Environmental Reportable Events Summary

January 15, 2024 – February 15, 2024

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

Event Date: January 13 – 18, 2024 (Updated)
Event Title: Plant 1, 2, and 3 – Cold Weather Event
Impacted Media (air, water, or soil): Air
Operating Unit: Plant 1 – Tail Gas Unit Incinerator (H-25), Main Plant Flare, GBR Flare, Fuel Gas System, Boiler 8. Plant 2 – Main Plant Flare
Event Summary: On January 13, 2024, a cold front moved into the Denver area. The ambient temperatures dropped from a high of 30 degrees Fahrenheit (deg F) to a low of approximately -2 deg F in the evening. The abnormally low temperatures persisted in the Denver area until January 17, 2024, at which time a general warming trend was observed. During this period of abnormally cold temperatures, Suncor encountered a series of operational issues that began on the evening of January 13, 2024, and continued for several days thereafter. During this time, critical equipment was kept running, brought back online, or taken offline in order to be able to safely assess the equipment for damage and complete maintenance activities associated with the refinery's recovery plan. On January 13, 2024, at approximately 5:15 a.m., the Plant 1 Hydrogen Plant had a malfunction of a purge gas valve. The valve was closing slowly, causing purge gas swings. Operations personnel took the valve off-line to perform maintenance, which caused the hydrogen bed purifying system to trip from 10 beds to 8 beds. This decrease in available purifying beds required the routing of Hydrogen Sulfide (H_2S) rich gases to the Plant 1 Main Flare. Operations responded to the trip by stabilizing the unit in 8 bed mode and then reintroduced purge gas valves until normal operation was achieved. Upon return to normal operation the flaring ceased. On January 13, 2024, at approximately 7:00 p.m. the No. 2 Sulfur Recovery Unit (SRU) experienced an increased gas flow rate. Suncor operations personnel immediately responded to the incident and employed standard operating procedures to bring the No. 2 Hydrodesulfurizer (HDS) cold separator level indicator back online. Operations reduced the rates at acid gas producing units, which limited the duration of the event, and reduced SO2 emissions from H-25. This significantly reduced the SO2 emissions from the tail gas incinerator (H-25) and allowed the unit to come back into compliance with its SO2 emission limits. Operations observed that the No. 2 HDS cold separator level indicator (10LC318) had stopped reading correctly due to being frozen (which was not known at the time of the event), this caused kerosene to overflow to the amine system. Once the kerosene was in the amine system it went to the No. 2 SRU. The hydrocarbons reduced the sulfur conversion to approximately 75% (normally it runs near 100%) and the remaining 25% of acid gas was routed to the tail gas unit and the incinerator (H-25). In response, the main plant amine system was slumped to reduce the amount of acid gas coming from the unit and going to the sulfur recovery complex. Subsequently, Suncor determined that the No. 2 HDS cold separator drum level indicator was not functioning, therefore, it was taken from automatic control to manual control. This resulted in a decrease in hydrocarbon carryover. Due to the amount of kerosene in the system, it took time to burn off the remaining hydrocarbon. Once it was burned off, the No. 2 SRU sulfur recovery efficiency recovered and returned to normal. On January 14, 2024, at approximately 3:17 a.m., the Plant 1/Plant 2 Fuel Gas transfer line drain valve was opened to prevent liquid accumulation and potential freeze up. The fuel gas line was open to Plant 1 Fuel gas and closed off to Plant 2 Fuel gas. The Plant 1 Fuel gas system had sour fuel gas. The Plant 1/Plant 2 fuel gas

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

line was sending fuel gas to the Plant 2 Fuel Gas system, and there was a drain line opened to the Plant 2 Flare system. The drain line is normally opened to bleed off liquids that accumulate which is normally acceptable, but in this case the Plant 1 fuel gas system was sour, causing sour fuel gas to be routed the Plant 2 Flare system.

These cold weather events are still under investigation and more detailed information will be provided after the investigations are complete.

The relevant permit terms or conditions for this event include:

Permit Term or Condition	Maximum Reported Value
Title V Operating Permit 96OPAD120, Condition 13.8 – Carbon Monoxide (CO) emissions from Boiler 8 shall not exceed 0.060 lbs/MMBtu of a 24-hour rolling average.	Boiler 8: 1/16/2024 9:00 p.m. – 1/17/2024 7:00 p.m. (22 hours) Maximum Boiler 8 CO was 0.094 lbs/MMBtu
Title V Operating Permit 96OPAD120, Condition 20.1 – SO_2 from the tail gas incinerator (H-25) shall not exceed 15.68 lbs/hr.	1/13/2024 7:00 p.m. – 1/15/2024 6:00 a.m. (35 hours) 1/16/2024 12:00 a.m. – 2:00 a.m. (2 hours) 1/16/2024 3:00 a.m. – 4:00 a.m. (1 hour) Maximum SO_2 was 2,651 lbs/hr
Title V Operating Permit 96OPAD120, Condition 20.6: SO_2 emissions from the tail gas incinerator (H-25) not to exceed 250 ppmv @ 0% O_2 on a 12-hour rolling average.	1/13/2024 7:00 p.m. – 1/15/2024 12:00 p.m. (41 hours) 1/15/2024 2:00 p.m. – 1/17/2024 12:00 a.m. (34 hours) 1/17/2024 3:00 a.m. – 1/18/2024 12:00 a.m. (21 hours) Maximum SO_2 was 18,769 ppmv
Title V Operating Permit 96OPAD120, Condition 29.8: Maintain the Net Heating Value in the combustion zone of the Plant 1 Main Plant Flare above 270 Btu/scf.	1/16/2024 12:45 a.m. – 10:00 a.m. (9.25 hours) Net Heating Value was <270 btu/scf
Title V Operating Permit 96OPAD120, Condition 29.9: Plant 1 flare gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	1/13/2024 8:00 a.m. – 12:00 p.m. (4 hours) 1/14/2024 3:00 a.m. – 1/15/2024 5:00 p.m. (38 hours) 1/16/2024 2:00 a.m. – 12:00 p.m. (10 hours) Maximum H_2S was 330 ppmv
Title V Operating Permit 96OPAD120, Condition 30.10: Plant 3 flare gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	1/13/2024 9:00 a.m. – 12:00 p.m. (3 hours) Maximum H_2S was 321 ppmv

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

Environmental Reportable Events Summary

January 15, 2024 – February 15, 2024

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

Title V Operating Permit 96OPAD120, Condition 31.8: Maintain the Net Heating Value in the combustion zone of the GBR Flare above 270 Btu/scf.	1/16/2024 3:15 a.m. – 3:30 a.m. (15 minutes) 1/16/2024 5:00 a.m. – 5:15 a.m. (15 minutes Net Heating Value was <270 Btu/scf
Title V Operating Permit 96OPAD120, Various Conditions: Plant 1 fuel gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	1/14/2024 4:00 p.m. – 1/15/2023 6:00 p.m. (26 hours) Maximum H_2S was 300 ppmv
Title V Operating Permit 95OPAD108, Condition 32.9: Plant 2 flare gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	1/14/2024 2:00 a.m. – 10:00 p.m. (20 hours) 1/15/2024 2:00 a.m. – 4:00 p.m. (14 hours) Maximum H_2S was 330 ppmv

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. In addition, the refinery's fenceline monitoring system (required by Colorado House Bill 21—1189) did not detect any increased levels of monitored compounds.

Event Date: January 18, 2024

Event Title: Plant 1 – Wastewater Treatment Unit Process Water Spill by Tank 60

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

Operating Unit: Plant 1 – Tank 60 Tank Equalization

Event Summary:

On January 18, 2024, at approximately 4:00 p.m., a mixture of oily wastewater and solids classified as hazardous waste (F038) was released to soil during maintenance activities in the wastewater treatment unit of the refinery. This release resulted in an estimated total volume of 42-gallons (i.e., one barrel) of the oily water and solids mixture being released. Per EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERLCA), the reportable quantity of the material released is 1 lbs.

A vacuum truck was immediately deployed to recover standing liquid. Due to low temperatures, approximately 3 inches of saturated surface soil froze. The excavation of the impacted soil commenced on the following day, January 19, 2024, and was completed by January 22, 2024. All waste generated as a result of the release (including excavated soil and decontamination materials) was managed and disposed of as hazardous waste. All impacts remained onsite and there are no known or anticipated environmental or health risks associated with the release.

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. In addition, the refinery's fenceline monitoring system (required by Colorado House Bill 21—1189) did not detect any increased levels of monitored compounds.

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

Environmental Reportable Events Summary

January 15, 2024 – February 15, 2024

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

Event Date: January 19, 2024
Event Title: Plant 1 – No. 1 Crude Unit and No. 2 Hydrodesulfurizer (HDS) Shutdown
Impacted Media (air, water, or soil): Air
Operating Unit: Plant 1 – Main Plant Flare
Event Summary:
On January 19, 2024, at approximately 3:00 a.m., the No. 1 Crude Unit and the No. 2 HDS underwent planned shutdowns. Shutting down and steaming out the units in preparation for maintenance activity caused the hydrogen sulfide (H_2S) concentration in the Plant 1 Main Plant Flare gas to exceed the 162 ppm 3-hour rolling average limit.

The relevant permit terms or conditions for this event include:

Permit Term or Condition	Maximum Reported Value
Title V Operating Permit 96OPAD120, Condition 29.9: Plant 1 flare gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	1/19/2024 3:00 a.m. – 6:00 a.m. (3 hours) Maximum H_2S was 292 ppmv

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. In addition, the refinery's fenceline monitoring system (required by Colorado House Bill 21—1189) did not detect any increased levels of monitored compounds.

Event Date: January 31, 2024
Event Title: Plant 1 – Outfall 002B Water Sample Exceedance
Impacted Media (air, water, or soil): water
Operating Unit: Plant 1 – Outfall 002B

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

Environmental Reportable Events Summary

January 15, 2024 – February 15, 2024

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

Event Summary:
On January 31, 2024, at approximately 5:20 a.m., water samples were collected at internal Outfall 002B. The analytical results for benzene were 7 ug/L, which exceeds the applicable daily maximum permit limit of 5 ug/L. Based on downstream sampling data, there was no impact to surface water in Sand Creek as a result of the exceedance. A water sample was collected at the combined outfall 020A, which discharges to Sand Creek and is located downstream of Outfall 002B. The combined outfall 020A sample results were in compliance with the permit limit and below the drinking water Maximum Contaminant Level (MCL) of 5 ug/L for benzene.

During Suncor's investigation of the incident, water in Lagoon No. 2, which is upstream of Outfall 002B, was found to have an elevated benzene concentration. Lagoon No. 2 was subsequently isolated from the outfall during the afternoon of January 31, 2024. Results of follow up sampling performed at 5:20 a.m. on February 1, 2024, at Outfall 002B were below the detection limit for benzene, confirming that the discharge had returned to compliance.

As an immediate step taken to prevent a reoccurrence, Suncor has implemented regular sampling of Lagoon No. 2 (upstream of Outfall O02B) for benzene. This additional sampling location may change to or include Lagoon No. 1 after it has been put back into service.

Event Date: February 11, 2024
Event Title: Plant 1 – No. 2 Hydrogen-Desulfurization (HDS) Planned Start-up
Impacted Media (air, water, or soil): Air

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

Environmental Reportable Events Summary

January 15, 2024 – February 15, 2024

Emissions violations are determined following review by the Colorado Department of Public Health & Environment (CDPHE); emissions exceedances do not necessarily constitute violations.

Operating Unit: Plant 1 – Main Plant Flare

Event Summary:

On February 11, 2024, at approximately 5:00 a.m., the planned startup of the No. 2 Hydrodesulfurization (HDS) Unit required a sweep of hydrogen gas (H_2) through the system to increase the No. 2 HDS unit temperature as required by the startup procedure. This sweep caused an increase in the H_2 flow to the flare header and exceeded the capacity of the Flare Gas Recovery Unit (FGRU), which in turn caused hydrogen sulfide (H_2S) rich gases to be routed to the Plant 1 Main Flare. The concentration of H_2S in the Plant 1 Main Flare exceeded the 162 ppm 3-hour rolling average limit for approximately 9 hours.

The relevant permit terms or conditions for this event include:

Permit Term or Condition	Maximum Reported Value
Title V Operating Permit 96OPAD120, Condition 29.9: Plant 1 flare gas shall not exceed 162 ppmv H_2S averaged over a 3-hour period.	2/11/2024 5:00 a.m. – 2:00 p.m. (9 hours) Maximum H_2S was 320 ppmv

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. In addition, the refinery's fenceline monitoring system (required by Colorado House Bill 21—1189) did not detect any increased levels of monitored compounds.

**Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*