

Event Investigation Report
EIR-2020-052, *Investigation of AOP-015 Inside of SY Farm*
WRPS-PER-2020-1923

Responsible Manager:	[Redacted Signature]	1/18/21	Date
Event Investigator:	[Redacted Signature]	01/18/2021	Date
[Redacted] Event Investigation Team Lead	[Redacted Signature]	Digitally signed by [Redacted]	Date: 2021.01.18 11:45:31 -08'00' /
Event Investigator [Redacted]	[Redacted Signature]	[Redacted]	Date
[Redacted] Event Investigation Team (under instruction)	[Redacted Signature]	[Redacted]	Date

This Event Investigation Report was initiated on 12/2/2020 for investigation of a report of odors with symptoms inside of SY Farm per the requirements of TF-AOP-015, Response to Reported Odors or Unexpected Changes to Vapor Conditions. In addition, on 12/22/2020, a similar event occurred within SY Farm and since this report was still in progress, this report will include that event as well.

Event	Investigation of TF-AOP-015 Inside of SY Farm.																													
PER Number	WRPS-PER-2020-1923																													
Date/Time of Event	12/02/2020 0900																													
Location	Inside SY Farm.																													
Personnel Affected	<p>Three (3) FE&C Personnel reported odors. Two (2) of the individuals experienced symptoms including watery/irritated eyes and sharp pain around nose, jaw, and back of the head.</p> <p>All three of the affected workers completed Odor Response Cards and were transported to the onsite medical provider (HPMC) by the Field Work Supervisor (FWS). The workers were returned to work without restriction.</p>																													
Odor/Taste	<ul style="list-style-type: none"> • Sharp • Pungent • Battery acid 																													
Industrial Hygiene (IH) Investigative Sampling/Monitoring Results	<p>Monitoring and Sampling Data Results:</p> <ul style="list-style-type: none"> • Ammonia (NH₃): Less than detectable • Total Volatile Organic Compounds (VOC)s: Less than detectable. 																													
Potential Source	Upon evaluation of plausible sources, meteorological conditions and industrial hygiene monitoring/sampling, no readily identifiable cause of the odors was determined.																													
Meteorological Data	<table border="1"> <thead> <tr> <th>Time</th> <th>Weather Station</th> <th>Wind Speed (MPH)</th> <th>Wind Direction</th> <th>Temperature (F)</th> <th>Barometric Pressure (steady/rising/falling)</th> </tr> </thead> <tbody> <tr> <td>0845</td> <td>19</td> <td>1.04</td> <td>173.2° S</td> <td>33.2°</td> <td>29.8 steady</td> </tr> <tr> <td>0900</td> <td>19</td> <td>1.58</td> <td>176.5° S</td> <td>34.0°</td> <td>29.8 steady</td> </tr> <tr> <td>0915</td> <td>19</td> <td>1.93</td> <td>180.5° S</td> <td>34.5°</td> <td>29.8 steady</td> </tr> </tbody> </table>						Time	Weather Station	Wind Speed (MPH)	Wind Direction	Temperature (F)	Barometric Pressure (steady/rising/falling)	0845	19	1.04	173.2° S	33.2°	29.8 steady	0900	19	1.58	176.5° S	34.0°	29.8 steady	0915	19	1.93	180.5° S	34.5°	29.8 steady
Time	Weather Station	Wind Speed (MPH)	Wind Direction	Temperature (F)	Barometric Pressure (steady/rising/falling)																									
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0900	19	1.58	176.5° S	34.0°	29.8 steady																									
0915	19	1.93	180.5° S	34.5°	29.8 steady																									
Waste Disturbing or Tank Work in Adjacent Area	Fan Inspections (WO# 663012,663014, 677733, 677732, 678382) Swap primary exhauster train from B to A per TO-060-245, "Operate SY241 Primary Exhauster System" and TO-060-240, "Operate 241SY-VTA-EF-003 Annulus Exhauster System."																													
Other Work in Adjacent Area	<ul style="list-style-type: none"> • MSA was applying a granular herbicide (2+2 vibro) inside S Farm (SDS 036732A) • A site contractor was servicing a Port-o-let downwind from where the workers were located. 																													

On December 2, 2020, at approximately 0900, a Federal Engineers and Constructors (FE&C) (subcontractor) work crew was installing ductwork on the new exhauster inside SY Farm (WO# 569337) when three (3) workers encountered a “sharp, pungent, battery acid type” odor. Two (2) of the individuals experienced symptoms including watery/irritated eyes and sharp pain around nose, jaw, and back of the head.

At the time the odors were reported, the individuals were wearing Full Face Air Purifying Respirators (FFAPR) with organic vapor filters and ToxiRAE personal ammonia monitors. There was not an Industrial Hygiene Technician (IHT) present during the event. Upon encountering the odors, the workers immediately exited the area, returned to their office, and notified the Field Work Supervisor (FWS). Meteorological data collected at the time from weather Station #19 indicates light winds from the SSW at 1.5mph, 34° F, and a steady barometric pressure.

At approximately 0945, notifications were made as required by TFC-OPS-OPER- C-57, “Event Notification”, and the Central Shift Manager (CSM) entered TF-AOP-015 for response to reported odors. Access to the area was restricted.

IHTs responded to the area and took direct readings (Survey #20-09264) for Ammonia (NH₃) and Volatile Organic Compounds (VOC), and collected two bag samples. Direct reading instrument (DRI) results were below action levels and supported restoring access to restricted area. After confirming the required actions were completed, the CSM exited TF-AOP-015 and access was restored. Note: IH field response monitoring was performed per “IH Direction.”

All three of the affected workers completed Odor Response Cards and were transported to the onsite medical provider (HPMC) by the Field Work Supervisor (FWS). The workers were returned to work without restriction.

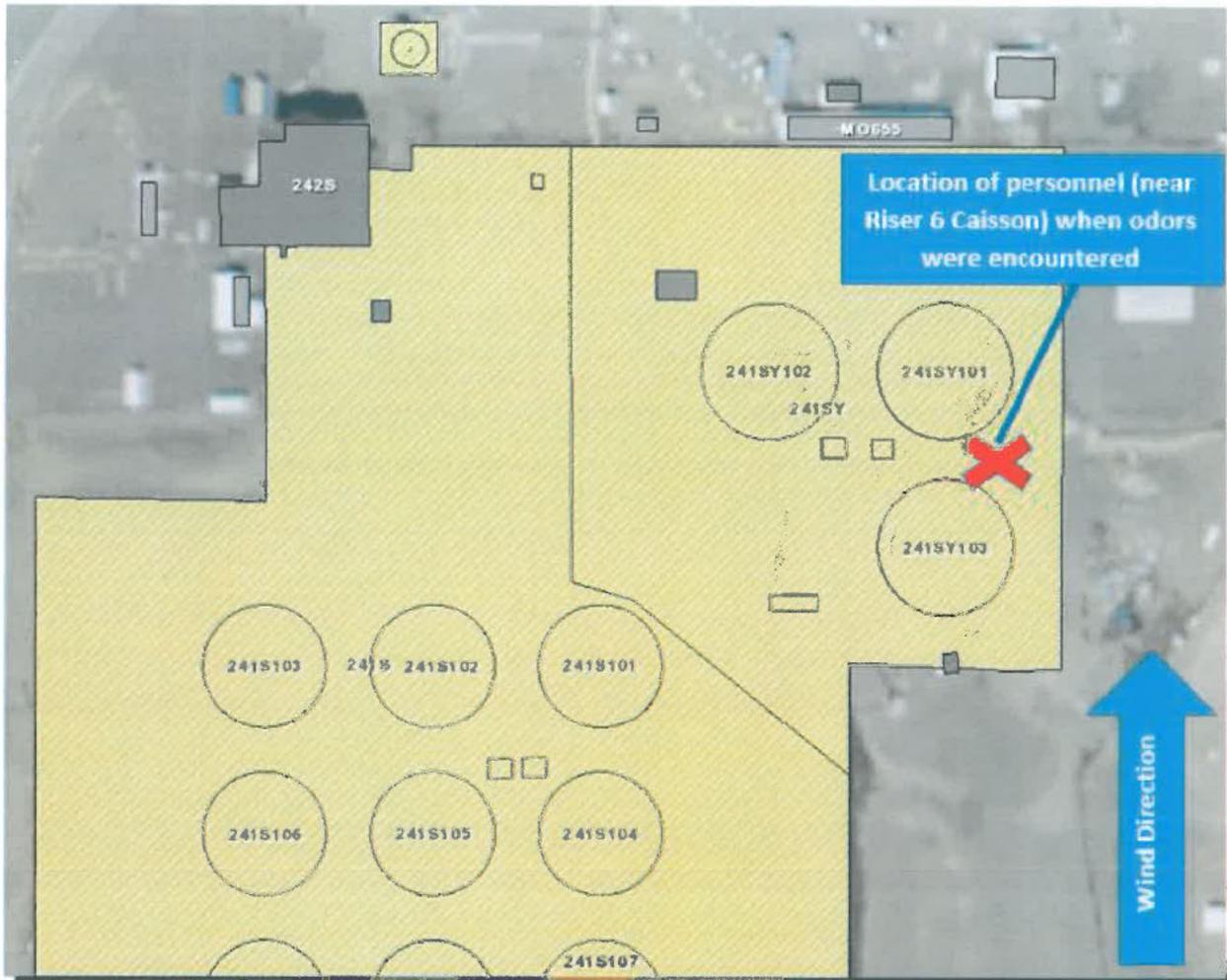


Figure 1: This figure shows the relative location of employees (near Riser 6 Caisson) and wind direction when odors were encountered.

Event Timeline:

December 2, 2020

- 0900: Three (3) subcontract employees encounter odors inside SY Farm and immediately exit the area
- 0911: Subcontractor FWS notifies SY Team Area Day Shift Manager of odors inside SY Farm
- 0913: SY Team Area Day Shift Manager instructs work crew remaining in SY Farm to exit the area
- 0916: Exhauster fan swap performed
- 0920: SY Team Area Day Shift Manager notifies CSM of reported odors inside SY Farm
- 0945: CSM notified personnel of TF-AOP-015. Entering TF-AOP-015 Response to Reported Odors for odors reported in SY Farm. Access to SY Farm is restricted. Radio announcement complete. Notified ORP FR.
- 0958: SOEN: "Entering TF-AOP-015 Response to Reported Odors for odors reported in SY Farm. Access to SY Farm is restricted. All personnel exit SY Farm, move to a safe upwind location, and stay clear of the new SY exhauster pad. CSM"
- 1002: Production Operations Industrial Hygienists (IHs) arrive at Central Shift Office

- 1005: Production Operations IH informs Production Operations IH of potential source location at riser 6 caisson and Respiratory Protection Equipment bagged and in possession of FWS
- 1006: Production Operations IH contacts Production Operations Shift Industrial Hygiene Technician (IHT) Supervisor and is informed that Production Operations IHTs are in route to Central Shift Office.
- 1008: FWS contacts CSM:
- Employees experienced “sharp, acidic, pungent” odor
 - One employee reported “muscle tightening”
- 1009: CSM directs response actions as per TF-AOP-015
- 1011: Production Operations IHTs arrive at Central Shift Office
- 1011: Event investigation initiated
- 1015: Production Operations IHTs brief Production Operations IHTs on response actions:
- Respiratory Protection Equipment as per RPF TF-AOP-015 Task 1
 - Monitoring as per Industrial Hygiene direction: Ammonia, Volatile Organic Compounds (VOCs)
 - Two Grab samples at location of odor indicated on odor response cards, and/or location where readings indicate
 - Analyze Grab samples with MIRAN SapphIRe for Nitrous Oxide, Jerome J505 for Mercury,
 - Deliver grab samples to 2704 HV for analysis by HAPSITE®
- 1017: Production Operations Shift IHTs depart Central Shift Office to acquire Respiratory Protection Equipment and stage at 241-SY Change Trailer. Air Sampling and surface wipe samples collected from each respirator.
- 1020: Production Operations IHTs contact Hanford Weather Station
- 1048: Odor Response Cards arrive at Central Shift Office
- 1100: Production Operations IH contacts Production Operations IHTs with details on locations indicated on odor response cards and gives permission to begin field response actions.
- 1154: Production Operations IHTs notify Production Operations IHTs that field readings for Ammonia and Volatile Organic Compounds (VOCs) are less than detectable and two grab samples collected. Production Operations IH asks Production Operations IHTs to perform survey of forklift near 219-S Transfer Lines before returning to Production Operations IH Laboratory.
- 1231: Production Operations IHTs notify Production Operations IHTs that grab samples have been analyzed with MIRAN SapphIRe for Nitrous Oxide, Jerome J505 for Mercury and are about to be transported to 2704HV for analysis by HAPSITE®
- 1240: Production Operations IHTs report that all field response instruments have passed Post-Use-Function-tests
- 1252: Production Operations IHTs deliver grab samples to 2704 HV IH Laboratory
- 1306: 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. Normal access to SY Farm is restored. CSM

Immediate Actions Taken:

1. Stopped work
2. Notified CSM
3. Access to area restricted
4. Odor Response Cards completed
5. Entered TF-AOP-015 Response to Reported Odors
6. IHTs responded to the area and took direct reading instrument (DRI) readings for (NH₃) and VOCs and collected two bag samples.

Readings from Industrial Hygiene Sampling and/or Monitoring:

- ToxiRAE readings were below response levels
- NH₃. At or below background levels

- VOCs- At or below background levels

Facility Impact

None.

Discussion of Potential Source(s):

In order to thoroughly investigate all potential sources, IH proceeded to have the respirators tested as a part of the investigation. The three respirators worn by the workers were collected and placed in sealed bags. In addition, two un-issued/unopened respirators from the same issuing station were obtained along with some of the plastic bagging material used by the cleaning vendor to seal the respirators in before they are sent to the field for use. Air samples from each of these artifacts was analyzed on the Hapsite GC. The results of the analysis indicate that there are several compounds present in the bagging material that are capable of volatilizing. Specifically, low levels of toluene, carbon disulfide and some aliphatic hydrocarbons were detected. This chemical signature from the bagging material was subsequently found in the air samples from all five respirators tested. In addition to air sampling, surface wipe samples were collected from each respirator and sent in for laboratory analysis. Results indicate trace levels of quaternary amines from the cleaning process were present in each surface wipe collected. The results from both the Hapsite and the surface wipe sampling indicate very low levels of several chemical compounds, however, none of these compounds were found at levels exceeding an established occupational exposure limit (OEL) or an action limit.

Upon evaluation of plausible sources, meteorological conditions, and industrial hygiene monitoring/sampling, no readily identifiable cause of the odors was determined.

Condition(s) Adverse to Quality:

None

Attachments: (See page 10)

1. List of Personnel Contacted
2. Redacted Odor Response Cards (10 pages)
3. Industrial Hygiene Investigation Report (4 pages)
4. Logbook Entries

Event	Symptoms Experienced Inside SY Farm (No Odors Encountered)																													
PER Number	No PER associated with this event.																													
Date/Time of Event	12/22/2020 0930																													
Location	Inside SY Farm near B-Train exhauster.																													
Personnel Affected	One (1) WRPS HPT reported symptoms of dizziness, headache, and metallic taste. Employee was transported to onsite medical provider (HPMC) and released without restriction.																													
Odor/Taste	<ul style="list-style-type: none"> • No Odors Encountered • Metallic Taste. 																													
Industrial Hygiene (IH) Investigative Sampling/Monitoring Results	Monitoring and Sampling Data Results: <ul style="list-style-type: none"> • Ammonia (NH₃): At or below background levels • Total VOCs: At or below background levels. 																													
Potential Source	Upon evaluation of plausible sources, meteorological conditions, and industrial hygiene monitoring/sampling, no readily identifiable cause of the symptoms was determined.																													
Meteorological Data	<table border="1"> <thead> <tr> <th>Time</th> <th>Weather Station</th> <th>Wind Speed (MPH)</th> <th>Wind Direction</th> <th>Temperature (F)</th> <th>Barometric Pressure (steady/rising/falling)</th> </tr> </thead> <tbody> <tr> <td>0915</td> <td>19</td> <td>16.8</td> <td>286.5 WNW</td> <td>44.5°</td> <td>29.3 steady</td> </tr> <tr> <td>0930</td> <td>19</td> <td>15.0</td> <td>285.7 WNW</td> <td>45.4°</td> <td>29.3 steady</td> </tr> <tr> <td>0945</td> <td>19</td> <td>16.1</td> <td>306.0 NW</td> <td>46.5°</td> <td>29.4 steady</td> </tr> </tbody> </table>						Time	Weather Station	Wind Speed (MPH)	Wind Direction	Temperature (F)	Barometric Pressure (steady/rising/falling)	0915	19	16.8	286.5 WNW	44.5°	29.3 steady	0930	19	15.0	285.7 WNW	45.4°	29.3 steady	0945	19	16.1	306.0 NW	46.5°	29.4 steady
Time	Weather Station	Wind Speed (MPH)	Wind Direction	Temperature (F)	Barometric Pressure (steady/rising/falling)																									
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0930	19	15.0	285.7 WNW	45.4°	29.3 steady																									
0945	19	16.1	306.0 NW	46.5°	29.4 steady																									
Waste Disturbing or Tank Work in Adjacent Area	No Waste Disturbing activities scheduled and no 'other' in-tank work on release sheet.																													

On December 22, 2020 at approximately 0930, two (2) Health Physics Technicians (HPTs) were performing routine surveillance work in 241-SY Farm near B-Train primary exhauster, when one (1) of them experienced a headache, dizziness, and metallic taste. There were no odors encountered by either individual.

When the symptoms occurred, both HPTs were wearing a Full Face Air Purifying Respirator (FFAPR) with organic vapor filters and ToxiRAE personal ammonia monitors. There was not an IHT present during the event. Upon onset of the symptoms, both HPTs immediately exited the area, returned to their office, and notified their manager.

Meteorological data collected at the time from weather Station #19 indicates winds from the WNW at 15mph, 34° F, and a steady barometric pressure.

At approximately 0945, the CSM initiated response actions per TFC-OPS-OPER-C-67 and notified the on-call DOE Facility Representative. Access to the area was restricted.

NOTE: At 1003, CSM exited TFC-OPS-OPER-C-67 due to not meeting the entry criteria. (No odors encountered) [IHT monitoring will be performed as a precaution.]

Both workers completed Odor Response Cards. The affected individual was transported to the onsite medical provider (HPMC) and returned to work without restriction.

IHTs responded to the area and took DRI readings (Survey #20-10049) for Ammonia (NH₃) and Volatile Organic Compounds (VOCs). DRI results were below action levels and supported restoring access to restricted area. After confirming the required actions were completed, the CSM restored access to the area.

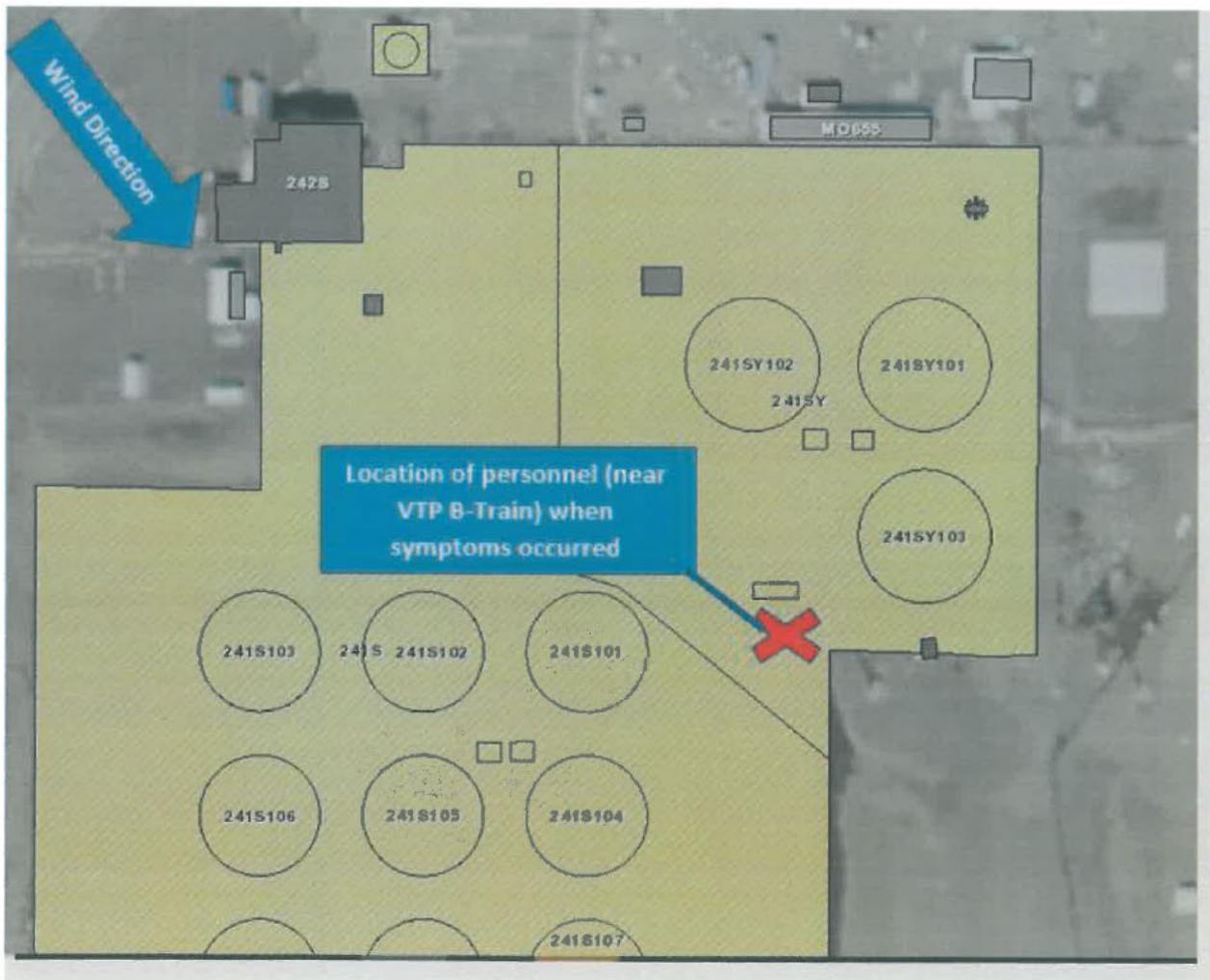


Figure 2: This figure shows the relative location of personnel (near VTP B-Train) and wind direction when symptoms occurred.

Event Timeline:

12/22/2020

- 0930: HPT experiences dizziness, headache, and metallic taste while working in SY Farm
- 0932: CSM contacts Production Operations IH Manager to request Industrial Hygiene support
- 0934: Production Operations IHs Report to Central Shift Office
- 0939: Production Operations IH contacts Prod Operations IH Manager to request support of response actions
- 0941: Affected Employee Manager contacts CSM with information update:
* No odor detected
* Symptoms - Headache, metallic taste
* No ToxiRAE alarm
* Employee in route to HPMC
* RPE has been secured
- 0943: SOEN: "All personnel in SY Farm place work in a safe configuration and exit the farm. Access restricted to SY Farm. CSM"
- 0944: Production Operations IH Manager contacts Production Operations IH with IH Program Manager request to perform in-depth survey of light plants and other equipment associated with lead-acid batteries
- 0946: Production Operations IH sends Odor Response Card hyper-link to affected employee supervisor
- 0952: Production Operations Shift IHT Supervisor and Production Operations Shift IHTs arrive at Central Shift Office to support response actions
- 0955: Production Operations Shift IHT Supervisor contacts IH Programs to ensure Nucon HAPSITE is initiated to support grab sample analysis
- 1000: CSM briefs Production Operations IHTs
- 1003: Production Operations IH contacts Respiratory Protection Program Authority; Central Shift Manager exits TF-OPS-OPER-C-67 due to not meeting criteria. (No odors detected)
- 1005: Production Operations IH Manager contacts Production Operations IH with update on location of affected employee's Respiratory Protection Equipment, status of in farm equipment, and possible co-located work
- 1007: Production Operations IH contacted IH Program Manager about implementation of TFC-PLN-120
- 1009: Production Operations IH contacts Production Operations IH Manager about Production Operations IHT support for response actions and investigation
- 1024: IH Programs Manager contacts Production Operations IH to discuss resources to support grab sample analysis
- 1230: IH reports to CSM that all IHT readings for SY Farm are at or below background level, no hazards detected. Access to SY Farm has been restored. Notified ST Team Area Day Shift Manager and DOE Facility Representative.

Immediate Actions Taken:

1. Stopped work
2. Notified CSM
3. Access to area was restricted
4. Odor Response Cards completed
5. IHTs responded to the area and took DRI readings for NH₃ and VOCs.

Readings from Industrial Hygiene Sampling and/or Monitoring:

ToxiRAE readings were below response levels
NH₃- At or below background levels
VOCs- At or below background levels.

Facility Impact

None.

Discussion of Potential Source(s):

Upon evaluation of plausible sources, meteorological conditions, and industrial hygiene monitoring/sampling, no readily identifiable cause of the symptoms was determined.

Condition(s) Adverse to Quality:

None

Attachments:

1. List of Personnel Contacted
2. Redacted Odor Response Cards (10 pages)
3. Industrial Hygiene Investigation Report (4 pages)
4. Logbook Entries

Attachment 1: List of Personnel Contacted

12/2/2020 Event:

1. [REDACTED] Central Shift Manager
2. [REDACTED] TFP Construction Manager
3. [REDACTED] IH Safety and Health Manager West Area
4. [REDACTED] HAMTC Safety Rep
5. [REDACTED] Construction Manager (WRPS)
6. [REDACTED] FWS (FE&C)
7. [REDACTED] ST Area Day Manager
8. [REDACTED] Production Operations IH

12/22/2020 Event:

1. [REDACTED] IH Safety and Health Manager West Area
2. [REDACTED] Production Operations IH
3. [REDACTED] ST Area Day Manager
4. [REDACTED] RadCon Deputy Manager Production Operations
5. [REDACTED] RadCon Production Operations
6. [REDACTED] IHT Production Operations West

Attachment 2: Redacted Odor Response Cards (12/2/20)

ODOR RESPONSE CARD - 241-SY FARM

Odors Detected with *NO* Immediate symptoms

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, [REDACTED]. Provide the bulleted information below.
3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected *WITH* Symptoms

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

241-SY FARM

Attachment 2: Redacted Odor Response Cards (12/2/20)

ODOR RESPONSE CARD - 241-SY FARM

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

- Date and time odor was noticed around 9 AM
- Your name and the work you were performing [REDACTED] Part work at sy in CA
- Location of odors (mark area on map and wind direction) CA in sy / wind from the west
- 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
 Cleaning Solution Ammonia Other: _____
- Possible Source Dust from
- 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: Sting pain around the nose and behind the ears

2. Send this card to the Central Shift Office.

Attachment 2: Redacted Odor Response Cards (12/2/20)

ODOR RESPONSE CARD - 241-SY FARM

Odors Detected with *NO* Immediate symptoms

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, [REDACTED]. Provide the bulleted information below.
3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected *WITH* Symptoms

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

241-SY FARM

Attachment 2: Redacted Odor Response Cards (12/2/20)

ODOR RESPONSE CARD - 241-SY FARM

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

- Date and time odor was noticed 12-2-20 APPROX 9:00 AM
- Your name and the work you were performing [REDACTED] INSTALLING DUCTWORK
- Location of odors (mark area on map and wind direction) MAP WITH MARKS SENT TO [REDACTED]
- 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
 Cleaning Solution Ammonia Other: 3 CHEMICAL
- Possible Source ?
- Your symptoms (if any) Headache Dizziness/Light-Headed Nausea Cough
 Fatigue/Drowsiness/Weakness Sore/Burning Throat Difficulty Breathing N/A
 Watery/Irritated Eyes/Trouble with Vision Tingling/Numbness/Paralysis Rash/Itching
 Other: _____

2. Send this card to the Central Shift Office.

Attachment 2: Redacted Odor Response Cards (12/2/20)

ODOR RESPONSE CARD - 241-SY FARM

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

- Date and time odor was noticed 12 26 -20 9 AM ?
- Your name and the work you were performing [REDACTED] Working in CA
- Location of odors (mark area on map and wind direction) SY
- 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
 Cleaning Solution Ammonia Other: kind of Breat smell hard to explain
- Possible Source ?
- 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: _____

2. Send this card to the Central Shift Office.

Attachment 2: Redacted Odor Response Cards (12/22/20)

ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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.

241-SY FARM

Attachment 2: Redacted Odor Response Cards (12/22/20)

ODOR/VAPOR RESPONSE CARD - 241-SY FARM	
1. Contact CSM, Complete below bulleted information and map.	
• Date and time of event:	<u>12/22/2020, 9:30am</u>
• Check Applicable:	<input checked="" type="checkbox"/> Odor <input type="checkbox"/> Alarm 6 ppm <input type="checkbox"/> Alarm 12 ppm <input type="checkbox"/> Alarm Other: _____
• Your name and the work you were performing:	<u>[REDACTED], routine surveys</u>
• Location of event (mark area on map and wind direction):	<u>A and B filter banks</u>
• Name(s) of others in or near the affected area:	<u>[REDACTED] (experienced symptoms)</u>
• Was an IHT present?	<u>NO</u>
• Describe the Odor:	<input type="checkbox"/> Sweet <input type="checkbox"/> Sour <input type="checkbox"/> Musty <input type="checkbox"/> Earthy <input checked="" type="checkbox"/> Metallic <input type="checkbox"/> Smoky <input type="checkbox"/> Rotten <input type="checkbox"/> Onion <input type="checkbox"/> Septic <input type="checkbox"/> Ammonia <input type="checkbox"/> Cleaning Solution <input type="checkbox"/> Other: _____
• Possible Source:	<u>A, B filter banks</u>
• Your Symptoms (if any):	<input checked="" type="checkbox"/> Headache <input checked="" type="checkbox"/> Dizziness/Light-Headed <input type="checkbox"/> Nausea <input type="checkbox"/> Cough <input type="checkbox"/> Fatigue/Drowsiness/Weakness <input type="checkbox"/> Sore/Burning Throat <input type="checkbox"/> Difficulty Breathing <input type="checkbox"/> Watery/Irritated Eyes/Trouble with Vision <input type="checkbox"/> Tingling/Numbness/Paralysis <input type="checkbox"/> Rash/Itching <input checked="" type="checkbox"/> Other: <u>metallic taste in mouth, no odors</u>
2. Send this card to the Central Shift Office.	

Attachment 2: Redacted Odor Response Cards (12/22/20)

ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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.

241-SY FARM

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Attachment 2: Redacted Odor Response Cards (12/22/20)

ODOR/VAPOR RESPONSE CARD - 241-SY FARM	
1. Contact CSM, Complete below bulleted information and map.	
• Date and time of event:	9:30 am 12-22-20
• Check Applicable:	<input checked="" type="checkbox"/> Odor <input type="checkbox"/> Alarm 6 ppm <input type="checkbox"/> Alarm 12 ppm <input type="checkbox"/> Alarm Other: _____
• Your name and the work you were performing:	[REDACTED] HPT Routine Survey
• Location of event (mark area on map and wind direction):	SY Farm ventilation path
• Name(s) of others in or near the affected area:	[REDACTED]
• Was an IHT present?	no
• Describe the Odor:	<input type="checkbox"/> Sweet <input type="checkbox"/> Sour <input type="checkbox"/> Musty <input type="checkbox"/> Earthy <input checked="" type="checkbox"/> Metallic <input type="checkbox"/> Smoky <input type="checkbox"/> Rotten <input type="checkbox"/> Onion <input type="checkbox"/> Septic <input type="checkbox"/> Ammonia <input type="checkbox"/> Cleaning Solution <input checked="" type="checkbox"/> Other: metallic taste in mouth
• Possible Source:	A, b, filter banks
• Your Symptoms (if any):	<input checked="" type="checkbox"/> Headache <input checked="" type="checkbox"/> Dizziness/Light-Headed <input type="checkbox"/> Nausea <input type="checkbox"/> Cough <input type="checkbox"/> Fatigue/Drowsiness/Weakness <input type="checkbox"/> Sore/Burning Throat <input checked="" type="checkbox"/> Difficulty Breathing <input type="checkbox"/> Watery/Irritated Eyes/Trouble with Vision <input type="checkbox"/> Tingling/Numbness/Paralysis <input type="checkbox"/> Rash/Itching <input type="checkbox"/> Other: pressure in between ears, ears cold to the touch, but feel like they're hot
2. Send this card to the Central Shift Office.	
no odors detected, just metallic taste in mouth	

Attachment 3: Industrial Hygiene Investigation Report (12/02/2020)

Washington River Protection Solutions INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT		
Event Title: Investigation of AOP-015 Inside of SY Farm		PER Number: WRPS-PER-2020-1923 IHIR Number:
Date: 12/02/2020	Time: 09:00	Location: Inside SY Farm near the new exhauster
Event Summary and Timeline: Event Summary and Timeline: On December 2, 2020 three Federal Engineers and Constructors (FE&C) sub-contractor employees performing work inside the SY farm reported smelling a pungent, battery acid type odor. In addition, two of the workers reported symptoms including eye irritation and pain behind the ears and at the back of the head. At the time that the odor was reported all three individuals were wearing Full Face Air Purifying Respirators (FFAPR) with organic vapor filters. The workers were also wearing ToxiRAE personal ammonia monitors. After reporting the odors the workers were evaluated at HPMC and released to work with no restrictions. Required notifications were made to the Central Shift Office and the farm was placed on restricted access. Under IH verbal direction, IHTs responded to the area and took DRI readings for Ammonia (NH3) and Volatile Organic Compounds (VOC), and collected two bag samples. In addition, the three respirators worn by the workers were collected, placed in plastic bags and delivered to IH for inspection and evaluation.		
Sampling/Monitoring Results: DRI monitoring was completed in the farm after the event and the results were below action levels.		
SWIHD References: Survey 20-09264 AOP 15 was called around 1010am inside the farm, and the farm was cleared by an IH team. ToxiRAE data log results: ToxiRae data logs indicate the peak on one unit is 2ppm at 0909 with readings returning to zero after 3 minutes. The other two units did not have any readings. IHTs entered SY farm for event investigation around 1130am, IHTs surveyed into location with a direct reading instrument and took two bag samples at 103 LDP. IHTs continued to monitor around inside perimeter of farm as well as around the running exhauster. IHTs swept perimeter around outside of the farm as well as reach lifts in RMA staging area and building 241SY271 with no notable readings. Aerosols and paint products noted inside of digging area between 101 and 103. IHT noticed a cleaning product smell while monitoring outside of farm. Portable bathrooms has been cleaned same day with the cleaner smell found to be coming from them. Bag samples were transported to 272AW/103A for source readings and delivered to 2750-E for hapsite analysis. All instrumentation passed pre and post use function tests within prescribed tolerances. AreaRae and MultiRae readings were normal after checking morning and afternoon logs. Grab bag samples were collected and analyzed for nitrous oxide, ammonia, VOC and mercury. All results were less than detectable. Survey 20-09191 Air Sampling: IHT's performed Area Sampling for COPC's, Stack Monitoring and placed compass point Area RAEs in support of work crews in 241-SY Farm. IHT's set up Hotel Load in Farm at 0800 and pulled at 1500. Results for aldehyde panel, nitrous oxide and nitrosamines were all less than detectable. A Farm was cleared by the afternoon. AreaRae and MultiRae readings were normal after checking morning and afternoon logs.		
Additional Information: Co-located work taking place during the event is as follows: - MSA was applying a granular herbicide (2+2 vibro) inside S farm (SDS 036732A). - A site contractor was servicing a Port-o-let downwind from where the workers were located. In order to thoroughly investigate all potential sources, IH proceeded to have the respirators tested as a part of the investigation. The three respirators worn by the workers were collected and placed in sealed bags. In addition, two un-issued/unopened respirators from the same issuing station were obtained along with some of the plastic bagging material used by the cleaning vendor		

Attachment 3: Industrial Hygiene Investigation Report (12/02/2020)

Washington River Protection Solutions INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT(Continued)	
<p>Additional Information:</p> <p>to seal the respirators in before they are sent to the field for use. Air samples from each of these artifacts was analyzed on the Hapsite GC. The results of the analysis indicate that there are several compounds present in the bagging material that are capable of volatilizing. Specifically, low levels of toluene, carbon disulfide and some aliphatic hydrocarbons were detected. This chemical signature from the bagging material was subsequently found in the air samples from all five respirators tested. In addition to air sampling, surface wipe samples were collected from each respirator and sent in for laboratory analysis. Results indicate trace levels of quaternary amines from the cleaning process were present in each surface wipe collected.</p> <p>The results from both the Hapsite and the surface wipe sampling indicate very low levels of several chemical compounds, however, none of these compounds were found at levels exceeding an established OEL or an action limit. None of the compounds detected are known to produce an odor commonly associated with battery acid.</p>	
<p>Recommendations/Conclusions:</p> <p>Although, it is not believed that there are any occupational hazards associated with the cleaning products or bagging material used in the sanitation process, if more workers report similar symptoms the issue may need further evaluation. At this time there are only three workers who have reported experiencing this type of a reaction when wearing a FFAPR with OV filters. By comparison there are an estimated 200-250 respirators worn each day by WRPS employees and no other reports similar to this event have been received.</p>	
<p>Other:</p> <p>None</p>	
<p>Industrial Hygienist:</p> <p>_____</p> <p style="text-align: center;"><i>Print First and Last Name</i></p>	<p>_____</p> <p style="text-align: right;"><i>Digitally signed by _____</i> <small>Date: 2021.01.04 09:31:07 -0800</small></p> <p style="text-align: center;"><i>Signature / Date</i></p>
<p>Industrial Hygiene Level 2 Manager:</p> <p>_____</p> <p style="text-align: center;"><i>Print First and Last Name</i></p>	<p>_____</p> <p style="text-align: right;"><i>Digitally signed by _____</i> <small>Date: 2021.01.12 16:34:34 -0800</small></p> <p style="text-align: center;"><i>Signature / Date</i></p>

Attachment 3: Industrial Hygiene Investigation Report (12/22/2020)

Washington River Protection Solutions INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT		
Event Title: Worker experienced a metallic taste while working in SY Farm		PER Number: WRPS-PER-2020-1923 IHIR Number:
Date: 12/22/2020	Time: 0930	Location: 241-SY Near VIP B-Train
Event Summary and Timeline: Event Summary: At approximately 0930 12/22/2020 an worker performing routine work in 241-SY Farm experienced a headache and metallic taste. No odors were detected. ToxiRAE personal Ammonia monitor did not alarm.		
Field Response Timeline: 0932: Central Shift Manager contacts Production Operations Industrial Hygiene Manager to request Industrial Hygiene support 0934: Production Operations Industrial Hygienists Report to Central Shift Office 0939: Production Operations Industrial Hygienist contacts Production Operations Industrial Hygiene Manager to request support of response actions 0941: Affected Employee Manager contacts Central Shift Manager with information update: * No odor detected * Symptoms - Headache, metallic taste * No ToxiRAE alarm * Employee in route to HPMC * RPE has been secured 0943: SOEN: "All personnel in SY Farm place work in a safe configuration and exit the farm. Access restricted to SY Farm. CSM" 0944: Production Operations Industrial Hygiene Manager contacts Production Operations Industrial Hygienist with Industrial Hygiene Program Manager request to perform in-depth survey of light plants and other equipment associated with lead-acid batteries 0946: Production Operations Industrial Hygienist sends Odor Response Card hyper-link to affected employee supervisor 0952: Production Operations Shift Industrial Hygiene Technician Supervisor and Production Operations Shift Industrial Hygiene Technicians arrive at Central Shift Office to support response actions 0955: Production Operations Shift Industrial Hygiene Technician Supervisor contacts Industrial Hygiene Programs to ensure Nucon HAPSITE is initiated to support grab sample analysis 1000: Central Shift Manager briefs Production Operations Industrial Hygiene Technicians 1003: Production Operations Industrial Hygienist contacts Respiratory Protection Program Authority 1005: Production Operations Industrial Hygiene Manager contacts Production Operations Industrial Hygienist with update on status of affected employee's Respiratory Protection Equipment acquisition, status of in farm equipment, possible co-located work 1007: Production Operations Industrial Hygienist contacted Industrial Hygiene Program Manager about implementation of TFC-PLN-120 1009: Production Operations Industrial Hygienist contacts Production Operations Industrial Hygiene Manager about Production Operations Industrial Hygiene Technician support for response actions and investigation 1024: Industrial Hygiene Programs Manager contacts Production Operations Industrial Hygienist to discuss resources to support grab sample analysis		
Sampling/Monitoring Results: West area IHT's entered SY with MultiRAE DRI and monitored area in response to metallic taste. IHT walked perimeter and then tank to tank and around inlets and risers, no action levels detected. IHT then performed source monitoring at A-train (active exhaustor train) and got nominal readings from exhaustor source 6ppm-12ppm NH3 and 300ppb-500ppb VOC. At this point ██████████ contacted shift office and relayed results to shift manager.		

Attachment 4: Logbook Entries (12/02/20)

- 12/02/2020 – 09:45 Notified Personnel for TF-AOP-015, Entering TF-AOP-015 Response to Reported Odors for odors reported in SY Farm. Access to SY Farm is restricted. All personnel exit SY Farm and move to a safe upwind location, and stay clear of the new SY exhauster pad. SOEN sent. Radio announcement complete. Notified ORP FR [REDACTED]
- 12/02/2020 – 09:45 Entered TF-AOP-015 Response to Reported Odors or Unexpected Changes to Vapor Conditions. Notified by ST ADM Andy Purvis that three (3) FE&C Construction workers reported odors inside of SY Farm near the new SY Exhauster Pad and were taken to HPMC for evaluation. The workers were wearing HFAPR with organic vapor filters. Reported odors were sharp and acidic odor like battery acid. Symptoms included muscle tightening in neck. SY exhauster is operating. Access to SY Farm is restricted.
- 12/02/2020 – 10:15 Directed Industrial Hygiene Technicians (IHT) to implement Tank Waste Odor Sample Plan IHP-09001.
- 12/02/2020 – 10:22 Sent Attachment 2 - Communication Template to DL – WRPS AOP-015 Event Notification.
- 12/02/2020 – 10:58 Odor Response Cards were submitted and only 2 workers reported symptoms. Odor reported as sour, metallic, chemically, and burnt smell. Symptoms included headache, sharp pain around the nose and behind ears, and watery/irritated eyes.
- 12/02/2020 – 12:59 Closing TF-AOP-015. Notified by FWS [REDACTED] were all evaluated at HPMC and were released to return to work without restriction. Notified by IH [REDACTED] that IHP-09001 response actions are complete and no hazards were detected. DRI Survey # 20-09264. Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. SOEN sent. Radio announcement complete. Notified ORP FR [REDACTED] Sent Attachment 3 - Follow-Up Event Summary to DL – WRPS AOP-015 Event Notification.

Attachment 4: Logbook Entries (12/22/20)

12/22/2020 -- [REDACTED] reported that [REDACTED] was performing HPT routines in SY Farm near B Train primary exhauster and experienced a metallic smell and taste, and became light headed. [REDACTED] was wearing an APR and had [REDACTED] and [REDACTED]. [REDACTED] did not experience any symptoms or odors. Directed them to fill out odor response cards and transport [REDACTED] to HPMC for evaluation.

12/22/2020 -- 09:46 Requested ST ADM to notify personnel in SY Farm to evacuate the farm and to restrict access.

12/22/2020 -- 09:47 [REDACTED] reported that [REDACTED] did not experience an odor as previously reported, but did have symptoms.

12/22/2020 -- 09:48 Requested IH assistance per OPER-C-67 to develop Attachment A response plan. SOEN and radio announcement made to restrict access to SY Farm.

12/22/2020 -- 09:54 Notified [REDACTED] (FACREP) of 0934 and 0947 entries.

12/22/2020 -- 09:57 Update to 0934 entry, employees did not have a ToxiRAE alarm while in SY Farm.

12/22/2020 -- 10:03 No longer responding to individual in SY Farm with symptoms per OPER-C-67 due to the criteria not being met (no odors detected). However, we will be performing IHT monitoring of the affected location as a precaution. IH [REDACTED] are assisting with providing details to IHT's and dispatching them.

12/22/2020 -- 12:30 [REDACTED] (IHT) reported that all IHT readings for SY Farm are at or below background level, no hazards detected. Access to SY Farm has been restored. Notified ST ADM. [REDACTED]
