

## ConocoPhillips Alaska, Inc

Hi Brittany, Attached are the comments for the public notice CPF-1 Permit No. Aq0267MSS10.

This includes the following documents (attached to this e-mail):

\_CPAI\_CPF-1\_PN\_AQ0267MSS10\_Comments\_Cover\_Letter.docx

Attachment I \_AQ0267MSS10\_Public\_Notice\_Comments\_Table.docx This document contains the bases for requested revisions and comments detailed in the Redline/Strikeout (RLSO) version of the permit and TAR included with this comment package as Attachments II and III.

Attachment II \_RLSO\_of\_AQ0267MSS10\_Pre\_Permit\_and\_TAR.docx This is a version of the draft permit and TAR (through Appendix A only) with proposed revisions represented as RLSO edits.

The bases for the revisions are detailed in Attachment I.

Attachment III \_RLSO\_of\_AQ0267MSS10\_Modeling\_Report.docx This is a version of Appendix B of the TAR (Modeling Report) with proposed revisions represented as RLSO edits. The bases for the revisions are detailed in Attachment I.

Thank you so much! Robin

Robin Glover | Environmental Coordinator – GKA Air Quality ConocoPhillips Alaska, Inc. |

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**Robin Glover**  
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Env. Sustainability & Permitting  
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Robin.Glover@conocophillips.com

October 7, 2021

**Submitted Electronically**

ATTN: Brittany Crutchfield  
Alaska Department of Environmental Conservation  
Air Permit Program  
555 Cordova Street  
Anchorage, Alaska 99501  
[brittany.crutchfield@alaska.gov](mailto:brittany.crutchfield@alaska.gov)

**Subject: ConocoPhillips Alaska, Inc. CPF-1 H<sub>2</sub>S Limit Increase Project Public Notice Draft Minor Permit AQ0267MSS10 and Technical Analysis Report - Public Comments**

Dear Permit Intake Clerk:

ConocoPhillips Alaska, Inc. (CPAI) is submitting these comments in response to the public notice preliminary Air Quality Control Minor Permit No. AQ0267MSS10 authorizing the H<sub>2</sub>S Limit Increase project at the Central Production Facility 1 (CPF-1) stationary source. These comments are for the draft permit as well as the Technical Analysis Report (TAR) that accompanies the draft permit, and are being submitted as a package comprised of the following electronically provided attachments:

- **Attachment I** (*Attachment I\_AQ0267MSS10\_Public\_Notice\_Comments\_Table.docx*):

This document contains the bases for requested revisions and comments detailed in the Redline/Strikeout (RLSO) version of the permit and TAR included with this comment package as Attachments II and III.

- **Attachment II** (*Attachment II\_RLSO\_of\_AQ0267MSS10\_Pre\_Permit\_and\_TAR.docx*):

This is a version of the draft permit and TAR (through Appendix A only) with our proposed revisions represented as RLSO edits. The bases for the revisions are detailed in Attachment I.

- **Attachment III** (*Attachment III\_RLSO\_of\_AQ0267MSS10\_Modeling\_Report.docx*):

This is a version of Appendix B of the TAR (Modeling Report) with our proposed revisions represented as RLSO edits. The bases for the revisions are detailed in Attachment I.

CPAI requests an opportunity to review the Alaska Department of Environmental Conservation's (ADEC) response to comments and the resulting updated permit, permit TAR, and the TAR appendices created in response to these comments before ADEC issues a final permit. The reasons for this request are primarily to (1) confirm that ADEC has not made any changes to the permit not requested during the public comment period for which we have not had the opportunity to prepare comments (if deemed necessary); and (2) confirm that where and if ADEC has agreed to make changes that such changes are made completely.

Brittany Crutchfield, ADEC

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Subject: CPAI Public Notice Draft Minor Permit AQ0267MSS10 and TAR Public Comments for the CPF-1

We appreciate the opportunity to provide comments on the permit and TAR, as well as the Department's timely processing of this submittal. If you have any questions or require additional information, please do not hesitate to contact me at (907) 263-4874 or

[Robin.Glover@conocophillips.com](mailto:Robin.Glover@conocophillips.com).

Sincerely,

A handwritten signature in blue ink, appearing to read "Robin Glover".

Robin Glover

Environmental Coordinator – Greater Kuparuk Area Air Quality

Enclosures (Electronic):

Attachment I\_AQ0267MSS10\_Public\_Notice\_Comments\_Table.docx

Attachment II\_RLSO\_of\_AQ0267MSS10\_Pre\_Permit\_and\_TAR.docx

Attachment III\_RLSO\_of\_AQ0267MSS10\_Modeling\_Report.docx

Electronic cc: [patrick.dunn@alaska.gov](mailto:patrick.dunn@alaska.gov)  
[dec.aq.airreports@alaska.gov](mailto:dec.aq.airreports@alaska.gov)  
[jesse.jack@alaska.gov](mailto:jesse.jack@alaska.gov)

## ATTACHMENT I

**ConocoPhillips Alaska, Inc.'s (CPAI's) requested revisions to the CPF-1 Preliminary Permit No. AQ0267MSS10 and associated Technical Analysis Report (TAR) for the public comment period that ends October 15, 2021.**

Note that the bases presented in this table are intended to describe the edits made in a red-line strike-out (RLSO) version of the CPF-1 Preliminary Permit No. AQ0267MSS10, which is included with the comment package as **Attachment II** (Permit and TAR) and **Attachment III** (Modeling Report) and should be referred to in conjunction with this document.

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
<b>Permit Cover</b>		
1	Permit title heading, footer page numbers, and section headers throughout the permit	Change the font to Times New Roman to match the font in the rest of the permit.
2	First paragraph under Permit Contact	Revise the sentence so that "Title I permit" is plural, since there is more than one Title I permit with terms and conditions being revised or rescinded.
3	Table of Contents	Update the Table of Contents field, since Section 2 is missing the title, and other section titles in the Table of Contents do not match the section titles in the permit.
<b>Section 1 Permit Administration</b>		
No Comments		
<b>Section 2 Emissions Unit Inventory</b>		
4	Table 1	Move Table 1 to the previous page so that it begins under the title for Table 1.
5	Table 1, EU ID 14	Correct a typographical error in the EU ID 14 model number as shown.
6	Note below Table 1	Revise the note under Table 1 to only include the emissions units that are included in the table and authorized by the AQ0267MSS10 permit.  Add the phrase "and permitted" to the note, to clarify that these emissions units have been permitted in addition to being previously installed.
<b>Section 3 Fee Requirements</b>		
7	Condition 5.1	Revise the assessable PTE to 5,232 tpy consistent with the total assessable emissions presented in Table 3 of the TAR. See comment <b>44</b> .
8	New Condition 6.3 (after Condition 6.2)	Condition 6 does not match Standard Permit Condition (SPC) I. If it is appropriate, add subcondition 6.3 to be consistent with the Department's SPC I.  If the Department left this subcondition from SPC I out for a reason, CPAI requests that this be described in the TAR.

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
<b>Section 4 Ambient Air Quality Protection Requirements</b>		
9	Conditions 7.1	Remove Conditions 7.1a through 7.1d, and revise Condition 7.1 to replace the conditions removed with a reference to the CPF-1 Title V Operating Permit for the fuel gas sulfur content monitoring, recordkeeping, and reporting. These changes should be made for the following reasons: <ol style="list-style-type: none"> <li>1) An analogous condition is written this way in the CPF-3 Minor Permit No. AQ0171MSS03, which is for a similar H<sub>2</sub>S increase permitting action;</li> <li>2) The monthly and 12-month average sulfur content monitoring for these emissions units (EUs) already exists in the CPF-1 Title V Operating Permit;</li> <li>3) Condition 10.2 of this CPF-1 Minor Permit No. AQ0267MSS10 refers to the sulfur content monitoring requirements in the CPF-1 Title V Operating Permit, thus Condition 7.1 should be consistent with that.</li> </ol>
10	Condition 7.2	Remove Condition 7.2 and move the limits into Condition 7.1. CPAI would prefer these conditions be combined because Condition 7.1 and 7.2 are similar enough that they can be combined without obfuscating the permit.
<b>Section 5 Limits to Avoid Prevention of Significant Deterioration (PSD) Major Modification</b>		
11	Section 5 Heading	Revise the heading for Section 5 to clarify that this NO <sub>x</sub> limit for PSD avoidance is not a result of the most recent permitting action (H <sub>2</sub> S Limit Increase) but was established in an earlier permit action.
12	Condition 8	Correct a typographical error as shown.
<b>Section 6 Revisions to Previous Permit Actions</b>		
13	Condition 9	Revise the EUs listed to exclude EU 36, since EU 36 has no applicable requirements in this permit.
14	Condition 9, Title of the 3 <sup>rd</sup> Table	Add the EU “H-1R01”, since this table applies to this EU and revised limits apply to this EU.
15	Condition 9, 4 <sup>th</sup> Table	Remove the ICE Air Heater (H-102A) from the table since this EU has no applicable requirements in this permit and limits applicable to this EU have not been revised.
16	Condition 9, 5 <sup>th</sup> Table	Remove the phrase “Carried Forward” in the explanation column, since the revised ambient demonstration is the explanation for the revised limit.
17	Condition 9, 5 <sup>th</sup> Table, 2 <sup>nd</sup> row	Remove the second row, since the liquid fuel sulfur limits established in Construction Permit AQ0267CP01 are not being modified by this permit and do not need to be carried forward into this permit.
<b>Section 7 SO<sub>2</sub> Emissions Monitoring, Recordkeeping, &amp; Reporting</b>		
18	Condition 10	Make “Calendar” in the first sentence lower case, which is consistent with the verbiage in the rest of the permit. Also, include “for the preceding year” in the last sentence, to clarify that the emissions are calculated for the previous year.
19	Condition 10.2	Correct the typographical error in the first sentence as shown.

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
20	Condition 10.4	Revise the baseline emissions amount that is subtracted from the total emissions in the equation to be 107 tpy, which is consistent with the number of significant digits shown in the baseline emissions disclosed in the application. The baseline emissions are stated as 106.9 tpy, however the baseline emissions are 107.2 tpy. If it is rounded to the correct amount of significant digits, it should be 107 tpy.
21	Condition 11	Correct the typographical error in the first sentence as shown.
22	Condition 11.5	Correct the typographical errors as shown.
23	Condition 12	Capitalize the “u” in “Eus” and add an “and” after the 4 <sup>th</sup> comma to complete the list of emission units in the sentence.
24	Condition 12.1 and 12.1b	Correct the typographical errors as shown since “operating” is misspelled.
25	Condition 12.2c	Correct the typographical error as shown since “information” is misspelled.
<b>Section 8 Recordkeeping, Reporting, and Certification Requirements</b>		
No Comments		
<b>Section 9 Standard Permit Conditions</b>		
No Comments		
<b>Section 10 Permit Documentation</b>		
26	Document Details	<p>Revise the document details to indicate when the Department received the application and to carry forward historical document details from permit AQ0267MSS06. This revision is requested because this permit rescinds permit AQ0267MSS06, and this is consistent with how this has been handled in other similar minor permits.</p> <p>Remove the placeholder for additional application information, since CPAI is not aware of additional information being submitted as part of the Departments review of the permit application.</p>
<b>Technical Analysis Report (TAR) for the Terms and Conditions of Minor Permit AQ0267MSS10</b>		
27	Title Page	Capitalize “terms and conditions” since these are nouns in the title.
28	1. Introduction	Revise the 2 <sup>nd</sup> sentence to simplify the section, since the application was submitted under both classifications. Also, remove the text at the end of the paragraph since it is an incomplete sentence and appears to be left in unintentionally.
29	2. Stationary Source Description, 1 <sup>st</sup> paragraph	Revise this paragraph to provide additional information to describe the CPF-1 stationary source and to be consistent with the description in the application. Furthermore, this revision is requested because some of the quantities of emission unit types listed in this paragraph are not accurate and do not contribute any value to the description of the source considering the information presented in Table 1 of the permit.
30	2. Stationary Source Description, last sentence	Revise this sentence to clarify that the renewed operating permit is pending, not a renewal application, since the initial renewal application was submitted in 2007.

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
31	3. Permitting History and Background on H <sub>2</sub> S Limits. 1 <sup>st</sup> paragraph	<p>Revise this paragraph to include details that CPAI considers important to the background of this limit and to include a description of how the limit is being revised. The changes are consistent with the background information provided in the permit application.</p> <p>Correct the typographical error in the 2<sup>nd</sup> sentence of this paragraph as shown, because “change” is misspelled.</p>
32	3. Permitting History and Background on H <sub>2</sub> S Limits. 2 <sup>nd</sup> paragraph	<p>Revise this paragraph to include details that CPAI considers important to the background of this limit to accurately describe how the limit is being revised. The changes are consistent with the background provided in the application.</p>
33	3. Permitting History and Background on H <sub>2</sub> S Limits. 3 <sup>rd</sup> paragraph	<p>Add the averaging period that applies to the limits listed in this paragraph for clarity, and correct typographical errors in the 2<sup>nd</sup> sentence as shown.</p>
34	3. Permitting History and Background on H <sub>2</sub> S Limits. 4 <sup>th</sup> paragraph	<p>Revise this paragraph to include details that CPAI considers important to the background of this limit to accurately describe how/why the limits are being revised/removed.</p> <p>Revise the last sentence of this paragraph to correct a typographical error and to detail the averaging period for the limit being established.</p>
35	4. Application Description	<p>Revise this section to include the actual date the application was submitted and to include the other changes requested in the application to this list of requests.</p>
36	6. Application Review Findings, Item 5	<p>Include a dash in “24 month”, to be consistent with hyphenation used throughout the permit and TAR.</p>
37	6. Application Review Findings, Item 6	<p>Add a “0” in the 18 AAC citation to correct the citation number and include additional details (citation, averaging periods, and applicable standards) that are relevant to the requirements fulfilled by the ambient analysis.</p>
38	6. Application Review Findings, Item 7	<p>Correct typographical and other errors that include a space after “Inc.” in the 1<sup>st</sup> sentence, “readdress” is changed to “readdressing” in the 3<sup>rd</sup> sentence, and the permit number in the last sentence is corrected to refer to the appropriate CPF-3 minor permit.</p> <p>Revise the 1<sup>st</sup> sentence to be clear which emissions units do not have BACT limits and differentiate them from those that do (EUs 14 and 17).</p>
39	6. Application Review Findings, Item 12	<p>Revise this paragraph to list each of the ORLs that are being removed, since there is no longer a need for the PSD avoidance ORLs that limit the SO<sub>2</sub> emissions, sulfur content, or heat input ratings of these units.</p>
40	6. Application Review Findings, Item 13	<p>Revise this item to accurately reflect the reason that emissions were reduced for pollutants other than SO<sub>2</sub>. Emissions from NO<sub>x</sub>, CO, VOC, and PM were reduced due to the removal of the PSD avoidance limits for EUs 42, 46, and 47, as noted in the application. See comment <b>43</b> for revisions to Table 3.</p>

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
41	7. Emissions Summary and Permit Applicability, 2 <sup>nd</sup> paragraph	Revise the language in the second sentence of this paragraph to reflect the fact that there were changes in PTE of other regulated pollutants, but that change in PTE did not impact PSD permit applicability because there were no changes in actual emissions for any pollutant other than SO <sub>2</sub> . This is related to comment 40 for Application Review Findings Item 13 above.
42	7. Emissions Summary and Permit Applicability, Table 2	Revise the Baseline Actuals and Projected Actuals SO <sub>2</sub> tpy emissions in the first two rows of the table for consistency with what is presented in the application or explain where the difference comes from. The Baseline Actuals presented in the application is 107.2 tpy, and so the Projected Actuals should be 146.8 tpy by adding 39.6 tpy to the 107.2 tpy (Baseline Actuals).
43	7. Emissions Summary and Permit Applicability, Table 3 PTE and Footnote [a]	<p>Revise the PTE in the first three rows of this table to match the PTE presented in the application, and revise Table Note [a] to reflect the basis for the “PTE Before Modification” emissions, as described in the application.</p> <p>As written, the “PTE Before Modification” emissions and Table Note [a] describing the PTE before modification do not accurately reflect the PTE before modification used to assess the change in emissions for this project. There have been numerous changes to the CPF-1 PTE that have occurred since they were documented in the MSS07 permit (see the suggested language for the footnote). These changes in emissions are not a part of the H<sub>2</sub>S Limit Increase Project resulting in the AQ0267MSS10 permit and should not be reflected in the “Change in PTE” listed in Table 3. Therefore, please adjust the “PTE Before Modification” emissions to be consistent with the “PTE Before Modification” emissions in the application since those incorporate all PTE changes that occurred prior to the H<sub>2</sub>S Limit Increase Project.</p>
44	7. Emissions Summary and Permit Applicability, Table 3, Total Assessable	The “Total Assessable” emissions appear to exclude the VOC emissions. The PTE including VOC emissions should instead be 5,232 tpy based on the summation of the emissions for the “PTE after Modification” in the second row of the table.
45	8. Revisions to Permit Conditions, Table 5	The term “production heaters” needs to be included after “DS1E and DS1J” in the far-right column of the last two rows in this table to describe the EUs that are being discussed in these sections of the table.
46	9. Permit Conditions, Section 1: Permit Administration	The text in this section should be indented to align with the formatting of the subsequent sections.
47	9. Permit Conditions, Section 4: Ambient Air Quality Protection Requirements, Condition 7, Ambient Air Quality Protection Requirements	The 24-hour averaging period should be included in the list of AAAQS in the second sentence of this section since this ambient standard was modeled for and compared to the maximum impacts. This is consistent with the AAAQS listed in Condition 7 and the conclusions in the Department’s review of CPAI’s ambient demonstration in Appendix B to the TAR.
48	9. Permit Conditions, Section 6: Revisions to Previous Permit Actions	Revise the first sentence of this section to correct the typographical error in the Section 6 reference and to clarify that only H <sub>2</sub> S limits that are not BACT limits are being revised by this permit.



No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
49	10. Permit Administration	Instead of a revision to the renewal application, CPAI would like to incorporate the provisions of this permit into the CPF-1 Title V Operating Permit by an administrative amendment process described in 18 AAC 50.542(e). CPAI expects this permit action to be the same as the administrative amendment that incorporated the provisions of the CPF-3 Minor Permit AQ0171MSS02 into the CPF-3 Title V Operating Permit, and CPAI understands that like the permitting action for CPF-3, it will be subject to an EPA 45-day review.
<b>TAR Appendix A: Emissions Calculations</b>		
50	Table A-1, SO <sub>2</sub> PTE Column and Footnote 1	Add clarifying language to the totals in the SO <sub>2</sub> PTE column to show which are BACT limits. Consequently, revise footnote 1 for the table as shown to accurately reflect the fact that BACT limits are not based on mass balance calculations.
51	Table A-1, Operating Limits	Add text to the H <sub>2</sub> S content operating limit for EU ID 17 to clarify that the limit is a 24-hr average H <sub>2</sub> S BACT limit, similar to the text provided for EU ID 14 which is also subject to a 24-hour average H <sub>2</sub> S BACT limit.
<b>Review of ConocoPhillips Alaska, Inc's Ambient Demonstration for the CPF-1 H<sub>2</sub>S Limits Increase Project, Minor Permit AQ0267MSS10</b>		
52	Title heading and footer	Change the font to Times New Roman to match the font in the permit and the modeling report.
53	2.1. Project Location and Description	Revise the second sentence of this section to include Construction Permit No. AQ0267CP01 as a permit that CPAI currently operates under for CPF-1, since it is active and is being revised by this permit action.  Also revise the third sentence of this section to clarify that only permits AQ0267CP01 and AQ0267MSS06 contain limits that are being revised.
54	2.2. Project Classification, 1 <sup>st</sup> paragraph	Remove the word "ambient" before "AAQs" since the acronym "AAQs" already includes the word ambient.
55	2.2. Project Classification, 2 <sup>nd</sup> paragraph	Remove the words "established" and "9773-AC016" from the third sentence of this paragraph. These edits are suggested because not all the conditions being revised were established in the permits listed in this sentence, and Permit No. 9773-AC016 is not a permit with conditions being revised.
56	2.3. Modeling Protocol Submittal	Capitalize "minor permit" in the last sentence of the second paragraph since "minor permit" is being used in the name for the AQ0171MSS03 permit.
57	3.1. Approach	Revise the description of DS1E and DS1J second paragraph of this section. As it is written, this description does not reflect one of the changes requested in the permit application. That change was to remove the ORL that could allow the size of the heaters to be increased in the future. The description should also be revised to be less specific about the heaters and more generically refer to the site emissions inventory.
58	3.4 Meteorological Data	Correct the typographical errors to correct the spelling of "Nuiqsut" and "use" as shown.
59	3.6. Terrain	Correct the typographical error in the last sentence of this section as shown.
60	3.7. EU Inventory	Revise the listing of figures referenced, since EU locations are also shown in figures 2-3 and 2-4 of Appendix E to the application.

No.	Location in permit or TAR	Basis of the Request Detailed in the Redline/Strikeout (RLSO) version of the permit, included as Attachment II (Permit and TAR) and Attachment III (Modeling Report).
61	3.7. EU Inventory, Table 1	Correct the spelling of “Econotherm” in the description for stack IDs ECL06A and ECL06B, correct the stack ID spelling for EU ID 49, and add EU ID numbers for the stack IDs G702A and G702B (MTU Emergency Generators).
62	3.8.1.1. Sulfur Compound Emissions, 1 <sup>st</sup> paragraph	For completeness, this discussion should include information about EUs 69 and 70 because these units are liquid-fired.
63	3.8.1.1. Sulfur Compound Emissions, 2 <sup>nd</sup> paragraph	1-hour SO <sub>2</sub> was not previously modeled at CPF-1; therefore, this reference to the 1-hour standard should be removed from this list.
64	3.9. Off-site Source Characterization	In the last sentence of this section, there should be a comma instead of a semicolon since the last phrase of the sentence is not a complete thought.
65	3.12. Receptor Grid	In the second bullet, the public access area referred to should be the CPF-1 pad, not the DS1F pad, since the CPF-1 pad is the area characterized by this receptor grid being described.
66	3.12. Receptor Grid, DS1E and DS1J grids	Correct the typographical error in the second bullet as shown.
67	4. Results and Discussion, Table 4	Correct the 24-hour total impact concentration to be 86.8 µg/m <sup>3</sup> . This is consistent with the impact concentration in Table 3-2 of Attachment E of the permit application and is the correct 24-hour Total Impact value calculated by adding the Modeled Design Concentration and Background Concentration shown in the Table.
68	5. Conclusion	The permits revised should include Permit No. AQ0267MSS06 since there is a 275 ppmv (at any time) limit included in that permit that is being revised.

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**  
**AIR QUALITY CONTROL MINOR PERMIT**

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**Minor Permit:** AQ0267MSS10      **Preliminary Date – September 15, 2021**  
**Rescinds Permit:** AQ0267MSS06  
**Revises Permit:** AQ0267CPT01

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit AQ0267MSS10 to the Permittee listed below.

**Owners:**      **ConocoPhillips Alaska, Inc.**      **ExxonMobil Alaska Production Inc.**  
700 G Street (Zip 99501)      3301 C Street, Suite 400 (Zip 99503)  
P.O. Box 100360      P.O. Box 196601  
Anchorage, AK 9910-0360      Anchorage, AK 99519-6601

**Chevron USA Inc.**  
P.O. Box 36366  
Houston, TX 77236

**Operator:**      **ConocoPhillips Alaska, Inc.**  
P.O. Box 100360  
Anchorage, AK 99510-0360

**Stationary Source:**      **Central Production Facility #1**

**Location:**      70° 19' 24" N; 149° 36' 30" W

**Project:**      H<sub>2</sub>S Limit Increase

**Permit Contact:**      Robin Glover, (907) 263-4874, robin.glover@conocophillips.com

The Permittee submitted an application for Minor Permit AQ0267MSS10 under 18 AAC 50.508(6) in order to revise or rescind the terms and conditions of ~~a~~-Title I permits. The project is also classified under 18 AAC 50.502(c)(3) for changes to an existing stationary source that will cause an emission increase greater than 10 tons per year (tpy) of sulfur dioxide (SO<sub>2</sub>).

This permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50. As required by AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this permit.

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James R. Plosay, Manager  
Air Permits Program

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### Abbreviations and Acronyms

AAC.....	Alaska Administrative Code	NESHAPs.....	National Emission Standards for Hazardous Air Pollutants [as contained in 40 C.F.R. 61 and 63]
ADEC.....	Alaska Department of Environmental Conservation	NOx.....	nitrogen oxides
AOS.....	Air Online Services	NRE.....	nonroad engine
AS.....	Alaska Statutes	NSPS.....	New Source Performance Standards [as contained in 40 C.F.R. 60]
ASTM.....	American Society for Testing and Materials	O & M.....	operation and maintenance
BACT.....	best available control technology	O <sub>2</sub> .....	oxygen
bhp.....	brake horsepower	PAL.....	plantwide applicability limitation
CDX.....	Central Data Exchange	PM-10.....	particulate matter less than or equal to a nominal 10 microns in diameter
CEDRI.....	Compliance and Emissions Data Reporting Interface	PM-2.5.....	particulate matter less than or equal to a nominal 2.5 microns in diameter
C.F.R. ....	Code of Federal Regulations	ppm.....	parts per million
CAA.....	Clean Air Act	ppmv, ppmvd.....	parts per million by volume on a dry basis
CO.....	carbon monoxide	psia.....	pounds per square inch (absolute)
Department.....	Alaska Department of Environmental Conservation	PSD.....	prevention of significant deterioration
dscf.....	dry standard cubic foot	PTE.....	potential to emit
EPA.....	US Environmental Protection Agency	SIC.....	Standard Industrial Classification
EU.....	emissions unit	SIP.....	State Implementation Plan
gr/dscf.....	grain per dry standard cubic foot (1 pound = 7000 grains)	SPC.....	Standard Permit Condition or Standard Operating Permit Condition
gph.....	gallons per hour	SO <sub>2</sub> .....	sulfur dioxide
HAPs.....	hazardous air pollutants [as defined in AS 46.14.990]	The Act.....	Clean Air Act
hp.....	horsepower	TPH.....	tons per hour
ID.....	emissions unit identification number	tpy.....	tons per year
kPa.....	kiloPascals	VOC.....	volatile organic compound [as defined in 40 C.F.R. 51.100(s)]
LAER.....	lowest achievable emission rate	VOL.....	volatile organic liquid [as defined in 40 C.F.R. 60.111b, Subpart Kb]
MACT.....	maximum achievable control technology [as defined in 40 C.F.R. 63]	vol%.....	volume percent
MMBtu/hr.....	million British thermal units per hour	wt%.....	weight percent
MMscf.....	million standard cubic feet	wt% <sub>fuel</sub> .....	weight percent of sulfur in fuel
MR&R.....	monitoring, recordkeeping, and reporting		

**Section 1**      ***Permit Administration***

1. Construction Permit 267CP01 remains in effect except as revised by Minor Permit AQ0267MSS10.
2. Minor Permit AQ0267MSS06 is rescinded by Minor Permit AQ0267MSS10.

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**Section 2**      ***Emission Unit Inventory***

**Emissions Unit (EU) Authorization.** The Permittee is authorized to install and operate the EUs listed in Table 1 in accordance with the minor permit application and the terms and conditions of this permit. The information in Table 1 is for identification purposes only, unless otherwise noted in the permit. The specific EU descriptions do not restrict the Permittee from replacing an EU identified in Table 1.

**Table 1 – EU Inventory**

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EU #	EU Tag No.	Equipment Unit Description	Rating/Max Capacity	Installation Date
<b>Group I – Gas Turbines</b>				
1	C-2101-A	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	5/2004
2	C-2101-B	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	10/2003
3	C-2101-C	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	11/2004
4	G-201-A	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	1979
5	G-201-B	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	1979
6	G-201-C	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	1979
7	G-201-D	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	1979
8	G-3201-E	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	10/1981
9	G-3201-F	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	10/1981
10	P-2202-A	EGT (Ruston) TB5400 Water Injection Pump	5,400 hp ISO	5/1993
11	P-2202-B	EGT (Ruston) TB5400 Water Injection Pump	5,400 hp ISO	5/1993
12	P-CL07-A	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5,400 hp ISO	5/1993
13	P-CL07-B	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5,400 hp ISO	5/1993
14	G-3203	GE Frame 6 (PG6561-B) Gas Turbine Electric Generator	53,500 hp (39,930 kW) ISO	1999
<b>Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)</b>				
15	H-201	Broach Emergency Heater (Dual fired)	27.8 MMBtu/hr [heat input, LHV]	1979
16	G1-14-01	Born Crude Heater (KUTP)	44.4 MMBtu/hr [heat input, LHV]	12/1984

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17	H-3204	Kvaerner Process Systems Fuel Gas Heater	9.7 MMBtu/hr [heat input, LHV]	1999
<b>Group IV – Flares</b>				
29	H-101B	McGill Emergency Flare	1.6 MMscf/day (Pilot/Purge/Assist) Combined Total for all flares	10/1981
30	H-KF01	Kaldair I-58-VS Emergency Flare/Control Device (LP)		1991
31	H-KF02	Kaldair I-87-FS Emergency Flare (HP)		1991
32	H-CR01A	McGill Emergency Flare		Unknown
33	H-CR01B	McGill Emergency Flare		1/1985
<b>Group V – Incinerators</b>				
35	H-250	Comptro Incinerator w/ supplemental gas-fired burners: Primary Burner #1 Primary Burner #2 Secondary Burner	1,300 lb/hr 0.8 MMBtu/hr 0.8 MMBtu/hr 2.0 MMBtu/hr	1980
<b>Group VI – Other Equipment (Drill Site Heaters and Drill Site Production Heaters)</b>				
37	H-1A01	Latoka Drill Site Heater (1A)	16.4 MMBtu/hr [heat input, LHV]	12/1981
38	H-1B01	Latoka Drill Site Heater (1B)	16.4 MMBtu/hr [heat input, LHV]	12/1981
39	H-2V01	CE NATCO Drill Site Heater (1C)	14.5 MMBtu/hr [heat input, LHV]	1984
40	H-3F01	CE NATCO Drill Site Heater (1D)	19.6 MMBtu/hr [heat input, LHV]	1985
42	H-1E02	GTS Energy Production Heater (1E)	30.0 MMBtu/hr [heat input, LHV]	8/15/05
43	H-1F01	BS & B Drill Site Heater (1F)	14.9 MMBtu/hr [heat input, LHV]	10/1982
44	H-1G01	BS & B Drill Site Heater (1G)	14.9 MMBtu/hr [heat input, LHV]	10/1982
45	H-1F-1901	Latoka Drill Site Heater (1H)	16.4 MMBtu/hr [heat input, LHV]	6/1982

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46	H-1J01A	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]	12/1/04
47	H-1J01B	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]	12/1/04
48	H-1Q01	BS&B Drill Site Heater (1Q)	21.0 MMBtu/hr [heat input, LHV]	1985
49	H-1R01	BS&B Drill Site Heater (1R)	17.2 MMBtu/hr [heat input, LHV]	1985

Notes:

EUs 1 through 17, 29 through 33, 35, 37 through 40, and 42 through 49 have already been installed and permitted at the stationary source.

3. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement EU, including any applicable minor or construction permit requirements.

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### Section 3 ***Fee Requirements***

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4. **Administration Fees.** The Permittee shall pay to the Department all assessed permit administration fees. Administration fee rates are set out in 18 AAC 50.400-403.

**Assessable Emissions.** For each period from July 1 through the following June 30, the Permittee shall pay to the Department an annual emission fee based on the stationary source's assessable emissions, as determined by the Department under 18 AAC 50.410. The Department will assess fees per ton of each air pollutant that the stationary source emits or has the potential to emit in quantities 10 tons per year or greater. The quantity for which fees will be assessed is the lesser of the stationary source's:

- 4.1 potential to emit of ~~4,7675,232~~ TPY; or
- 4.2 projected annual rate of emissions, in TPY, based upon actual annual emissions for the most recent calendar year, or another 12-month period approved in writing by the Department, when demonstrated by credible evidence of actual emissions, based upon the most representative information available from one or more of the following methods:
  - a. an enforceable test method described in 18 AAC 50.220;
  - b. material balance calculations;
  - c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or
  - d. other methods and calculations approved by the Department, including appropriate vendor-provided emissions factors when sufficient documentation is provided.

**Assessable Emission Estimates.** The Permittee shall comply as follows:

- 4.3 No later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions as determined in Condition 5.2. Submit actual emissions estimates in accordance with the submission instructions on the Department's Standard Permit Conditions web page at <http://dec.alaska.gov/air/air-permit/standard-conditions/standard-condition-i-submission-instructions/>.
- 4.4 The Permittee shall include with the assessable emissions report all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates.
- 4.5 If the stationary source has not commenced construction or operation on or before March 31st, the Permittee may submit to the Department's Anchorage office a waiver letter certified under 18 AAC 50.205 that states the stationary source's actual annual emissions for the previous calendar year are zero TPY and provides estimates for when construction or operation will commence.

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4.54.6 If no estimate or waiver letter is submitted on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit in Condition 5.1.

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**Section 4**     ***Ambient Air Quality Protection Requirements***

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5. **Fuel Limits.** To protect the 1-hour, 3-hour, 24-hour, and annual SO<sub>2</sub> AAAQS; and the 3-hour, 24-hour, and annual Class II maximum allowable increases (increments); the Permittee shall:

5.1 Limit the hydrogen sulfide (H<sub>2</sub>S) content of the fuel gas fired in EUs 1 through 17, 29 through 33, and 35 to no more than 300 ppmv at standard conditions and fuel gas fired in EUs 37 through 40 and 42 through 49 to no more than 500 ppmv at standard conditions, on a consecutive 12-month average basis. Monitor, record, and report the consecutive 12-month average H<sub>2</sub>S concentration as required in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

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~~a. Determine compliance no less than once a month with the fuel gas H<sub>2</sub>S content limit as follows:~~

~~(i) Determine the fuel gas H<sub>2</sub>S content of the fuel using ASTM D 4810-88, ASTM D 4913-89, Gas Producer's Association method 2377-86.~~

~~(ii) The fuel gas H<sub>2</sub>S analysis required under this condition may be performed by the owner or operator, a service contractor retained by the owner or operator, or the fuel vendor.~~

~~b. Keep records of the analysis conducted as required in Condition 7.1a(i).~~

~~e. Report in each operating report required by the applicable operating permit issued to the stationary source under AS 46.14 and 18 AAC 50, the monthly fuel gas H<sub>2</sub>S concentration, for each month of the reporting period.~~

~~d. Report as excess emissions and permit deviation as described in the applicable operating permit issued to the stationary source under AS 46.14 and 18 AAC 50, should the fuel gas H<sub>2</sub>S concentration exceed the limit in Condition 7.1, or if Conditions 7.1a through 7.1e are not met.~~

5.2 Limit the hydrogen sulfide (H<sub>2</sub>S) content of the fuel gas fired in EUs 37 through 49 to no more than 500 ppmv at standard conditions on a consecutive 12-month average basis.

a. Determine compliance no less than once a month with the fuel gas H<sub>2</sub>S content limit as follows:

(i) Determine the fuel gas H<sub>2</sub>S content of the fuel using ASTM D 4810-88, ASTM D 4913-89, Gas Producer's Association method 2377-86.

(ii) The fuel gas H<sub>2</sub>S analysis required under this condition may be performed by the owner or operator, a service contractor retained by the owner or operator, or the fuel vendor.

b. Keep records of the analysis conducted as required in Condition 7.2a(i).

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- ~~e. Report in each operating report required by the applicable operating permit issued to the stationary source under AS 46.14 and 18 AAC 50, the monthly fuel gas H<sub>2</sub>S concentration, for each month of the reporting period.~~
- ~~d. Report as excess emissions and permit deviation as described in the applicable operating permit issued to the stationary source under AS 46.14 and 18 AAC 50, should the fuel gas H<sub>2</sub>S concentration exceed the limit in Condition 7.2, or if Conditions 7.2a through 7.2c are not met.~~

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**Section 5 *Previously Established Limits to Avoid Prevention of Significant Deterioration (PSD) Major Modification***

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6. Limit total nitrogen oxides (NOx) emissions from EUs 1 through 3 listed in Table 1 to no greater than 824 tons per 12 consecutive month period. Monitor, record and report NOx emissions, as described in the ~~oeprating~~-operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

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**Section 6 Revisions to Previous Permit Actions**

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7. The SO<sub>2</sub> explanations and the H<sub>2</sub>S limits and explanations for EUs 1 through 17, 29 through 33, 35, 37 through 40, 43 through 45, 48, and 49, established in Exhibit B of Construction Permit 267CP01 are rescinded and replaced as follows:

**Sources (Turbines): GE Frame 3 Turbines (C-2101-A, C-2101-B, and C-2101-C), EGT (Ruston) TB5000 Turbines (G-201-A, G-201-B, G-201-C, G-201-D, G-3201-E, and G-3201-F), and EGT (Ruston) TB5400 Turbines (P-2202-A, P-2202-B, P-CL07-A, and P-CL07-B)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	GE Frame 3	200 ppmv H <sub>2</sub> S in fuel gas	300 ppmv H <sub>2</sub> S in fuel gas (annual average)	Revised ambient demonstration submitted by CPAI on 5/3/2021.
	EGT (Ruston) TB5000 Series	200 ppmv H <sub>2</sub> S in fuel gas		
	EGT (Ruston) TB5400 Series	200 ppmv H <sub>2</sub> S in fuel gas	109 tpy total combined, except G-201-(A through D)	EPA PSD BACT and 10/7/97 permit revision.

**Source (Turbine): GE Frame 6 Turbine (G-3203)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	G-3203	200 ppmv H <sub>2</sub> S in fuel gas (24-hour average)	No Change.	Carried Forward. ADEC BACT limit.
			300 ppmv H <sub>2</sub> S in fuel gas (annual average)	Revised ambient demonstration submitted by CPAI on 5/3/2021.

**Sources (Heaters): Broach Dual-fired Heater (H-201); Born Crude Heater (G1-14-01); and Drill Site Heaters (H-1A01, H-1B01, H-2V01, H-3F01, H-1F01, H-1G01, H-1F-1901, H-1Q01, ~~H-1V01~~, H-1R01)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	Broach Heater	200 ppmv H <sub>2</sub> S in fuel gas	300 ppmv H <sub>2</sub> S in fuel gas (annual average)	Revised ambient demonstration submitted by CPAI on 5/3/2021.

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Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
	Born Heater	168 ppmv H <sub>2</sub> S in fuel gas and 4.5 tpy	162 ppmv H <sub>2</sub> S in Fuel gas (running 3-hr average)  300 ppmv H <sub>2</sub> S in fuel gas (annual average)	The limit in 40 C.F.R. 60.104(a)(1) converts to 162 ppmv @ 59°F. Ton per year limit is now rolled into the group limit.  Revised ambient demonstration submitted by CPAI on 5/3/2021.
	Drill Site Heaters	200 ppmv H <sub>2</sub> S in fuel gas	500 ppmv H <sub>2</sub> S in fuel gas (annual average)	Revised ambient demonstration submitted by CPAI on 5/3/2021.
			33 tpy (total for all units except H-201)	EPA PSD BACT and 10/7/97 permit revision

**Sources (Heaters): Kvaerner Fuel Gas Heater (H-3204) and ICE Air Heater (H-102A)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	H-3204	200 ppmv H <sub>2</sub> S in fuel gas (24-hour average)	No Change.  300 ppmv H <sub>2</sub> S in fuel gas (annual average)	Carried Forward. ADEC BACT limit.  Revised ambient demonstration submitted by CPAI on 5/3/2021.
	H-102A	0.5% sulfur content in liquid fuel	No change.	Carried forward.

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**Source: Incinerator (H-250)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	H-250	200 ppmv H <sub>2</sub> S in fuel gas.	300 ppmv H <sub>2</sub> S in fuel gas (annual average)	<del>Carried Forward.</del> Revised ambient demonstration submitted by CPAI on 5/3/2021.
		0.5% sulfur content in liquid fuel	No limit.	The incinerator supplemental burners do not use liquid fuel.

**Sources (Flares): McGill Emergency Flares (H-101B, H-CR01A, and H-CR01B) and Kaldair Smokeless Emergency Flares (H-KF01, and H-KF02)**

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO <sub>2</sub>	H-101B, H-CR01A, H-CR01B, H-KF01, and H-KF02	200 ppmv H <sub>2</sub> S in fuel gas	300 ppmv H <sub>2</sub> S in fuel gas (annual average)	Revised ambient demonstration submitted by CPAI on 5/3/2021.

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## Section 7 *SO<sub>2</sub> Emissions Monitoring, Recordkeeping, & Reporting*

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8. **Monitoring.** Beginning in ~~Calendar~~ calendar year 2022 and ending in calendar year 2031, the Permittee shall monitor emissions from EUs 1 through 17, 29 through 33, 35 (gas-fired burners only), 37 through 40, and 42 through 49, and beginning in 2023 and ending in 2032, the Permittee shall calculate calendar year SO<sub>2</sub> emissions from the EUs for the preceding year as follows:

- 8.1 Monitor and record the amount of fuel gas burned in million standard cubic feet (MMscf) during each calendar month of the calendar year by either:
  - a. Using a fuel gas meter calibrated to manufacturer's specifications and accurate to within ± 5 percent; or
  - b. Using an hour meter and assuming manufacturer's full load fuel consumption rate.
- 8.2 Calculate ~~and the~~ total SO<sub>2</sub> emissions for each calendar month of the calendar year using the amount of fuel gas recorded under Condition 10.1, the monthly H<sub>2</sub>S content of the fuel gas measured as described in the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50, and the following equation:

$$SO_2(\text{tons}) = \frac{\text{Fuel Gas (MMscf)} * H_2S (\text{ppmv}) * 64 \frac{\text{lbs } SO_2}{\text{mol } H_2S}}{379.4 \frac{\text{scf}}{\text{mol}} * 2,000 \frac{\text{lbs}}{\text{ton}}}$$

- 8.3 By the reporting date specified for the operating report which encompasses the reporting for the month of December, required by the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50 of each calendar year, calculate the total SO<sub>2</sub> emissions for the preceding calendar year by summing the total emissions calculated in Condition 10.2 for all 12 months of the preceding calendar year.
- 8.4 By the reporting date specified for the operating report which encompasses the reporting for the month of December, required by the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50 of each calendar year, determine the net change in SO<sub>2</sub> emissions for the preceding calendar year as follows:

$$\begin{aligned} \text{Net Change in } SO_2 \text{ Emissions} \\ = (SO_2 \text{ emissions calculated in Condition 10.3}) - 106.97 \text{ tpy} \end{aligned}$$

**Recordkeeping.** The Permittee shall maintain the following records for EUs 1 through 17, 29 ~~through~~ through 33, 35 (gas-fired burners only), 37 through 40, and 42 through 49 and make them available to the Department upon request.

- 8.5 The fuel gas consumed (MMscf) for each calendar month of the calendar year;
- 8.6 The weighted average fuel gas H<sub>2</sub>S concentration (ppmv) data for each calendar month of the calendar year;

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- 8.7 The total SO<sub>2</sub> emissions for each calendar month calculated under Condition 10.2 and supporting calculations used to obtain the emission estimates;
- 8.8 The total SO<sub>2</sub> emissions for each calendar year calculated under Condition 10.3 and the supporting calculations to obtain the emission estimates; and
- 8.9 The net change in SO<sub>2</sub> emissions for each calendar ~~year-year calculated-calculated~~ under Condition 10.4.

**Reporting.** For ~~Bus-EUs 1~~ through 17, 29 through 33, 35 (gas-fired burners only), 37 through 40, ~~and~~ 42 through 49, the Permittee shall report as follows:

- 8.10 For calendar years 2022 through 2031, report in the operating report required by the ~~oeprating-operating~~ permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50 the following information:
  - a. SO<sub>2</sub> emissions for each calendar month of the calendar year calculated under Condition 10.2; and
  - b. In the final ~~oeprating-operating~~ report for the calendar year, report the net change in emissions calculated under Condition 10.4 for the calendar year ending with the last month of the reporting period.
- 8.11 Within 60 days after the end of each calendar year 2022 through 2031, report the following information to the Department if the net change in SO<sub>2</sub> emissions calculated under Condition 10.4 for the preceding year reaches or exceeds 40 tpy<sup>1</sup>:
  - a. The name, address and telephone number of the major stationary source;
  - b. The annual emissions calculated under Condition 10.3 and the net change in emissions calculated under Condition 10.4; and
  - c. Any other information that the Permittee wishes to include in the report (e.g., an explanation as to why the emissions differ from the preconstruction projection).
- 8.12 Report as a permit deviation as described in the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50 if monitoring, recordkeeping, or reporting under Conditions 10, 11, or 12 is not completed as required.

<sup>1</sup> ConocoPhillips Alaska, Inc. is required to submit a PSD permit application if the net change in emissions calculated under Condition 10.4 for the preceding year reaches or exceeds 40 tpy.

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**Section 8**      **Recordkeeping, Reporting, and Certification Requirements**

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9. **Certification.** The Permittee shall certify any permit application, report, affirmation, or compliance certification submitted to the Department and required under the permit by including the signature of a responsible official for the permitted stationary source following the statement: *“Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.”* Excess emission reports must be certified either upon submittal or with an operating report required for the same reporting period. All other reports and other documents must be certified upon submittal.

- 9.1 The Department may accept an electronic signature on an electronic application or other electronic record required by the Department if the person providing the electronic signature
  - a. uses a security procedure, as defined in AS 09.80.190, that the Department has approved; and
  - b. accepts or agrees to be bound by an electronic record executed or adopted with that signature.

**Submittals.** Unless otherwise directed by the Department or this permit, the Permittee shall submit to the Department one certified copy of reports, compliance certifications, and/or other submittals required by this permit. The Permittee may submit the documents electronically or by hard copy.

- 9.2 Submit the certified copy of reports, compliance certifications, and/or other submittals in accordance with the submission instructions on the Department’s Standard Permit Conditions web page at <http://dec.alaska.gov/air/air-permit/standard-conditions/standard-condition-xvii-submission-instructions/>.

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**Section 9**      ***Standard Permit Conditions***

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10. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for
  - 10.1 an enforcement action; or
  - 10.2 permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280.
11. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.
12. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of the permit.
13. The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the Permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
14. The permit does not convey any property rights of any sort, nor any exclusive privilege.
15. The Permittee shall allow the Department or an inspector authorized by the Department, upon presentation of credentials and at reasonable times with the consent of the owner or operator to
  - 15.1 enter upon the premises where an emissions unit subject to this permit is located or where records required by the permit are kept;
  - 15.2 have access to and copy any records required by this permit;
  - 15.3 inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and
  - 15.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

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**Section 10**     ***Permit Documentation***

<u>Date</u>	<u>Document Details</u>
<u>November 22, 2013</u>	<u>CPAI submits application to revise AQ0267MSS02</u>
<u>May 3, 2021</u> <del>Month DD, 20YY</del>	<u>Application to revise/rescind AQ0267MSS06</u> received
<u>Month DD, 20YY</u>	<u>Response received from Permittee / Applicant regarding additional application information.</u>

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**Technical Analysis Report**  
**For the Terms and Conditions of**  
**Minor Permit AQ0267MSS10**

**Issued to ConocoPhillips Alaska, Inc.**  
**For the Central Production Facility #1**

**Alaska Department of Environmental Conservation**  
**Air Permits Program**

**Prepared by Brittany Crutchfield**

**Preliminary – September 15, 2021**



## 1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Permit AQ0267MSS10 to ConocoPhillips Alaska, Inc. for the Central Production Facility #1. Their application is classified under 18 AAC 50.502(c)(3) for changes to an existing stationary source that will cause an emission increase greater than 10 tpy SO<sub>2</sub>, and ConocoPhillips Alaska, Inc. requested the permit under 18 AAC 50.508(6) in order to revise terms or conditions previously established in a Title I Permit. Minor Permit AQ0267MSS10 revises Construction Permit AQ0267CPT01 and rescinds Minor Permit AQ0267MSS06. The TAR for both permits remains

## 2. STATIONARY SOURCE DESCRIPTION

The Central Production Facility #1 is a Prevention of Significant Deterioration (PSD) major existing stationary source located on the Alaska North Slope and is one of three central production facilities owned and operated by ConocoPhillips Alaska, Inc. The emissions unit (EU) inventory consists of 14 turbines, four and heaters, two diesel-fired emergency generator equipment, seven freeze protection pumps, five emergency flares and an emergency control device flares, two an incinerators, 14 drill site or production heaters, five storage tanks, a topping plant, three IC engines, a mobile gasoline storage/dispensing tank, and a rock crusher unit.

ConocoPhillips Alaska, Inc. currently operates under Operating Permit AQ0267TVP01, Revision 2 under a permit shield (a renewal/renewed application for the operating permit is pending).

## 3. PERMITTING HISTORY AND BACKGROUND ON H<sub>2</sub>S LIMITS

Air Quality Control Permit to Operate No. 9373-AA004 issued to ARCO Alaska Inc. on May 11, 1993 and then amended on January 3, 1997 established an ambient air quality limit of 200 ppmv H<sub>2</sub>S to address field gas souring. At the time, the Department determined that this was not considered a physical plant change or a change in the method of operations, so PSD review was not required, but that increment was being consumed so ambient limits were necessary. These limits were included in Exhibit B of Air Quality Control Permit to Operate No. 9373-AA004 and has been carried forward into Construction Permit 267CP01 and Operating Permit No. AQ0267TVP01, Revision 4. Exhibit B of Construction Permit 267CP01 indicates that the 200 ppmv H<sub>2</sub>S limit for EUs 1 through 3 and 8 through 13 as, "Carried forward. EPA PSD BACT and 10/7/97 permit revision." However, permit documentation does not indicate that the H<sub>2</sub>S content of the fuel gas was established as a BACT limit itself. A BACT limit for SO<sub>2</sub> was established as a ton per year limit, but a short-term or long-term limit on H<sub>2</sub>S concentration was not established as BACT. ConocoPhillips Alaska, Inc. is revising this 200 ppmv H<sub>2</sub>S ambient air protection limit to be 300 ppmv (annual average).

For EUs 14 and 17, Prevention of Significant Deterioration Construction Permit No. 9773-AC016 was issued February 13, 1998. In the permit and as noted in the TAR for this permit, the 200 ppmv H<sub>2</sub>S on a 24-hour average limit was established as SO<sub>2</sub> BACT and as an ambient air quality protection limit. This requirement was carried forward into Construction Permit No. 267CP01 and Operating Permit No. AQ0267TVP01, Revision 4. For ambient air quality protection purposes, ConocoPhillips Alaska, Inc. is establishing a 300 ppmv (annual average) H<sub>2</sub>S limit in Minor Permit AQ0267MSS10.

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EU 16 is subject to the requirements of 40 C.F.R. 60 Subpart J, and is therefore subject to a limit of 162 ppmv H<sub>2</sub>S (3-hour average). For ambient air quality protection purposes, ConocoPhillips Alaska, Inc. is establishing a 300 ppmv (annual average) H<sub>2</sub>S limit in Minor Permit AQ0267MSS10.

Minor Permit No. AQ0267MSS01 issued August 5, 2005 has since been revised and rescinded by the issuance of Minor Permit No. AQ0267MSS06 issued March 28, 2014. Minor Permit No. AQ0267MSS01 established a 275 ppmv (at any time) H<sub>2</sub>S limit for EUs 42, 46, and 47 for PSD major modification avoidance. Since the issuance of Minor Permit No. AQ0267MSS06, EUs 42, 46, and 47 have been installed and their combined SO<sub>2</sub> potential to emit (PTE) based on 500 ppmv H<sub>2</sub>S and their installed heat input ratings is less than the PSD permitting thresholds. Therefore, PSD avoidance limits are not required and can be removed. For ambient air quality protection purposes, ConocoPhillips Alaska, Inc. is establishing a 500 ppmv (annual average) H<sub>2</sub>S limit in Minor Permit AQ0267MSS10.

#### 4. APPLICATION DESCRIPTION

ConocoPhillips Alaska, Inc. submitted their application on May 3, 2021~~Month DD, 20YY~~. The requested changes are as follows:

- Revise H<sub>2</sub>S limits in Construction Permit AQ0267CPT01;~~and~~
- Rescind H<sub>2</sub>S limits in Minor Permit AQ0267MSS06;
- Revise the emission unit inventory in AQ0267MSS06 for EU IDs 42, 46, and 47; and
- Rescind the PSD avoidance limits for EU IDs 42, 46, and 47 in AQ0267MSS06.

#### 5. CLASSIFICATION FINDINGS

Based on the review of the application, the Department finds that:

1. Minor Permit AQ0267MSS10 is classified under 18 AAC 50.502(c)(3) for beginning a physical change to or a change in the method of operation of an existing stationary source with a potential to emit greater than 10 tons per year of SO<sub>2</sub>.
2. Minor Permit AQ0267MSS10 is classified under 18 AAC 50.508(6) to revise or rescind terms and conditions of a Title I permit.

#### 6. APPLICATION REVIEW FINDINGS

Based on the review of the application, the Department finds that:

1. ConocoPhillips Alaska, Inc.'s minor permit application for the Central Production Facility #1 contains the elements listed in 18 AAC 50.540.
2. The minor permit no longer needs to include the conditions associated with the *State Emissions Standards*, since those provisions are part of the Title V Operating Permit AQ0267TVP02, Revision 1. The minor permit likewise does not need to include the *General Recordkeeping, Reporting, and Certification* conditions, or the *Standard Conditions*, except as required under 18 AAC 50.544(a)(5).
3. ConocoPhillips Alaska, Inc. is not requesting a change to the annual SO<sub>2</sub> BACT limits.
4. The actual-to-projected-actual test is used only to determine the PSD applicability of the emissions increases, it is not used to establish a PSD avoidance limit for H<sub>2</sub>S.

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5. The 24-month period of January 2019 to December 2020 was selected for the baseline actual emissions. ConocoPhillips Alaska, Inc. believes that this 24-month period represents the highest SO<sub>2</sub> emission rates from gas burning equipment and the highest average fuel gas H<sub>2</sub>S concentrations in the last 10 years. Choosing the highest SO<sub>2</sub> emission rates for the baseline is consistent with 40 C.F.R. 52.21(b)(48)(i), which indicates ConocoPhillips Alaska, Inc. may select any consecutive ~~24-24~~-month period within the 10-year period immediately preceding the date that the Department received the complete permit application.
6. ConocoPhillips Alaska, Inc. fulfilled the 18 AAC 50.540(k)(3) and 50.540(c)(2) requirements by submitting an updated ambient SO<sub>2</sub> air quality analysis with the application. The analysis demonstrates that increasing the H<sub>2</sub>S limits will not cause or contribute to a violation of the 1-hour, 3-hour, 24-hour, and annual SO<sub>2</sub> AAAQS, or 3-hour, 24-hour, and annual SO<sub>2</sub> PSD Class II increments.
7. ConocoPhillips Alaska, Inc. stated that the fuel gas H<sub>2</sub>S limits for EUs 1 through 3 and 8 through 13 in Construction Permit 267CP01 are not BACT limits. The Department concurs with ConocoPhillips Alaska, Inc.'s position and agrees that ConocoPhillips Alaska, Inc.'s request to change the fuel gas H<sub>2</sub>S limits is not subject to BACT review as the BACT limits are for SO<sub>2</sub> emissions, not H<sub>2</sub>S concentrations. The H<sub>2</sub>S limits can therefore be changed without readdressing the SO<sub>2</sub> BACT limits and can be revised by a Title I permit revision under 18 AAC 50.508(6). This decision is consistent with Minor Permit AQ0171MSS02AQ0171MSS03.
8. For EUs 14 and 17 the previously established 200 ppmv H<sub>2</sub>S concentration on a 24-hour average limit for BACT listed in Section 6 is still applicable even though the ambient air quality protection limit is higher.
9. EU 16 is still subject to the NSPS requirements even though the ambient air quality protection limit is higher.
10. Increasing H<sub>2</sub>S limits does not directly threaten compliance with the annual SO<sub>2</sub> BACT limits because actual SO<sub>2</sub> emissions are a function of both the H<sub>2</sub>S concentration and the volume of fuel gas combusted.
11. Because the net emissions increase is approximately 39.6 tpy SO<sub>2</sub>, which is greater than 50 percent of the PSD-significant emissions threshold of 40 tpy, the provisions of 40 C.F.R. 52.21(r)(6) will apply to Central Production Facility #1 because there is a "reasonable possibility" that a major modification may result from the project.
12. ConocoPhillips Alaska, Inc. did request that owner requested limits (ORLs) for EUs 42, 46 and 47 in Minor Permit AQ0267MSS06 be removed. The ORLs included a maximum combined rating of the EUs prior to their installation. ConocoPhillips Alaska, Inc. included a revised PTE for these EUs assuming 500 ppmv fuel sulfur content which the Department believes is a conservative estimation. The Department agrees that the combined rating of EUs 42, 46 and 47 and total SO<sub>2</sub> emissions are below the ORLs limit and therefore no longer require the ORLs for H<sub>2</sub>S, SO<sub>2</sub> emissions, or heat input. Therefore, with this issuance of Minor Permit AQ0267MSS10, the H<sub>2</sub>S-ORLs limit established in Minor Permit No. AQ0267MSS01 and carried forward in Minor Permit AQ0267MSS06 ~~is-are~~ no longer needed.

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13. ConocoPhillips Alaska, Inc. provided updated emissions calculations not including emissions from EUs that have been removed from service since the issuance of Minor Permit AQ0267MSS07. ~~Therefore, though only SO<sub>2</sub> was affected with this permitting action, PTE from NO<sub>x</sub>, CO, VOC, and PM were reduced due to the removal of the PSD avoidance limits for EUs 42, 46, and 47, as noted in the application.~~ ~~emissions for NO<sub>x</sub>, CO, VOC, and PM were reduced.~~

**7. EMISSIONS SUMMARY AND PERMIT APPLICABILITY**

ConocoPhillips Alaska, Inc. provided emission calculations for Central Production Facility #1 with the application for Minor Permit AQ0267MSS10.

Table 2 shows the PSD permit applicability of the project with respect to SO<sub>2</sub> emissions. The project has no effect on the actual emissions of other regulated pollutant emissions and does not trigger the need for step two of the two-step PSD applicability procedure. Baseline actual SO<sub>2</sub> emissions in tpy are calculated using baseline actual H<sub>2</sub>S concentrations in ppmv in combination with the amount of fuel combusted.

**Table 2 – PSD Permit Applicability, (tpy)**

Description	SO <sub>2</sub> (tpy)
Baseline Actuals (BAE)	107. <del>32</del>
Projected Actuals (PAE)	146. <del>98</del>
PAE-BAE	<b>39.6</b>
PSD Step 1 Increase	39.6
PSD Significance Level	40
PSD Review Required?	No

Table Notes:

Step 1 PSD permit applicability conducted in accordance with 40 C.F.R. 52.21(a)(2)(iv)(c).

Step 1 PSD permit applicability determined only based on SO<sub>2</sub> emissions from EUs 1 through 17, 29 through 33, 35 (gas-fired burners only), 37 through 40, and 42 through 49.

Table 3 shows the emissions summary and permit applicability with assessable emissions from the stationary source. Emission factors and detailed calculations for SO<sub>2</sub> are provided in Appendix A.

A summary of the potential to emit (PTE) and assessable PTE, as determined by the Department, is shown in Table 3 below.

**Table 3 – Emissions Summary and Permit Applicability, tons per year (tpy)**

Parameter	NO <sub>x</sub>	CO	VOC	PM-2.5	PM-10	SO <sub>2</sub>
PTE before Modification[a]	<del>3,333.632</del> 93	<del>1,079.210</del> 73	<del>468.6467</del>	<del>128.9118</del>	<del>128.9118</del>	<del>321.7320</del>
PTE after Modification	3,263.0	1,048.2	464.9465	115.3	115.3	340.6341

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Parameter	NOx	CO	VOC	PM-2.5	PM-10	SO <sub>2</sub>
Change in PTE	-70,629.9	-3425.1	-3,71.64	-13,62.27	-13,62.27	18,920.6
18 AAC 50.502(c)(3) Permit Thresholds	10	N/A	N/A	10	10	10
502(c)(3) Applicable?	N	N/A	N/A	N	N	Y
Title V Permit Thresholds	100	100	100	100	100	100
Title V Permit Required?	Y	Y	Y	Y	Y	Y
Assessable Emissions [b] [c]	3,263	1,048	465	115	115	341
Total Assessable[d]	4,7675,232					

Table Notes:

- [a] – PTE before modification emissions calculations are based on calculations submitted to the Department with the September 24, 2019 CPF-1 Title V Operating Permit Minor Modification Application, with the addition of the emissions summarized in the Off-Permit Change Notification, dated March 9, 2020, and submitted to the Department March 10, 2020, for the operation of the Drill Site 1B drilling cuttings boiler (EU ID 71), is from the Technical Analysis Report for Permit AQ0267MSS07
- [b] – Assessable emissions include fugitive emissions.
- [c] – Assessable emissions include any pollutant greater than or equal to 10 tpy.
- [d] – PM-10 emissions include PM-2.5 emissions. Therefore, PM-2.5 is not counted in total assessable emissions.

**8. REVISIONS TO PERMIT CONDITIONS**

Table 4 below lists the requirements carried over from Construction Permit 267CP01 into Minor Permit AQ0267MSS10.

Table 4 – Comparison of 267CP01 to AQ0267MSS10 Conditions<sup>2</sup>

Permit 267CP01 Condition No.	Description of Requirement	Permit AQ0267MSS10 Condition No.	How Condition was Revised
Exhibit B	Emission and Operating Limits	Section 6	SO <sub>2</sub> limits were not revised but the H <sub>2</sub> S content limit was revised. Revisions to each limit is documented in the tables included in Condition 9.

Table 5 below lists the requirements carried over from Minor Permit AQ0267MSS06 into Minor Permit AQ0267MSS10.

Table 5 – Comparison of AQ0267MSS06 to AQ0267MSS10 Conditions<sup>3</sup>

Permit AQ0267MSS06 Condition No.	Description of Requirement	Permit AQ0267MSS10 Condition No.	How Condition was Revised
3	NOx ORL for EUs 1-3	Condition 8	Condition was revised to include EU IDs.

<sup>2</sup> This table does not include all standard and general conditions.

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4	Production Heater Input Limit	None	Condition removed as the EUs installed as DS1E and DS1J Production Heaters (EUs 42, 46, and 47) authorized under AQ0267MSS06 have a combined heat input of less than the limit established.
5	Fuel Gas H <sub>2</sub> S Content Limit	None	This condition is no longer required as the EUs installed as DS1E and DS1J <u>production heaters</u> at the stationary source (EUs 42, 46, and 47) do not require an H <sub>2</sub> S limit in order to avoid PSD permitting.
6	SO <sub>2</sub> Emission Limit	None	This condition is no longer required as the EUs installed as DS1E and DS1J <u>production heaters</u> at the stationary source (EUs 42, 46, and 47) have a combined SO <sub>2</sub> PTE of less than 35 tpy.

**9. PERMIT CONDITIONS**

The bases for the standard and general conditions imposed in Minor Permit AQ0267MSS10 are described below.

**Cover Page**

18 AAC 50.544(a)(1) requires the Department to identify the stationary source, Permittee, and contact information. The Department provided this information on the cover page of the permit.

**Section 1: Permit Administration**

Minor Permit AQ0267MSS10 only revises portions of Construction Permit 267CP01. Condition 1 states that the terms and conditions of Construction Permit 267CP01 are still in effect except as revised by Minor permit AQ0267MSS10.

Minor Permit AQ0267MSS10 rescinds Minor Permit AQ0267MSS06 as stated in Condition 2.

**Section 2: Emissions Unit Inventory**

The EUs authorized and/or restricted by this permit are listed in Table 1 of the permit. Unless otherwise noted in the permit, the information in Table 1 is for identification purposes only. Condition 3 is a general requirement to comply with AS 46.14 and 18 AAC 50 when installing a replacement EU.

**Section 3: Fee Requirements**

18 AAC 50.544(a)(2) requires the Department to include a requirement to pay fees in accordance with 18 AAC 50.400 – 18 AAC 50.499 in each minor permit issued under 18 AAC 50.542. The Department used the Standard Permit Condition (SPC) I language for Minor Permit AQ0267MSS10.

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#### Section 4: Ambient Air Quality Protection Requirements

##### Condition 7, Ambient Air Quality Protection Requirements

18 AAC 50.544(a)(3) and 18 AAC 50.544(a)(6) require the Department to include conditions to protect air quality, when warranted. The Department determined that conditions are warranted to protect the 1-hour, 3-hour, 24-hour, and annual SO<sub>2</sub> AAAQS, and the 3-hour, 24-hour, and annual Class II maximum allowable increases (increment) for the reasons described in Appendix B of this TAR.

#### Section 6: Revisions to Previous Permit Actions

As discussed in the 6section 6 of this TAR, the H<sub>2</sub>S fuel content limits, with the exception of limits for EU IDs 14 and 17, are not the BACT limits established for the stationary source. Therefore the Department has revised the H<sub>2</sub>S limits established in Exhibit B of Construction Permit 267CP01 as indicated in the tables included in Condition 9. Condition 9 revises only the H<sub>2</sub>S limits, the other limits established in Exhibit B of Construction Permit 267CP01 remain unchanged.

#### Section 7: SO<sub>2</sub> Emissions Monitoring, Recordkeeping, & Reporting

The provisions of 40 C.F.R. 52.21(r)(6) apply with respect to any regulated NSR pollutant emitted from projects for existing emissions units at a major stationary source in circumstances where there is a reasonable possibility that a project that is not part of a major modification may result in a significant emissions increase of that pollutant. The requirements include additional monitoring, recordkeeping, and reporting during the 10-year contemporaneous period after the application was submitted (i.e., the project baseline date). Condition 10 requires monitoring of the quantity of fuel gas consumed by EUs 1 through 17, 29 through 33, 35, 37 through 40, and 42 through 49 as well as calculating the total calendar month and total calendar year SO<sub>2</sub> emissions. The Permittee is also required to calculate the net change in SO<sub>2</sub> emissions each calendar year, which will determine if the project was actually a major modification under 40 C.F.R. 52.21(b)(2). Conditions 11 and 12 include specific recordkeeping and reporting requirements.

#### Section 8: General Recordkeeping, Reporting, and Certification Requirements

##### Condition 13, Certification

18 AAC 50.205 requires the Permittee to certify any permit application, report, affirmation, or compliance certification submitted to the Department. This requirement is reiterated as a standard permit condition in 18 AAC 50.345(j). Minor Permit AQ0267MSS10 uses the standard condition language, but also expands it by allowing the Permittee to provide electronic signatures.

##### Condition 14 Submittals

Condition 14 clarifies where the Permittee should send their reports, certifications, and other submittals required by the permit. The Department included this condition from a practical perspective rather than a regulatory obligation.

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## Section 9: Standard Permit Conditions

### Conditions 15 – 20, Standard Permit Conditions

18 AAC 50.544(a)(5) requires each minor permit issued under 18 AAC 50.542 to contain the standard permit conditions in 18 AAC 50.345, as applicable. 18 AAC 50.345(a) clarifies that subparts (c)(1) and (2), and (d) through (o), may be applicable for a minor permit.

The Department included all of the minor permit-related standard conditions of 18 AAC 50.345 in Minor Permit AQ0267MSS10. The Department incorporated these standard conditions as follows:

- 18 AAC 50.345(c)(1) and (2) is incorporated as Condition 15 of Section 9 (Standard Permit Conditions);
- 18 AAC 50.345(d) through (h) is incorporated as Conditions 16 through 20, respectively, of Section 9 (Standard Permit Conditions); and
- As previously discussed, 18 AAC 50.345(j) is incorporated as Condition 13 of Section 7 (Recordkeeping, Reporting, and Certification Requirements).

## 10. PERMIT ADMINISTRATION

ConocoPhillips Alaska, Inc. requested that the Department incorporate the minor permit provisions into the operating permit as an administrative amendment. CPAI may not operate under the provisions of Minor Permit AQ0267MSS10 until the Department issues a revision to Operating Permit AQ0267TVP01. may operate in accordance with Minor Permit AQ0267MSS10 once a revision to the permit application for Operating Permit AQ0267TVP02 has been received by the Department.

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**APPENDIX A: EMISSIONS CALCULATIONS**

Table A-1 presents details of the EUs, their characteristics, and emissions. Potential emissions are estimated using maximum annual operation for all fuel burning equipment as defined in 18 AAC 50.990(39) subject to any operating limits.

**Table A-1 – SO<sub>2</sub> Emissions Summary, in Tons Per Year (TPY)**

EU ID	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	SO <sub>2</sub> PTE <sup>1</sup>	
1	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	300 ppmv H <sub>2</sub> S	109.0 <u>(BACT Limit)</u>	
2	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	300 ppmv H <sub>2</sub> S		
3	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	16,260 hp ISO	300 ppmv H <sub>2</sub> S		
8	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		
9	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		
10	EGT (Ruston) TB5400 Water Injection Pump	5,400 hp ISO	300 ppmv H <sub>2</sub> S		
11	EGT (Ruston) TB5400 Water Injection Pump	5,400 hp ISO	300 ppmv H <sub>2</sub> S		
12	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5,400 hp ISO	300 ppmv H <sub>2</sub> S		
13	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5,400 hp ISO	300 ppmv H <sub>2</sub> S		
4	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		10.38
5	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		10.38
6	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		10.38
7	EGT (Ruston) TB5000 Electric Generator (Dual fired)	4,900 hp ISO	300 ppmv H <sub>2</sub> S		10.38
14	GE Frame 6 (PG6561 B) Gas Turbine Electric Generator	53,500 hp (39,930 kW) ISO	200 ppmv H <sub>2</sub> S 24-hr average (BACT Limit)	65.6	
15	Broach Emergency Heater (Dual fired)	27.8 MMBtu/hr [heat input, LHV]	300 ppmv H <sub>2</sub> S 0.25 %S liquid fuel	5.28 1.86	
17	Kvaerner Process Systems Fuel Gas Heater	9.7 MMBtu/hr [heat input, LHV]	200 ppmv H <sub>2</sub> S <u>24-hr average (BACT Limit)</u>	1.30	
29	McGill Emergency Flare	1.6 MMscf/day (Pilot/Purge/Assist) Combined Total for all flares	300 ppmv H <sub>2</sub> S	14.78	
30	Kaldair I-58-VS Emergency Flare/Control Device (LP)		300 ppmv H <sub>2</sub> S		
31	Kaldair I-87-FS Emergency Flare (HP)		300 ppmv H <sub>2</sub> S		
32	McGill Emergency Flare		300 ppmv H <sub>2</sub> S		
33	McGill Emergency Flare		300 ppmv H <sub>2</sub> S		

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EU ID	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	SO <sub>2</sub> PTE <sup>1</sup>
35	Compro Incinerator w/ supplemental gas-fired burners: Primary Burner #1 Primary Burner #2 Secondary Burner	1,300 lb/hr 0.8 MMBtu/hr 0.8 MMBtu/hr 2.0 MMBtu/hr	300 ppmv H <sub>2</sub> S	7.58
16	Born Crude Heater (KUTP)	44.4 MMBtu/hr [heat input, LHV]	300 ppmv H <sub>2</sub> S	33.0 (BACT Limit)
37	Latoka Drill Site Heater (1A)	16.4 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
38	Latoka Drill Site Heater (1B)	16.4 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
39	CE NATCO Drill Site Heater (1C)	14.5 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
40	CE NATCO Drill Site Heater (1D)	19.6 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
43	BS & B Drill Site Heater (1F)	14.9 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
44	BS & B Drill Site Heater (1G)	14.9 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
45	Latoka Drill Site Heater (1H)	16.4 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
48	BS&B Drill Site Heater (1Q)	21.0 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
49	BS&B Drill Site Heater (1R)	17.2 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	
42	GTS Energy Production Heater (1E)	30.0 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	10.08
46	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	12.36
47	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]	500 ppmv H <sub>2</sub> S	12.36
<b>TOTAL</b>				314.72

Table Notes:

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<sup>1</sup> Except for BACT limits, the SO<sub>2</sub> emissions were calculated using mass balance, H<sub>2</sub>S limit, and the rated fuel consumption.

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## APPENDIX B: MODELING REPORT

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**Alaska Department of Environmental Conservation**

**Air Permit Program**

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Review of  
**ConocoPhillips Alaska, Inc.'s**  
**Ambient Demonstration**  
for the  
**CPF1 H<sub>2</sub>S Limits Increase Project**

**Minor Permit AQ0267MSS10**

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Prepared by: Jesse R. Jack  
August 31, 2021

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## 1. INTRODUCTION

This report summarizes the Alaska Department of Environmental Conservation's (Department's) findings regarding the ambient demonstration submitted by ConocoPhillips Alaska, Inc. (CPAI) for the CPF1 H<sub>2</sub>S Limits Increase Project. CPAI submitted this analysis in support of their May 3, 2021 minor permit application (AQ0267MSS10). CPAI demonstrated that operating the Central Processing Facility 1 (CPF1) emissions units (EUs) within the restrictions listed in this report will not cause or contribute to a violation of the 1-hour, 3-hour, 24-hour, and Annual Sulfur Dioxide (SO<sub>2</sub>) Alaska Ambient Air Quality Standards (AAAQS) established in 18 AAC 50.010. Additionally, CPAI demonstrated that the project will not cause or contribute to a violation of the 3-hour, 24-hour, and Annual SO<sub>2</sub> maximum allowable increases (increments) described in 18 AAC 50.020.

## 2. PROJECT BACKGROUND

The following sub-sections provide additional background on the proposed project and application materials.

### 2.1. Project Location and Description

CPF1 is an existing stationary source located in the Kuparuk area of Alaska's North Slope. CPAI presently operates CPF1 under [AQ0267CP01](#), AQ0267MSS05, AQ0267MSS06, AQ0267MSS07 and AQ0267TVP01 Revision 4. ~~These permits~~ [Permits AQ0267CP01 and AQ0267MSS06](#) contain conditions established to protect ambient air quality which limit the hydrogen sulfide (H<sub>2</sub>S) content of gaseous fuel. CPAI is proposing to increase those limits to 300 parts per million by volume (ppmv) for production facility equipment fuel, and 500 ppmv for drill site equipment fuel.

### 2.2. Project Classification

CPAI's minor permit application is classified under 18 AAC 50.502(c)(3) for SO<sub>2</sub>. In accordance with the application information requirements of 18 AAC 50.540(c)(2)(A), applicants must provide an ~~ambient~~ AAAQS analysis for each triggered pollutant. CPAI fulfilled this requirement by submitting an AAAQS analysis for 1-hour, 3-hour, 24-hour, and Annual SO<sub>2</sub> with their minor permit application.

CPAI's minor permit application is also classified under 18 AAC 50.508(6) due to their request to revise terms or conditions previously established in a permit issued under the Title I provisions of the Clean Air Act. Applicants subject to this provision must include the effects of revising those terms or conditions on the underlying ambient demonstration, per 18 AAC 50.540(k)(3)(C). CPAI wants to revise conditions ~~established~~ in Construction Permit No. ~~9773-AC016~~, AQ0267CP01, and AQ0267MSS06, to protect the SO<sub>2</sub> standards and increments. CPAI therefore fulfilled the 18 AAC 50.540(k)(3)(C) showing requirement by submitting an updated ambient demonstration with their minor permit application.

### 2.3. Modeling Protocol Submittal

The Department does not typically require a modeling protocol to be submitted with minor permit applications.<sup>1</sup> However, a protocol is helpful to ensure that the modeling tools, procedures, input data, and assumptions that are used by an applicant are consistent with both State and Federal guidance.

CPAI did not submit a modeling protocol for the CPF1 H<sub>2</sub>S Limits Increase Project. However, they and their consultant, SLR International Corporation (SLR), discussed several key aspects with the Department prior to conducting the ambient analysis. Their approach to their ambient analysis also closely follows that of their previously-permitted project for Central Processing Facility #3 (~~minor~~ Minor permit-Permit AQ0171MSS03).

### 2.4. Application Submittal

The Department received CPAI's permit application and ambient demonstration on May 3, 2021. SLR prepared the application and ambient analysis on their behalf.

## 3. SOURCE IMPACT ANALYSIS

CPAI used computer analysis (modeling) to predict the ambient SO<sub>2</sub> air quality impacts. The Department's findings regarding CPAI's analysis are discussed below.

### 3.1. Approach

CPAI conducted cumulative analyses to demonstrate compliance with the AAAQS and increments. They did not perform a project-only analysis for comparison to the significant impact levels (SILs), instead opting to perform cumulative analyses for each of the applicable averaging periods. They also assumed that all permanent EUs were increment-consuming, and opted to omit increment-expanding activities from their modeling; this simplified their analyses by obviating the need to develop separate parameters for their AAAQS and increment modeling (see sections 3.7.2 and 3.9 for more details).

CPF1 is aggregated with a number of nearby oilfield drill sites. CPAI is also requesting increases to existing H<sub>2</sub>S limits for EUs at these aggregated drill sites in their application for AQ0267MSS10. Two of these drill sites – DS1E and DS1J – are located in close proximity to CPF1 and ~~are sites where large heaters may be installed in the future~~ have the largest emissions from gas-fired equipment compared to any other drill site in the area. Rather than simply modeling these sites as off-site sources, CPAI chose to conduct near-field analyses in which DS1E and DS1J are explicitly modeled in order to account for the larger ~~heater~~ emissions inventories, and to represent impacts from increased SO<sub>2</sub> emissions at the aggregated drill sites.

### 3.2. Model Selection

There are a number of air dispersion models available to applicants and regulators. The U.S. Environmental Protection Agency (EPA) lists these models in their *Guideline on Air Quality*

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<sup>1</sup> The Department may request an applicant submit a modeling protocol in accordance with 18 AAC 50.540(e)(2).

*Models* (Guideline), which the Department has adopted by reference in 18 AAC 50.040(f). CPAI used EPA's AERMOD Modeling System (AERMOD) for their ambient analysis. AERMOD is an appropriate modeling system for this permit application.

The AERMOD Modeling System consists of three major components: AERMAP, used to process terrain data and develop elevations for the receptor grid and EUs; AERMET, used to process the meteorological data; and the AERMOD dispersion model, used to estimate the ambient pollutant concentrations.

CPAI used the versions of AERMET and AERMOD that were current at the time they prepared their application (versions 19191). However, EPA updated AERMOD and AERMET on April 22, 2021. The latest versions are now AERMOD and AERMET versions 21112.

The Department does not generally require applicants update their ambient demonstrations if there is a subsequent model update, unless there is reason to believe that it would affect the outcome of the modeling demonstration. The Department reviewed EPA's Model Change Bulletins and determined that the revisions regard optional features, non-pertinent algorithms, and other changes that would lead to decreased estimates. The Department also conducted a sensitivity analysis by running the modeled input files in the latest version of AERMOD and AERMET. It found that none of the changes in the latest versions of the model software warrant an updated modeling analysis.

CPAI assumed all terrain elevations were zero rather than running AERMAP, which is common practice for new source review modeling on the North Slope coastal plain.

The Department finds that CPAI selected appropriate models for their ambient analysis.

### **3.3. Modeling Domain**

The modeling domain is used to help establish and limit the receptor grid and offsite emissions inventory. CPAI used a reasonable modeling domain for their ambient demonstration. The modeling domain is described on page 5 of Attachment E of their permit application.

### **3.4. Meteorological Data**

CPAI continued to use the same meteorological data set as used in support of their CPF3 permit, AQ0171MSS03. These data consist of three years of data collected at Nuiqsut during the calendar years of 2016, 2017 and 2019. These data represent the plume transport conditions of the CPF1 EUs. CPAI continued to use the datasets processed with the previous version of AERMET, as discussed above; the Department reprocessed the meteorological data using the current version of AERMET (version 21112) and the previously approved AERMET settings and determined that CPAI's modeling continues to demonstrate compliance with the AAAQS and increments.

CPAI's continued ~~used~~use of this processed data set is appropriate. Additional information regarding the Department's quality assurance review of the Nuiqsut data, and the surface



parameters used by CPAI to process the data, can be found in Appendix B of the Technical Analysis Report for Minor Permit AQ0171MSS03.

### 3.5. Coordinate System

Air quality models need to know the relative location of the EUs, structures (if applicable), and receptors, in order to properly estimate ambient pollutant concentrations. Therefore, applicants must use a consistent coordinate system in their modeling analysis.

CPAI used the Universal Transverse Mercator (UTM) grid for their coordinate system. This is the most commonly used approach in AERMOD assessments. The UTM system divides the world into 60 zones, extending north-south, and each zone is 6 degrees wide in longitude. The modeled EUs, structures, and receptors are all located in UTM Zone 6. CPAI used the North American Datum of 1983 reference for each UTM coordinate.

### 3.6. Terrain

Terrain features can influence the dispersion of exhaust plumes from EUs and the resulting ambient air concentrations of the pollutants being emitted. Digitized terrain elevation data is, therefore, generally included in a modeling analysis, unless the entire modeling domain is over water or the terrain features are so slight that a flat terrain assumption can be made. AERMOD's terrain preprocessor, AERMAP, uses terrain data to obtain the base elevations for the modeled EUs, buildings, and receptors; and to calculate a "hill height scale" for each receptor.

CPAI did not include terrain data in their modeling analysis because the entire modeling domain is composed of featureless terrain. This approach is common on Alaska's north slope, and is acceptable for this project.

### 3.7. EU Inventory

CPAI modeled the EUs listed in Table 1. The EU locations are shown in figures 2-2, ~~2-5~~ and through 2-6 of Appendix E to their application. CPAI characterized all EUs as point sources, as the emissions from each source will pass through an exhaust stack.

**Table 1. Modeled EU Inventory**

EU ID	Stack ID	Description	Cumulative Rating
1	C2101A1	Gas Lift Compressor Turbine (bypass stack)	16,260 hp ISO
	C2101A2	Gas Lift Compressor Turbine (WHRU stack)	
2	C2101B1	Gas Lift Compressor Turbine (bypass stack)	16,260 hp ISO
	C2101B2	Gas Lift Compressor Turbine (WHRU stack)	
3	C2101C1	Gas Lift Compressor Turbine (bypass stack)	16,260 hp ISO
	C2101C2	Gas Lift Compressor Turbine (WHRU stack)	
4	G201A1	Ruston Generator Turbine (bypass stack)	4,900 hp ISO
	G201A2	Ruston Generator Turbine (WHRU stack)	
5	G201B1	Ruston Generator Turbine (bypass stack)	4,900 hp ISO
	G201B2	Ruston Generator Turbine (WHRU stack)	
6	G201C1	Ruston Generator Turbine (bypass stack)	4,900 hp ISO
	G201C2	Ruston Generator Turbine (WHRU stack)	
7	G201D1	Ruston Generator (bypass stack)	4,900 hp ISO
	G201D2	Ruston Generator (WHRU stack)	
8	G3201E	Ruston Generator	4,900 hp ISO
9	G3201F	Ruston Generator	4,900 hp ISO
10	P2202A1	Water Injection Pump Turbine	5,400 hp ISO
	P2202A2 *		
11	P2202B1	Water Injection Pump Turbine	5,400 hp ISO
	P2202B2 *		
12	PCL07A	Water Injection Pump Turbine	5,400 hp ISO
13	PCL07B	Water Injection Pump Turbine	5,400 hp ISO
--	ECL06A*	Econotherm WHRU associated with PCL07A	N/A
--	ECL06B *	Econotherm WHRU associated with PCL07B	N/A
14	G3203	GE Frame 6 Combustion Turbine Generator	53,500 hp ISO
15	H201L	Broach Dual-Fuel Heater (liquid fuel)	27.8 MMBtu/hr LHV
	H201G	Broach Dual-Fuel Heater (fuel gas)	
16	G11401	Born Topping Plant Crude Heater	44.4 MMBtu/hr LHV
17	H3204	Kvaerner Fuel Gas Heater	9.7 MMBtu/hr LHV
29	H101B	McGill Flare	1.6 MMscf/day, combined
30	HKF01	Kaldair I-58-VS Flare	
31	HKF02	Kaldair I-87-FS Flare	
32	HCR01A	McGill Flare	
33	HCR01B	McGrill Flare	
35	H250	Solid Waste Incinerator	3.6 MMBtu/hr
37	H1A01	Lakota Drill Site 1A Heater	16.4 MMBtu/hr LHV
38	H1B01	Lakota Drill Site 1B Heater	16.4 MMBtu/hr LHV
39	H2V01	CE Natco Drill Site 1C Heater	14.5 MMBtu/hr LHV
40	H3F01	CE Natco Drill Site 1D Heater	19.6 MMBtu/hr LHV
42	H1E02	GTS Drill Site 1E Heater	30.0 MMBtu/hr LHV
43	H1F01	BS&B Drill Site 1F Heater	14.9 MMBtu/hr LHV
44	H1G01	BS&B Drill Site 1G Heater	14.9 MMBtu/hr LHV
45	H1F1901	Lakota Drill Site 1H Heater	16.4 MMBtu/hr LHV
46	H1J01AB	Petrochem Drill Site 1J Heaters (combined)	36.8 MMBtu/hr LHV
47			36.8 MMBtu/hr LHV
48	H1Q01	BS&B Drill Site 1Q Heater	21.0 MMBtu/hr LHV
49	<del>H1R01</del> H1R01	BS&B Drill Site 1R Heater	17.2 MMBtu/hr LHV
-69	G702A	MTU Emergency Generator	2745 kW
-70	G702B	MTU Emergency Generator	2745 kW

\* Unit has been decommissioned; source was modeled with no emissions or flow.

### 3.7.1. Excluded EUs

CPAI excluded the drill site freeze protection pump engines, and the Drill Site 1B cuttings module boiler, from their modeling analysis. These EUs are small, intermittently operated, and have releases close to the ground. Further, impacts from this type of EU are known to be reflected in the ambient background data. Therefore, CPAI did not explicitly model these EUs. The Department agrees with this approach.

### 3.7.2. Increment Analysis

CPF1 is located within a Class II area of the Northern Alaska Air Quality Control Region. The major source baseline date for SO<sub>2</sub> is January 6, 1975. The minor source baseline date is June 1, 1979. CPAI included all permanent EUs in their increment analysis, assuming that they are increment-consuming. Thus, it was not necessary to distinguish between pre- and post-baseline date emissions.

## 3.8. EU Release Parameters

The assumed emission rates and characterization of how the emissions enter the atmosphere will significantly influence an applicant's modeled results. Therefore, applicants must provide the stack height, diameter, location, and base elevation, in addition to the pollutant emission rates, exhaust plume exit velocity, and exhaust temperature for each exhaust stack.

### 3.8.1. Emission Rates

The Department generally found CPAI's modeled emission rates to be consistent with the emissions information provided throughout their application. The exceptions, or items that otherwise warrant additional discussion, are discussed below. A discussion regarding turbine emissions is provided in the *Load Analysis* sub-section under EU Release Parameters.

#### 3.8.1.1. Sulfur Compound Emissions

SO<sub>2</sub> emissions are directly related to the sulfur content of the fuel. The sulfur content of liquid fuel is in the form of elemental sulfur, while the sulfur content of fuel gas is in the form of hydrogen sulfide (H<sub>2</sub>S). CPAI's CPF1 EUs consist, mostly, of fuel gas-fired equipment. The exception is EU 15, a dual-fired emergency heater; CPAI assumed 0.25% sulfur content by weight for this EU. Exceptions also include EUs 69 and 70 which are liquid-fired emergency generators which CPAI assumed would combust only ULSD. They assumed their fuel gas-fired EUs at the CPF1 facility – EUs 1 through 17, 29 through 33, and 35 - use fuel with a maximum H<sub>2</sub>S content of 300 parts per million by volume (ppmv); while the EUs at the aggregated drill sites – EUs 37 through 49 – were assumed to use fuel with a maximum H<sub>2</sub>S content of 500 ppmv.

The Department had previously imposed conditions to protect the ~~1-hour~~, 3-hour, 24-hour and Annual SO<sub>2</sub> AAQS and the 3-hour, 24-hour, and Annual SO<sub>2</sub> Increments, by restricting the maximum H<sub>2</sub>S content. In their most recent modeling

analysis, CPAI assumed a higher H<sub>2</sub>S content; thus, the Department is amending those conditions accordingly in AQ0267MSS10.

#### **3.8.1.2. Short-term Emission Rates**

The modeled emission rate should generally reflect the maximum emissions allowed during a given averaging period. For the 1-hour SO<sub>2</sub> standards, an applicant may use the annualized emission rate for intermittently operated EUs.

CPAI used the maximum emissions, by pollutant and averaging period, to develop their modeled EU emission rates. Therefore, the Department is not including any short-term operational restrictions for the CPF1 EUs.

#### **3.8.2. Point Source Parameters**

In addition to the previously discussed emission rates, applicants must provide the stack height, diameter, location, base elevation, exhaust plume exit velocity, and exhaust temperature for each EU characterized as a point source.

The Department generally found the modeled stack parameters to be consistent with the vendor information or expectations for similarly sized EUs. The items that warrant additional discussion are addressed below.

##### **3.8.2.1. Load Analysis**

The maximum ambient pollutant concentration does not always occur during the full-load operating conditions that typically produce the maximum emissions. The relatively poor dispersion that occurs with cooler exhaust temperatures and slower part-load exit velocities may produce the maximum ambient impacts. Turbine emissions also tend to greatly vary by fuel type, load, and inlet air temperature. Therefore, EPA recommends that a load analysis be conducted on the primary EUs to determine the worst-case conditions.

CPAI conducted an analysis to determine the worst-case parameters for the seven CPF1 turbines with operating waste heat recovery units (WHRUs). The exhaust from these EUs is apportioned between a WHRU and a bypass stack using a damper installed in the exhaust stream. The WHRU significantly affects the exit temperature and other release parameters. CPAI analyzed continuous monitoring data collected during 2018 and 2019 to determine the worst-case stack parameters for these EUs. Their approach and results are described in more detail in Appendix C of their application for AQ0267MSS10.

##### **3.8.2.2. Horizontal/Capped Stacks**

Capped stacks or horizontal releases generally lead to higher impacts in the immediate near-field than what would occur from uncapped, vertical releases. The presence of non-vertical stacks or stacks with rain caps therefore requires special handling in an AERMOD analysis. EPA describes the proper approach for

characterizing these types of stacks in their *AERMOD Implementation Guide*.<sup>2</sup> EPA has also developed an option in AERMOD that will automatically revise the stack and exhaust parameters for any stack identified as horizontal (using the POINTHOR keyword) or capped (using the POINTCAP keyword).

CPAI used this option to characterize their capped and horizontal stacks. They characterized EUs 15, 42, 46 and 47 as having vertical, capped releases. They also characterized EUs 29, 32 and 33 as having horizontal releases. They characterized all other EUs as having uncapped, vertical releases.

Each of the EUs discussed above have already been installed at the stationary source. Therefore, the Department is *not* including a permit condition that requires the stacks modeled as uncapped, vertical releases to be constructed as uncapped, vertical releases.

### 3.9. Off-site Source Characterization

CPAI included the EUs from nearby stationary sources in their cumulative AAAQS and increment analyses. CPAI's basis for selecting the modeled nearby stationary sources is described in Section 3.13 (**Off-site Impacts**) of this report. The characterization of these nearby EUs is described below.

Each nearby off-site source was modeled as a single volume source. The volume sources were an identical 100 meters wide, by 100 meters long, by 15 meters tall. Emissions rates for these sources was based on actual emissions data from the 2017 National Emission Inventory (NEI).

For their SO<sub>2</sub> increment analyses, CPAI assumed that each of the project and offsite stationary sources are increment consuming. Emissions from nonpoint and mobile sources, on the other hand, were assumed to be increment expanding. Emissions from non-point and mobile sources in the North Slope region sources are typically related to oil production, which was approximately four times higher at the baseline date; further, fuel sulfur content has been reduced substantially since that time. Thus, CPAI expected that SO<sub>2</sub> emissions from nonpoint and mobile sources would be lower at the present than they were at the baseline date. Rather than model the increment expansion from these sources, CPAI simply omitted these sources from their modeling; a conservative aspect of their approach.

### 3.10. Downwash

Downwash refers to the situation where local structures influence the plume from an exhaust stack. Downwash can occur when a stack height is less than a height derived by a procedure called "Good Engineering Practice" (GEP), which is defined in 18 AAC 50.990(42). It is a consideration when there are receptors relatively near the applicant's structures and exhaust stacks.

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<sup>2</sup> *AERMOD Implementation Guide* (EPA-454/B-18-003); April 2018.

EPA developed the “Building Profile Input Program – PRIME” (BPIP<sub>PRM</sub>) program to determine which stacks could be influenced by nearby structures and to generate the cross-sectional profiles needed by AERMOD to determine the resulting downwash. CPAI used the current version of BPIP<sub>PRM</sub>, version 04274, to determine the building profiles needed by AERMOD.

CPAI included all of the modeled point sources in their downwash analysis, except for those at the aggregated drill sites. The Department used a proprietary 3-D visualization program to review CPAI’s characterization of the exhaust stacks and structures. The characterization matches the figures provided in CPAI’s permit application. CPAI appropriately accounted for downwash in their modeling analysis. BPIP<sub>PRM</sub> indicated that the modeled exhaust stacks are within the GEP stack height requirements.

### 3.11. Ambient Air Boundary

The AAAQS and increments only apply in *ambient air* locations, which has been defined by EPA as, “*that portion of the atmosphere, external to buildings, to which the general public has access.*”<sup>3</sup> Applicants may, therefore, exclude areas that they own or lease from their ambient demonstration if public access is effectively precluded. They conversely need to model that portion of their property/lease that has no such restriction, or where there is an easement or public right-of-way. Natural features, such as dense vegetation or topographical features, can provide adequate barriers to public access, although the adequacy of the given features must be evaluated on a case-specific basis.

In most cases, CPAI used the edge of the roughly 5-foot-high gravel pad as the ambient air boundary. This is a standard and acceptable approach for modeling North Slope stationary sources. The exception to this approach is for the road and public access area located on the north side of the CPF1 facility, which is depicted in Figures 2-2 through 2-4 of CPAI’s permit application. This area was modeled as ambient air. CPAI’s ambient air boundary is acceptable.

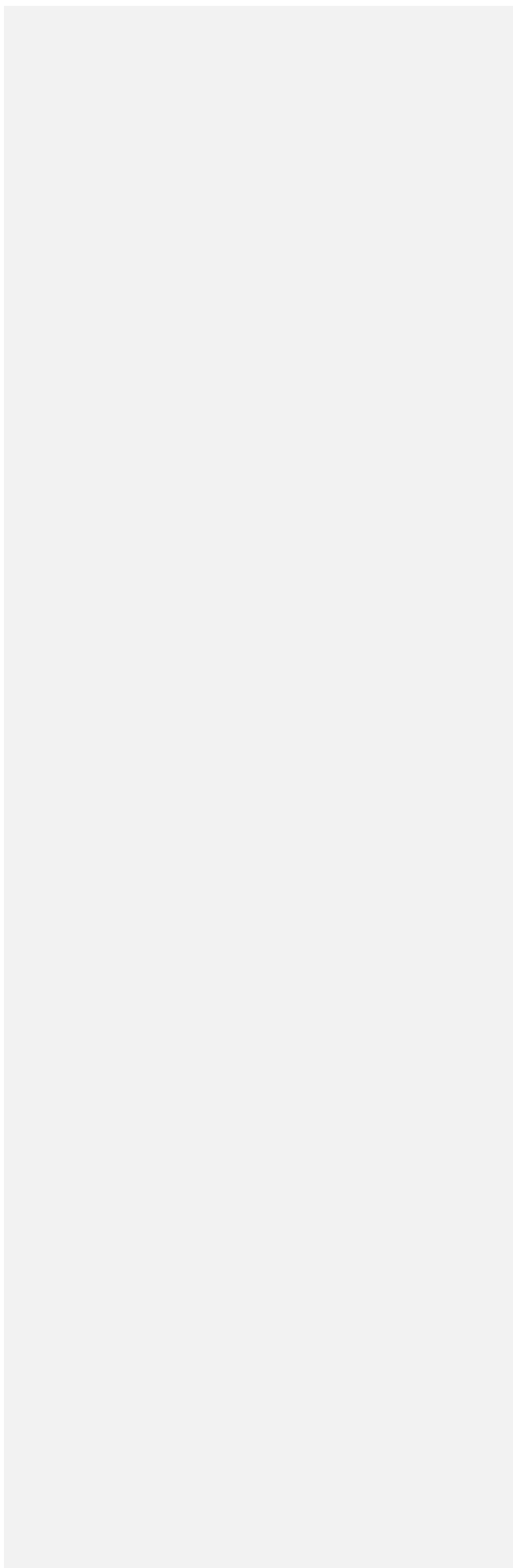
### 3.12. Receptor Grid

A dispersion model will calculate the concentration of the modeled pollutant at locations defined by the user. These locations are called receptors. Designated patterns of receptors are called receptor grids.

CPAI used different sets of rectangular grids to characterize the CPF1, DS1E and DS1J areas. The receptor resolutions are:

- 25 m along the ambient boundary;
- 25 m within the public access area on the ~~DS1E~~ CPF1 pad;
- 25 m from the ambient boundary to a distance of 100 m;
- 100 m from 100 m to 1.4 km; and
- 500 m from 1.4 km to 2.5 km.

<sup>3</sup> The term “ambient air” is defined in 40 CFR 50.1. The Alaska Legislature has also adopted the definition by reference in AS 46.14.90(2).



For the DS1E and DS1J grids:

- 25 m along the ambient boundary;
- 25 m from the ambient boundary to a distance of 100 m; and
- 100 m from 100 to 900 m.

CPAI's grid has sufficient resolution and coverage to determine the maximum impacts.

### 3.13. Off-Site Impacts

The air quality impact from natural and regional sources, along with long-range transport from far away sources, must be accounted for in a cumulative AAAQS demonstration. The increment consuming impact from nearby anthropogenic sources must likewise be accounted for in a cumulative increment demonstration. The approach for incorporating these impacts must be evaluated on a case-specific basis for each type of assessment and for each pollutant.

Section 8.3 of the Guideline discusses how the off-site impacts could be incorporated for purposes of demonstrating compliance with an air quality standard. In summary, the off-site impacts must either be represented through ambient monitoring data or through modeling. However, Section 8.3.3(b)(iii) notes, "*The number of nearby sources to be explicitly modeled in the air quality analysis is expected to be few except in unusual situations.*" Section 8.3.3(b) further states, "*...sources that cause a significant concentration gradient in the vicinity of the [applicant's source] are not likely to be adequately characterized by the monitored data due to the high degree of variability of the source's impacts.*"

CPAI explicitly modeled several off-site stationary sources within the vicinity of CPF1 for their increment and cumulative AAAQS demonstration. The modeled stationary sources, and distance from CPF1, are listed below in Table 2.

**Table 2: Modeled Off-Site Sources**

Stationary Source Owner and Name	Distance from CPF1 (km)
CPAI Central Production Facility #2 (CPF2)	11
CPAI Central Production Facility #3 (CPF3)	11
Hilcorp Alaska, LLC Milne Point Production Facility	16
CPAI Kuparuk Seawater Treatment Plant	23
Eni US Operating Co. Nikaitchuq Development	23
Eni US Operating Co. Oooguruk Development Project	31

For their cumulative AAAQS analysis, CPAI represented impacts from more distant sources using ambient background data. The data chosen by CPAI were collected at the DS1F monitoring site, approximately 4 km southwest of CPF1, during 2012 and 2013.

The Department finds CPAI's approach to representing off-site impacts to be adequate.



### 3.14. Modeled Design Concentrations

EPA allows applicants to use modeled concentrations that are consistent with the form of the standard or increment as the modeled design concentration. For the probabilistic AAAQS, applicants may use the multi-year average of the highest values (at a given receptor) when comparing a modeled concentration to the SIL.

The Department allowed CPAI to compare the high second-high (h2h) modeled concentrations to the short-term deterministic AAAQS and increments. CPAI compared the 99<sup>th</sup> percentile of the 1-hour daily maximum impacts averaged over three years to the 1-hour SO<sub>2</sub> AAAQS. For the Annual SO<sub>2</sub> AAAQS and increment, CPAI used the maximum annual concentration. Their approach is consistent with the form of these ambient standards and increments.

**Table 3. Allowed Design Concentrations**

Pollutant	Avg. Period	Allowed Value
SO <sub>2</sub>	1-hr	The multi-year average of the high fourth-high daily maximum 1-hour concentration
	3-hr	The maximum high second-high 3-hour concentration from any year
	24-hr	The maximum high second-high 24-hour concentration from any year
	Annual	The maximum annual concentration from any year

## 4. RESULTS AND DISCUSSION

The maximum modeled SO<sub>2</sub> impacts from CPAI's cumulative AAAQS analysis are presented in Table 4. The background concentration, total impact, and respective ambient standard are also presented for comparison. The total modeled impacts are less than the respective AAAQS. Therefore, CPAI has demonstrated compliance with the AAAQS.

**Table 4. Maximum impacts compared to the ambient standards**

Pollutant	Avg. Period	Modeled Design Concentration (µg/m <sup>3</sup> )	Background Concentration (µg/m <sup>3</sup> )	Total Impact (µg/m <sup>3</sup> )	AAAQS (µg/m <sup>3</sup> )
SO <sub>2</sub>	1-hour	173	6.0	179	196
	3-hour	229	5.5	235	1,300
	24-hour	83.9	2.9	9686.8	365
	Annual	11.9	0.30	12.2	80

The maximum modeled SO<sub>2</sub> impacts from CPAI's increment demonstration is presented in Table 5. The respective Class II increment is also presented for comparison. All of the impacts are less than the applicable Class II increment. Therefore, CPAI has demonstrated compliance with the maximum allowable increases.

**Table 5. Maximum impacts compared to the increments**

Pollutant	Avg. Period	Modeled Design Concentration (µg/m <sup>3</sup> )	Class II Increment (µg/m <sup>3</sup> )
SO <sub>2</sub>	3-hr	229	512
	24-hr	83.9	91
	Annual	11.9	20

## 5. CONCLUSION

The Department concludes the following based on its review of CPAI's modeling analysis:

1. The emissions from the proposed EUs will not cause or contribute to a violation of the 1-hour, 3-hour, 24-hour, and annual SO<sub>2</sub> AAAQS listed in 18 AAC 50.010.
2. The emissions from the proposed EUs will not cause or contribute to a violation of the 3-hour, 24-hour, and annual SO<sub>2</sub> increments listed in 18 AAC 50.020.
3. CPAI's modeling analysis complies with the ambient demonstration requirements of 18 AAC 50.540(c)(2) and 18 AAC 50.540(k)(3).
4. CPAI conducted their modeling analysis in a manner consistent with the Guideline, as required under 18 AAC 50.215(b)(1).

The Department is making the following revisions to Permits [AQ0267CP01](#) and [AQ0267MSS06](#) for the reasons described in this modeling report:

- **Exhibit B:** The H<sub>2</sub>S restriction for EUs 1 through 17, 29 through 33, and 35, will now be 300 ppmv. The H<sub>2</sub>S restriction for EUs 37 through 49 will now be 500 ppmv. The new limits are needed to protect the 3-hour, 24-hour and annual Class II SO<sub>2</sub> increments, and the 1-hour, 3-hour, 24-hour and annual AAAQS.

The remaining ambient air conditions in previous active permits remain as written.