

C-67 Event Investigation Reports (Redacted) EIR-2024-036 C-67 (04/15/2024)

(Settlement Agreement Deliverable)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC27-08RV14800



**P.O. Box 850
Richland, Washington 99352**

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N. J. Pearson

Washington River Protection Solutions

Date Published

April 2024

WRPS

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APPROVED

By Lynn M Ayers at 9:26 am, Apr 24, 2024

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Date

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Washington River Protection Solutions
EVENT SUMMARY

NOTE: This form provides timely notification to management and documents preliminary information of an event that may require a more formal investigation. Details may change upon further examination and analysis. The following is a current status of available information:

1. **Project:** Facilities 2. **Report Date:** 04/18/2024

3. **Investigation Title:** C-67 Odor Response at 2704HV Mask Station

4. **Investigation Report Number:** EIR-2024-036

5. **Responsible Manager:** [REDACTED]

6. **Event Investigator:** [REDACTED]

7. **Area / Building / Location:** 200East/2704HV/RPE Issuing Station Room H-105

8. **Date and Approximate Time of Event:** **Date:** 04/15/2024 **Time (military):** 1224 hours

9. **Associated Action Request (AR) Number:** WRPS-AR-2024-1425

10. **Associated Occurrence Report Number (if applicable):** NA

11. **Event Investigation Meeting Held:** Yes [] or No [X] **Date:** NA **Time (military):** NA

12. Activity in Progress: *(What activity was under way, include procedures and work order numbers, as applicable)*

The Mask Station workers were performing their assigned duties per procedures:

- 1) TO-020-028 - Respirator Issuance and Control
- 2) TO-020-024 - Clean E-Z Flow Regulators for SCBA and Supplied-Air Respirators
- 3) DOE-0352 - Hanford Site Respirator Protection Program

There were 5 people total in the Respiratory Protection Equipment (RPE) Issuing Station room performing these duties when the event happened. Affected personnel were not in an area requiring the use of RPE.

13. Personnel Involved: *(Job positions, number of personnel, identify any support organizations or subcontractors)*

6 Nuclear Chemical Operator - (NCO)- Washington River Protection Solutions (WRPS)

1 Field Work Supervisor - (FWS) WRPS

14. What Happened: *(Provide a short discussion of what happened)*

On 04/15/2024 at approximately 1215 hours a NCO (NCO-1) entered 2704HV room H105, the RPE Issuing Station, from the outside entrance where 5 other NCOs were present. Upon entering the room, the NCO-1 smelled a stronger than normal odor. NCO-1 does not work in H105. The NCO-1 asked NCO-2 if an odor was detectable, but NCO-2 did not smell the odor.

NCO-1 contacted the FWS to get a second opinion of the odor. The FWS walked over to H105, and immediately smelled the odor as described by NCO-1. The FWS instructed NCO-2 to evacuate room H105. NCO-2 then notified NCOs-3,4,5,6 to immediately leave room H105 and go to the lobby of building 2704HV. NCO-2 locked the entrance to the outside of the building and ensured all the NCOs had evacuated. NCO-2 then closed the inside entrance to room H105 and posted an "Authorized Personnel Only" sign on the door.

Industrial Hygiene Technicians (IHT) were notified of the odor and took readings from a Direct Reading Instrument (DRI) of the area in and around room H105. None of the readings were at an action level.

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15. Where Did It Happen: *(Description of work area and working conditions. Include information on weather conditions, PPE, Postings, etc.)*

Location

The odor was detected inside room H105 at building 2704HV.

Weather Conditions: The event took place inside a building, but room H105 has an entry door from the outside. Weather information was checked by Point of Exposure (POE) IHs from Data Fusion & Advisory System (DFAS), powered by Smart Site for weather conditions at the time of the event.

Wind speed: 18 Miles Per Hour (MPH) gusting to 30 MPH.

Wind Direction: From the West

Temperature: 67 degrees Fahrenheit

Barometric Pressure: 29.30 inHg

Humidity: 19%.

16. Impact to Facility: *(Caused by the event or a description of known consequences)*

Room H105 was restricted access for approximately 2 hours.

17. Immediate Actions Taken: *(List immediate actions taken to stabilize the scene or respond to the event)*

- [1218] - NCO-1 reports odor to FWS.
- [1220] - FWS confirms presence of odor in room H105.
- [1220] - Room H105 is evacuated and both entry points are barricaded and restricted access signs posted.
- [~1222] - IHT personnel begin to investigate reported odor in and around room H105.
- [1224] - FWS notifies Central Services Organization (CSO) of odor; CSO declares a C-67 odor event.
- [~1226] - Odor response cards are filled out by NCOs 1-6.
- [1234] - Shift Office Emergency Notification (SOEN) is sent.
- [1418] - Action responses are complete, results are below action levels, and access is restored to the area.

18. Compensatory Actions Taken:

None.

19. Remedial Actions Taken:

None.

20. Key Elements of the Investigation: *(Key investigation points)*

To summarize the conclusions of the Industrial Hygiene Event Investigation Report (IHIR-00096) for EIR-2024-036, C-67 Odor Response at 2704HV Mask Station, investigation and DRI monitoring, all readings were below action levels.

The IHTs performed monitoring in and around areas that individuals experienced odors. The results of this monitoring on the IHIR-00096 report are as follows:

- No odors detected by Facilities IH or the IHTs.

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- DRI readings were taken in multiple areas and the results are as follows:

<u>LOCATION</u>	<u>VOCs (10.6 eV)</u>	<u>Action Level (AL) for all locations</u>
2704HV Lobby	0.000 ppm	0.6 ppm
2704HV Hallway	0.010 ppm	
Mask Station (H105) Entrance	0.000 ppm	
Mask Station (H105) HVAC Vent Ducts	0.000 ppm	
Mask Station (H105) Ceiling Vents	0.000 ppm	
2704HV South Exterior	0.000 ppm	

DRI monitoring performed during TFC-OPS-OPER-C-67 response actions did not indicate further actions necessary from a worker safety and health occupational exposure standpoint. As a result, the area was released from restricted access at 1418 hours.

Hanford Mission Integration Solutions (HMIS) Refrigeration Equipment Services (RES) was contacted and made aware of the odor event at 2704HV. HMIS RES stated that they would perform a follow-up evaluation on these HVAC units to ensure they are functioning properly.

Per discussion with HMIS RES, ProTek EG Safety Data Sheet (SDS) (#081783) is used in both HVAC units. This product is a liquid that contains the following components:

- Ethylene glycol (CAS #107-21-1) at 40-95% by weight.
- Sodium nitrate (CAS #7632-00-0) at 0.1-1% by weight.
- Tolytriazole sodium salt (CAS #64665-57-2) at 0.01-1% by weight.

Per SDS #081783, odors are not anticipated under normal use of this product. If odors are detected, the First Aid measures for inhalation is to move the person to fresh air (Section 4 of the SDS, First Aid Measures). The two HVAC units inside H105 are separate from the rest of the units in 2704HV. The two units are adjacent to the mask issuing station, with two registers on each unit. See Figure 1.



Figure 1: Room H105 RPE Issuing Station

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21. Positive Aspects Identified:

- NCO-1 recognized a potentially hazardous situation and acted appropriately by getting a second opinion.

22. Key Take Aways / Learning Opportunities:

Following procedures, protocol, and quick action adds to the safety of workers.

23. Event Investigation:

- ☐ An Event Investigation will be completed per [TFC-OPS-OPER-C-14](#).
- ☐ This event will be managed by another process, i.e., Operability Evaluation, Engineering Technical Evaluation, etc.
- ☒ This event does not require continuation of the Event Investigation process.

Responsible Manager Approval:

Name (First, Middle Initial, Last)

Digitally signed by _____
Date: 2024.04.18 14:53:57 -07'00'

Signature / Date

CAS Manager Approval:

Name (First, Middle Initial, Last)

Digitally signed by _____
Date: 2024.04.18 15:23:54 -07'00'

Signature / Date

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR)

Event Title: TFC-OPS-OPER-C-67 Response 2704HV H105	IHIR Number: IHIR-00096
	IHEI Number: N/A

Date: 4/15/2024	Time: 1224	Location: 2704HV
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Event Summary and Timeline:

At approximately 1224 on 4/15/2024, workers reported smelling a "sweet, glycol" odor at the RPE issuing station (room H105) at 2704HV. Affected personnel were not in an area requiring the use of Respiratory Protection Equipment. No symptoms were reported, and all personnel declined precautionary medical surveillance.

Field Response Timeline:

- 1218 Projects FWS calls Projects IH and informs them that an individual reported smelling a sweet, antifreeze odor in H105.
- 1220 Projects IH arrives at 2704HV and detects no odors outside of 2704HV or in the hallway outside of H105. Both entry points are barricaded or posted as restricted access.
- 1221 Projects IH verifies with odor discoverer that they detected an antifreeze odor in H105 and asks individuals if they have any symptoms or want to receive medical surveillance. All individuals decline.
- 1222 Projects IH walks down adjacent office spaces and verifies no co-located work is occurring.
- 1224 CSO is contacted and declares a C-67 odor response event.
Projects IH contacts painter FWS to verify no painting activities were occurring at 2704HV. Painter FWS confirms no painting was occurring at 2704HV.
- 1226 POE Shift IHT supervisor contacts POE IH-1 and describes a sweet odor at 2704HV. POE IH-1 instructs that 10.6 eV and 11.7 eV PID DRIs that are equipped to detect ammonia be prepared.
- 1228 POE IH-1 arrives at CSO.
- 1229 POE IH-2 arrives at CSO.
POE Shift IHT supervisor contacts IHT and relays instructions.
CSM receives an update that "sweet" odors were detected at the 2704HV mask station, HVAC units are present in the room, and that all workers reported no symptoms and declined medical surveillance.
- 1230 Projects IH is informed by one of the odor discoverers that the HVAC system within H105 is a glycol-based system.
- 1232 Projects IH informs CSM that the HVAC system within H105 is believed to be a glycol-based system.
CSM asks whether the HVAC units are portable and if the odor is detectable anywhere else. Projects IH answers no to both questions.
POE IHs check DFAS, powered Smart Site™, for current weather details:
 - Mixing Height: 1500 meters
 - Stability Class: A
 - Barometric Pressure and trend: 29.30 inHg (steady)
 - Temperature: 67 F
 - Relative Humidity: 19%
 - Wind Speed and Direction W at 18 gusting to 30 mph
- 1237 Projects IH attempts to contact facility owner regarding HVAC system in H105. POE IHs devise an action limit of 0.6 ppm for field response.
POE IH-3 arrives at CSO.
- 1241 POE Shift IHT supervisor informs POE IH-1 that a 11.7 eV PID DRI is unavailable.
- 1242 POE Shift IHT supervisor notifies and briefs level 1 ESHQ manager, level 2 IH manager, and POE IH manager about C-67 event.
- 1243 FWS contacts CSM asking whether they can scan OVRC.
CSM confirms.
- 1246 FOS IH manager contacts facilities IH and directs them to respond at CSO.
- 1251 Facilities IH calls painter FWS to verify no painting activities are occurring at 2704HV. Painter FWS confirms no painting activities are occurring at 2704HV.
- 1253 Facilities IH arrives at CSO.
- 1254 Performance Assurance calls CSO.
Both parties agree that Performance Assurance will call back in a few hours.
- 1255 Three IHTs arrive with instruments at CSO.

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INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Event Summary and Timeline:

Projects IH attempts to contact Maintenance Manager regarding HVAC system in H105.
1258 5 OVRC are received by CSO.
1300 Sign stating "Authorized Personnel Only" is hung on interior barricade.
CSM contacts event investigator.
1303 POE Shift IHT supervisor instructs POE IHTs to grab wands for the DRI.
1304 Facility representative contacts CSM with a C-67 update.
1307 CSM and POE IH-2 sign TFC-OPS-OPER-C-67 Attachment A sheet 1 of 2.
POE IH-1 tells POE Shift IHT supervisor that they are ready to brief IHTs.
1312 POE IH-1 briefs POE IHTs on response:
IHTs are instructed to monitor per IHSP-POE-MULTI-TFC-OP-OPER-C-67 for total VOCs using a 10.6 eV PID with an action limit of 0.6 ppm.
IHTs are told to be cognizant of cross interference with the DRI.
IHTs are instructed to monitor hallway into H105 (mask station), in H105, and HVAC ducts in H105.
IHTs are told that RPE is not required, but a voluntary upgrade is available.
1315 Facilities IH and POE IHTs depart CSO.
POE Shift IHT supervisor updates level 1 ESHQ manager, level 2 IH manager, and POE IH manager on response actions.
1321 Maintenance Manager contacts Projects IH and provides additional contact information for WRPS personnel who could answer questions regarding the HVAC system.
1326 Responding personnel arrive at 2704HV.
1329 Facilities IH directs IHTs to start DRI data log in 2704HV lobby.
Projects IH contacts WRPS facilities personnel and verifies that the HVAC units operating within H105 are a glycol-based system.
Projects IH convenes with responding personnel and briefs on response actions thus far.
1331 Responding personnel enter H105 and perform sweep.
1337 Facilities IH updates POE IH-3 that there are 2 HVAC units in H105, with 2 registers on each unit, and 6 total upper vents.
Facilities IH updates POE IH-3 that all readings are below detection limit (<0.010 ppm VOC).
1342 Facilities IH calls POE IH-3 and states that responding personnel have monitored the perimeter outside H105 and all readings are below detection limit (<0.010 ppm VOC).
1344 Facilities IH updates POE IH-3 that the DRI data log has been ended.
Responding personnel depart from 2704HV.
1349 POE Shift IHT supervisor updates level 1 ESHQ manager, level 2 IH manager, and POE IH manager on field response completion.
1354 Facilities IH arrives at CSO and states that IHTs are on their way to perform post use function test for their DRI.
Facilities IH briefs CSM that projects IH accompanied responding personnel, facilities IH and IHTs detected no odor at H105 but projects IH detected a faint vinegar smell, and that all readings were below the detection limit (<0.010 ppm).
1401 POE Shift IHT supervisor contacts projects IH and asks if the facilities group has been notified of the odor.
Projects IH confirms that they have.
1402 Projects IH contacts WRPS facilities personnel and determines what, if any, actions they will be taking.
WRPS facilities personnel state that they will be contacting HMIS RES regarding the odor and may send out an email to 2704HV building occupants.
1404 IHTs update POE Shift IHT supervisor that the DRI passed the post use function test.
Projects IH contacts POE IHT Shift supervisor and informs them of WRPS facilities potential path forward.
1405 CSM and POE IH-2 sign TFC-OPS-OPER-C-67 Attachment A sheet 2 of 2.
POE IH-1 is informed that HMIS RES is going to perform a follow-up evaluation of the equipment.
1418 Action responses are complete, and access is restored to the area.
1422 Project IH contacts HMIS RES employee.
HMIS RES employee states that the HVAC units located in H105 are isolated from the rest of the 2704HV HVAC units and the system uses ProTek EG (SDS #081783).

Field Response Timeline Acronyms:

ACGIH American Conference of Governmental Industrial Hygienists
AL Action Limit
CSM Central Shift Manager
CSO Central Shift Office

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INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Event Summary and Timeline:

DFAS Data Fusion Advisory System
DRI Direct Read Instrument
EG Ethylene Glycol
FOS Field Operations Support
FWS Field Work Supervisor
ESHQ Environmental, Safety, Health & Quality
eV electron-volts
HMIS Hanford Mission Integration Solutions
IH Industrial Hygienist
IHA Inomedic Health Applications inc.
IHIR Industrial Hygiene Event Investigation Report
IHT Industrial Hygiene Technician
inHg Inches of Mercury
mph miles per hour
OEL Occupational Exposure Limit
OSHA Occupational Safety and Health Administration
OVRC Odor/Vapor Response Card
PEL Permissible Exposure Limit
PID Photoionization Detector
PO Production Operations
POC Point of Contact
POE Production Operations-East
ppm parts per million
RES Refrigerate Equipment Services
SDS Safety Data Sheet
SWIHD Site Wide Industrial Hygiene Database
TLV Threshold Limit Value
VOC Volatile Organic Compound

Sampling/Monitoring Results:

Direct Reading Instrument Monitoring Results:

POE IH-1 & POE IH-2 Monitoring Selections- Based on the Odor Descriptor "sweet" and suspected odor source of "glycol" from "AC units", monitoring for Total VOCs (10.6 eV PID) was performed:

- "Sweet": The American Industrial Hygiene Association (AIHA) [Odor Threshold for Chemicals with Established Health Standards, 2nd Edition](#), lists several chemicals with the odor character "sweet". A majority of them are volatile organic compounds detectable with DRI equipped with a 10.6 eV and/or 11.7 eV PID.
- The most common glycols utilized in Heating, Ventilation, Air Conditioning (HVAC) units are ethylene glycol and propylene glycol. Both volatile organic compounds are detectable with DRI equipped with a 10.6 eV or 11.7 eV PID. The AIHA Odor Threshold for Chemicals with Established Health Standards, 2nd Edition, does not list an odor character for ethylene glycol or propylene glycol.
- The Total VOC Action Limit (AL) was conservatively set at 0.6 ppm based on ethylene glycol. Total VOC AL Development:

Equation 1. Converting from mg/m³ to ppm

$$ppm = \frac{X \text{ mg/m}^3 \times 24.45}{MW}$$

Equation 2. Adjusting PID Reading Display for Specific Compound

$$\text{Adjusted Reading} = X \text{ ppm (display)} \times CF$$

Equation 3. Adjusted Action Limit for Specific Compound

$$\text{Adjusted Action Limit (display)} = \frac{X \text{ ppm (AL)}}{CF}$$

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INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Sampling/Monitoring Results:

Agent	CAS No.	MW (g/mol)	Correction Factors (CF)				OSHA PEL	ACGIH TLV	Adjusted AL (10.6 eV PID)
			10.6 eV C	11.7 eV C					
Ethylene Glycol	107-21-1	62.07	16	+	6	+	Ceiling - 40 ppm	Ceiling - 100 mg/m ³ (39.39 ppm)	0.6 ppm ^A
Propylene Glycol	57-55-6	76.09	4	+	1.6	+	N/A	N/A	N/A

(ACGIH, 2016; [NIH, n.d.](#); [OSHA, n.d.](#); [RAE Systems by Honeywell, 2018](#))

^ACompounds indicated in green by Honeywell are referred to as "high-boiling ("heavy") or very reactive compounds". As there is a potential loss of analyte prior to encountering the PID, a 50% safety factor was utilized for the Adjusted AL (RAE System by Honeywell, 2018).

- DRI equipped with an 11.7 eV PID were unavailable for response actions. Therefore, only the 10.6 eV PID was utilized for response actions.

Refer to [TOC-IH-58956](#) for more detail on the monitoring strategy and action limit development for response to odors.

Two IHTs reported to shift office for C-67 response to stronger than normal odors reported in 2704HV H105. IHTs received instructions from POE IH-1 to monitor for VOCs using a MultiRAE Pro RAE (10.6 eV lamp) per IHSP-POE-MULTI-TFCOPSOPERC67. IHTs were instructed to sweep the hallway outside of H105, H105 including the HVAC vents, and the south perimeter of the building outside H105. Facilities IH and the IHTs entered the building at the main entrance at 1328, and facilities IH directed the IHTs to start the data log at 1329. The highest reading in the hallway outside H105 measured at 0.010 ppm. The responding personnel convened with projects IH in the hallway prior to entering H105.

Upon entry, IHTs first monitored in their breathing zones at the entrance of the H105. All readings were below the detection limit (<0.0010 ppm). Responding personnel visually inspected the room, and noticed two HVAC units within the room, with two registers each, and an overhead ceiling duct with six total vents (see pictures below). IHTs performed a sweep of the room and took readings at all four HVAC registers and all six HVAC upper vents. All readings were below the detection limit (<0.010 ppm).



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INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Sampling/Monitoring Results:

No odors were detected by Facilities IH or the IHTs. Projects IH detected a slight vinegar smell. After completing a sweep of H105, responding personnel exited the building and performed a sweep at the south exterior of the building outside H105. All readings remained below the detection limit. Upon departing 2704HV, the IHTs were instructed to perform a post use function test on their instrument. The MultiRAE passed at 1400.

LOCATION	VOCs (10.6 eV)
2704HV Lobby	0.000 ppm
2704HV Hallway	0.010 ppm
Mask Station (H105) Entrance	0.000 ppm
Mask Station (H105) HVAC Vent Ducts	0.000 ppm
Mask Station (H105) Ceiling Vents	0.000 ppm
2704HV South Exterior	0.000 ppm

SWIHD References:

Event Response Site Wide Industrial Hygiene Database Direct Reading Instrumentation (DRI) Survey:

- #24-02760 "TFC-OPS-OPER-C67 Response at 2704 HV"

Additional Information:

Respiratory Protection Equipment was not prescribed for the Initiating Event. Accordingly, at the time of the Initiating Event, the Affected Workers were not wearing Respiratory Protection Equipment. Respiratory Protection Equipment was not required, nor worn, for the Response Actions.

Response actions are detailed below, on TFC-OPS-OPER-C-C-67 Attachment A pages 1 and 2.

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Additional Information:

Response to Stronger than Normal Odors	Manual Document Page Issue Date	Operations TFC-OPS-OPER-C-67, REV B-4 5 of 9 January 5, 2023
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Attachment A – Response Plan

RESPONSE PLAN		Sheet 1 of 2
DESCRIPTION OF EVENT (date & time, description of event, location, symptoms, etc.): At approximately 1224 on 04/15/2024 three workers reported a "sweet, glycol" odor at the RPE issuing station (room H105) at 2704HV. No symptoms were reported and all personnel declined precautionary medical evaluation.		
RESPONSE STEPS: <i>Attach additional pages as needed</i> • Restrict access to room H105 of 2704HV. • Perform monitoring as per IHSP-POE-MULTI-TFCOPSOPERC67: ○ Volatile Organic Compounds (10.6 eV PID) – Action Limit 0.6 ppm ○ Monitor the hallway on the way into H105, perform sweep of H105, then monitor HVAC ducts and registers in H105.		
IH Sampling Plan # <u>IHSP-POE-MULTI-TFCOPSOPERC67</u> Respiratory Protection Form # <u>N/A</u> RWP # <u>N/A</u> Other <u>N/A</u>		
REQUIRED APPROVAL SIGNATURES		
Industrial Hygiene:	Signature Print (First & Last) Date	<u>04/15/2024</u> Date
Shift Manager:	Signature Print (First & Last) Date	<u>04/15/2024</u> Date
ADDITIONAL SIGNATURES (as determined by Shift Manager or Safety & Health Rep; N/A if not applicable)		
RadCon:	<u>N/A</u> <u>N/A</u> <u>N/A</u> Signature Print (First & Last) Date	
Environmental:	<u>N/A</u> <u>N/A</u> <u>N/A</u> Signature Print (First & Last) Date	
Engineer:	<u>N/A</u> <u>N/A</u> <u>N/A</u> Signature Print (First & Last) Date	
Industrial Safety:	<u>N/A</u> <u>N/A</u> <u>N/A</u> Signature Print (First & Last) Date	

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Additional Information:

Response to Stronger than Normal Odors	Manual Document Page Issue Date	Operations TFC-OPS-OPER-C-67, REV B-4 6 of 9 January 5, 2023
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Attachment A – Response Plan (cont.)

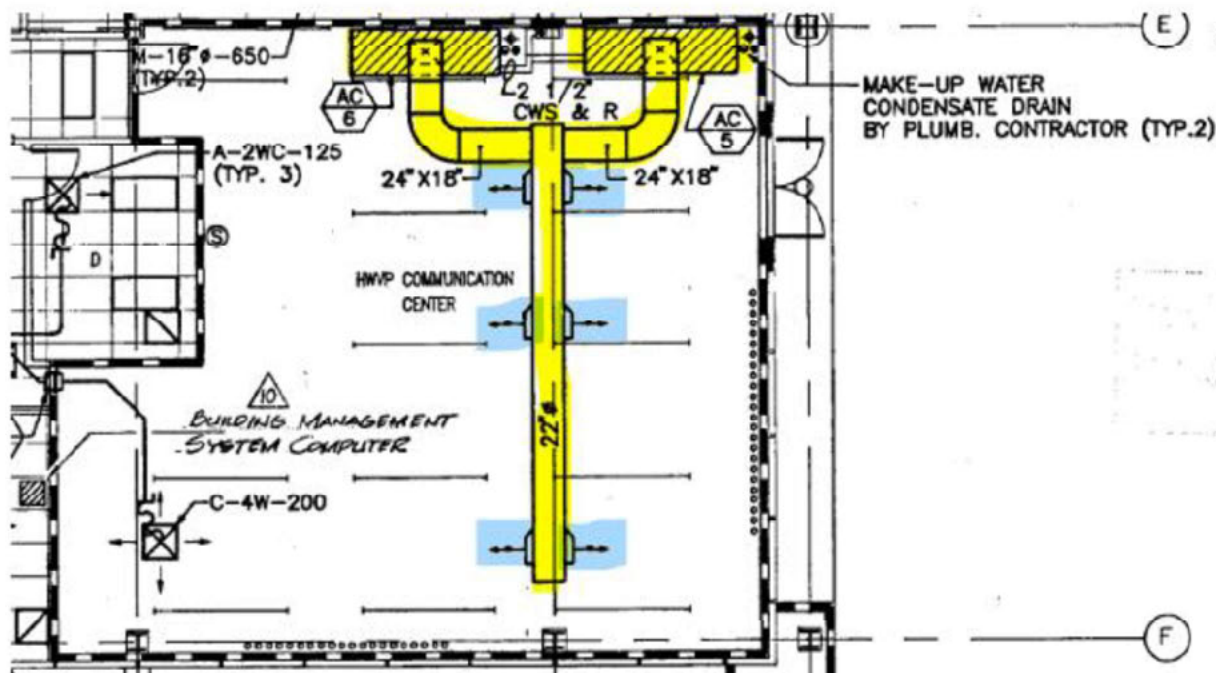
RESPONSE PLAN		Sheet 2 of 2
Odor Response Plan Notes (monitoring data, results of actions taken, etc. Use more sheets as necessary) • Response Team included 2 Industrial Hygienists and 2 Industrial Hygiene Technicians. • Halfway to 2704HV H105. ○ Volatile Organic Compounds (10.6 eV PID) – 0.010 ppm ○ No odors present. • 2704HV H105. ○ Volatile Organic Compounds (10.6 eV PID) – Less than detectable (<0.010 ppm) ○ Faint “vinegar” odor perceived by 1 Industrial Hygienist. • HVAC ducts and registers in 2704HV H105. ○ Volatile Organic Compounds (10.6 eV PID) – Less than detectable (<0.010 ppm) ○ No odors present. • Exterior of building outside of 2704HV H105. ○ Volatile Organic Compounds (10.6 eV PID) – Less than detectable (<0.010 ppm) ○ No odors present. • Instruments passed post-use-function-test at 1404 on 04/15/2024.		
RESPONSE PLAN COMPLETED:		
Industrial Hygiene:	SignaturePrint (First & Last)Date	
Shift Manager:	SignaturePrint (First & Last)Date	

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT (IHIR) (Continued)

Additional Information:

The "sweet, glycol" odor was detected in H105, which has two HVAC units inside and exterior doors that open to a parking/staging area. Vehicles frequently park outside this door throughout the day to deliver equipment to the mask fit station. When the projects IH responded at 2704HV, there was a truck parked outside H105 delivering cooling equipment, but it was not idling. This vehicle was no longer present once responding personnel arrived at 2704HV. Readings were taken in the parking/staging area in addition to inside H105, but no readings were above the detection limit.

The two HVAC units inside H105 are separate from the rest of the units in 2704HV. The two units are adjacent to the mask issuing station, with two registers on each unit. Below is a screengrab from the 2704HV 1st floor south wing HVAC floor plan (Attachment A - H-2-116780-1):



The HVAC system is highlighted in yellow, with each of the supply ducts at the ceiling highlighted in blue. Readings were taken at all six supply ducts, all below the detection limit (<0.010 ppm).

Per discussion with HMIS RES, ProTek EG (SDS #081783) is used in both HVAC units. This product is a liquid that contains the following components:

- Ethylene glycol (CAS #107-21-1) at 40-95% by weight.
- Sodium nitrate (CAS #7632-00-0) at 0.1-1% by weight.
- Tolytriazole sodium salt (CAS #64665-57-2) at 0.01-1% by weight.

In the 2016 ACGIH TLV booklet, no 8-hr TWA TLV has been set for any of these constituents. No PELs exist for sodium nitrate or tolytriazole sodium salt. However, ethylene glycol has an ACGIH ceiling of 100 mg/m³ (39.39 ppm) and an OSHA ceiling of 40 ppm. The lower of the two ceiling values was used to set an appropriate action limit, described in the sampling/monitoring results section of this report. Per the SDS, odors are not anticipated under normal use of this product.

On 4/15/2024, HMIS RES was contacted and made aware of the odor event at 2704HV. HMIS RES stated that they would perform a follow-up evaluation on these units to ensure they are functioning properly.

On 4/16/2024, facilities IH contacted HMIS RES, who stated that the last service date for the H105 HVAC units was 11/8/2023. The next regularly scheduled service date is 5/1/2024. An evaluation has not yet been performed on the systems by HMIS RES, as a work package must be developed before any intrusive work can be performed into the units.

Recommendations/Conclusions:

IH concludes the exact source of the odors is unknown, but they were most likely present from the HVAC units inside H105. IHT monitoring did not indicate that ethylene glycol vapors were present at or above the ACGIH or OSHA ceiling limits at the time of response. IH recommends HMIS RES perform a follow-up evaluation of the HVAC units to ensure that they are functioning properly.

Others:

- None of Affected Workers reported symptoms, and all declined precautionary medical surveillance.

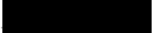
Associated Documents:

iCAS Number: N/A

EIR Number: 2024-036

Industrial Hygienist:*Print First and Last Name**Signature / Date*Digitally signed by 

Date: 2024.04.16 11:09:09 -07'00'

Industrial Hygiene Level 3 Manager*Print First and Last Name**Signature / Date*Digitally signed by 

Date: 2024.04.16 11:27:56 -07'00'

Industrial Hygiene Level 2 Manager:*Print First and Last Name**Signature / Date*Digitally signed by 

Date: 2024.04.16 12:22:48 -07'00'

ODOR/VAPOR RESPONSE CARD

1. Complete below information and map (Page 1).

- Date and time of event: 4-15-24
- Check Applicable:
 - ☒ Odor
 - ☐ Ammonia Alarm (6 ppm)
 - ☐ Ammonia Alarm (12 ppm)
 - ☐ Alarm (other - describe):
- Your name and the work you were performing: [REDACTED] Issue Respiratory
- Other Work Underway? Describe: Unitech drop off
- Location of event (mark area on map and wind direction): 2704 HV / H105
- Name(s) of others in or near the affected area: [REDACTED]
- Was Industrial Hygiene present, who? No, Responded
- Describe the odor:
 - ☒ Sweet
 - ☐ Sour
 - ☐ Smoky
 - ☐ Septic/Sewer
 - ☐ Musty
 - ☐ Rotten
 - ☐ Metallic
 - ☐ Onion
 - ☐ Earthy
 - ☐ Ammonia
 - ☐ Citrus
 - ☐ Solvent
 - ☐ Other (describe):
- Is source known/likely? Describe: Glycol
- Your symptoms? ☒ None
 - ☐ Headache
 - ☐ Dizziness
 - ☐ Nausea
 - ☐ Cough
 - ☐ Fatigue
 - ☐ Weakness
 - ☐ Sore Throat
 - ☐ Difficulty Breathing
 - ☐ Eye Irritation
 - ☐ Rash
 - ☐ Itch
 - ☐ Tingling
 - ☐ Numbness
 - ☐ Taste
 - ☐ Other (describe):

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD

1. Complete below information and map (Page 1).

- Date and time of event: April 15th, 2024 12:25pm

- Check Applicable:

☒ Odor ☐ Ammonia Alarm (6 ppm) ☐ Ammonia Alarm (12 ppm) ☐ Alarm (other - describe): _____

- Your name and the work you were performing:

_____ returning to office

- Other Work Underway? Describe:

RPE Issuer

- Location of event (mark area on map and wind direction):

2704HV Issue Station

- Name(s) of others in or near the affected area:

- Was Industrial Hygiene present, who?

No

- Describe the odor:

☒ Sweet ☐ Sour ☐ Smoky ☐ Septic/Sewer ☐ Musty ☐ Rotten
☐ Metallic ☐ Onion ☐ Earthy ☐ Ammonia ☐ Citrus ☐ Solvent
☒ Other (describe):
Glycol

- Is source known/likely? Describe:

AC units use glycol

- Your symptoms? ☒ None

☐ Headache ☐ Dizziness ☐ Nausea ☐ Cough ☐ Fatigue
☐ Weakness ☐ Sore Throat ☐ Difficulty Breathing ☐ Eye Irritation ☐ Rash
☐ Itch ☐ Tingling ☐ Numbness ☐ Taste
☐ Other (describe): _____

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM.

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ODOR/VAPOR RESPONSE CARD

1. Complete below information and map (Page 1).

- Date and time of event: 4-15-24
- Check Applicable:
 - ☒ Odor
 - ☐ Ammonia Alarm (6 ppm)
 - ☐ Ammonia Alarm (12 ppm)
 - ☐ Alarm (other - describe): _____
- Your name and the work you were performing:
[REDACTED] VCS
- Other Work Underway? Describe:
MASK Station, MASK Delivery
- Location of event (mark area on map and wind direction):
2704 HV H105
- Name(s) of others in or near the affected area: _____
- Was Industrial Hygiene present, who?
NO
- Describe the odor:
 - ☐ Sweet
 - ☐ Sour
 - ☐ Smoky
 - ☐ Septic/Sewer
 - ☐ Musty
 - ☐ Rotten
 - ☐ Metallic
 - ☐ Onion
 - ☐ Earthy
 - ☐ Ammonia
 - ☐ Citrus
 - ☐ Solvent
 - ☒ Other (describe): _____
- Is source known/likely? Describe:
I Just walked in and Told to exit
- Your symptoms? ☒ None
 - ☐ Headache
 - ☐ Dizziness
 - ☐ Nausea
 - ☐ Cough
 - ☐ Fatigue
 - ☐ Weakness
 - ☐ Sore Throat
 - ☐ Difficulty Breathing
 - ☐ Eye Irritation
 - ☐ Rash
 - ☐ Itch
 - ☐ Tingling
 - ☐ Numbness
 - ☐ Taste
 - ☐ Other (describe): _____

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM.
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ODOR/VAPOR RESPONSE CARD

1. Complete below information and map (Page 1).

- Date and time of event: 4/15/2024 12:15 PM
- Check Applicable:
 - ☒ Odor
 - ☐ Ammonia Alarm (6 ppm)
 - ☐ Ammonia Alarm (12 ppm)
 - ☐ Alarm (other - describe):
- Your name and the work you were performing:
[REDACTED] mask station
- Other Work Underway? Describe:
- Location of event (mark area on map and wind direction):
H105
- Name(s) of others in or near the affected area:
- Was Industrial Hygiene present, who?
NO
- Describe the odor:
 - ☐ Sweet
 - ☐ Sour
 - ☐ Smoky
 - ☐ Septic/Sewer
 - ☐ Musty
 - ☐ Rotten
 - ☐ Metallic
 - ☐ Onion
 - ☐ Earthy
 - ☐ Ammonia
 - ☐ Citrus
 - ☐ Solvent
 - ☐ Other (describe):
- Is source known/likely? Describe:
- Your symptoms? ☐ None
 - ☐ Headache
 - ☐ Dizziness
 - ☐ Nausea
 - ☐ Cough
 - ☐ Fatigue
 - ☐ Weakness
 - ☐ Sore Throat
 - ☐ Difficulty Breathing
 - ☐ Eye Irritation
 - ☐ Rash
 - ☐ Itch
 - ☐ Tingling
 - ☐ Numbness
 - ☐ Taste
 - ☒ Other (describe): None

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD

1. Complete below information and map (Page 1).

- Date and time of event: 4-15-24 12:15 pm

- Check Applicable:

☐ Odor ☐ Ammonia Alarm (6 ppm) ☐ Ammonia Alarm (12 ppm) ☐ Alarm (other - describe):

- Your name and the work you were performing:

Issue Masks

- Other Work Underway? Describe:

Issue Masks

- Location of event (mark area on map and wind direction):

H105 2704 HV

- Name(s) of others in or near the affected area:

- Was Industrial Hygiene present, who?

NO

- Describe the odor:

☐ Sweet ☐ Sour ☐ Smoky ☐ Septic/Sewer ☐ Musty ☐ Rotten
☐ Metallic ☐ Onion ☐ Earthy ☐ Ammonia ☐ Citrus ☐ Solvent
☐ Other (describe): could Not Smell

- Is source known/likely? Describe:

- Your symptoms? ☒ None

☐ Headache ☐ Dizziness ☐ Nausea ☐ Cough ☐ Fatigue
☐ Weakness ☐ Sore Throat ☐ Difficulty Breathing ☐ Eye Irritation ☐ Rash
☐ Itch ☐ Tingling ☐ Numbness ☐ Taste
☐ Other (describe):

- ### 2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM.
- If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.