Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

January 22, 2026

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 Source ID 103 Combustion Turbine/Duct Burner Unit #3 Excess NOx Emissions Malfunction Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC ("Shell"), located in Beaver County PA, is submitting this malfunction report to the Pennsylvania Department of Environmental Protection (PADEP) for excess NOx emissions from Cogen Unit #3[1] on December 26, 2025.

This malfunction did not pose an imminent and substantial danger to public health and safety or the environment.

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

- **Nature and cause of the incident**
  On December 26, 2025, Cogen Unit #3's SCR system (Source ID C103) tripped, which yielded a 1-hour average NOx concentration exceedance above the permit limit of 2 ppmvd (at 15% O2).

- **Time when the malfunction or breakdown was first observed**
  SCR system trip: 12/26/25 00:07

- **The date and time that the malfunction started and ended**
  SCR system trip: 12/26/25 00:07
  Normal SCR operations restored: 12/26/25 00:30

  In total, this yielded one 1-hour average NOx concentration exceedance for the 00:00 hour.

- **An estimate of the emissions associated with the malfunction**
  5.00 lbs of excess NOx emissions

- **The calculations that were used to determine that quantity**
  The calculations are based on Cogen Unit #3 stack's CEMS analyzer readings during the malfunction.

  Minute data was extracted from the CEMS analyzer for the following parameters: NOx ppmvd @15% O2 and NOx lb/hr. A representative baseline NOx lb/hr value was calculated by averaging

[1] Identified as Combustion Turbine/Duct Burner (Source ID 103) in PA-04-00740C

the steady state, compliant data leading up to the event. This baseline value was then subtracted from the NOx lb/hr data for each minute the NOx concentration exceeded 2 ppmvd @15% O2 during the malfunction. The minute excess lb/hr data was then converted to lb data and summed together to calculate the total excess NOx emissions.

See Attachment A for CEMS output and calculation details.

- **The steps, if any, that the facility took to limit the duration and/or quantity of emissions associated with the malfunction**
  Operator action was taken to restore normal SCR system operations as quickly as possible. This included bypassing the instrument that ultimately caused the trip event (see section below for details).

- **A detailed analysis that sets forth the root cause of the malfunction, to the extent determinable**
  On December 26, 2025, at approximately 00:07, Cogen #3's SCR heater tripped due to low air flow. The system responded per design and stopped ammonia injection to the SCR catalyst, which caused the unit's stack NOx levels to increase.

  Following the event, field operators went to assess the SCR system health. Based on initial troubleshooting, it was concluded that the air flow meter was giving a false low value and caused the low flow trip. The subsequent investigation identified that the flow meter is obstructed with material that broke free from the SCR air blower's noise reducing muffler, which is made of foam-like material. This is supported by the flow meter's low signal strength as well as a history of muffler integrity issues.

- **An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of a malfunction resulting from the same Root Cause or contributing causes in the future**
  <u>SCR system trip due to false air flow indication</u>
  - The flow indication has been bypassed and an interim mitigation plan developed.
    - With the flow meter not functioning/bypassed, the SCR system has lost some redundancy, risking future system trips in the event of air blower issues.

  <u>False air flow indication due to flow meter obstruction</u>
  - The flow meter needs to be removed, cleaned out, and then reinstalled. It is recommended that this work is done while Cogen Unit #3 remains online. The details of this plan will be included in a Request for Determination (RFD) to be submitted to the Department by the end of January 2026.
  - To prevent future flow meter obstruction events, an MOC will be progressed to remove the mufflers from all 3 Cogen Units' SCR blowers.

- **To the extent that investigations of the causes and/or possible corrective action(s) still are underway on the due date of the report, a statement of the anticipated date by which a follow-up report will be submitted**
  This is the final report for this malfunction.

- **Corrective action is final or timeline for implementation**

Event	Root Cause	Corrective Actions	Timing
SCR system trip	False air flow indication	Bypass flow indication	Complete
Air flow meter obstruction	Blower muffler material broke free and obstructed meter	Pull, clean, and reinstall flow meter	TBD pending referenced RFD
		Progress MOC to remove blower mufflers (all 3 Cogen units)	Q2 2026*

**Pending technical assurance review and approval and safeguarding analysis*

If you have any questions regarding this matter, please do not hesitate to contact Lauren Uffelman at lauren.uffelman@shell.com.

Sincerely,

Martin Padilla
HSSE Manager

CC:
Scott Beaudway, Air Quality Specialist

Attachment A

Cogen 3 CEMS Output Data and Excess Emissions Calculations

	Cogen 3 CEMS Data, minute average		Manual Calculations	
Date and Time	NOx @15% O2, ppmvd	NOx, lb/hr	NOx above baseline, lb/hr (baseline=4.2 lb/hr)	Excess NOx Emissions, lbs
12/25/2025 23:30	1.66	4.1	-	-
12/25/2025 23:31	1.68	4.1	-	-
12/25/2025 23:32	1.7	4.1	-	-
12/25/2025 23:33	1.71	4.1	-	-
12/25/2025 23:34	1.68	4.1	-	-
12/25/2025 23:35	1.65	4.1	-	-
12/25/2025 23:36	1.66	4.1	-	-
12/25/2025 23:37	1.68	4.2	-	-
12/25/2025 23:38	1.67	4.1	-	-
12/25/2025 23:39	1.68	4.2	-	-
12/25/2025 23:40	1.67	4.2	-	-
12/25/2025 23:41	1.69	4.2	-	-
12/25/2025 23:42	1.69	4.2	-	-
12/25/2025 23:43	1.69	4.2	-	-
12/25/2025 23:44	1.68	4.2	-	-
12/25/2025 23:45	1.67	4.2	-	-
12/25/2025 23:46	1.67	4.2	-	-
12/25/2025 23:47	1.69	4.2	-	-
12/25/2025 23:48	1.69	4.2	-	-
12/25/2025 23:49	1.69	4.2	-	-
12/25/2025 23:50	1.7	4.2	-	-
12/25/2025 23:51	1.7	4.2	-	-
12/25/2025 23:52	1.71	4.2	-	-
12/25/2025 23:53	1.72	4.2	-	-
12/25/2025 23:54	1.72	4.2	-	-
12/25/2025 23:55	1.72	4.2	-	-
12/25/2025 23:56	1.73	4.2	-	-
12/25/2025 23:57	1.71	4.2	-	-
12/25/2025 23:58	1.71	4.2	-	-
12/25/2025 23:59	1.71	4.2	-	-
12/26/2025 0:00	1.71	4.2	-	-
12/26/2025 0:01	1.71	4.2	-	-
12/26/2025 0:02	1.72	4.2	-	-
12/26/2025 0:03	1.71	4.2	-	-
12/26/2025 0:04	1.71	4.2	-	-
12/26/2025 0:05	1.72	4.2	-	-
12/26/2025 0:06	1.72	4.2	-	-
12/26/2025 0:07	1.73	4.2	-	-
12/26/2025 0:08	4.38	11.2	7.02	0.12
12/26/2025 0:09	7.71	19.5	15.32	0.26
12/26/2025 0:10	8.91	23	18.82	0.31
12/26/2025 0:11	9.59	24.4	20.22	0.34
12/26/2025 0:12	10.11	25.7	21.52	0.36
12/26/2025 0:13	10.51	27.1	22.92	0.38
12/26/2025 0:14	10.1	25.8	21.62	0.36
12/26/2025 0:15	7.83	20.2	16.02	0.27
12/26/2025 0:16	7.44	18.7	14.52	0.24
12/26/2025 0:17	7.46	18.8	14.62	0.24
12/26/2025 0:18	7.44	18.8	14.62	0.24
12/26/2025 0:19	7.41	18.8	14.62	0.24
12/26/2025 0:20	6.41	16.7	12.52	0.21
12/26/2025 0:21	6.11	15.3	11.12	0.19
12/26/2025 0:22	5.01	12.5	8.32	0.14
12/26/2025 0:23	4.76	12.5	8.32	0.14
12/26/2025 0:24	4.7	11.8	7.62	0.13
12/26/2025 0:25	4.31	11.1	6.92	0.12
12/26/2025 0:26	6.06	15.3	11.12	0.19
12/26/2025 0:27	4.54	11.8	7.62	0.13
12/26/2025 0:28	6.91	17.4	13.22	0.22
12/26/2025 0:29	5.28	13.2	9.02	0.15
12/26/2025 0:30	2.44	6.3	2.12	0.04
12/26/2025 0:31	1.95	4.9	-	-
12/26/2025 0:32	1.81	4.9	-	-
12/26/2025 0:33	1.76	4.2	-	-
12/26/2025 0:34	1.25	3.5	-	-
12/26/2025 0:35	0.57	1.4	-	-
12/26/2025 0:36	0.42	1.4	-	-
12/26/2025 0:37	0.4	0.7	-	-
12/26/2025 0:38	0.5	1.4	-	-
12/26/2025 0:39	0.58	1.4	-	-
12/26/2025 0:40	0.64	1.4	-	-
12/26/2025 0:41	0.67	1.4	-	-
12/26/2025 0:42	0.68	2.1	-	-
12/26/2025 0:43	0.67	1.4	-	-
12/26/2025 0:44	0.67	1.4	-	-
12/26/2025 0:45	0.66	1.4	-	-

12/26/2025 0:46	0.66	1.4	-	-
12/26/2025 0:47	0.65	1.4	-	-
12/26/2025 0:48	0.65	1.4	-	-
12/26/2025 0:49	0.65	1.4	-	-
12/26/2025 0:50	0.65	1.4	-	-
12/26/2025 0:51	0.65	1.4	-	-
12/26/2025 0:52	0.66	1.4	-	-
12/26/2025 0:53	0.65	1.4	-	-
12/26/2025 0:54	0.66	1.4	-	-
12/26/2025 0:55	0.66	1.4	-	-
12/26/2025 0:56	0.67	1.4	-	-
12/26/2025 0:57	0.68	1.4	-	-
12/26/2025 0:58	0.68	1.4	-	-
12/26/2025 0:59	0.69	2.1	-	-
12/26/2025 1:00	0.7	2.1	-	-
12/26/2025 1:01	0.7	2.1	-	-
12/26/2025 1:02	0.71	2.1	-	-
12/26/2025 1:03	0.71	2.1	-	-
12/26/2025 1:04	0.72	2.1	-	-
12/26/2025 1:05	0.74	2.1	-	-
12/26/2025 1:06	0.76	2.1	-	-
12/26/2025 1:07	0.77	2.1	-	-
12/26/2025 1:08	0.79	2.1	-	-
12/26/2025 1:09	0.8	2.1	-	-
12/26/2025 1:10	0.81	2.1	-	-
12/26/2025 1:11	0.82	2.1	-	-
12/26/2025 1:12	0.84	2.1	-	-
12/26/2025 1:13	0.84	2.1	-	-
12/26/2025 1:14	0.86	2.1	-	-
12/26/2025 1:15	0.88	2.1	-	-
12/26/2025 1:16	0.89	2.1	-	-
12/26/2025 1:17	0.9	2.1	-	-
12/26/2025 1:18	0.92	2.1	-	-
12/26/2025 1:19	0.92	2.1	-	-
12/26/2025 1:20	0.94	2.1	-	-
12/26/2025 1:21	0.94	2.1	-	-
12/26/2025 1:22	0.96	2.8	-	-
12/26/2025 1:23	0.97	2.8	-	-
12/26/2025 1:24	0.98	2.8	-	-
12/26/2025 1:25	0.99	2.8	-	-
12/26/2025 1:26	1	2.8	-	-
12/26/2025 1:27	1	2.8	-	-
12/26/2025 1:28	1.02	2.8	-	-
12/26/2025 1:29	1.03	2.8	-	-
12/26/2025 1:30	1.03	2.8	-	-
12/26/2025 1:31	1.05	2.8	-	-
12/26/2025 1:32	1.06	2.8	-	-
12/26/2025 1:33	1.07	2.8	-	-
12/26/2025 1:34	1.07	2.8	-	-
12/26/2025 1:35	1.09	2.8	-	-
12/26/2025 1:36	1.1	2.8	-	-
12/26/2025 1:37	1.11	2.8	-	-
12/26/2025 1:38	1.13	2.8	-	-
12/26/2025 1:39	1.13	2.8	-	-
12/26/2025 1:40	1.13	2.8	-	-
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12/26/2025 1:42	1.16	2.8	-	-
12/26/2025 1:43	1.16	2.8	-	-
12/26/2025 1:44	1.18	2.8	-	-
12/26/2025 1:45	1.18	2.8	-	-
12/26/2025 1:46	1.19	2.8	-	-
12/26/2025 1:47	1.21	2.8	-	-
12/26/2025 1:48	1.21	2.8	-	-
12/26/2025 1:49	1.22	2.8	-	-
12/26/2025 1:50	1.22	2.8	-	-
12/26/2025 1:51	1.23	3.5	-	-
12/26/2025 1:52	1.25	3.5	-	-
12/26/2025 1:53	1.25	3.5	-	-
12/26/2025 1:54	1.27	3.5	-	-
12/26/2025 1:55	1.27	3.5	-	-
12/26/2025 1:56	1.28	3.5	-	-
12/26/2025 1:57	1.29	3.5	-	-
12/26/2025 1:58	1.31	3.5	-	-
12/26/2025 1:59	1.32	3.5	-	-
12/26/2025 2:00	1.33	3.5	-	-
			SUM (lbs)	**5.00**