

**OFF-SITE PARTIAL COMPLIANCE INSPECTION FOR THE CLEAN AIR ACT (CAA)
NON-FINANCIAL RECORDS REVIEW FOR THE RESOURCE CONSERVATION AND RECOVERY
ACT (RCRA)**

September 10, 2020

BASIC INFORMATION

Facility Name: Sinclair Casper Refining Company

Date of Opening Conference: June 26, 2020

CAA ID: WY000000560200005

Date Records Received: July 14, 2020

RCRA ID: WYD048743009

Facility Location: 5700 E Highway 20/26
Casper, Wyoming, 82609

Date Records Review Completed: August 12, 2020

Facility Contact: Bruce Sowers,
Environmental, Health, and Safety Manager;
bsowers@sinclairoil.com

Date Evaluation Completed: September 9, 2020

CAA Status: Title V Major Source, National Emissions Standards for Hazardous Air Pollutants (NESHAP) Major Source

RCRA Notification Status: Treatment, storage, and disposal facility, Large Quantity Generator

Lead Inspector: Cindy Schafer, Environmental Engineer, U.S. EPA Region 8 (RCRA/CAA)

Other Participants:

1. Kristin McNeill, Environmental Scientist, U.S. EPA Region 8 (RCRA)
2. Bob Gallagher, Environmental Engineer, U.S. EPA Region 8 (CAA)
3. Chris Hanify, Air Quality Engineer, Wyoming Department of Environmental Quality (DEQ)
4. Bob Breuer, Solid and Hazardous Waste Inspection and Enforcement Program Manager, Wyoming DEQ
5. Charlie Plymale, Solid and Hazardous Waste Inspection, Compliance and Enforcement Inspector, Wyoming DEQ
6. Erik Roylance, Leak Detection and Repair Compliance, Sinclair Casper Refining Company
7. Stephen Gill, Vice President for Safety and Excellence, Sinclair Oil Corporate Office
8. Stuart Griner, Environmental Engineer, Sinclair Casper Refining Company
9. Paul Conrad, Environmental Group, Sinclair Oil Corporate Office
10. Sam Greene, Air Quality Engineer, Sinclair Oil Corporate Office
11. Jim Rubles, Refinery Manager, Sinclair Casper Refining Company

Facility Type: Petroleum Refinery

Applicable Regulations to Records Review:

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CAA: New Source Performance Standards (NSPS) Subparts GGG, GGGa, VV, VVa, and QQQ (incorporated by reference in Chapter 5, Section 2(b) of the Wyoming Administrative Rules)
NESHAP Subpart CC (incorporated by reference in Chapter 5, Section 3(b) of the Wyoming Administrative Rules)

RCRA: 40 CFR Parts 264 and 265, Subparts AA, BB and CC (RCRA air regulations) (incorporated by reference in Chapter 1, Section 2(a) of the Wyoming Administrative Rules).

OPENING CONFERENCE

- | | |
|---|---|
| ☒ Small Business Resources Information
Sheet provided to Mr. Roylance on June 17, 2020 | ☒ Confidential business information (CBI)
warning to facility provided |
| | ☐ CBI was provided or discussed during the inspection |

The following information was obtained verbally during the conference call with Mr. Sowers and other Sinclair representatives or through email communications with Mr. Sowers, unless otherwise noted.

Company Ownership: The Holding family purchased the refinery in 1968 and operated it under the name Little America Refining Company. In 1978, the Holding family purchased the Sinclair Oil Corporation and in 2006 the facility became the Sinclair Casper Refining Company (SCRC). The facility has approximately 145 employees and 20-30 embedded contractors. It operates 24 hours per day, seven days per week.

General Facility and Process Description: SCRC has the capacity to process approximately 25,000 barrels per day (bpd) of crude oil. The facility recently received a Prevention of Significant Deterioration permit to eliminate the limit on facility capacity and it has demonstrated increased capacity. SCRC anticipates an approximate 5,000 bpd increase in facility capacity. The facility primarily produces gasoline and diesel fuels. It also produces a slurry oil, which has a higher sulfur content. A mixed butane/butylene intermediate is sent to the Sinclair Wyoming Refinery in Sinclair, WY for further processing to make isooctane. A mixed sour propane/butane intermediate is also sent off-site for further processing. A mixed butane stream is used in gasoline blending or sent off-site for further processing.

SCRC is connected to a pipeline from the Powder River basin and to a few sources in Colorado, North Dakota, and Canada. The first step after the crude oil is received at the facility is processing by the desalter, prior to processing by the crude fractionation unit (Crude Unit). The desalter removes salt and water from the crude oil. The desalted crude oil goes to the Crude Unit and the oily wastewater goes into the oily water sewer system followed by oil/water separation. The recovered oil is recycled back to the Fluidized Catalytic Cracking (FCC) unit and the clarified wastewater is processed by the Aggressive Biological Treatment Unit (ABTU) for treatment. The ABTU is a RCRA permitted waste treatment unit.

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The Crude Unit produces: light components, straight run naphtha, kerosene/diesel and gasoil. The light components, which consist of butane and lighter hydrocarbons, go to a liquid ring compressor and then to the FCC gas plant. Straight run naphtha from the Crude Unit goes to storage tanks before being fed to the naphtha hydrotreater for desulfurization. The desulfurized naphtha is fed to the Reformer unit to produce higher octane gasoline blend stock and hydrogen. The kerosene/diesel stream goes to intermediate storage and then to the Catalytic Hydro-Desulfurization (CHD) unit to remove sulfur from the product stream. Gasoil from the Crude Unit is sent to the FCC unit.

The FCC receives gasoil from the Crude Unit and cracks the gasoil into: light ends, naphtha, light cycle oil, and slurry oil. The propane/propylene mix from the FCC fractionation tower goes to the Catalytic Polymerization (Cat Poly) unit where it is recombined into gasoline. The Cat Poly unit converts C3 olefinic chain hydrocarbons to C6 to C9 polymer hydrocarbons. FCC naphtha is treated in a hydrotreater to remove hydrogen sulfide (H_2S) and it is then used as blendstock. FCC light cycle oil goes to intermediate storage and then to the CHD unit to remove sulfur from the product stream. The slurry oil from the FCC is sold as product.

The Reformer converts straight chain hydrocarbon to ring hydrocarbons to improve octane. As a result, there are excess hydrogen molecules and the facility has a hydrogen (H_2) stream and compressors that are in H_2 service. Excess H_2 is used in the naphtha hydrotreater, CHD and FCC hydrotreater to remove sulfur from hydrocarbon molecules.

Light ends from the: Cat Poly, CHD, Depropanizer, FCC, FCC Gasoline Hydrotreater and Naphtha Hydrotreater are sent to amine units to remove H_2S and then routed to boilers and process heaters where the light ends are utilized as fuel. The H_2S waste stream is processed in a Sulfur Recovery Unit (SRU) which produces a molten sulfur product.

Streams containing methane through butane are generated in the: Cat Poly, CHD, Naphtha Hydrotreater and Reformer. The methane through butane combined stream is fed to the depropanizer tower. A butane/C5 mix is drawn off the bottom of the depropanizer and used as gasoline blend stock or shipped off-site as product. A sour propane/butane mix is sold to Tallgrass Energy for further fractionation. Light ends off the top of the depropanizer are routed to an amine unit for H_2S removal and then to the refinery fuel gas system.

The oily water sewer system receives oily wastewater from numerous sources such as: unit process drains, tank water draws, laboratory sampling wastes, groundwater remediation and sour water processing. At each step of the refining process, sour wastewater is generated. The sour water is processed in the Sour Water Stripper. The H_2S and ammonia (NH_3) removed from the water go to the SRU, and stripped sour water is used for crude desalting. The excess stripped sour water and oily desalter brine flow to the oily water sewer system and oil/water separation.

Most processing units have relief lines going to the flare. The facility does not conduct routine flaring except for combusting any excess sweet refinery fuel gas. The flare is used primarily for process safety purposes during upset conditions. The facility purchases natural gas to power the flare pilot light.

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Fuel blending is done in the product tanks in the tank farm and at the truck loading rack. Ethanol is added to gasoline at the truck loading rack to meet the renewable fuels standards. SCRC can add biofuels to diesel, but they have not sold biofuel/diesel mix due to lack of demand.

There are 52 storage tanks at the facility that contain: crude oil, intermediates, products and wastes. There are 36 tanks that have cone roofs; three tanks have internal floating roofs; and 13 tanks have external floating roofs.

The facility has about 12,000 components in light liquid service or gas/vapor service plus about 2,600 components in heavy liquid service and 300 components in methane service in their leak detection and repair (LDAR) monitoring program. The facility uses flame ionization detectors for method 21 monitoring.

RECORDS REVIEW

Mr. Sowers and Mr. Griner provided the following records on July 13-14, 2020:

CAA

- LDAR monitoring and repair records for July 1, 2016 – July 1, 2020
- LDAR calibration records for July 1, 2016 – July 1, 2020
- Process unit shutdowns for July 1, 2016 – July 1, 2020
- Process flow diagrams
- Inspection plan for unsafe-to-monitor and difficult-to-monitor components
- Tank list including: contents, vapor pressure, NSPS Kb applicability, and NESHAP CC applicability

RCRA

- Analytical results for K051 waste showing that the concentration of organic compounds with a vapor pressure greater than 0.3 kPa is less than 20%
- Waste profiles for cadmium sulfate powder and solution from lab (D006) and desalter sludge from demolition of #4 and #5 crude unit desalters (D007, D008, D009, D010)
- Manifests from July 1, 2016 – July 1, 2020 for the above two waste streams
- Semi-annual reports required by 40 CFR §§ 60.487, 60.487a, 60.592 and 60.592a

RECORDS REVIEW RESULTS

Areas of Concern:

CAA

- A review of the information provided indicates that Tanks 207, 218, 307, 400, 617, 619, and 702 meet the applicability criteria for NSPS Kb; the tanks are greater than 75 m³ and store volatile organic liquids. (See 40 CFR § 60.110b.)
- Review of the LDAR database containing monitoring information from 5/22/2013 through 6/30/2020 identified the following concerns:

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- Over 100 missed first attempts at repair of equipment leaks. The 40 CFR §§ 60.482-2(c)(2), 60.482-3(g)(2), 60.482-7(d)(2), 60.482-8(c)(2), 60.482-10(g)(1), 60.482-2a(c)(2), 60.482-3a(g)(2), 60.482-7a(d)(2), 60.482-8a(c)(2), and 60.482-10a(g)(1) require that the first attempt at repair be conducted within five days of leak detection.
- Over 150 missed final repairs of equipment leaks. The 40 CFR §§ 60.482-2(c)(1), 60.482-3(g)(1), 60.482-7(d)(1), 60.482-8(c)(1), 60.482-10(g)(2), 60.482-2a(c)(1), 60.482-3a(g)(1), 60.482-7a(d)(1), 60.482-8a(c)(1), and 60.482-10a(g)(2) require that final repairs are completed within 15 days of leak detection, unless delay of repair is allowed.
- Over 13,000 missed monitoring inspections. Pumps in light liquid service are required to be monitored monthly per 40 CFR §§ 60.482-2(a)(1) and 40 CFR 60.482-2a(a)(1). Valves in gas/vapor service and light liquid service are required to be monitored monthly per 40 CFR §§ 60.482-7(a)(1) and 60.482-7a(a)(1) unless after two consecutive months of no leaks detected, then the valve may be monitored quarterly per 40 CFR §§ 60.482-7(c) and 60.482-7a(c). Connectors are required to be monitored annually per 40 CFR § 60.482-11a(b)(3)(i).
- Nearly 100 instances of improperly placing equipment on delay of repair (DOR) when the component was isolatable. DOR requirements in 40 CFR §§ 60.482-9 and 60.482-9a include circumstances in which DOR is allowed. Approximately 20 components were placed on DOR for over one year.

RCRA

- Based on documentation provided, it appears that the K051 tank is not equipped with and operating air emissions' controls as required by 40 CFR Part 264, Subpart CC (RCRA Subpart CC) to be exempt from RCRA Subpart CC. During the off-site evaluation, SCRC representatives stated that SCRC is following the requirements of NESHAP Subpart CC for this unit in lieu of RCRA Subpart CC. The NESHAP Subpart CC requirements allow for emissions averaging. If K051 is not equipped with operating air emissions' controls, then the requirements of 40 CFR § 264.1080(b)(7) are not being met.
- The pipe runs leading to and from the K051 tank are subject to the RCRA Subpart BB provisions that require Method 21 monitoring within five days when evidence of a leak is found per 40 CFR § 264.1058(a). The LDAR database did not include any monitoring events for components in the pipe runs leading to and from the K051 tank.

SIGNATURES

Lead RCRA/CAA Inspector: CYNTHIA SCHAFER

Digitally signed by CYNTHIA
SCHAFER
Date: 2020.09.10 13:03:27 -06'00'

RCRA/Oil Pollution Act Enforcement Branch Chief: Janice Pearson

Digitally signed by Janice
Pearson
Date: 2020.09.11 17:25:08 -06'00'

CAA Enforcement Branch Chief: _____