

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: Health Physics Technician (HPT) Routines in AP Farm **Date:** 04/26/2021

Area/Building/Location: MO-2259 AP Farm Change Trailer **Approximate Time of Event:** 0830

AR Number: WRPS-AR-2021-3078

Responsible Manager: [REDACTED]

EIR Number: EIR-2021-030

Event Investigator: [REDACTED]

EVENT SUMMARY PART I

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

HPTs were at MO-2259, AP Farm Change Trailer, preparing to enter AP Farm for routine survey tasks.

Personnel Involved (Job positions, number of personnel, identify any support organizations or subcontractors directly involved):

Radiological Controls Health Physics Technician (HPT) - [x2]

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

- While donning PPE in preparation for AP Farm entry inside MO-2259, one of the two HPTs had their personal ammonia monitor (ToxiRAE) device "blip" for less than a second.
- When the HPT removed the ToxiRAE to view the display it was reading [0 ppm].
- No other monitors in the area were in alarm.
- The two HPTs waited several minutes to be sure the unit was operating correctly and then continued into Farm to complete task.
- Once completed, HPTs returned their ToxiRAE devices to IHT and mentioned the unit had 'bleeped'
- IHT downloaded device data log and performed post entry test of device.
- ToxiRAE device data showed an alarm of [7 ppm] during use (Alarm setpoint is 6 ppm)
- IHT informed management and CSM was notified
- CSM entered into TF-AOP-015, "Response to Personal Ammonia Monitor Alarm"
- HPTs were instructed to see the CSM and filled out Odor Response Cards
- TF-AOP-015 recovery actions/DRI monitor readings found no ammonia readings in the area
- Post-use testing of the ToxiRAE monitor determined the device was in working order with no issues.

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

MO-2259, AP Farm Change Trailer

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

MO-2259 was restricted while AOP-015 response actions were completed, but was returned to service within an hour.

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

- IHT immediately informed management once alarm condition determined on device
- CSM entered into AOP once informed
- AOP response actions/DRI monitoring determined no readings at MO-2259

Notifications Already Made (Time and personnel notified):

~1000hrs IH Management notified
~1005hrs CSM notified
~1007hrs CSM releases SOEN regarding entry into AOP-015 at MO-2259

This event does not merit an Event Investigation meeting

Washington River Protection Solutions
EVENT SUMMARY (Continued)

Project: Health Physics Technician (HPT) Routines in AP Farm Date: 04/26/2021

Area/Building/Location: MO-2259 AP Farm Change Trailer Approximate Time of Event: 0830

AR Number: WRPS-AR-2021-3078 Responsible Manager: [REDACTED]

EIR Number: EIR-2021-030 Event Investigator: [REDACTED]

This event merits an Event Investigation meeting

Basis for Determination:

As there were only two personnel involved, personal interviews and statements provided enough information to document the investigation. If it is determined through the continuation of the investigation to necessitate a meeting, one will be scheduled.

Responsible Manager:

[REDACTED]

Print First and Last Name

[REDACTED]

Signature / Date

CAS Manager:

[REDACTED]

Print First and Last Name

[REDACTED]

Signature / Date

EVENT SUMMARY PART II

Key Elements of the Investigation (Key investigation points):

Event Summary:

A Personal Ammonia Monitor (ToxiRAE) alarmed (for ~1 second) and indicated greater than 6 (six) parts per million ammonia but less than 12 (twelve) parts per million ammonia inside the new 241-AP Farm Change Trailer (MO2259). The monitor then dropped to 0 (zero) parts per million ammonia. Two workers were present at the time of Personal Ammonia Monitor alarm. Workers continued work, entering 241-AP Farm to perform Health Physics Technician (HPT) Routines. After routines were completed, workers exited the farm, and returned Personal Ammonia Monitors to the Personal Ammonia Monitor- Checkout (PAM-C) station, only then notifying a Production Operations Industrial Hygiene Technician that the Personal Ammonia Monitor had alarmed. Production Operations Industrial Hygiene Technician notified Production Operations Shift Industrial Hygiene Technician Supervisor of Personal Ammonia Alarm.

Standing Order #SO-OPS-18-007, "ToxiRAE Use and Alarm Response, Rev. 6, low level (6ppm) response actions are as follows:

"Required Alarm Response Actions:

Response Level (6 ppm) Low Level Alarm

- Work crew check ToxiRAE levels.
- Place work in a safe configuration.
- Work crew move out of the affected area (determined by cleared alarm and/or additional ToxiRAE not alarming).
- Work crew will notify Shift Manager (SM).
- o SM will communicate requirement to stay out of affected area to collocated work.
- Work crew will notify adjacent workers to avoid area.
- IHT response per TF-AOP-015 "Response to Personal Ammonia Monitor Alarm"
- Affected Worker will identify ToxiRAE as having alarmed when returning instrument for day."

Findings:

- Personal monitor exceeded 7ppm but dropped to less than alarm set point and remained there during the duration of the wearers task
 - Alarm occurred in the change trailer. No indications present of concentrations exceeding 6 ppm on other worker personal monitor within the closed space
 - Workers failed to respond to the alarm per SO and proceeded to complete work activities.
- Also, workers alluded to reacting and responding differently to a Personal Ammonia Monitor alarm if they were inside the Farm, meaning that the severity of the alarm may be in question depending on

Washington River Protection Solutions
EVENT SUMMARY (Continued)

Project: Health Physics Technician (HPT) Routines in AP Farm Date: 04/26/2021

Area/Building/Location: MO-2259 AP Farm Change Trailer Approximate Time of Event: 0830

AR Number: WRPS-AR-2021-3078 Responsible Manager: [REDACTED]

EIR Number: EIR-2021-030 Event Investigator: [REDACTED]

Key Elements of the Investigation (Key investigation points):

one's location.

Further Information:

- At the time of the initiating event the Affected Workers were wearing Respiratory Protection Equipment in accordance with the Management Directed Respiratory Protection Form "MDRPF-PLN-173" Task 1: Full Face Air Purifying Respirator (FF-APR) with Gas/Vapor cartridges (MSA GME Chemical Vapor) in preparation on entering 241-AP Farm.
- While the event initiating Personal Ammonia Monitor recorded a peak reading of seven (7) parts per million, and was above the response level (RL), all Personal Ammonia Monitor readings were below the Ammonia action level (AL) and were well below all established occupational exposure limits (OEL).
- The Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) continued to operate normally and within specifications (passed bump test) after the initiating event.
- All Affected Personnel were offered voluntary medical surveillance, but declined.

Field Response area readings (AOP-015 Response):

- Ammonia: Less than Detectable [less than one (1) parts per million]

Data Collected from both ToxiRAE devices present at the initiating event is as follows:

ToxiRAE 002634 (event initiating ToxiRAE):

- Ammonia: Peak Reading of seven (7) parts per million at 08:52 (Data Log Line 159)
- Ammonia: In the ten (10) minutes prior to the Peak Reading Event, Readings fluctuated between zero (0) parts per million and three (3) parts per million (08:41 to 08:51, Data Log Lines 148-158)
- Ammonia: In the ten (10) minutes following the Peak Reading Event, Readings fluctuated between zero (0) parts per million and three (3) parts per million (08:53-09:03, Data Log Lines 160-170)

ToxiRAE 003687 (present at Initiating Event):

- Ammonia: Peak of two (2) parts per million (Data Log Line 210 at 09:40)
- Ammonia: Reading of zero (0) parts per million at the time of the Initiating Event (08:52, Data Log Line 162)
- Ammonia: In the ten (10) minutes prior to the Peak Reading Event, Readings fluctuated between zero (0) parts per million and one (1) parts per million (08:41 to 08:51, Data Log Lines 151-161)
- Ammonia: In the ten (10) minutes following the Peak Reading Event, peak Reading of zero (0) parts per million (08:53-09:03, Data Log Lines 162-172)

The Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) continued to operate normally and within specifications (passed bump test) after the initiating event. While the Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) fluctuated prior to and following the Peak Reading Event, RPP-RPT-61096 (Wearable Ammonia Detector Field Trial) stated that false positive concentration readings (positive bias) can be expected up to four (4) parts per million with the ToxiRAE Pro. Therefore, it does not appear the alarm was resultant from instrument malfunction. Various working conditions have the potential to affect a ToxiRAE while worn in the field; however, it cannot be concluded any of these contributed to the Personal Ammonia Monitor alarm. While the approximate exhauster plume, based on a review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, for 241-A Farm Exhausters (POR518 & POR519) included MO2259 (location of the initiating event), atmospheric neutral stability combined with high atmospheric mixing height, and 241-A Farm Exhauster source Direct Reading Instrument readings obtained the morning of 04/26/2021, indicate there was a very low potential for ground level exposure from Tank Farm Exhausters. Additionally, no ongoing work around the A-Complex identified during the Industrial Hygiene Event Investigation that may cause the Personal Ammonia Monitor alarm.

Washington River Protection Solutions
EVENT SUMMARY (Continued)

Project: Health Physics Technician (HPT) Routines in AP Farm Date: 04/26/2021

Area/Building/Location: MO-2259 AP Farm Change Trailer Approximate Time of Event: 0830

AR Number: WRPS-AR-2021-3078 Responsible Manager: [REDACTED]

EIR Number: EIR-2021-030 Event Investigator: [REDACTED]

While the event initiating Personal Ammonia Monitor recorded a peak reading of seven (7) parts per million, and was above the response level (RL), all Personal Ammonia Monitor readings were below the Ammonia action level (AL) and were well below all established occupational exposure limits (OEL). Therefore, Ammonia exposures are well below the workplace concentrations to which a person can be exposed without suffering adverse health effects.

The workers' response to the Personal Ammonia Monitor alarm was less than adequate. Personnel performance issues will be handled outside of the Corrective Action Management process.

[see Industrial Hygiene Event Investigation Report #IHIR-00013 for additional information]

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

- The Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) was tested following the event with no issues found.
- Industrial Hygiene performed an event investigation that is detailed in report #IHIR-00013

Lessons Learned or Information That the Work Force Needs Immediately:

None at this time.

- 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:

Actions from this event will be directed at personnel performance and therefore continuation of the Event Investigation process is not warranted.

Responsible Manager:
[REDACTED] _____
Print First and Last Name
[REDACTED] _____
Signature / Date
Digitally signed by [REDACTED]
Date: 2021.05.04 16:16:08 -07'00'

CAS Manager:
[REDACTED] _____
Print First and Last Name
[REDACTED] _____
Signature / Date
Digitally signed by [REDACTED]
Date: 2021.05.04 16:26:53 -07'00'

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT

Event Title: TF-AOP-015 Entry at MO2259 (New 241-AP Change Trailer)		PER Number: N/A
		IHIR Number: IHIR-00013
Date:	Time:	Location:
04/26/2021	0852	MO2259 (New 241-AP Change Trailer)

Event Summary and Timeline:

Event Summary:

A Personal Ammonia Monitor alarmed and indicated greater than 6 (six) parts per million ammonia but less than 12 (twelve) parts per million ammonia inside the new 241-AP Farm Change Trailer (MO2259). Two workers were present at the time of Personal Ammonia Monitor alarm. Workers continued work, entering 241-AP Farm to perform Health Physics Technician (HPT) Routines. After routines were completed, workers exited the farm, and returned Personal Ammonia Monitors to the Personal Ammonia Monitor- Checkout (PAM-C) station, notifying a Production Operations Industrial Hygiene Technician that the Personal Ammonia Monitor had alarmed. Production Operations Industrial Hygiene Technician notified Production Operations Shift Industrial Hygiene Technician Supervisor of Personal Ammonia Alarm.

Field Response Timeline:

- 0852 Approximate Time of Event - Personal Ammonia Monitor alarm
- 0941 Affected Workers check-in Personal Ammonia Monitors to the Personal Ammonia Monitor- Checkout (PAM-C) station, notifying a Production Operations Industrial Hygiene Technician that the Personal Ammonia Monitor had alarmed
- 0949 Production Operations Industrial Hygiene Technician notifies Production Operations Shift Industrial Hygiene Technician Supervisor of Personal Ammonia Monitor alarm
- 0953 Production Operations Shift Industrial Hygiene Technician Supervisor notifies Production Operations Industrial Hygienists of Personal Ammonia Monitor alarm
 - Personal Ammonia Monitor alarmed at seven (7) parts per million
 - Affected Workers inside Change Trailer, alarmed prior to entering Tank Farm
- 0954 Production Operations Industrial Hygienists and Production Operations Shift Industrial Hygiene Technician Supervisor arrive at Central Shift Office
- 0954 Production Operations Shift Industrial Hygiene Technician Supervisor contacts Production Operations Industrial Hygiene Technician
- 0955 Production Operations Shift Industrial Hygiene Technician Supervisor updates Central Shift Manager on Initiating Event
- 0956 Production Operations Shift Industrial Hygiene Technician Supervisor contacts Affected Workers' Supervisor, notifying them of Initiating Event
- 0958 Production Operations Shift Industrial Hygiene Technician arrives at Central Shift Office
- 1003 Central Shift Manager contacts Affected Workers to acquire location of Personal Ammonia Monitor alarm
 - Personal Ammonia Monitor alarmed inside new 241-AP Farm Change Trailer (MO2259)
 - Central Shift Manager requests Affect Workers report to Central Shift Office to populate Odor/Vapor Response Cards (Odor/Vapor Response Card - A-6007-246)
- 1004 Production Operations Shift Industrial Hygiene Technician departs Central Shift Office to acquire other Personal Ammonia Monitor present during Initiating Event and provide both Personal Ammonia Monitors to Production Operations Industrial Hygiene Technician Lead for datalog download and Post Use Bump
- 1005 Production Operations Industrial Hygienist contacts the Level 2 (two) Industrial Hygiene Manager about initiating Industrial Hygiene Investigation Report
 - Initiate Industrial Hygiene Investigation Report
- 1008 Shift Operations Event Notification (SOEN): "Entering TF-AOP-015 Response to Personal Ammonia Monitor Alarm for ToxiRAE alarm at new AP Change Trailer MO-2259. Access to MO-2259 is restricted. CSM."

Field Response Timeline continued on next page.

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

Event Summary and Timeline:

Field Response Timeline (continued):

- 1008 Production Operations Industrial Hygienist reviews the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details dashboard for current conditions:
- Stability Class: D (Neutral Stability) to E (Slightly Stable Conditions)
 - Atmospheric Mixing Height: one-thousand-five-hundred (1,500) feet above grade
 - Wind Direction: ninety-five (95°) degrees (Out of East)
 - Wind Speed: four-point-seven (4.7) miles per hour
 - Production Operations Industrial Hygienist determines no additional restricted assess required beyond Affected Area
- 1009 Production Operations Shift Industrial Hygiene Technician returns to Central Shift Office
- 1011 Affected Workers arrive at Central Shift Office to populate Odor/Vapor Response Cards (Odor/Vapor Response Card - A-6007-246)
- 1012 Central Shift Manager reviews the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details dashboard for current conditions:
- Central Shift Manager concurs with Production Operations Industrial Hygienists that no additional restricted assess is required beyond Affected Area
- 1015 Affected Workers submit Odor/Vapor Response Cards (Odor/Vapor Response Card - A-6007-246) for Production Operations Industrial Hygienist review
- 1016 Production Operations Industrial Hygienist offers Affected Workers medical surveillance
- Both Affected Workers decline medical surveillance
- 1018 Production Operations Industrial Hygienist gives briefing on response actions to Production Operations Shift Industrial Hygiene Technician
- Monitor affected area as per IHP-09001 "Response to ammonia monitor alarm"
 - Respiratory Protective Equipment may be worn as per Respiratory Protection Form "TF-AOP-015" "Task 4: Voluntary Upgrade"
- 1020 Event Responding Production Operations Industrial Hygienist and Production Operations Shift Industrial Hygiene Technician depart Central Shift Office for response
- 1023 Event Responding Production Operations Industrial Hygienist and Production Operations Shift Industrial Hygiene Technician arrive at MO2259 and begin response
- 1032 Event Responding Production Operations Industrial Hygienist contacts Production Operations Industrial Hygienist:
- Direct Reading Instrumentation indicates ammonia concentrations present at Affected Area are less than detectable [less than one (1) part per million]
- 1033 Event Responding Production Operations Industrial Hygienist and Production Operations Shift Industrial Hygiene Technician depart MO2249 to perform Post Use Function Test of Direct Reading Equipment
- 1034 Event Responding Production Operations Industrial Hygienist arrives at Central Shift Office
- 1048 Event Responding Production Operations Shift Industrial Hygiene Technician contacts Production Operations Industrial Hygienist to report event response Direct Reading Instrumentation has passed post-use-function-tests
- 1128 Shift Office Event Notification (SOEN): "Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM"

Sampling/Monitoring Results:

Field Response area readings:

- Ammonia: Less than Detectable [less than one (1) parts per million]

ToxiRAE 002634 (event initiating ToxiRAE):

- Ammonia: Peak Reading of seven (7) parts per million at 08:52 (Data Log Line 159)
- Ammonia: In the ten (10) minutes prior to the Peak Reading Event, Readings fluctuated between zero (0) parts per million and three (3) parts per million (08:41 to 08:51, Data Log Lines 148-158)
- Ammonia: In the ten (10) minutes following the Peak Reading Event, Readings fluctuated between zero (0) parts per million and three (3) parts per million (08:53-09:03, Data Log Lines 160-170)

Sampling/Monitoring Results continued on next page.

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

Sampling/Monitoring Results:

ToxiRAE 003687 (present at Initiating Event):

- Ammonia: Peak of two (2) parts per million (Data Log Line 210 at 09:40)
- Ammonia: Reading of zero (0) parts per million at the time of the Initiating Event (08:52, Data Log Line 162)
- Ammonia: In the ten (10) minutes prior to the Peak Reading Event, Readings fluctuated between zero (0) parts per million and one (1) parts per million (08:41 to 08:51, Data Log Lines 151-161)
- Ammonia: In the ten (10) minutes following the Peak Reading Event, peak Reading of zero (0) parts per million (08:53-09:03, Data Log Lines 162-172)

SWIHD References:

- Event Response Site Wide Industrial Hygiene Database (SWIHD) Direct Reading Instrument (DRI) Survey # 21-04573 "TF-AOP-015 entry at MO2259"
- Management Directed TFC-PLN-173 Site Wide Industrial Hygiene Database (SWIHD) Direct Reading Instrument (DRI) Survey # 21-04561 "A Farm Stack Reading for Hotel Load"

Additional Information:

At the time of the initiating event the Affected Workers were wearing Respiratory Protection Equipment in accordance with the Management Directed Respiratory Protection Form "MDRPF-PLN-173" Task 1: Full Face Air Purifying Respirator (FF-APR) with Gas/Vapor cartridges (MSA GME Chemical Vapor) in preparation on entering 241-AP Farm.

Additional Information on the Personal Ammonia Monitors (ToxiRAEs):

The ToxiRAE response time (t90), the time needed for the ToxiRAE to read 90% full-scale of the true concentration of ammonia, is sixty (60) seconds. Blocking the gas inlet of the ToxiRAE, high humidity, and/or water droplets can disturb diffusion into the sensor, leading to false readings.

ToxiRAE 002634 (event initiating ToxiRAE):

- Put into service on 08/06/2018
- Unit Name: ToxiRAE Pro (PGM-1860)
- Unit Serial Number (SN): G024009046
- User ID: TOXI2634
- Measure Type: Max
- Datalog Mode: Continuous
- Datalog Type: Auto
- Sample Period: sixty (60) seconds
- Calibration Time: 04/21/2021 @ 22:02
- Datalog Begin: 04/26/2021 @ 06:13
- Datalog End: 04/26/2021 @ 10:09
- Passed Post Use Bump Test: 04/26/2021 @ 11:12

ToxiRAE 003687 (present at initiating event):

- Put into service on 08/19/2019
- Calibration Time: 04/21/2021 @ 19:49
- Datalog Begin: 04/26/2021 @ 06:10
- Datalog End: 04/26/2021 @ 10:07
- Passed Post Use Bump Test: 04/26/2021 @ 11:12

Additional Information continued on next page.

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

Additional Information:

Production Operations Industrial Hygienists tested various working conditions on 04/01/2021 that could occur to a ToxiRAE while worn in the field to determine their potential effects on ToxiRAE readings. Refer to Table on next page for peak Ammonia readings observed during testing.

Functionality Test	ToxiRAE (003254)	Peak Reading Control ToxiRAE	Experimental ToxiRAE
Blocking Gas Inlet:			
• Nitrile Gloves	2 ppm	2 ppm	2 ppm
• Skin Contact	5 ppm	7 ppm	7 ppm
• Cloth (cotton) Material	2 ppm	2 ppm	2 ppm
Respirator Proximity:			
• FF-APR with MSA GME Chemical	2 ppm	2 ppm	N/A
Durability:			
• Kinetic	0 ppm	N/A	0 ppm
Chemical Interferences:			
• Sharpie	2 ppm	N/A	2 ppm
• Expo White Board Marker	1 ppm	N/A	1 ppm
• Hand Sanitizer	3 ppm	N/A	3 ppm
• Ball Point Pen	0 ppm	N/A	0 ppm
• Water	6 ppm	N/A	6 ppm

All instruments exhibited similar instrument response, response times, and returned to zero (cleared) in similar times for the functionality tests listed above.

The Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details dashboard records atmospheric conditions every fifteen (15) minutes. Review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details dashboard for the time of the Event (0852) and around the event (0845 & 0900) indicate the cause of the Personal Ammonia Monitor alarm is unlikely to be from Tank Farm Exhauster emissions based on:

- Stability Class
 - D (Neutral Stability)
- Atmospheric Mixing Height
 - At 0845: eight-hundred (800) feet above grade
 - At 0900: one-thousand (1,000) feet above grade
- Wind Direction
 - At 0845: three-hundred-seven degrees (307°) (Out of North West)
 - At 0852: three-hundred-eight degrees (308°) (Out of North West)
 - At 0900: two-hundred-eighty-six degrees (286°) (Out of West North West)
- Wind Speed
 - At 0845: seven-point-seven (7.7) miles per hour
 - At 0852: seven-point-seven (7.7) miles per hour
 - At 0900: five-point-nine (5.9) miles per hour

While the approximate exhauster plume for 241-A Farm Exhausters (POR518 & POR519) included M02259 (location of the initiating event), atmospheric neutral stability combined with high atmospheric mixing height indicate there was a very low potential for ground level exposure from 241-A Farm Exhausters (refer to IHIR-00013 Attachment 1). This is further supported by a review of preliminary (field information verified but awaiting responsible Industrial Hygienist approval) Management Directed TFC-PLN-173 Site Wide Industrial Hygiene Database (SWIHD) Direct Reading Instrument (DRI) survey readings:

- Survey # 21-04561 "Hotel Load "A Farm Stack Reading for Hotel Load":
 - 04/26/2021 @ 0806 POR519 Source Ammonia Reading: one (1) part per million
 - 04/26/2021 @ 0808 POR518 Source Ammonia Reading: four (4) parts per million
 - 04/26/2021 @ 1200 POR519 Source Ammonia Reading: three (3) parts per million
 - 04/26/2021 @ 1203 POR518 Source Ammonia Reading: six (6) parts per million

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

Recommendations/Conclusions:

Recommendations:

Communicate results of the Industrial Hygiene Event Investigation to the Affected Workers.

Conclusions:

The Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) continued to operate normally and within specifications (passed bump test) after the initiating event. While the Event Initiating Personal Ammonia Monitor (ToxiRAE 002634) fluctuated prior to and following the Peak Reading Event, RPP-RPT-61096 (Wearable Ammonia Detector Field Trial) stated that false positive concentration readings (positive bias) can be expected up to four (4) parts per million with the ToxiRAE Pro. Therefore, it does not appear the alarm was resultant from instrument malfunction. Various working conditions have the potential to affect a ToxiRAE while worn in the field; however, it cannot be concluded any of these contributed to the Personal Ammonia Monitor alarm. While the approximate exhaustor plume, based on a review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, for 241-A Farm Exhaustors (POR518 & POR519) included MO2259 (location of the initiating event), atmospheric neutral stability combined with high atmospheric mixing height, and 241-A Farm Exhaustor source Direct Reading Instrument readings obtained the morning of 04/26/2021, indicate there was a very low potential for ground level exposure from Tank Farm Exhaustors (refer to IHIR-00013 Attachment 1). Additionally, no on-going work around the A-Complex identified during the Industrial Hygiene Event Investigation that may cause the Personal Ammonia Monitor alarm.

Washington River Protection Solutions (WRPS) follows a comprehensive strategy for reducing exposure to workplace hazards as much as reasonably possible with regard to occupational exposure limits (OEL) in the Tank Farms. The term occupational exposure limit is used to represent: (1) the concentration or intensity of an airborne agent that is allowable, (2) the time period over which workplace concentrations are averaged to compare with the allowable exposure, and (3) the allowable concentration of a biological exposure index (BEI) in a biological sample. Occupational exposure limits are considered the maximum concentrations to which a person can be exposed without suffering adverse health effects.

The Occupational Safety and Health Administration has established the Ammonia eight (8) hour time weighted average (TWA) permissible exposure limit (PEL) at fifty (50) parts per million. The American Conference of Governmental Industrial Hygienists (ACGIH) has established the Ammonia eight (8) hour time weighted average (TWA) threshold limit value (TLV) at twenty-five (25) parts per million. The American Conference of Governmental Industrial Hygienists (ACGIH) has also established the Ammonia fifteen (15) minute short-term exposure limit (STEL) threshold limit value (TLV) at thirty-five (35) parts per million. Per the Department of Energy Worker Safety and Health Program (10 CFR 851), Washington River Protection Solutions (WRPS) is to use the lower (more protective) occupational exposure limit.

As control measure to reduce the potential for an unacceptable worker exposure, Washington River Protection Solutions (WRPS) utilizes action levels (AL). If not prescribed by regulation, action levels (AL) are typically established at 50% of the OEL. An action level (AL) is a concentration (when reached) at which a specific action is taken. The Ammonia action level (AL) utilizing direct reading instrumentation is conservatively rounded down for instrument resolution and set at twelve (12) parts per million. Additionally, Washington River Protection Solutions (WRPS) Industrial Hygiene Department has established a conservative, reasonable, and data-derived response level (RL) of six (6) parts per million 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 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.

While the event initiating Personal Ammonia Monitor recorded a peak reading of seven (7) parts per million, and was above the response level (RL), all Personal Ammonia Monitor readings were below the Ammonia action level (AL) and were well below all established occupational exposure limits (OEL). Therefore, Ammonia exposures are well below the workplace concentrations to which a person can be exposed without suffering adverse health effects.

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

Other:

All Affected Personnel were offered voluntary medical surveillance, but declined.
EIR(Event Investigation Report)# 2021-030.

Industrial Hygienist:

Print First and Last Name

Signature / Date

*Digitally signed by _____
Date: 2021.05.18 15*

Industrial Hygiene Level 2 Manager:

Print First and Last Name

Signature / Date

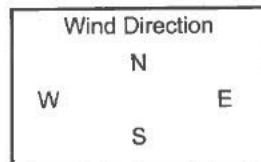
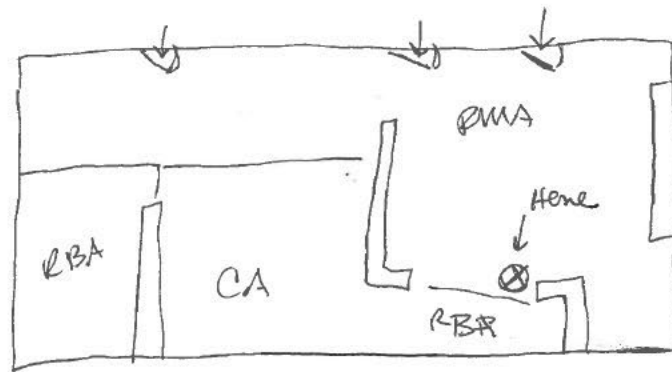
*Digitally signed by _____
Date: 2021.05.18 16:04:28 -07'00'*

ODOR/VAPOR RESPONSE CARD

MO - 2259

ODOR OR VAPOR ALARM EVENT

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager (CSM), [REDACTED] complete below bulleted information and map.
 - Your name and the work you were performing
 - Your symptoms (if any)
 - Date and time of event
 - Location of event (mark area on map and the wind direction)
 - Describe the odor, if applicable
 - Name of others in or near the affected area
 - Was an IHT present?
 - Possible source
3. Complete map.
4. Complete the back of card.
5. **Send this card immediately to the Central Shift Office.**



ODOR/VAPOR RESPONSE CARD

1. Contact CSM, Complete below bulleted information and map.

- Date and time of event: 4-26-21
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work you were performing: [REDACTED] ~ HPT Routines
- Location of event (mark area on map and wind direction): M02259
- Name(s) of others in or near the affected area: [REDACTED]
- Was an IHT present? NO
- Describe the Odor: Sweet Sour Musty Earthy Metallic Smoky Rotten Onion
 Septic Ammonia Cleaning Solution Other: NONE
- Possible Source: UNKNOWN
- Your Symptoms (if any): Headache Dizziness/Light-Headed Nausea Cough
 Fatigue/Drowsiness/Weakness Sore/Burning Throat Difficulty Breathing
 Watery/Irritated Eyes/Trouble with Vision Tingling/Numbness/Paralysis Rash/Itching
 Other: NONE

2. Send this card to the Central Shift Office.

ODOR/VAPOR RESPONSE CARD

ODOR OR VAPOR ALARM EVENT

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager (CSM), ██████████ complete below bulleted information and map.
 - Your name and the work you were performing
 - Your symptoms (if any)
 - Date and time of event
 - Location of event (mark area on map and the wind direction)
 - Describe the odor, if applicable
 - Name of others in or near the affected area
 - Was an IHT present?
 - Possible source
3. Complete map.
4. Complete the back of card.
5. **Send this card immediately to the Central Shift Office.**

