Pennsylvania
Department of
Environmental Protection

November 3, 2025

Laura Sabolyk
Senior Regulatory Advisor
Shell Chemical Appalachia, LLC
Shell Polymers Monaca
300 Frankfort Road
Monaca, PA 15061

Dear Laura Sabolyk:

On October 24, 2025, the Department sent an e-mail to Shell asking for additional information about the potential to employ Flare Gas Recovery (FGR) at Shell Polymers Monaca (Facility). Since then, Shell personnel have asked the Department to clarify what information the Department is seeking related to FGR. This letter clarifies what the Department is seeking and replaces the October 24, 2025, e-mail.

In a letter dated September 23, 2025, Shell identified reasons why Shell concluded that FGR is not technically feasible to be employed at the Facility. However, it did not identify, provide or discuss the engineering evaluations, data, facts, and calculations that support the reasons and conclusions in the September 23 letter. The Department is seeking the engineering evaluations, data, facts, and/or calculations which Shell used to support the reasons and conclusions in the September 23 letter. Specific reasons and conclusions cited by Shell for which the Department is seeking this background supporting information are:

Polyethylene Manufacturing Vent Streams

- "These vents contain significant amounts of diluents (i.e., air and nitrogen) that make their capture and recovery for use as fuel technically infeasible."
- "The resulting heating value of the mixed vent stream was determined to be below the design and engineering practices which require recovered gas to be > 25 MJ/kg to qualify as recoverable fuel."
- "Only intermittent vents associated with startups, shutdowns, and malfunctions and regenerations, reactor blowdowns and purges, and the PE3 degasser are routed to the HP Flare System and are very high in nitrogen content (typically above 75% N2)."

Ethylene Manufacturing Vent Streams

- "To assess the technical feasibility of controlling ethylene plant vent streams, Shell did an updated review of vent streams routed to flares that originate from ethylene manufacturing process units." [emphasis added]

- "During normal operation of the cracking unit, no routine vent gases other than analyzer vents, natural gas purges, and supplemental fuel for heating value are directed to the flares. As a result, during normal operations there is little or no VOC gas to recover using a flare gas recovery system. Essentially, any gas that could be recovered would provide no beneficial use as fuel and the recovery would not result in the reduction of VOC emissions as there is no VOC for recovery."

  Note: In the Facility's potential to emit calculations most recently updated on September 5, 2025, annual VOC in the high-pressure header system routed to the totally enclosed ground flares and elevated flare is over 11,970 tons per year and in the low pressure header system routed to the continuous vent thermal oxidizer, with the multipoint ground flare as backup, is over 30,700 tons per year.

- "Due to the intermittent nature of the ethylene manufacturing vent streams and the composition of the streams it was determined that flare gas recovery was <u>not technically feasible due to gas quality and quantity</u>." [emphasis added]
- "As a result, use of either the furnaces or cogen units to combust ethylene would result in
  1) damage to the burners due to ethylene's high heat release and
  2) burner fouling due to the formation of polymerization residue."
- "The capture and recovery of cracking furnace product gas during a unit startup, shutdown, or malfunction for use as a feedstock is not technically feasible because of the low purity of the captured gases."

<u>Shell's Conclusion</u>

- "Based on a detailed review of characteristics [i.e., <u>heating values in British thermal units per standard cubic feet (Btu/scf)</u> and vent stream frequency] of PE units and ethylene manufacturing plant vent streams routed to the SPM flares, the conclusion that flare gas recovery is not technically feasible was reaffirmed." [emphasis added]
- "This <u>detailed vent gas analysis</u> further supports the determinations reached in the February 16, 2015, plan approval application as well as the determinations documented in the April 11, 2025, Fifth Response to Plan Approval Application Technical Deficiency Letter." [emphasis added]

The statements in the September 23 Letter would not be made in a vacuum, and Shell must have relied on data and information such as a detailed vent gas analysis including characteristics like heating values in British thermal units per standard cubic feet (Btu/scf) and baseline flow rate in standard cubic feet (scf), the Facility's fuel gas demand for the ethane cracking furnaces and natural gas-fired turbines, and the equipment required to modify the existing fuel gas system. Similarly, without such data and information the Department is unable to determine that the recovered flare gas cannot be managed to maintain an acceptable heating value, quality and flow rate by blending the recovered gas with the existing plant fuel gas through the installation of additional equipment to maintain a stable fuel supply to gas-fired equipment.

The Department will contact you to schedule a meeting to discuss this clarified request. Additionally, the Department understands that Shell believes that the supporting engineering

evaluations, data, facts and calculations may contain Confidential Business Information (CBI). Please contact Sheri Guerrieri, SW AQ NSR or Brian Greenert SW OCC to discuss handling Shell's CBI concerns.

Sincerely,

Alexander Sandy/AS
Air Quality Engineering Specialist
Air Quality Program

cc: Mark Gorog, Air Quality Program Regional Manager
Sheri Guerrieri, Environmental Engineer Manager (New Source Review)
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