Note: The 2017 AECOM Air Dispersion Modeling found on the website uses more accurate terrain height receptors than this 2016 Mondre Air Dispersion Modeling. As a result, Air Management Services believes the 2017 AECOM Air Dispersion Modeling has more accurate results.

MONDRE
ENERGY, INC.

TO: SEPTA

FROM: Steven F. Miller, VP Engineering, Mondre Energy, Inc. ("MEI")

DATE: May 27, 2016

RE: **MIDVALE COMBINED HEAT AND POWER SYSTEM**
REFINED AIR QUALITY MODELING ANALYSIS - FINAL

SEPTA retained MEI to estimate the net increase in ground level concentrations of criteria pollutants (carbon monoxide, sulfur dioxide, nitrogen dioxide and particulate matter) resulting from the operation of a proposed natural gas-fired combined heat and power system ("CHP System") to be located at the Midvale bus depot site. The results of our analysis are provided herein.

Description of Air Quality Modeling

MEI retained Ambient Air Quality Services Inc. ("AAQS") to perform the air quality modeling. AAQS used a refined, U.S. EPA approved air dispersion model (USEPA AERMOD). The procedures used in conducting the modeling analysis followed the requirements outlined in 40 CFR Part 51 Appendix W "Guideline on Air Quality Models" (U.S. EPA 2005). The AERMOD air dispersion model covered a square region 5-km on a side, centered on midpoint between the cogeneration stacks. AERMOD also takes weather conditions into account by using five years (2011 - 2015) of meteorological data as recorded at the Philadelphia International Airport to model the impact on ground-level air quality.

SEPTA provided CHP project documents from which MEI obtained the parameters (shown in Appendix A) required for the modeling, including property boundaries; CHP System stack location and building elevations; CHP System emission rates; CHP system engine data; and CHP System building drawings.

MEI surveyed the boilers at Midvale Garage and used the model number displayed on the burners to obtain technical specifications from the burner manufacturer. MEI developed parameters for boiler emissions required for modeling (shown in Appendix B) based on emissions data supplied by the burner manufacturer and from secondary sources.

The air quality modeling results were used to:

1. Predict whether ambient air quality resulting from emissions from the SEPTA Midvale Cogeneration Units would meet national ambient air quality standards ("NAAQS") as established by the U.S. Environmental Protection Agency, and
2. Estimate the impact on air quality at the Midvale Garage fence line.

The maximum predicted ground level air concentrations obtained from the air quality modeling analysis for the two cogeneration units were combined with the background air concentrations to assess the impact of operation of the cogeneration units on air quality in the surrounding area.

The average annual ambient air quality levels of NO_2 and $PM_{2.5}$ over five years (2011 - 2015) as measured by the City of Philadelphia Air Management Services Laboratory (AMS LAB) at 1501 E. Lycoming Ave. in Philadelphia, were used to establish the existing background air quality for SEPTA Midvale Garage area. This location is approximately 3.4 miles east of the SEPTA Midvale Garage. Background ambient air quality measurements taken at this location are considered representative of the air quality levels in the area surrounding the proposed CHP System site.

Results of Air Quality Modeling

Impact on Air Quality at Fence Line: Tables 1 and 2 below summarize annual average increase in ground level concentrations of nitrogen dioxide (NO_2) and particulate matter ($PM_{2.5}$) at ten locations along the Midvale bus depot property line shown in Figure 1 that are projected to result from operation of the proposed CHP System.

The average annual increase in levels of NO_2 and $PM_{2.5}$ measured in micrograms per cubic meter (µg/m3) at each of these ten perimeter locations are shown in the columns on the left side of Tables 1and 2 for CHP System stack heights ranging from 50 feet to 94 feet.

The background levels of NO_2 and $PM_{2.5}$ measured in micrograms per cubic meter (µg/m3) at each of the ten perimeter locations in Figure 1 are shown in the center column of Tables 1 and 2 for CHP System stack heights ranging from 50 feet to 94 feet.

The percentage increase in levels of NO_2 and PM_2 above background levels at each of the ten perimeter locations are shown on the right side of Tables 1 and 2 in the yellow shaded columns for CHP System stack heights ranging from 50 feet to 94 feet.

> ***Result: NO_2 levels increase 1.4% or less and PM_2 levels increase 0.7% or less at all locations along the Midvale property line.***

Impact on Air Quality vs. EPA Standards - Cogeneration Units Only: The air quality impact modeling was performed for four potential stack heights - 50 ft., 56 ft., 65 ft. and 94 ft. The maximum predicted concentrations for each stack were combined with the maximum measured concentrations from the AMS Laboratory and then compared to the NAAQS to assess the impact of the cogeneration unit emissions on the existing air quality levels. This approach over predicts the combined impacts (maximum plus measured concentration) since the maximum predicted

and maximum measured concentrations do not necessarily occur concurrently in space or time. Note that the distance and direction of the predicted point of highest concentration relative to the CHP System stack varies with stack height.

Result: The maximum predicted concentrations when combined with the maximum measured concentrations resulted in combined concentrations which were below all of the NAAQS for all stack heights. (See Table 3)

Impact on Air Quality vs. EPA Standards - Cogeneration Units + Boiler Shutdown: Hot water supplied by the cogeneration system will be used to heat the Midvale Garage during the winter months. As a result the natural gas-fired boilers currently used for space heating will no longer operate. A netting analysis was performed to determine the incremental change in the air quality due to the operation of the new CHP System and the shutdown of the existing boilers at each of the four potential stack heights.

Result: The maximum predicted incremental change in concentrations when combined with the maximum measured concentration resulted in combined concentrations which were below all of the NAAQS. (See Table 4)

Impact on Air Quality vs. EPA Standards at Fence Line: The maximum predicted concentrations associated with the "Cogeneration Units Only" analysis were determined at the ten receptor locations along the SEPTA Midvale Garage property line shown in Figure 1 below.

Result: The maximum predicted concentrations when combined with the maximum measured concentration resulted in combined concentrations which were below all of the NAAQS at each of the ten property line receptor locations. (See Table 5)

MONDRE ENERGY, INC.

Table 1
Impact on Ground Level NO_2 Concentrations at SEPTA Midvale Property Line

	Project Impact - NO_2 - Annual (µg/m3)				% Increase vs. Background				
Stack Height, Ft.	50	56	65	94	Stack Height, Ft.	50	56	65	94
Point					Background (µg/m3)				
1	0.224	0.178	0.132	0.081	38	0.6%	0.5%	0.3%	0.2%
2	0.526	0.389	0.270	0.135	38	1.4%	1.0%	0.7%	0.4%
3	0.470	0.406	0.335	0.231	38	1.2%	1.1%	0.9%	0.6%
4	0.257	0.246	0.221	0.164	38	0.7%	0.6%	0.6%	0.4%
5	0.168	0.156	0.136	0.099	38	0.4%	0.4%	0.4%	0.3%
6	0.132	0.124	0.111	0.080	38	0.3%	0.3%	0.3%	0.2%
7	0.146	0.139	0.126	0.100	38	0.4%	0.4%	0.3%	0.3%
8	0.151	0.138	0.122	0.095	38	0.4%	0.4%	0.3%	0.3%
9	0.134	0.120	0.104	0.071	38	0.4%	0.3%	0.3%	0.2%
10	0.119	0.102	0.086	0.063	38	0.3%	0.3%	0.2%	0.2%
					Average	0.6%	0.5%	0.4%	0.3%

Table 2
Impact on Ground Level $PM_{2.5}$ Concentrations at SEPTA Midvale Property Line

	Project Impact - $PM_{2.5}$ - Annual (µg/m3)				% Increase vs. Background				
Stack Height, Ft.	50	56	65	94	Stack Height, Ft.	50	56	65	94
Point					Background (µg/m3)				
1	0.030	0.024	0.018	0.011	10.0	0.3%	0.2%	0.2%	0.1%
2	0.070	0.052	0.036	0.018	10.0	0.7%	0.5%	0.4%	0.2%
3	0.063	0.054	0.045	0.031	10.0	0.6%	0.5%	0.4%	0.3%
4	0.034	0.033	0.029	0.022	10.0	0.3%	0.3%	0.3%	0.2%
5	0.022	0.021	0.018	0.013	10.0	0.2%	0.2%	0.2%	0.1%
6	0.018	0.017	0.015	0.011	10.0	0.2%	0.2%	0.1%	0.1%
7	0.019	0.019	0.017	0.013	10.0	0.2%	0.2%	0.2%	0.1%
8	0.020	0.018	0.016	0.013	10.0	0.2%	0.2%	0.2%	0.1%
9	0.018	0.016	0.014	0.010	10.0	0.2%	0.2%	0.1%	0.1%
10	0.016	0.014	0.012	0.008	10.0	0.2%	0.1%	0.1%	0.1%
					Average	0.3%	0.3%	0.2%	0.1%

Figure 1 – Point Locations of Property Boundary Points Referenced in Tables 1 and 2

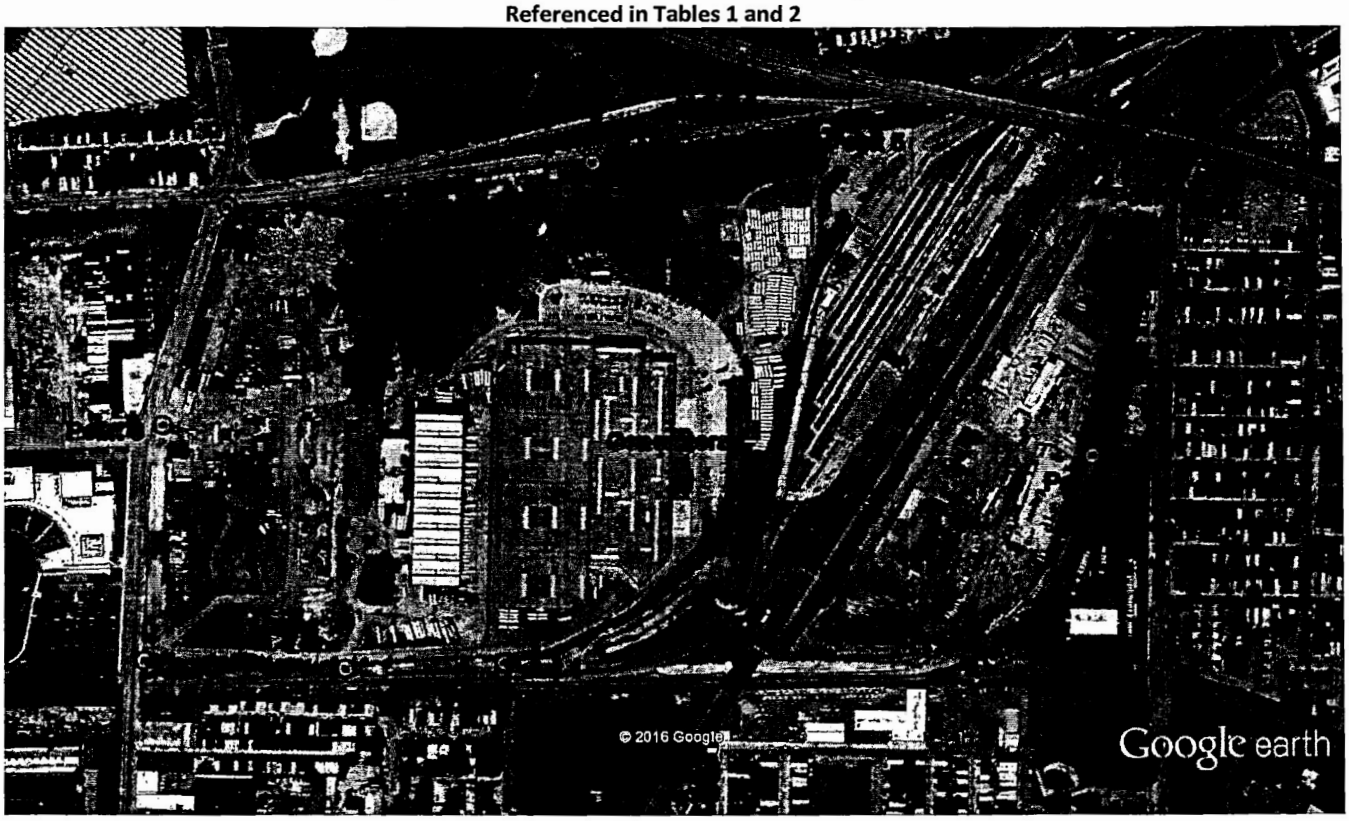


Table 3
Predicted Overall Maximum Concentrations
Cogeneration Units only

Overall Maximum Impact Cogen Only								
Pollutant - Ave Period	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**
NO_2	**NO_2 1-hr**				**NO_2 - Annual**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	60	45	29	7	3.3	1.2	0.5	0.3
Maximum Background Concentration (µg/m^3)	75.9	75.9	75.9	75.9	38.0	38.0	38.0	38.0
Combined Concentration (µg/m3)	136	120	105	83	41.3	39.2	38.5	38.2
National Ambient Air Quality Standard (µg/m3)	188	188	188	188	100	100	100	100
Combined Concentration as a Percent of NAAQS	**72%**	**64%**	**56%**	**44%**	**41%**	**39%**	**39%**	**38%**
Location of Impact from Cogen Stack (Distance, Direction)	50 meter, 0 Deg	71 m, 45 Deg	112 m, 64 Deg	180 m, 34 Deg	50 meter, 0 Deg	112 m, 153 Deg	112 m, 64 Deg	320 m, 39 Deg
SO_2	**SO_2 1-hr**				**SO_2 3-hr**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	0.443	0.331	0.213	0.051	0.424	0.304	0.195	0.046
Maximum Background Concentration (µg/m^3)	11.2	11.2	11.2	11.2	22.4	22.4	22.4	22.4
Combined Concentration (µg/m3)	11.6	11.5	11.4	11.3	22.8	22.7	22.6	22.4
National Ambient Air Quality Standard (µg/m3)	1950	1950	1950	1950	1300	1300	1300	1300
Combined Concentration as a Percent of NAAQS	**1%**	**1%**	**1%**	**1%**	**2%**	**2%**	**2%**	**2%**
Location of Impact from Cogen Stack (Distance, Direction)	50 meter, 0 Deg	71 m, 45 Deg	112 m, 64 Deg	180 m, 34 Deg	50 meter, 0 Deg	71 m, 45 Deg	112 m, 64 Deg	180 m, 34 Deg
$PM_{2.5}$	**$PM_{2.5}$ - 24-hr**				**$PM_{2.5}$ - Annual**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	5.5	2.5	1.1	0.3	0.44	0.17	0.07	0.04
Maximum Background Concentration (µg/m^3)	29	29	29	29	10	10	10	10
Combined Concentration (µg/m3)	34.5	31.5	30.1	29.3	10.4	10.2	10.1	10.0
National Ambient Air Quality Standard (µg/m3)	35	35	35	35	15	15	15	15
Combined Concentration as a Percent of NAAQS	**99%**	**90%**	**86%**	**84%**	**70%**	**68%**	**67%**	**67%**
Location of Impact from Cogen Stack (Distance, Direction)	50 meter, 0 Deg	50 m, 0 Deg	112 m, 64 Deg	283 m, 45 Deg	50 meter, 0 Deg	112 m, 153 Deg	212 m, 45 Deg	320 m, 39 Deg

Table 3 (Cont.)
Predicted Overall Maximum Concentrations
Cogeneration Units only

Overall Maximum Impact Cogen Only								
Pollutant - Ave Period	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**
PM_{10}	**PM_{10} - 24-hr**							
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	5.5	2.5	1.1	0.3				
Maximum Background Concentration (µg/m^3)	67	67	67	67				
Combined Concentration (µg/m3)	72.5	69.5	68.1	67.3				
National Ambient Air Quality Standard (µg/m3)	150.0	150.0	150.0	150.0				
Combined Concentration as a Percent of NAAQS	**48%**	**46%**	**45%**	**45%**				
Location of Impact from Cogen Stack (Distance, Direction)	50 meter, 0 Deg	50 m, 0 Deg	112 m, 64 Deg	283 m, 45 Deg				
CO	**CO 1-hr**				**CO 8-hr**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	75	56	36	9	70	41	27	6
Maximum Background Concentration (µg/m^3)	3086	3086	3086	3086	2514	2514	2514	2514
Combined Concentration (µg/m3)	3161	3142	3122	3095	2584	2555	2541	2520
National Ambient Air Quality Standard (µg/m3)	40,000	40,000	40,000	40,000	10,000	10,000	10,000	10,000
Combined Concentration as a Percent of NAAQS	**8%**	**8%**	**8%**	**8%**	**26%**	**26%**	**25%**	**25%**
Location of Impact from Cogen Stack (Distance, Direction)	50 meter, 0 Deg	100 m, 0 Deg	112 m, 64 Deg	180 m, 34 Deg	50 meter, 270 Deg	100 m, 0 Deg	112 m, 64 Deg	283 m, 45 Deg

Table 4
Predicted Overall Maximum Incremental Concentrations
Cogeneration Units Net of Boiler Emissions

Overall Maximum Incremental Impact (Cogen – Boilers)								
Pollutant - Ave Period	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**
NO_2	**NO_2 1-hr**				**NO_2 - Annual**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	43.5	25.1	7.88	2.73	1.34	0.273	0.116	0.059
Maximum Background Concentration (µg/m^3)	75.9	75.9	75.9	75.9	38.0	38.0	38.0	38.0
Combined Concentration (µg/m3)	119	101	84	79	39.3	38.2	38.1	38.0
National Ambient Air Quality Standard (µg/m3)	188	188	188	188	100	100	100	100
Combined Concentration as a Percent of NAAQS	**64%**	**54%**	**45%**	**42%**	**39%**	**38%**	**38%**	**38%**
Location of Impact from Cogen Stack (Distance, Direction)	50m, 0 Deg	100m, 0 Deg	206 m 166 Deg	250 m, 127 Deg	50m, 0 Deg	158 M, 168 Deg	320m, 39 Deg	532m, 41 Deg
SO_2	**SO_2 1-hr**				**SO_2 3-hr**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	0.327	0.206	0.065	0.020	0.322	0.200	0.095	0.015
Maximum Background Concentration (µg/m^3)	11.2	11.2	11.2	11.2	22.4	22.4	22.4	22.4
Combined Concentration (µg/m3)	11.5	11.4	11.3	11.2	22.7	22.6	22.5	22.4
National Ambient Air Quality Standard (µg/m3)	1950	1950	1950	1950	1300	1300	1300	1300
Combined Concentration as a Percent of NAAQS	**1%**	**1%**	**1%**	**1%**	**2%**	**2%**	**2%**	**2%**
Location of Impact from Cogen Stack (Distance, Direction)	50m, 0 Deg	100m, 0 Deg	158m, 162 Deg	250m, 127 Deg	50m, 0 Deg	100m, 0 Deg	158m, 162 Deg	302m, 152 Deg
$PM_{2.5}$	**$PM_{2.5}$ – 24-hr**				**$PM_{2.5}$ – Annual**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	2.10	0.658	0.131	0.058	0.180	0.037	0.016	0.008
Maximum Background Concentration (µg/m^3)	29	29	29	29	10	10	10	10
Combined Concentration (µg/m3)	31.1	29.7	29.1	29.1	10.2	10.0	10.0	10.0
National Ambient Air Quality Standard (µg/m3)	35	35	35	35	15	15	15	15
Combined Concentration as a Percent of NAAQS	**89%**	**85%**	**83%**	**83%**	**68%**	**67%**	**67%**	**67%**
Location of Impact from Cogen Stack (Distance, Direction)	50m, 0 Deg	112m, 153 Deg	206m, 166 Deg	461m, 41 Deg	50m, 0 Deg	158m, 162 Deg	320 m, 39 Deg	532m, 41 Deg

Table 4 (Cont.)
Predicted Overall Maximum Incremental Concentrations
Cogeneration Units and Net of Boiler Emissions

Overall Maximum Incremental Impact (Cogen – Boilers)								
Pollutant - Ave Period	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**	**50 ft stack**	**56 ft stack**	**65 ft stack**	**94 ft stack**
PM_{10}	**PM_{10} - 24-hr**							
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	3.66	1.46	0.266	0.076				
Maximum Background Concentration (µg/m^3)	67	67	67	67				
Combined Concentration (µg/m3)	70.7	68.5	67.3	67.1				
National Ambient Air Quality Standard (µg/m3)	150.0	150.0	150.0	150.0				
Combined Concentration as a Percent of NAAQS	**47%**	**46%**	**45%**	**45%**				
Location of Impact from Cogen Stack (Distance, Direction)	50m, 0 Deg	100m, 0 Deg	206m, 166 Deg	424m, 45 Deg				
CO	**CO 1-hr**				**CO 8-hr**			
Predicted Maximum Incremental Concentration (µg/m3) for Cogen and Boilers	56.8	40.2	23.8	4.60	50.0	27.8	9.40	2.28
Maximum Background Concentration (µg/m^3)	3086	3086	3086	3086	2514	2514	2514	2514
Combined Concentration (µg/m3)	3143	3126	3110	3091	2564	2542	2523	2516
National Ambient Air Quality Standard (µg/m3)	40,000	40,000	40,000	40,000	10,000	10,000	10,000	10,000
Combined Concentration as a Percent of NAAQS	**8%**	**8%**	**8%**	**8%**	**26%**	**25%**	**25%**	**25%**
Location of Impact from Cogen Stack (Distance, Direction)	50m, 0 Deg	100m, 0 Deg	112m, 153 Deg	250m, 127 Deg	50m, 0 Deg	100m, 0 Deg	158m, 72 Deg	391m, 40 Deg

Table 5
Predicted Maximum Fence Line Concentrations
Cogeneration Units Only

50 ft stack
Fence line receptors

No	meters	direction	1-hr NOx	Background	Combined	NAAQS	% of NAAQS	24 hr PM2.5	Background	Combined	NAAQS	% of NAAQS
1	341	195	15.17	75.9	91.07	188	48%	0.623	29	29.6	35	85%
2	325	104	15.52	75.9	91.42	188	49%	0.935	29	29.9	35	86%
3	352	61	12.10	75.9	88.00	188	47%	0.538	29	29.5	35	84%
4	507	28	8.19	75.9	84.09	188	45%	0.334	29	29.3	35	84%
5	316	342	13.03	75.9	88.93	188	47%	0.389	29	29.4	35	84%
6	306	297	13.44	75.9	89.34	188	48%	0.312	29	29.3	35	84%
7	551	261	6.23	75.9	82.13	188	44%	0.284	29	29.3	35	84%
8	582	238	6.03	75.9	81.93	188	44%	0.307	29	29.3	35	84%
9	647	215	5.78	75.9	81.68	188	43%	0.395	29	29.4	35	84%
10	457	206	8.86	75.9	84.76	188	45%	0.307	29	29.3	35	84%

56 ft stack
Fence line receptors

No	meters	direction	1-hr NOx	Background	Combined	NAAQS	% of NAAQS	24 hr PM2.5	Background	Combined	NAAQS	% of NAAQS
1	341	195	12.77	75.9	88.67	188	47%	0.503	29	29.5	35	84%
2	325	104	12.71	75.9	88.61	188	47%	0.740	29	29.7	35	85%
3	352	61	10.32	75.9	86.22	188	46%	0.439	29	29.4	35	84%
4	507	28	7.65	75.9	83.55	188	44%	0.313	29	29.3	35	84%
5	316	342	12.43	75.9	88.33	188	47%	0.358	29	29.4	35	84%
6	306	297	12.87	75.9	88.77	188	47%	0.290	29	29.3	35	84%
7	551	261	5.60	75.9	81.50	188	43%	0.265	29	29.3	35	84%
8	582	238	5.10	75.9	81.00	188	43%	0.274	29	29.3	35	84%
9	647	215	5.12	75.9	81.02	188	43%	0.353	29	29.4	35	84%
10	457	206	7.50	75.9	83.40	188	44%	0.263	29	29.3	35	84%

Table 5 (Cont.)
Predicted Maximum Fence Line Concentrations
Cogeneration Units Only

65 ft stack
Fence line receptors

No	meters	direction	1-hr NOx	Background	Combined	NAAQS	% of NAAQS	24 hr PM2.5	Background	Combined	NAAQS	% of NAAQS
1	341	195	8.90	75.9	84.80	188	45%	0.332	29	29.3	35	84%
2	325	104	9.48	75.9	85.38	188	45%	0.452	29	29.5	35	84%
3	352	61	8.10	75.9	84.00	188	45%	0.344	29	29.3	35	84%
4	507	28	6.80	75.9	82.70	188	44%	0.267	29	29.3	35	84%
5	316	342	9.35	75.9	85.25	188	45%	0.275	29	29.3	35	84%
6	306	297	11.24	75.9	87.14	188	46%	0.243	29	29.2	35	84%
7	551	261	4.65	75.9	80.55	188	43%	0.218	29	29.2	35	83%
8	582	238	4.24	75.9	80.14	188	43%	0.233	29	29.2	35	84%
9	647	215	4.24	75.9	80.14	188	43%	0.297	29	29.3	35	84%
10	457	206	6.31	75.9	82.21	188	44%	0.203	29	29.2	35	83%

94 ft stack
Fence line receptors

No	meters	direction	1-hr NOx	Background	Combined	NAAQS	% of NAAQS	24 hr PM2.5	Background	Combined	NAAQS	% of NAAQS
1	341	195	4.87	75.9	80.77	188	43%	0.158	29	29.2	35	83%
2	325	104	4.97	75.9	80.87	188	43%	0.164	29	29.2	35	83%
3	352	61	4.68	75.9	80.58	188	43%	0.218	29	29.2	35	83%
4	507	28	3.99	75.9	79.89	188	42%	0.156	29	29.2	35	83%
5	316	342	5.41	75.9	81.31	188	43%	0.141	29	29.1	35	83%
6	306	297	5.35	75.9	81.25	188	43%	0.136	29	29.1	35	83%
7	551	261	3.22	75.9	79.12	188	42%	0.144	29	29.1	35	83%
8	582	238	3.04	75.9	78.94	188	42%	0.152	29	29.2	35	83%
9	647	215	2.79	75.9	78.69	188	42%	0.178	29	29.2	35	83%
10	457	206	3.73	75.9	79.63	188	42%	0.111	29	29.1	35	83%

Appendix A

Information Provided by SEPTA

Figure A1 - Property Boundaries

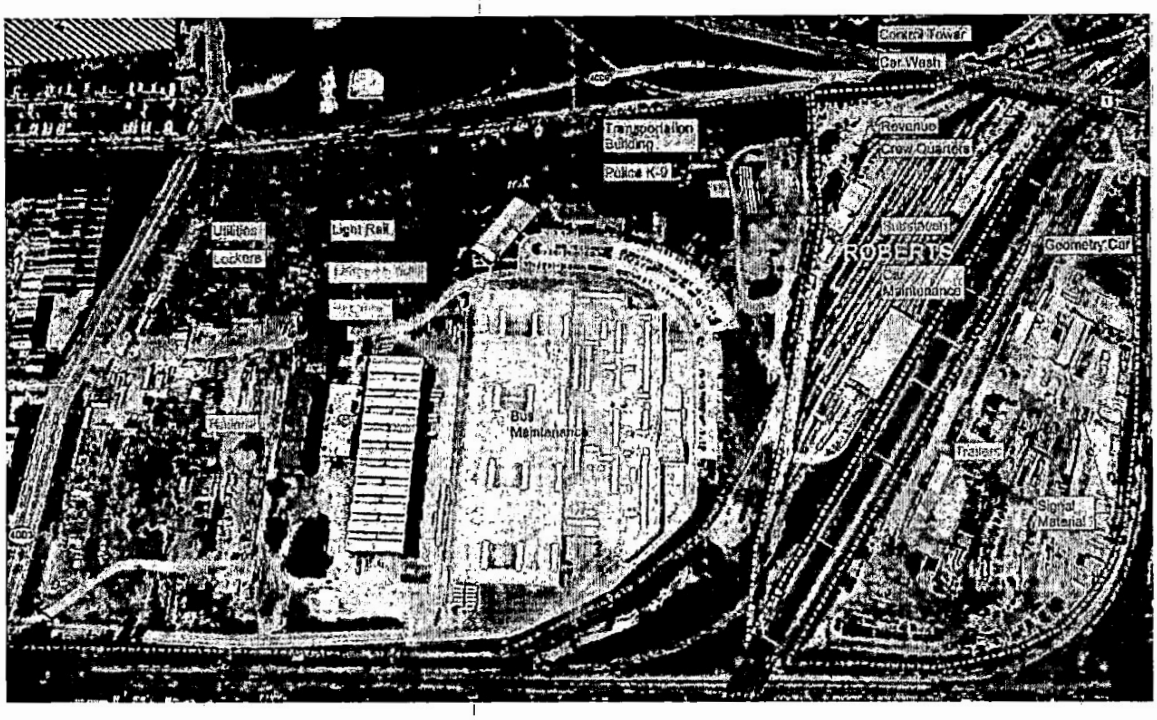


Figure A2 - Stack Locations, Building Elevations & Dimensions

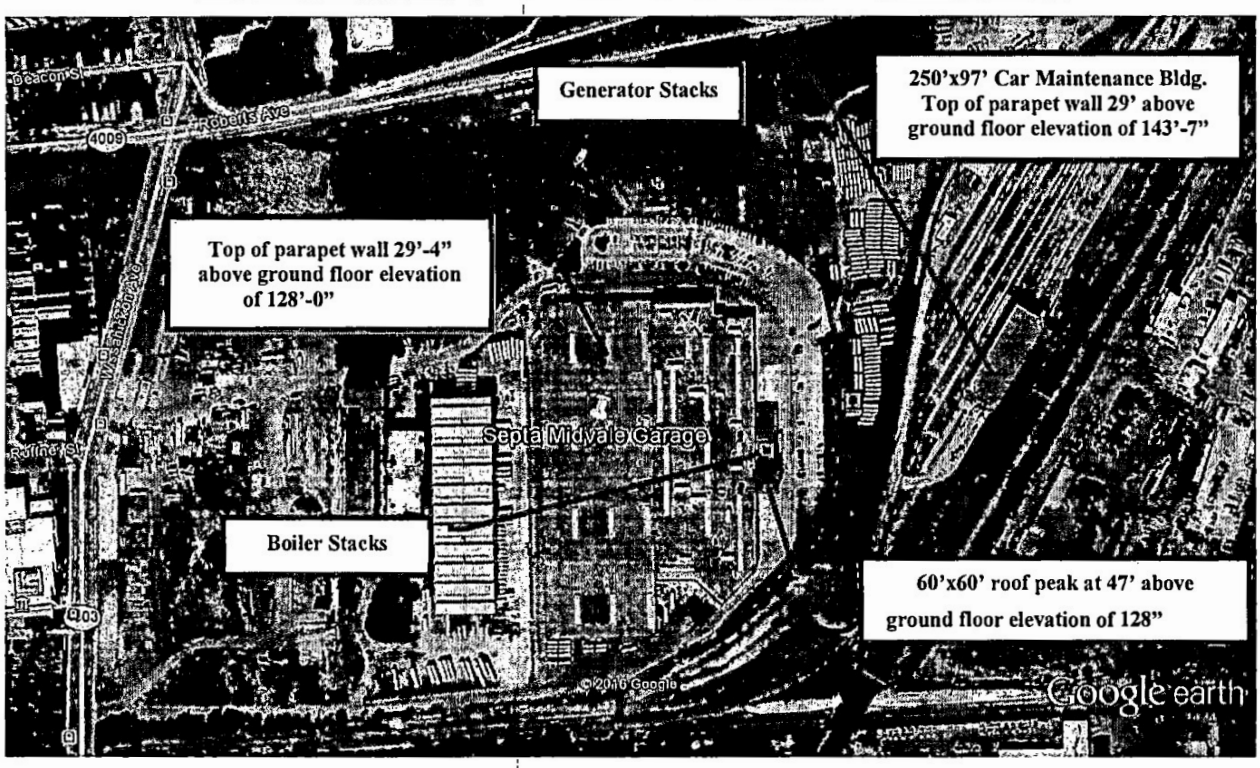
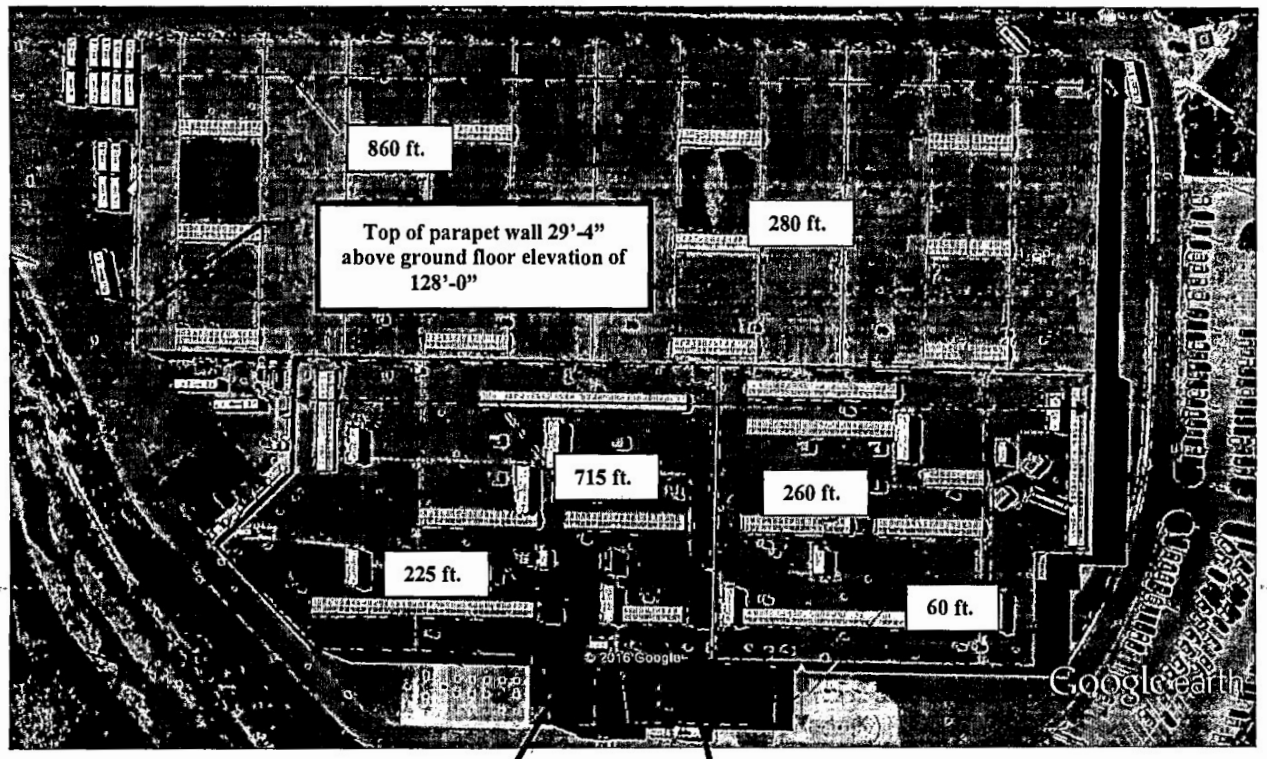


Figure A3 - Midvale Garage Dimensions & Roof Elevations



Note: Elevations were provided by SEPTA. Building dimensions were estimated by Mondre Energy using Google Earth scaling tool.

Figure A4 - Generator Stack Centerline Location[1]

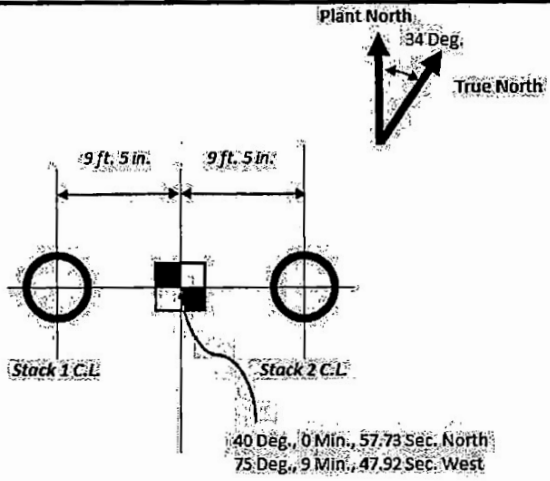


Table A1 – Elevation Summary

Midvale Garage Floor	128'-0"
Generator Building Top of Floor	140'-0"
Car Maintenance Building Floor	143'-7"
Generator Building Roof	169'-2"
Top of Engine Exhaust Stacks	180'-0"

[1] Mondre Energy obtained generator stack latitude and longitude from Google Earth using site plans provided by SEPTA.

Table A2 - Emission Rates

	Post Catalyst Emissions		
	Lbs/Hr /Engine	Lbs/Year /Engine	Total Lbs/Year
NOx	2.695	22,369	44,737
CO	3.369	27,963	55,925
PM10	0.36	2,988	5,976
PM2.5	0.36	2,988	5,976
SO2	0.02	166	332
CO2e	4.239	35,184	70,367
VOC	2.022	16,783	33,565
Formaldehyde	0.674	5,594	11,188
Total HAPs (Not Including Formaldehyde)	0.7	5,810	11,620
Total HAPs (Including Formaldehyde)	1.38	11,454	22,908

Table A3 Engine Data

Engine Data		
Engine Stack velocity	5,128	Ft/Minute
Engine Stack ID	29.5	Inches
Engine Stack OD	30.0	Inches
Engine Stack Outlet	50	Ft Above Grade
Operating Hrs/Engine	8,300	Hrs/Year
Number of Engines	2	

Appendix B

Midvale Boiler Information

Figure B1 – Boiler Stack Location[2]

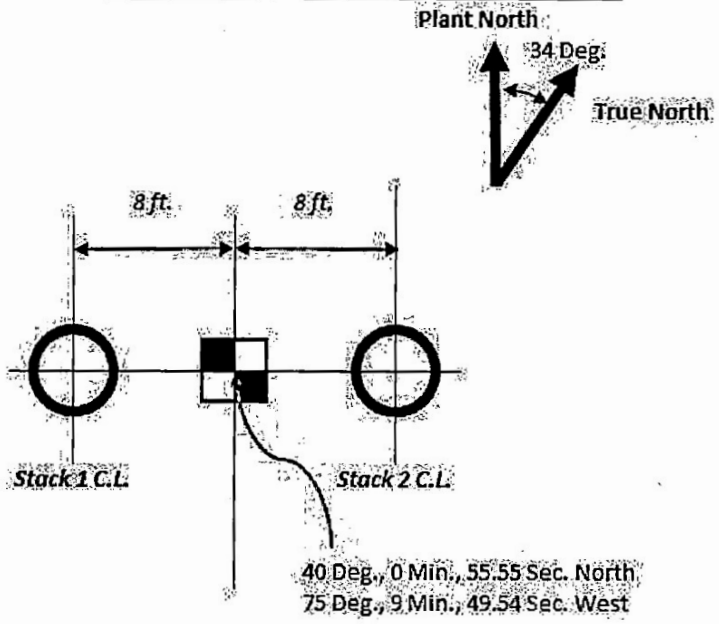


Table B1 – Boiler Burner Data [3]

Total Burner Max	18.00	MMBtu/hr
Single Burner Max	9,000	MBH HHV
Nat Gas HHV	1,025	btu/Scf
Single Burner Max	0.0087805	MMSCFH
Number of Burners	2	
Total Burner Max	0.0175610	MMSCFH

[2] Mondre Energy obtained boiler stack latitude and longitude from Google Earth using site plans provided by SEPTA.

[3] The two boilers are equipped with Power Flame Model LNIC6-GO-30 burners that are modeled firing simultaneously at maximum rate of 9,000 MBH hhv each. The information in Table B1 is from Power Flame product data.

Table B2 – Boiler Burner Emission Rates

	Emission Factors		
	lbs/MMSCF[4]	lbs/MMBtu[5]	Lbs/Hr
NOx	--	0.037	0.6660
CO	--	0.037	0.6660
PM10	--	0.0048	0.0864
PM2.5	--	0.0048	0.0864
SO2	0.600	--	0.0105
CO2e	120,000	--	2,107
VOC	5.500	--	0.0966

[4] Source EPA Guidance Document Table 1-4.2 found at https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf
[5] Power Flame product data