Changes “Other Than Inconsequential” Require These Additional Reviews:

Joint Review Group (JRG)

USQ # TF-17-1418-S, Rev 1

<table>
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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
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<tr>
<td>J-4</td>
<td>12/17/2018</td>
<td>Added level of detail</td>
<td>Updated personnel safety to mention the BWP. Removed references to “X-Rays.”</td>
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<td>J-3</td>
<td>09/28/2017</td>
<td>WRPS-PER-2017-1322</td>
<td>Added the following to the environmental section: “Report work space air samples to WRPS Environmental Protection and appropriate WRPS Shift Office for grab air samples equal to or greater than 10 DAC within the work space AND/OR contamination found during post job radiological surveillance of the posted and controlled radiological boundary area boundary that exceeds the Radiological Work Plan (RWP).”</td>
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<tr>
<td>J-2</td>
<td>07/05/2017</td>
<td>Add level of detail</td>
<td>Add action to ensure QR is lowered to hard stop before leveling platform.</td>
</tr>
<tr>
<td>J-1</td>
<td>06/15/2017</td>
<td>WRPS-PER-2016-2177.3</td>
<td>Struck out 3.4.4 Changed title on SAC 5.8.2 Flammable Gas Controls</td>
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<tr>
<td>J-0</td>
<td>07/19/2016</td>
<td>Periodic Review</td>
<td>Add criteria for “open riser” and controls to RadCon section. Revise section for RadCon controls during installation of riser equipment. Remove option to install glovebag. Update Records section to current standard.</td>
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Setup and Takedown of Core Sampling System

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for setup and takedown of the Core Sampling System CSS-POR264-SAMP (CSS #1).

1.2 Scope

1.2.1 This procedure is applicable to Setup/Takedown for core sampling on all Hanford Site Tank Farm Facilities.

1.2.2 The Core Sampling System (CSS) procedures provide specific tank instructions.

2.0 INFORMATION

2.1 Terms and Definitions

- CB  Circuit Breaker
- DT  Electrical Power Distribution Trailer
- PN  Part Number
- QR  Quill Rod
- SR  Shielded Receiver
- CSS Core Sampling System
- Independent Check - Verification by a second person that a task has been performed correctly.
2.2 General Information

2.2.1 If this procedure is revised during the performance of a job, the original signature sheets (Checklist 1 and Checklist 2) should be transferred to the back of the revised procedure.

2.2.2 Specific steps and/or sections of this procedure may be performed by a certified operator in any order needed to support maintenance activities when equipment is not physically attached to a tank. When performing maintenance inside the boundaries of tank farms, all steps subject to tank farm control must be followed (i.e., dome loading controls must be observed at all times when working inside a tank farm; flammable gas monitoring and ignition source controls must be followed when working in any tank intrusive region).

2.2.3 Specific steps and/or sections of this procedure may be performed as needed to support training when the equipment is not attached to a tank, or the operation will not impact any tank intrusive zones. When training is conducted with equipment physically attached to a tank, or the operation will impact tank intrusive zones, steps must be followed as written in this procedure.

2.2.4 HPT baseline survey is a detailed radiation/contamination survey of the complete setup area prior to the placement of equipment and ground covers. These surveys are to include the areas where the CSS and Onsite Transfer Cask (OTC) will be located. The final post job surveys should contain the same detail as baseline surveys and be performed after the removal of equipment and ground covers.

2.2.5 All filled out Data Sheets, and Checklists of this procedure will be saved as a permanent record in accordance with the facility Records Inventory and Disposition Schedule.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Failure to use the DOE/RL-92-36 Hanford Site Hoisting and Rigging Manual for ALL lifts could result in excessive dome loading due to equipment drops.

3.1.1 Beryllium controls will be implemented and followed as authorized in the Beryllium Work Permit (BWP).

3.1.2 Hearing protection is required when working within 5 feet of the hydraulic unit or High Volume sampler and when working within 15 feet of the sides or 30 feet of the rear of active crane operations.

3.1.3 Industrial hygiene monitoring shall be performed in accordance with applicable Industrial Hygiene Sample Plan.

3.1.4 Negative pressure must be confirmed on actively-ventilated tanks when the riser is opened (e.g., masslin cloth or audio confirmation). Failure to confirm negative pressure may expose workers to tank vapors.

3.1.5 Minimum required respiratory protection and voluntary upgrade is identified using one of the following:
- Farm specific TVIS, Respiratory Protection Form
- Farm specific TVIS, SEG 3

3.2 Equipment Safety

**CAUTION** - Failure to protect electrical cables and lines from vehicles or other mechanical damage could result in damage to those items.

**NOTE**  Outrigger charts are provided by MSA Crane and Rigging in each of their mobile cranes. The charts comply with RPP-CALC-56716 are used to satisfy the following step.

3.2.1 For mobile crane set-up, outrigger pads shall be sized as required by RPP-CALC-56716, “Soil Bearing Capacity for Crane Loads.”
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 the ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03. (ALARACT 02.3)

NOTE - A riser is considered to be “not open” if a barrier (e.g., sealed sleeving, certified glove bag, breather filter) exists between tank head space and the environment.

3.3.2 Airborne Radioactive Area posting and respiratory protection are required when a riser is open to tank head space unless the tank is actively ventilated, or when required by RWP or work package instruction.

3.3.3 High Radiation Areas (HRA) will be controlled per TFC-ESHQ-RP_MON-C-11.

3.3.3.1 If a newly established High Radiation Area is to be left unattended, completion of the WRPS High Radiation Area Establishment Checklist (Site Form A-6005-915) is required prior to the area being left unattended.

3.3.4 Radiological areas may be DOWN-POSTED based on HPT survey results. These areas will be re-posted and adjusted as conditions and work activities require.

3.3.5 Work area shall be posted/controlled as a CA for all work when breaching a riser or contaminated systems on the CSS.

3.3.5.1 Breach area(s) shall be controlled as HCA(s).
3.4 Environmental Compliance

3.4.1 The following requirements must be met:

3.4.1.1 Do not open pits or risers if sustained winds are greater than 25 mph. (ALARACT 02.3)
   - A local wind speed measurement device may be used in lieu of Hanford Meteorological Station readings, provided the reading is taken in an unobstructed location that is representative of the work area. (ALARACT 02.3)
   - Use of a local device and the measured wind speed readings taken from it must be documented in the Work Management System Work Record.

3.4.1.2 Minimize open riser time using valves, caps, adapters, or plugs as appropriate. (ALARACT 02.3)

3.4.1.3 HPT coverage will be performed as specified in the Radiological Work Permit. (ALARACT 02.3)

3.4.1.4 Equipment is decontaminated or contained when removed from tanks.
   - Equipment is decontaminated or contained when removed from tanks when >50,000 dpm/100 cm² beta/gamma and/or >70 dpm/100 cm² alpha.
   - Swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained <50,000 dpm/100 cm² beta/gamma and/or <70 dpm/100 cm² alpha.
   - Containments used during the work must be in accordance with TFC ESHQ RP_RWP-C-02 latest revision, Attachment A, Containment Selection Guide. (ALARACT 02.3)

3.4.1.5 Verify passive or active HEPA filtration on tanks. (ALARACT 02.3)

3.4.1.6 Pre and post job surveys (smears) shall be taken. (ALARACT 02.3)

3.4.1.7 Pits and risers shall be covered whenever they are unattended.
3.4 Environmental Compliance (Cont.)

3.4.2 In accordance with TFC-ESHQ-ENV_RM-C-04, “Water Discharge in Tank Farms”, routine maintenance and operation activities may result in small incidental discharge of raw water as long as the below listed limits and conditions are met. (ref. TFC-ESHQ-ENV_RM-C-04, Table 2, Water Discharge at Tank Farms for the listing of approved incidental discharges):

- No discharge from a single activity may exceed 60 gallons released to the soil
- Appropriate best management practices (BMPs) shall be implemented to prevent unnecessary discharges.
- No ponding of liquid or erosion of soil
- During pre-job planning, measures to limit soil erosion will be incorporated in the work plan
- During performance of the work, all measures to limit ponding and/or erosion will be implemented.

3.4.3 Immediately report any spills or releases to the appropriate WRPS Shift Office. This includes any water discharge to surface contamination areas.

3.4.4 Report work space air samples to WRPS Environmental Protection and appropriate WRPS Shift Office for grab air samples equal to or greater than 10 DAC within the work space AND/OR contamination found during post job radiological surveillance of the posted and controlled radiological boundary area boundary that exceeds the Radiological Work Plan (RWP).

3.5 Limits

HNF-SD-WM-TSR-006, Tank Farms Technical Safety Requirements

AC 5.9.2 Ignition Controls

SAC 5.8.2 Flammable Gas Controls

Some steps in this procedure implement Defense in Depth controls as described in RPP-13033, Tank Farms Documented Safety Analysis.

ALARACT 02.3, Tank Farm ALARACT Demonstration for Low Purge Gas Core Sampling.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Equipment identified on Bill Of Materials
- Rubber matting
- Lead blankets
- Two Eyewash Stations with drench hoses
- Other tools, equipment and supplies as identified by Shift Manager/OE/FLM/User.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up
- 2-MISC-049, Bolt Torqueing Guidelines
- 2-MISC-160, Static Bonding for TOC Equipment
- Site Form A-6005-436, Generator Initial Start-Up Checklist
- Site Form A-6005-437, Hanford Site Generator Re-start-Up Checklist.

4.3 Field Preparations

4.3.1 COMPLETE appropriate verifications and actions on Checklist 1 - Prerequisite Conditions.
5.0 PROCEDURE

5.1 Operate Generator

NOTE - The following steps may be performed at any time during the performance of this procedure and may be repeated as necessary.

5.1.1 IF directed by the FWS, START generator per Generator Initial Start-Up Checklist and per vendor instructions.

5.1.2 IF directed by the FWS, RESTART generator per Hanford Site Generator Re-start-Up Checklist and per vendor instructions.

5.1.3 IF directed by the FWS, SHUTDOWN generator per vendor instructions.

Special Instruction

Negative pressure must be confirmed on actively-ventilated tanks when the riser is opened (e.g., masslin cloth or audio confirmation).

NOTE - Sections 5.2 through 5.10 may be performed in any logical order or not at all as necessary to facilitate setup of CSS.

5.2 Complete Daily Prerequisites

5.2.1 COMPLETE verifications and actions on Checklist 3.

5.3 Bond and Ground Equipment (SAC 5.8.2, AC 5.9.2)

NOTE - Bonding/grounding and installation of equipment may be completed during multiple shifts and in any order, at FWS direction.

- Figure 1 and Figure 2 show recommended bonding/grounding schematics. Alternate configurations are allowed provided that the resistances specified on Data Sheet 1 can be measured and are within the required limits.

5.3.1 CONNECT bonding/grounding equipment as called out on Data Sheet 1 in accordance with 2-MISC-160/NFPA 70 article 250/NFPA 77.

5.3.2 MEASURE AND RECORD resistance values for Data Sheet 1.

5.3.3 CONFIRM those items requiring bonding/grounding have been bonded/grounded BEFORE being used (FWS).

5.3.4 WHEN Section 5.3 is complete, FWS SIGN AND DATE Checklist 2.
### 5.4 Stage CSS and Support Equipment

**NOTE** - Steps 5.4.1 through 5.4.9 may be worked and repeated in any logical order.

**WARNING**

Failure to use the DOE/RL-92-36 Hanford Site Hoisting and Rigging Manual for ALL lifts could result in excessive dome loading due to equipment drops.

---

5.4.1 **IF** item is to be lifted within 20 feet of any underground storage tank, **MAINTAIN** the bottom height of the item to less than 20 feet above the surface grade, or pit floor above the waste storage tank (covered or uncovered) AND **POSITION** sampling equipment.

**CAUTION**

Failure to protect electrical cables and lines from vehicles or other mechanical damage could result in damage to those items.

---

5.4.2 **CONFIRM** bonding/grounding has been completed for any of the following items used prior to making electrical connections to that item.

- Generator
- Electrical Power Distribution Trailer
- Core Sampling System (CSS) *(SAC 5.8.2, AC 5.9.2)*
- Hydraulic Power Unit (HPU).

5.4.3 **ENSURE** electrical cord inspections on all associated equipment prior to connecting.

5.4.4 **INSTALL** Lockout/Tagout as determined by Electrical Hazardous Energy Form.

5.4.5 **INSTALL or REMOVE** linebackers as necessary to support core sampling system set-up activities.
5.4 Stage CSS and Support Equipment (Cont.)

_____ 5.4.6 IF used, CONFIRM the following connections are made:

- Power cable from Service Trailer to Generator
- Power cable from DT to the Generator
- Power cable from DT/Generator to Support truck
- Power cable from DT/Generator to CSS
- Power cable from DT/Generator to HPU
- Hydraulic hoses from HPU to CSS
- Electrical connections from HPU to CSS
- Electrical connections from Portable Exhauster to CSS
- Electrical connections for SR Tower
- Electrical connections for Drill Tower.

_____ 5.4.7 ENSURE NEC inspection has been performed AND

FWS SIGN AND DATE Checklist 2.

_____ 5.4.8 CHECK any Ground Fault Circuit Interrupter (GFCI) to be used.

_____ 5.4.9 WHEN GFCI checks are complete, Electrician SIGN AND DATE

Checklist 2.
5.4 Stage CSS and Support Equipment (Cont.)

_____ 5.4.10 IF Cask Truck Rotary Hoist Inspection PM ES-000365 (for EIN E-37976) or PM ES-000366 (for EIN E-37977) have not been performed within the last 12 months

OR

IF directed by FWS/OE, PERFORM the following:

_____ 5.4.10.1 ENSURE PM ES-000365 is completed.

_____ 5.4.10.2 ENSURE PM ES-000366 is completed.

_____ 5.4.10.3 IF PM is NOT on an annual frequency, CONTACT CSS Engineer to put PM back to annual frequency.

_____ 5.4.11 WHEN Cask Truck Rotary Hoist Inspection PMs are verified current, FWS SIGN AND DATE Checklist 2.

_____ 5.4.12 WHEN Section 5.4 is complete, FWS SIGN AND DATE Checklist 2.
Setup and Takedown of Core Sampling System

5.5 Install Riser Equipment

5.5.1 ENSURE required bonding for riser components is complete per Checklist 2.

5.5.2 CONFIRM ground covering has been installed around riser(s).

5.5.3 ENSURE the work area is posted as a CA.

5.5.4 ENSURE a drape is installed around the riser.

5.5.5 ESTABLISH radiological controls as follows:

- 5.5.5.1 POST/CONTROL work area as an HRA.
- 5.5.5.2 CONTROL the drape as an HCA.
- 5.5.5.3 IF tank is not actively ventilated, POST work area as an ARA.

5.5.6 REMOVE Riser Cover into bagging or sleeving (sleeving required if removing a shield plug).

- 5.5.6.1 HPT PERFORM dose rate and contamination survey.

5.5.7 IF directed by Tank Sampling and Analysis Plan (TSAP) to take zip cord reading, PERFORM the following:

- 5.5.7.1 ENSURE work area is posted/controlled as survey results and tank ventilation status require.
- 5.5.7.2 INSTALL top hat.
- 5.5.7.3 ENSURE distance from top of riser to top of top hat has been recorded on Checklist 2.
- 5.5.7.4 INSPECT AND INSTALL sleeving on top hat.
- 5.5.7.5 TAKE Surface Level and Sludge Level measurements as directed by TSAP AND RECORD on Checklist 2.
- 5.5.7.6 REMOVE zip cord into sleeving.
- 5.5.7.7 REMOVE top hat into bagging or sleeving.

5.5.8 ENSURE work area is posted/controlled as survey results and tank ventilation status require.
5.5 Install Riser Equipment (Cont.)

5.5.9 INSTALL desired equipment in riser.

5.5.10 CONFIRM Core Sampling DS seal (Frisbee seal) is in place and is in good condition AND

FWS RECORD on Checklist 2.

5.5.11 WHEN Section 5.5 is complete, FWS SIGN AND DATE Checklist 2.
5.6 Assemble and Level Core Sampling System

5.6.1 IF outriggers need positioning to facilitate sampling, **PERFORM** the following:

5.6.1.1 **LIFT** CSS into the air approximately 6” to position outriggers.

5.6.1.2 **WHEN** outriggers are properly positioned, **LOWER** CSS back onto the ground.

5.6.2 **REMOVE** turn buckles and level platform.

5.6.3 **MEASURE** initial platform to riser flange distance **AND** **RECORD** on Checklist 2.

5.6.4 **WHEN** Step 5.6.3 is complete FWS **SIGN** AND **DATE** Checklist 2.

5.6.5 **FORWARD** measurements to Engineering **AND** **REQUEST** completion of Data Sheet 2.

5.6.6 **IF** towers have already been installed, **GO TO** step 5.6.9.

5.6.7 **ATTACH** shielded receiver tower.

5.6.8 **ATTACH** drill tower.

5.6.9 **ENSURE** all connections are complete for drill/SR tower.

5.6.10 **ENSURE** required QR adapter has been installed per Data Sheet 2.
5.6 Assemble and Level Core Sampling System (Cont.)

5.6.11 IF QR adapter must be changed, **PERFORM** the following.

5.6.11.1 **ENSURE** ground cover is installed in work area.

5.6.11.2 **POST** work area as a CA.

5.6.11.3 **ENSURE** a drape with absorbent is installed below QR.

5.6.11.4 **CONTROL** drape as HCA.

NOTE – Steps 5.6.11.5 and 5.6.11.7 are performed concurrently.

5.6.11.5 **REPLACE** QR adapter.

5.6.11.6 **ENSURE** removed equipment is bagged or sleeved.

5.6.11.7 **HPT PERFORM** dose rate and contamination survey during replacement activities.

5.6.11.8 **REMOVE** drape at any time after termination of HCA controls.

5.6.12 **ENSURE** QR is lowered to hard stop.

5.6.13 **LEVEL** CSS at height on line N of Data Sheet 2.

5.6.14 **VERIFY** (FWS) leveling of CSS and final QR to riser flange distance **AND**

**FWS SIGN AND DATE** Checklist 2.

5.6.15 **VERIFY** equipment operates within parameters identified in Checklist 4 **AND**

**FWS SIGN AND DATE** Checklist 4.
5.7 Prepare Drill String

5.7.1 **OBTAIN** drill string, core barrel and bit specified on Data Sheet 2.

5.7.2 FWS **VERIFY** drill string, bit and core barrel length staged for sampling are those specified on Data Sheet 2 **AND**

FWS **SIGN AND DATE** Checklist 2.
5.8 Restore Risers

5.8.1 **ENSURE** work area is posted as a CA.

5.8.2 **CONFIRM** ground covering has been installed around the riser.

5.8.3 **ENSURE** a drape is installed around the riser.

5.8.4 **ENSURE** that the work area is posted/controlled as an HRA.

5.8.5 **CONTROL** the drape as a HCA

5.8.6 **IF** the tank is not actively ventilated and a direct unfiltered path to the tank headspace will exist when equipment is removed, **POST** the work as an ARA.

5.8.7 **REMOVE** riser equipment into bagging or sleeving.

5.8.7.1 **HPT** **PERFORM** dose rate and contamination monitoring as equipment is removed to ensure RWP limits are not exceeded.

5.8.8 **HPT** **PERFORM** contamination survey of riser flange.

5.8.8.1 **IF** removable contamination is > 50,000 dpm/100cm² beta-gamma or > 70 dpm/100cm² alpha **DECONTAMINATE** to below these levels or until successive decontamination attempts result in no further reduction.

**NOTE** - Riser cover replacement may be with temporary or permanent riser cover.

5.8.9 **USE** Garlock gasket **AND** **REPLACE** riser cover.

5.8.10 **IF** permanent riser cover was installed, **TORQUE** all flange bolts per 2-MISC-049.

5.8.11 **RECORD** torque wrench calibration data and flange bolts torque values on Checklist 2.

5.8.12 **IF** bonding and grounding wires were connected, **REMOVE** bonding and grounding wires from riser.

5.8.13 **WHEN** Section 5.8 is complete, FWS **SIGN AND DATE** Checklist 2.
5.9 Break Down Core Sampling System

WARNING
Failure to use the DOE/RL-92-36 Hanford Site Hoisting and Rigging Manual for ALL lifts could result in excessive dome loading due to equipment drops.

5.9.1 ENSURE turnbuckles are installed.

Special Instruction
Steps 5.9.2 through 5.9.9 may be worked concurrently, in any logical order, or not at all.

5.9.2 IF breakdown of CSS platform is not necessary, GO TO Step 5.9.7.

5.9.3 INSTALL Lockout/Tagout as determined by Electrical Hazard Evaluation Form.

5.9.4 EXTEND AND LOWER drill tower to hard stop.

5.9.5 REMOVE drill tower.

5.9.6 REMOVE shielded receiver tower.

5.9.7 LOWER CSS platform.

5.9.8 IF CSS outriggers need to be retracted, LIFT CSS approximately 6” off the ground and retract outriggers.
5.9 Break Down Core Sampling System (Cont.)

5.9.9 DISCONNECT the following connections as required:
- Power cable from Service Trailer to Generator
- Power cable from DT to the Generator
- Power cable from DT/Generator to Support truck
- Power cable from DT/Generator to CSS
- Power cable from DT/Generator to HPU
- Hydraulic hoses from HPU to CSS
- Electrical connections from HPU to CSS
- Electrical connections from Portable Exhauster to CSS
- Electrical connections for SR Tower
- Electrical connections for Drill Tower.

5.9.10 INSTALL or REMOVE linebackers as necessary to support core sampling system take down activities.

5.9.11 WHEN Section 5.9 is complete, FWS SIGN AND DATE Checklist 2.
### 5.10 Restore Job Site

**NOTE** - Steps 5.10.1 through 5.10.7 may be performed in any logical order or as necessary to accomplish task.

- **5.10.1**  **CONFIRM** no further sampling is required at current tank.
- **5.10.2**  **IF** DT was used, **DISCONNECT** 480 V power cable from generator to DT.
- **5.10.3**  **IF** bonding/grounding has not been removed, **REMOVE** remaining bonding/grounding.
- **5.10.4**  **MAINTAIN** the bottom height of each item to be lifted within 20 feet of underground storage tanks to less than 20 feet above the surface grade, or pit floor above the waste storage tank (covered or uncovered) **AND** **REMOVE** remaining sampling equipment from tank dome as needed.
- **5.10.5**  **IF** contamination is found, **DECONTAMINATE** area to pre-job levels.
- **5.10.6**  **PACKAGE** waste **AND STAGE** waste containers per TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up.
- **5.10.7**  **COMPLETE** post job radiological survey of work area, equipment and waste containers, HPT **SIGN AND DATE** Checklist 2.
- **5.10.8**  **RESTORE** area to as-found radiological postings as survey results allow.
- **5.10.9**  **WHEN** Section 5.10 is complete, FWS **SIGN AND DATE** Checklist 2.
5.11 Records

The following records are generated during the performance of this procedure.

5.11.1 **SUBMIT** the completed records to the shift office for record retention.
- This procedure in its entirety.

FWS/OE/Shift Manager **SEND** the completed records to the Central Shift Office for records retention.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWS/OE/Shift Manager</td>
<td></td>
<td></td>
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</tbody>
</table>

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Checklist 1 - Prerequisite Conditions

<table>
<thead>
<tr>
<th>TANK#</th>
<th>RISER#</th>
<th>CORE#</th>
<th>WORK PKG#</th>
<th>CONDITION</th>
<th>RESPONSIBLE PERSON</th>
</tr>
</thead>
<tbody>
<tr>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td><strong>PERFORM</strong> field verification that the tank and risers to be utilized are correct.</td>
<td>FWS Sign/Print (First &amp; Last)/Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Independent Check Sign/Print (First &amp; Last)/Date</td>
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<tr>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td><strong>RECORD</strong> the following information from Engineer. \n<strong>MARK</strong> N/A if item will not be used during sampling: \nLength of dome space survey wire wrapped tubing. \nLength of riser sleeve: ________ \nBonding/Grounding riser and tank number: \nR- ______/Tank</td>
<td>FWS Sign/Print (First &amp; Last)/Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HPT Sign/Print (First &amp; Last)/Date</td>
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<tr>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td><strong>VERIFY</strong> baseline or pre-job survey of work area prior to placement of equipment and ground covers AND \n<strong>RECORD</strong> survey number below.</td>
<td></td>
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</tbody>
</table>
## Checklist 2 - Procedure Signoff Sheet

Sheet 1 of 2

<table>
<thead>
<tr>
<th>TANK#</th>
<th>RISER#</th>
<th>CORE#</th>
<th>WORK PKG#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP</th>
<th>CONDITION</th>
<th>RESPONSIBLE PERSON</th>
<th>SIGN/PRINT (First &amp; Last)/DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.4</td>
<td>BOND AND GROUND EQUIPMENT complete</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.4.7</td>
<td>NEC Inspection complete.</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.4.9</td>
<td>GFCI check complete.</td>
<td>ELECTRICIAN</td>
<td></td>
</tr>
<tr>
<td>5.4.11</td>
<td>Cask Truck Rotary Hoist Inspection PMs complete.</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.4.12</td>
<td>STAGE CSS AND SUPPORT EQUIPMENT complete.</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.5.7.3</td>
<td>Top of Riser to top of top hat.</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.5.7.5</td>
<td>Surface Level ____________inches</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sludge Level ____________ inches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5.10</td>
<td>Frisbee seal is in good condition</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.5.11</td>
<td>INSTALL RISERS EQUIPMENT complete</td>
<td>FWS</td>
<td></td>
</tr>
</tbody>
</table>

**STAGE CSS AND SUPPORT EQUIPMENT**

- Top of Riser to top of top hat.
- Surface Level ____________ inches
- Sludge Level ____________ inches

**Frisbee seal is in good condition**

**INSTALL RISERS EQUIPMENT complete**

## Checklist 2 - Procedure Signoff Sheet

Sheet 1 of 2

<table>
<thead>
<tr>
<th>TANK#</th>
<th>RISER#</th>
<th>CORE#</th>
<th>WORK PKG#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Setup CSS to Sample (Cont.)

<table>
<thead>
<tr>
<th>STEP</th>
<th>CONDITION</th>
<th>RESPONSIBLE PERSON</th>
<th>SIGN/PRINT (First &amp; Last)/DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6.3 and 5.6.4</td>
<td>Initial platform TO Riser Flange dist.: __________ in.</td>
<td>FWS or Operator</td>
<td></td>
</tr>
<tr>
<td>5.6.14</td>
<td>Leveling of CSS and final QR to riser flange correct.</td>
<td>FWS or Operator</td>
<td></td>
</tr>
<tr>
<td>5.7.2</td>
<td>DRILL STRING, BIT PART NUMBER, and CORE BARREL LENGTH correct.</td>
<td>FWS</td>
<td></td>
</tr>
</tbody>
</table>

### Takedown CSS After Sampling

<table>
<thead>
<tr>
<th>STEP</th>
<th>CONDITION</th>
<th>RESPONSIBLE PERSON</th>
<th>SIGN/PRINT (First &amp; Last)/DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.8.11</td>
<td>Sample Riser: torque wrench S.N.: __________ Cal. Due Date: __________ Torque Value: __________ ft-lbs.</td>
<td>Maintenance or FWS</td>
<td></td>
</tr>
<tr>
<td>5.8.13</td>
<td>RESTORE RISERS complete.</td>
<td>FWS</td>
<td></td>
</tr>
<tr>
<td>5.9.11</td>
<td>Break Down CSS</td>
<td>FWS or Operator</td>
<td></td>
</tr>
<tr>
<td>5.10.7</td>
<td>POST JOB SURVEY complete</td>
<td>HPT or FWS</td>
<td></td>
</tr>
<tr>
<td>5.10.9</td>
<td>RESTORE JOB SITE complete</td>
<td>FWS</td>
<td></td>
</tr>
</tbody>
</table>
### Checklist 3 - Daily Check Sheet

<table>
<thead>
<tr>
<th>TANK#</th>
<th>RISER#</th>
<th>CORE#</th>
<th>WORK PKG#</th>
</tr>
</thead>
</table>

**FWS PERFORM the following:**  
(check each item when complete)

- **INITIAL:**
- **DATE:**
- **SHIFT:**

- **VERIFY** RWP has not expired.

- **CONFIRM** dome load New Activity Load Assessment form and Route Map is attached to work package as required by TFC-OPS-OPER-C-10.
  
  All vehicle movement must be accompanied by at least one spotter who performs only that function while the vehicle is in transit. Spotter must be positioned in direction of travel and have direct communication with driver. *(Defense in Depth)*

- **VERIFY** passive ventilation (breather filter and seal loop) is operational on tank being sampled
  
  **MARK** N/A if actively ventilated.

- **CONFIRM** active ventilation system is running and **CONFIRM** negative pressure on tank  
  (e.g., magnehelic, pressure watch). **MARK** N/A if not actively ventilated. *(ALARACT 02.3.2j)*
## Checklist 4 - Sampling Parameters to Confirm After Setup/Assembly

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>LOW VALUE</th>
<th>HIGH VALUE</th>
<th>ACCEPTABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Hoist Position System Functional, the Hoist Stops when Full Up and can be Zeroed out at top</td>
<td>N/A</td>
<td>N/A</td>
<td>Y/N</td>
</tr>
<tr>
<td>Sample Hoist Load Cell Indication with RLU hanging is within expected range.</td>
<td>40</td>
<td>47</td>
<td>Y/N</td>
</tr>
<tr>
<td>Grapple Hoist Position System Functional, the Hoist Stops when Full Up and can be Zeroed out at top</td>
<td>N/A</td>
<td>N/A</td>
<td>Y/N</td>
</tr>
<tr>
<td>Grapple Hoist Load Cell Indication with grapple hanging is within expected range.</td>
<td>15</td>
<td>25</td>
<td>Y/N</td>
</tr>
<tr>
<td>Grapple Hoist Up Limit Bypass functional</td>
<td>N/A</td>
<td>N/A</td>
<td>Y/N</td>
</tr>
<tr>
<td>Drill Position at Full down</td>
<td>-0.125in</td>
<td>+0.125 in</td>
<td>Y/N</td>
</tr>
<tr>
<td>After equipment has been assembled, PM ES-108934 has been performed.</td>
<td>N/A</td>
<td>N/A</td>
<td>Y/N</td>
</tr>
<tr>
<td>Platform Rotation Clockwise/Counter Clockwise functional.</td>
<td>N/A</td>
<td>N/A</td>
<td>Y/N</td>
</tr>
</tbody>
</table>

* Expected grapple weight readings are already verified in the specific sampling procedure (TO-080-503 and TO-080-518).
Data Sheet 1 - Bonding/Grounding Resistance Values

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>NOT Used</th>
<th>LIMIT &lt;25Ω</th>
<th>ELECTRICIAN INITIAL/DATE</th>
<th>VERIFIED BY INITIAL/DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Sample Riser to Bonding/Grounding riser (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*R4</td>
<td>Lifting Bail to bonding bus or sample riser (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R5</td>
<td>Sample riser to bonding bus (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R18</td>
<td>Sample riser to riser adapter (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R17</td>
<td>Sample riser to riser sleeve (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>CSS frame to bonding/grounding riser (AC 5.9.2, SAC 5.8.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OTHER:

- Multimeter Fluke 27, 77, 87 or equivalent

<table>
<thead>
<tr>
<th>Electrician Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
<th>Serial Number</th>
<th>Cal Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrician Signature</td>
<td>Print (First &amp; Last)</td>
<td>Date</td>
<td>Serial Number</td>
<td>Cal Due Date</td>
</tr>
<tr>
<td>Electrician Signature</td>
<td>Print (First &amp; Last)</td>
<td>Date</td>
<td>Serial Number</td>
<td>Cal Due Date</td>
</tr>
</tbody>
</table>

*Not always required, see ignition controls screening in work package.
**Data Sheet 2 - Drill String Calculations and Sampler Requirements**

<table>
<thead>
<tr>
<th>TANK#</th>
<th>RISER#</th>
<th>CORE#</th>
<th>WORK PKG#</th>
</tr>
</thead>
</table>

**Drill String LENGTHS**

<table>
<thead>
<tr>
<th>Length</th>
<th>Type (Circle Type Used)</th>
<th>QTY</th>
<th>TOTAL LENGTH</th>
<th>ROD #’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. BIT:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] Push Bit PN: 1000VD/1</td>
<td>[ ] Push Adapter</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>[ ] Rotary Bit PN: 1000VD/9</td>
<td>[ ] Rotary Adapter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUILL ROD ADAPTER:</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>[ ] UNFLUTED PN: H-14-108673-39</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>[ ] FLUTED PN: H-14-108673-40</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CORE BARREL:</td>
<td></td>
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</tr>
</tbody>
</table>

**Length**

- **B. 60 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **C. 24 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **D. 20 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **E. 12 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **F. 6 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **G. 3 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

- **H. 19 inch rods**
  - NON-PLATED, UNFLUTED*
  - NICKEL-PLATED, FLUTED

**I. TOTAL Drill String LENGTH:** (Lines A + B + C + D + E + F + G + H)

**OR PUSH** (Lines A + B + C + D + E + F + G + H + 9.3125) Push Adapter

**J. RISER ELEVATION:** REF-

**K. TANK BOTTOM ELEVATION:** REF-

**L. TANK BOTTOM SAFETY MARGIN** = 3 inches (0 to -12 inches in push mode)

**M. RISER FLANGE TO ADJUSTED TANK BOTTOM** [(Line J - Line K)*12 - line L]

**N. FINAL QR to RISER FLANGE DISTANCE**

**O. QR to TANK BOTTOM** (Line M + Line N)

**P. Expected Sampler Type (and quantity)**

- Required: (Sampler type may change with waste conditions.)
  - Veriﬁed by (Eng): [ ]
  - Date: [ ]
  - Checked by (Eng): [ ]
  - Date: [ ]
  - Veriﬁed by (FWS): [ ]

- Nickel plated drill rod may be used in place of non-plated.
Figure 1 - Recommended Bonding/Grounding Riser Connections

NOTE:
All wire to be #10 AWG (minimum) unless otherwise noted.
Figure 2 - Recommended Sample Connections

*See Ignition Control Screening in Work Package for Applicability and further information.

NOTE:
All wire to be #10 AWG (minimum) unless otherwise noted.
Figure 3 - Drill String Numbering System

EXAMPLE:

BYxxx-Rx-x

SECOND ROD SEGMENT
IN DRILL STRING
#BY110-RX-3

FIRST ROD SEGMENT
IN DRILL STRING
#BY110-RX-2

ASSEMBLED CORE BARREL
#BY110-RX-1

SAMPLE RISER

Rod Segment No.
Riser No.
Tank No.
Tank Designator