Environmental Reportable Events Summary

Event Date: April 17, 2023

Event Title: Plant 2 No. 2 Fluidized Catalytic Cracking Unit Shutdown for 2023 Turnaround

Impacted Media (air, water, or soil): Air

Operating Unit: Plant 2 Main Plant Flare

Event Summary:

On April 17, 2023, Suncor initiated the shutdown of the Plant 2 process units to prepare for a planned turnaround event. A turnaround is a scheduled maintenance event where refinery process units are taken offline for a period of time to undergo maintenance, inspection, and repairs. As is standard procedure during the shutdown of the No. 2 Fluidized Catalytic Cracking Unit (No. 2 FCCU), it was necessary to vent overpressure from the unit to the Plant 2 Main Plant Flare to prevent unsafe conditions. The venting of these gases resulted in elevated hydrogen sulfide (H_2S) concentrations at the Plant 2 Main Flare. H_2S is combusted at the flare tip, which results in the generation of sulfur dioxide (SO_2) and water vapor.

The Plant 2 Main Plant Flare gas H_2S limit was exceeded from 11:00 a.m. to 2:00 p.m. on April 17, 2023.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Maximum Reported Value
162 ppm H_2S in flare gas for a 3-hour average	**216 ppm** H_2S in flare gas (3-hour rolling average)

The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.

Event Date: April 22, 2023

Event Title: Oil Movements Division 1 Vapor Combustor Temperature Excursion

Impacted Media (air, water, or soil): Air

Operating Unit: Plant 1 OMD-1 Rail Rack Vapor Combustion Unit

Event Summary:

On April 22, 2023, during regular loading operations at the Oil Movement Division 1 (OMD-1) Rail Rack, the combustion zone temperature of the OMD-1 Rail Rack Vapor Combustion Unit (VCU) fell below the permitted minimum threshold of 1,299°F (calculated on the basis of a 6-hour rolling average). This occurred between 1:57 a.m. and 2:03 a.m. When the temperature in the VCU dropped below the permit limit, a decision was made to stop all rail car loading at 2:03 a.m.

To address the temperature drop, operations personnel introduced additional supplemental city gas to raise the temperature before resuming loading operations at 7:24 a.m. that same day. The 6-hour rolling average temperature fell below 1,299°F for a total of 13 minutes from 1:57 a.m. to 2:03 a.m. and from 7:24 a.m. to 7:30 a.m.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Minimum Reported Value
Temperature in combustion zone shall not be less than 1,299 deg F (6-hour rolling average)	**1,297 deg F** (6-hour rolling average)

The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.

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Environmental Reportable Events Summary

Event Date: April 22, 2023

Event Title: Plant 1 Pressure Swing Adsorption Unit Trip

Impacted Media (air, water, or soil): Air

Operating Unit: Plant 1 Main Plant Flare

Event Summary:

On April 22, 2023, the Plant 1 Main Plant Flare gas hydrogen sulfide (H_2S) limit was exceeded due to a malfunction involving multiple valves in the pressure swing adsorption (PSA) unit at the Hydrogen Plant. This malfunction caused the PSA unit to trip, as designed, and resulted in the opening of the flare suction valve on the Plant 1 main plant flare gas recovery system. This resulted in gases with elevated concentrations of H_2S to go to the Plant 1 Main Plant Flare. Operators quickly isolated the PSA valve to the flare skid and began working to bring the PSA unit back online. H_2S is combusted at the flare tip, which results in the generation of sulfur dioxide (SO_2) and water vapor.

The Plant 1 Main Plant Flare gas H_2S limit was exceeded from 2:00 p.m. until 10:00 p.m. on April 22, 2023, as a result of this event.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Maximum Reported Value
162 ppm H_2S in flare gas (3-hour rolling average)	**318 ppm** H_2S in flare gas (3-hour rolling average)

The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.

Event Date: April 28, 2023 – April 30, 2023

Event Title: Plant 1 Tail Gas Unit Trip

Impacted Media (air, water, or soil): Air

Operating Unit: Plant 1 Tail Gas Unit and No. 2 Sulfur Recovery Unit

Event Summary:

On April 28, 2023, the Tail Gas Unit (TGU) reducing gas generator (RGG) burner tripped after a significant rise in pressure in the TGU prevented the RGG combustion blowers from supplying adequate air to the RGG burner. This triggered a safety shutdown of the TGU and No. 2 Sulfur Recovery Unit (No. 2 SRU). Consequently, gases with high hydrogen sulfide (H_2S) concentrations, typically treated and recovered in the No. 2 SRU and TGU, were sent directly to the tail gas unit incinerator (H-25) and the Plant 1 Main Plant Flare for control, which resulted in elevated sulfur dioxide (SO_2) emissions from H-25 and the flare.

The event resulted in flaring of acid gas at the Plant 1 Main Plant Flare, SO_2 exceedances at H-25, and H_2S exceedances in the Plant 1 fuel and flare gas systems. H_2S is combusted at the flare tip, which results in the generation of sulfur dioxide (SO_2) and water vapor.

The event started on April 28, 2023, at 10:00 p.m. and ended on April 30, 2023, at 6:00 a.m. after the units were restarted and stabilized.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Maximum Reported Value
April 28, 2023	
SO_2 limits were exceeded for 2 hours	
250 ppm SO_2 at 0% O_2 (12-hour rolling average) from the tail gas unit incinerator (H-25)	**2,873 ppm** SO_2 at 0% O_2 (12-hour rolling average)

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15.68 lb/hr SO_2 from the Plant 1 tail gas unit incinerator (H-25)	**1,150 lb/hr** SO_2 from the Plant 1 tail gas unit incinerator (1-hour average)
April 29, 2023	
SO_2 limits were exceeded for 24 hours	
250 ppm SO_2 at 0% O_2 (12-hour rolling average) from the tail gas unit incinerator (H-25)	**5,528 ppm** SO_2 at 0% O_2 (12-hour rolling average)
15.68 lb/hr SO_2 from the Plant 1 tail gas unit incinerator (H-25)	**447 lb/hr** SO_2 from the Plant 1 tail gas unit incinerator (1-hour average)
500 lb SO_2 Refinery-wide 24-hr rolling period (EPCRA Reportable Quantity)	**4,689 lbs** SO_2 (maximum 24-hr rolling total during the event)
H_2S in Flare Gas limit was exceeded for 19 hours	
162 ppm H_2S in Plant 1 Main Plant flare gas (3-hour rolling average)	**329 ppm** H_2S in Plant 1 Main Plant flare gas (3-hour rolling average)
H_2S in Refinery Fuel gas was exceeded for 24 hours	
162 ppm H_2S in Plant 1 fuel gas (3-hour rolling average)	**300 ppm** H_2S in Plant 1 fuel gas (3-hour rolling average)
April 30, 2023	
H_2S in Refinery Fuel gas was exceeded for 6 hours	
162 ppm H_2S in Plant 1 fuel gas (3-hour rolling average)	**300 ppm** H_2S in Plant 1 fuel gas (3-hour rolling average)

Data gathered from the Commerce City North Denver (CCND) Air Monitoring network showed higher-than-normal levels of SO_2 at two of the CCND Air Monitoring program stations located north of the refinery; however, those levels remained below acute health guideline values routinely used by state and federal public health agencies.

Event Date: May 4, 2023

Event Title: Pressure Swing Adsorption (PSA) Unit Trip

Impacted Media (air, water, or soil): Air

Operating Unit: Plant 1 Main Plant Flare

Event Summary:

On May 4, 2023, the pressure swing adsorption (PSA) unit at the Hydrogen Plant tripped. The PSA unit trip caused the flare suction valve on the Plant 1 main plant flare gas recovery system to automatically open as designed, redirecting gases with elevated concentration of hydrogen sulfide (H_2S) to the Plant 1 Main Plant Flare. As a result, the Plant 1 Main Plant Flare gas H_2S limit was exceeded. Operators worked diligently to bring the PSA unit back online and restore the Hydrogen Plant's functionality. The issue was resolved once the PSA came back online. H_2S is combusted at the flare tip, which results in the generation of sulfur dioxide (SO_2) and water vapor.

The Plant 1 Main Plant Flare gas H_2S limit was exceeded from 12:00 a.m. to 7:00 a.m. on May 4, 2023.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Maximum Reported Value
162 ppm H_2S in flare gas (3-hour rolling average)	**321 ppm** H_2S in flare gas (3-hour rolling average)

The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.

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Environmental Reportable Events Summary

Event Date: May 12, 2023
Event Title: Hazardous Waste Overflow to Soil
Impacted Media (air, water, or soil): Soil
Operating Unit: Plant 3 Waste Cleaning Pad
Event Summary: On May 12, 2023, heavy rains caused the sump at the concrete cleaning wash pad area to overflow, releasing heat exchanger bundle sludge mixed with rainwater. Heat exchanger bundle sludge is listed as a hazardous waste under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and has a reportable quantity of 10 lbs. Approximately 42 gallons of the material mixed with rainwater were released to soil, which is above the reportable quantity. The overflow was immediately contained after discovery through the use of oil booms. Vacuum trucks were deployed to recover the material and the impacted soil was excavated within 24-hours. All waste generated as a result of the release was consolidated into a roll-off container for proper management. There are no known or anticipated health risks associated with the release.

Event Date: May 12, 2023
Event Title: Stormwater Discharge Event
Impacted Media (air, water, or soil): Water
Operating Unit: Plant 3 Waste Cleaning Pad
Event Summary: On May 12, 2023, there was a stormwater discharge from two unpermitted discharge points due to excessive rain that caused flooding at the site. The stormwater discharge resulted in unintentional and temporary noncompliance with Suncor's Colorado Discharge Permit System (CDPS) industrial stormwater permit. The discharged water showed no visual indications of pollution and the analytical lab results did not exceed permit limits. Suncor complied with all remedial measures necessary to minimize or prevent any discharge in violation of the permit. The stormwater discharge was discovered at around 7:30 a.m. on May 12, 2023, and was stopped by 5:00 p.m. the same day. Stormwater was observed flowing offsite onto Metro Water Recovery (Metro) property through a small crack in a concrete containment wall. This discharge combined with stormwater originating from Metro's property and discharged to Burlington Ditch. Stormwater was also discovered flowing over the stormwater containment wall onto Farmers Reservoir and Irrigation Company (FRICO) property. The flow onto FRICO's property then discharged into Burlington Ditch. Sample results demonstrated that the discharged water did not exceed permit limits and, notably, the benzene concentration was below the instrumentation detection limit. The collected stormwater was pumped from the flooded area to the refinery's wastewater treatment system to lower the water level to below the top of the containment wall at the property boundary. In addition, the crack in the concrete wall was sealed. Suncor plans to perform an assessment to determine the need for enhanced stormwater management in the area.

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