

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: Production Operations Date: 01/23/2023

Area/Building/Location: 200W/MO-296 (SY Farm Change Trailer) Approximate Time of Event: 0910

AR Number: WRPS-AR-2023-0706 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-004 Event Investigator: [REDACTED]

EVENT SUMMARY PART 1

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

Two separate work crews supporting the WO# 950202 "241-SY Sump Level Reading" and WO# 523606 "SY-103 Double-Shell Tank Annulus Ultrasonic Testing" work evolutions, in addition to personnel providing Contamination Area (CA) Step-Off Pad (SOP) support, were within the MO-296 SY Farm Change Trailer.

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

Personnel supporting the WO# 950202 "241-SY Sump Level Reading" work evolution:

- 1 WRPS Field Work Supervisor (FWS)
- 3 WRPS Instrument Techs (IT)
- 1 WRPS Health Physics Technician (HPT)

Personnel supporting the WO# 523606 "SY-103 Double-Shell Tank Annulus Ultrasonic Testing" work evolution:

- 2 WRPS HPTs

Personnel providing CA SOP support within the MO-296 SY Farm Change Trailer:

- 3 WRPS HPTs

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

On 01/23/2023, at approximately 0910, two separate work crews and CA SOP support were inside the MO-296 SY Farm Change Trailer when one worker had their Ventis Pro personal ammonia monitor alarm, indicating a 6 parts per million (ppm) Response Level. Nine additional workers were in MO-296 and within 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. Workers did not report experiencing symptoms and declined precautionary medical surveillance.

Field response TF-AOP-015 monitoring within the MO-296 SY Farm Change Trailer indicated a less than detectable concentration (< 1 ppm) for ammonia.

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

Work crews were inside the MO-296 SY Farm Change Trailer, which is located along the north 241-SY Tank Farm boundary.

Upon entering the MO-296 SY Farm Change Trailer from the SY Tank Farm, 4 workers were within a posted radiological Contamination Area (CA) and wearing anti-contamination clothing as required by Radiological Work Permit (RWP) TF-104. Whereas 6 additional workers were within the posted Radiological Buffer Area (RBA), which does not require anti-contamination clothing or respiratory protection equipment. At the time of the Ventis Pro alarm, the workers were not in an area requiring use of respiratory protection and had doffed their respiratory protection equipment following their exit from the SY Tank Farm.

Weather conditions inside the MO-296 SY Farm Change Trailer would not be applicable due to being an indoor temperature-controlled environment. However, given the close proximity to SY Tank Farm, 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 0910 on 01/23/2023:

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EVENT SUMMARY (Continued)

Project: Production Operations Date: 01/23/2023

Area/Building/Location: 200W/MO-296 (SY Farm Change Trailer) Approximate Time of Event: 0910

AR Number: WRPS-AR-2023-0706 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-004 Event Investigator: [REDACTED]

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

- Wind Speed: 1.6 miles per hour (mph)
- Wind Direction: 306° (out of Northwest)
- Mixing Height: 140 feet above grade
- Stability Class: E (slightly stable 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 no exhaust plumes were within the work area location at the reported time of the event, thus determining the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions (Refer to Attachment 1).

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

Access was restricted to MO-296 for approximately 1.5 hours. No additional impacts to scheduled 01/23/2023 work evolutions occurred.

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

- Central Shift Manager (CSM) initiated TF-AOP-015 and restricted access to MO-296.
- CSM reviewed the DFAS data and determined mixing height was >100 ft., therefore, no additional access restrictions were required.
- CSM made required TF-AOP-015 notifications.
- CSM offered precautionary medical surveillance to workers. Workers declined medical surveillance.
- CSM requested Odor/Vapor Response Cards from affected workers.
- Production Operations shift Industrial Hygiene Technician (IHT) initiated TF-AOP-015 response actions and monitoring per IHP-09001. Direct reading instrument (DRI) area readings inside MO-296 indicated a less than detectable (< 1 ppm) ammonia concentration.
- Event Investigation EIR-2023-004 "TF-AOP-015 at SY Farm Change Trailer" was initiated.

Notifications Already Made (Time and personnel notified):

[0910]- CSM informed a Ventis Pro personal ammonia monitor alarmed at 6 ppm while a worker was inside MO-296. The Ventis Pro personal ammonia monitors of 9 other individuals within the immediate work area did not alarm or indicate elevated ammonia concentrations. The CSM directed the workers to exit the MO-296 SY Farm Change Trailer in a controlled manner.

[0928]-The CSM initiated TF-AOP-015, restricted access, provided radio announcement, and issued SOEN "Entered TF-AOP-015 Response to Personal Ammonia Monitor Alarm for ventis-pro alarm at SY Change Trailer. Access to the SY Farm Change Trailer is restricted. All personnel exit the SY Farm Change Trailer." CSM contacted the on-call DOE Facility Representative and informed them of TF-AOP-015 event initiation.

[0958]- CSM provided TF-AOP-015, Attachment 1- Initial Communication Template in email to distribution list "DL - WRPS Odor/Vapor Event Notification".

[1104]- CSM provided Attachment 2- Follow-up Event Summary in email to distribution list "DL - WRPS Odor/Vapor Event Notification".

[1111]- CSM issued SOEN "Exited TF-AOP-015 for SY Farm Change Trailer. Normal access to SY Farm Change Trailer is restored." CSM provided radio announcement and contacted the on-call DOE Facility Representative and informed them TF-AOP-015 response was exited.

This event does not merit an Event Investigation meeting

This event merits an Event Investigation meeting

Basis for Determination:

Information gathered from interviews and documentation reviews have provided sufficient information regarding this event.

Washington River Protection Solutions
EVENT SUMMARY (Continued)

Project: Production Operations Date: 01/23/2023

Area/Building/Location: 200W/MO-296 (SY Farm Change Trailer) Approximate Time of Event: 0910

AR Number: WRPS-AR-2023-0706 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-004 Event Investigator: [REDACTED]

Responsible Manager:

[REDACTED] [REDACTED] [REDACTED]
Print First and Last Name *Signature / Date*

CAS Manager:

[REDACTED] [REDACTED] [REDACTED]
Print First and Last Name *Signature / Date*

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EVENT SUMMARY (Continued)

Project: Production Operations Date: 01/23/2023

Area/Building/Location: 200W/MO-296 (SY Farm Change Trailer) Approximate Time of Event: 0910

AR Number: WRPS-AR-2023-0706 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-004 Event Investigator: [REDACTED]

EVENT SUMMARY PART 2

Key Elements of the Investigation (Key investigation points):

To summarize the conclusions of the Industrial Hygiene Event Investigation Report, IHIR-00062 "TF-AOP-015 Response at 241-SY Change 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-00062 conclusion:

(1) The event initiating Ventis Pro personal ammonia monitor (#005105) indicated erroneous ammonia concentrations and alarm conditions when in a controlled office environment and during vehicle transport where no ammonia source was present.

(2) Nine additional workers were within the immediate area of the individual when the Ventis Pro personal ammonia monitor alarmed. None of the other workers' Ventis Pro personal ammonia monitor alarmed or indicated elevated ammonia concentrations.

(3) Evaluation of the weather details determined the cause of the Ventis Pro personal ammonia monitor alarm 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).

(4) Because nitric acid was utilized in nearly all production processes that generated tank waste, and the most common byproduct of those processes was reduction of nitrate ion to ammonia during the dissolution (oxidation) of irradiated fuel, ammonia is the most prevalent chemical of potential concern (COPC) found in all tanks. Therefore, ammonia is utilized as a sentinel indicator for Tank Waste Chemical Vapor COPCs, thus direct reading instruments (DRIs) equipped with an ammonia sensor are utilized at a minimum when monitoring for tank waste chemical vapors/COPCs. Field response DRI monitoring following initiation of TF-AOP-015 indicated a less than detectable ammonia concentration (<1ppm), thus providing additional indication the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions.

(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 SY farm is 310 ppm. The SY exhauster is not currently connected to VMDS; therefore, readings are acquired in accordance with TF-OPS-IHT-037 once per calendar day. The highest ammonia concentration observed at the SY exhauster between 01/16/2023 and 01/22/2023 was 2 ppm. Conservatively utilizing the highest ammonia concentration observed in the SY exhauster, a predicted ground receptor ammonia concentration of 0.016 ppm (or 0.064% of the established Occupational Exposure Limit for ammonia) would be expected if SY tank farm exhauster emissions were present. The predicated ammonia concentrations at unspecified ground receptors provides further justification the odor source was unlikely to be resultant of Tank Farms exhauster emissions.

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

The Ventis Pro personal ammonia monitor (#005105) unit was removed from service.

Lessons Learned or Information That the Work Force Needs Immediately:

None.

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EVENT SUMMARY (Continued)

Project: Production Operations Date: 01/23/2023

Area/Building/Location: 200W/MO-296 (SY Farm Change Trailer) Approximate Time of Event: 0910

AR Number: WRPS-AR-2023-0706 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-004 Event Investigator: [REDACTED]

- 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-00062 "TF- AOP-015 Response at 241-SY Change Trailer" form the basis that further investigation will provide no additional information or operational benefit.

Responsible Manager:

[REDACTED] [REDACTED] [REDACTED]
Print First and Last Name Signature / Date

CAS Manager:

[REDACTED] [REDACTED] [REDACTED]
Print First and Last Name Signature / Date

EIR-2023-004 Attachment 1

DFAS Exhauster Potential Exposure Zone Model

Actual weather conditions on 01/23/2023 @ 0910:

- Wind Speed: 1.6 mph
- Wind Direction: 306° (out of Northwest)
- Mixing Height: 140 feet above grade
- Stability Class: E (slightly stable conditions)



MO-296 Location of Ventis Pro Instrument Alarm



SY Exhauster

Estimated Potential Exposure Zone



Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT

Event Title: <p style="text-align: center;">TF-AOP-015 Response at 241-SY Change Trailer</p>	PER Number: <p style="text-align: center;">N/A</p>	
		IHIR Number: <p style="text-align: center;">IHIR-00062</p>

Date: 01/23/2023	Time: 0907	Location: 241-SY Change Trailer (MO296)
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Event Summary and Timeline:

EVENT SUMMARY:
A Personal Ammonia Monitor alarmed and indicated greater than 6 ppm ammonia but less than 12 ppm ammonia inside the 241-SY Change Trailer (MO296). Ten workers were present at the time of personal ammonia monitor alarm. Six workers were on the Radioactive Material Area (RMA) side of the change trailer, and four were on the Contamination Area (CA) side. The workers had exited the farm and were in the change trailer at the time of the Personal Ammonia Monitor 6 ppm alarm.

FIELD RESPONSE TIMELINE:

0907: Approximate Time of Initiating Event

0910: Health Physics Technician notified Production Operations-West Shift Manager, Production Operations-West Industrial Hygienist, and Production Operations-West Industrial Hygiene Technician Supervisor of an alarming Personal Ammonia Monitor. Initially reported two alarming Personal Ammonia Monitors, one at 6ppm and one at 7ppm. No odors were reported. Work crew was instructed to vacate the change trailer, restrict access, and fill out Odor-Vapor Response Cards. Other member of the work crew notified the Central Shift Manager of one alarming Personal Ammonia monitor simultaneously.

0913: Production Operations-West Industrial Hygiene Technician Supervisor directed Production Operations-West Industrial Hygiene Technician to begin prepping instruments and be on standby.

0920: Production Operations-East Industrial Hygienist arrived at Central Shift Office.

0921: Second Production Operations-East Industrial Hygienist arrived at Central Shift Office.

0921: Central Shift Manager directs the Event Initiating Personal Ammonia Monitor to be segregated.

0922: Production Operations-West Industrial Hygiene Technician Supervisor was contacted by Production Operations Shift Industrial Hygiene Technician Supervisor, and was informed a Production Operations Shift Industrial Hygiene Technician would be responding.

0923: Production Operations Shift Industrial Hygiene Technician began prepping the instrument.

0924: Review of the Data Fusion and Advisor System (DFAS) application was performed by Production Operations-East Industrial Hygienist:
01/23/2023 @ 0924 (TF-AOP-015 Current Time):

- Wind Speed: 2.5 mph
- Wind Direction: 319° (out of Northwest)
- Mixing Height: 140 feet above grade
- Stability Class: E (slightly stable conditions)

0929: Production Operations-West Industrial Hygienist contacted the Projects Safety and Health Manager (delegate for Production Operations-West Safety and Health Manager) to provide an update. Production Operations-West Shift Manager directed Production Operations-West Industrial Hygiene Technician Supervisor and Production Operations-West Industrial Hygienist to respond to the change trailer and collect Odor-Vapor Response Cards and alarming Personal Ammonia Monitor.

0929: Shift Office Event Notification (SOEN): "Entered TF-AOP-015 Response to Personal Ammonia Monitor Alarm for ventis-pro alarm at SY Change Trailer. Access to the SY Farm Change Trailer is restricted. All personnel exit the SY Farm Change Trailer. CSM"

0930: Production Operations-East Industrial Hygienist retrieved most recent VMDS data:
01/22/2023 at 2008
Ammonia: 0 ppm

0930: Production Operations Shift Industrial Hygiene Technician arrived at the Central Shift Office.

0932: Blank Odor-Vapor Response Cards were given to Production Operations Shift Operations Engineer to bring to the work crew to fill out.

0933: Per the Central Shift Manager, response actions for 6 ppm were entered.

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INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT(Continued)

Event Summary and Timeline:

- 0933: Production Operations-East Industrial Hygienist briefed Production Operations Shift Industrial Hygiene Technician on information received and response actions.
- 0934: Projects Safety and Health Manager contacted Central Shift Manager for updates.
- 0935: Production Operations-West Industrial Hygienist and Production Operations-West Industrial Hygiene Technician Supervisor arrived at the SY Farm Change Trailer and spoke with the remaining work crew as many had already left. Access to Change Trailer was already restricted upon arrival. Production Operations-West Industrial Hygienist initially collected four Odor-Vapor Response Cards, all of which had no odor reported. The Health Physics Technician confirmed with the Production Operations West-Industrial Hygienist that only one Personal Ammonia Monitor alarmed, and one other Personal Ammonia Monitor was showing negative results which caused confusion. Upon finding this information out, the Production Operations-West Industrial Hygienist and Production Operations-West Industrial Hygiene Technician Supervisor observed a total of three personal ammonia monitors among the work crew showing negative results ranging from -8 ppm to -3 ppm while standing outside. The remaining work crew returned to 272WA to fill out Odor-Vapor Response Cards as they did not have anymore blank forms out in the field.
- 0939: All members of the work crew did not report symptoms and declined HPMC evaluation.
- 0946: Production Operations-East Industrial Hygienist requested IHIR number from IH Records.
- 0940: The event initiating Personal Ammonia Monitor was showing 3 to 4 ppm while standing outside of the change trailer.
- 0945: Production Operations Shift Operations Engineer arrived at the SY Farm Change Trailer. Production Operations-West Industrial Hygienist gave the Production Operations Shift Operations Engineer the four completed Odor-Vapor Response Cards. The Production Operations Shift Operations Engineer left the change trailer to go to 272WA to collect the remaining six Odor-Vapor Response Cards from the work crew that had already left.
- 0946: Production Operations-East Industrial Hygienist contacted the Weather Station for Meteorological conditions:
- 01/23/2023 @ 0900 (approximately 6 min before Initiating Event):
 - o Barometric Pressure: 29.67 inches of mercury and falling slightly
 - o Wind speed and direction: 1 mph out of North
 - o Temperature: 27°F
 - o Relative Humidity: 96%
 - 01/23/2023 @ 0915 (approximately 11 min after Initiating Event):
 - o Barometric Pressure: 29.682 inches of mercury
 - o Wind speed and direction: 2 mph out of Northwest
 - o Temperature: 28°F
 - o Relative Humidity: 96%
- 0950: Central Shift Manager Notified Facility Representative.
- 0956: Production Operations Shift Industrial Hygiene Technician arrived at the SY Farm Change Trailer.
- 1000: Event initiating Personal Ammonia Monitor alarmed again while standing outside of the change trailer while other Personal Ammonia Monitors were showing negative readings.
- 1002: Event Responding Production Operations Shift Industrial Hygiene Technician reported Direct Reading Instrument is less than detectable.
- Ammonia: less than one (1) part per million
- Event initiating Personal Ammonia Monitor was given to Production Operations Shift Industrial Hygiene Technician to take to Central Shift Office.
- 1004: Central Shift Manager contacted Performance Assurance group to initiate Event Investigation
- 1008: Production Operations Shift Industrial Hygiene Technician contacted Production Operations Shift Industrial Hygiene Technician Supervisor and notified that the Personal Ammonia Monitor was alarming again while in their possession but current Direct Reading Instrumentation results were less than detectable.
- 1012: Production Operations-West Industrial Hygienist arrived at 272WA and informed the Production Operations-West Shift Manager that Odor-Vapor Response Cards had been handed over to the Production Operations Shift Operations Engineer to be taken to Central Shift Office and all Field Response results were less than detectable.
- 1014: Event initiating Personal Ammonia Monitor continued to alarm in the Production Operations Shift Industrial Hygiene Technician's possession.
- 1014: Production Operations Shift Industrial Hygiene Technician Supervisor arrived at Industrial Hygiene Lab.
- 1027: Production Operations Shift Industrial Hygiene Technician Supervisor notified Production

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

Operations-East Industrial Hygienist that the Direct Read Instrument passed Post-Use function test.

1031: Production Operations-East Industrial Hygienist was informed by Production Operations Shift Industrial Hygiene Technician Supervisor that all results were less than detectable. Production Operations-East Industrial Hygienist relayed these results to the Central Shift Manager.

1034: Central Shift Manager provided Performance Assurance Point of Contact with an Event Investigation Report number (EIR 2023-004).

1038: Shift Office Event Notification (SOEN): "Initiated Event Investigation EIR-2023-004, "TF-AOP-015 at SY Farm Change Trailer." POC: [REDACTED] CSM."

1110: Shift Office Event Notification (SOEN): "Exited TF-AOP-015 for SY Farm Change Trailer. Normal access to SY Farm Change Trailer is restored. CSM"

Sampling/Monitoring Results:

Field Response area readings:

- Ammonia: Less than Detectable (< 1 ppm)

Ventis Pro V 005105 (Event Initiating Personal Ammonia Monitor):

- Ammonia: Peak of 6 ppm on instrument display, as reported by Affected Worker

- Ammonia: Multiple peaks of 6 ppm on datalog

- o Ammonia @ 09:07:02- 6 ppm

- o Ammonia @ 09:08:42- 6 ppm

- o Ammonia @ 09:09:52- 6 ppm

- o Ammonia @ 09:10:22- 6 ppm

- o Ammonia @ 09:11:22- 6 ppm

- o Ammonia @ 09:12:22- 6 ppm

- o Ammonia @ 10:01:40- 6 ppm

- Datalog peaks occurred in various locations, not all at the SY Farm Change Trailer

SWIHD References:

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

- #23-00525 "TF-AOP-015 Response at 241-SY Change Trailer"

Additional Information:

At the time of the initiating event the Affected Workers were not wearing Respiratory Protection Equipment. Individuals had already exited SY Farm and doffed their Respiratory Protection prior to the Personal Ammonia Monitor alarming. Respiratory Protection Equipment not required, nor worn, for Response Actions.

Review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details dashboard, per TF-AOP-015 3.1.8, for configuring field response:

01/23/2023 @ 0924 (TF-AOP-015 Current Time):

- Wind Speed: 2.5 mph

- Wind Direction: 319° (out of Northwest)

- Mixing Height: 140 feet above grade

- Stability Class: E (slightly stable conditions)

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

Additional Information:

Memo WRPS-1904672.1, TANK FARM EXHAUST ~ CK CONCENTRATION ALARM/ ACTION LEVELS FOR AMMONIA establishes stack alarm/action set points for Tank Farm Exhausters. The alarm/action set points are based on a linear extrapolation of the Quantitative Risk Assessment (QRA) model prediction; conservatively established at the ammonia stack concentration that could result in various ammonia concentrations at an unspecified ground receptor.

- High Alarm → ammonia concentration of 2.5 ppm at an unspecified ground receptor
- High High Alarm → ammonia concentration of 5 ppm at an unspecified ground receptor

Memo WRPS-1904672.1, TANK FARM EXHAUST ~ CK CONCENTRATION ALARM/ ACTION LEVELS FOR AMMONIA:

Tank Farm	Exhauster	High Alarm	High High Alarm
241-SY	Primary	310 ppm	620 ppm

The 241-SY Primary Exhauster is not currently connected to Vapor Monitoring Detection System (VMDS). Readings are acquired in accordance with TF-OPS-IHT-037 when Stack Monitoring for Ammonia via the Vapor Monitoring Detection System (VMDS) is unavailable. Stack readings are required once per calendar day in accordance with ARP-T-041-00002.

Vapor Monitoring Detection System (VMDS) Alternate Monitoring 01/16/2023 to 01/22/2023:

Tank Farm	Exhauster	Minimum	Maximum
241-SY	Primary	0 ppm	2 ppm*

* 01/17/2023-01/19/2023 TF-OPS-IHT-037 Table 1 and Datasheet 1 were not attached to survey for review as of 01/23/2023 @ 1020.

Monitoring for Tank Waste Chemical Vapors:

Ammonia is used as a sentinel Tank Waste Chemical Vapor for chemicals of potential concern (COPC). Each Hanford production process had different feedstock chemicals and generated different waste streams. Hanford production processes were also separated temporally, with different processes being performed at different times in the history of Hanford production (1943 - 1986). Some chemicals are common to all processes/waste streams (e.g., nitric acid), while others are specific to particular processes/waste streams. Some in-tank waste treatment processes (e.g., neutralization and de-nitrification) used the same chemical feed stocks (e.g., sodium hydroxide solution) in most, if not all Tank Farms. The chemistry and radiochemistry of these compounds result in waste stream similarities across all tank farms. Because nitric acid was common to nearly all processes that generated tank waste and the most common result of those processes was reduction of nitrate ion to ammonia during the dissolution (oxidation) of irradiated fuel, ammonia is the most common chemical of potential concern (COPC) and is found in all tanks. It is logical to choose ammonia for the sentinel as it is a byproduct of all production processes and found in all tanks. Therefore, when monitoring for Tank Waste Chemical Vapors/chemicals of potential concern (COPC), Direct Reading Instrumentation (DRI) equipped with an ammonia sensor is utilized at a minimum.

Meteorological information from the Hanford Weather Station for Station #19:

- 01/23/2023 @ 0900 (approximately 5 min before Initiating Event):
 - o Barometric Pressure: 29.67 inches of mercury and falling slightly
 - o Wind speed and direction: 1 mph out of North
 - o Temperature: 27°F
 - o Relative Humidity: 96%
- 01/23/2023 @ 0915 (approximately 10 min after Initiating Event):
 - o Barometric Pressure: 29.682 inches of mercury
 - o Wind speed and direction: 2 mph out of Northwest
 - o Temperature: 28°F
 - o Relative Humidity: 96%

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

Recommendations/Conclusions:

Recommendations:

N/A

Conclusions:

Review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, 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.

The Event Initiating Personal Ammonia Monitor (Ventis PRO V 005105) datalog was downloaded and reviewed. The Personal Ammonia Monitor continued to alarm sporadically after it was removed from the change trailer (i.e. outside of the change trailer and in vehicles), indicating that it was producing false positive results. Direct Reading Instrumentation monitoring performed at the SY Farm Change Trailer during response actions did not readily identify a source that would have induced the Personal Ammonia Monitor alarm, and indicated further action was not necessary to protect worker safety and health. The Personal Ammonia Monitor alarm was not an indication of changing conditions nor an employee chemical exposure event. As a result the area was released from restricted access and work was allowed to continue.

Other:

Affected Personnel were offered voluntary medical examination, and all declined.

EIR #2023-004

Industrial Hygienist:

Print First and Last Name

Signature / Date

Industrial Hygiene Level 2 Manager:

Print First and Last Name

Digitally signed by

Signature / Date

ODOR/VAPOR RESPONSE CARD - 241 SY FARM

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

- Date and time of event: 1-23-23
- Check Applicable:
 Odor Ammonia Alarm (6 ppm) Ammonia Alarm (12 ppm) Alarm (other - describe): _____
- Your name and the work you were performing:
[REDACTED] Changing in trailer
- Other Work Underway? Describe:
NA
- Location of event (mark area on map and wind direction):
SY Change Trailer
- Name(s) of others in or near the affected area:
[REDACTED]
- Was Industrial Hygiene present, who? NO
- Describe the odor:

<input type="checkbox"/> Sweet	<input type="checkbox"/> Sour	<input type="checkbox"/> Smoky	<input type="checkbox"/> Septic/Sewer	<input type="checkbox"/> Musty	<input type="checkbox"/> Rotten
<input type="checkbox"/> Metallic	<input type="checkbox"/> Onion	<input type="checkbox"/> Earthy	<input type="checkbox"/> Ammonia	<input type="checkbox"/> Citrus	<input type="checkbox"/> Solvent
<input type="checkbox"/> Other (describe): <u>NO odor</u>					
- Is source known/likely? Describe:
Faulty ventis Pro
- Your symptoms? None

<input type="checkbox"/> Headache	<input type="checkbox"/> Dizziness	<input type="checkbox"/> Nausea	<input type="checkbox"/> Cough	<input type="checkbox"/> Fatigue
<input type="checkbox"/> Weakness	<input type="checkbox"/> Sore Throat	<input type="checkbox"/> Difficulty Breathing	<input type="checkbox"/> Eye Irritation	<input type="checkbox"/> Rash
<input type="checkbox"/> Itch	<input type="checkbox"/> Tingling	<input type="checkbox"/> Numbness	<input type="checkbox"/> Taste	
<input type="checkbox"/> Other (describe):				

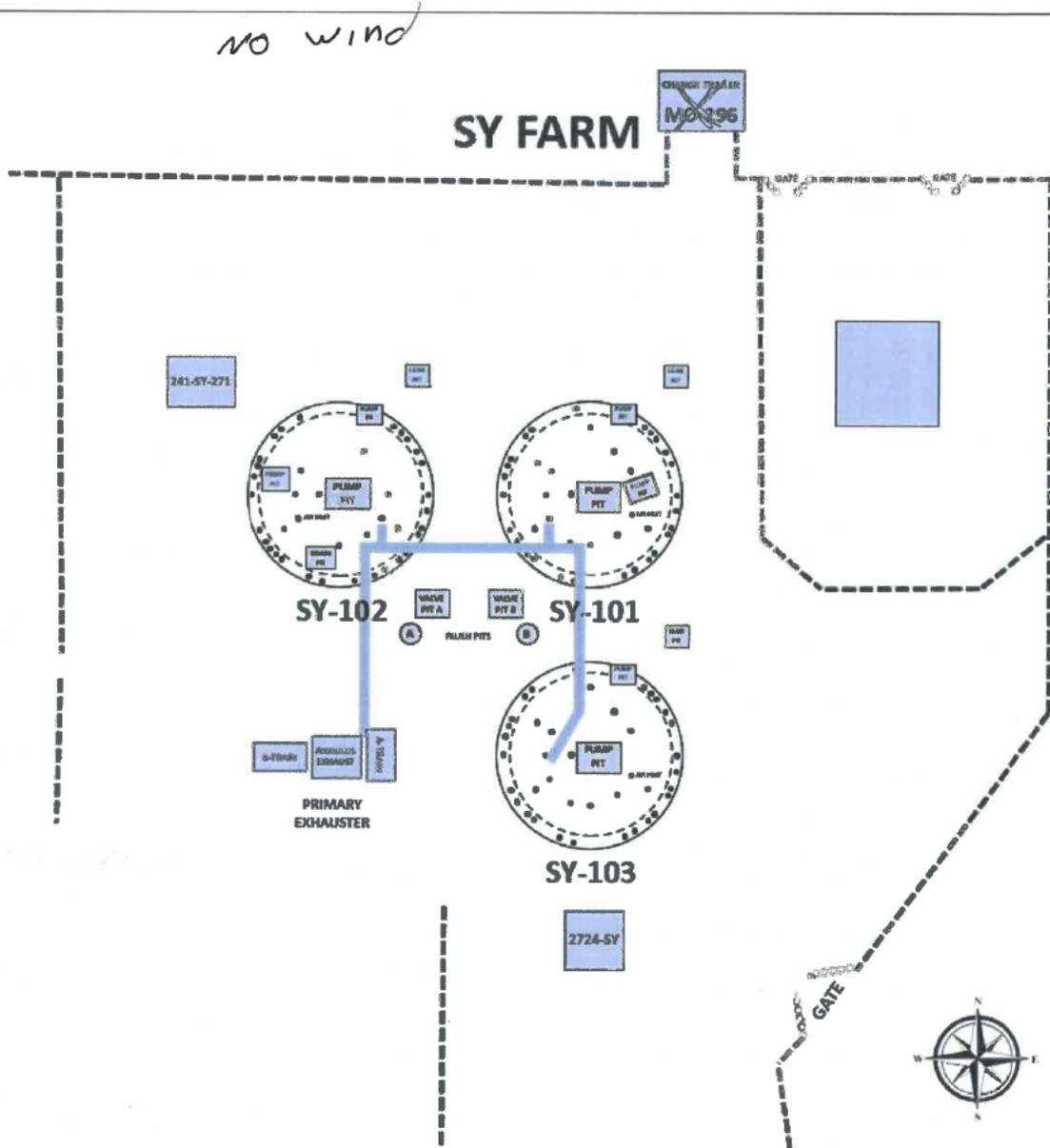
2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD - 241 SY 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.



ODOR/VAPOR RESPONSE CARD - 241 SY FARM

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

- Date and time of event: 1/23/2023 - 9AM
- Check Applicable:
 - Odor
 - Ammonia Alarm (6 ppm)
 - Ammonia Alarm (12 ppm)
 - Alarm (other - describe): NA
- Your name and the work you were performing:
[REDACTED] - Getting ready in change trailer
- Other Work Underway? Describe:
NA
- Location of event (mark area on map and wind direction):
Change Trailer (SY) MO-296
- Name(s) of others in or near the affected area:
[REDACTED]
- Was Industrial Hygiene present, who?
NA
- Describe the odor:
 - Sweet
 - Sour
 - Smoky
 - Septic/Sewer
 - Musty
 - Rotten
 - Metallic
 - Onion
 - Earthy
 - Ammonia
 - Citrus
 - Solvent
 - Other (describe):
- Is source known/likely? Describe:
NA
- Your symptoms? None
 - Headache
 - Dizziness
 - Nausea
 - Cough
 - Fatigue
 - Weakness
 - Sore Throat
 - Difficulty Breathing
 - Eye Irritation
 - Rash
 - Itch
 - Tingling
 - Numbness
 - Taste
 - Other (describe):

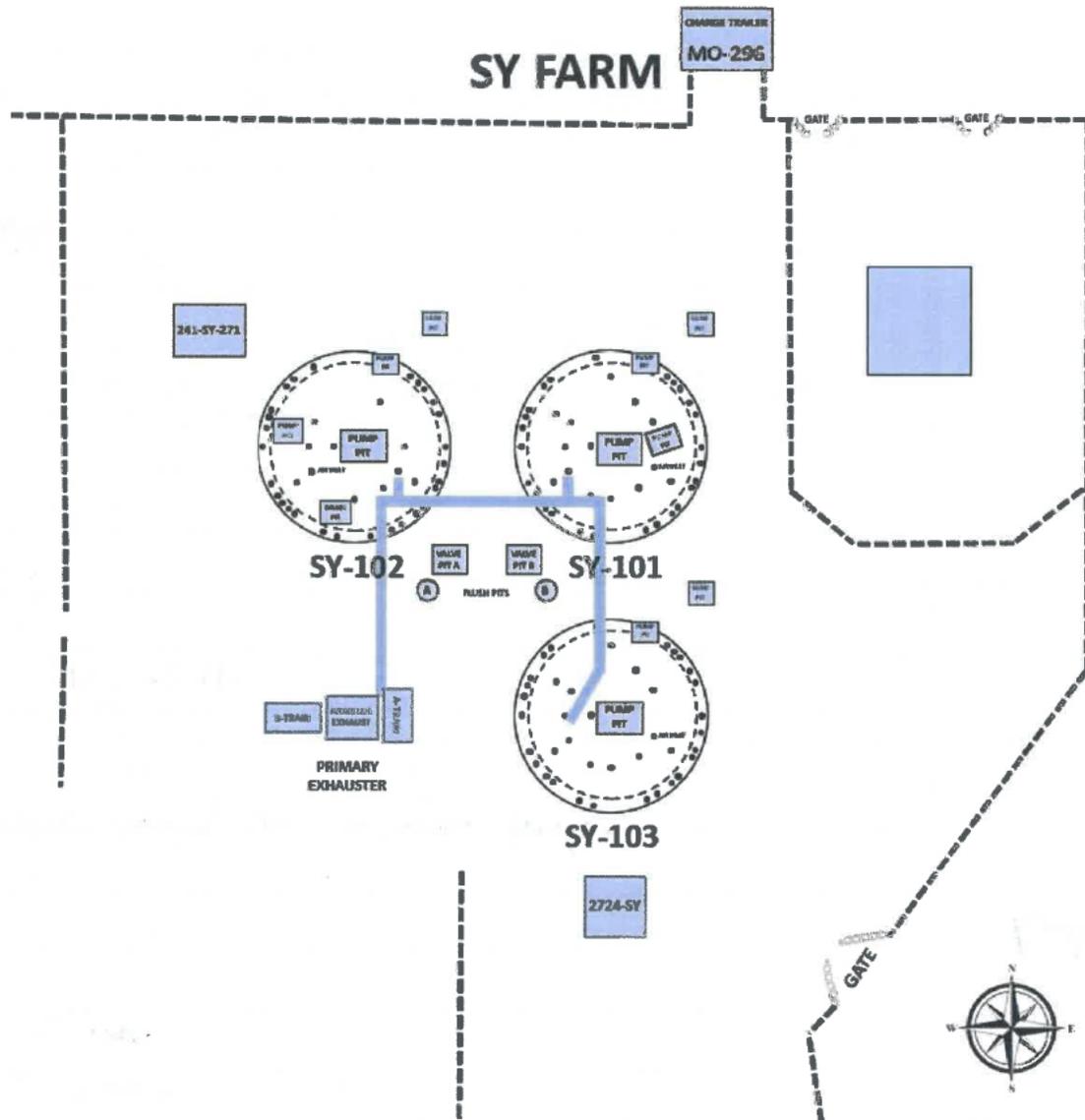
2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD - 241 SY 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.



ODOR/VAPOR RESPONSE CARD - 241 SY FARM

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

- Date and time of event: 9:30 1/23/2023
- Check Applicable:
 - Odor
 - Ammonia Alarm (6 ppm)
 - Ammonia Alarm (12 ppm)
 - Alarm (other - describe): _____
- Your name and the work you were performing: 
- Other Work Underway? Describe: _____
- Location of event (mark area on map and wind direction): MO 296
- Name(s) of others in or near the affected area: 
- Was Industrial Hygiene present, who? NO
- Describe the odor:
 - Sweet
 - Sour
 - Smoky
 - Septic/Sewer
 - Musty
 - Rotten
 - Metallic
 - Onion
 - Earthy
 - Ammonia
 - Citrus
 - Solvent
 - Other (describe): _____
- Is source known/likely? Describe: N/A
- Your symptoms? None
 - Headache
 - Dizziness
 - Nausea
 - Cough
 - Fatigue
 - Weakness
 - Sore Throat
 - Difficulty Breathing
 - Eye Irritation
 - Rash
 - Itch
 - Tingling
 - Numbness
 - Taste
 - Other (describe): _____

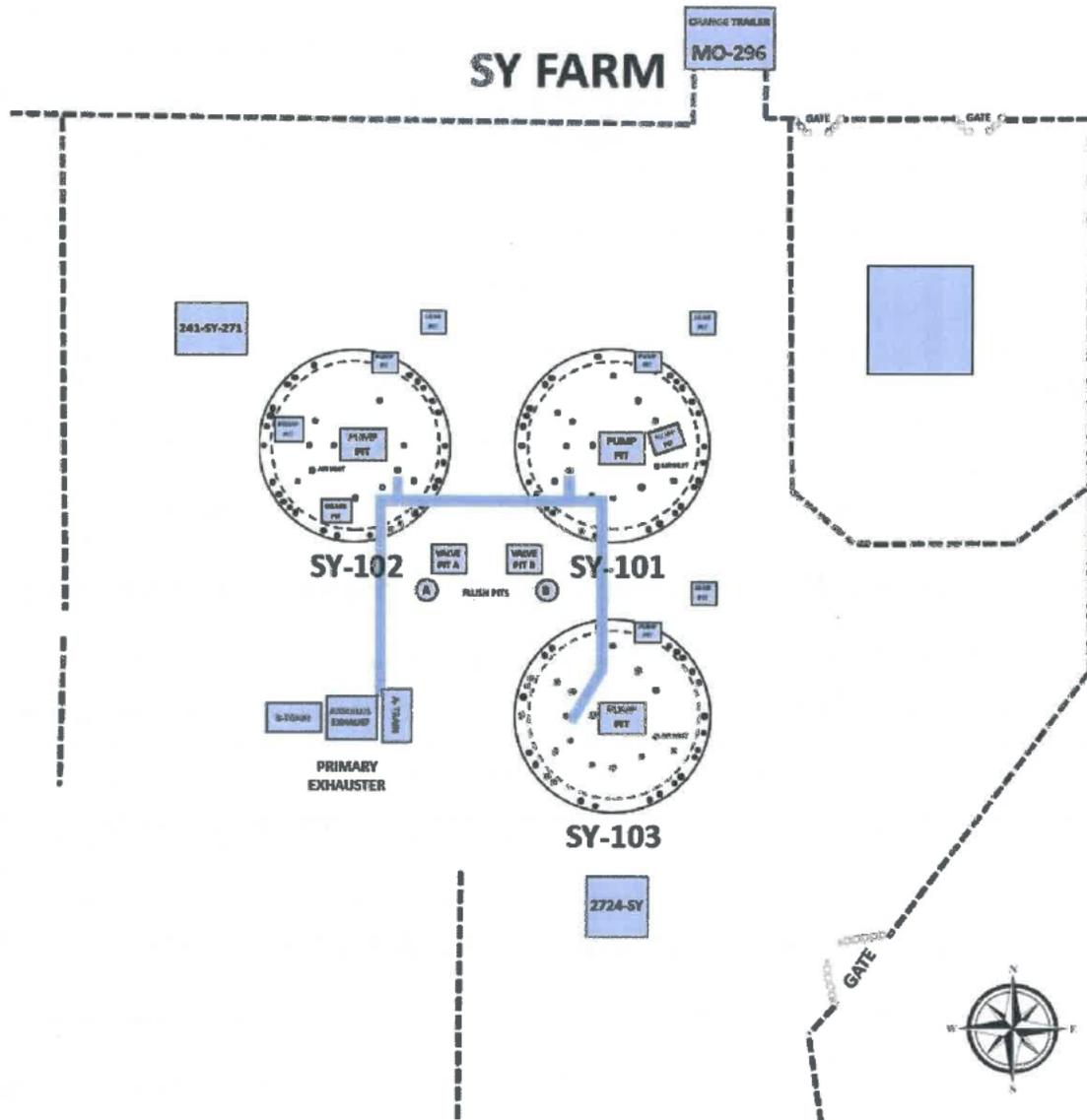
2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD - 241 SY 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.



ODOR/VAPOR RESPONSE CARD - 241 SY FARM

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

- Date and time of event: 1/23/23
- Check Applicable:
 - Odor
 - Ammonia Alarm (6 ppm)
 - Ammonia Alarm (12 ppm)
 - Alarm (other - describe): alarm in group
- Your name and the work you were performing:
[REDACTED] - FWS
- Other Work Underway? Describe:
change trailer
- Location of event (mark area on map and wind direction):
MOZAO SY change trailer
- Name(s) of others in or near the affected area:

- Was Industrial Hygiene present, who?
No
- Describe the odor:
 - Sweet
 - Sour
 - Smoky
 - Septic/Sewer
 - Musty
 - Rotten
 - Metallic
 - Onion
 - Earthy
 - Ammonia
 - Citrus
 - Solvent
 - Other (describe): _____
- Is source known/likely? Describe:
NONE
- Your symptoms? None
 - Headache
 - Dizziness
 - Nausea
 - Cough
 - Fatigue
 - Weakness
 - Sore Throat
 - Difficulty Breathing
 - Eye Irritation
 - Rash
 - Itch
 - Tingling
 - Numbness
 - Taste
 - Other (describe): _____

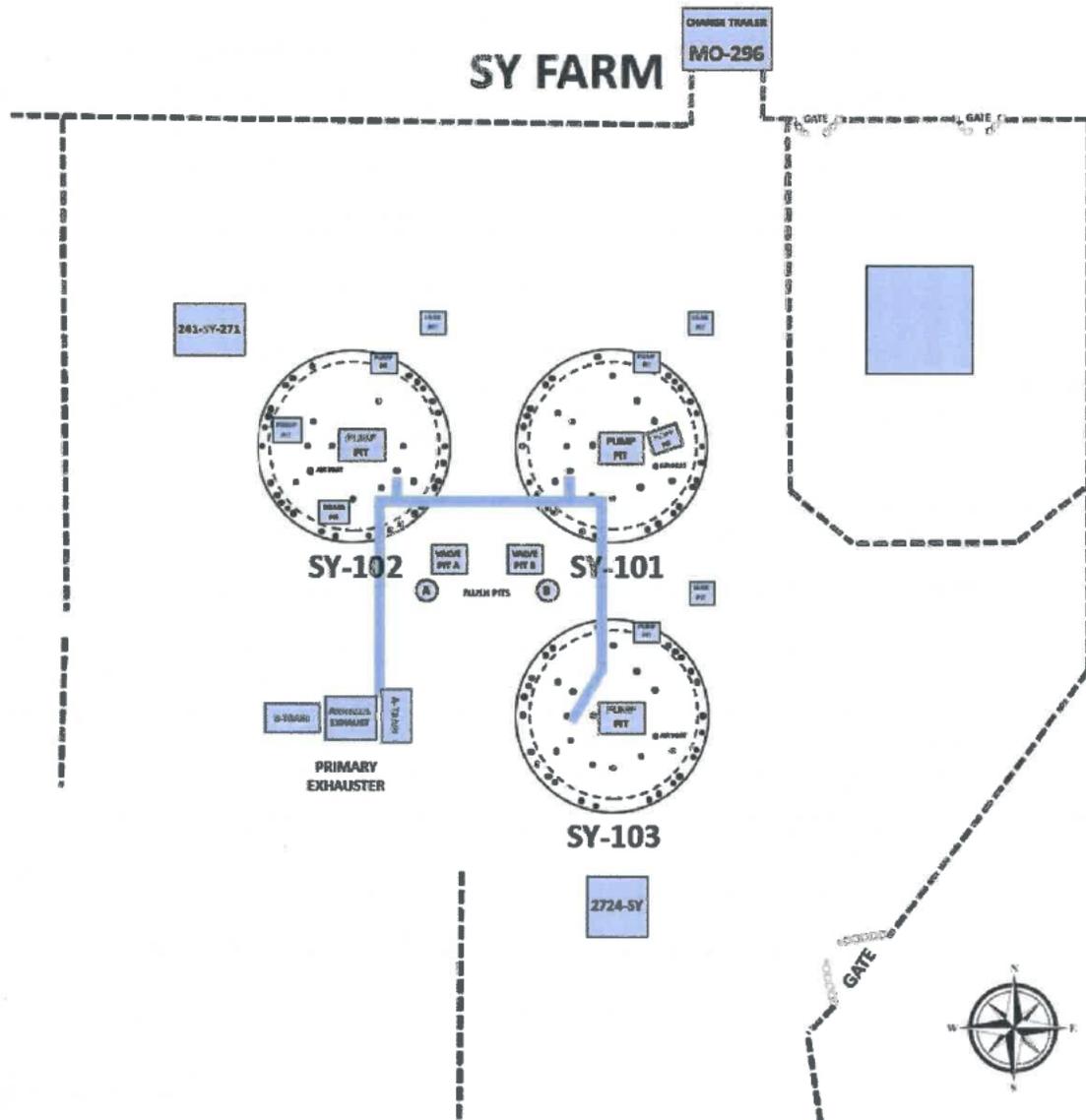
2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD - 241 SY 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.



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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

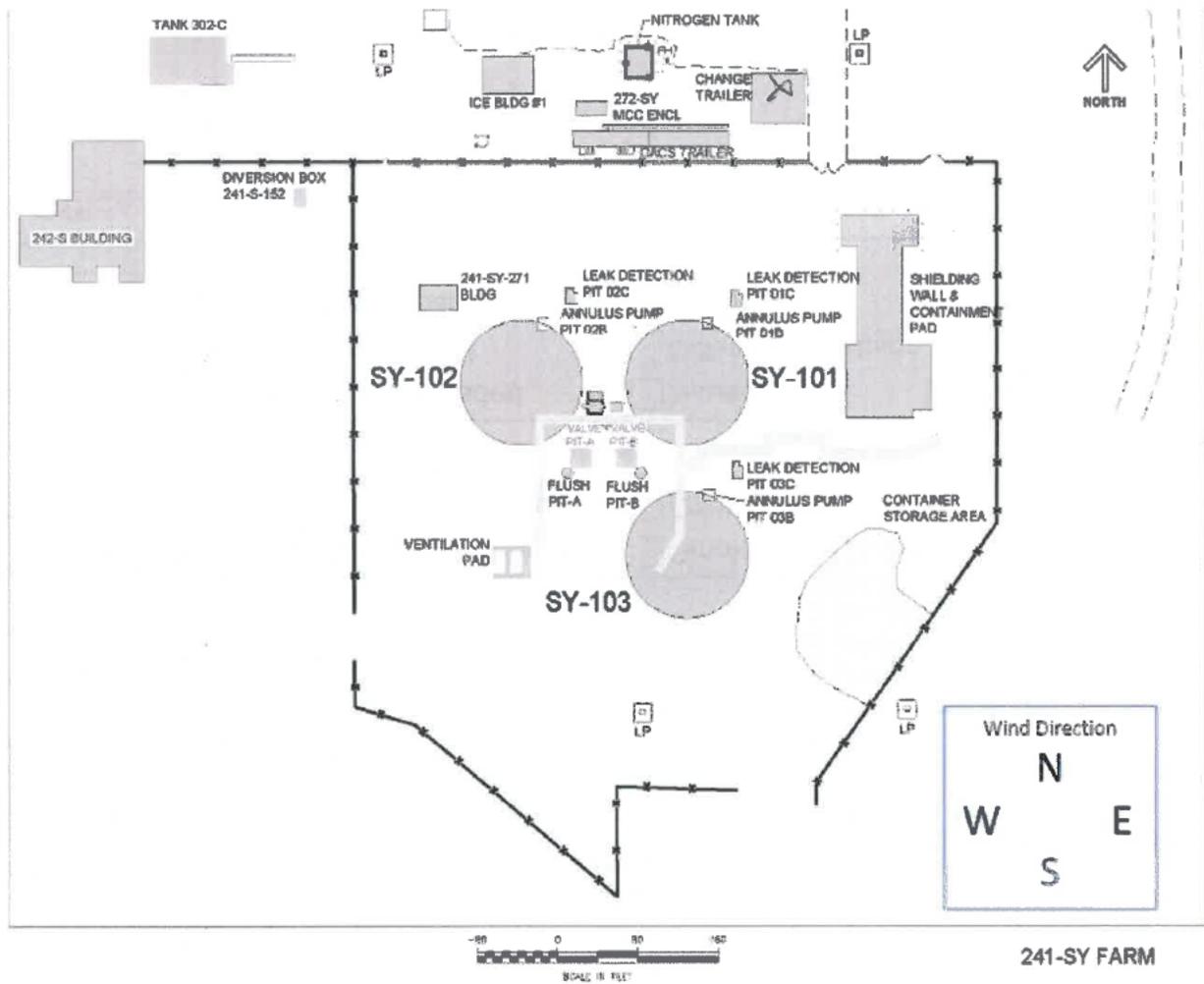
- Date and time of event: ~ 0900 1/23/23
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work you were performing:  MPT
- Location of event (mark area on map and wind direction): _____
- Name(s) of others in or near the affected area: MO-296
- Was an IHT present? NO
- Describe the Odor: Sweet Sour Musty Earthy Metallic Smoky Rotten Onion
 Septic Ammonia Cleaning Solution Other: None
- Possible Source: UNK
- 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 - 241-SY FARM

ODOR OR VAPOR ALARM EVENT

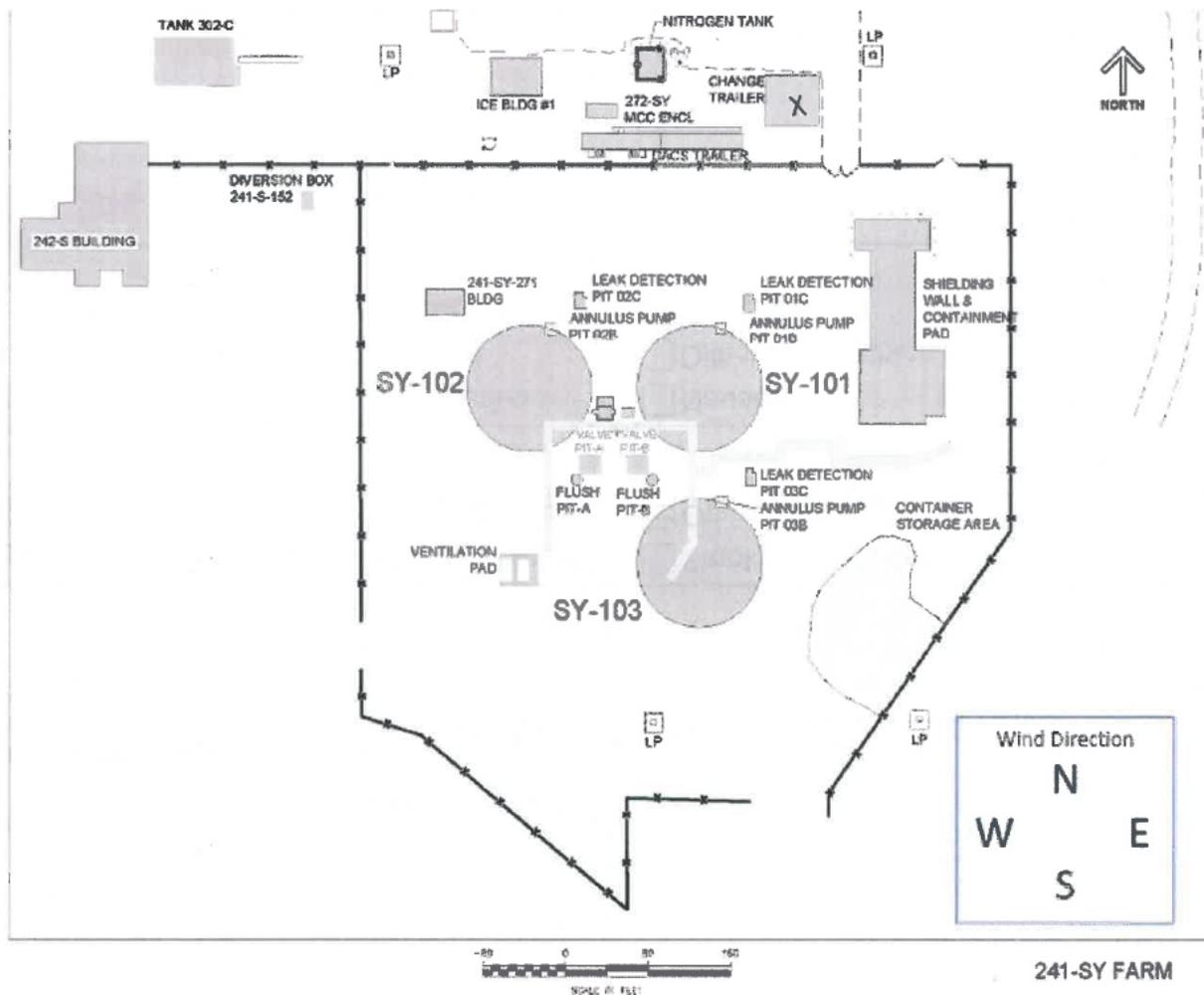
1. Notify Immediate Supervisor.
2. Contact Central Shift Manager (CSM), [REDACTED] complete below bulleted information and map.
 - Your name and the work you were performing
 - Your symptoms *(if any)*
 - Date and time of event
 - Location of event *(mark area on map and the wind direction)*
 - Describe 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.**



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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.



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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

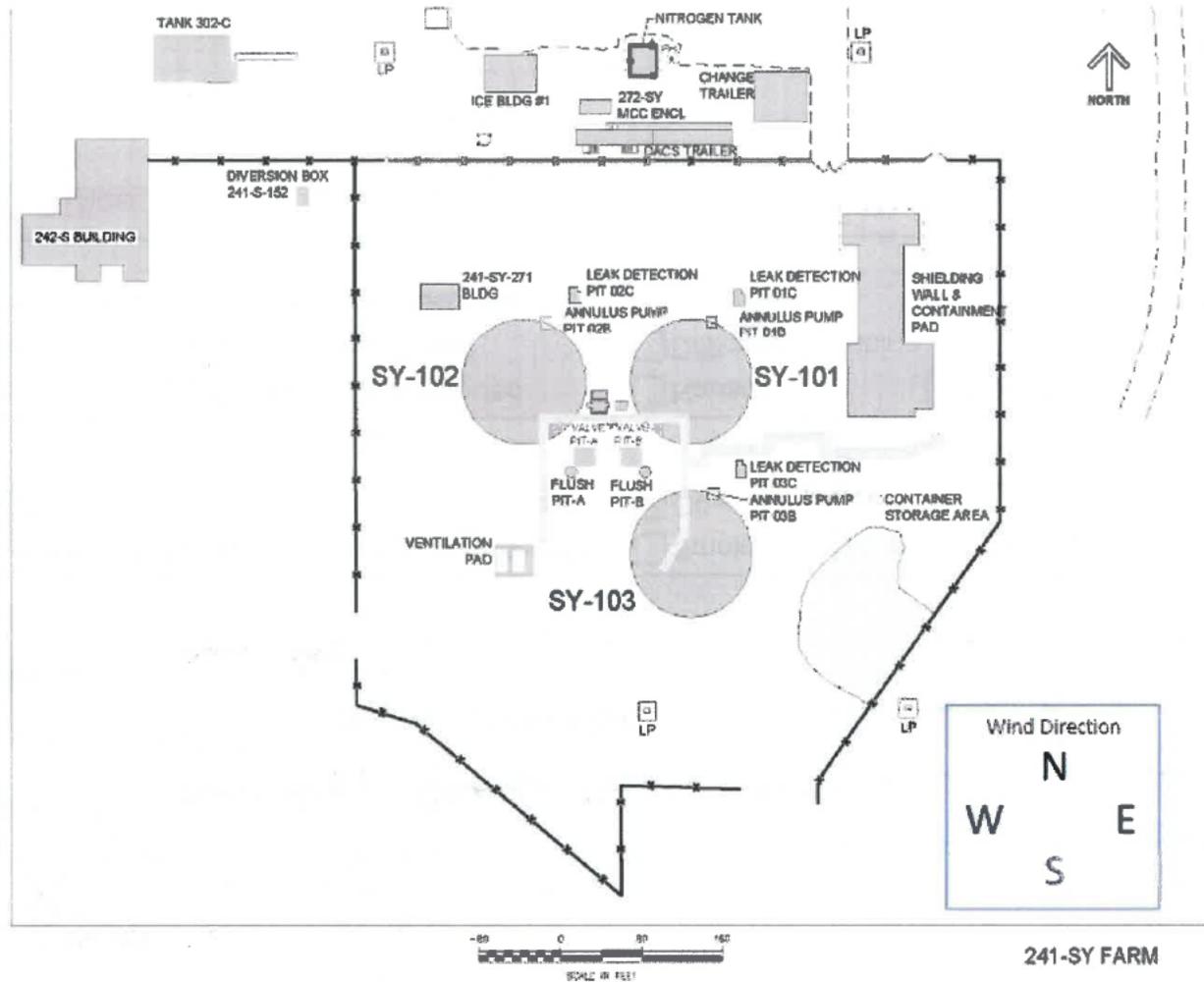
- Date and time of event: 9:15am 1/23/23
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work your were performing: [Redacted] Change Trailer MO-296
- Location of event (mark area on map and wind direction): Trailer MO-296
- Name(s) of others in or near the affected 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: _____
- 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.

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.**



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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

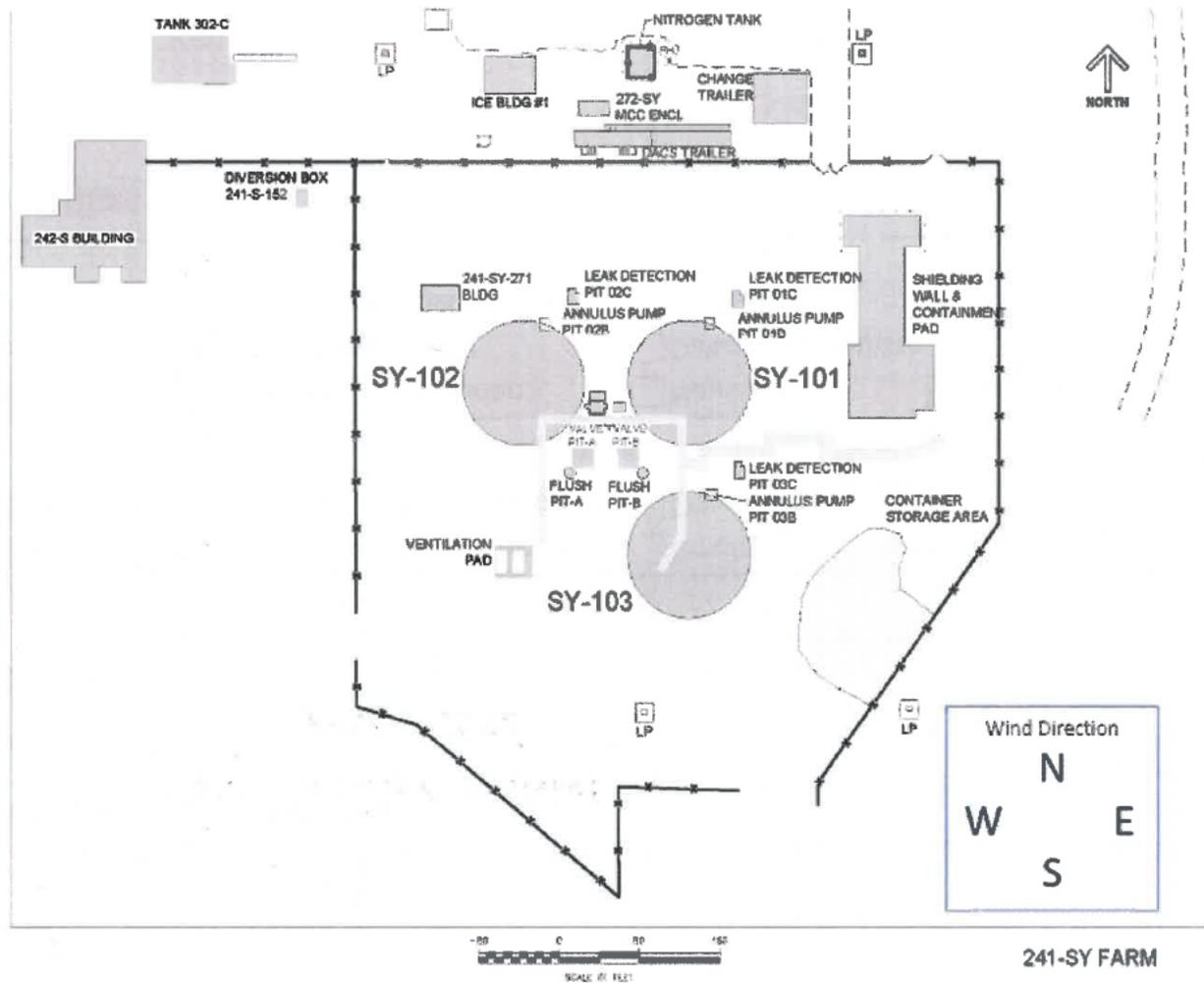
- Date and time of event: 1-23-23
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work your were performing: Sy Trailer maint
- Location of event (mark area on map and wind direction): MD-296
- Name(s) of others in or near the affected area: _____
- Was an IHT present? No
- Describe the Odor: Sweet Sour Musty Earthy Metallic Smoky Rotten Onion
 Septic Ammonia Cleaning Solution Other: _____
- 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.

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.**



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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

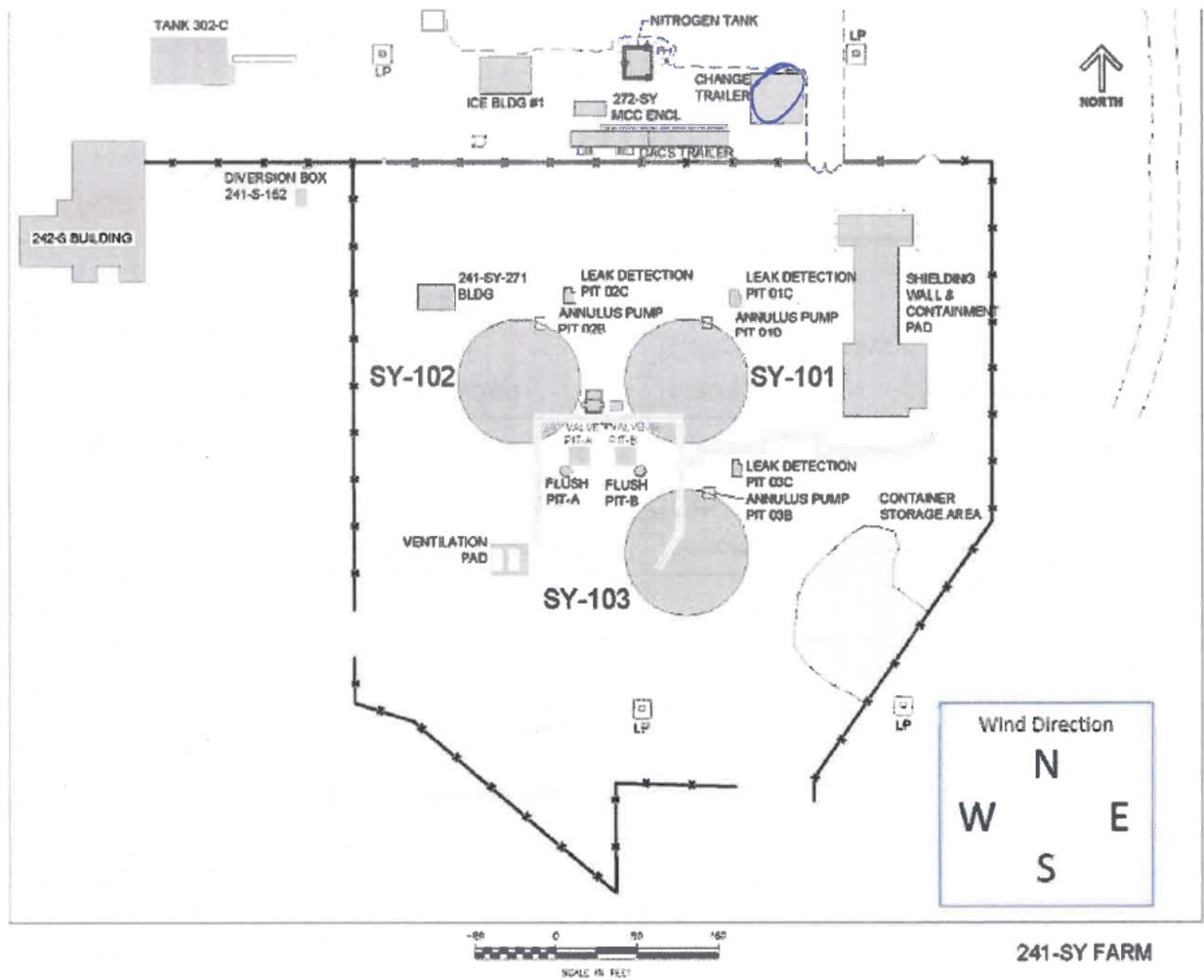
- Date and time of event: 09:15 1.23.23
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work your were performing: Exit change trailer
- Location of event (mark area on map and wind direction): MO-296
- Name(s) of others in or near the affected area: _____
- Was an IHT present? NO
- Describe the Odor: Sweet Sour Musty Earthy Metallic Smoky Rotten Onion
 Septic Ammonia Cleaning Solution Other: _____
- 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 - 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.**



ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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

- Date and time of event: 1/23/23 0910
- Check Applicable: Odor Alarm 6 ppm Alarm 12 ppm Alarm Other: _____
- Your name and the work your were performing:  Sump level
- Location of event (mark area on map and wind direction): MO-296
- Name(s) of others in or near the affected area: _____
- Was an IHT present? No
- Describe the Odor: Sweet Sour Musty Earthy Metallic Smoky Rotten Onion
 Septic Ammonia Cleaning Solution Other: NONE
- 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: NONE

2. Send this card to the Central Shift Office.

ODOR/VAPOR RESPONSE CARD - 241-SY FARM

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.**

