



COLORADO
Department of Public
Health & Environment

February 8, 2022

Sent Via E-Mail

Adams County Commissioners
Commissioners Office
4430 South Adams County Parkway
5th Floor, Suite C5000A
Brighton, CO 80601-8204

REF: Suncor Energy (U.S.A), Inc. - Commerce City Refinery, Plant 2, FID #
0010003, OP # 95OPAD108

SUBJECT: Response to Comments on Draft Renewal Operating Permit

Dear Adams County Commissioners:

Comments were submitted by Adams County Commissioners on the draft renewal Operating Permit (95OPAD108) and supporting Technical Review Document for Suncor's Commerce City Refinery, Plant 2 to the Colorado Air Pollution Control Division (Division) via e-mail on March 17, 2021 during the 30-day public comment period. Supplemental comments were submitted by Adams County Commissioners to the Air Quality Control Commission (AQCC) via email on April 30, 2021 during the extended public comment period.

The Adams County Commissioner's comments have either been summarized or taken in part or in full from the March 17 and April 30, 2021 submittals. Note that where the Division has summarized the comment, it is labeled as "Comment Summary" and where the Division has copied the comment or portion of the comment directly from Adams County Commissioners' submittals, it is labeled as "Comment." Note that for the most part, tables and/or graphs included in the Adams County Commissioners' comments have not been copied into the Division's response. Every effort has been made to respond to all of the issues raised in Adams County Commissioners' March 17 and April 30, 2021 comments.

Although the Adams County Commissioners' comments were addressed to the Commission (AQCC), the Division has responded to Adams County Commissioners' comments consistent with the Commission's and Division's respective roles. The AQCC oversees Colorado's Air Quality Program and promulgates regulations for the program. The Division implements the Colorado's Air Quality Program and is responsible for issuing permits, conducting air quality monitoring and enforcing violations, in addition to other implementing activities. Although the AQCC conducted the public comment hearings, their duty was to hold the hearing and gather comments, which are forwarded to the



Division for its consideration prior to a final action on the permit. Therefore, the Division is responding to these comments and making determinations on whether changes to the permit are necessary, since this is not a duty for the AQCC. The Division acknowledges that there may be other avenues to work with Adams County under the AQCC's authority and otherwise outside the context of this permit action and looks forward to these opportunities to meet our shared goals of improving environmental performance at the facility.

The Division has addressed Adams County Commissioners' comments as follows:

MARCH 17, 2021 COMMENTS

Comment: Adams County provides these comments solely to protect the health, well-being, and safety of its citizens that live near or are impacted by the emissions from the Suncor Refinery. Unincorporated areas of Adams County surround the refinery and as such Adams County is the only governmental body that can represent the needs and interests of citizens not within the jurisdiction of home rule cities. Adams County has been affected by all facets of the emissions and unplanned releases from the Refinery and has unique knowledge and expertise beneficial to the Air Quality Control Commission.

While we appreciate the thoroughness of the Divisions review of the Suncor application, we believe the draft permit fails to address two fundamental issues - the unexcused excess emission events from the facility and increasing actual emissions from the Refinery. Accordingly, Adams County requests a Public Hearing to address the following comments and support approval of the Title V permit after the deficiencies identified are addressed:

Division Response: The Division forwarded Adam County's request for a public comment hearing to the Air Quality Control Commission (AQCC). The AQCC held virtual public comment hearings on May 1 and May 4, 2021. At the May 1 public comment hearing, the AQCC extended the public comment period until May 11, 2021. The Division accepted written public comments during the 30-day public comment period (February 17 through March 19, 2021) up until the May 11, 2021 extension provided by the AQCC. Oral comments were made at the public comment hearings on May 1 and May 4, 2021.

The issues noted in these paragraphs are discussed in more detail in Adams County's specific comments, thus the Division's response is addressed under the specific comments later in this document.

I. The Permit Conditions do not ensure compliance with existing emission requirements

Comment: At the heart of any air emission permit, emission limits are established for a stationary source to protect human health and the environment. The Suncor Title V permit is designed to consolidate all permit requirements from the hundreds of individual sources at the refinery and ensure compliance with all applicable requirements.

A review of CDPHE and EPA data illustrates that Suncor is rarely in compliance with the existing emission limits contained in both the existing Title V and draft Title V permit. Figure 1 [not shown here] illustrates the number of violations at the facility from 2013-2019. Adams County previously requested from APCD information and data pertaining to excess emissions associated with violation events. As of the date of this letter, county staff has not received the requested information and reserves the right to supplement county comments with additional analysis up to and including the public hearing.

Division Response: The Division acknowledges that Suncor has exceedances of its emission limitations, but disagrees that the facility is rarely in compliance with emission limits. It is true that Suncor's quarterly excess emission reports (EERs) and semi-annual monitoring reports typically identify at least some emission units covered under the permit that have had excess emissions or monitoring or permit deviations during the reporting period and thus had intermittent periods of non-compliance. The EERs only address emission units equipped with continuous emission or opacity monitoring systems, and not all emission units have excess emissions during a specific reporting period. In addition, monitoring or permit deviations do not mean there is necessarily an emission limit exceedance. It is possible to have a monitoring or permit deviation while still complying with emission limits.

Suncor is a large and complex source, which is subject to many Colorado and federal regulations. For instance, federal requirements that apply to Suncor include as many as eight different New Source Performance Standards (NSPSs) and four different National Emission Standards for Hazardous Air Pollutants (NESHAPs). A specific piece of equipment, such as a storage or process tank can be subject to requirements under Colorado Regulations, an NSPS and a NESHAP. The Suncor refinery has a large number of emission units subject to requirements; ranging from large equipment such as the fluid catalytic cracking units (FCCUs), to small equipment such as piping components (e.g. valves and flanges). Such equipment can be subject to a variety of emission limitations, monitoring, recordkeeping and/or reporting requirements. Enforcement action can be taken for failure to comply with any of these requirements.

The Division conducts compliance oversight activities of the facility throughout the year, including annual inspections, performance test oversight, review of submitted reports, and more to assess compliance with Suncor's applicable requirements. The Division then takes the appropriate enforcement actions based on the results of these compliance oversight activities and Suncor's self-reporting. The Division has had numerous enforcement actions with Suncor, including the Compliance Order on Consent (Case Nos. 2019-097 & 2019-194) effective March 6, 2020 (March 2020 Settlement). The Division expects Suncor to significantly improve compliance at the facility and the requirements of the March 2020 Settlement are intended to drive such action.

With regard to the requested additional emissions information, the Division worked with Adams County during the public comment period to provide the requested data. The Division received additional comments from Adams County on April 30, 2021 and assumes that Adams County received the requested information. The Division's response to Adams County's April 30, 2021 comments are included later in this document.

Comment: This pattern of non-compliance raises an issue not addressed in the Technical Review Document (TRD) or draft Title V permit: whether the excess emissions are routine emissions and should be mitigated by additional enforceable controls in the permit. Consistent with AQCC 5 CCR 1001-5, Part C, III.C.8 and III.C.9 (*eff 2/14/2021*), Suncor must include in the Title V permit a compliance plan and compliance schedule to ensure excess emissions are eliminated except in the rare moments where an unforeseeable and uncontrollable event occurs.

While we are cognizant of the Suncor Compliance Order on Consent, executed on March 6, 2020, we are not convinced that the root cause analysis and maximum expenditure of \$5 million is enough to guarantee compliance. CCR 1001-5, Part C, III.C.8 and III.C.9, require the filing of a compliance plan and schedule with the Title V permit, that, "shall be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based."

Given the refinery has been issued 15 enforcement orders since 2011 by EPA and CDPHE, it is appropriate that the Title V permit contain a binding compliance plan and schedule to break the cycle of permit non-compliance and compliance orders.

Division Response: Sources are required to submit a schedule of compliance for requirements for which they are not anticipated to be in compliance with at the time of permit issuance and that schedule of compliance is required to be included in the Title V permit (see Regulation No. 3, Part C, Sections III.C.9 and V.C.16.c). However, a compliance schedule is not required as Suncor is not anticipated to be out of compliance with applicable requirements upon issuance of the permit. Generally a determination of non-compliance is not final until the agency takes final action, thus compliance schedules are usually derived from a settlement and as indicated below, the Division has included the recommendations from the investigation required by the March 2020 Settlement. With that said, compliance schedules may need to be developed in the future in the context of future enforcement actions.

The Division acknowledges that Suncor does have periods of non-compliance with emission limitations, however, these are intermittent exceedances and the Division fully expects that Suncor can and will comply with emission limitations. Therefore, a compliance schedule is not necessary. However, the Division acknowledges that the current level of performance is unacceptable and that much more needs to be done to significantly reduce the number of violations at the facility.

Since the March 2020 Settlement required an investigation into the causes of emissions exceedances and stipulated that Suncor must implement recommendations from that investigation in order to minimize or prevent future emissions exceedances, the Division agrees that including the accepted recommendations into the permit are appropriate. For Plant 2, the recommendation proposed by Suncor and accepted by the Division as part of the March 2020 Settlement is to install and operate a modernized automated shutdown system for the FCCU by December 31, 2022. The Division will include this requirement in the permit. Specifically the permit will specify that Suncor upgrade the

Plant 2 FCCU to include a Programmable Logic Controller, upgraded instrumentation, automated shutdown valves, and new hydraulic pressure units by December 31, 2022.

II. The Permit Fails to Address modifications at the facility that may be causing the air quality violations.

Comment: The TRD, on page 4, provides estimated potential to emit (PTE) and actual emissions from the Suncor Plant 2 facility (Table 1 below [not shown here]). However, as shown in Table 2, CDPHE estimated actual reported emissions from the facility for the past decade are significantly higher than the actual emissions values contained in the TRD. The total emissions values shown in table 2 were derived through summation of all reported source emissions per year from data provided by APCD staff. An issue that needs to be addressed in the Title V permit is the accuracy of the emissions being used as the basis for the TRD.

Total Suncor Emissions (Tons/year)										
Year	Toulene	N-Hexane	Xylenes	Benzene	H ₂ S	PM ₁₀	SO ₂	CO	VOC	NOX
2010	0	1	0	0	5	234	406	422	294	837
2011	0	3	0	1	2	241	234	355	315	670
2012	-	-	-	-	-	-	-	-	-	-
2013	0	2	0	2	6	143	217	452	424	764
2014	1	12	1	1	3	267	249	435	390	775
2015	1	13	1	1	13	148	183	463	416	563
2016	2	19	2	3	13	140	406	487	651	571
2017	2	19	2	3	3	144	196	406	588	593
2018	1	13	1	1	13	144	177	449	590	592
2019	0	4	0	0	11	145	186	456	578	641

Table 2: Suncor-Commerce City actual reported emissions

As Table 2 demonstrates, n-Hexane, H₂S, CO, and VOC emissions have increased since 2010ⁱ

Division Response: The table of actual emissions on page 4 of the TRD was intended for information purposes only. The Division typically includes a summary of potential emissions in the TRD for informational purposes and to demonstrate actual emissions are lower than potential emissions. For the Plant 2 equipment the TRD shows the breakdown of actual emissions by emission unit (beginning on page 150) and notes the year the data came from. Since the Plant 2 TRD addressed the Plant 2 equipment, for the sake of convenience the Division used actual emissions for Plants 1 and 3 equipment from the TRD prepared for the Plants 1 and 3 renewal permit (issued October 1, 2012). This is noted on pages 4- 5 of the TRD.

Since Adams County has concerns over the actual emissions included in the TRD, the Division will replace the actual emissions table with a facility wide summary of actual

ⁱ Data provided from CDPHE to Adams County, March 2021

emissions from the Division's inventory, data year 2019. In addition, we will remove the table beginning on page 150 that breaks down actual emissions by emission unit. While there may be confusion over different data sets, the different data sets still show that actual emissions are below the potential to emit.

Facilities report actual emissions on air pollutant emission notices (APENs) for individual emission units and those emissions are included in the Division's inventory database and the Division provided information from this database to Adams County. Actual emissions can change from year to year based on the level of operations for that emission unit. In addition, sources are only required to report actual emissions on their APENs every five years, unless there is a significant increase in emissions. In the past many sources have reported allowable (or permitted) or higher emissions as actual emissions.

The Division has not performed a detailed analysis of the data provided by Adams County and is not able to ascertain what is happening with the actual H₂S, CO and hexane emissions. For example, it would be important to consider emissions levels in conjunction with other parameters such as actual throughputs and actual operating parameters, as well as whether projects or modifications at the plant occurred. There could be other reasons for a perceived increase in the emissions data not associated with the plant or operations.

In the case of hexane emissions, the APEN reporting level had historically been 1,000 pounds per year. The APEN reporting threshold means if actual hexane emissions from a unit were more than zero but less than 1,000 pounds, the source would not report the actual hexane emissions on the APEN. The APEN reporting thresholds were changed in April 2014 to 250 pounds per year so starting in 2014, a source would have to report actual hexane emissions from any unit that exceeded 250 pounds instead of 1,000 pounds. It is possible that Suncor always had hexane emissions at those same levels but was not required to report them until 2014. Further, as shown in Table 2 of Adams County's comments, hexane emissions are lower in 2019 and will continue to be lower because in January 2018 Suncor asked to use a different emission factor for hexane which predicts lower emissions for the same quantity of gases combusted.

The Division acknowledges the apparent increase in VOC emissions. One possible reason for this change is due to changes in the VOC emission factors for the flares. The revised flare VOC emission factors predict higher VOC emissions for the same volume of gas combusted.

Please be aware that actual emissions can change from year to year depending on the operating rate of the refinery. Increases in actual annual emissions are acceptable, so long as they are below the annual emission limitations for the respective equipment.

III. Adams County is concerned that actual emissions of VOCs, H₂S and carbon monoxide have been increasing as a result of multiple "minor modifications" or changes that have not been evaluated as a modification.

Comment: A review of Suncor publications reveals that Suncor has spent, "\$1.3 billion in improvements since purchasing the refinery, spending \$300-\$400 million since 2015 alone

in capital upgrades and investments in new technology". Additionally, in 2006 Suncor nearly doubled the percentage of high sulfur content oil sands from 8,000 barrels per day to 15,000 barrels per day.

The Division's TRD does not identify any permit or process changes associated with the increase in use of high sulfur feed stock. A question, therefore, not addressed in the TRD or draft permit is whether the increase in sulfur content feedstock with associated equipment and technology updates was a modification subject to either new source performance standards for petroleum refineries (40 CFR Part 60) or non-attainment new source review (NSR) permitting program requirements. Further, Suncor appears to have made numerous minor modifications that allowed it to avoid installing controlling equipment to reduce those emissions. While parsing every change into small discrete activities that required Construction Permits may be "technically justifiable", the Commission may want to evaluate whether the sum of these permitting activities was possibly a circumvention of NSPS or NSR.

Division Response: Adams County mentions a project in 2006 in which Suncor sought to double the percentage of high sulfur content oil sands and notes that this is not addressed in the draft permit. Modifications were made to equipment at the Suncor refinery, primarily the No. 3 crude unit (i.e. Plant 3), in 2006 to allow for the handling of a broader slate of crude, including oil sands from Suncor's Canadian production facilities. Those changes are discussed in Suncor's 2004 permit application for the Clean Fuels Project. Construction permits were issued for those projects on May 24, 2004 and those construction permits have since been incorporated into the Plants 1 and 3 Operating Permit (96OPAD120). The No. 3 crude unit is part of Plant 3 and addressed in the Title V permit for Plants 1 and 3 (96OPAD120). The No. 2 crude unit, which is addressed in the Plant 2 permit, processes low sulfur crude oil and does not process tar/oil sands crude.

The Division acknowledges that there are numerous modification applications submitted for both of Suncor's Title V permits. The Division appropriately reviews the modifications submitted by Suncor and as part of our review considers whether the projects may be related to other projects and whether they should be aggregated to determine whether PSD and/or NANSR requirements apply. The Division also evaluates projects occurring at all of the plants including Plants 1, 2 and 3 when evaluating whether modifications are related. Absent any specific comments regarding the Plant 2 modifications, the Division cannot provide a more specific response.

Comment: Additionally, Suncor has requested an increase of 11.66 tons per year (TPY) particulate matter (PM) emissions and 138.05 TPV in VOC emissions. (with a reduction in SO₂, NO_x and CO). This dramatic increase in permitted emissions (although not NNSR significant because of the way the individual actions are apparently permitted) accelerates the trend of increasing actual emissions from the facility.

Division Response: The modifications for the Plant 2 permit were submitted and approved over a period of 10 years (from March 2009 through 2020), so the emission increases did not occur all at once.

It should be noted that the modifications did not involve the installation of new equipment, other than piping components such as valves, flanges and connectors which can leak and result in emissions. The changes in permitted or allowable emissions frequently involved changes in emission calculation methodology, without a corresponding increase in the allowable process rate of the equipment, or were the result of emission limitations included for equipment that previously had no emission limitations (e.g. the cooling tower). While modifications to revise an emission calculation methodology for a piece of equipment or to incorporate a new emissions limit on a emissions unit that did not previously have an emissions limit reflects an increase in the overall emissions associated with the permit, it does not reflect an increased amount of emissions physically being released from the refinery. Please be aware that even with the serious designation, Colorado's permitting requirements allow facilities to increase their allowable emissions, although increases above certain levels may trigger more stringent requirements.

IV. The Suncor refinery is unique and compliance with Ozone re-designation, Regional Haze and Greenhouse Gas Emission Reduction goals should be evaluated as permit modifications or as a stand-alone regulatory proceeding.

Comment: As the Commission well knows, the Denver Metropolitan Region and Colorado are facing increasingly challenging emission reduction requirements associated with the impending ozone designation of severe from serious non-attainment. Colorado will soon be addressing the challenges of reducing NO_x to achieve Regional Haze requirements. Additionally, Colorado has established a goal of achieving a 26 percent reduction in greenhouse gas (GHG) emissions by 2025 and 50 percent by 2030.

The Suncor Refinery is one of the largest, non-coal fired power plant, emitters of VOCs, NO_x and GHG emissions in Colorado. Adams County recommends that the Commission develop a comprehensive, enforceable reduction strategy for the Refinery given its location and direct impact to surrounding environmental justice communities. Addressing the disproportionate impact this single, largest industrial source of GHG and criteria pollutants has on the health and welfare of these communities through such a facility-specific regulatory approach aligns with the goals and strategies specified in APCD's recently released Climate Equity Framework.

Division Response: The purpose of the Title V permit is to incorporate all applicable requirements for a facility into a permit and to improve compliance by requiring recordkeeping, monitoring, reporting and annual compliance certifications. There is no ability under the Title V permit regulations to develop a comprehensive, enforceable reduction strategy for the Refinery.

With that said, the AQCC may promulgate new regulations that could affect the equipment at Suncor for other purposes such as meeting greenhouse gas reduction or regional haze requirements or as part of the ongoing efforts to attain the ozone standards. If such requirements are promulgated, Suncor would be required to comply with those requirements and include them in their Title V permit(s) at a later date. The Division agrees that it is important to consider ways to reduce emissions from industrial sources, including refineries for a host of air quality reasons. The AQCC recently adopted

emission reduction requirements under the Regional Haze Rule and is committed to additional rulemaking in the future to reduce industrial sector emissions pursuant to HB21-1266.

- V. Suncor should provide the public with frequent, understandable excess emission reports that quantify excess emissions where possible and specify the cause of the event and corrective actions taken or planned (particularly considering continual sources of upsets, malfunctions, and leaks).**

Comment: Adams County is concerned that the frequent upset reports filed by Suncor are neither understandable to the public nor the Division and do not satisfy the need for transparency. The County recommends that the Commission add a recordkeeping and reporting requirement to the Title V Permit to address this knowledge gap. The new reporting mechanism would require Suncor to provide, for every upset or excess emission event, the date, duration, calculated volume of emissions (e.g., pounds per hour), a cumulative tally of annual excess emissions, whether the event is similar to other upsets and why the previous corrective action failed to prevent the new event.

Division Response: Suncor is required to report excess emissions under various State and federal requirements. For sudden and unavoidable failures of process equipment that result in excess emissions, Suncor can report the incident as a malfunction using an affirmative defense to a claim of violation of a standard from civil penalty. In order to claim a malfunction, Suncor is required to report the malfunction as soon as possible but no later than noon of the Division's next working day. Written notification must also be made by the end of the next reporting period.

State and federal regulations require that certain information be reported in excess emission reports (EERs) or malfunction reports (MRs). As previously noted, EERs are required for emission units that rely on continuous emission or opacity monitoring systems and only with respect to those pollutants monitored by the continuous emission or opacity monitoring systems. While the Division understands that information regarding the Suncor facility is not always easy to understand, many of the reports have specific requirements for what must be reported and cannot always be simplified. The Division has approved Suncor's excess emission report format and the Division has a specific malfunction report form that sources are required to use.

Sources are required to report on both EERs and MRs, the date and time the event started and ended and the duration of the event. For EERs, sources are required to report the magnitude of the excess emission (in units of the standard, e.g. ppm) and for MRs, sources are required to report the total emissions, in tons, for the event.

The current EERs and MRs include much of the information Adams County indicates should be in a new report the Division should require. The Division considers that requiring Suncor to provide information such as whether the event is similar to other upsets and why the previous corrective action failed to prevent the new event are questions the Division asks during EER and MR report reviews, inspections and/or enforcement actions and are not appropriate for the EER and MR reports. Therefore, the Division will not require it for the EER and MR reports.

In addition, calculating the mass emissions from either an excess emission event or an upset is not always possible. For instance excess opacity emissions cannot be converted to a mass basis. In addition, some thresholds reported on the EERs are not actual emission exceedances. For instance, the 500 lb per 24-hour threshold for flares is not an emission limitation; it is a threshold, above which Suncor must conduct a root cause and corrective action analysis. Federal regulations require Suncor to include exceedances of the 500 lb SO₂ threshold for flares on the EERs. Therefore, the Division will not require that Suncor report mass emission on their EERs. For similar reasons, maintaining a cumulative total of mass “excess” emissions is also not practical. As previously stated, Suncor is required to report mass emissions for malfunctions on their MRs, although as with EERs, not all exceedances (e.g. opacity) can be converted to a mass basis. The Division will not require Suncor to maintain a cumulative total of mass emissions from malfunctions.

Finally, please be aware that the excess emissions reported are exceedances of short-term emission limits. All emissions for a given emission unit, including excess emissions are to be included in assessing compliance with the emission unit’s annual emission limitations, or if not subject to annual emission limitations, must be included in their annual emission calculations and reported on their APENs.

While the Division is not going to revise either the EER or MR formats, the Division understands the desire for the community to have emissions data for the Suncor facility. The Plant 2 renewal permit, as well as the Plants 1 and 3 permit require that Suncor calculate emissions for the various emission units, regardless of whether or not they are subject to an annual emission limitation. As previously discussed beginning on page 6, sources are not required to update their APENs every year, nor are they required to revise their APENs if their actual emissions decrease. Therefore, the Division will revise the Plant 2 renewal permit to require that Suncor submit an annual emissions report detailing total actual emissions from the facility and the amount of emissions that occurred as a result of exceedances of any permit limit and a quarterly community compliance report that will identify in an easy to understand format any emissions violations at the facility during the previous quarter.

VI. In addition to the mandated root cause analysis of excess emissions, a proactive, plant-wide Failure Modes and Effects Analysis should be incorporated into the permit to mitigate the frequency of malfunctions, upsets, and human error-based violations, as well as and identify opportunities for redundancy, LAER, and BACT controls.

Comment: Through the issued Compliance Order on Consent, Case Nos. 2019-097 & 2019-194, the Division required a formal Root Cause Investigation. Root Cause Investigations are useful and pertinent for systemic and reoccurring violations or emission exceedances. However, in the context of Consent Decrees and the Compliance Orders on Consent for this company and facility, there seems to be similar categories of consequence, but with dissimilar root causes. In this case, a more appropriate analysis would be use of Failure Modes and Effects Analysis (FMEA) or Fault Tree Analysis (FTA). An FMEA looks at risks associated with hardware failures from a bottom-up approach and classifies the

consequence of those failures based on severity. If a single point or probable single failure scenario results in exceeding emissions limitations, the operator must evaluate adding redundancy or removing the risk by other means. A Fault Tree Analysis (FTA) is a top-down approach, where a hazard (e.g., tank venting) is identified and all reasonable and unlikely causes are identified whether it be hardware, software, automation, or human error. For each critical cause, the operator should address how that cause is being mitigated to the maximum extent practicable. These two types of analyses are inherently more useful to prevent future failures that are non-systemic in nature. However, Root Cause Investigations are post appraising in nature, are not predictive, and therefore do not provide assurance to the public that emissions exceedances will deescalate at the Suncor Plant 2.

Some of the failures delineated in the Compliance Orders on Consent were identified as being caused by loss of material integrity (e.g., piping wall thickness loss, corrosion). Based on the age of the facility, it is necessary to perform API-579 Fitness-for-Service (FFS) assessments for pressurized systems and pressure vessels. The goal of the FFS assessments is to determine a "remaining life" for each critical piece of equipment or critical component. The remaining life (expressed in months or years) informs maintenance schedules and eventually equipment replacement. Performing these assessments is not only critical for safety but also critical for preventing future catastrophic emission releases.

Division Response: This comment indicates that a root cause analysis or a failure modes and effects analysis should be included in the permit.

The draft renewal permit for Plant 2 requires a root cause and corrective analysis for the Plant 2 Main Flare if SO₂ emissions exceed 500 lbs in any 24-hour period (see Section II, Condition 32.5, which is a federal requirement under NSPS Ja) and for certain flow events (see Section II, Condition 40.102.3, which is a federal requirement under MACT CC). Excess emissions from many malfunctions or upsets can result in increased flaring due to unintended shutdowns, thus a root cause analysis conducted for the Plant 2 Main Flare may identify issues with other process units.

In addition, please be aware that the Consent Decrees for both Plant 2 and Plants 1 and 3 require root cause analyses for the flares and sulfur recovery units for certain events. The root cause analysis trigger for the flares is consistent with the root cause analysis trigger set forth in NSPS Ja.

The Division considers provisions for conducting a root cause analysis beyond those already required by the permit or the Consent Decrees are not appropriate. The appropriate place for addressing investigations into permit violations, such as the root cause analysis required by the March 2020 Settlement is during an enforcement action. During the enforcement process, the Division can identify the appropriate emission units and/or violations for which further investigation or actions may be necessary to determine appropriate remedies or next steps to prevent future violations.

Regarding a Failure Modes and Effects Analysis (FMEA) or Fault Tree Analysis (FTA), discussions with Adams County personnel on November 30, 2022 and during the

discussion, Adams County's consultant indicated that the FTA was more appropriate than the FMEA. However, as discussed in that meeting and after further review, it is clear that there are no well-defined procedures for conducting a FTA and FTAs are not specific to emission exceedance events, therefore, including FTA requirements is not appropriate for the permit. While a FTA may not be appropriate for the permit, the Division is still exploring how to implement the FTA process in other meaningful ways.

Comment: Adams County appreciates the opportunity to provide public comment on the draft Title V permit for Plant 2. However, because certain essential information such as the Root Cause Analysis, excess emissions data, and 2020 semi-annual deviation reports were not available before the Comment filing deadline, Adams County respectfully reserves the right to supplement our comments up to and including the Public Hearing.

Division Response: The Division received additional comments from Adams County on April 30, 2021 and the Division's response to those comments are included later in this document.

APRIL 30, 2021 COMMENTS

Comment: Adams County provides these comments as a supplement to its March 17, 2021 comments submitted to the Air Pollution Control Division ("Division"). The County has reviewed additional emissions data provided by the Division, comments provided by other local governments, and funded an expert evaluation of the Kearney Third Party Root Cause Investigation Final Report ("Kearney Report").

Both the emissions data provided by the Division and the Kearney Report reinforce Adams County's recommendations that Suncor be compelled to provide the Division (1) timely, accurate, and transparent reports on actual and excess emissions for all regulated pollutants, including volatile organic compounds (VOCs) that are clear and comprehensible to the general public. These reports must provide the mass emission quantity of each pollutant emitted during the permit deviation and/or excess emission event. More critically, the refinery's compliance history and the Kearney report clearly demonstrate that Suncor is either unwilling or incapable of operating in compliance with its current operating permit conditions. Therefore, Adams County recommends that the Division and EPA require Suncor to fund an (2) independent third-party expert to undertake a Failure Modes and Effects Analysis or Fault Tree Analysis of Plant 2 in its entirety.

Additionally, the history of non-compliance and the inability of Suncor to provide an even facially adequate root cause investigation reinforces our recommendation that it is now appropriate to require a (3) schedule of compliance for all sources of excess emissions at the facility, and not just the FCCUs and the SRUs. Finally, (4) Adams County recommends that the Division begin the process of implementing a comprehensive evaluation of Suncor's emissions in light of impacts to the local community, ozone re-designation, Regional Haze, and Greenhouse Gas Emission Reduction requirements.

Division Response: The issues noted in these paragraphs are discussed in more detail in Adams County's specific comments. Thus the Division's response is addressed under the specific comments later in this document.

I. Monitoring and reporting at the refinery are deficient and new reporting and monitoring and conditions must be included in the Title V Operating Permit.

Comment: Adams County proposed in our original comments that the Title V permit contain clear, accurate and understandable reporting requirements. As demonstrated in the written comments submitted by Adams County, Tri-County Health Department, the City of Denver and Commerce City, the evaluation of Suncor's excess emission and deviation reports yielded different estimates of both the hours of non-compliance and number of occurrences by each respective jurisdiction, , [sic] primarily due to lack of clarity within those reports. Furthermore, these reports obfuscate the actual mass emissions associated with such events.

In our March 17, 2021 comments, Adams County included Division data documenting the increasing routine and excess emissions from the refinery between 2010 and 2019. Adams County reviewed the 2020 semi-annual deviation reports and conferred with the Division to evaluate the refinery's most recent compliance with their operating permit emission limits. As Figure 1 [not shown here] demonstrates, the frequency and duration of permit violations and associated excess emissions in 2020 only marginally improved from 2019's unprecedented number of excess emission events.

Recently, the Division conducted an analysis of the tons of emissions associated with Suncor's reported excess emission events in 2019, exclusive of vapor loss-related violations, which demonstrates that emissions of sulfur dioxide exceeded permit limits by **57.8 tons** as shown in the table below [not shown here]. Excess nitrogen oxide emissions were not calculated by Division staff for any of the reported excess emission events.

The Division's excess emissions data for 2020 indicates that while the Plant 2 FCCU operated at significantly reduced capacity that year, Suncor still emitted **30.8 unpermitted tons of SO₂**. What the Division could not do is provide an estimated amount of the VOCs associated with the reported 2,040 hours of violations in 2019 and the 3,048 hours of excess emissions associated with vapor loss violations in 2020. Our understanding for the lack of data on actual VOC emissions is merely that Suncor is not required to report excess VOC on a tons per year basis, per Title V, and since these are considered to be fugitive emissions, they are not reportable. However, as demonstrated in reported potential to emit calculations within the Title V permit renewal application, Suncor could be required to calculate and report mass vapor loss emissions using EPA emission factors.

Clearly, the gap in reporting of routine and excess emissions must be remedied. Adams County asserts that the Title V permit, as drafted, fails to provide the public, elected officials, and even the Division with meaningful information on how Suncor is complying with permit conditions let alone contributing to the degradation of regional air quality. Adams County urges that recommendation V from our March 17, 2021 comment letter be included in the Title V permit.

Division Response: As indicated on page 10 of the Division’s response to Adams County’s March 17, 2021 comment no. V, the Division will revise the permit to require that Suncor submit a monitoring report summarizing actual annual (calendar year) emissions for each emission unit addressed in Section II of the permit at the end of the calendar year with their semi-annual monitoring report or annual compliance certification.

While the report the Division’s Compliance and Enforcement Program (CEP) staff provided Adams County with mass emissions for certain excess emission events, those emissions are only in excess of short-term emission limits and not necessarily in excess of annual (tons per year) emission limitations. In addition, as discussed in the Division’s response to Adams County’s March 17, 2021 comment no. V (see beginning on page 9), some thresholds reported on the EERs are not actual emission exceedances. For instance, the 500 lb SO₂ per 24-hour threshold reported on EERs for flares is not an emission limitation, it is a threshold, above which Suncor must conduct a root cause and corrective action analysis. It appears that some of the mass emissions included on the table in Adams County’s comments are from events in which SO₂ emissions from the flare exceeded the 500 lb per 24 hour threshold (e.g. the 10/21/19 event for the P1 flare). However, it is not an “excess” emissions.

Adams County noted that excess nitrogen oxide emissions were not reported for any of the 2019 excess emissions events. Suncor did not report any excess NO_x emissions in 2019 in their EERs or MRs.

Regarding 2020 excess emissions, Adams County’s comment notes that even though the Plant 2 FCCU operated at a significantly reduced capacity, there were still excess emissions. Although the Plant 2 FCCU may be operating at limited capacity, Plant 2 is a fully functioning refinery, and Plants 1 and 3 are a fully functioning refinery. Therefore, the Plants 1 and 3 equipment can operate fully, even though the Plant 2 FCCU operated at a significantly reduced capacity.

Adams County also commented on the failure of either the Division or Suncor to estimate emissions from vapor loss violation events reported on Suncor’s semi-annual monitoring and permit deviation reports. These vapor loss violations (e.g. open hatch, produce on tank roof) are violations of work practice requirements, not emission limitations. Therefore, Suncor is not required to calculate emissions from these events. The Division acknowledges that there may be emissions associated with these events. However, it is difficult to estimate these emissions. The Title V permit includes fenceline monitoring requirements for benzene emissions. This monitoring is intended to better manage fugitive emissions from the refinery as it is difficult to directly measure or quantify fugitive emissions and to provide an extra measure of protection for surrounding communities.

- II. The Kearney Investigation Report does not satisfy even the basic requirements for a Root Cause Investigation, and a Failure Modes and Effects Analysis or Fault Tree Analysis should be required to determine why the facility cannot comply with permit conditions for all emission sources.**

Comment and Comment Summary: The Root Cause Investigation (RCI) conducted by independent consultant, A.T. Kearney Limited (Kearney), primarily concludes that the majority of incidents leading to excess emissions at the refinery were caused by human factors, which are nearly impossible to translate into enforceable conditions and requirements within the Title V permit. Given the weight the RCI was given in the March 2020 compliance order for determining mechanisms through which the refinery could be brought into compliance with its existing operations permit, Adams County engaged a nationally recognized expert to evaluate the adequacy of the Kearney Investigation Report findings, herein referred to as the Kearney Report. We are providing the evaluation below:

The remainder of this section of Adam County's April 30, 2021 comments, provides a review of the Root Cause Investigation conducted by A. T. Kearney Limited.

Division Response: The process for the root cause investigation is not specified by regulations and is not an applicable requirement for the Title V operating permit. The Division's Compliance and Enforcement Program staff are aware of Adams County's comment, and the Division acknowledges the need for ongoing efforts outside the context of this particular permit renewal that will improve environmental performance at the facility and reduce environmental harm to nearby communities. However, because the purpose of this comment response is to respond to comments on the draft permit, and this comment pertains to a report required by the Compliance Order on Consent, the draft permit is not the appropriate forum to address these concerns and the Division is not providing further response to this comment in this document.

III. The 2020 excess emissions data demonstrates that the refinery cannot manage routine ("stable") operations in compliance with its operating permit, therefore, a schedule of compliance for all sources of excess emissions at the facility, and not just the FCCUs and the SRUs must be incorporated into the Title V permit renewal.

Comment: The Kearney Report confirms Adams County's concerns that the Suncor refinery is incapable of operating in compliance with the permit conditions. While professing that the "facility's design is sufficient to meet environmental permits during steady state operations", the report examines 140 incidences of non-compliance during a 730-day period, a non-compliance rate of 19%, *for the FCCU and SRU alone*. Combined with the vapor loss violations, the facility appears to be challenged to operate in compliance with environmental permits.

Most concerning is that the Kearney Report glosses over the failure to operate consistent with permit conditions. The Kearney Report states, at page 24:

"All refineries experience occasional excursions of process variables outside equipment safe operating limits ... In 2019, the site experienced an average of 2.2 excursions per day, which was an increase from 0.7 Excursions per day in 2018."

The County is concerned that the Kearney Report has conflated a 75 percent increase in unpermitted events with "all refineries experience an occasional excursion." Kearney's belief in the adequacy of a steady state model under normal operating conditions is a likely cause of underestimating actual emissions and a foundational reason for such a high volume of emissions exceedances. A steady state model is probably insufficient for accurate emissions evaluation of actual operations given the complexity of operations at the facility. It is more than likely the proposed Plant 2 operating permit renewal has emission limits that are inaccurately developed.

Division Response: The Division's Compliance and Enforcement Program staff are aware of Adams County's comment, and the Division acknowledges the need for ongoing efforts outside the context of this particular permit renewal that will improve environmental performance at the facility and reduce environmental harm to nearby communities. However, because the purpose of this comment response is to respond to comments on the draft permit, and this comment pertains to a report required by the Compliance Order on Consent, the draft permit is not the appropriate forum to address these concerns and the Division is not providing further response to this comment in this document.

Adams County states "the proposed Plant 2 operating permit renewal has emission limits that are inaccurately developed." Without specific information regarding which emission limits were inaccurately developed and why, the Division cannot provide a specific response. For those units with emissions limits, the Division established emission limits based on information provided in the relevant application. The Division also reviewed those limits and emissions factors as part of the application review process. The Division considers that the draft Plant 2 renewal permit includes all applicable requirements, as of the date the draft permit was open for public comment, and the permit includes sufficient monitoring requirements.

Comment: Further, as explained in our expert evaluation, the Kearney Report almost exclusively focused on human error and failed to determine the true root cause of incidents leading to excess emission events and upset conditions. The Division does not have the ability or authority to regulate human error and should require the submittal of a compliance plan and schedule that remedies all sources of excess emissions not limited to the FCCUs and SRUs. The complete compliance plan and schedule must be based on findings of an independent Failure Modes and Effects Analysis or Fault Tree Analysis and subsequent recommendations for appropriate engineering design, process, and equipment controls to eliminate excess emissions from upsets and malfunctions.

Division Response: As previously stated on page 4, in response to Adams County's March 17, 2021 comments, a compliance schedule is not required. However, the Division will include a requirement in the permit for Suncor to upgrade the Plant 2 FCCU to include a Programmable Logic Controller, upgraded instrumentation, automated shutdown valves, and new hydraulic pressure units by December 31, 2022.

The March 2020 Settlement required a root cause investigation into the causes of emissions exceedances and stipulated that Suncor must implement recommendations

from that investigation in order to minimize or prevent future emissions exceedance. The Division accepted Suncor's proposed implementation plan in a May 20, 2021 letter.

The purpose of the Title V permit is to incorporate all applicable requirements for a facility into a permit and to improve compliance by requiring recordkeeping, monitoring, reporting and annual compliance certifications. There is no requirement under Title V permit regulations to require a FMEA or FTA for excess emission events. The Division discussed the drawbacks of these methods on page 11. While a FTA may not be appropriate for the permit, the Division is still exploring how to implement the FTA process in other meaningful ways.

IV. Adams County recommends that the Division begin the process of implementing a comprehensive evaluation of Suncor's emissions in light of impacts to the local community, ozone re-designation, Regional Haze, and greenhouse gas emissions reduction requirements

Comment: As stated in our introduction, Adams County urges the Division to establish reporting requirements that enable all parties to understand the operations within the entire refinery, compel Suncor to complete a comprehensive FMEA or FTA of Plant 2, and include a compliance plan based on such findings to ameliorate the unacceptable number and severity of all excess emissions. We also believe now is the time for the Commission to direct Division staff to establish an appropriate singular regulatory process for Suncor that will achieve compliance with existing Title V requirements, address inequitable public health and climate impacts to the local community, and implement emission reduction strategies to comply with ozone nonattainment designation, Regional Haze Rule, and Greenhouse Gas Emissions Reduction requirements.

Division Response: As indicated on page 9 of the Division's response to Adams County's March 17, 2021 comment no. V, the Division will revise the permit to require that Suncor submit a monitoring report summarizing actual annual (calendar year) emissions for each emission unit addressed in Section II of the permit at the end of the calendar year with their semi-annual monitoring report or annual compliance certification.

The Division has responded to Adams County's comments regarding reporting requirements on page 10 and conducting an FMEA or FTA in the above response.

As previously stated, on page 8, there is no ability under the Title V permit regulations to develop a comprehensive, enforceable reduction strategy for the Refinery.

With that said, the AQCC may promulgate new regulations that could affect the equipment at Suncor for other purposes such as meeting greenhouse gas reduction or regional haze requirements or as part of the ongoing efforts to attain the ozone standards. If such requirements are promulgated, Suncor would be required to comply with those requirements and include them in their Title V permit(s) at a later date. The Division agrees that it is important to consider ways to reduce emissions from industrial sources, including refineries for a host of air quality reasons. The AQCC recently adopted emission reduction requirements under the Regional Haze Rule and is committed to

additional rulemaking in the future to reduce industrial sector emissions pursuant to HB21-1266.

The next step for this draft renewal permit is to forward it to EPA for their 45-day review period. At the end of that period, any revisions required by EPA will be incorporated into the permit, and the permit issued.

Please be aware that the proposed permit and technical review document that were submitted to EPA, as well as the responses to other commenters are posted on the Air Pollution Control Division's public notice website at:
<https://www.colorado.gov/cdphe/air-permit-public-notice>.

We appreciate that you took the time to thoroughly review the draft permit and technical review document and provide meaningful comments to the Division. Please feel free to contact me at (303) 692-3267 or jackie.joyce@state.co.us if you have any further questions.

Sincerely,



Jacqueline Joyce
Operating Permit Unit
Stationary Sources Program
Air Pollution Control Division

cc: Katie Keefe, Adams County, via e-mail
D. J. Law, U. S. EPA Region 8, via e-mail
Bernd Haneke, Suncor Energy (U.S.A.), Inc., via e-mail