Tank Farm Operating Procedure  

GENERAL

Changes “Other Than Inconsequential” Require These Additional Reviews:

Radiological Controls:
Central Radcon Organization

USQ # N/A-4

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Operate Portable Temporary Radioactive Air Emission Unit (PTRAEU) Vacuums

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1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this activity is to provide a means of providing a negative pressure using the Portable Temporary Radioactive Air Emission Unit (PTRAEU) vacuum cleaners, to maintain contamination integrity and perform radiological decontamination activities.

1.2 Scope

This procedure provides instructions for the safe Start-Up, Operation and Shut-Down of the Portable Temporary Radioactive Air Emission Unit (PTRAEU) vacuum cleaners.

1.2.1 The PTRAEU HEPA filter vacuum cleaners addressed in this procedure are of the following types:
- Euroclean UZ 930 and 948
- NILFISK GM80 and GM82/GS82.

2.0 INFORMATION

2.1 Terms and Definitions
- PTRAEU - Portable Temporary Radioactive Air Emission Unit

2.2 General Information

2.2.1 NILFISK GM82 DP gauge indicates necessary operation of agitator handle to clean main filter.

2.2.2 Loss of vacuum (due to filter loading), is the only observable indication that Euroclean UZ930 or NILFISK GM80 no longer meets acceptable operation.

2.2.3 The Eurocleans and NILFISK vacuums have no hr/meter. Total run time will be calculated on data sheet from Start and Stop times.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

WARNING - The PTRAEUs are not waterproof and measures should be taken to provide a weatherproof environment. Failure to comply may result in shock hazard.

WARNING - Failure to use a 110 volt AC GFCI protected receptacle may result in shock hazard.

3.1.1 Compliance with DOE-0359, Hanford Site Electrical Safety Program is required when working with this procedure.

3.2 Radiation and Contamination Control

3.2.1 The PTRAEU vacuum cleaners used in areas established to control removable surface contamination or airborne radioactivity (except areas where only tritium is present) should be equipped with High-Efficiency Particulate Air (HEPA) filters. If the material to be vacuumed is wet enough to preclude re-suspension, then HEPA filters are not necessary.

3.2.2 The PTRAEU vacuum cleaners used for radiological work should be:

- Uniquely marked and labeled,
- Controlled by a Radiological Work Permit, (see TFC-ESHQ-RP_RWP-C-04, Radiological Work Permits)
- Controlled to prevent unauthorized use,
- Designed to ensure HEPA filter integrity under conditions of use,
- Designed to prevent unauthorized access to the inner surfaces of the vacuum.

3.2.3 When this procedure is worked in radiological areas, an approved radiological work permit (RWP) is required. If radiological conditions or work performed falls outside the scope of the RWP, all work activities must be discontinued until a new or revised RWP has been issued in accordance with TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning.

3.2.4 A nuclear safety review should be performed and documented prior to the use of a PTRAEU vacuum cleaner for fissile material.
3.3 Environmental Compliance

3.3.1 All Portable Temporary Radioactive Air Emission Unit(s) (PTRAEU’s) must be approved by Environmental prior to use and must comply with TFC-ESHQ-ENV_RM-C-10, Use of Portable/Temporary Radioactive Air Emission Units.
4.0 PREREQUISITES

4.1 Performance Documents

The following document may be needed to perform this procedure:
- A-6003-962 (WRPS) Chain of Custody/Sample Analysis Request
- A-6003-774, Ignition Source Control Requirements Screening Of Work Activities And Equipment Used In Performing Work Activities
- 3-VB-491 In-Place Testing of HEPA Filter Systems (Vacuum Cleaner)
- TFC-ESHQ-ENV_RM-C-10, Use of Portable/Temporary Radioactive Air Emission Units

4.2 Field Preparations

NOTE - All steps in this section may be performed in sequence, parallel or any logical order

____ 4.2.1 ENSURE the following have been recorded on the Portable Temporary Radioactive Air Emission Unit (PTRAEU) Logsheet 1 and Data Sheet 1:
- PTRAEU Serial Number
- Work Package Number
- Model Number
- Date
- Location.

____ 4.2.2 HPT RECORD the following on Data Sheet 2:
- Location
- Serial Number
- Model Number.

____ 4.2.3 IF ignition source control is applicable, ENSURE Ignition Source Control Requirements Screening (Site form A-6003-774) has been completed.
4.2 Field Preparations (Cont.)

4.2.4 **ENSURE** applicable requirements are met per the steps below:

- **4.2.4.1 CONFIRM** estimated Radiological Emissions/handling limits for this activity have been calculated by Radiological Engineering and/or Environmental in accordance with the TFC-ESHQ-ENV_RM-C-10, Use of Portable/Temporary Radioactive Air Emission Units AND **ENSURE** a copy of the calculation is included in the work package.

**NOTE** - For most Tank Farm applications, the contamination source is particulate contamination (solid).

- **4.2.4.2 RECORD** contamination source (liquid, gas or solid) for this operation on Logsheet 1 AND **IF** assistance is needed, CONTACT FWS or Environmental Field representative.

- **4.2.4.3 FWS VERIFY** unit has been satisfactorily aerosol tested within the last 365 days per 3-VB-491, In-Place Testing of HEPA Filter Systems (Vacuum Cleaner) or since the unit was opened or modified, whichever is most recent.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **4.2.4.4 Operations RECORD** Radiological Handling Limits and estimated emissions from Step 4.2.4.1 on Logsheet 1.
5.0 **PROCEDURE**

5.1 **PTRAEU Startup and Operation**

**WARNING**

The PTRAEUs are not waterproof and measures should be taken to provide a weatherproof environment. Failure to comply may result in shock hazard.

5.1.1 WHEN wet conditions exist, PLACE PTRAEU in weather protected area or condition.

**WARNING**

Failure to use a 110 volt AC GFCI protected receptacle may result in shock hazard.

5.1.2 CONNECT PTRAEU to a 110 volt AC GFCI protected receptacle.

5.1.3 PERFORM the following smears AND RECORD in pre-start section of Data Sheet 2:

- Outlet of PTRAEU vacuum cleaner
- Joints/connections on PTRAEU vacuum cleaner.

5.1.4 PERFORM survey of PTRAEU HEPA filter housing AND RECORD in pre-start section of Data Sheet 2:

5.1.4.1 IF dose rate is greater than 130 mrem/hr on contact, NOTIFY FWS for resolution AND RECORD results in Comments Section of Data Sheet 2.

5.1.5 INITIAL Pre-Start column of Data Sheet 2.

5.1.6 IF other confirmatory measurement methods are required, ENSURE Environmental Field Representative has specified method in work package instructions.
5.1 PTRAEU Startup and Operation (Cont.)

5.1.7 **ENSURE** HPT has Started Portable Air Sampler(s).

5.1.7.1 **RUN** Air Sampler(s) continuously whenever the PTRAEU is operating.

**NOTE** - PTRAEU may be started/stopped as needed while performing this procedure.

5.1.8 **POSITION** PTRAEU ON/OFF switch to ON.

**NOTE** - Loss of vacuum (due to filter loading), is the only observable indication that Euroclean UZ930 or NILFISK GM80 no longer meets acceptable operation.

- The manometer on NILFISK GM82 is not calibrated and is used to notify the operator when to shake the agitator handle to clean the main (pre) filter.

5.1.9 **IF** any of the following conditions occur, **PERFORM** the following:

<table>
<thead>
<tr>
<th>Unit Identifier</th>
<th>Condition</th>
</tr>
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<tbody>
<tr>
<td>Euroclean UZ948</td>
<td>Indicating lamp illuminates OR Loss of vacuum</td>
</tr>
<tr>
<td>Euroclean UZ930</td>
<td>Loss of vacuum</td>
</tr>
<tr>
<td>NILFISK GM80</td>
<td>Loss of vacuum</td>
</tr>
<tr>
<td>NILFISK GM82</td>
<td>After agitator handle has been operated, continued loss of vacuum</td>
</tr>
</tbody>
</table>

5.1.9.1 **POSITION** PTRAEU unit On/Off switch to OFF.

5.1.9.2 **NOTIFY** HPT to **PERFORM** Surveys of Pre-filter and HEPA housing **AND**

**ENSURE** conditions do not exceed RWP requirements.

5.1.9.3 **NOTIFY** FWS for resolution **AND**

**RECORD** results in Data Sheet 2 Comments Section.
5.1 PTRAEU Startup and Operation (Cont.)

NOTE - The Euroclean UZ948/930 and NILFISK GM80/82/GS82 do not have hour meters. The total run time will be calculated in Section 5.2.

5.1.10 RECORD the following Logsheet 1:
• START time
• DATE of Startup
• Operator’s name.

5.1.11 RECORD the following within 15 minutes of start up in “At Start” column of Data Sheet 1:
• Initials
• Time
• Status of indicating lamp (Euroclean UZ948)
• Vacuum is being drawn
• Manometer indication (NILFISK GM82/GS82).

5.1.12 MONITOR applicable indication AND
RECORD data (hourly) in accordance with Data Sheet 1.

5.1.13 RECORD any problems or discrepancies in COMMENTS section of Data Sheet 1.
5.2 PTRAEU Shutdown

5.2.1 IF any of the following occur, POSITION PTRAEU ON/OFF switch to OFF.
- Work Release OE or FWS requests PTRAEU to be shut down
- Unusual operating noises from PTRAEU
- Abnormal conditions which could contribute to an air emission release
- Completion of work associated with this task.

5.2.2 NOTIFY FWS and HPT PTRAEU has been shut down.

5.2.3 RECORD the following on Logsheet 1:
- STOP time
- DATE of shutdown
- Operator’s name.

5.2.4 CALCULATE total run time from step 5.2.3 AND
RECORD Total Hours on Logsheet 1.

5.2.5 PERFORM the following smears AND
RECORD in End of Shift/Shutdown section of Data Sheet 2:
- Outlet of PTRAEU vacuum cleaner
- Joints/connections on PTRAEU vacuum cleaner.

5.2.6 IF contamination is detected, NOTIFY Environmental on-call representative and Radiological Control.

5.2.7 PERFORM survey of PTRAEU HEPA filter housing AND
RECORD in End of Shift/Shutdown section of Data Sheet 2.

5.2.7.1 IF dose rate is greater than 130 mrem/hr on contact, NOTIFY FWS for resolution AND
RECORD in Comments sections of Data Sheet 2.

5.2.8 INITIAL End of Shift/Shutdown column of Data Sheet 2.
5.2 PTRAEU Shutdown (Cont.)

**WARNING**
The PTRAEUs are not waterproof and measures should be taken to provide a weatherproof environment. Failure to comply may result in shock hazard.

5.2.9 **WHEN** not in use, **ENSURE** PTRAEU discharge outlet is protected (e.g., plastic bag).

**OR**

**STORE** PTRAEU vacuum cleaner in weather protected area.

5.2.10 **WHEN** PTRAEU vacuum cleaner is not running, **NOTIFY** HPT to shutdown portable air samplers.

5.2.11 HPT **RECORD** results of air sample analysis for alpha and beta-gamma under Confirmatory Measurements Logsheet 1.

5.2.12 **FORWARD** sample to laboratory or counting facility for detailed analysis, using one of the follow:
- Chain of Custody/Sample Analysis Request (A-6003-962)[WRPS]
- the Automated Bar Coding of All Samples at Hanford (ABCASH) system.

5.2.13 **ATTACH** completed copies of the Radiation Survey Report (RSR) and the Air Sample Analysis to the work package.

5.2.14 HPT **DOCUMENT** the following on Logsheet 1:

5.2.14.1 **RECORD** Survey Report# for Work Activity.
5.2 PTRAEU Shutdown (Cont.)

5.2.15 FWS PERFORM the following:

5.2.15.1 REVIEW AND ENSURE, Logsheet 1, Data Sheet 1 and Data Sheet 2 are properly filled out.

5.2.15.2 INCLUDE copy of Logsheet 1 in Work Package.

5.2.15.3 FORWARD copy of completed Logsheet 1 of estimated radioactive emissions calculation, and air sample analyses to the Environmental Compliance SME who approved the work package this procedure was performed under.
5.3 Records

5.3.1 PERFORM the following for records identified within this procedure.

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

OR

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

5.3.1.2 SUBMIT the package to FWS/OE/Shift Manager.

<table>
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<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
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<tr>
<td>4.2 Field Preparations</td>
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<td>5.3 Records</td>
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<td>Data Sheet 2 - HPT Monitoring</td>
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<td>Logsheets</td>
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<tr>
<td>Logsheet 1 - PTRAEU Vacuums</td>
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</tr>
</tbody>
</table>

5.3.2 FWS/OE/Shift Manager SEND the completed records 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 Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02, Records Management.
# Data Sheet 1 - Operations Monitoring

**NOTE** - This data sheet may be copied if exhauster will be operated for more than 4 hours.

## PTRAEU AIR FLOW MONITORING

<table>
<thead>
<tr>
<th>Procedure Step</th>
<th>Parameter</th>
<th>Limit</th>
<th>“AT START” (within 15 min)</th>
<th>Hourly Monitoring (5.1.12)</th>
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<tbody>
<tr>
<td>5.1.11</td>
<td>Time:</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1.11</td>
<td>*Manometer Indication (GM 82/GS 82)</td>
<td>“HI”</td>
<td>HI [ ] LO [ ]</td>
<td>HI [ ] LO [ ]</td>
</tr>
<tr>
<td>5.1.11</td>
<td>** Vacuum is being drawn</td>
<td>“NO”</td>
<td>No [ ] Yes [ ]</td>
<td>No [ ] Yes [ ]</td>
</tr>
<tr>
<td>5.1.11</td>
<td>*** Indicating Lamp (UZ948)</td>
<td>OFF</td>
<td>No [ ] Yes [ ]</td>
<td>No [ ] Yes [ ]</td>
</tr>
<tr>
<td>5.1.11</td>
<td>Operator Initials:</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMMENTS:**

* Manometer Indication is “HI” when HEPA or main (pre) filter is loaded on NILFISK GM82/GS82.

** Loss of vacuum indicates loaded HEPA filter.

*** Indicating lamp is “ON” when HEPA filter is loaded on Euroclean UZ948.

FWS or Operations Representative Review (Print [First & Last]/Sign): ___________________________ Date_______________

FWS or Operations Representative forward copies to Shift Operations.
### Operate Portable Temporary Radioactive Air Emission Unit (PTRAEU) Vacuums

**Data Sheet 2 - HPT Monitoring**

<table>
<thead>
<tr>
<th>Work Step</th>
<th>Parameter</th>
<th>Pre-Start</th>
<th>End of Shift/Shutdown</th>
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<tr>
<td>5.1.3, 5.2.5</td>
<td>PTRAEU Exhaust Smear (DPM/100cm$^2$)</td>
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<tr>
<td></td>
<td>PTRAEU Vacuum cleaner Connections and Joints Smear Survey (DPM/100cm$^2$)</td>
<td></td>
<td></td>
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<tr>
<td>5.1.4, 5.2.7</td>
<td>HEPA Filter Housing Dose Rate (MR/HR C.W.)</td>
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<tr>
<td>5.1.5, 5.2.8</td>
<td>HPT Print (First &amp; Last), Sign, Date</td>
<td></td>
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</table>

**Comments:**

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**NOTE** - One copy of data sheet is used for each shift exhauster operated.

**FWS or Operations Representative Review** (Print [First & Last] /Sign): ___________________________ Date ____________
Operate Portable Temporary Radioactive Air Emission Unit (PTRAEU) Vacuums

Logsheet 1 - PTRAEU Vacuums

AREA 200E – 200W (circle one)
SOURCE: – Liquid – gas – solid (circle one)
Daily Radiological Handling Limit:_______________

<table>
<thead>
<tr>
<th>Operator Name</th>
<th>START: Date &amp; Time</th>
<th>STOP: Date &amp; Time</th>
<th>Calculate Total Run Time from START &amp; STOP times</th>
<th>Estimated Emissions (mrem/yr)</th>
<th>Air Sample Results (uCi/mL)</th>
<th>Radiation Survey #</th>
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* Attach copies of emissions calculations using guidelines in the TFC-ESHQ-ENV_RM-C-10, Use of Portable/Temporary Radioactive Air Emission Units, and also the Data to support confirmatory measurements.

**FWS or Operations Representative Review** (Print [First & Last]/Sign): ________________________________ Date: __________________

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