

EVENT INVESTIGATION REPORT

TF-AOP-015 Event West of TX Change Trailer

EIR-2019-038

[Redacted]

Event Investigation Team Lead

Date

10/08/19

[Redacted]

Event Investigation Team Under Instruction

Date

10/08/19

[Redacted]

PER Responsible Manager

Date

10/08/19

TF-AOP-015 Event West of TX Change Trailer

Executive Summary

On Wednesday, September 4, 2019 at 1330, while performing Winterization (WO#505553) at the TX Farm Change Trailer (MO817), two electricians encountered odors outside the Farm near the change trailer. They immediately left the area and returned to 272WA. They notified the Field Work Supervisor (FWS), who then contacted the Central Shift Office. (CSO). The CSO declared entry into TF-AOP-015 and made notifications per procedure. The CSO initiated an Event Investigation and Industrial Hygiene (IH) responded. Neither electrician exhibited any signs or symptoms. Both individuals declined medical evaluation at HPMC. All sample results were below detectable and/or action levels.

Interviews with the affected individuals were conducted in lieu of an event investigation meeting. Considering wind direction, plausible odor source was the TX/TY Tank Farm.

Investigation Summary

On Wednesday, September 4, 2019 two electricians performing Winterization (WO#505553) drove together to the TX Farm Change Trailer (MO817), entering the area from the north, and parking in front of the change trailer. Electrician 1 entered the change trailer to perform duties. Electrician 2 exited the truck and proceeded to the disconnect rack near the fence. Electrician 1 exited the Change Trailer at approximately 1330. As Electrician 1 approached the disconnect rack, he noticed a faint "onion-like" odor. When he got closer, Electrician 2 asked, "Do you smell that?" Both Electricians noticed odors described as Ammonia. The two electricians immediately left the area and returned to 272WA. Upon arrival at 272AW, Electrician 2 notified the FWS who contacted the Shift Office. Both electricians then completed odor response cards. Both indicated they had no symptoms and declined medical evaluation.

At 1351, the CSO sent out a Shift Office Event Notification (SOEN) declaring a TF-AOP-015 at the TX Farm Change Trailer and at 1356 Odor Response Cards were received at the CSO. CSO restricted access to the Tank Farm and requested assistance from IH. At 1441, IHTs depart CSO to perform TF-AOP-015 field response actions. At 1708, SOEN was issued "Response actions for the TF-AOP-015 event at TX Farm have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM"

Interviews with the two electricians and the FWS were conducted in lieu of an event investigation meeting based on the limited number of individuals involved.

Event Timeline

09/04/2019

- 1351: SOEN: “Entering TF-AOP-015 for odors at the TX Farm change trailer outside the farm. Stay clear of this area” CSM
- 1354: Central Shift Manager (CSM) briefs Shift Production Operations Operating Engineer (SPO OE) and Shift Production Operations Nuclear Control Operators (SPO NCOs) on access restriction. SPO OE and SPO NCOs depart CSO to perform access restriction activities.
- 1356: Odor Response Cards (ORCs) arrive at CSO
- 1358: CSM initiates response actions as per TF-AOP-015 3.1.12
- 1414: COMs FIHP briefs PO IHTs on response actions
- Respiratory Protection Equipment (RPE) will be worn in accordance with RPF TF-AOP-015 task 2
 - Monitoring will be performed as per Industrial Hygiene Sampling Plan IHP-09001
 - Ammonia (NH₃), Volatile Organic Compound (VOC), H₂S monitoring will be performed in area of concern
 - Two (2) grab samples will be collected.
 - One (1) grab sample from general area
 - One (1) grab sample from source if identified, or from general area if no source is identified)
 - Perform monitoring of grab samples for Nitrous Oxide (N₂O), elemental mercury (Hg) at Production Operations Temporary IHT Lab (MO511), transport grab samples to 2704 HV Industrial Hygiene Programs IHT Lab for analysis by NUCON HAPSITE® portable GC/MS.
- 1438: CSM contacts Plutonium Finishing Plant Central Shift Manager (PFP CSM) to acquire access to PFP Restricted Access Zone (PFP RAZ) for PO IHTs performing response actions.
- 1708: SOEN: “Response actions for the TF-AOP-015 event at TX Farm have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

Meteorological Data

Event	TF-AOP-015 Event West of TX Change Trailer					
Date/Time of event	September 04, 2019/1330					
Location	West of TX Change Trailer (MO817)					
Odor	Ammonia, “Onion-like”					
Symptoms	No symptoms reported					
DRI results during event	Less than Detection Level (DL) for ammonia (NH ₃) and Hydrogen Sulfide (H ₂ S) on sweep of reported odor location					
Possible source(s)	Vapors from the TX/TY Tank Farm					
Weather conditions on September 04, 2019 1330 (data from weather station 6)	Time	Wind Dir (From)	Wind Speed	Ave Temp	Bar	Relative Humidity
	1300	114	4.0mph	83.5F	29.3	24%
	1330	66	5.0mph	84.0F	29.3	24%
	1400	58	8.0mph	84.7	29.2	25%
Waste disturbing or tank work in adjacent area	No waste disturbing activities or tank work occurring in TX/TY Farm or adjacent areas.					

IH Response Team Sample Results (Adjacent to TX/TY Farm)

Agent	Result
NH ₃	<IDL
H ₂ S	<IDL
N ₂ O	0.3ppm (actionable hazard level 25 ppm)
Hg	13 ng/m ³ (actionable hazard level 12,500 ng/m ³)
VOC	10ppb (actionable hazard level 2 ppm)

*Instrument Detection Limit (IDL)

Compensatory Measures

- The affected in-field workers immediately left the area and returned to 272WA, where they notified the FWS, who contacted the CSO.

Preliminary Extent of Condition Review

- No extent of condition exists for this investigation

Facility Impact

- No facility impact associated with this event

Discussion of Potential Causes

- Vapors from the TX/TY Tank Farm are a potential source

Discussion of Positive Aspects of the Event

- Event response was well coordinated from the CSO
- Electricians immediately left the area and informed their supervisor

Recommendations/Proposed Corrective Actions

- No recommendations or proposed corrective actions

Figures:

1. Aerial View of TX/TY farm

Attachments:

1. Industrial Hygiene Investigation Report

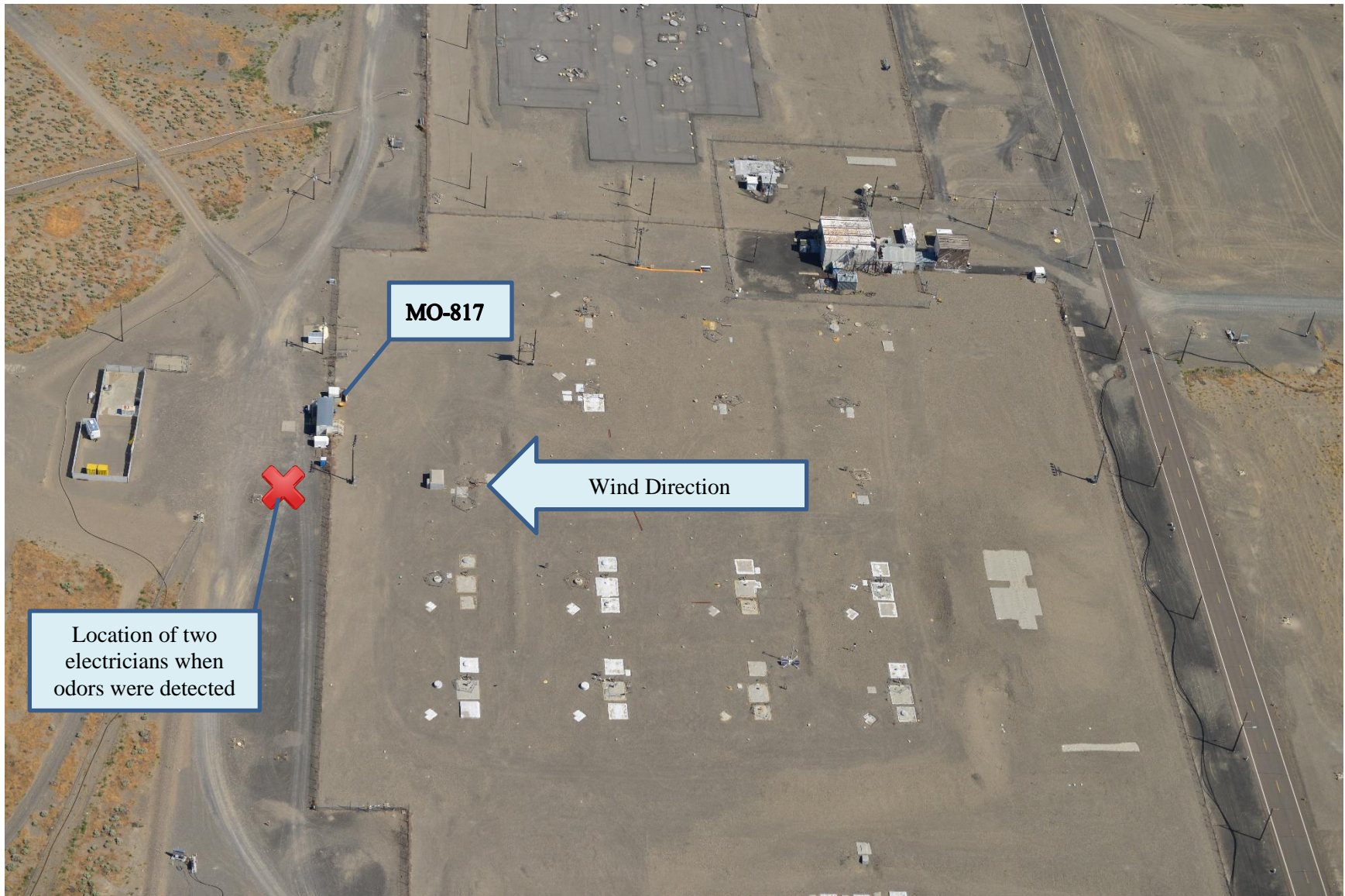


Figure 1- Aerial View of TX Farm- This figure shows the relative location of the electricians and the wind direction when odors were detected.

Attachment 1
Industrial Hygiene Investigation Report

TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**PER Number:**
WRPS-PER-2019-1821**Time/Date & Event location:**

1330 09/04/2019 W of 241-TX/TY Change Trailer (MO817)

EIR Number:
EIR-2019-0381. **Event Summary** *(including number of workers involved and activity in progress):*

At approximately 1330 two (2) Electricians South West of the 241TX/TY change trailer (MO817) smelled an "ammonia, onion" odor. No symptoms were reported at that time.

- Was an IHT Present during initiating event? [] Yes [X] No

IH Monitoring/ Sample Survey Reports:

Event response: 19-07997 "AOP 15 TX Change Trailer"

Weather Conditions at Time of Event:

Ambient outside conditions:

- | | |
|---|-----------------------|
| • Weather station: | Station 19 @ 1330 |
| • Wind Direction and Speed: | E @ 5 mph |
| • Barometric Pressure (<i>steady/rising/falling</i>): | 29.26" Hg and falling |
| • Temperature (F°): | 84 |
| • Humidity: | 26% |

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Field Response Timeline:

- 1351: SOEN: "Entering TF-AOP-015 for odors at the TX Farm change trailer outside the farm. Stay clear of this area. CSM"
- 1354: AN Team Field Industrial Hygiene Professional (AN FIHP), Central Operations and Maintenance Field Industrial Hygiene Professional (COMs FIHP), AY/AZ Team Field Industrial Hygiene Professional (AY/AZ FIHP), Production Operations East Industrial Hygiene Manager (PO EIHM) arrive at Central Shift Office (CSO)
- 1354: Central Shift Manager (CSM) briefs Shift Production Operations Operating Engineer (SPO OE) and Shift Production Operations Nuclear Control Operators (SPO NCOs) on access restriction. SPO OE and SPO NCOs depart CSO to perform access restriction activities.
- 1356: Odor Response Cards (ORCs) arrive at CSO
- 1356: SY Team Field Industrial Hygiene Professional (SY FIHP) Contacts AN FIHP to offer support of TF-AOP-015 response actions.
- 1358: CSM initiates response actions as per TF-AOP-015 3.1.12
- 1400: Effluent Treatment Facility Team Field Industrial Hygiene Professional (ETF FIHP), Evaporator Team Field Industrial Hygiene Professional (EV FIHP), Production Operations Field Industrial Hygiene Professional PO FIHP
- 1403: COMs FIHP is notified that Hydrogen Sulfide (H₂S) sensor equipped MultiRAE is in route to ETF for pre-use-function-test.
- 1404: AY/AZ FIHP contacts Production Operations Industrial Hygiene Technician Lead (PO IHTL) to initialize Ohio Lumex and Miran SapphIRe
- 1405: Terra Graphics Engineering Technicians (TGETs) arrive at CSO
- 1406: COMs FIHP briefs TGETs
- 1413: Production Operations Industrial Hygiene Technicians (PO IHTs) and Production Operations Industrial Hygiene Technician Supervisor (PO IHTS) arrive at CSO.
- 1414: COMs FIHP briefs PO IHTs on response actions
- Respiratory Protection Equipment (RPE) will be worn in accordance with RPF TF-AOP-015 task 2
 - Monitoring will be performed as per Industrial Hygiene Sampling Plan IHP-09001
 - Ammonia (NH₃), Volatile Organic Compound (VOC), H₂S monitoring will be performed in area of concern
 - Two (2) grab samples will be collected.
 - One (1) grab sample from general area
 - One (1) grab sample from source if identified, or from general area if no source is identified)
 - Perform monitoring of grab samples for Nitrous Oxide (N₂O), elemental mercury (Hg) at Production Operations Temporary IHT Lab (MO511), transport grab samples to 2704 HV Industrial Hygiene Programs IHT Lab for analysis by NUCON HAPSITE® portable GC/MS.
- 1417: PO IHTs depart CSO to collect RPE, instruments, and supplies
- 1419: COMs FIHP requests AY/AZ FIHP request NUCON HAPSITE® initialization
- 1420: COMs FIHP attempts to contact Industrial Hygiene Programs (IHP) Instrument Lead to support NUCON HAPSITE® initialization
- 1421: AY/AZ FIHP attempts to contact Industrial Hygiene Programs Industrial Hygiene Technician Supervisor (IHP IHTS) to support NUCON HAPSITE® Initialization
- 1421: TGETs depart CSO
- 1423: H₂S sensor equipped MultiRAE arrives at CSO, ETF IHT communicates instrument pre-use function check values to COMs FIHP
- 1423: Industrial Hygiene Programs Manager (IHPM) initiates initialization of NUCON HAPSITE®
- 1424: COMs FIHP contacts PO IHT to notify H₂S sensor equipped MultiRAE has arrived at CSO
- 1438: CSM contacts Plutonium Finishing Plant Central Shift Manager (PFP CSM) to acquire access to PFP Restricted Access Zone (PFP RAZ) for PO IHTs performing response actions.
- 1441: COMs FIHP provides PO IHT the H₂S sensor equipped MultiRAE.
- 1441: PO IHTs depart CSO to perform TF-AOP-015 field response actions
- 1708: SOEN: "Response actions for the TF-AOP-015 event at TX Farm have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM"

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Glossary:

AOP	Abnormal Operating Procedure
ANFIHP	AN Team Field Industrial Hygiene Professional
AYAZFIHP	AY/AZ Team Field Industrial Hygiene Professional
ASAP	As Soon As Possible
COMs	Central Operations and Maintenance
COMsFIHP	Central Operations and Maintenance Field Industrial Hygiene Professional
CSM	Central Shift Manager
CSO	Central Shift Office (274AW Room 5)
CVST	Chemical Vapors Solutions Team
DL	Detection Limit
EIR	Event Investigation Report
ESH&Q	Environmental Safety Health and Quality
ETF	Effluent Treatment Facility
ETFIHT	Effluent Treatment Facility Industrial Hygiene Technician
EV	Evaporator
EVFIHP	EV Team Field Industrial Hygiene Professional
FEI	Fugitive Emissions Investigation
FEST	Fugitive Emissions Sub-Team
H ₂ S	Hydrogen Sulfide
Hg	Mercury
HPMC	Hollie P. Mooers Corporation
IH	Industrial Hygiene
IHP	Industrial Hygiene Plan
IHPIHTL	Industrial Hygiene Programs Industrial Hygiene Technician Lead
IHT	Industrial Hygiene Technician
MO	Mobile Office
N ₂ O	Nitrous Oxide
NH ₃	Ammonia
OE	Operating Engineer
ORC	Odor Response Card
PNNL	Pacific Northwest National Laboratories
PO	Production Operations
POIHT	Production Operations Industrial Hygiene Technician
POIHTL	Production Operations Industrial Hygiene Technician Lead
POIHTS	Production Operations Industrial Hygiene Technician Supervisor
POSIHT	Production Operations Shift Industrial Hygiene Technician
POSIHTS	Production Operations Shift Industrial Hygiene Technician Supervisor
POWASHM	Production Operations West Area Safety and Health Manager
R/C	Retrieval and Closure
RPE	Respiratory Protection Equipment
RPF	Respiratory Protection Form
SM	Shift Manager
TF	Tank Farms
TGET	Terra Graphics Engineering Technician
TGIHRV	Terra Graphics Industrial Hygiene Response Van
TVA2020	Toxic Vapor Analyzer 2020

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Glossary (cont.):

UTNCOL Ultrasonic Testing Nuclear Control Operator Lead
VOC Volatile Organic Compounds

Field IH Author:

[Redacted Name]

Print First and Last Name

[Redacted Name]

[Redacted Phone No.]

Phone No.

10/07/2019

Date

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2. GCMS Sample Results:

See Attachment A for HAPSITE (GCMS) Results

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3. Additional Information:

- Odor Response Cards received:

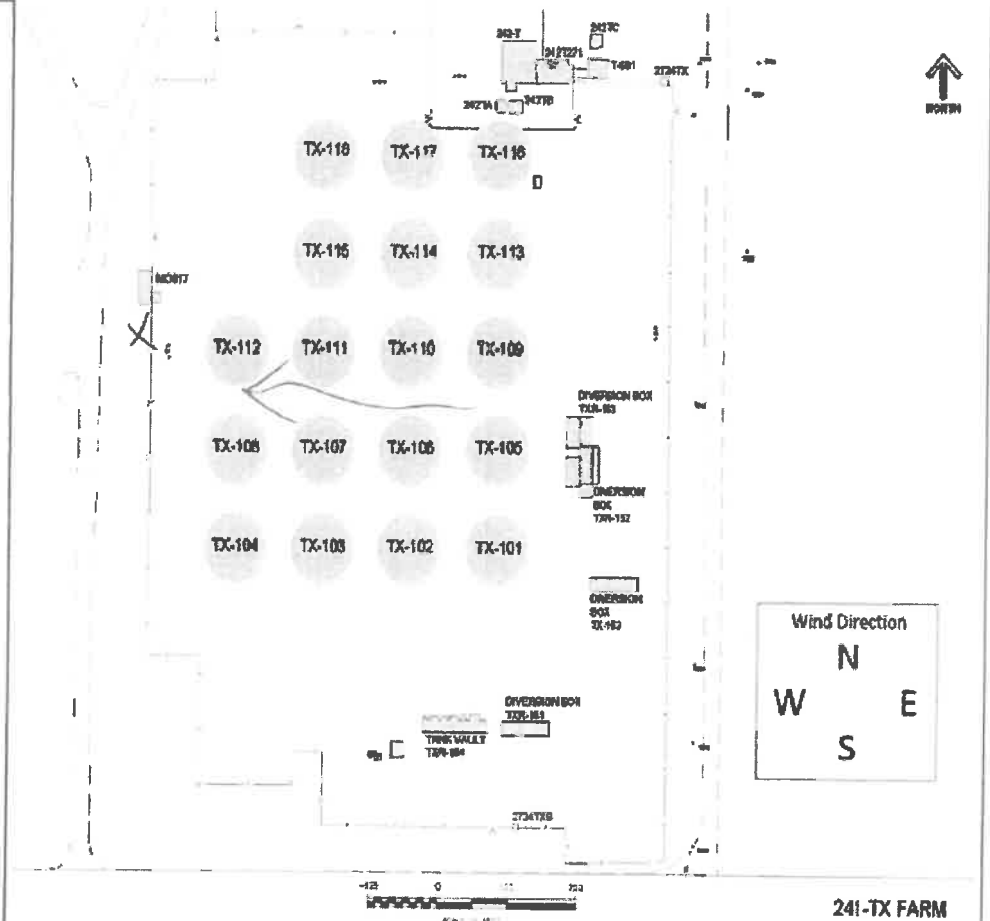
ODOR RESPONSE CARD - 241-TX FARM

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.



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ODOR RESPONSE CARD - 241-TX FARM

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

- Date and time odor was noticed 1:30 PM
- Your name and the work you were performing [Redacted] Winterization
- Location of odors (mark area on map and wind direction) Change trailer SW outside
- 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 ?
- 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.

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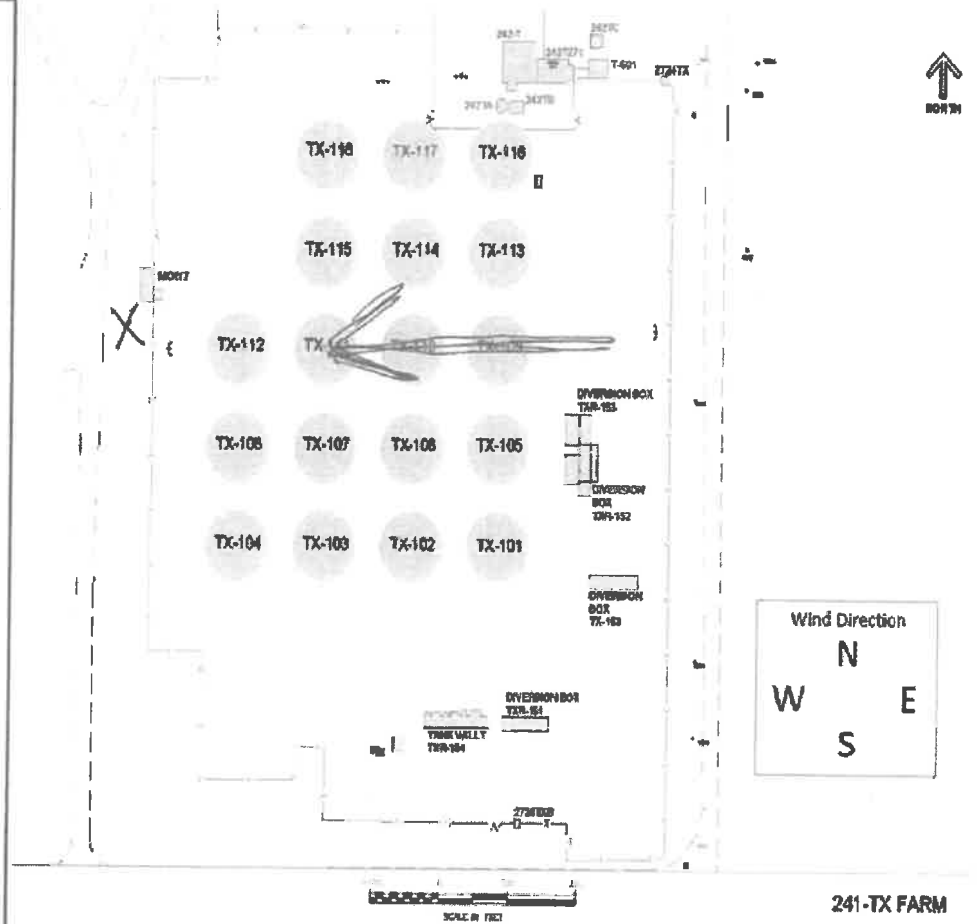
ODOR RESPONSE CARD - 241-TX FARM

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.



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ODOR RESPONSE CARD - 241-TX FARM

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

- Date and time odor was noticed 9-4-19 1:30PM Ammonia
- Your name and the work you were performing [REDACTED] winterization
- Location of odors (mark area on map and wind direction) At change trailer wind was blowing E to W
- 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 TX Farm Tanks
- 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.

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• **Summary of IH Monitoring and Sampling Data:**

a. **Monitoring:**

Event Response: 19-07997 "AOP 15 TX Change Trailer"

DRI field readings:

VOC:	10 ppb
NH ₃ :	<DL
H ₂ S:	<DL

Grab samples:

VOC:	10 ppb
NH ₃ :	<DL
Hg:	13 ng/m ³
CO:	<DL
O ₂ :	20.9%
LEL	0.000%
N ₂ O:	0.3 ppm
H ₂ S:	<DL

b. **Sampling:**
N/A

4. Summary of Employee Reported Information (e.g., symptoms)

None of the employees reported experiencing symptoms

5. Recommendations/Conclusions:

Identification of Source of the Concern: [] Yes [x] No

6. Other:

S&H Program Management:

[Redacted]

Print First and Last Name

[Redacted]

[Redacted]

Phone No.

10/9/19
Date

Attachment A
GCMS Laboratory Results

HAPSITE GC-MS Bag Sample Results Survey 19-07997, TX Tank Farm: (EIR-2019-038).

Two bag samples were collected in response to an odor reported at TX Tank Farm. These samples were analyzed using an Inficon HAPSITE GC-MS on September 5, 2019. Data was submitted for interpretation on September 30, 2019, interpreted on October 1, 2019, and reported the same day. Results for the System and Bag Blank Samples were satisfactory. Bag sample results are found below. The compounds listed below were found in both samples and the zero air-sample bag blank at concentrations consistent with sample bag contaminants.

Compounds Found in Samples

Compound	Clean Air Blank	Zero Air-Bag Blank	Bag #1	Bag #2	Comments
Internal Standard #1	X	X	X	X	Added by instrument during analysis
Plasticizer (Methyl Methacrylate)				X	Typical sample bag component
Internal Standard #2	X	X	X	X	Added by instrument during analysis
C10 Terpene (D-Limonene)		X	X	X	Typical sample bag component
Silane Compound (Tetramethylsilane)		X	X	X	Typical sample bag component
C9-15 Alkane Hydrocarbons		X	X	X	Not found above background

No compounds were found at concentrations above background.

If you have questions contact [REDACTED] CIH at [REDACTED]

[REDACTED]