COMMONWEALTH OF PENNSYLVANIA **MEMO**
Department of Environmental Protection
Southwest Regional Office

TO Air Quality Permit File PA-04-00740B

FROM Melissa L. Jativa/MLJ
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THROUGH Edward F. Orris, P.E./EFO
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RE Comment and Response Document
Shell Chemical Appalachia LLC
Shell Polymers Monaca Site
Permit Decision: Approved
Potter and Center Townships, Beaver County
APS # 1008145, Auth # 1299664, PF # 775836

DATE February 16, 2021

Shell Chemical Appalachia LLC ("Shell") submitted a plan approval application received by the Pennsylvania Department of Environmental Protection ("Department") on December 18, 2019, for the installation and temporary operation of sulfur hexafluoride (SF6)-insulated high voltage equipment associated with the cogen area of the Shell Polymers Monaca Site in Potter and Center Townships, Beaver County. The Department of Environmental Protection's ("Department's") review of the submitted application has been completed and the public comment period has expired. This memo documents activity that has taken place since the Department's review memo was finalized.

Notice of intent to issue the plan approval was published in the *Pennsylvania Bulletin* on October 3, 2020; published in *The Times (Beaver County Times)* on October 5-7, 2020; sent to United States Environmental Protection Agency ("EPA") on October 6, 2020; and sent to WV DEP and OH EPA on October 6, 2020, in accordance with the requirements of 25 Pa. Code §§127.44-127.46. All required methods of public notice were fulfilled as of October 7, 2020, and the regulatory 30-day public comment period would have ended at the close of business on November 6, 2020. Commenters who requested an extension were informed by the Department via email that the Department would accept comments until November 16, 2020. The Department also posted a statement on the regional website that "DEP will accept written comments on draft plan approvals 04-00740B and 04-00740C until November 16, 2020."

Notice of intent to issue was provided to the applicant on September 28, 2020, and the applicant fulfilled the requirement to publish the notice within 10 days of receipt, in accordance with the

requirements of 25 Pa. Code §127.44(c). Copies of the proposed plan approval and review memo were emailed to H. James Sewell, CSU Environmental Manager, Shell Polymers.

Copies of the proposed plan approval and review memo were made available for the public to view on the Department's regional website on October 3, 2020. Copies of the plan approval application were made available for the public to view on the website on October 15, 2020. The Department posted a statement on the regional website that "DEP will accept written comments on draft plan approvals 04-00740B and 04-00740C until November 16, 2020." Commenters who requested an extension were informed by the Department via email that the Department would accept comments until November 16, 2020.

Received comments are substantively addressed below in this document. Comments have been identified, summarized, and categorized where possible. Numbers in parentheses following each comment identify to which commentators the comment applies. See attached Comment and Response Document for PA-04-00740C for list of commenters. Also see attached Comment and Response Document for PA-04-00740C for responses to comments requesting denial of PA-04-00740B, comments expressing concern over greenhouse gases and climate change, comments requesting an extension on the public comment period, and comments requesting a public hearing.

COMMENTS AND RESPONSES

1. **Comment :** Multiple commenters are concerned that Shell installed sulfur hexafluoride (SF_6)-insulated high voltage equipment without prior approval from DEP in violation of 25 Pa. Code §127.11. Draft Plan Approval No. PA-04-00740B would now authorize the installation and operation of this equipment, which is a source of fugitive emissions of SF_6.

   Under the draft plan approval, there is a potential to emit 854 tons per year of Carbon Dioxide Equivalent (CO_2e) from the SF_6-insulated equipment. Although 854 tons per year is a relatively small fraction of the facility's total CO_2e emissions, SF_6 is a long-lived, highly potent greenhouse case. In fact, SF_6 is one of the most potent greenhouse gases, with a global warming potential (GWP) 22,800 times greater than CO_2 over a 100-year time span and an atmospheric lifetime of 3,200 years.[1] Shell's use of SF_6 is even more troubling given the existence of quality alternatives. The U.S. Environmental Protection Agency and industry partners have jointly studied for years how to reduce SF_6 emissions.[2] Alternatives with significantly lower GWP, atmospheric life, and toxicity are already in use.[3] These alternatives should be considered instead of SF_6 to reduce the GHG impacts of the facility. The public has the right to a public hearing to weigh in on Shell's use of this extremely potent greenhouse gas. Shell's failure to include the potential for SF_6 emissions in its initial plan approval should not deprive the public of an opportunity to comment on this important issue. (1, 3, 12, 16, 18, 20, 77, 78, 80 – 602)

   Response: Shell is currently constructing a petrochemical facility under Plan Approval 04-00740A issued June 18, 2015. Shell installed sulfur hexafluoride (SF_6)-insulated high voltage equipment in 2018 during the construction of the petrochemical facility without prior approval from DEP. The Department and Shell entered into a Consent Order and Agreement that was finalized on November 11, 2019. Compliance and enforcement issues were resolved through the CO&A, which required the submission of a plan approval application to authorize the installation and initial operation of SF_6 insulated voltage equipment, and included the assessment of a civil penalty.

   Shell's proposed Best Available Control Technology (BACT) and the conditions proposed for Plan Approval 04-00740B include manufacturer guaranteed maximum leakage rates, leak monitoring technology, Leak Detection and Repair (LDAR) requirements, and recordkeeping requirements.

   Plan Approval Application 04-00740B evaluated BACT for high voltage equipment and the Department concurs with Shell's analysis that SF_6 free alternatives were not demonstrated in practice and not available control technology for purposes of the BACT analysis for the source category. Additionally, Shell provided an analysis of 145 kV MIS equipment and SF_6 free products available including GE's g, Siemans' Clean Air, and ABB's Air Plus.

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[1] *Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, available at https://www.ipcc.ch/report/ar4/wg1/.*

[2] *SF6 Emission Reduction Partnership for Electric Power Systems, available at https://www.epa.gov/f-gas-partnership-programs/electric-power-systems-partnership.*

[3] *See 3M Company, 3M Novec Dielectic Fluids SF6 Alternatives For Power Utilities (Jan. 2017), available at https://www.epa.gov/sites/production/files/2017-02/documents/nyberg_presentation_2017_workshop.pdf; SF6 Emission Reduction Partnership for Electric Power Systems, Moving Toward SF6-Free High Voltage Circuit Breakers: Considerations for Adopting Vacuum Breaker and Fluorinated Gas Alternative Technologies*

These products were potentially available at the time of submittal of Plan Approval 04-00740B. The weight of SF_6 in the 145 kV MIS equipment represents greater than 99% of the weight of SF_6 in SF_6 containing equipment at the facility. A short circuit requirement of 63kA on a 3 second basis is required for Shell's 145 kV MIS equipment. The alternatives are rated at 40 kV on a 3 second basis and do not meet the requirement for Shell's equipment.

Additionally for the remaining 1% of the SF_6 by weight at the facility (located in the PDS Substation, Outside MIS transformers and Step Up Transformers), the analysis concluded that alternatives are not available or safety considerations precluded the use of SF_6 free equipment.

The commenter stated: "Alternatives with significantly lower GWP are already in use". The links provided in footnotes 2 and 3 did not contain information on any SF_6 free equipment currently in use that meets the short circuit requirement of 63kA on a 3 second basis that is required for Shell's 145 kV MIS equipment (containing) 99% of the SF_6 at the facility.

Additionally, the Department concurs with the commenter that "854 tons per year is a relatively small fraction of the facility's total CO2e emissions." Note that this facility is subject to BACT for CO_2e which includes regulation of carbon dioxide and methane emissions. Potential emissions from this facility will be minimized by the application of BACT for CO_2e. Reviews of plan approval applications 04-00747A, 04-00747B, and 04-00747C have been conducted accordingly and this requirement has been satisfied. Carbon dioxide and methane emissions from future projects at this or any other facility will be evaluated in accordance with applicable air quality rules and regulations at that time. This may include a case-by-case PSD analysis for greenhouse gas emissions as appropriate. At this time, there is no NAAQS for greenhouse gases.

One aspect of this project of particular note to this comment is that Shell will be recovering and utilizing hydrogen generated during the ethane cracking process as fuel for the furnaces. Recovered hydrogen is expected to constitute nearly 50% of the fuel requirements of the furnaces and will result in less CO_2e than if the furnaces combusted natural gas alone.

See Response to Comment #18 of the attached Comment and Response Document regarding the request for a public hearing.