



Shell Chemical Appalachia LLC  
300 Frankfort Rd  
Monaca, PA 15061

February 26, 2025

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

**RE: PA-04-00740C LP Multipoint Ground Flare (C204B) Ethylene Header Visible Emissions Follow Up Report**

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this *follow up* report to the Pennsylvania Department of Environmental Protection (PADEP) to provide a status update regarding the December 6, 2024, LP Multipoint Ground Flare Ethylene Header Visible Emissions Malfunction Report, which was submitted on January 6, 2025. All outstanding items have been addressed, as detailed below.

- **Name and location of the facility**  
Shell Polymers Monaca  
300 Frankfort Road, Monaca PA, 15061
- **Summary of incident**  
On December 6, 2024, starting at approximately 7:07, Visible Emissions (VE) that exceeded 5 minutes in a consecutive 2-hour period were present at the Ethylene Header of the LP Multipoint Ground Flare (MPGF). The cause of the VE was determined to be inadequate combustion air supplied to the flare following an increase in vent gas flow rate. The combustion air fan was in cascade control during this event, and its speed automatically increased as flare vent gas flow increased; however, the fan’s automatic response was not sufficient to avoid smoking as not enough air was provided during the VE period.
- **Status of outstanding items**  
Pending as of January 6, 2025 (TBD items):

Issue	Root Cause	Corrective Action(s)	Timing
MPGF VE	TBD	TBD	TBD
Missed Method 22 observations	Operations responding to fluid operating conditions associated with freezing temperatures	Train more site personnel to conduct Method 22 observations in the event the operators are responding to site operational conditions	TBD

1. MPGF VE Root Cause, Corrective Action(s), and Timing

The perimeter air assist fan that supplies combustion air to the MPGF ethylene header was in cascade control during this event, and its speed automatically increased as flare vent gas flow increased. However, the fan's automatic response was not sufficient to avoid smoking as not enough air was provided during the VE period. The root cause of the control scheme not providing enough air was determined to be either issue with the fan curve or that the fan is underperforming. Note that the fan curve represents the required fan speed for a range of vent gas flows.

**Combustion Air Fan Performance**

The fan's health was assessed by the site's rotating equipment group and was determined to be performing as expected based on available process data.

**Combustion Air Fan Curve**

Based on the assessment of the combustion air fan performance, the VE root cause has been concluded to be an issue with the fan curve. Note that the curve has already been updated based on learnings from past VE events and a plant step test. The site's heat transfer group has determined that additional changes to the fan curve are not recommended due to the flare header's variable response (flame appearance) to effectively the same process conditions. Due to this, future adjustments to the curve risk worsening the problem.

To address the combustion air fan curve deficiencies, the project process has been initiated to scope and identify the appropriate solution. The lead solution is a camera technology that monitors the flare combustion zone and automatically adjusts the air fan to yield proper combustion conditions. As the proposed solution still requires a feasibility review and scoping, the exact implementation timeline is unknown at this time. Once the solution is fully scoped and a timeline identified, an update may be provided to the agency.

The following interim mitigations have been identified while the project progresses:

- a. Improved flare vent gas flow rate alarm setpoints to drive faster console operator intervention during flaring events in which VE are present
- b. The site is planning installation of an additional camera that monitors the MPGF which will provide another vantage point and improve operator response to VE events. The new camera will be installed no later than the end of Q2 2025.

**2. Method 22 Observations Training**

The site is planning to train additional operator positions and the Emergency Response Team on how to conduct Method 22 observations. The training is scheduled throughout March 2025. This will result in 6-7 additional people per shift who can perform Method 22s.

If you have any questions regarding this matter, please don't hesitate to contact Kimberly Kaal at [kimberly.kaal@shell.com](mailto:kimberly.kaal@shell.com) or me at [nathan.levin@shell.com](mailto:nathan.levin@shell.com).

Sincerely,



Nathan Levin  
Operations Manager

CC:

Scott Beaudway, Air Quality Specialist  
Valerie Shaffer, Air Quality District Supervisor