

Washington River Protection Solutions
EVENT SUMMARY

Check PART 1 box to hide that section of the form. Check PART 2 box it will show that section.

PART 1 (hide)* **PART 2 (show)***

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:

Project: Retrieval/Construction Date: 08/25/2022

Area/Building/Location: A Farm Change Trailer MO-2249 (200 East) Approximate Time of Event: 1345

AR Number: WRPS-AR-2022-2366 Responsible Manager: [REDACTED]

EIR Number: WRPS-EIR-2022-070 Event Investigator: [REDACTED]

EVENT SUMMARY PART II

Key Elements of the Investigation (Key investigation points):

To summarize the conclusions of the Industrial Hygiene Event Investigation Report, IHIR-00049 "TF-AOP-015 Entry at A Farm Egress Trailer", the Ventis Pro personal ammonia monitor alarm was not indicative of an employee chemical exposure event or changing Tank Farm conditions related to Tank Farm vapors.

The following considerations support the IHIR-00049 conclusion:

- (1) Two additional workers were in the immediate area of the individual when the Ventis Pro personal ammonia monitor alarmed. None of the other workers' Ventis Pro personal ammonia monitors alarmed or indicated elevated ammonia concentrations.
- (2) Ammonia is used as a sentinel tank waste chemical vapor for chemicals of potential concern (COPC), therefore, direct reading instruments (DRIs) equipped with an ammonia sensor are utilized at a minimum when monitoring for tank waste chemical vapors/COPCs. Immediately following the Ventis Pro personal ammonia monitor "Response Level" alarm initiation, workers notified a co-located Industrial Hygiene Technician (IHT) with Direct Reading Instrument (DRI) occupying the A Farm cool-down tent that is located directly outside the MO-2249 A Farm Change Trailer. The IHT collected a DRI reading from within the MO-2249 A Farm Change Trailer, indicating a less than detectable concentration for ammonia (<1 ppm). Indicating the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions.
- (3) Field response DRI monitoring conducted by a shift IHT inside the MO-2249 A Farm Change Trailer, following initiation of TF-AOP-015, indicated a less than detectable ammonia concentration (< 1 ppm), which is below background levels. Providing additional indication the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions.
- (4) Evaluation of the weather details determined the cause of the odor source was unlikely to be resultant of Tank Farms exhauster emissions based on the wind direction, wind speed, mixing height, and stability class at the reported time of event (Refer to Attachment 1 for DFAS PEZ Model).

The Data Fusion and Advisory System (DFAS) application, powered by SmartSite™, was utilized for outdoor weather details at the time of the Ventis Pro personal ammonia monitor alarm. The DFAS dashboard indicated the following weather conditions at 1333 on 08/25/2022:

- Wind Speed: 4.6 miles per hour (mph)
- Wind Direction: 112° (out of East/Southeast)
- Mixing Height: 1000 feet above grade
- Stability Class: C (slightly unstable conditions)

The DFAS dashboard provides a Exhauster Potential Exposure Zone (PEZ) Model of the exhaust plumes at the reported time of the event based on wind speed, wind direction, mixing height, and stability class. Evaluation of the PEZ Model indicates exhaust plumes of the AN Exhauster, 702-AZ Exhauster, POR-127 Exhauster, POR-126 Exhauster, POR-518 Exhauster, POR-519 Exhauster, and AW Exhauster were not within the work area location at the reported time of the event. While MO-2249 appeared to be within the Potential Exposure Zone of the AP Exhauster emission plume, the approximate distance MO-2249 is located from the AP Exhauster is approximately 1,200 feet. Thus, determining the cause of the observed odors was unlikely to be resultant of Tank Farms exhauster emissions (Refer to Attachment 1).

Washington River Protection Solutions
EVENT SUMMARY (Continued)

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Area/Building/Location: A Farm Change Trailer MO-2249 (200 East) **Approximate Time of Event:** 1345

AR Number: WRPS-AR-2022-2366 **Responsible Manager:** [REDACTED]

EIR Number: WRPS-EIR-2022-070 **Event Investigator:** [REDACTED]

Key Elements of the Investigation (Key investigation points):

(5) Memo WRPS-1904672.1, "TANK FARM EXHAUST STACK CONCENTRATION ALARM/ACTION LEVELS FOR AMMONIA" establishes ammonia concentration stack alarm/action set points for tank farm exhausters based on the predicated ammonia concentration at unspecified ground receptors utilizing the Quantitative Risk Assessment (QRA) model. The exhauster high level alarm was established at concentrations where the predicted ground receptor ammonia concentration of 2.5 ppm (or 10% of the established Occupational Exposure Limit for ammonia) could be observed. The exhauster high level alarm conservatively established for A Complex (excluding A farm) is 460 ppm. According to the Vapor Monitoring and Detection System (VMDS), the ammonia concentration observed at the time of event occurrence was 0 ppm at the POR-126 exhauster, 0.96 ppm at the POR-127 exhauster, and 12.711 ppm at the 702-AZ exhauster. Conservatively utilizing the higher ammonia concentration observed in the 702-AZ exhauster, a predicted ground receptor ammonia concentration of 0.069 ppm (or 0.27% of the established Occupational Exposure Limit for ammonia) would be expected if AY/AZ or AX tank farm exhauster emissions were present. The exhauster high level alarm conservatively established for A farm is 160 ppm. According to the Vapor Monitoring and Detection System (VMDS), the ammonia concentration observed at the time of event occurrence was 2.586 ppm at the POR-518 exhauster and 3.203 ppm at the POR-519 exhauster. Conservatively utilizing the higher ammonia concentration observed in the POR-519 exhauster, a predicted ground receptor ammonia concentration of 0.050 ppm (or 0.20% of the established Occupational Exposure Limit for ammonia) would be expected if A tank farm exhauster emissions were present. Therefore, providing further indication the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions.

Additional Compensatory/Remedial Measures (any additional measures taken if different from immediate actions):

None.

Lessons Learned or Information That the Work Force Needs Immediately:

None. Per TFC-OPS-OPER-C-28, "Operating Experience/Lessons Learned", this event did not meet the criteria requiring generation of a Lessons Learned.

- 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

Basis for Determination:

This event does not require continuation of the event investigation process under TFC-OPS-OPER-C-14, "Event Investigation Process". The facts, findings, and comprehensive account captured under this Event Summary and the Industrial Hygiene Event Investigation Report, IHIR-00049 "TF-AOP-015 Entry at A Farm Egress Trailer", form the basis that further investigation will provide no additional information or operational benefit.

Responsible Manager:

[REDACTED]

Print First and Last Name

[REDACTED] Digitally signed by [REDACTED]
Date: 2022.09.01 14:05:57 -0700

Signature / Date

CAS Manager:

[REDACTED]

Print First and Last Name

[REDACTED] Digitally signed by [REDACTED]
Date: 2022.09.01 14:08:11 -0700

Signature / Date

EIR-2022-070 Attachment 1

DFAS Exhauster Potential Exposure Zone Model

Actual conditions on 08/25/2022 @ 1333:

- Wind Speed: 4.6 mph
- Wind Direction: 112°
- Mixing Height: 1000 feet
- Stability Class: C (slightly unstable)

AN EXHAUSTER
Estimated Potential Exposure Zone

702-AZ EXHAUSTER

POR-127 EXHAUSTER

POR-126 EXHAUSTER

POR-518/POR-519 EXHAUSTERS
Estimated Potential Exposure Zone

MO-2249 A FARM Change Trailer
Location of Ventis Pro Instrument Alarm

AW EXHAUSTER
Estimated Potential Exposure Zone

AP EXHAUSTER



Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT

Event Title: <p style="text-align: center;">TF-AOP-015 Entry at A Farm Egress Trailer</p>	PER Number: <p style="text-align: center;">N/A</p>
IHIR Number: <p style="text-align: center;">IHIR-00049</p>	

Date: 08/25/2022	Time: 1330	Location: A Farm Egress Trailer (MO-2249)
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Event Summary and Timeline:

Event Summary:

A Personal Ammonia Monitor alarmed inside the A Farm Egress Trailer. Three workers were present at the time of personal ammonia monitor alarm. Workers immediately exited the building.

Field Response Timeline:

1343 SOEN declares "Entered TF-AOP-015 for Response to Personal Ammonia Monitor Alarm"

1345 Production Operations East Industrial Hygienists arrive at Central Shift Office

1346 Central Shift Manager contacts Field Work Supervisor to request the alarming Personal Ammonia Monitor and Odor/Vapor Response Cards to the Shift Office

1348 Industrial Hygiene Technician Supervisor arrives at Central Shift Office

1348 Industrial Hygienist reviews the Data Fusion Advisory System for weather data

- Stability Class: C (Slightly unstable conditions)
- Wind: 4.6 mph East South East
- Mixing Height: 1000 ft

1352 Affected personnel arrive at Central Shift Office and fill out Odor/Vapor Response Cards

1353 Shift Operations Industrial Hygiene Technicians arrive at Central Shift Office

1355 Retrieval Closure Industrial Hygienists en route to Central Shift Office

1356 Production Operations East Industrial Hygienist briefs Industrial Hygiene Technicians

- Alarm occurred in the A-Farm egress change trailer on the contamination area (CA) side
- Affected employee was drinking water at time of the alarm
- Affected employee initially declined medical, had no symptoms and did not smell odors

1400 Affected personnel changed mind and was sent to medical

1403 Industrial Hygiene Technician Supervisor reports Personal Ammonia Monitor data log peak of 12 ppm

1412 Retrieval Closure Industrial Hygienist and Industrial Hygiene Technicians depart for response

1428 Retrieval Closure Industrial Hygienist reports preliminary results of 0 ppm ammonia and 0 ppm Volatile Organic Compounds during response

1444 Post-use function complete and all readings were less than detectable

1458 SOEN declares "Exiting TF-AOP-015"

Sampling/Monitoring Results:

Field Response area readings:

- Ammonia: Less than Detectable (< 1 ppm)

Ventis Pro V 004734 (Event Initiating Personal Ammonia Monitor):

- 8/25/2022 1:32:47 0 ppm ammonia
- 8/25/2022 1:32:57 0 ppm ammonia
- 8/25/2022 1:33:07 0 ppm ammonia
- 8/25/2022 1:33:17 0 ppm ammonia
- 8/25/2022 1:33:27 0 ppm ammonia
- 8/25/2022 1:33:37 8 ppm ammonia
- 8/25/2022 1:33:47 7 ppm ammonia
- 8/25/2022 1:33:57 2 ppm ammonia
- 8/25/2022 1:34:07 0 ppm ammonia
- 8/25/2022 1:34:17 0 ppm ammonia
- 8/25/2022 1:34:27 0 ppm ammonia
- 8/25/2022 1:34:37 0 ppm ammonia
- 8/25/2022 1:34:47 0 ppm ammonia

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

Sampling/Monitoring Results:

All readings before 1:32:47 and after 1:34:47 were below detectable limits.

SWIHD References:

- Event Response Site Wide Industrial Hygiene Database Direct Reading Instrument Survey #22-05588

Additional Information:

At the time of the initiating event, the employee wearing the alarming personal ammonia monitor was inside the A Farm Egress Trailer (MO-2249), sitting on the bench drinking water. No respiratory equipment was worn, as the alarm occurred outside the tank farm boundaries. The worker reported that they did not smell odors.

Additionally, two other workers wearing personal ammonia monitors were walking next to the worker at the time of the alarm, neither of which alarmed. The workers immediately notified a nearby Industrial Hygiene Technician with a Direct Reading Instrument occupying the A Farm cool down tent. The Technician extended the instrument into the change trailer and readings for ammonia were less than detectable.

Additional Information on the Personal Ammonia Monitor (Ventis Pro V):

Ventis Pro V 004788 (event initiating instrument):

- Setup Date: 09/29/2021
- Sensor ID: 21090N0034
- Unit Serial Number (SN): 210922C-085
- User ID: 004788
- Datalog Interval: 10 seconds
- Passed Daily Function Test for Ammonia (Bump Test): 8/25/2022
- Last Successful Calibration of Unit for Ammonia: 08/22/2022

Review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details and Chemical Details dashboards, and ammonia concentrations at the tank farm exhauster's, around the reported time of the event indicate the cause of the personal ammonia monitor alarm is unlikely to be from Tank Farm Exhauster emissions based on:

08/25/2022 @ 1350

- Wind Speed: 4.6 mph
- Wind Direction: 112° ESE
- Mixing Height: 1000 feet above grade
- Stability Class: C (slightly unstable conditions)

08/25/2022 Vapor Monitoring Data System (VMDS) ammonia readings:

- POR 518 at 1331: 2.586 ppm ammonia
- POR 519 at 1331: 3.203 ppm ammonia
- POR 126 at 1331: 0 ppm ammonia
- POR 127 at 1331: 0.096 ppm ammonia
- 702 AZ at 1331: 12.711 ppm ammonia

Recommendations/Conclusions:

Recommendations:

N/A

Conclusions:

Washington River Protection Solutions (WRPS) Industrial Hygiene Department has established a conservative, reasonable, and data-derived response level (RL) of 6 ppm for Personal Ammonia Monitor concentrations associated with tank waste gases/vapors in the Hanford Tank Farms. The intent of this response level is to enhance the safety of Hanford Tank Farm workers by establishing

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

Recommendations/Conclusions:

a conservative and timely indicator of potential changing conditions in Tank Farm gas/vapor conditions, at which prudent and protective investigative measures may be taken.

Review of the stack emissions using the VMDS application, field readings, weather details, and chemical details dashboards for the reported time of the event indicate the cause of the personal ammonia monitor alarm is unlikely to be from Tank Farm Exhauster emissions. Monitoring via direct reading instrumentation and observations made by the IH and IHTs during the event response demonstrated conditions which caused the alarm were no longer present, allowing the exit of TF-AOP-015.

Other:

Event Investigation Report # EIR-2022-070

Industrial Hygienist:

Print First and Last Name

Digitally signed by _____
Date: 2022.08.31 14:56:27 -0700

Signature / Date

Industrial Hygiene Level 2 Manager:

Print First and Last Name

Digitally signed by _____
Date: 2022.08.31 14:41:54 -0700

Signature / Date

ODOR/VAPOR RESPONSE CARD - 241 A FARM

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

- Date and time of event: 8-25-22 1:45
- Check Applicable:
 - Odor
 - Ammonia Alarm (6 ppm)
 - Ammonia Alarm (12 ppm)
 - Alarm (other - describe):
- Your name and the work you were performing: [Redacted] Laborer scaffolding
- Other Work Underway? Describe: A trailer 2249
- Location of event (mark area on map and wind direction): Change trailer / Exit trailer 2249 CA side
- Name(s) of others in or near the affected area: whole crew and fitters
- Was Industrial Hygiene present, who?
- Describe the odor:
 - Sweet
 - Sour
 - Smoky
 - Septic/Sewer
 - Musty
 - Rotten
 - Metallic
 - Onion
 - Earthy
 - Ammonia
 - Citrus
 - Solvent
 - Other (describe): N/A
- Is source known/likely? Describe: None
- 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 - 241 A FARM

Instructions:

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager (CSM), at [REDACTED]
3. Complete both pages of this form and include as many details as possible, including:
 - a. Approximate location, see map at right;
 - b. Wind direction, speed and description, such as stable or gusty wind;
 - c. Environmental conditions, such as hot, cold, windy, rainy;
 - d. Other work or contractors in the area;
 - e. Anything else you think is relevant.
4. Provide the completed card to your Supervisor*, Industrial Hygiene*, Union Safety Representative* or the CSM.

* If received by Supervisor, IH, or Union Safety Representative, the Supervisor/IH/ Union-SR will ensure card it is provided to the CSM.

A FARM

