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Scope of review: Prepared by Mark Uhart (Final)

Hello, my name is Mark Uhart and I live in Kalama. My undergraduate degree is in Wildlife Biology. Subsequent to obtaining my B.S. degree I served in the US Army Officer Corps for 21 years. I am now fully retired but here to serve the citizens of Kalama and my neighbors.

- We strongly support the agency's effort to select a qualified and impartial contractor to review the Final SEIS for KMMEF prepared by Life Cycle Associates. Although the FSEIS is a vast improvement over the SEIS, with APPENDICES A, B & C providing more verifiable facts, we still see holes in LCA's analysis. And we don't believe NWIW's Voluntary Mitigation Program Framework (VMPPF) will have effective governance, risk management and methods of compliance to ensure the refinery is safe, doesn't pollute our air or water, and doesn't negatively affect our property values.

We are eager to weigh in with our concerns. I will address three assumptions in the FSEIS that mask the actual amount of GHG emissions associated with this project. But first, let me address the development and use of assumptions in the EIS & FSEIS.

- Assumptions are suppositions without proof, but there are basic rules in the development of assumptions. An assumption is an action or condition based on variables and parameters that are more likely to occur than not occur. The assumption should be reasonable (defendable), supportable and consistent with relevant observations and verifiable facts. Why do we believe this assumption to be true? Expert reports, such as government, industry, financial and peer-reviewed research reports should be referenced to demonstrate an assumption is more likely to occur than not. The data behind the assumption should be from various viewpoints so as not to introduce bias, such as from a variety of industry analysts and scientists. I believe LCA's baseline variables and parameters for a number of our concerns should be carefully reviewed.
 1. The first assumption I'll address is LCA's belief that the methanol will be used to manufacture olefins, which produces less GHGs than if it were used as a fuel. Appendix A of the FSEIS states there is the "potential" that the methanol could be used as a fuel, rather than for MTO. The report provides supporting evidence that this is likely to occur, and acknowledges the market demand for methanol-fueled vehicles with methanol as a gas blend, or as derivatives to gasoline. China's demand for methanol to power defense and commercial vessels, 100% methanol commuter vehicles, methanol fuel cell, and methanol fuel cell hybrid vehicles, are all driving world demand for methanol as a fuel. China's demand alone is increasing 15-20% a year (See APPENDIX A, Figure 4.9.-Uses of Fuel Methanol in China.) Yet the "Key Findings" in APPENDIX A states, "*Again, KMMEF methanol is firmly targeted to the MTO*

market so this analysis is simply provided as general comparative information.” There is simply too much evidence indicating that at least some of the refinery’s methanol will be used as a fuel. We believe LCA’s analysis is assuming away a condition, that the methanol WILL NOT be used as a fuel, which is less likely to occur. The LCA analysis follows with, “*This MTO growth will occur with or without the KMMEF,*” That’s like going into a bar and saying to oneself, everyone else is drunk so I’ll get drunk too.” Just because another country doesn’t care about GHG emissions doesn’t make it OK for us to do the same.

2. The second assumption is that this plant will displace a coal-to-methanol plant in China, thus decreasing the amount of GHG emitted for the same amount of methanol produced. This displacement assumption is a major flaw in the FSEIS. If anything, assuming China has sufficient petroleum imports, the low price of oil will negatively affect coal-to-methanol plant production. And oil prices are likely to remain low. This means there will be little need for gas-based methanol in the plastics-olefins process.¹ Furthermore, APPENDIX F-“Energy Prices,” makes no mention of the effects of oil pricing on the methanol-to-olefin vs. and oil to naphtha processes. Was the intent to inflate the demand for methanol and mask the greenhouse gas emissions potential of this project? We don’t see a scenario in which GHG emissions would be displaced, as described in the FSEIS. The economic risks, based on variables in natural gas and petroleum pricing, must be fully explored. Ecology should be asking its consultant to avoid any use of NWIW’s “displacement” theory - the idea that gas-based methanol will “displace” coal-based methanol in the olefin market. It is far more likely that NWIW’s methanol will be burned as a fuel, resulting in higher GHGs. This should be the baseline scenario.
3. The third assumption that must be addressed is the upstream fugitive methane release associated with this project. There are two areas that should be explored further: (1) that the upstream CH₄ emissions were calculated based on the GREET1_2017 Model, and (2) LCA’s assumption that there will be less CO₂e emissions from a MTO than CTO production scenario, relying on the “displacement” assumption.

We reviewed APPENDIX A, Section 5-Displaced (upstream) Emission, as well as APPENDICES B & C of the FSEIS. We believe the GREET1_2019 Model provides better data for CH₄ emissions than the 2017 model. “Brandt et al. (2014) found that national scale atmospheric measurements suggest EPA’s total CH₄ inventory undercounts emissions by 50% (+/- 25%), though they discuss the difficulties in trying to attribute the emissions to specific sectors (e.g. natural gas, petroleum, coal, agricultural, landfills).” With updated data a bottom-up analysis, supplemented by a top-down analysis (covering 30% of U.S. gas production) Brandt et al. (2014) estimated national CH₄ emissions from natural gas and oil supply chains, to include CH₄ from oil shale deposits, are much higher than previously estimated. Their facility-based estimate of 2015 NG and oil supply chain emissions is around 60%

higher than the U.S. EPA GHGI estimate. These data are in line with the research done by Robert Howarth, Department of Ecology and Evolutionary Biology, Cornell University, published in April 2019. Ecology's analysis should be based on the Updated Natural Gas Pathways in the GREET1_2019 Model and supporting research. And, the difference in upstream CH4 emissions from the "displaced" CTO process should not be a factor in Ecology's conclusions.

We also urge Ecology to review the downstream market effects discussed in APPENDIX A, Sect. E.2., and the Market Displacement Effects of MTO and Naphtha discussed in APPENDIX B, para 8, with respect to the displacement assumption. The LCA analysis relies heavily on this displacement assumption to reduce the amount of GHG resulting from this project. While producing methanol from coal in China may be more expensive than producing it from natural gas in North America, there was no attempt to include the naphtha to olefin market forces in the LCA analysis. (See Appendix A, Sect. 4.5.2 Marginal Methanol Resources) "*...the cost advantages of producing methanol at the KMMEF from natural gas and shipping it efficiently to Asian markets, including China's coastal chemical complexes, will displace methanol production from existing coal-based plants in China and should also discourage development of new coal-based methanol plants.*")

We appreciate your taking time to hear our position on these three points. We hope Washington will continue to stand for clean air and water and not feel compelled to accommodate the fossil fuel industry.

ⁱ Reference comments of Prof. Paul Thiers, who stated that oil would have to remain durably above \$85-90/bbl for this to even begin to make sense. Since the crash in oil prices from late 2014 to early 2016, China is seeing a return to oil to naphtha production and interest in building new coal to olefins plants has subsided. Coal to olefins will only return as a target for increased production if oil goes back to well over 70 dollars per barrel (Zhang et. al. 2017.) As I write these comments it is at 46 dollars per barrel. Not surprisingly, several proposed coal to olefins plants in China are now in doubt (ICIS 2018). These plants will probably never be built, even without methanol imports from the KMMEF plant.