Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

November 23, 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 Source IDs 032 and 036 Ethane Cracking Furnace #2 and #6 NOx Emissions Malfunction Report, October 22-23, 2022

Dear Mr. Gorog,

Shell Chemical Appalachia LLC ("Shell") is submitting this incident report to the Pennsylvania Department of Environmental Protection (PADEP).

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

- **Nature and cause of the incident**
  On October 22 at ~2:00PM following a restart of the Ethane Cracking Unit (ECU), the fuel gas composition to the Ethane Cracking Furnaces (Furnaces) changed from natural gas only and reintroduced tail gas (hydrogen and methane) recycled from ECU. Changing the fuel composition resulted in increased fuel gas consumption to maintain temperature at the outlet of the furnace. Increased fuel consumption resulted in increasing NOx emissions. At this time the NOx (ammonia flow) controllers for Furnace #2 and #6 were set to operate in automatic mode. Operating the NOx controllers in automatic mode maintains a fixed supply of ammonia and did not increase ammonia in response to the increasing NOx emissions. These combination of events resulted in block-hour average elevated NOx emissions (above 6.2 lb/hr) for Furnace #2 and #6 which were operating in Hot Steam Standby mode.

  Operations reset the NOx (ammonia flow) controllers to operate in cascade mode which responds to NOx analyzer feedback and increased flow of ammonia for control of NOx emissions. Corrective action also included udpates to NOx emissions alarms and development and distribution of additional Operator guidance for controlling NOx emissions in different operating modes.

- **Time when the incident was first observed, and duration of excess emissions**
  October 22, 2022 at ~ 2:00 PM 13 hours (Furnace #2) and 14 hours (Furnace #6)

- **Estimated rate of excess emissions[a,b]**

Source ID	Name	NOx (lbs)	NOx (tons)
032	Ethane Cracking Furnace #2	599.9	0.30
036	Ethane Cracking Furnace #6	549.1	0.27
Total		1,149	0.57

a Emissions in excess of 6.2 lb/hr applicable limit
b As determined by uncertified CEMS analyzer data

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