

Comments by EPA, Region 10 on Draft of the Preliminary
PSD Construction Permit AQ0934CPT02 and Technical Analysis Report for Donlin Gold Project

Donlin Gold, LLC Permit AQ0934CPT02

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Comments submitted to:

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On November 10, 2022, ADEC provided to EPA Region 10 a draft of the preliminary PSD Construction Permit AQ0934CPT02 (Permit) and technical analysis report (TAR) for Donlin Gold LLC's Donlin Gold Project. EPA Region 10 has reviewed the materials and has the following comments:

1. Conditions Necessary to Protect 24-Hour PM10 Increment Standard.

The EPA is concerned that the application and draft permit/TAR underestimate the project's PM10 emissions and ambient impacts. Modeling shows the project consuming 21.6 ug/m³ of the 30 ug/m³ 24-hour average Class II PSD increment. If PM10 emissions and/or impacts are significantly underestimated, the permit may not prevent the project from causing an exceedance of the ambient standards. Specifically, ADEC's (1) underestimation of average silt content and (2) misapplication of annual precipitation correction factor may significantly underestimate PM10 emissions from haul roads. In addition, Condition 33.1.d does not appear sufficient to assure compliance with the BACT limit applicable to haul roads (EU IDs 158-160 and 162).

1.a. Silt Content Estimations for Haul Roads. A significant portion of the PM10 emissions associated with the project is fugitive dust emissions generated by hauling waste rock on unpaved roads (751 tpy of the total 2003 tpy of PM10). The emission factor for these emissions is highly sensitive to a selection of a mean surface material silt content. The content value of 3.8% was selected based on a statewide average silt content value listed in an EPA online MS Excel spreadsheet available online through AP-42.¹ The values in the spreadsheet provide an estimated statewide average silt content for unpaved roads, the majority of which are rural low-traffic roads. These values are mainly intended for use in regional emissions and modeling assessments. The statewide average is not intended to be representative of a heavily-trafficked industrial or mining site. For any permitting project, ideally, site-specific surface silt content measurements should be used to determine the emission factor. In the absence of measurements, [AP-42 Table 13.2.2-1](#) provides a range of average silt contents determined over a range of industrial sites. Haul roads to and from a pit from several of the industries sampled were measured to have an average silt content of more than 8%. If the 8.3% silt content value for stone quarrying and processing haul roads was used to calculate emission factors for hauling waste rock on haul roads, the emission factors (lb PM10/vehicle mile traveled) and emission rates (lb PM10/hr) for fugitive dust on haul roads would nearly double.

EPA recommends ADEC revise the permit to include conditions for haul road surface silt content sampling and analysis. Silt content testing of haul road material is a common practice for mine sources to ensure the validity of the PM10 emission inventory and modeling assessments. We recommend the

¹ Go to <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-section-1322-unpaved-roads-related-information-0>, then click on link to MS Excel file "r13s0202_dec03 (xls)".

permit require testing be conducted at regular intervals, ideally a few times per year at various haul road locations across the project site, and results reported to ADEC.

1.b. Annual Precipitation Correction Factor. Additionally, it appears from the permit application and TAR (Appendices A and D) that haul road fugitive dust emission factors used an annual precipitation correction factor, as is recommended in AP-42 13.2.2. The emissions rates determined using the annual precipitation correction factor are intended for assessment of annual ambient PM10 impacts only. For short-term 24-hour PM10 impact assessment, the precipitation correction factor is not appropriate and its use in an emission factor would result in underprediction of maximum 24-hour PM10 impacts. It is not clear from the material provided if the same emission factor was used for both the annual and 24-hour PM10 assessments, but it appears as though the same factor was used for both. If this is the case, then the 24-hour PM10 increment consumption is underpredicted.

EPA recommends a reassessment of the 24-hour emission factor, and if it is indeed based on the annual precipitation-correction factor, then a corrected 24-hour emission factor should be calculated and used to determine ambient impacts.

1.c. Best Available Control Technology (BACT) Limit for Haul Roads. Condition 33 limits fugitive PM, PM10, and PM2.5 emissions from haul roads (EU IDs 158-160 and 162) to 3,445 tpy (combined). Condition 33.1(d)(ii) requires the permittee to determine compliance with this limit via Method 22² observations. However, Method 22 observations will not yield a numerical emissions rate. Therefore, Method 22 observations, alone, are insufficient to demonstrate compliance with the 3,445 tpy BACT limit.

Although ADEC identifies Condition 33's 3,445 tpy PM10 limit applicable to haul and access roads as a BACT limit, it is not a BACT limit. The applicable BACT emission limitation is the work practice standard in Condition 33.1.d. Separately, the annual emission limit is intended to assure the project does not cause or contribute to PM10/PM2.5 NAAQS or increment violation. The annual emission limit reflects the emission rate the applicant modeled and assumes certain operating rates and the implementation of BACT in the derivation of the emission factor used to calculate annual emissions. Because the 30 ug/m³ PM10 increment standard is a daily standard, the corresponding emission limits must limit daily emissions.

EPA recommends ADEC revise the permit to include conditions requiring the permittee to demonstrate compliance with a daily PM10 emission limit via daily emissions calculations that take into account the variables in AP-42 Chapter 13.2.2. These conditions could include road silt content sampling and analysis (see comment 1.a above) to verify a default emission factor or to derive a new one as well as requirements to monitor and record vehicle-miles-traveled and vehicle weight.

2. Permit Requirements Applicable to Emissions Generated by Traffic Between Mine and Jungjuk Port.

According to the Permit and TAR, ADEC determined that the Access Road (EU ID 162) is part of the Donlin Gold Project stationary source. However, the TAR does not contain analysis supporting this conclusion. This determination is also a change in interpretation from Permit No. AQ0934CPT01³ which does not regulate the Access Road (EU ID 162). The Access Road (EU ID 162) refers to bus, light vehicle

² 40 CFR part 60, Appendix A-7. Section 2.3 of Method 22 states: "This method determines the amount of time that visible emissions occur during the observation period (*i.e.*, the accumulated emission time). This method does not require that the opacity of emissions be determined. Since this procedure requires only the determination of whether visible emissions occur and does not require the determination of opacity levels, observer certification according to the procedures of Method 9 is not required."

³ Permit No. AQ0934CPT01 becomes invalid June 30, 2023 if construction does not commence by that deadline.

and water truck travel along 47.4 km unpaved road between Jungjuk Port and the mine site. See TAR page 21 and [October 29, 2021 application material \(Access Road Emissions in Appendix B\)](#). Various conditions in the Permit regulate stationary source emissions (fugitive dust) generated by EU ID 162.

Alaska Statute AS 46.14.990(4) (effective January 4, 2013) was approved by EPA Region 10 into the Alaska Implementation Plan through a [September 19, 2014 final rulemaking](#). The provision in Alaska law references 40 CFR 51.166(b) in defining “building, structure, facility or installation” or “BSFI.” The definition of BSFI on January 4, 2013 in [40 CFR 51.166\(b\)\(6\)](#) is as follows:

Building, structure, facility, or installation means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same Major Group (i.e., which have the same two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101–0066 and 003–005–00176–0, respectively).

EPA questions whether the Access Road meets the criteria within the BSFI definition to be considered part of the same BSFI as the mine site. Rather, the emissions from the Access Road appear to meet the definition of secondary emissions. The term “secondary emissions” is defined in 40 CFR 52.21(b)(18) and incorporated by reference into the Alaska SIP. 18 AAC 50.040(h)(4). ADEC’s PSD rules require ADEC to consider secondary emissions when evaluating whether to grant or deny an application. 18 AAC 50.040(h)(9) and 18 AAC 50.306(b)-(c) (incorporating by reference 40 CFR 52.21(k)). Secondary emissions, however, are not regulated in the PSD permit because the emissions are not generated by the major stationary source itself.

EPA Region 10 recommends ADEC either (1) remove EU ID 162 from the permit, redefine the boundaries of the Donlin Gold Project stationary source to exclude the Access Road, and consider the emission from the Access Road as “secondary emissions” or (2) include within the TAR an analysis demonstrating that EU ID 162 is part of the same BSFI as the mine site. The TAR should specifically demonstrate that EU ID 162 is “adjacent” to the mine site as that term is used in the BSFI definition.

3. BACT Analysis for Power Generation Engines EU IDs 1 through 12 – Evaluation of New Source Performance Standards (NSPS) & National Emission Standards for Hazardous Air Pollutants (NESHAP) Emission Limits.

The definition of BACT in 40 CFR 52.21(b) has been approved by EPA Region 10 into the Alaska Implementation Plan through a [February 10, 2022 final rulemaking](#). See 18 AAC 50.040(h)(4) and 50.306(b). The definition states:

Best available control technology means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable

standard under 40 CFR part 60, 61, or 63. (Emphasis added). If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.

Although the draft TAR states that NSPS subparts IIII and JJJJ and NESHAP subpart ZZZZ⁴ requirements apply to the engines, the TAR does not specify in any further detail the actual federal emission limits that apply. These federal rules have many different emission limits that apply to different categories of engines, and the applicability provisions for the federal rules are complex. The TAR does not draw a comparison between the BACT limits and the applicable emission limits in the federal rules. Thus, the TAR does not sufficiently explain that BACT limits are at least as stringent as NSPS and NESHAP requirements.

EPA Recommends ADEC add sufficient detail to the BACT analysis in the TAR to demonstrate that the permit limits are at least as stringent as requirements in 40 CFR parts 60, 61 and 63.

4. Source Test Requirements for Power Generation Engines (EU IDs 1 through 12).

Condition 24.3(b) requires Permittee to conduct source testing of three of the 12 Power Generation Engines to measure CO, NO_x and VOC and determine compliance with BACT limits (g/kW-hr). The limits reflect performance values offered by Wartsila, manufacturer of the 18V50DF engines the applicant intends to purchase, install and operate. See October 29, 2021 application material (Wartsila information in Appendix F). The emission rates presumably reflect emission reductions achieved by use of SCR and oxidation catalyst. The TAR does not explain why the permit does not require testing of all 12 engines. The TAR only states, “BACT limits for EU IDs 1 through 12 require source testing on three units, instead of one, as representation for all of the units to limit emission rate variability between the twelve units.” One of the factors to consider when evaluating whether to require testing of identical units is margin of compliance.⁵ Neither the application nor the TAR discuss expected margin of compliance. Because neither the application nor the TAR specifies uncontrolled emissions for the Wartsila 18V50DF engines, it is unknown the degree to which emissions must be reduced to achieve compliance. The TAR suggests use of oxidation catalyst and SCR achieve control efficiencies of 90% for CO and VOC, and 80 – 90% for NO_x. The TAR also does not explain whether testing is required pursuant to NSPS subparts IIII and/or JJJJ for EU IDs 1 through 12.

EPA recommends ADEC explain in the TAR the basis for requiring the Permittee to conduct source testing of only three engines and whether this is consistent with source testing requirements in NSPS subparts IIII and/or JJJJ.

5. Automatic Exemptions During Periods of Start-up.

Condition 24.1 of the draft Permit requires the permittee to limit the number of hours EU IDs 1 through 12 operate without selective catalytic reduction and oxidation catalyst pollution control systems in full

⁴ 40 CFR parts 60, subparts IIII and JJJJ; 40 CFR part 63, subpart ZZZZ.

⁵ April 27, 2009 EPA memorandum entitled, “Issuance of the Clean Air Act National Stack Testing Guidance” available at <https://www.epa.gov/compliance/clean-air-act-national-stack-testing-guidance>.

operation to 2,190 hours combined 12 consecutive month period. Condition 24.2(a) states, “Install, operate, and maintain SCR and oxidation catalyst emission controls on EU IDs 1 through 12, according to the manufacture’s [sic] specifications, at all times the units are operating, except during the allowable startup hours as specific in Condition 24.1.” EPA’s longstanding position is that PSD permits cannot contain automatic exemptions which allow excess emission during startup and shutdown.⁶

EPA recommends ADEC revise the permit to remove the automatic exemption from BACT limits during periods of startup and shutdown. Replace the automatic exemption with an emission limitation that reflects BACT during startup and shutdown if ADEC determines BACT (during startup and shutdown) to be something other than the emission limits in Table 2 of the permit.

6. Form of the Requirements for Compliance Indicators for Power Generation Engines EU IDs 1 through 12.

Condition 24.3(d)(iii)(A) requires Permittee to maintain the oxidation catalyst such that the pressure drop across each oxidation unit is within the acceptable range identified in the manufacturer’s specifications. The permit does not contain a similar condition requiring the Permittee to maintain inlet temperature of an SCR unit or oxidation catalyst and urea injection rate of an SCR unit within acceptable ranges. Instead, the Permittee is required to report whenever those compliance indicators are outside the acceptable range identified in the manufacturer’s specification. In accordance with 18 AAC 50.306(d)(1), “In each PSD permit issued under this section, the department will include terms and conditions as necessary to ensure that the permittee will construct and operate the proposed stationary source or modification in accordance with this section.” Operating SCR unit and oxidation catalyst at relatively low inlet temperatures and ammonia injection rates diminishes pollution control effectiveness. All parameters need to be within the acceptable range that demonstrates BACT limits on a continuous basis.

EPA recommends ADEC either (1) revise the permit to include condition requiring the Permittee to maintain inlet temperature of an SCR unit or oxidation catalyst and urea injection rate of an SCR unit within acceptable ranges or (2) revise the TAR to explain why such condition is not necessary to assure compliance with the BACT limits.

7. Reporting Requirements for Power Generation Engines EU IDs 1 through 12 – Temperature Out of Range.

Condition 24.3(d)(i)(C) requires Permittee to report whenever the inlet gas temperature of an SCR unit or oxidation catalyst unit is outside the acceptable range identified in the manufacturer’s specifications.

EPA Region 10 recommends this condition be finalized to also require Permittee to report whether the temperature was outside the range measured/recorded during source testing on the engine conducted pursuant to Condition 24.3(b), if applicable. It is possible that source testing of the engine has not been conducted because testing is required of only three of twelve engines.

8. Reporting Requirements for Power Generation Engines EU IDs 1 through 12 – Urea Injection Flow Rate Out of Range.

⁶ January 28, 1993, Memorandum from John B Rasnic to Linda M Murphy re *Automatic or Blanket Exemptions for Excess Emission During Startup, and Shutdowns under PSD*, available at <https://www.epa.gov/sites/default/files/2015-07/documents/automati.pdf>.

Condition 24.3(d)(ii)(C) requires Permittee to report whenever the urea injection flow rate of an SCR unit is outside the acceptable range identified in the manufacturer's specifications.

Like Comment No. 7, EPA Region 10 recommends this condition be finalized to also require Permittee to report whether the flow rate was outside the range measured/recorded during source testing on the engine conducted pursuant to Condition 24.3(b), if applicable. It is possible that source testing of the engine has not been conducted because testing is required of only three of twelve engines.

9. Reporting Requirements for Power Generation Engines EU IDs 1 through 12 – Oxidation Catalyst Pressure Drop Out of Range.

Condition 24.3(d)(iii)(C) requires Permittee to report whenever the pressure drop across an oxidation catalyst unit is outside the acceptable range identified in the manufacturer's specifications.

Like Comment No.'s 7 and 8, EPA Region 10 recommends this condition be finalized to also require Permittee to report whether the pressure drop was outside the range measured/recorded during source testing on the engine conducted pursuant to Condition 24.3(b), if applicable. It is possible that source testing of the engine has not been conducted because testing is required of only three of twelve engines.

10. Explanation of Monitoring Decision for Incinerators EU IDs 27 and 28.

Condition 27.1(a) requires Permittee to conduct a source test of EU IDs 27 and 28 to demonstrate compliance with CO, NO_x, PM/PM₁₀/PM_{2.5}, VOC and GHG BACT limits. However, the permit includes no monitoring requirements for demonstration of ongoing compliance with applicable emission limits. Including these monitoring requirements to assure ongoing compliance with BACT limits is likely necessary pursuant to 18 AAC 50.306(d). In addition, NSPS subpart CCCC applies to EU ID 27⁷ and NSPS subpart LLLL applies to EU ID 28.⁸ The federal regulations require monitoring of the incinerators to demonstrate ongoing compliance with applicable requirements.⁹

EPA recommends ADEC revise the permit to include monitoring requirements necessary to demonstrate ongoing compliance with BACT limits for EU IDs 27 and 28 as well as any applicable monitoring required by NSPS subparts CCCC and LLLL.

11. Dust Collector Monitoring.

Condition 29.2(a) as part of monitoring the dust collector has a reporting requirement whenever the pressure differential is not within the limits established by the manufacturer.

EPA recommends ADEC clarify this condition to make clear that the limits on pressure differential are the same during the performance test conducted in accordance with Condition 29.1(c) to demonstrate compliance. Similar clarifications may be needed for Conditions 29.3(b) and 29.5(a).

⁷ See 40 CFR 60.2000; 60.2015, and 60.2265. EU ID 27 meets the definition of commercial and industrial solid waste incineration unit and will commence construction after June 4, 2010.

⁸ See 40 CFR 60.4760; 60.4775; and 60.4930. EU ID 28 meets the definition of a sewage sludge incineration (SSI) unit and will commence construction after October 14, 2010.

⁹ See 40 CFR 60.2145 and 60.4885.

In place of pressure differential monitoring, EPA recommends ADEC consider requiring use of bag leak detection system (BLDS) to monitor the performance of dust collectors.¹⁰ There is no evidence in the TAR that ADEC considered this monitoring technique to satisfy 18 AAC 50.306.

12. Synthetic Minor Source for Hazardous Air Pollutants.

Condition 37 limits formaldehyde emissions generated by power plant engines EU IDs 1 through 12 to less than or equal to 9.7 tons per year (tpy). Pursuant to 18 AAC 50.225(b)(3), in order to obtain an owner-requested limit, the applicant must submit a calculation of the stationary source's actual emissions and potential to emit air pollutants. The TAR does not specify the actual emissions of formaldehyde and potential to emit formaldehyde from emission units other than EU IDs 1 through 12. The October 29, 2021 application in Section 4.1.5 states, "The HAP emission calculations for the Project are provided in Appendix B." Appendix B of that submittal, however, does not contain HAP emissions calculations. To effectively limit the facility's formaldehyde emissions to less than the 10 tpy major source threshold, potential formaldehyde emissions for emission units other than EU IDs 1 through 12 must be less than 0.3 tpy.

EPA recommend ADEC revise the TAR to (1) include a complete inventory of actual and potential formaldehyde emissions from all emission units, (2) demonstrate that the 9.7 tons per year PTE limit on EUs 1 through 12 is sufficient to avoid major stationary source status in light of total formaldehyde emissions from the source, and (3) demonstrate that the facility's potential emissions of all HAPs, combined, is less than 25 tpy.

¹⁰ EPA OAPQS document entitled, *Fabric Filter Bag Leak Detection Guidance*, September 1997. EPA-454/R-98-015 available at <https://www3.epa.gov/ttnemc01/cem/tribo.pdf>.