

November 23, 2021

Sent via email to: Email: linda.kildahl@ecy.wa.gov

Ms. Linda Kildahl
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

RE: HollyFrontier Puget Sound Refinery Comments on 2nd Draft Regional Haze State Implementation Plan

Dear Mr. Gent:

The HollyFrontier Puget Sound Refinery (HFPSR) appreciates the opportunity to provide comments on the Washington Department of Ecology's (Ecology's) 2nd Draft of the State Implementation Plan for Regional Haze (2nd draft SIP). Please note that on November 1, 2021, ownership of Puget Sound Refinery (PSR) transferred from Equilon Enterprises LLC d/b/a Shell Oil Products US (Shell) to HollyFrontier Puget Sound Refining LLC (HFPSR) and as such all comments now submitted are on behalf of HFPSR.

At the request of Ecology, HFPSR (formerly owned by Shell) submitted a January 30, 2020 letter to Ecology identifying specific emission units at the HFPSR that met Ecology's criteria for a four-factor analysis. HFPSR also submitted the requested four-factor analysis for each subject emission unit in a report submitted on April 30, 2020. Ecology shared a 1st draft of the Regional Haze SIP four factor analysis in January 2021, and HFPSR provided comments on the conclusions made in the 1st draft SIP on February 16, 2021.

HFPSR recognizes and appreciates Ecology's willingness to incorporate comments from both HFPSR and the Western States Petroleum Association (WSPA) as part of the ongoing rulemaking efforts. The changes to the draft SIP based on previous comments and discussion are appreciated as well, and HFPSR looks forward to future collaboration towards reconciling discrepancies between HFPSR's and Ecology's cost calculations. In reviewing the 2nd draft SIP, HFPSR has identified a few important remaining comments, which are provided in detail below.

Comments from WSPA on 2nd Draft SIP

While the intention of this letter is to provide comments that are specifically relevant to HFPSR, the comments on the 2nd draft SIP prepared by WSPA are pertinent, and HFPSR wants to emphasize and reiterate the key takeaways from those comments, which are summarized below.

- ▶ Language in the 2nd draft SIP concluding that "refineries cause poor visibility" should be revised to either clarify that these are only possible conclusions (as Western Regional Air Partnership did not provide site-specific apportionment of visibility impairment) or provide further evidence to substantiate Ecology's claims.
- ▶ The refineries' overall contributions to visibility-impairing pollutant emissions should be more accurately represented. Refinery emissions of NO_x, SO₂, PM₁₀, and other visibility-impairing pollutants represent a very small fraction of the total anthropogenic emissions in Washington, yet the current language in the 2nd draft SIP suggests that refinery emissions represent a vast majority of emissions and of available emissions reductions.

- ▶ The current SIP language indicates that the predominant winds in the region would result in the refineries directly causing visibility impairment in local Class 1 areas, but no evidence is provided to substantiate these conclusions. Available wind rose data indicates that the predominant wind direction in the region would not coincide with winds traveling from the refineries to Class 1 areas.
- ▶ Table 7-6, as currently presented, has no relevance to the conclusions drawn in the SIP or to the Regional Haze Program as a whole. The data presented in the table is provided without the necessary context for understanding the nature of NO_x emissions from the Washington refineries, comparisons made to refineries in other states are not adequately substantiated, and the data does not inform any conclusions made for source selection under the Regional Haze Program or the anticipated emissions reductions resulting from the four-factor analysis.
- ▶ Further clarification should be provided for the source of Ecology's preliminary cost estimates. As currently presented, the cost calculation descriptions imply that the refineries did not develop cost estimates consistent with EPA guidance.
- ▶ Cost calculations prepared for control technology analyses should be developed using site- and unit-specific data wherever possible, including the use of heuristics and formulae developed specifically for the given emission units.

Characterization of HollyFrontier HFPSR NO_x Emissions

As noted in HFPSR's comments on the 1st draft SIP, the NO_x emissions intensity comparison table in Section 7.6 of this draft is an oversimplification of the NO_x emissions at a given refinery. There are important, fundamental differences between refinery processes and equipment that make this type of comparison inappropriate. The differences in NO_x emissions are not an indicator of poorly-controlled emission units, but are instead indicative of the varying crude slate, equipment, and products at a given refinery. Emissions from HFPSR, as an example, include emissions from a co-located cogeneration (or cogen) plant. The cogen plant is a non-refining process that other refineries in the state do not have. Moreover, refineries vary in complexity based on the types of products produced and operations conducted at the site. Less complex refineries that do not operate certain types of process equipment (e.g., FCCUs) will have lower total NO_x emissions per barrel of throughput. In contrast to the implications in the 2nd draft SIP, HFPSR has well-controlled NO_x emissions compared to most refineries, with controls installed on all but two process heaters, and SCR installed on its cogen units.¹ This table represents an oversimplification of NO_x emissions from refineries and ultimately does not aid in the development of conclusions for the Regional Haze Program. As such, HFPSR requests that Ecology remove the refinery comparison table and possibly replace it with a description of the varying NO_x emissions sources at refineries to provide the adequate context for the NO_x control analyses that follow.

HFPSR Analysis of SCR as a Control Technology

In HFPSR's initial four-factor analysis, the report notes that SCR is a well-established technology in the industry. The only basis for determining these emissions controls were not appropriate for installation at HFPSR were the site-specific costs developed by HFPSR as part of the four-factor analysis. HFPSR and Ecology agree that SCR has been demonstrated as a technically feasible control technology for heaters and boilers in the refining industry. HFPSR is encouraged by Ecology's willingness to ensure that analyses of SCR as a retrofit technology are as accurate as possible, and refining assessments of both the technical feasibility and the cost of retrofitting individual units with SCR on a unit-specific basis will be critical to that effort.

¹ All emission units in the Vacuum Pipe Still, Delayed Coking Unit, FCCU, and all three Hydrotreater Unit process areas are equipped with low-NO_x burners, and the Cogen units are equipped with SCR.

As part of the ongoing efforts by both Ecology and HFPSR to reconcile differences in cost calculations, it is important that conclusions made about the costs of retrofitting existing boilers and heaters with SCR are centered on unit-specific assessments. This includes both the recognition of the specific operating conditions that distinguish heaters and boilers located at refineries from those in other industries (such as the utility industry that served as the basis for the EPA Control Cost Manual) and using cost calculation heuristics that are appropriate for refineries as well. Extensive research prepared by WSPA in conjunction with rulemaking efforts for the South Coast Air Quality Management District (SCAQMD) in Southern California indicates that the underlying cost curves in the EPA Control Cost Manual – while appropriate for the utility industry – result in substantial underestimation of retrofit costs for the refinery industry. This research, which is described in detail in WSPA's comments on the 2nd draft SIP, was accepted by the SCAQMD and played a central role in the rulemaking efforts in Southern California.

HFPSR appreciates Ecology's recognition and incorporation of comments on the 1st draft of the SIP that recognized Ecology's initial cost calculations did not incorporate site-specific analysis and that future refinement is necessary. Conclusions made in the 2nd draft SIP regarding likely cost effectiveness are premature because the cost calculations lacked site-specific data and were also developed using EPA Control Cost Manual cost estimate tools that were not developed with the refinery industry in mind. The EPA Control Cost Manual and Regional Haze Guidance recommend using site-specific costs wherever possible. HFPSR is optimistic that the continued research and collaboration on the part of both HFPSR and Ecology will result in a complete and accurate site-specific analysis of appropriate emissions reductions solutions for the Regional Haze Program.

Boiler #1 (Erie City Boiler)

For Boiler #1 (Erie City Boiler), the 2nd draft SIP maintains the previous draft's conclusion that a regulatory order would be needed to shut the unit down by January 2028. HFPSR's analysis included a conservative assumption that the boiler had a remaining useful life of eight years. The remaining useful life is a consideration in a four-factor analysis for determining whether to require controls. The specific timeframe, however, is an estimate used solely for the preparation of the best available cost-effectiveness calculations for implementing additional emission controls. At no point in time has HFPSR agreed to a shutdown of the boiler by January of 2028.

The regional haze program should not mandate a shutdown of the equipment, but instead provide HFPSR with the flexibility to evaluate its options for compliance. As such, the 2nd draft SIP should be revised to include the possibility of substantial upgrades to Boiler #1, rather than exclusively mandating the shutdown of the boiler altogether. Should HFPSR elect these substantial upgrades to the boiler rather than shut down the boiler entirely, this would result in different NO_x emissions and a different remaining useful life, warranting a reevaluation of the anticipated retrofit costs. HFPSR looks forward to ongoing discussions with Ecology to reach agreement on an appropriate remaining useful life for the Boiler #1 to develop cost calculations that lead to an accurate retrofit cost for the four-factor analysis in the SIP.

FCCU / CO Boiler

As noted in previous comments submitted by HFPSR, the FCCU is outside the scope of review for the four-factor analysis. HFPSR recognizes and appreciates Ecology's updates to provide clarification regarding the specifics of the request made by Ecology initially for unit selection. In the 2nd draft SIP, however, Ecology notes the following:

It was Shell's understanding that the addition of particulate matter and SO2 controls on the FCCU in 2014 meant that they were not required to submit a NOx FFA.

Ecology's November 27, 2019 letter to HFPSR requested "Information for a 4-Factor analysis for each operational fluid catalytic cracking unit (FCCU), boiler greater than 40 MMBtu/hr, and heater greater than 40 MMBtu/hr located at your facility that has not been retrofitted since 2005." At no point does Ecology indicate that the applicability of units should be considered on an individual pollutant basis, and HFPSR fulfilled Ecology's requests exactly as written. HFPSR provided background information about these FCCU retrofits in its January 30, 2020 initial response to Ecology's information request. At no point between the January 2020 response and the January 2021 1st draft SIP, did Ecology indicate a need for additional information about the FCCU, or question the FCCU's exclusion from the four-factor analysis. In lieu of the passage identified above, HFPSR proposes the following update:

The Puget Sound Refinery's FCCU did not meet the criteria for unit selection as part of Ecology's Regional Haze request; therefore, cost information was not provided by the Puget Sound Refinery in their FFA.

The suggested language above accurately reflects that HFPSR was not required to submit a four-factor analysis for this unit.

Cogen Units

The cogen units at the HFPSR fall outside the scope of review identified by Ecology for the four-factor analysis. Ecology's November 27, 2019 letter to HFPSR requested a four-factor analysis for boilers and process heaters greater than 40 MMBtu/hr. The cogen units are combustion turbines and do not fall under these specific source types. However, HFPSR did include the cogen units in its initial four-factor analysis to show an example of implemented SCR for NO_x control. In addition to continuing to operate the cogen units with SCR, over the last five years HFPSR has discontinued firing of liquid fuel in the units, which has resulted in NO_x reductions. Liquid fuel firing was discontinued in Cogen #2 in June 2015, in Cogen #3 in June 2016, and in Cogen #1 in June 2017. HFPSR has obtained federally enforceable permit limitations to make these changes permanent.

The 2nd draft SIP, as with the previous draft, identifies the three cogen units at the refinery as requiring further study. However, further study is not needed because the cogen units already have BACT limits. Ecology cites the fact that similar new units are permitted at levels below 2 ppm NO_x. However, those low emission limits for new turbines represent a much more stringent level of control (i.e., Lowest Achievable Emission Rate, or LAER) that may be appropriate for nonattainment areas, but this level does not represent a RACT level of control. Per the EPA's regional haze guidance,² it is appropriate for states to preclude new, reconstructed, or modified units subject to best available control technology (BACT) or LAER analyses from regional haze analyses entirely, as "The statutory considerations for selection of BACT and LAER are also similar to, if not more stringent than, the four statutory factors for reasonable progress." HFPSR's cogens already operate with SCR, the best retrofit technology proposed by Ecology in the 2nd draft SIP for all other emission units. The SCR systems were installed as a BACT control option and were designed to meet a particular outlet concentration. The refinery currently operates the cogens and SCR system to minimize emissions of NO_x while also maintaining low levels of ammonia slip. Attempting to lower NO_x emissions

² U.S. Environmental Protection Agency, "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period." 20 August 2019. Retrieved from: <https://www.epa.gov/sites/default/files/2019-08/documents/8-20-2019-regional-haze-guidance-final-guidance.pdf>

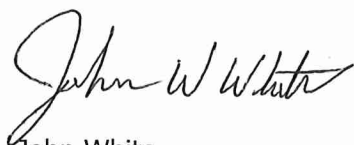
further would raise the possibility of emitting substantially more ammonia, a regulated toxic air pollutant in Washington, and risk violation of the ammonia emission limits on the cogens.

Comparing the emission rates of HFPSR's turbines to those of new turbines is not a relevant comparison for assessing the performance of an SCR system. New turbines will have a lower NO_x inlet emission rate to the SCR than existing turbines can achieve.

To summarize, further reducing the NO_x emission limit for the Cogen units would have negligible benefit to air quality and visibility and represents a level of control far more stringent than those the EPA indicated should be considered under the regional haze program. The Cogen units BACT limits are similar to or more stringent than RACT. HFPSR therefore recommends that the analyses and conclusions regarding the cogens be removed from the 2nd draft SIP entirely.

Thank you for considering our comments. HFPSR looks forward to future collaboration with Ecology to develop comprehensive and accurate analysis for the individual units at the refinery. We appreciate the opportunity to review Ecology's draft report and are available to respond to any questions that Ecology may have about our four-factor analysis or these comments.

Sincerely,

A handwritten signature in black ink that reads "John White". The signature is written in a cursive, flowing style.

John White
VP of Refining and Plant Manager
HollyFrontier Puget Sound Refinery