Port Hamilton Refining and Transportation, LLLP (PHRT)

St. Croix, U.S. Virgin Islands

Caribbean Regional Response Team Meeting
January 23-25/2024
Rio Piedras, Puerto Rico

Christopher Jimenez, OSC EPA Region 2

EPA General Duty Clause - Section 112(r)(1) of the Clean Air Act

- Section 112(r)(1) of the Clean Air Act Amendments of 1990, also known as the General Duty Clause (GDC), requires owners and operators of facilities to ensure regulated chemicals are managed safely

WHAT DOES THE GENERAL DUTY CLAUSE INVOLVE?

- Facilities subject to the General Duty Clause are responsible to:
  - Identify hazards posed by chemicals and assessing impacts of possible releases,
  - Design and maintain a safe facility and take necessary steps to prevent an accidental release,
  - Minimize consequences of accidental releases that do occur

EPA General Duty Clause (GDC) Inspection

- EPA conducted a GDC inspection at the PHRT facility the week of September 20, 2022
- During the inspection, EPA inspectors observed numerous examples of corrosion on process valves, flanges, pipes, nuts, bolts, and pressure relief devices in all the process units viewed during the Inspection

PHRT Chemical Removal Schedule

- EPA entered into a legal agreement requiring the facility to hire experts to safely remove chemicals in process equipment EPA had identified as being of concern during the inspection
- EPA conditionally approved plans to safely remove the three identified chemicals at the refinery:
  - Ammonia
  - Liquid Petroleum Gas (LPG)
  - Rich Amine Solution
- EPA employees were on the facility during the entire chemical de-inventory operation

Rich Amine Solution

- An amine system removes hydrogen sulfide (H_2S) and carbon dioxide (CO_2) from various fuel gases produced in a refinery
- Removal of waste gases are an important process to prevent corrosion and meet environmental regulations

- When an amine solution is referred to as “rich,” it means that the amine solution contains H_2S
- Amine has a fishy smell, while H_2S smells a bit like rotten eggs

PHRT Chemical Removal Schedule

LIQUID AMINES

- PHRT began the chemical de-inventory of the liquid amines on April 25, 2023
  - 327,112 gallons liquid amines have been removed from the process vessels and placed into 63 ISO containers
  - As of June 27, all 63 ISO containers were shipped off island for disposal
  - The remaining ISO containers were staged on the property, then at the container port awaiting shipment and disposal off island
- The amine de-inventory operation was completed on June 27, 2023


DANA
DYNAMIC
USDOT-201-6389

PHRT Chemical Removal Schedule

AMINE VAPOR

- PHRT began the amine vapor degassing on May 20, 2023
- A steam boiler was used to degas the lines
- The gas vapor that remained in the process unit was treated using a passive scrubber unit.
- All amine vapor was required to be captured and destroyed with use of in-line passive scrubbers before the unit can be cleaned
- All rinsate from this process was captured and staged on site initially in portable Frac tanks and then was transferred to 2 bulk storage tanks for disposal

AMMONIA

- Ammonia is a colorless gas with a very distinct odor
  - The odor is familiar since it is used in many household cleaners and smelling salts
- High levels of ammonia can irritate and burn the skin, mouth, throat, lungs and eyes
- Ammonia gas is easily compressed into a liquid, and when in a gaseous phase it dissolves easily in water

PHRT Chemical Removal Schedule

AMMONIA

- In March 2023, PHRT began making repairs to the ammonia system. Repair operations included encasing approximately 190 corroded or suspect valves and piping in the ammonia system
- The chemical de-inventory of the anhydrous ammonia was completed from May 10 – 14, 2023
  - 8,400 gallons of anhydrous ammonia was removed from the process vessels and related piping and placed into 2 ISO containers
  - The ISO containers were staged on the property, then at the container port pending shipment off island
- All Ammonia liquid ISO containers were shipped off island on June 22, 2023.

Close-up view of a carbon fiber-wrapped flange at Ammonia Drum D-7305. The carbon fiber wrap is rated to withstand approximately 2,000 pounds per square inch (PSI).

PHRT Chemical Removal Schedule

AMMONIA VAPOR

- The ammonia vapors within the ammonia tanks were removed and sparged
- Sparging is a process in which a gas is bubbled through water to remove the gases
  - Ammonia dissolves in water very easily to form ammoniated water
- 27 totes of ammoniated water were generated and are staged on PHRT property awaiting proper disposal
- After sparging the Ammonia Drums and associated piping were gas freed with Nitrogen.

Liquid Petroleum Gas (LPG)

- LPG is a flammable hydrocarbon gas made from propane, butane and small amounts of other hydrocarbons
- LPG generally has no odor, unless an odorant like mercaptan has been added to help people smell dangerous gas leaks
  - LPG at the facility is not odorized
- LPG is kept in pressure vessels to keep the gas in a liquid state

PHRT Chemical Removal Schedule

LIQUID PETROLEUM GAS (LPG)

- PHRT began the chemical de-inventory of the LPG on May 20, 2023
  - 26,700 gallons of LPG have been removed from the process vessels and placed into 5.5 ISO containers
  - The ISO containers staged on the property, then at the container port pending shipment off island
- De-inventory of the liquid LPG was be completed on July 21, 2023
- The last of the LPG was shipped off the island on 10/24/2023

PHRT Chemical Removal Schedule

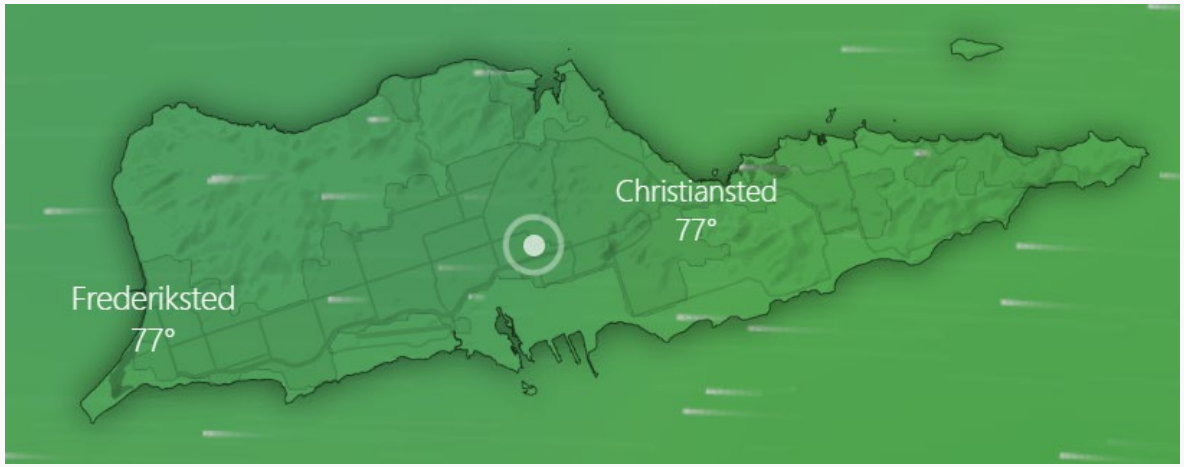
LPG VAPOR

- Part of the process to remove the LPG includes addressing the LPG vapor by using a thermal oxidizer
- A thermal oxidizer is a process unit that decomposes hazardous gases at a very high temperature
- Thermal oxidation began on June 21, 2023, and was completed on July 26, 2023

Nitrogen Dioxide and Sulfur Dioxide

- Using a thermal oxidizer is one of the most effective and proven methods to destroy hazardous gases
  - however, incomplete combustion can create nitrogen dioxide (NO_2) and sulfur dioxide (SO_2)
  - Use of the thermal oxidizers was conducted with very narrow temperature and pressure parameters
- EPA conducted air monitoring in the community and at the facility for NO_2 and SO_2

HOW IS EPA KEEPING THE PUBLIC SAFE

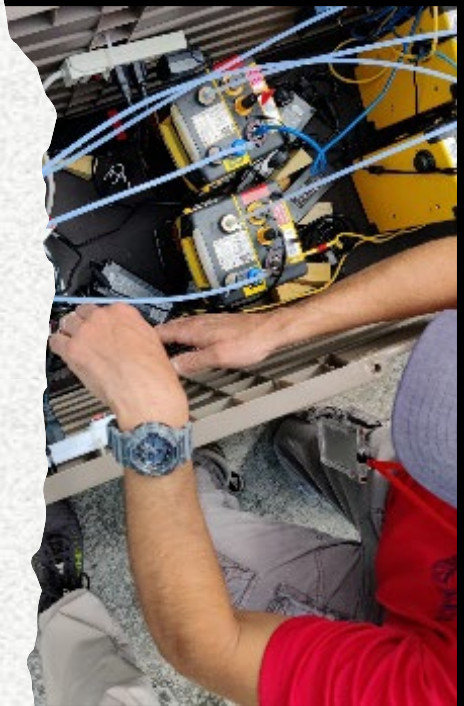


EPA conducted continuous air monitoring 24 hours a day for the entirety of removal operations

Air monitors were located in the facility, at operational locations, on the fence line of the facility and within the communities downwind and near the facility.

EPA actively monitored for the following chemicals of concern:

- **Hydrogen Sulfide (H_2S)**
- **Ammonia (NH_3)**
- **Sulfur Dioxide (SO_2)**
- **Nitrogen Dioxide (NO_2)**
- **Volatile Organic Compounds (VOCs)**



Fence Line Air Monitors

EPA Air Monitoring Equipment at Community Monitors

Community Air Monitors

EPA PUBLIC VIEWER

For information on EPA activities in the community and to view air monitoring data, visit:

https://phrt-epa.hub.arcgis.com/

What does each color mean for me?

Tier	Color
1	Green
2	Yellow
3	Red

- **GREEN**
  - While odors may be present, no adverse health effects are expected
  - No actions to be taken
- **YELLOW**
  - General public may experience discomfort and irritation
  - Await direction from Alert VI for downwind communities
- **Red**
  - Await direction from VITEMA for possible shelter-in-place
  - Await direction from VITEMA for how to reduce exposure risk

What happens when there is a color change on a monitor

If a monitor detected high concentrations of one of the compounds, VITEMA, DPNR and VI DOH were be notified

- Next steps were determined based upon where the monitor is located, concentrations detected and what activities are taking place on the facility
- The steps routinely involved EPA deploying a roving team to the location with DPNR to confirm readings

EPA NUISANCE ODOR HOTLINE

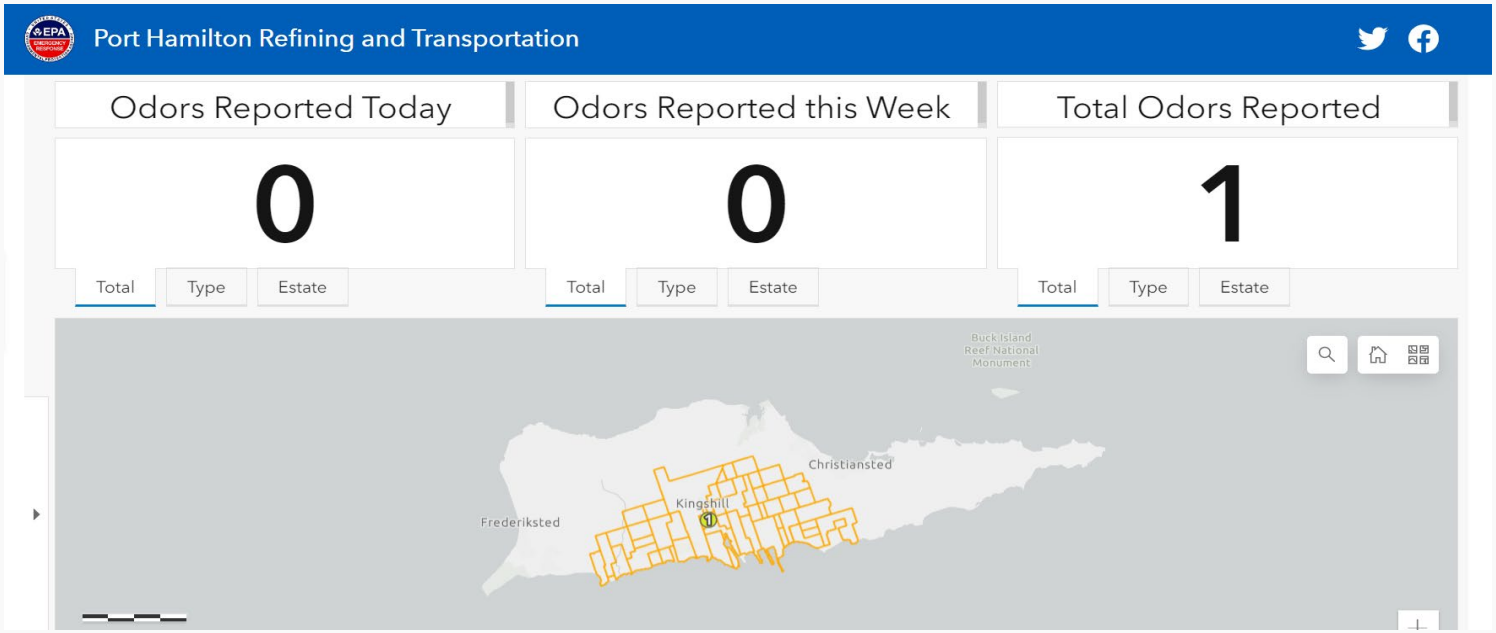
1-866-462-4789

EPA staffed a nuisance odor hotline for residents to call to report odors. Information residents were asked to provide include:

- Date and time the odor was observed
- The estate the odor was observed in
- A brief description of the odor
- Was the odor persistent or has it passed
- Have you notified any local agency

***All calls are taken anonymously; private information does not need to be provided. If any personal information is provided to EPA, it is protected under the Privacy Act and will not be released to any other entity.**

Nuisance Odor Complaints



- This dashboard on the EPA website showed all calls received to the hotline
- Yellow circles on the map represented the number of odor complaints received for each area
- All calls outside of the identified estates were referred to DPNR

How to Stay Informed on PHRT activities and EPA Community Air Monitoring

Call toll-free EPA hotline at (866) 462-4789

Visit the EPA Air Monitoring Website
https://phrt-epa.hub.arcgis.com/

Email EPA: stcroix@epa.gov

Sign up for VITEMA Alerts:

https://member.everbridge.net/index/89280773672900 8#/login

Visit the EPA Website on the PHRT Refinery at
https://www.epa.gov/vi/refinery-st-croix-us-virgin-islands