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Remarks for Public Comment
Allegheny County Health Department
Air Quality Program
Re: Regulation Comment
301 39th Street, Bldg. 7
Pittsburgh, PA 15201-1811

Submitted via email to: aqcomments@alleghenycounty.us

Ref. Comments for Proposed State Implementation Plan (SIP) Revision for a Limited Second Maintenance Plan for the Liberty-Clairton PM10 Area for the 1987 National Ambient Air Quality Standard (NAAQS)

Dear Dr. Bogen, ACHD Board of Health Members and Staff:

Thank you for holding this hearing on the Proposed State Implementation Plan (SIP) Revision for a Limited Second Maintenance Plan for the Liberty-Clairton PM10 Area for the 1987 National Ambient Air Quality Standard (NAAQS).

In Allegheny County, we should feel confident knowing that the air we breathe will not make us sick or cause cancer, asthma, or other diseases. We have the right to live and work in clean, safe-and healthy environments. Everyone knows that air pollution is bad for your health. No one wants to breathe dirty air, get sick, or to see our children, our parents, our friends, neighbors, or our colleagues get sick or die before their time.

ACHD should pursue more health-protective requirements for PM10 emissions for Allegheny County than are included in the proposed approach to the PM10 maintenance plan. There is strong evidence from recent public health research that PM10 levels like those found in Allegheny County are extremely likely resulting in health damage to the community. Attempts to pursue a maintenance plan based on outdated standards set 20 years ago will very likely result in health harms that can otherwise be avoided if public health knowledge and research are used as the basis for regulatory action, not outdated standards. As a health department, ACHD must, at a minimum, acknowledge the likely risks to public health by pursuing the current standards as part of the PM10 plan. A better approach would be to revise the plan based on standards more in line with the latest public health knowledge.

Despite being below the EPA regulatory limit of 150ug/m3 for 24-hour values, performance at the Liberty, Glassport, and Lincoln monitors remain above the WHO threshold of 50 ug/m3 for 3 of the 4 monitors for 2017 – 2019. The levels have not decreased since 2012 – 2014.

More up-to-date, consensus health research points to clear impacts of negative health outcomes at currently-observed levels at the PM10 monitors in Allegheny County. Current standards were first adopted 20 years ago at the 150ug/m3 level and have not been adequately updated to account for health research clearly indicating community harms:

Evidence Suggests a Causal Relationship Between SHORT-TERM PM10 Exposure and Health Outcomes (detailed references for each category are included in the appendix to this letter):

- Respiratory effects
    - Asthma exacerbations at 9.7-16.2 ug/m3
    - Increased respiratory mortality

- Cardiovascular effects
    - Ischemic heart disease at 12.8 ug/m3
    - Arrythmias

Evidence Suggests a Causal Relationship Between LONG-TERM PM-10 Exposure and Health Outcomes (again see appendix):

- Cardiovascular effects
    - Cardiovascular mortality at 7.3-31 ug/m3

- Metabolic effects
    - Type 2 diabetes at 6.2-34.0 ug/m3

- Cognitive effects at 7.08-8.50 ug/m3

- Behavioral effects at 18.39 ug/m3

- Cancer effects
    - Lung cancer at 4.0-20.8 ug/m3
    - Increased mortality
    - Cardiovascular mortality at 4.0-27.3 ug/m3

ACHD must continue to monitor PM10 levels and pursue reductions in both short-term and long-term PM10 exposure by issuing new health-protective requirements for emitters of PM10 pollution in permits and hold these polluters accountable to these updated standards in order to protect the health of Allegheny County residents. The current PM10 maintenance plan lacks these up-to-date health-protective requirements. At a minimum the standards should be set to the WHO limit of 50ug/m3. Better would be to set the standards for below 25 ug/m3 to protect public health in our county.

Our region suffers from some of the worst air pollution in the United States. According to an analysis of our region's pollution sources from the National Emissions Inventory, particle pollution from stationary industrial point sources are the largest contributor to our region's pollution, accounting for approximately two-thirds of our region's pollution.[1] Allegheny County also ranks in the top 2 percent of counties in the

[1] Breathe Project, "Air Pollution Sources," Available Online, https://breatheproject.org/resources/air-pollution-sources/, accessed December 9, 2020.

U.S. for cancer risk from point source air pollution. Our air poses a significant threat to public health with an increased risk of heart and lung disease, asthma, diabetes, cancer and premature death.[2]

The Breathe Project encourages ACHD to revise the current PM10 plan and to require, at a minimum, standards at the WHO limit of 50ug/m3. Better would be to set the standards below 25 ug/m3 to protect public health in our county. These updates should accompany updates to effective regulations, operational procedural requirements, inspections, and enforcement. Let's save lives, reduce burdens on vulnerable people, preserve future generations' rights to clean air and a healthy climate, and take action that makes everyone proud.

Thank you for your time and consideration.

Sincerely,

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project

[2] Breathe Project, "Air Pollution Sources," Available Online, https://breatheproject.org/resources/air-pollution-sources/ and https://breatheproject.org/app/uploads/2018/03/18-02-26_health_facts.pdf, accessed December 9, 2020.

APPENDIX: SUMMARIES OF PM10 STUDIES

Short-Term PM10 Exposure and Respiratory Effects

Zhao Y et al. Ambient fine and coarse particulate matter pollution and respiratory morbidity in Dongguan, China. Environmental Pollution 2016;222:126-131. DOI: 10.1016/j.envpol.2016.12.070

- This study estimated the short-term effects of PM10 on 44,801 hospital outpatient visits for respiratory disease from 2013-2015.
- Mean PM10 concentration of 18.6 ug/m3; 90th percentile of 29.0 ug/m3.
- An interquartile range increase in PM10 at lag day 3 was associated with a 7.24% (95% CI: 4.25%, 10.32%) increase in respiratory morbidity.
- 0.86% (95% CI: 0.50%, 1.23%) of respiratory morbidity was attributed to PM10.

Cheng NH, et al. Coarse particulate air pollution associated with increased risk of hospital admissions for respiratory diseases in a tropical city, Kaohsiung, Taiwan. International Journal of Environmental and Research and Public Health 2015;12:13053-13068. DOI: 10.3390/ijerph121013053

- Hospital admissions for respiratory diseases (COPD, asthma and pneumonia) and ambient PM10 were obtained for 2006-2010.
- Mean PM10 concentration of 31.7 ug/m3; 75th percentile of 42.1 ug/mn3, and maximum of 490 ug/m3.
- A 10 ug/m3 increase in PM10 on cool days but not warm days, was associated with a 3% (95% CI: 1%, 5%) increase in COPD admissions, 4% (95% CI: 1%, 7%) increase in asthma admissions, and 3% (95% CI: 2%, 4%) increase in pneumonia admissions.

Malig BJ, et al. Coarse particles and respiratory emergency department visits in California. American Journal of Epidemiology 2013;178:58-69. DOI 10.1093/aje/kws451

- Evaluated the relationship between PM10 and respiratory emergency department visits from 2005 to 2008 in 35 California counties.
- PM10 concentrations ranged from 5.6 to 34.4 ug/m3.
- A 10 ug/m3 increase in PM10 showed a 3.3% (95% CI: 2.0%, 4.6%) increase risk in asthma visits

Adar SD, et al. Ambient coarse particulate matter and human health: a systematic review and meta-analysis. Current Environmental Health Reports. 2014;1:258-274. DOI 10.1007/s40572-014-0022-z

- Meta-analysis of 23 mortality and 10 hospital admission studies that included 0.75 million respiratory deaths and 2.8 million hospital admissions for respiratory causes.
- Concentrations of PM10 ranged from a low of 3.7 ug/mm3 in US and a high of 101 ug/m3 in China.
- Each 10 ug/m3 increase in PM10 exposure was associated with 1.4% (95% CI: 0.1%, 1.8%) increase in mortality and hospital admissions due to respiratory causes.

Short-Term PM10 Exposure and Cardiovascular Effects

Powell H, et al. Ambient coarse particulate matter and hospital admissions in the medicare cohort air pollution study, 1999-2010. Environmental Health Perspectives 2015;123:1152-1158. DOI 10.1289/ehp.1408720

- Used air pollution data from EPA air quality monitoring network and daily emergency hospitalizations for 110 large urban US counties.

- Median PM10 exposure across all counties was 12.78 ug/m3; the 25th percentile was 9.94 ug/m3 and the 75th percentile was 15.84 ug/m3.
- A 10 ug/m3 increase in PM10 was associated with a 0.69 % (95% Posterior Interval: 0.45, 0.92). significant increase in same-day cardiovascular hospitalizations.
- After adjusting for PM2.5, this association remained significant (0.63% increase (95% PI: 0.38, 0.88).

Chen YC, et al. Short-term effects of coarse particulate matter on hospital admissions for cardiovascular diseases: a case-cross over study in a tropical city. Journal of Toxicology and Environmental Health 2015:78:1-13. DOI 10.1080/15287394.2015.1083520

- Hospital admissions for cardiovascular disease, including ischemic heart disease, stroke, congestive heart failure and arrhythmias, and ambient air pollution levels for Kaohsiung, Taiwan were obtained for 2006-2010.
- A 10 ug/m3 increase in PM10 on cooler days (<25^{O}C) was associated with increases of
    - 3% (95% CI: 2%, 4%) for ischemic heart disease admissions
    - 5% (95% CI: 4%, 6%) for stroke admissions
    - 3% (95% CI: 2%, 4%) in congestive heart failure admissions
    - 3% (95% CI: 0%, 6%) in arrhythmia admissions.

Long-Term PM10 Exposure and Cardiovascular Effects

Hart, JT et al. Effect modification of long-term air pollution exposures and the risk of incident cardiovascular disease in US women. Journal of the American Heart Association 2015:4. DOI 10.1161/JAHA.115.002301

- Nationwide cohort of 114 537 women in the Nurses' Health Study.
- Mean PM10 exposure was 7.3 to 31 ug/m3.
- For each 10 ug/m3 increase in 12-month average PM10, the multivariable adjusted hazard ratio for cardiovascular disease was 1.19 (95% CI: 1.10 to 1.28) among women with diabetes.

Cesaroni G, et al. Long term exposure to ambient air pollution and incidence of acute coronary events: prospective cohort study and meta-analysis in 11 European cohorts from the ESCAPE Project. BMJ 2014;348:f7412. URL http://ehp.niehs.nih.gov/1307301/

- 100,166 people enrolled from 11 cohorts participating in the European Study of Cohorts for Air Pollution Effects (ESCAPE) from 1997 to 2007 and followed for an average of 11.5 years.
- Mean PM10 exposures ranged from 8.2 to 8.6 ug/m3.
- A 10 µg/m3 increase in estimated annual mean PM10 was associated with a 12% (95% CI: 1.01 to 1.25) increased risk of coronary events.

Tonne C, et al. Long-term traffic air and noise pollution in relation to mortality and hospital readmission among myocardial infarction survivors. International Journal of Hygiene and Environmental Health 2015;219:72-78. DOI 10.1016/j.ijheh.2015.09.003

- Patients from the Myocardial Ischaemia National Audit Project database resident in Greater London (n=18,138) were followed for death or readmission for myocardial infarction.
- An association with mortality per interquartile range (IQR) increase of pollutant of 1.1 ug/m3 was observed for non-exhaust particulate matter PM10 (Hazard Ratio=1.05 (95%: CI 1.00, 1.10).

Long-Term PM10 Exposure and Metabolic Effects

Puett R, et al. Are particulate matter exposures associated with risk of type 2 diabetes? Environmental Health Perspectives 2011;119:384-389. DOI 10.1289/ehp.1002344

- Using two prospective cohorts, the Nurses' Health Study (NHS) and the Health Professionals Follow-Up Study (HPFS), they investigated the relationship of incident type 2 diabetes mellitus with exposure toPM10.
- Mean PM10 was 9.4 ug/m3 for the NHS cohort and 10.3 ug/m3 for the HPFS cohort.
- Quartile PM10 was 3.7 ug/m3 for the NHS cohort and 4.2 ug/m3 or the HPFS cohort.
- The hazard ratio for incident diabetes mellitus with interquartile range increases in average PM10 during the 12 months before diagnosis was 1.04 (95% CI, 0.99-1.09).

Long-Term PM10 Exposure and Nervous System Effects

Weuve J, et al. Exposure to particulate air pollution and cognitive decline in older women. Archives of Internal Medicine 2012;172:219-227. DOI 10.1001/archinternmed.2011.683

- The study population comprised the Nurses' Health Study Cognitive Cohort, which included 19,409 US women aged 70 to 81 years.
- Mean PM10 exposure was 8.5 ug/m3.
- Two-year decline on a global score was 0.020 (95% CI, -0.032 to -0.008) standard units worse per 10 µg/m3 increase in PM10.
- This effect is cognitive equivalent to aging by approximately 2 years per a 10 ug/m3 increase in PM10.

Long-Term PM10 Exposure and Cancer

Puett RC, et al. Particulate matter air pollution exposure, distance to road, and incident lung cancer in the Nurses' Health Study cohort. Environmental Health Perspectives 2014;122:926-932. DOI 10.1289/ehp.1307490

- Participants in the Nurses' Health Study, a nationwide prospective cohort of women; estimated 72-month average exposures to PM10.
- Follow-up for incident cases of lung cancer occurred from 1994 to 2010.
- Mean PM10 exposure was 8.5 ug/m3.
- During 1,510,027 person years, 2,155 incident cases of lung cancer were observed among 103,650 participants.
- In fully adjusted models, a 10 µg/m3 increase in 72-month average PM10 (Hazard Ratio = 1.04; 95% CI: 0.95, 1.14) was positively associated with lung cancer.

Raaschou-Nielsen, O, et al. Air pollution and lung cancer incidence in 17 European cohorts: Prospective analyses from the European Study of Cohorts for Air Pollution Effects (ESCAPE). The Lancet Oncology 2013;14:813-822. DOI 10.1016/S1470-2045(13)70279-1

- This prospective analysis of data obtained by the European Study of Cohorts for Air Pollution Effects used data from 17 cohort studies based in nine European countries.
- analyses and random effects models for meta-analyses.
- Mean PM10 exposure ranged from 4.0 to 20.8 ug/m3.
- The 312,944 cohort members contributed 4,013,131 person-years at risk.
- During follow-up (mean 12.8 years), 2,095 incident lung cancer cases were diagnosed.
- There was a statistically significant association between risk for lung cancer and PM10 (hazard ratio 1.22 [95% CI: 1.03, 1.45] per 10 µg/m3).

Short-Term PM10 Exposure and Mortality

Janseen NAH, et al. Short-term effects of PM2.5, PM10 and PM2.5-10 on daily mortality in the Netherlands. Science of the Total Environment 2013;463:20-26. DOI 10.1016/j.scitotenv.2013.05.062

- Daily concentrations of PM10 from the Dutch National Ambient Air Quality Monitoring Network as well as all cause and cause-specific mortality rates in The Netherlands were obtained for the period 2008-2009.
- Mean PM10 exposure was 7.7 ug/m3.
- A 10 μg/m3 increase in previous day PM was associated with 0.6% (95% CI: 0.2%, 1.0%) increase with mortality.

Lanzinger S, et al. Associations between ultrafine and fine particles and mortality in five central European cities - Results from the UFIREG study. Environment International 2016;88:44-52. DOI10.1016/j.envint.2015.12.006

- Examine the effect of short-term PM10 on (cause-specific) mortality in five European Cities.
- Mean PM10 ranged from 7-16 ug/m3.
- Cardiovascular mortality increased by 4.1% [0.4%; 8.0%] in association with a 4.7μg/m(3) increase PM10 lag days 2-5.

Long-Term Pm10 Exposure and Mortality

Bentayeb M, et al. Association between long-term exposure to air pollution and mortality in France: A 25-year follow-up study. Environment International 2015;85:5-14. DOI 10.1016/j.envint.2015.08.006

- Analyzed the association between long-term exposure to air pollution and mortality at the individual level in a large French cohort (n=20327 adults)
- The cohort recorded 1967 non-accidental deaths.
- Mean PM10 exposure was 8.0 ug/m3.
- Associations between PM10 and mortality
    - Total mortality was HR = 1.22 (95% CI: 1.09, 1.37)
    - Cardiovascular mortality was HR = 1.32 (95% CI: 0.89, 1.91)
    - Respiratory mortality was HR = 1.27 (95% CI: 0.96, 1.72)