pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Melissa Jativa/MJ MRG
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FROM Andrew W. Fleck AWF
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DATE September 21, 2020

RE Summary of Revised Air Quality Analyses for Prevention of Significant Deterioration
Shell Chemical Appalachia LLC
Plan Approval Application 04-00740C
Shell Polymers Monaca Site
Center Township and Potter Township, Beaver County

Background

The Pennsylvania Department of Environmental Protection (DEP) received a Plan Approval Application[1,2] on February 14, 2020, and February 26, 2020, from Shell Chemical Appalachia LLC (Shell) which incorporates "as-built" changes in design and construction associated with the Shell Polymers Monaca Site, henceforth Shell Facility, in Center and Potter townships, Beaver County. The Plan Approval Application was prepared by RTP Environmental Associates, Inc., on behalf of Shell. On March 4, 2020, the DEP Southwest Regional Office's (SWRO) Air Quality Program notified Shell that the Plan Approval Application was administratively complete.[3] Subsequently, the DEP received additional information associated with Shell's Plan Approval Application on April 24, 2020,[4] May 21, 2020,[5] May 28, 2020,[6] and September 3, 2020.[7]

[1] Air Quality Plan Approval Application. Shell Polymers Monaca Design Updates. Shell Chemical Appalachia LLC. Beaver County, Pennsylvania. Prepared by: RTP Environmental Associates, Inc., Raleigh, NC. February 2020.
[2] E-mail with attachments from H. James Sewell, Shell to Alexander Sandy, SWRO New Source Review Section. February 26, 2020.
[3] Letter from Alexander Sandy, SWRO New Source Review Section to H. James Sewell, Shell. March 4, 2020.
[4] Letter with enclosures from H. James Sewell, Shell to Alex Sandy, SWRO New Source Review Section. April 24, 2020.
[5] Letter with enclosures from H. James Sewell, Shell to Melissa Jativa, SWRO New Source Review Section. May 21, 2020.
[6] Letter with enclosures from H. James Sewell, Shell to Melissa Jativa, SWRO New Source Review Section. May 28, 2020.
[7] Letter with enclosures from H. James Sewell, Shell to Melissa L. Jativa, SWRO New Source Review Section. September 3, 2020.

The DEP issued Plan Approval 04-00740A on June 18, 2015, authorizing construction and temporary operation of the Shell Facility. The "as-built" changes in design and construction associated with the Shell Facility necessitated revisions to the air quality analyses for Prevention of Significant Deterioration (PSD) included in Shell's application for Plan Approval 04-00740A.

PSD Requirements

The Shell Facility is a new major stationary source. Shell's application for Plan Approval 04-00740A was therefore subject to the PSD regulations codified in 40 CFR § 52.21. These federal PSD regulations are adopted and incorporated by reference in their entirety in 25 *Pa. Code* § 127.83 and the Commonwealth's State Implementation Plan codified in 40 CFR § 52.2020.

The Shell Facility's potential to emit equals or exceeds the PSD significant emission rates[8] (SER) for carbon monoxide (CO), nitrogen oxides (NO_X), and particulate matter less than or equal to 10 micrometers in diameter (PM-10). Shell's Plan Approval Application therefore contains revisions to the following air quality analyses which were included in its application for Plan Approval 04-00740A:

- Relevant to 40 CFR § 52.21(k) through (n), air quality analyses of the Shell Facility's emissions of CO, NO_X, and PM-10;

- Relevant to 40 CFR § 52.21(o), additional impact analyses of the impairment to visibility, soils, and vegetation that would occur as a result of the Shell Facility and associated growth; and

- Relevant to 40 CFR § 52.21(p), initial screening calculations for analyses of the Shell Facility's emissions on air quality related values (AQRV) and visibility in nearby federal Class I areas.

Model Selection and Options

Shell's air dispersion modeling utilized the American Meteorological Society (AMS) / U.S. Environmental Protection Agency's (EPA) Regulatory Model (AERMOD) v19191. AERMOD is the EPA's required near-field air dispersion model for a wide range of regulatory applications in all types of terrain and for aerodynamic building downwash.[9] Shell utilized proprietary software, Providence/Oris BEEST Suite, to execute AERMOD and provided a test case example to demonstrate that the modeled concentrations were not affected by using this software.

AERMOD was executed with regulatory default options to calculate concentrations for each applicable pollutant and averaging time. Additionally, the flagpole receptor height option was selected in AERMOD with a default height of 0.0 meters.

[8] *Code of Federal Regulations*. 40 CFR § 52.21(b)(23)(i).
[9] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models). Subsection 4.2.2.1.

In the 1-hour and annual nitrogen dioxide (NO_2) significant impact level (SIL) analyses, the Ambient Ratio Method 2 (ARM2) option was selected with default upper and lower limits on the ambient NO_2/NO_X ratio applied to the modeled NO_X concentration of 0.9 and 0.5, respectively. In the 1-hour NO_2 National Ambient Air Quality Standard (NAAQS) analysis, the Plume Volume Molar Ratio Method (PVMRM) option was selected. Hourly ozone concentrations measured at the DEP's Brighton Township ambient monitoring site (ID: 42-007-0005) from January 1, 2006, through December 31, 2010, concurrent with the hourly meteorological data, were used with the PVMRM. The default ambient equilibrium NO_2/NO_X ratio of 0.9 was used with the PVMRM. Additionally, the default in-stack NO_2/NO_X ratios of 0.5 and 0.2 were used with the PVMRM for nearby emission sources less than 3 kilometers and greater than 3 kilometers, respectively, from the Shell Facility.[10] In the annual NO_2 NAAQS and PSD increment analyses, total conversion of NO to NO_2 was assumed in AERMOD.

Source Data Input

The Shell Facility's emissions of CO, NO_X, and PM-10 would be emitted to the atmosphere via a combination of typical unobstructed vertical stacks, flares, and as fugitives. The Shell Facility would consist of the following CO, NO_X, and PM-10 emission sources:

- 7 ethane cracking furnaces' stacks;
- 3 combustion turbines' stacks;
- 2 ground flares;
- 1 high pressure elevated flare;
- 1 multipoint ground flare;
- 1 low pressure incinerator stack;
- 1 caustic oxidizer stack;
- 1 rail-to-truck talc transfer stack;
- 26 process cooling tower cells' stacks;
- 6 cogen cooling tower cells;
- 2 emergency fire water pumps' stacks;
- 5 emergency generators' stacks;
- 2 catalyst heaters' stacks;
- 2 catalyst activator filters' stacks;
- 4 additive unloading stations' stacks;
- 1 compactor stack;
- 4 additive feeders' stacks;
- 1 extruder vent stack;
- 1 pellet dryer vent stack;
- 1 vacuum cleaning system stack;
- polyethylene blending silos' fugitives;
- polyethylene rail loading silos' fugitives;
- polyethylene truck loading silos' fugitives;
- 2 low density polyethylene vents' fugitives;
- polyethylene haul road fugitives; and
- talc haul road fugitives.

All stacks were characterized in AERMOD as point sources. Flares, except the multipoint ground flare, were also characterized in AERMOD as point sources. The multipoint ground flare and all fugitive emissions were characterized in AERMOD as volume sources.

[10] Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard. EPA memorandum from R. Chris Owen and Roger Brode, Air Quality Modeling Group to Regional Dispersion Modeling Contacts. September 30, 3014. Pages 8-9.

The emission rates and associated parameters entered in AERMOD for each source are consistent with those provided in Shell's Plan Approval Application and associated additional information.

According to the EPA's guidance,[11] an intermittent emission source or intermittent emission scenario would likely not be continuous enough or frequent enough to affect 1-hour NO_2 design concentrations. Nonetheless, in the 1-hour NO_2 analyses, emission data associated with the emergency fire water pumps and emergency generators, considered to be intermittent emission sources, were conservatively included in AERMOD. In the 1-hour NO_2 analyses, emission data associated with startup and shutdown of the combustion turbines and ethane cracking furnaces, considered to be intermittent emission scenarios, were not included in AERMOD.

The stack height entered in AERMOD for each Shell Facility point source does not exceed Good Engineering Practice (GEP) stack height.[12] Direction-specific downwash parameters, calculated by the EPA's Building Profile Input Program for the Plume Rise Model Enhancements algorithm (BPIPPRM) v04274, were entered in AERMOD for each Shell Facility point source.

In the 8-hour CO, 1-hour NO_2, annual NO_2, and 24-hour PM-10 NAAQS analyses, background concentrations consisted of a modeled and monitored component. The modeled components of the CO, NO_2, and PM-10 background concentrations were calculated by the inclusion in AERMOD of source data that represent existing nearby sources. The monitored components of the CO, NO_2, and PM-10 background concentrations were derived from conservatively representative data measured from January 1, 2016, through December 31, 2018, at existing ambient monitors listed later in the "Existing Ambient Air Quality" section of this memorandum. In the 8-hour CO, annual NO_2, and 24-hour PM-10 NAAQS analyses, the monitored components of the CO, NO_2 and PM-10 background were represented by the maximum concentration for each pollutant and averaging time, based on 3 years of data. In the 1-hour NO_2 NAAQS analysis, the monitored component of the NO_2 background was represented by temporally-varying concentrations by season and hour-of-day, based on 3 years of data, in accordance with the EPA's guidance.[13]

In the annual NO_2 Class II PSD increment analysis, emission data identical to those used in the annual NO_2 NAAQS analysis for existing nearby sources, were included in AERMOD to conservatively represent potential NO_2 increment-consuming emissions. In the 24-hour PM-10 and annual PM-10 Class II PSD increment analyses, emission data identical to those used in the 24-hour PM-10 NAAQS analysis for existing nearby sources, were included in AERMOD to conservatively represent potential PM-10 increment-consuming emissions.

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[11] Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard. EPA memorandum from Tyler Fox, Air Quality Modeling Group to Regional Air Division Directors. March 1, 2011. Pages 8-11.

[12] "Good Engineering Practice stack height" defined in 40 CFR § 51.100(ii).

[13] Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard. EPA memorandum from Tyler Fox, Air Quality Modeling Group to Regional Air Division Directors. March 1, 2011. Pages 17-21.

Receptor Data Input

Receptors were entered in AERMOD at locations defined to be ambient air.[14,15] The extent and density of AERMOD's receptor domain were adequate to determine the location and magnitude of the maximum concentrations and design concentrations.

In the Class II area analyses, receptors were entered in AERMOD along the Vanport bridge with flagpole heights representing the bridge's deck height above water. In the Class I SIL analyses, an arc of receptors was entered in AERMOD at a 50-kilometer distance from the Shell Facility in the direction range of nearby federal Class I areas with flagpole heights representing the minimum, average, and maximum elevations within each nearby federal Class I area.

Receptor elevations and hill height scales were calculated by the AERMOD terrain preprocessor (AERMAP) v18081 using the U.S. Geological Survey's (USGS) 3D Elevation Program (3DEP) data.

Meteorological Data Input

AERMOD utilized a 5-year meteorological dataset consisting of hourly records from January 1, 2006, through December 31, 2010. This dataset was derived from primary surface data from FirstEnergy's Beaver Valley Nuclear Power Station meteorological monitoring site and secondary surface data and upper air data from Pittsburgh International Airport (KPIT).

The meteorological dataset was processed by the DEP with the AERMOD meteorological preprocessor (AERMET) v19191 and its associated tool, AERSURFACE v13016. In AERMET, the surface friction velocity adjustment (ADJ_U*) option was used in regulatory default mode. This option is intended to address concerns regarding AERMOD's performance, i.e., overprediction of concentrations during stable low wind speed meteorological conditions, by adjusting the surface friction velocity based on Qian and Venkatram (2011).[16]

The fully processed dataset was appropriate for AERMOD to construct realistic boundary layer profiles to adequately represent plume transport and dispersion under both convective and stable conditions within the modeling domain.

Existing Ambient Air Quality

Existing ambient air quality was established for the area that the Shell Facility's emissions would affect by utilizing conservatively representative CO, NO_2, and PM-10 data measured from January 1, 2016, through December 31, 2018, at the ambient monitors listed in the following table:

[14] "Ambient air" defined in 40 CFR § 50(e)(1).
[15] Revised Policy on Exclusions from "Ambient Air." EPA memorandum from Andrew R. Wheeler, Administrator to Regional Administrators. December 2, 2019.
[16] Qian, W., and A. Venkatram, 2011. Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions. *Boundary Layer Meteorology*, 138, 475-491.

Monitors for Establishing Existing Ambient Air Quality

Pollutant	Monitor Name	Monitor ID	Monitor Operator
CO	Lawrenceville	42-003-0008	Allegheny County Health Department
NO_2	Beaver Falls	42-007-0014	DEP
PM-10	Beaver Falls	42-007-0014	DEP

The data from these monitors were used for two purposes. First, if the impact of the Shell Facility's emissions was calculated by AERMOD to be less than a pollutant's NAAQS SIL, then these data were used to support the conclusion that the impact of the Shell Facility's emissions of that pollutant would not cause or contribute to a violation of the NAAQS without having to conduct a cumulative impact analysis. Second, if the impact of the Shell Facility's emissions was calculated by AERMOD to be greater than a pollutant's NAAQS SIL, then these data were used to characterize the monitored portion of the background concentration in a cumulative impact analysis.

Preliminary Analyses

Shell conducted preliminary analyses with AERMOD to determine the combustion turbine load, the ethane cracking furnace mode, and the two ethane cracking furnaces that cause the maximum concentrations, i.e., worst-case impacts. The results of these preliminary analyses were used to determine the source data entered in AERMOD for the combustion turbines and ethane cracking furnaces in the SIL, NAAQS, and PSD increment analyses.

SIL Analyses Results

The impacts of the Shell Facility's emissions were calculated by AERMOD to be less than the following:

- The EPA's 1-hour CO NAAQS SIL;[17]

A cumulative impact analysis was therefore not necessary for the 1-hour CO NAAQS.

The impacts of the Shell Facility's emissions were calculated by AERMOD to be greater than the following:

- The EPA's 8-hour CO NAAQS SIL;[18]
- The EPA's 1-hour NO_2 interim NAAQS SIL;[19,20]
- The EPA's annual NO_2 NAAQS SIL;[21]

[17] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2).
[18] Ibid.
[19] Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program. EPA memorandum from Stephen D. Page, Office of Air Quality Planning and Standards (OAQPS) to Regional Air Division Directors. June 29, 2010. Pages 11-13.
[20] Interim 1-Hour Significant Impact Levels for Nitrogen Dioxide and Sulfur Dioxide. DEP memorandum from Andrew W. Fleck, BAQ Air Quality Modeling Section to Regional Air Program Managers. December 1, 2010.
[21] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2).

- The EPA's 24-hour PM-10 NAAQS SIL;[22]
- The EPA's annual NO_2 Class II PSD increment SIL;[23] and
- The EPA's 24-hour PM-10 and annual PM-10 Class II PSD increment SILs.[24]

Cumulative impact analyses were therefore necessary for the 8-hour CO, 1-hour NO_2, annual NO_2, and 24-hour PM-10 NAAQS, and the annual NO_2, 24-hour PM-10, and annual PM-10 Class II PSD increments.

The impacts of the Shell Facility's emissions were conservatively calculated by AERMOD to be less than the following:

- The EPA's annual NO_2, 24-hour PM-10, and annual PM-10 proposed Class I PSD increment SILs.[25]

Cumulative impact analyses were therefore not necessary for the annual NO_2, 24-hour PM-10, and annual PM-10 Class I PSD increments.

The impacts of the Shell Facility's emissions resulting from the air dispersion modeling that incorporates the "as-built" changes in design and construction presented in Plan Approval Application 04-00740C represent insignificant changes in concentrations when compared to the impacts of the Shell Facility's emissions resulting from the updated air dispersion modeling[26] of the original design presented in Plan Approval Application 04-00740A. A comparison of SIL analyses results for the two applications for (1) the NAAQS and/or Class II PSD increments and (2) the Class I PSD increments are provided in the following tables:

Comparison of Shell Facility SIL Analyses Results for NAAQS and/or Class II PSD Increments

Pollutant	Averaging Time	Maximum Concentration (µg/m^3)		Change in Concentration (µg/m^3)	Percent Change in Concentration
		Plan Approval Application 04-00740A	Plan Approval Application 04-00740C		
CO	1-hour	2034.85419	1775.58617	-259.26802	-12.74 %
	8-hour	919.74960	916.56048	-3.18912	-0.35 %
NO_2	1-hour	58.45017	59.48738	+1.03721	+1.77 %
	Annual	1.25839	1.29211	+0.03372	+2.68 %
PM-10	24-hour	11.23190	9.60440	-1.62750	-14.49 %
	Annual	2.59634	2.80329	+0.20695	+7.97 %

[22] Ibid.
[23] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2). Based on long-standing EPA policy and guidance, these NAAQS SILs have also been applied to Class II PSD increments.
[24] Ibid.
[25] *Federal Register*. 61 FR 38249. Prevention of Significant Deterioration and Nonattainment New Source Review; Proposed Rule. July 23, 1996.
[26] The air dispersion modeling of the original design presented in Plan Approval Application 04-00740A was updated to reflect changes in methodology, i.e., the use of AERMOD v19191 with ARM2 option, AERMAP v18081, and AERMET v19191 with ADJ_U* option.

Comparison of Shell Facility SIL Analyses Results for Class I PSD Increments

Pollutant	Averaging Time	Maximum Concentration ($\mu g/m^3$)		Change in Concentration ($\mu g/m^3$)	Percent Change in Concentration
		Plan Approval Application 04-00740A	Plan Approval Application 04-00740C		
NO_2	Annual	0.02683	0.02763	+0.00080	+2.98 %
PM-10	24-hour	0.26900	0.29529	+0.02629	+9.77 %
	Annual	0.01894	0.01998	+0.00104	+5.49 %

NAAQS Analyses Results

The impacts of the Shell Facility's emissions, in conjunction with emissions that represent existing nearby sources, were calculated by AERMOD to be less than the 8-hour CO, annual NO_2, and 24-hour PM-10 NAAQS.

The impacts of the Shell Facility's emissions, in conjunction with emissions that represent existing nearby sources were calculated by AERMOD to be greater than the 1-hour NO_2 NAAQS. According to the EPA's policy,[27] a Plan Approval may be issued to Shell since the impacts of the Shell Facility's emissions were calculated by AERMOD to be insignificant, i.e., less than the 1-hour NO_2 interim NAAQS SIL at the location and time of the modeled violations of the 1-hour NO_2 NAAQS.

PSD Increment Analyses Results

The impacts of the Shell Facility's emissions, in conjunction with emissions that conservatively represent potential increment-consuming sources, were calculated by AERMOD to be less than the annual NO_2, 24-hour PM-10, and annual PM-10 Class II PSD increments.

In accordance with 25 *Pa. Code* § 127.45(b)(4), the DEP's notice of proposed plan approval issuance in the *Pennsylvania Bulletin* must include, for sources subject to the PSD regulations, "the degree of increment consumption expected to result from the operation of the source or facility." To this end, the degree of Class II and Class I PSD increment consumption expected to result from the operation of the Shell Facility is provided in the following tables:

Degree of Class II PSD Increment Consumption from Operation of the Shell Facility

Pollutant	Averaging Time	Degree of Class II PSD Increment Consumption		Class II PSD Increment
		micrograms per cubic meter	Percent of Class II PSD Increment	micrograms per cubic meter
NO_2	Annual	< 1.29211	< 5.17 %	25
PM-10	24-hour	< 9.60440	< 32.02 %	30
	Annual	< 2.80329	< 16.49 %	17

[27] Air Quality Analysis for Prevention of Significant Deterioration (PSD). EPA memorandum from Gerald A. Emison, OAQPS to Thomas J. Maslany, Air Management Division. July 5, 1988.

Degree of Class I PSD Increment Consumption from Operation of the Shell Facility

Pollutant	Averaging Time	Degree of Class I PSD Increment Consumption		Class I PSD Increment
		micrograms per cubic meter	Percent of Class I PSD Increment	micrograms per cubic meter
NO_2	Annual	< 0.02763	< 1.11 %	2.5
PM-10	24-hour	< 0.29529	< 3.69 %	8
	Annual	< 0.01998	< 0.50 %	4

Confirmation of Air Dispersion Modeling Results

The DEP confirmed the overall results of Shell's air dispersion modeling by executing AERMOD upon reviewing the appropriateness of all model input, i.e., model options, emission data, downwash data, background concentration data, terrain data, and meteorological data.

Additional Impact Analyses

Impairment to visibility due to the Shell Facility's emissions is expected to be negligible based on a plume visual impact screening analysis for Raccoon Creek State Park using VISCREEN v13190 in accordance with the EPA's guidance.[28] Shell conducted a Level-2 plume visual impact screening analysis by utilizing the Iowa Department of Natural Resources Level-2 Visibility Screening Tool[29] to determine the meteorological conditions to be entered in VISCREEN.

No adverse impacts to soils and vegetation are expected from the Shell Facility's emissions.

General commercial and residential growth associated with the Shell Facility is expected to result in very small increases in emissions compared to total existing emissions. No measurable industrial growth associated with the Shell Facility is expected. Impairment to visibility, soils, and vegetation due to general commercial, residential, industrial, and other growth associated with the Shell Facility is expected to be insignificant.

The DEP notes that the secondary NAAQS were established to protect visibility and vegetation, among other things, and the impacts of the Shell Facility's emissions were estimated by AERMOD to be less than the secondary NAAQS for the criteria pollutants subject to PSD review.

[28] Workbook for Plume Visual Impact Screening and Analysis (Revised). October 1992. Publication No. EPA-454/R-92-023. Office of Air Quality Planning and Standards, Research Triangle Park, NC.
[29] Iowa Department of Natural Resources Level-2 Visibility Screening Tool (viscreen_tool.zip) was downloaded from https://www.iowadnr.gov/Environmental-Protection/Air-Quality/Modeling/Dispersion-Modeling#249516-psd-modeling-guidance.

Class I Area Analyses for AQRVs and Visibility

The DEP's SWRO provided written notice[30] of the "as-built" changes in design and construction associated with the Shell Facility to the Federal Land Managers (FLM) of the following nearby federal Class I areas: Dolly Sods Wilderness and Otter Creek Wilderness, both in West Virginia, and Shenandoah National Park in Virginia. The notice included initial screening calculations[31] to demonstrate that the Shell Facility's emissions would not adversely impact AQRVs and visibility in these nearby federal Class I areas. The FLM of each nearby federal Class I area stated that no analyses for AQRVs and visibility would be necessary.[32,33]

Conclusions

The DEP's technical review concludes that Shell's revised air quality analyses continue to satisfy the requirements of the PSD regulations. Additionally, Shell's revised air quality analyses are consistent with the methods and procedures described its modeling protocol.[34,35]

In accordance with 40 CFR § 52.21(k), Shell's source impact analyses demonstrate that the Shell Facility's emissions would not cause or contribute to air pollution in violation of the NAAQS for CO, NO_2, or PM-10. Additionally, Shell's source impact analyses demonstrate that the Shell Facility's emissions would not cause or contribute to air pollution in violation of the Class II or Class I PSD increments for NO_2 or PM-10.

In accordance with 40 CFR § 52.21(l), Shell's estimates of ambient concentrations are based on applicable air quality models, data bases, and other requirements specified in the EPA's *Guideline on Air Quality Models*[36] as well as the EPA's relevant air quality modeling policy and guidance.

In accordance with 40 CFR § 52.21(m), Shell provided an analysis of existing ambient air quality in the area that the Shell Facility would affect which included existing representative ambient monitoring data for CO, NO_2, and PM-10.

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[30] E-mail with attachment from Alexander Sandy, SWRO New Source Review Section to U.S. Forest Service and National Park Service representatives. March 4, 2020.
[31] U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, 2010. Federal Land Managers' Air Quality Related Values Work Group (FLAG): Phase I Report – Revised (2010). Natural Resource Report NPS/NRPC/NRR – 2010/232. National Park Service, Denver, CO. Subsection 3.2.
[32] E-mail from Jeremy Ash, U.S. Forest Service to Alexander Sandy, SWRO New Source Review Section. April 30, 2020.
[33] E-mail from Holly Salazer, National Park Service to Alexander Sandy, SWRO New Source Review Section. April 1, 2020.
[34] Air Dispersion Modeling Protocol for the Proposed Shell Chemical Appalachia, LLC Ethane Cracker/Poly[e]thylene Project in Beaver County Pennsylvania. Prepared by: RTP Environmental Associates, Inc., Raleigh, NC. February 2014.
[35] Letter from David Keen, RTP Environmental Associates, Inc. to Andrew Fleck, BAQ Air Quality Modeling Section. December 20, 2019.
[36] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W.

In accordance with 40 CFR § 52.21(n), Shell provided all information necessary to perform the air quality analyses required by the PSD regulations, including all dispersion modeling data necessary to estimate the air quality impacts of the Shell Facility's emissions.

In accordance with 40 CFR § 52.21(o), Shell provided additional impact analyses of the impairment to visibility, soils, and vegetation that would occur as a result of the Shell Facility and general commercial, residential, industrial, and other growth associated with the Shell Facility.

In accordance with 40 CFR § 52.21(p), written notice of the revisions to the Shell Facility have been provided to the FLMs of nearby federal Class I areas as well as initial screening calculations to demonstrate that the Shell Facility's emissions would not adversely impact AQRVs and visibility in nearby federal Class I areas.

If you have any questions regarding Shell's revised air quality analyses for PSD, you may contact me by e-mail at afleck@pa.gov or by telephone at 717.783.9243.

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