

5.30.3 **CONFIRM** sufficient volume is available in SWRT–B to perform the transfer.

5.30.4 **PLACE** the following AOVs in MANUAL/CLOSED:
- AOV-60J045 (CT-B Outlet)
- AOV-60J053 (CT-B to Dryer).

5.30.5 **CLOSE** following manual valves:
- 60J-035: 60J-P-1A Suction Isolation
- 60J-056: CT-B Recirc Isolation (top of CT-B)
- 60J-073: CT-A Pump Discharge to SWRT Isolation.
5.30 Transfer of CT-A Contents to SWRT-B Using 60J-P-1B (Cont.)

5.30.6 ENSURE the following manual valves OPEN:
- 60J-046: 60J-P-1B Suction Isolation
- 60J-047: 60J-P-1B Discharge Isolation
- 60J-049: 60J-P-1B Discharge Isolation
- 60J-054: CT-B Pump Discharge to SWRT Isolation
- 60J-025: CT to SWRT Isolation.

5.30.7 PLACE the following AOVs in MANUAL/OPEN:
- AOV-60H025: CT-B Verification Water Flush
- AOV-60H024: CT-A Verification Water Flush
- AOV-60J044: CT-A Outlet.

5.30.8 ALIGN AOV-60F013 to SWRT-B.

5.30.9 ENSURE seal water and cooling water are ON to 60J-P-1B.

5.30.10 PLACE pump 60J-P-1B in RUN.

5.30.11 MONITOR levels (decreasing in CT-A and increasing in SWRT-B).

5.30.12 WHEN transfer is complete, PERFORM the following:

5.30.12.1 PLACE pump 60J-P-1B in STOP.

5.30.12.2 PLACE AOV-60H024 in AUTO.

5.30.12.3 PLACE AOV-60H025 in AUTO.

5.30.13 PLACE the following AOVs in AUTO:
- AOV-60J053: CT-B to Dryer
- AOV-60J045: CT-B Outlet
- AOV-60J044: CT-A Outlet.

5.30.14 PERFORM Section 5.28 to backflush concentrate line to CT-A.

5.30.15 PERFORM Section 5.32 to flush transfer path from CT-A to SWRT.
5.31  Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank

NOTE -  Section 5.31 addresses the addition of sodium EDTA and tri-sodium phosphate.

5.31.1  **STAGE** chemical addition tank, transfer pump, and hoses near customer waste line between IXs and CTs.

5.31.2  **ENSURE** the following valves on customer waste line CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
</tr>
</tbody>
</table>

5.31.3  **ENSURE** the following 4% $\text{H}_2\text{SO}_4$ valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65C-020</td>
<td>4% Acid to CT-A</td>
</tr>
<tr>
<td>AOV-65C-041</td>
<td>4% Acid to CT-A</td>
</tr>
</tbody>
</table>

5.31.4  **SELECT** receiving CT AND

**OPEN** one of the following:
- Valve 60J-254 to feed CT-A

**OR**
- Valve 60J-255 to feed CT-B.

5.31.5  **MONITOR** LT-60J001A [LT-60J001B] tank level indication.

5.31.6  **MONITOR** AIT-60J012A [AIT-60J012B] pH indication.
5.31 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

5.31.7 CONFIRM CT level is greater than 39%,

   OR

CONFIRM as directed by process memo.

5.31.8 IF CT level is greater than 39%, ENSURE CT mixer (60J-BL-1A) [60J-BL-1B] is ON.

NOTE - At discretion of SOM, based on plant conditions, receiving CT pump may be left OFF as long as agitator is in operation.

5.31.9 ENSURE CT pump 60J-P-1A [60J-P-1B] is ON,

   OR

ENSURE as directed by SOM AND

RECORD directions in ETF Control Room Logbook.

NOTE - Power plug is a twist lock plug.

5.31.10 CONNECT power cord of the waste transfer pump to the electrical outlet.

5.31.11 CONNECT power cord of the chemical addition tank agitator to the closest available 120-volt power outlet.

5.31.12 ADD sanitary or verification water to chemical addition tank until level is about one foot below top of tank.

5.31.13 START chemical addition tank agitator.

5.31.14 CONNECT flexible impeller pump suction hose to chemical mix tank outlet valve V-1.

5.31.15 CONNECT hose to flexible impeller pump discharge and valve 60J-253 on customer waste line.
5.31 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

**WARNING**

Chemicals used for flushing operations may cause eye, skin and respiratory tract irritation.

5.31.16 **DON** the following PPE:
- Rubber gloves
- Tight fitting chemical goggles
- Chemical protective apron.

5.31.17 **ENSURE** emergency shower and eye wash station are identified and available.

5.31.18 **SLOWLY ADD** chemical and quantity specified by process memo to the chemical addition tank.

5.31.19 **AGITATE** chemical addition tank contents for ten minutes or until all solids have dissolved.

5.31.20 **OPEN** valve V-1 on discharge of chemical tank.

5.31.21 **STOP** chemical addition tank agitator.

**NOTE** - The waste transfer pump is capable of pumping in either direction depending on the switch direction. There are arrows above the “1” and “2” on the waste transfer pump switch showing which way the pump will pump when the switch is in that position. When transferring waste from the chemical addition tank, the switch shall be placed in the position where the arrow points toward 60J 253 and away from the chemical addition tank.

5.31.22 **PLACE** the waste transfer pump to either “1” or “2” depending on which direction the pump is to pump.

5.31.23 **OPEN** valve 60J-253 on customer waste line.
5.31 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

NOTE - On the pump head of the waste transfer pump is a valve that will bypass the pump itself. The valve is OPEN (i.e., pump bypassed) when the handle is parallel to the pump head. The valve is CLOSED (i.e., pump not bypassed) when the handle is perpendicular to the pump head.

5.31.24 OPEN bypass valve on waste transfer pump head until fluid is seen entering the transfer line.

5.31.25 WHEN fluid is seen at the pump in the hose, CLOSE pump bypass valve on waste transfer pump head.

NOTE - Occasionally the pump will not start when the switch on the outlet is turned ON. This will occur when the flexible impeller becomes bound up in the pump head. Usually the flexible impeller can be freed by reversing the flow direction and “bumping” (quickly turning ON then OFF) the pump.

5.31.26 TURN switch on outlet to ON.

5.31.27 IF the pump does not start, TURN the outlet switch to OFF AND PERFORM the following:

5.31.27.1 PLACE waste transfer pump to the opposite direction setting to reverse the flow.

5.31.27.2 QUICKLY TURN the pump ON and OFF.

5.31.27.3 RETURN to Step 5.31.27.

5.31.28 PLACE the waste transfer pump to either “1” or “2” depending on which direction the pump is to pump.

5.31.29 WHEN the chemical tank is empty, PLACE the waste transfer switch to “0.”
5.31 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

NOTE - Power plug is a twist lock plug.

5.31.30 CLOSE valve 60J-253.

5.31.31 ADD enough sanitary or verification water to chemical addition tank to rinse it thoroughly.

5.31.32 OPEN 60J-253.

5.31.33 TURN outlet switch to ON.

5.31.34 IF the pump does not start, TURN outlet switch to OFF AND PERFORM the following:

5.31.34.1 PLACE waste transfer pump to opposite direction setting to reverse flow.

5.31.34.2 QUICKLY TURN the pump ON and OFF.

5.31.34.3 RETURN to previous step.

5.31.35 PLACE the waste transfer pump to either “1” or “2” depending on which direction the pump is to pump.

5.31.36 ROTATE pump bypass valve several times from OPEN to CLOSE while flushing pump system to flush bypass line.

5.31.37 WHEN flush is finished, LEAVE bypass valve CLOSED.

5.31.38 WHEN the chemical tank is empty, PLACE the waste transfer switch to “0.”

5.31.39 TURN switch on outlet to OFF.

5.31.40 CLOSE valve 60J-253.

5.31.41 CLOSE valve V-1 on chemical addition tank discharge line.

5.31.42 DISCONNECT waste transfer pump from the electrical outlet.
5.31 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

5.31.43 **DISCONNECT** hoses from the following:
- Valve 60J-253
- Waste transfer pump
- Chemical addition tank.

5.31.44 **DRAIN** hoses into a catch container.

5.31.45 **OPEN** valve V-1 on chemical addition tank **AND**

**DRAIN** residual contents of tank into catch container.

5.31.46 **DISPOSE** of residual liquid into Sump 1.

5.31.47 **CLOSE** valve V-1 on chemical addition tank.

5.31.48 **PLACE** camlock caps on customer waste line connection at valve 60J-253, both the inlet and outlet of the waste transfer pump, and the outlet of the chemical addition tank.

5.31.49 **STORE** the following in RMA:
- Pump
- Hoses
- Extension cord in RMA.

5.31.50 **STORE** chemical addition tank in the tent on east side of verification berm.
5.32  Backflush Thin Film Dryer Feed Line to CT-A Using AOV-60H040

NOTE -  Section 5.32 can be used for flushing the feed line to prepare for a long term shutdown or when the feed line is suspected of being plugged.

5.32.1  ENSURE Thin Film Dryer is in SHUTDOWN.

5.32.2  ENSURE pump 60J-P-1A is in SHUTDOWN.

5.32.3  ENSURE the following valves are CLOSED:
- AOV-60J154, Concentrate Feed to Dryer
- AOV-60J053, CT-B to Dryer
- 60J-040, 60J-P-1A Discharge Isolation

5.32.4  ENSURE valve AOV-60J058, CT-A to Dryer, is OPEN.

5.32.5  PLACE AOV-60H040, Dryer Feed Line Verification Water Flush, to MANUAL/OPEN.

5.32.6  CONTINUE flush until CT-A level, LI-60J01A has increased 0.5%, or amount specified by SOM.

5.32.7  RETURN the following AOVs to AUTO condition:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J053</td>
<td>CT-B dryer feed valve</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Dryer feed inlet valve</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A dryer feed valve</td>
</tr>
</tbody>
</table>

5.32.8  OPEN valve 60J-040, 60J-P-1A Discharge Isolation.

5.32.9  ENSURE 60J-P-1A is in AUTO.

5.32.10 RETURN CT-A to READY or READY/RECEIVE mode.
5.33 Backflush Thin Film Dryer Feed Line to CT-B Using AOV-60H040

NOTE - Section 5.33 can be used for flushing the feed line to prepare for a long-term shutdown or when the feed line is suspected of being plugged.

5.33.1 ENSURE Thin Film Dryer is in SHUTDOWN.

5.33.2 ENSURE pump 60J-P-1B is in SHUTDOWN.

5.33.3 ENSURE the following valves are CLOSED:
- AOV-60J154, Concentrate Feed to Dryer
- AOV-60J058, CT-A to Dryer
- 60J-049, 60J-P-1B Discharge Isolation.

5.33.4 ENSURE valve AOV-60J053, CT-B to Dryer, is OPEN.

5.33.5 PLACE AOV-60H040, Dryer Feed Line Verification Water Flush, to MANUAL/OPEN.

5.33.6 CONTINUE flush until CT-B level, LI-60J01B has increased 0.5%, or amount specified by SOM.

5.33.7 RETURN the following AOVs to AUTO:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
</tr>
<tr>
<td>AOV-60J154</td>
<td>Dryer feed inlet valve</td>
</tr>
<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
</tr>
<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
</tr>
</tbody>
</table>

5.33.8 OPEN valve 60J-049 60J-P-1B, Discharge Isolation.

5.33.9 ENSURE 60J-P-1B is in AUTO.

5.33.10 RETURN CT-B to READY or READY/RECEIVE mode.
5.34 Backflush Circulation Pump 60J-P-1A

5.34.1 **ENSURE** pumps 60J-P-1A and 60J-P-1B is in MANUAL/OFF.

5.34.2 **ENSURE** drain hoses from 60J-021 to duplex strainer 60J-S-3 and from strainer to 20B-069 (under grating) are connected.

5.34.3 **ENSURE** the following valves in AUTO:
- AOV-60J044, CT-A Outlet
- AOV-60J045, CT-B Outlet.

5.34.4 **ENSURE** the following valves are CLOSED:
- 60H-234, PCV-60H-237 Inlet Isolation
- 60H-233, PCV-60H-237 Bypass
- 60H-231, Verification Water Inlet Isolation to CT-B pH Loop
- 60H-230, Verification Water Inlet Isolation to CT-A pH Loop
- 60J-022, 60J-P-1A Suction Flush Connection
- 60J-029, 60J-P-1A Discharge Isolation
- 95B-121, Seal Water to 60J-P-1A
- V-AIT60J012A-F, CT-A pH Loop Isolation
- V-PT60J011A-A, PT-60J011A Gauge Drain
- 60J-046, 60J-P-1B Suction Isolation
- 60J-021, CT to Sump 1 Isolation.

5.34.5 **PLACE** the following valves in MANUAL/OPEN:
- AOV-60H024, CT-A Verification Water Flush
- AOV-60H025, CT-B Verification Water Flush.

5.34.6 **ENSURE** the following valves are OPEN:
- 60H-075, Verification Water to CT Isolation
- 60J-035, 60J-P-1A Suction Isolation
- 60J-059, CT-A pH Loop Inlet Isolation
- 60J-039, 60J-P-1A Discharge PT-60J011A Gauge Isolation
- 20B-069, CT to Sump 1 Drain Isolation.
5.34 Backflush Circulation Pump 60J-P-1A (Cont.)

NOTE - 3-way valve 60J-020 has three different flow paths:
- Flow straight through the valve (south port to north port), used when flowing CT-B to 60J P 1B or backflushing line into CT-B
- Flow from the CT-B side to Sump 1 (south port to east port), used when draining CT-B to Sump 1
- Flow from the 60J-P-1B side to Sump 1 (north port to east port), used when draining CT-A to Sump 1 or backflushing 60J-P-1A or 60J-P-1B to Sump 1.

5.34.7 POSITION 3-way valve 60J-020 for draining 60J-P-1A to Sump 1 (North port to East Port).

5.34.8 MONITOR pressure on PT-60J011A.

5.34.9 SLOWLY OPEN 60H-230, Verification Water Inlet Isolation to CT-A pH Loop.

5.34.10 WHEN pressure as indicated by PT-60J011A has stabilized at approximately 80 – 90 psig, OPEN valve 60J-021.

5.34.11 CYCLE 60J-021 OPEN and CLOSED as directed by SOM AND RECORD directions in ETF Control Room Logbook.

5.34.12 IF pressure does not decrease or flow appears restricted, SWITCH valve on duplex strainer 60J-S-3 to bring opposite side into operation.

5.34.13 CLOSE 60H-230.

5.34.14 ENSURE 60J-021 is CLOSED.

5.34.15 PLACE the following valves in AUTO:
- AOV-60H024, CT-A Verification Water Flush
- AOV-60H025, CT-B Verification Water Flush.

5.34.16 POSITION 60J-020 for flow from CT-B to 60J-P-1B.

5.34.17 OPEN following valves:
- 60J-046, 60J-P-1B Suction Isolation
- 60J-029, 60J-P-1A Discharge Isolation
- V-AIT60J012A-F, CT-A pH Loop Isolation
- 95B-121, Seal Water to 60J-P-1A.
5.34 Backflush Circulation Pump 60J-P-1A (Cont.)

5.34.18 **ENSURE** 20B-069, CT to Sump 1 Drain Isolation is OPEN or as directed by SOM.

5.34.18.1 **RECORD** directions in ETF Control Room Logbook.

5.34.19 **INSPECT** drain hose and duplex strainer 60J-S-3 for leaks **AND**

**ADDRESS** issues per SOM direction.

5.35 Backflush Circulation Pump 60J-P-1B

5.35.1 **ENSURE** pump 60J-P-1B in MANUAL/OFF.

5.35.2 **ENSURE** drain hoses from 60J-021 to duplex strainer 60J-S-3 and from strainer to 20B-069 (under grating) are connected.

5.35.3 **ENSURE** the following valves in AUTO:

- AOV-60H025, CT-B Verification Water Flush
- AOV-60J045, CT-B Outlet.

5.35.4 **ENSURE** the following valves are CLOSED:

- 60H-234, PCV-60H-237 Inlet Isolation
- 60H-233, PCV-60H-237 Bypass
- 60H-230, Verification Water Inlet Isolation to CT-A pH Loop
- 60H-231, Verification Water Inlet Isolation to CT-B pH Loop
- 60J-027, 60J-P-1B Suction Flush Connection
- 60J-047, 60J-P-1B Discharge Isolation
- 95B-118, Seal Water to 60J-P-1B
- V-AIT60J012B-F, CT-B pH Loop Isolation
- V-PT60J011B-A, PT-60J011B Gauge Drain
- 60J-021, CT to Sump 1 Isolation.
5.35 Backflush Circulation Pump 60J-P-1B (Cont.)

5.35.5 ENSURE the following valves are OPEN:

- 60H-075, Verification Water to CT Isolation
- 60J-046, 60J-P-1B Suction Isolation
- 60J-061, CT-B pH Loop Inlet Isolation
- 60J-072, 60J-P-1B Discharge PT-60J011B Gauge Isolation
- 20B-069, CT to Sump 1 Drain Isolation.

NOTE - 3-way valve 60J 020 has three different flow paths:

- Flow straight through the valve (south port to north port), used when flowing CT-B to 60J-P-1B or backflushing line into CT-B
- Flow from the CT-B side to Sump 1 (south port to east port), used when draining CT-B to Sump 1
- Flow from the 60J-P-1B side to Sump 1 (north port to east port), used when draining CT-A to Sump 1 or backflushing 60J-P-1A or 60J-P-1B to Sump 1.

5.35.6 POSITION 3-way valve 60J-020 for draining 60J-P-1B to Sump 1 (North port to East port).

5.35.7 MONITOR pressure on PT-60J011B.

5.35.8 SLOWLY OPEN 60H-231, Verification Water Inlet Isolation to CT-B pH Loop.

5.35.9 WHEN pressure as indicated by PT-60J011B has stabilized at approximately 80 – 90 psig, OPEN valve 60J-021.

5.35.10 IF pressure does not decrease or flow appears restricted, SWITCH valve on duplex strainer 60J-S-3 to bring opposite side into operation.

5.35.11 CYCLE 60J-021 OPEN and CLOSED as directed by the SOM AND RECORD directions in ETF Control Room Logbook.

5.35.12 CLOSE 60H-231.

5.35.13 ENSURE 60J-021 is CLOSED.

5.35.14 POSITION 3-way valve 60J-020 for flow from CT-B to 60J-P-1B (South port to North port).
5.35  Backflush Circulation Pump 60J-P-1B (Cont.)

5.35.15  **OPEN** the following valves:
- 60J-047, 60J-P-1B Discharge Isolation
- 95B-118, Seal Water to 60J-P-1B
- V-AIT60J012B-F, CT-B pH Loop Isolation.

5.35.16  **ENSURE** 20B-069, CT to Sump 1 Drain Isolation is OPEN or as directed by SOM.

5.35.16.1  **RECORD** directions in ETF Control Room Logbook.

5.35.17  **INSPECT** drain hose and duplex strainer 60J-S-3 for leaks **AND**
**ADDRESS** issues per SOM direction.
5.36 Add chemicals to CT Using Air Operated Diaphragm Pump and Chemical Addition Tank

NOTE - Section 5.36 addresses the addition of sodium EDTA and tri-sodium phosphate.

5.36.1 STAGE chemical addition tank, transfer pump, and hoses near customer waste line between IXs and CTs.

5.36.2 ENSURE the following valves on customer waste line CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
</tr>
<tr>
<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
</tr>
<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
</tr>
</tbody>
</table>

5.36.3 ENSURE the following 4% $\text{H}_2\text{SO}_4$ valves CLOSED:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65C-020</td>
<td>4% Acid to CT-A</td>
</tr>
<tr>
<td>AOV-65C-041</td>
<td>4% Acid to CT-A</td>
</tr>
</tbody>
</table>

5.36.4 SELECT receiving CT AND

OPEN one of the following:
- Valve 60J-254 to feed CT-A

OR
- Valve 60J-255 to feed CT-B.

5.36.5 MONITOR LT-60J001A [LT-60J001B] tank level indication.

5.36.6 MONITOR AIT-60J012A [AIT-60J012B] pH indication.
5.36  Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

5.36.7  CONFIRM CT level is greater than 39%,

 OR

CONFIRM as directed by process memo.

5.36.8  IF CT level is greater than 39%, ENSURE CT mixer (60J-BL-1A) [60J-BL-1B] is ON.

NOTE -  At discretion of SOM, based on plant conditions, receiving CT pump may be left OFF as long as agitator is in operation.

5.36.9  ENSURE CT pump 60J-P-1A [60J-P-1B] is ON,

 OR

ENSURE as directed by SOM AND

RECORD directions in ETF Control Room Logbook.

NOTE -  Compressed air supply is located next to the Polishers. Air line may be connected to 1B-080, 1B-081 or 1B-082.

5.36.10  CONNECT air line to compressed air valve 1B-080 or 1B-081 or 1B-082.

5.36.11  CONNECT other end of air line to diaphragm pump at valve 1B-102.

5.36.12  ENSURE 1B-102 is CLOSED.

5.36.13  OPEN valves 1B-015 and 1B-080 or 1B-081 or 1B-082.

5.36.14  ADD sanitary or verification water to chemical addition tank until level is about one foot below top of tank.

5.36.15  START chemical addition tank agitator.

5.36.16  CONNECT diaphragm pump suction hose to chemical mix tank outlet valve V-1.

5.36.17  CONNECT hose to diaphragm pump discharge and valve 60J-253 on customer waste line.
5.36 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

WARNING
Chemicals used for flushing operations may cause eye, skin and respiratory tract irritation.

5.36.18 DON the following PPE:
- Rubber gloves
- Tight fitting chemical goggles
- Chemical protective apron.

5.36.19 ENSURE emergency shower and eye wash station are identified and available.

5.36.20 SLOWLY ADD chemical and quantity specified by process memo to the chemical addition tank.

5.36.21 AGITATE chemical addition tank contents for ten minutes or until all solids have dissolved.

5.36.22 OPEN valve V-1 on discharge of chemical tank.

5.36.23 STOP chemical addition tank agitator.

5.36.24 OPEN valve 60J-253 on customer waste line.

NOTE - Opening valve 1B-102 will start the pump.

5.36.25 OPEN valve 1B-102 on pump.

NOTE - PCV-1B-101 will typically be adjusted to between 50 and 100 psig. PCV may be adjusted to less than 50 psig at direction of SOM.

5.36.26 ADJUST PCV-1B-101 as needed to operate pump.

5.36.27 WHEN the chemical tank is empty, CLOSE valve 1B-102.
5.36 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

5.36.28 CLOSE valve 60J-253.

5.36.29 ADD enough sanitary or verification water to chemical addition tank to rinse it thoroughly.

5.36.30 OPEN 60J-253.

NOTE - Opening valve 1B-102 will start the pump.

5.36.31 OPEN valve 1B-102.

5.36.32 WHEN the chemical tank is empty, CLOSE valve 1B-015.

5.36.33 WHEN air pressure has bled off of pump, THEN CLOSE valves 1B-080/080/082 and 1B-102.

5.36.34 CLOSE valve 60J-253.

5.36.35 CLOSE valve V-1 on chemical addition tank discharge line.

**WARNING**

Air pressure may be trapped in air line so caution must be exercised when disconnecting the line from the pump and air supply.

5.36.36 DISCONNECT waste transfer pump from air line.

5.36.37 DISCONNECT air line from valve 1B-080 or 1B-081 or 1B-082.

5.36.38 DISCONNECT hoses from the following:
- Valve 60J-253
- Waste transfer pump
- Chemical addition tank.

5.36.39 DRAIN hoses into a catch container.

5.36.40 OPEN valve V-1 on chemical addition tank AND

DRAIN residual contents of tank into catch container.
5.36 Add Chemicals to CT Using Flexible Impeller Pump and Chemical Addition Tank (Cont.)

5.36.41 DISPOSE of residual liquid into Sump 1.

5.36.42 CLOSE valve V-1 on chemical addition tank.

5.36.43 PLACE camlock caps on customer waste line connection at valve 60J-253, both the inlet and outlet of the waste transfer pump, and the outlet of the chemical addition tank.

5.36.44 STORE the following in RMA:
- Pump
- Hoses.

5.36.45 STORE chemical addition tank as directed by SOM.
Concentrate Tank System Operation

5.37 Records

5.37.1 PERFORM the following for records identified within this procedure.

5.37.1.1 RECORD the number of times the record was generated in applicable column

OR

PLACE a check mark (✓) in the N/A column.

5.37.1.2 SUBMIT the package for verification of completed records.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Sheets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 1 – CT System Startup Electrical Breaker Alignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 2 – CT System Startup Valve Position Alignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 3 – CT System AOV Mode Alignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Sheet 4 – SWRT Available Volume Calculation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FWS/OE/Shift Manager SEND the completed records with Records Submittal Checklist attached to the Central Shift Office for records retention.

________________________ / __________________________ / ________________
Signature                  Print (First & Last)             Date
FWS/OE/Shift Manager

The record custodian identified in the Company Level Record Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
## Table 1– CT Level (%) to Volume (gal) Conversion Chart

<table>
<thead>
<tr>
<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
<th>Liquid Level (%)</th>
<th>Volume (Gallons)</th>
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</thead>
<tbody>
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<td>0</td>
<td>913</td>
<td>25</td>
<td>2284</td>
<td>50</td>
<td>3655</td>
<td>75</td>
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<td>1955</td>
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<td>4696</td>
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<td>20</td>
<td>2010</td>
<td>45</td>
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<td>70</td>
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<td>95</td>
<td>6122</td>
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<td>21</td>
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<td>3600</td>
<td>74</td>
<td>4970</td>
<td>99</td>
<td>6341</td>
</tr>
</tbody>
</table>

**NOTE**
1. Tank contents (gallons) = (LL%*54.83) + 913
2. 0% level = 3.5” above weld line between tank dish and side wall.
3. 100% level = 2” below overflow level.

Ref: VI 22314, Supplement 1, V1354-001-A-322/323/324/325/326/327
### Data Sheet 1 – CT System Startup Electrical Breaker Alignment

<table>
<thead>
<tr>
<th>Panel Number</th>
<th>Breaker Name</th>
<th>Required Position</th>
<th>Initials</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Instrumentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP-3</td>
<td>CKT4, IDP-3</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Electrical Equipment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Toggle Switch for Pump 60J-P-4 (Local)</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS-25B-001</td>
<td>Switched 120VAC Outlet (Local)</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCC-2</td>
<td>Concentrate Tank 1A Mixer Motor 60J-BL-1A</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCC-2</td>
<td>60J-P-1A, Concentrate Circulation Pump “A”</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCC-2</td>
<td>Concentrate Tank 1B Mixer Motor 60J-BL-1B</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCC-2</td>
<td>60J-P-1B, Concentrate Circulation Pump “B”</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

_________________________/_________________________/_________________________/  
Signature Print (First & Last) Initials Date  
NCO or SOE  

_________________________/_________________________/_________________________/  
Signature Print (First & Last) Initials Date  
NCO or SOE  

_________________________/_________________________/_________________________/  
Signature Print (First & Last) Initials Date  
SOM Completion Review
## Concentrate Tank System Operation

### Data Sheet 2 – CT System Startup Valve Position Alignment

<table>
<thead>
<tr>
<th>Valve Number</th>
<th>Valve Name and Location</th>
<th>Required Position</th>
<th>Initials</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Sink</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60I-032</td>
<td>Concentrate Tk A Discharge Isolation Valve at Sample Sink</td>
<td>CLOSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60I-033</td>
<td>Concentrate Tk B Discharge Isolation Valve at Sample Sink</td>
<td>CLOSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60I-055</td>
<td>Sampling Sink Vessel Ventilation Valve</td>
<td>OPEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60I-054</td>
<td>Raw Water to Sample Sink Isolation Valve</td>
<td>CLOSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60I-066</td>
<td>Sample Sink Drain Valve</td>
<td>OPEN</td>
<td></td>
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</tr>
<tr>
<td><strong>Concentrate Circulation System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60J-020</td>
<td>CT-A &amp; CT-B 3-way drain valve to sump # 1 (South port to North port)</td>
<td>CT-B to 60J-P-1B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60J-021</td>
<td>CT to Sump 1 Isolation</td>
<td>CLOSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60J-035</td>
<td>60J-P-1A Suction Isolation</td>
<td>OPEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60J-040</td>
<td>60J-P-1A Discharge Isolation</td>
<td>OPEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60J-022</td>
<td>60J-P-1A Suction Flush Conn</td>
<td>CLOSED</td>
<td></td>
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<tr>
<td>60J-041</td>
<td>CT-A Isolation to Sampling Sink</td>
<td>CLOSED</td>
<td></td>
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<tr>
<td>60J-043</td>
<td>CT- A Recirc Isolation (Top of CT-A)</td>
<td>OPEN</td>
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<tr>
<td>60J-046</td>
<td>60J-P-1B Suction Isolation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>60J-049</td>
<td>60J-P-1B Discharge Isolation</td>
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<td>60J-P-1B Suction Flush Connection</td>
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<td>60J-056</td>
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<td>60J-036</td>
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<td>60J-038</td>
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*(Continued on Next Sheet)*
### Concentrate Tank System Operation

#### Data Sheet 2 – CT System Startup Valve Position Alignment (Cont.)

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<thead>
<tr>
<th>Valve Number</th>
<th>Valve Name and Location</th>
<th>Required Position</th>
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<td>60J-047</td>
<td>60J-P-1B Discharge Isolation</td>
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<td>Concentrate Transfer to SWRT</td>
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<td>Gauge Root Valves</td>
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<td>60J-039</td>
<td>60J-P-1A Discharge PT-60J011A Gauge Isolation</td>
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<td>pH Meter Isolation and Vent Valves</td>
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<td>60J-060</td>
<td>CT-B pH Loop Outlet Isolation</td>
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<td>Verification Water</td>
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<td>60H-230</td>
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<td>PCV-60H-237 Inlet Isolation</td>
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<td>PI-60H-200 Isolation</td>
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(Continued on Next Sheet)
## Data Sheet 2 – CT System Startup Valve Position Alignment (Cont.)

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<th>Valve Number</th>
<th>Valve Name and Location</th>
<th>Required Position</th>
<th>Initials</th>
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<tr>
<td><strong>Tank Loop Seals</strong></td>
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<td>60J-074</td>
<td>CT-A Loop Seal Drain Valve</td>
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<td>60J-070</td>
<td>CT-A Loop Seal Fill Valve</td>
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<td>60J-245</td>
<td>CT-A Loop Seal Sight Glass Upper Isolation Valve</td>
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<td>60J-246</td>
<td>CT-A Loop Seal Sight Glass Lower Isolation Valve</td>
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<td>60J-075</td>
<td>CT-B Loop Seal Drain Valve</td>
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<td>60J-071</td>
<td>CT-B Loop Seal Fill Valve</td>
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<td><strong>Secondary Waste Transfer to CT</strong></td>
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<td>60I-057</td>
<td>SWRT Transfer to CT-A (top of CT-A)</td>
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<td>60I-070</td>
<td>SWRT Transfer to CT-B (top of CT-B)</td>
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<td><strong>Tank Spray Ring Water</strong></td>
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<td>60H-033</td>
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<td>CT-B Hose Connection Isolation (top of CT-B)</td>
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<td><strong>Vessel Vent Cooler</strong></td>
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<td>95C-120</td>
<td>CT-B Vent Cooler Drain Valve (top of CT-B)</td>
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<td><strong>Dryer Feed Line Flush</strong></td>
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<td>60H-117</td>
<td>PI-60H-229 Isolation (Dryer Mezzanine)</td>
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(Continued on Next Sheet)
## Concentrate Tank System Operation

### Data Sheet 2 – CT System Startup Valve Position Alignment (Cont.)

<table>
<thead>
<tr>
<th>Valve Number</th>
<th>Valve Name and Location</th>
<th>Required Position</th>
<th>Initials</th>
<th>Date</th>
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<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
<td>CLOSED</td>
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<tr>
<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
<td>CLOSED</td>
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<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
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### Drum Waste Unloading System

<table>
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<th>Valve Number</th>
<th>Valve Name and Location</th>
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<th>Initials</th>
<th>Date</th>
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<tbody>
<tr>
<td>60J-253</td>
<td>Unload Line Isolation Valve (floor near IX)</td>
<td>CLOSED</td>
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<td>60J-254</td>
<td>CT-A Isolation Valve (top of CT-A)</td>
<td>CLOSED</td>
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<tr>
<td>60J-255</td>
<td>CT-B Isolation Valve (top of CT-B)</td>
<td>CLOSED</td>
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**Comments:**

---

**Signature**

Print (First & Last) / Initials / Date

NCO or SOE

**Signature**

Print (First & Last) / Initials / Date

NCO or SOE

**Signature**

Print (First & Last) / Initials / Date

SOM Completion Review

---
# Data Sheet 3 – CT System AOV Mode Alignment

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<thead>
<tr>
<th>AOV Number</th>
<th>AOV Description</th>
<th>Required Mode</th>
<th>Initials</th>
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<tbody>
<tr>
<td>AOV-60J029</td>
<td>From Evaporator</td>
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<td>AOV-60J044</td>
<td>CT-A Outlet</td>
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<td>AOV-60H024</td>
<td>CT-A Verification Water Flush</td>
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<td>AOV-60J045</td>
<td>CT-B Outlet</td>
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<tr>
<td>AOV-60H025</td>
<td>CT-B Verification Water Flush</td>
<td>AUTO</td>
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<tr>
<td>AOV-60J058</td>
<td>CT-A to Dryer</td>
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<tr>
<td>AOV-60J053</td>
<td>CT-B to Dryer</td>
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<tr>
<td>AOV-60H040</td>
<td>Dryer Feed Line Verification Water Flush</td>
<td>AUTO</td>
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<tr>
<td>AOV-65C041</td>
<td>4% Sulfuric Acid to CT-A</td>
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<td>AOV-65C023</td>
<td>4% Sulfuric Acid to CT-B</td>
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<td>AOV-65C042</td>
<td>4% [50%] Caustic to CT-A</td>
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<td>4% [50%] Caustic to CT-B</td>
<td>AUTO</td>
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**Comments:**

_________________________ / __________________________ / __________ / __________
Signature                  Print (First & Last)       Initials       Date
NCO or SOE

_________________________ / __________________________ / __________ / __________
Signature                  Print (First & Last)       Initials       Date
NCO or SOE

_________________________ / __________________________ / __________ / __________
Signature                  Print (First & Last)       Initials       Date
SOM Completion Review
Data Sheet 4 – SWRT Available Volume Calculation

CT-A Transfer to SWRT
CT-A level in % (LI-60J-001A) = __________ %

SWRT level in % (LI-60I-001A/B) = __________ %

CT-A volume in gallons (Table 1, this procedure) = __________ gal

SWRT volume in gallons (ETF-60I-008 calibration table) = __________ gal

18,279 gal - _________ gal = ______________ gal

|-----------|--------------------|

Where: 93% Total SWRT Volume (18,279) - SWRT Volume = Available SWRT Volume

CT-B Transfer to SWRT
CT-B level in % (LI-60J-001B) = __________ %

SWRT level in % (LI-60I-001A/B) = __________ %

CT-B volume in gallons (Table 1, this procedure) = __________ gal

SWRT volume in gallons (ETF-60I-008 calibration table) = __________ gal

18,279 gal - _________ gal = ______________ gal

|-----------|--------------------|

Where: 93% Total SWRT Volume (18,279) - SWRT Volume = Available SWRT Volume

____________________ / ______________________ / __________________
Signature Print (First & Last) Date
CRO/SOM