pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL COUNSEL

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PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

December 13, 2016

VIA E-FILING ONLY

Ms. Christine Walker
Acting Board Secretary
Commonwealth of Pennsylvania
ENVIRONMENTAL HEARING BOARD
Rachel Carson State Office Bldg., 2nd Fl.
400 Market Street, P.O. Box 8457
Harrisburg, PA 17105-8457

Re: The Delaware Riverkeeper Network et al vs. Commonwealth of Pennsylvania, Department of Environmental Protection, and R.E. Gas Development, LLC,
EHB Docket No. 2014-142

Dear Ms. Walker:

Please accept for E-filing the Department's Parties' Joint Stipulation Regarding Facts and Exhibits.

Thank you for your assistance, and please do not hesitate to contact me if you have any questions.

Sincerely,

s/ Michael A. Braymer
Michael A. Braymer
Supervisory Counsel

Enclosures

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12/13/2016
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COMMONWEALTH OF PENNSYLVANIA
BEFORE THE ENVIRONMENTAL HEARING BOARD

THE DELAWARE RIVERKEEPER NETWORK, CLEAN AIR COUNCIL, DAVID DENK, JENNIFER CHOMICKI, ANTHONY LAPINA, and JOANN GROMAN,	:	
Appellants,	:	
v.	:	EHB Docket No. 2014-142
COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION and R.E. GAS DEVELOPMENT, LLC, Permittee.	:	
Appellees.	:	

PARTIES' JOINT STIPULATION REGARDING FACTS AND EXHIBITS

Appellants, the Delaware Riverkeeper Network, Clear Air Council, David Denk, Jennifer Chomicki, Anthony Lapina, and Joann Groman, (collectively "Appellants"), Permittee, R.E. Gas Development, ("RE Gas"), and the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department") by and through their undersigned counsel, hereby submit this Joint Stipulation regarding Facts and Exhibits.

I. STIPULATED FACTS

A. *The Department's Short Term Air Studies*

1. The Department of Environmental Protection conducted three screening studies on unconventional gas extraction emissions in 2009 and 2010 ("Short Term Air Studies").

2. The Department's September 12, 2014 Comment/Response/Section 3251 Conference Response Letter on Geyer Well Permit Applications, identified the Short Term Air Studies as part of the support for its approval of the Geyer permits.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

3. This statement largely reflects prior statements of the Department stating, for example, "Results of the limited ambient air sampling initiative conducted in the southwest region did not identify concentrations of any compound that would likely trigger air-related health issues associated with Marcellus Shale drilling activities." (Exhibit A-7, DEP Southwest Short –Term Air Study, p. iii).

4. The scope of the Short Term Air Studies' sampling efforts were limited to several natural gas facilities in Pennsylvania. Due to the limited scope and duration of the sampling and the limited number of sources and facilities sampled, the findings only represent conditions at the time of the sampling and do not represent a comprehensive study of emissions.

5. These short-term sampling efforts do not address the cumulative impact of air emissions from natural gas operations in Pennsylvania.

6. The sampling results provide some basic information on certain pollutants emitted to the atmosphere during selected phases of gas extraction operations in the Marcellus Shale formation.

7. As a screening study it was not intended to give the Department data from which to draw long-term conclusions; rather, it is a partial "snapshot" only of the time that was sampled. The Short Term Air Study was not a risk assessment, due to the fact that the Department monitored for less than a week (2-4 days) at target sites.

8. As these were screening studies, to determine preliminary information about some of the possible air emissions from these sources, there was insufficient data to undertake a full risk assessment.

9. The Short Term Air Studies took place in the Southwest, Northcentral, and Northeast Regions, and were published in 2010 and 2011.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

10. The Short Term Air Studies focused on acute health effects only (i.e. not chronic), and did not analyze cancer risk.

11. The Short Term Air Studies also did not analyze the cumulative impacts of unconventional gas extraction emissions.

12. The Short Term Air Studies did not involve air monitoring at wet gas well sites, such as the Geyer well site.

13. Ultimately, the Short Term Air Studies did not make a conclusion as to whether unconventional gas extraction emissions were safe or unsafe.

14. The intent of the Short Term Air Studies was not to conduct an all-inclusive survey of possible air contaminants. The intent was to collect some preliminary, Pennsylvania specific data to better inform the Department on possible future sampling and other programmatic needs.

15. The Short Term Air Studies determined that further study was warranted based on the fact that the Department found signatures of industrial/urban emissions in rural areas.

16. No further study occurred as to well sites or wastewater impoundment emissions.

17. Based on the results of the Short Term Air Studies the Department decided that future efforts would focus on the long-term or permanent infrastructure due to the relative transient nature of certain well pad activities.

18. In the Short Term Air Studies, the Department could not monitor for certain acutely- toxic chemicals known to be emitted from unconventional gas extraction, such as acrylamide and glutaraldehyde, because it lacked the equipment to do so.

19. Sampling for these two compounds was precluded because the Department did not have an onsite electrical supply.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

20. The Department also could not monitor in the Short Term Studies for fine particulate matter or diesel particulate matter.

21. Sampling for these two compounds was precluded because the Department did not have an onsite electrical supply.

22. The Short Term Air Studies drew no conclusions as to the presence, absence, or safety for any compounds not monitored.

23. The Department used several types of equipment to monitor air around selected sites, one of which was the "Open-Path Fourier Transform Infrared Spectrometer" ("Open-Path").

24. The Open-Path works by shooting a beam through the air to a special mirror, which then bounces the beam back to the machine to be analyzed.

25. If the beam and mirror are not situated properly, the equipment will not catch the target emissions.

26. The Open-Path's detection limits are known to be affected by weather, such as precipitation and humidity; the Open-Path's detection limits also tend to be substantially higher for certain types of compounds, such as hydrogen sulfide and methyl mercaptan.

27. Although the Department was aware of these limitations, it used the Open-Path in the screening studies for hydrogen sulfide and methyl mercaptan, among others. For the type of sampling being done during Short Term Air Studies, the Department decided that Open-Path was the best tool available.

28. Concerns were raised in the Department during monitoring about detection limits for hydrogen sulfide; however, since the Department had already started using the equipment, the Department finished the monitoring with that piece of equipment because changing

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

equipment for hydrogen sulfide at that point in the project would have led to two separate sets of data from two devices that may or may not have been comparable.

29. The Department continued the use of the Open-Path despite the knowledge of the detection limits issue because the studies were short-term screening-type studies and investment in other types of equipment was not pursued.

30. The Open-Path is usually used to give a general idea of what compounds are in the air. The Department uses the Open-Path to quantitatively measure emissions.

31. In 1999, the EPA wrote this about Open-Path:

> "The system produces data that is a time sequence of the path-averaged atmospheric concentrations of various gases. Because the FT-IR can potentially measure the concentration of a large number of atmospheric gases, this method does not address the requirements for measuring a particular gas or a set of gases. Rather, it is intended to be a generalized method."

32. The Department has a standard of procedure involving the Open-Path data.

33. The standard of procedure explains that the Department applies a reporting limit that is two times higher than the detection limit, and the detection limit is three times higher than the instrument's algorithmic method detection limit ("MDL") determination.

34. This can result in data being excluded and results showing "non-detects" when in fact, the chemical was detected at the site.

35. A chemical detection greater than the MDL and less than the reporting limit may represent a false positive. The Department uses reporting limits of 6- times the MDL to reduce the chance and frequency of false positives.

36. The Department uses a time-weighted concentration instead of the mean concentration reported by the Open-Path.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

37. The Open-Path measures the air in certain time intervals, and produces a concentration for each interval.

38. The Open-Path software then produces a mean concentration, which represents the mean of all the frames.

39. The Department takes the mean concentration representing when the chemical was actually detected, and averages it out over the entire monitoring period (e.g. 5-7 hours).

40. While an employee is operating the Open-Path, the software will display certain instantaneous detections (i.e. shorter than the full interval of time being monitored by the Open-Path).

41. Sometimes the machine displays compounds as being in a "warning zone." If employees catch this detection on the screen, they may write that down in a log sheet.

42. The "warning zone" display represents an instantaneous reading flag that does not show up in raw data reports. The instantaneous reading flag also has not been analyzed by the instrument software.

43. The notations regarding the "warning zone" instantaneous reading flag and other observations from lab employees in the log sheets were not factored into the Department's final analysis.

44. Some data regarding n-hexane collected by employees on June 8, 2010, operating the chromatograph/mass spectrometer ("GC/MS") was not in the final report, and thus the report in this instance shows that a particular chemical was not detected when, in fact, it was.

45. Although the studies were designed to be snapshots in time and screening studies only, the Department analyzed the results against reference concentrations.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

46. A reference concentration is an estimate of an exposure level to a given chemical "below which (non-cancer) adverse health effects are not expected to occur" in a particular period of time. (Exhibit A-7, DEP Southwest Short –Term Air Study, p. 17).

47. A reference concentration is used to produce a hazard quotient, which is equal to an air monitoring result divided by the reference concentration.

48. If a hazard quotient is less than one, non-cancer health effects are not expected.

49. The Department also calculated a hazard index, which equals the sum of all hazard quotients for a given sample; if the hazard index equals less than one, again, non-cancer health effects are not expected.

50. Some chemicals have no reference concentrations keyed to the time-frame that the Department needed (i.e. acute/short-term) and therefore the Department could not draw any conclusions about health or safety for chemicals it detected, but for which it had no reference concentrations.

51. It is the Department's position that where possible, it tried to use the appropriate and most conservative values. Appellants disagree.

52. Other chemicals, including methyl mercaptan, had reference concentrations but are listed in the Short Term Air Studies as not having them, and therefore again, no conclusions can be drawn.

53. The Department only used the listed EPA IRIS hierarchy of reference values in the Short Term Air Studies and if there was not a value available in the IRIS system one was not utilized.

54. Methyl mercaptan was found at various unconventional gas extraction emission monitoring sites including the Yeager wastewater impoundment in Washington County.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

55. Because methyl mercaptan is heavier than air, it tends to travel more along the ground and affect shorter individuals (like children) to a different degree than taller individuals (like adults). (Exhibit A-45, ATSDR Document of Methyl Mercaptan, pp.1-2).

56. When the Department later calculated the hazard quotients at the impoundment site, one reference concentration yielded hazard quotients as high as 145.75. (Exhibit A-44, Lazor Affidavits on Methyl Mercaptan and SW Study Impoundment Site).

57. In calculating the hazard quotients at the impoundment site, the Department used the same assumptions that were used in the Southwest Short-Term Report. (Exhibit A-44, Lazor Affidavits on Methyl Mercaptan and SW Study Impoundment Site ¶19).

58. The primary assumptions used were the maximum 2 minute concentration for methyl mercaptan determined by the Open-Path in each sampling event were assumed to have existed continuously for an entire hour, and it was assumed that it is an area where people would be present continuously. (Exhibit A-44, Lazor Affidavits on Methyl Mercaptan and SW Study Impoundment Site ¶21a. and b.).

59. Certain compounds were detected at levels to produce odors, e.g. the methyl mercaptan concentrations measured during the Yeager Impoundment sampling in Washington County. The levels detected could cause violations of odor emission provisions in 25 Pa. Code §123.31 (relating to limitations) if they persisted off the property and the Department determined that the odors were "malodors" as defined in 25 Pa. Code §121.1 (relating to definitions).

60. The Department also used the National Ambient Air Quality Standards, which are focused on regional air quality, for "criteria pollutants" such as ozone, sulfur dioxide, and carbon monoxide, instead of using reference concentrations (which are human exposure-focused).

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

61. Monitoring using the GC/MS and Summa canisters also gave the Department information on "tentatively identified compounds," which are compounds that monitoring equipment may detect in the air and attempt to identify, but for which the machine was not calibrated to identify in the monitoring session.

62. Although the Short Term Air Studies noted that certain tentatively identified compounds were found, the Department did not incorporate this understanding into its final conclusions on health and safety.

63. The Department decided that it could not be certain of tentatively identified compounds' presence and actual quantitation.

64. No one in the Department involved in the Short Term Air Studies had any medical, toxicological, industrial hygiene, or public health training, and the Department does not employ toxicologists or industrial hygienists.

65. The Department of Health did not participate in any analysis of the short-term studies.

B. *Air Emissions from Unconventional Natural Gas Well Sites*

66. Air pollution from unconventional natural gas extraction is regulated by the Department's Bureau of Air Quality mostly through Air Quality Permit Exemption Category 38 ("Exemption 38").

67. Exemption 38 conditionally exempts unconventional natural gas operations at well sites from the air pollution plan approval or air pollution operating permit requirements.

68. Krishnan Ramamurthy was the Chief of the Air Permitting Division in the Department's Air Bureau and is currently the Acting Bureau Director.

69. Mr. Ramamurthy is the principle author of Exemption 38.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

70. Exemption 38 is not designed to assess site-specific impacts.

71. Exemption 38 does not account for the distinction between acute and chronic exposure to air pollutants.

72. Exemption 38 contains an exemption threshold on volatile organic compounds ("VOCs") from sources otherwise not regulated of 2.7 tons per year ("tpy").

73. The Department's basis for the Exemption 38 VOC limit is a 1978 federal Environmental Protection Agency ("EPA") VOC *de minimis* determination.

74. The 2.7 tons per year VOC emission exemption threshold is also consistent with the thresholds applicable to other processes. The EPA VOC *de minimis* threshold is a daily and hourly limit.

75. The Department's 2.7 tpy of VOCs figure can be derived by scaling up the EPA hourly and daily VOC *de minimis* determination, however EPA does not itself calculate a yearly threshold.

76. EPA recently finalized control technique guidelines for oil and gas activities that do not include hourly or daily limits and include only yearly limits that are greater than 2.7 tpy. See https://www.epa.gov/sites/production/files/2016-10/documents/2016-ctg-oil-and-gas.pdf

77. Exemption 38 contains an exemption threshold on hazardous air pollutants ("HAPs") of 0.5 tpy of actual emissions of a single HAP and 1 tpy of actual emissions of a combination of HAPs.

78. The federal Clean Air Act major source HAP thresholds are based on a potential to emit a single HAP, while the Department's major source HAP thresholds are based on actual emissions.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

79. The Department's basis for the Exemption 38 exemption thresholds on HAPs is that these thresholds are 5% and 4% of the federal Clean Air Act major source HAPs thresholds respectively. Additionally the emission exemption threshold is also half of the HAP emission threshold applicable to other processes.

80. Exemption 38 contains an exemption threshold on nitrogen oxides ("NOx") from stationary internal combustion engines of 100 pounds per hour, 0.5 tons per day, 2.75 tons per ozone season, and 6.6 tpy.

81. The Department's basis for the NOx limits is that the emission exemption threshold is consistent with the threshold applicable to different processes.

82. Fugitive emissions are not included in the caps on VOCs, HAPs, and NOx, provided that the VOC emissions are addressed elsewhere in the Exemption 38 criteria such as LDAR.

83. It is theoretically possible to have an air pollution release that complies with Exemption 38, but that poses a human health risk.

84. The bases for the Department's belief that unconventional gas operators will not exceed Exemption 38 emissions limits are gas composition, water sampling, how other states regulate oil and gas, and how EPA regulates gas.

85. Goetz, et al., Atmospheric Emission Characterization of Marcellus Shale Natural Gas Development Sites is the only peer-reviewed research that, according to the Department, supports its belief that unconventional well site emissions are low and within the bounds of Exemption 38.

86. The bases for the Department's belief that emissions from unconventional gas well sites are low enough so as to not pose a health risk are the Department's Short Term Air

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

Studies, the operator-reported emissions data from the Department's Marcellus air inventory, and emissions factors.

87. The Department does not know whether the emissions factors that the Department allows operators to use are consistent with current science. The Department believes that the emission factors are based upon accepted EPA methods.

88. The Department does not consider other sources of nearby pollution, including other gas wells, when conditionally exempting unconventional gas wells from the air permitting requirements.

89. The Department does not consider background levels of air pollution when conditionally exempting unconventional gas wells from air permitting requirements.

90. Exemption 38 does not place any limits on the proximity of an unconventional gas well to human populations.

91. The impact on human health from air emissions is greater the closer the pollution source is to human dwellings.

92. Air monitoring is not required to show Exemption 38 compliance.

93. The Department provided Exemption 38 compliance demonstration instructions that operators must follow when preparing and submitting compliance demonstrations. Exhibit A-97 are these instructions.

94. Regional offices review Exemption 38 compliance demonstrations. The Department has created internal policy on compliance demonstration on how compliance demonstration reviews are to be conducted by regional office staff. Exhibit A-98 is this policy.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

95. Mr. Ramamurthy is not aware of any Department finding that an operator failed to comply with Exemption 38 pollution control requirements, and is only aware of instances in which an operator failed to submit a compliance demonstration.

II. STIPULATION AS TO AUTHENTICITY OF EXHIBITS

The Parties agree that the exhibits listed in their respective Pre-Hearing Memoranda are authentic. The Parties reserve all other objections regarding their admission at the hearing in the above-captioned appeal. The Parties may supplement this stipulation regarding exhibits before or during the hearing.

E-FILED
12/13/2016
PENNSYLVANIA ENVIRONMENTAL HEARING BOARD

III. RESERVATION OF RIGHTS

The Parties reserve the right to offer any additional facts and exhibits identified in any Party's Pre-Hearing memorandum.

Respectfully submitted,

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