

# Environmental Reportable Events Summary



<b>Event Date:</b> 01/25/2022
<b>Event Title:</b> Loss of Plant 2 Boilers
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 2 Boilers 504 and 505
<b>Event Summary:</b> <p>During cold weather, the city gas line froze which resulted in a loss of fuel to the Plant 2 boilers. This caused the boilers to trip offline. Operations attempted to re-light the boilers but was unsuccessful with the frozen instrument. Operations personnel then had to shut down multiple processing units in Plant 2. This caused high H<sub>2</sub>S concentration gases to be sent to the refinery fuel gas system and the flare. At the flare tip, and in the refinery fuel gas system, H<sub>2</sub>S is combusted, which results in the generation of SO<sub>2</sub> and water vapor.</p> <p>This event began 01/25/2022 at 10:00 p.m. and ended on 01/26/2022 at 5:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• 162 ppm H<sub>2</sub>S in flare gas for a 3-hour average<ul style="list-style-type: none"><li>• Reported at <b>196 ppm</b> H<sub>2</sub>S in flare gas for a 3-hour average</li></ul></li><li>• 162 ppm H<sub>2</sub>S in fuel gas for a 3-hour average<ul style="list-style-type: none"><li>• Reported at <b>170 ppm</b> H<sub>2</sub>S in fuel gas for a 3-hour average</li></ul></li></ul> <p>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.</p>
<b>Event Date:</b> 01/27/2022
<b>Event Title:</b> Startup Emissions Exceedances
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 2 Fluidized Catalytic Cracking Unit (FCC)
<b>Event Summary:</b> <p>While starting up the Plant 2 FCC, torch oil was introduced to the unit which caused elevated carbon monoxide (CO) emissions. During the startup, elevated H<sub>2</sub>S in the flare system was also present as the unit was brought online. At the flare tip, and in the refinery fuel gas system, H<sub>2</sub>S is combusted, which results in the generation of SO<sub>2</sub> and water vapor. The CO emissions were brought under control after the unit was stabilized following startup activities. The high H<sub>2</sub>S to flare gas emissions were brought under control after closing a bypass valve that was left open during the startup.</p> <p>This event began 01/27/2022 at 1:00 a.m. and ended on 01/29/2022 at 12:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• 500 ppm CO at 0% O<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>• Reported at <b>2,031 ppm</b> CO at 0% O<sub>2</sub> for a 1-hour average</li></ul></li><li>• 162 ppm H<sub>2</sub>S in flare gas for a 3-hour average<ul style="list-style-type: none"><li>• Reported at <b>267 ppm</b> H<sub>2</sub>S in flare gas for a 3-hour average</li></ul></li></ul> <p>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.</p>

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# Environmental Reportable Events Summary



<b>Event Date:</b> 01/31/2022
<b>Event Title:</b> Boiler 8 Carbon Monoxide (CO) Exceedance
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Boiler 8
<b>Event Summary:</b> <p>The fuel gas regulator connected to Boiler 8 malfunctioned, which contributed to increased Carbon Monoxide (CO) emissions. The CO emissions were brought back into compliance through a rebalancing of steam generation from all Plant 1 boilers.</p> <p>This event began 01/31/2022 at 12:00 p.m. and ended on 02/01/2022 at 12:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of 0.060 lb of CO per MMBtu for a 24-hour period (average)<ul style="list-style-type: none"><li>○ Reported at <b>0.065 lb</b> of CO per MMBtu for a 24-hour period (average)</li></ul></li></ul> <p>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.</p>
<b>Event Date:</b> 01/31/2022
<b>Event Title:</b> Hazardous Waste Spill to Soil
<b>Impacted Media</b> (air, water, or soil): Soil
<b>Operating Unit:</b> Plant 1 Waste Storage Area
<b>Event Summary:</b> <p>A roll-off box containing hazardous wastewater sludge leaked from the door of the box. A valve on the containment wall at the Waste Pad was left open, which resulted in the spill running outside of containment and onto soil. Approximately 20 gallons (80 kg) of the material was spilled from the container. The door was repaired to prevent any further leaks. The spill was reported to the National Response Center (NRC), State Emergency Response Commission (SERC), and the Adams County Local Emergency Planning Committee (LEPC).</p> <p>Approximately 4 kg of hazardous waste spilled onto soil, exceeding the 1-pound Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) reportable quantity (RQ) of the waste, Resource Conservation and Recovery Act (RCRA) waste codes F037 and F038.</p> <p>The area where the spill occurred was excavated and backfilled with clean soil.</p>

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# Environmental Reportable Events Summary



<b>Event Date:</b> 02/02/2022
<b>Event Title:</b> Tier 2 Event – Vapor Release Alarm Activated
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 2 No. 3 Sulfur Recovery Unit (SRU)
<b>Event Summary:</b> <p>During maintenance work on the Plant 2 SRU, an isolation valve failed to isolate the process from the instrument that was being removed for replacement. This resulted in process gases being released from the unit. Maintenance personnel activated the plant alarm system and sounded the vapor release alarm. Operations personnel quickly shut down the unit which stopped the release. While the SRU was shut down, this resulted in high H<sub>2</sub>S gases being sent to the refinery fuel gas system which caused a permit exceedance.</p> <p>More details regarding this event will be included in a separate summary report which will be posted online.</p> <p>The specific permit exceedance for this event was:</p> <ul style="list-style-type: none"><li>• 162 ppm H<sub>2</sub>S in Plant 2 Fuel Gas for a 3-hour average<ul style="list-style-type: none"><li>○ Reported at <b>300 ppm</b> (max value) for a 3-hour average</li></ul></li></ul> <p>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.</p>
<b>Event Date:</b> 02/09/2022
<b>Event Title:</b> Plant 2 Fluidized Catalytic Cracking Unit (FCC) Emergency Shut Down
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 2 Fluidized Catalytic Cracking Unit (FCC)
<b>Event Summary:</b> <p>Vibrations in the Plant 2 FCC main air blower compressor indicated a potential failure in the compressor or the gearbox. Operations personnel had to shut down the Plant 2 FCC in order to prevent further damage to the equipment or a more serious incident. This resulted in an opacity from the Plant 2 FCC.</p> <p>This event began 01/27/2022 at 1:00 a.m. and ended on 01/29/2022 at 12:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• 20% Opacity for 6-minute average<ul style="list-style-type: none"><li>• Reported at <b>69%</b> for a 6-minute average</li></ul></li><li>• 30% Opacity for 6-minute average<ul style="list-style-type: none"><li>• Reported at <b>69%</b> for a 6-minute average</li></ul></li></ul> <p>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.</p>

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# Environmental Reportable Events Summary



<b>Event Date:</b> 02/14/2022
<b>Event Title:</b> Startup Emissions Exceedances
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 2 Fluidized Catalytic Cracking Unit (FCC)
<b>Event Summary:</b> While starting up the Plant 2 FCC, torch oil was introduced to the unit which caused elevated carbon monoxide (CO) emissions from the unit. The CO emissions were brought under control after torch oil was removed from the unit.  This event began 02/14/2022 at 12:00 p.m. and ended on 02/15/2022 at 1:00 a.m.  The specific permit exceedances for this event were: <ul style="list-style-type: none"><li>• 500 ppm CO at 0% O<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>• Reported at <b>2,031 ppm</b> (max value) CO at 0% O<sub>2</sub> for a 1-hour average</li></ul></li></ul> 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.
<b>Event Date:</b> 02/14/2022
<b>Event Title:</b> Tank 2005 Vent to Atmosphere
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Plant 1 Sulfur Recovery Complex
<b>Event Summary:</b> An alarm sounded in the Plant 1 control room indicating low or loss of sweep air in the sulfur tank, T 2005. Loss of sweep air can result in hazardous conditions through the buildup of H <sub>2</sub> S vapors in the tank. Air eductors were replaced, but the low air flow issue persisted indicating a likely blockage in the air system. To prevent a more significant issue, the vent from the tank was opened to atmosphere instead of to the incinerator. The issue was resolved when the blockage in the line was eliminated through addition of heat to the lines.  This event began 02/14/2022 at 10:38 p.m. and ended on 02/18/2022 at 3:44 p.m.  The specific permit exceedances for this event were: <ul style="list-style-type: none"><li>• Emissions from sulfur pit (T2005) are routed to the TGU and vented through the TGU incinerator (H-25).<ul style="list-style-type: none"><li>• Sulfur pit emissions vented to atmosphere</li></ul></li></ul> 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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