Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

November 2, 2022

Mark Gorog P.E., Regional Manager Air Quality
Program Pennsylvania Department of Environmental
Protection Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: PA-04-00740C Polyethylene Unit 3 (Source ID 202) Reactor Circulation Pump Seal Leak Malfunction and High-Pressure (HP) Header System (Source ID 205) Excess Emission Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC ("Shell") is submitting this Malfunction Report to the Pennsylvania Department of Environmental Protection (PADEP) for excess flaring emissions from the blowdown of reactors in PE3 at the high-pressure ground flares (HPGF) due to circulation pump seal leaks.

- **Name and location of the facility**
  Shell Polymers Monaca
  300 Frankfort Road, Monaca PA, 15061

- **Nature and cause of the incident**

  During commissioning activities in Polyethylene Unit 3 (PE3), the reactor circulation pump (P-43001) inboard mechanical seal failed, leaking isobutane into the pump seal fluid. As it is not possible to isolate the circulation pump due to its integrated design with the reactor loop, the reactor (R-43001) was de-inventoried to facilitate the repair of the pump seal. The other reactor in PE3 (R-43002) and the associated pump (P-43002) were also de-inventoried of isobutane due to safety integrity concerns to facilitate the replacement of the circulation pump seal in this reactor loop. As a result, a controlled amount of isobutane was sent to the HPGFs. This resulted in the flaring of approximately 180 tons of isobutane on October 2, 2022.

  Once the reactor was depressurized to facilitate the repair, the new seals can be installed, and the reactors/circulation pumps will be pressure tested to confirm tightness to resume commissioning activities in PE3.

- **Time when the incident was first observed, and duration of excess emissions**
  Excess emission from de-inventorying the reactors began on October 2, 2022, beginning at 02:30 PM and ended on October 2, 2022 at approximately 5:00 PM. No visible

emissions or smoke was observed from the HPGFs during this event.

- **Estimated rate of excess emissions**

  Based on the reactor size, pressure and meter readings, the estimated excess emissions for this reactor blowdown event have been calculated using the gas composition and emission factors as:

CO2e:	588.96 tons
CO:	1.31 tons
NOx:	0.29 tons
SO2:	0.00 tons
PM (Filt):	0.01 tons
PM10:	0.03 tons
PM2.5:	0.03 tons
VOC:	3.97 tons
HAP:	0.0078 tons

If you have any questions regarding this matter, please contact me at (724) 709-2467 or kimberly.kaal@shell.com.

Sincerely,

Kimberly Kaal

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

CC:
Anna Hensel, District Supervisor
Scott Beaudway, Air Quality Specialist