Petition of PECO Energy Company-Gas for a Finding of Necessity Pursuant to 53 P.S Section 10619 That the Situation of Two Buildings Associated with a Gas Reliability Station in Marple Township, Delaware County Is Reasonably Necessary for the Convenience and Welfare of the Public – On Remand Call-In Further Telephonic Hearings on Remand	Docket No.: P-2021-3024328

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Judge's Chambers

Piatt Place

301 5th Avenue

Suite 220

Pittsburgh, PA

Tuesday, November 28, 2023

Commencing at 10:00 a.m.

INDEX TO EXHIBITS

Docket No. P-2021-3024328

Hearing Date: November 28, 2023

NUMBER	FOR IDENTIFICATION	IN EVIDENCE
Marple Township Exhibit		
Ted Uhlman, and Julie		
Baker Remand Statement		

PECO EXHIBITS:

PECO Statement 6-RR		
Written Statement of Jeffrey Harrington	2465	2465
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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY FOR A FINDING OF NECESSITY

PURSUANT TO 53 P.S. § 10619

Docket No. P-2021-3024328

REMAND DIRECT TESTIMONY

WITNESS: EDWARD KETYER M.D.

SUBJECT: PROVIDE EXPERT TESTIMONY REGARDING THE POTENTIAL ENVIRONMENTAL AND HEALTH CONSEQUENCES ASSOCIATED WITH PECO'S PROPOSED GAS RELIABILITY STATION TO BE LOCATED AT 2090 SPROUL ROAD, MARPLE TOWNSHP, PA.

DATED: September 22, 2023

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Testimony of Dr. Edward Ketyer
Proposed PECO Reliability Station and Related Infrastructure
Submitted July 15, 2021
Revised September 22, 2023

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Dr. Edward Ketyer, M.D., F.A.A.P., and my address is 102 Meadowvue Court in Venetia, PA (Washington County).

II. PURPOSE

Q. Dr. Ketyer, what is the purpose of your testimony in this proceeding?

A. I am providing expert testimony regarding the potential environmental and health consequences associated with the proposed Gas Reliability Station to be located at 2090 Sproul Road, Marple Township, PA. My testimony is based on my education and experience.

Q. What is your educational background?

A. I received my B.A. degree from the University of Vermont in 1982. I received my M.D. degree from Northwestern University.

Q. Please describe your work experience relevant to your Direct Testimony.

A. I am a pediatrician who retired from patient care after 26 wonderful years in a busy primary care pediatric office. Until my retirement I was a Clinical Assistant Professor of Pediatrics in the Department of Pediatrics at the University of Pittsburgh School of Medicine. I am still employed by Allegheny Health Network as their Social Media Medical Advisor for the AHN Pediatric Institute (AHN Pediatrics - Pediatric Alliance).

Q. What other certifications or experiences further qualify you to provide your expert testimony?

A. I am proud to be the editor and principle writer for *The PediaBlog* (www.thepediablog.com), a blog centered around pediatric topics of interest for parents and caretakers, with posts published every day since August 2012.

I remain a member of the Pennsylvania Medical Society and the Allegheny County Medical Society.

I am also a Fellow of the American Academy of Pediatrics and the AAP Council on Environmental Health and Climate Change (COEHCC).

Since 2015, I have been a medical advisor for SWPA Environmental Health Project — a non-profit, evidence-based, public health organization dedicated to assisting residents reduce their health risks objectively associated with living near shale gas (unconventional) oil and gas operations in Pennsylvania's Marcellus Shale region and other areas in the U.S.

I am a board member and President-elect of Physicians for Social Responsibility, a statewide non-profit environmental health advocacy organization helping doctors and other health care providers and the public learn about health risks objectively associated with shale gas development and climate change, in addition to other topics of national and global importance. I also serve on the steering committee of Concerned Health Professionals of Pennsylvania, a group of physicians and nurses who understand that there is no safe way to frack.

I am a Co-Chair of the Education and Outreach Workgroup of the Cancer and Environment Network of Southwestern Pennsylvania.

Finally, I am a member of the Climate Reality Project Leadership Corps. and Climate Reality Pittsburgh & SWPA Chapter.

Q. Dr. Ketyer, based upon your education, training, and experience, do you believe that you are capable for expressing an opinion to a reasonable degree of professional certainty as to the environmental impact as it relates to the proposed gas reliability station that is the subject to this proceeding?

A. Yes, I do.

Q. Dr. Ketyer, are you sponsoring any exhibits?

A. Yes. I am sponsoring Exhibit EK-1, which is my professional CV. I am also sponsoring Exhibit EK-2, which is my expert report.

III. ENVIRONMENTAL IMPACT

Q. Are there environmental concerns with the proposed Gas Reliability Station?

A. Yes, there are environmental concerns affecting public health and safety. These include potential and expected harms to the health of residents living nearby, and to children attending an elementary school less than 500 feet away from the proposed site.

Q. **Can you explain what those environmental concerns are?**

A. There will be an impact on human health, air pollution and discharges of emissions, due to the close proximity of the proposed siting to residential and commercial properties, residents and schoolchildren- this calls for consideration of the facility as representing a threat to public health and safety.

Q. What are the public safety impacts of the Gas Reliability Station?

A. At the intersection of two busy roads, in close proximity to homes, retail businesses, and an elementary school, the proposed siting is unwise. It is dangerous. It exposes children and their families to harmful emissions from burning natural gas, noise, and light pollution, and it compromises public

safety due to the potential for inadvertent leaks and explosions that can occur accidently or during periods of maintenance at the facility.

Q. Can you describe the overall impact on air pollution?

A. Burning methane (CH4) generates specific physical and chemical byproducts that must be released into the atmosphere in order for efficient combustion to occur. While the PECO website offers very little information about what activities will actually be going on at the site in Marple Township, my understanding is that six large methane-fired "heaters" operating alone or in combination will produce large enough volumes of emissions to produce health symptoms in adults and children living, shopping, and learning nearby.

Q. Can you describe what emissions from the facility will have an effect on the environment with increased risks to public health?

A. The emissions produced by burning natural gas are by and large invisible due to the size and physical properties of each component. Each component of the air pollution generated by burning natural gas has very significant health risks potentially associated with it. There is no safe level of exposure to any component of pollution resulting from natural gas combustion. We know that even small amounts of exposure, even when brief, can produce significant health signs and symptoms that can affect quality of life for some and increase the risk of poor health outcomes for everyone.

A. Air Pollution

We also know that invisible particles, smelly vapors, and chemicals that constitute modern air pollution caused mostly from burning fossil fuels like natural gas can impair fertility, complicate pregnancies, and lead to poor birth outcomes. Birth defects and developmental delays caused by

some components of toxic air pollution lead to lifelong health burdens for young children, for their families, and for society. ADHD, learning disabilities, and even the development of autism have been associated with air pollution exposure during pregnancy. Lung cancer, bladder cancer, and other types of adult and childhood cancers are linked to air pollution, which impacts practically every organ system in the body — not just the lungs, but also the heart and brain, the liver and kidneys. Adults with chronic obstructive pulmonary diseases (COPD) and other chronic lung diseases, heart disease, and children with asthma have worse symptoms and sicker days when air quality is not good. Recent research describes the links between air pollution and the development of obesity, type 2 diabetes, dementia, anxiety, depression and other forms of mental illness. And it is now estimated that nearly 9 million people worldwide die prematurely each year as a result of air pollution, and that includes hundreds of thousands of Americans.

1. **Fine and ultrafine particulate matter** (PM 2.5 refers to particles 2.5 micrometers and smaller) Researchers have linked PM 2.5 pollution with impaired fertility, miscarriage, and poor birth outcomes such as low birth weight, small-for-gestational age newborns, and prematurity — each of which carry lifelong health burdens for children, their families, and society. Breathing air contaminated with PM 2.5 exacerbates lung symptoms in children and adults with asthma and other chronic lung diseases. PM 2.5 is a potent contributor to the development of cardiovascular and cerebrovascular disease (i.e. heart attacks and strokes). PM 2.5 is a known carcinogen, causing lung cancer and bladder cancer, and is associated with other types of cancer in adults. Breathing PM 2.5 causes headaches in some people and sinus problems in others.
There is no safe level of PM 2.5 exposure because even small exposures (even those under EPA or WHO standards) can still result in noticeable health symptoms.

2. Volatile organic compounds The burning of fossil fuels, including natural gas, produces VOCs like benzene. Benzene is a known carcinogen, causing cancer in children and adults. Fossil fuel combustion (which includes natural gas) results in emissions of other harmful VOCs potentially leading to serious health concerns, including toluene (permanent neurological damage), ethylbenzene and xylene (ENT and neurotoxicity), and formaldehyde (ENT and lung irritant, human carcinogen).

3. Nitrogen oxides (NOx)

Nitrogen oxide is produced abundantly wherever fossil fuels and natural gas are combusted. Nitrogen oxide combines with VOCs in the presence of sunlight and heat to produce ground level ozone, also known as smog. Ozone adversely impacts every person's lung function. It has been shown to stunt lung function growth in infants and young children. Whether one is young or old, rich or poor, active or sedentary, everyone's lung function is diminished on days when ozone levels are high.

4. Carbon monoxide (CO)

Carbon monoxide is toxic to every human if exposure is high enough. Depending on the level and duration of exposure, carbon monoxide can cause symptoms as mild as headaches, dizziness, and nausea, to more severe symptoms like hallucinations and loss of consciousness, and death.

5. Carbon dioxide (CO2)

Burning methane produces about 50% less CO2 than coal per energy equivalent. On a planet facing a climate emergency, with all the methane being fracked and burned, that is still a lot of greenhouse gas emissions. CO2 from the burning of fossil fuels, including fossil gas, is the principle greenhouse gas responsible for causing the climate crisis. Climate change is adversely

impacting the health and safety of children and adults around the world right now. It is a health threat to every child on the planet today, and will be a threat for generations to come until humans decide to abruptly stop using fossil fuels.

6. Sulfur dioxide (SO2)

Burning methane results in less sulfur dioxide pollution compared with burning coal and oil, but as I alluded to earlier, "less" does not mean "none." SO2 in low amounts can cause upper and lower respiratory irritation; higher exposures can lead to difficulty breathing and death from respiratory failure and cardiac arrest.

7. Radon gas

Natural gas slated to flow through the Marple Township Natural Gas Gate Station comes from the highly radioactive Marcellus Shale. Radioactivity is a major health threat from upstream and downstream sources in the shale gas supply chain, beginning at the wellhead and continuing on to consumers' stovetops and furnaces.

Radon gas has been shown to be one of these radioactive threats. Radon is the second-leading cause of lung cancer behind tobacco smoke.

8. Methane (from incomplete combustion, intentional venting, and unintentional leaks).

Large volumes of methane leak inadvertently and are vented and flared intentionally into the atmosphere throughout every phase of natural gas extraction (conventional and especially unconventional shale gas development), transportation/transmission, delivery, and consumption. Methane is an extremely potent greenhouse gas, trapping heat in the atmosphere 86 times more effectively compared with CO2 over a 20-year time period. Methane leaks abundantly from

fracked gas infrastructure — from gas wells to pipelines to compressor stations to processing facilities to gate stations and metering stations to homes and businesses. Any greenhouse gas savings achieved by burning natural gas instead of coal is instead squandered by allowing methane to carelessly escape from natural gas infrastructure.

B. Noise and light pollution

Noise pollution and light pollution from the proposed Marple Township gate station will potentially result in additional adverse health impacts, especially mental health. Both types of pollution have been shown to interfere with healthy, restful, restorative sleep in residents living nearby loud and bright industrial sites. Cognition may be impacted from chronic exposure to loud background noise, creating a disadvantage for students who wish to learn efficiently and working adults who wish to be productive on the job.

I would like to pause and note here that any human who witnesses environmental degradation and destruction (as this project represents to anyone seeing the big picture) generally experiences a negative impact on their mental health. And this is especially true in children.

C. Vehicular traffic

The proposed PECO Gate Station in Marple Township is sited on the corner of a busy intersection. The surrounding homes, school, and businesses already generate abundant car, truck, and school bus traffic. In the event of anticipated vehicular accidents, an evacuation plan for the neighboring community, school, and businesses must be created, made public, and updated as local conditions/development change.

D. Explosions and fires

It is well known that pipelines can leak and spill. They can shift in the ground and slip into sinkholes. Over time, pipelines rust and corrode. Pipeline accidents and explosions can destroy homes and property, and they can maim and kill people. There are multiple examples of each of these incidents involving pipelines in Pennsylvania. The proposed Gate Station in Marple Township is essentially a part of the pipeline infrastructure. Because natural gas will enter and exit the facility, and because the pipelines are expected to undergo physical stress due to cooling and heating, the Gate Station will plausibly be subjected to any and all of these potentially catastrophic events. Residents, businesses, and the parents of schoolchildren must be warned ahead of time of the potential threats this facility presents to the health and safety of all community members.

It is my understanding that first responders will not be allowed to respond to an incident or accident occurring at the site unless PECO first determines whether they are needed. This doesn't sound like a good idea. Properly trained police, firefighters, and EMS personnel should be able to respond immediately to any dangerous incident in the community. If true, the public will need to be educated about why PECO thinks this is an advisable emergency protocol.

Q: In your opinion, given potential impact of reduced air quality and emissions resulting from the proposed PECO facility, should this facility be located where proposed?

A: This proposed PECO facility is NOT reasonably necessary for the convenience and welfare of the public. As a pediatrician, a father, and an advocate for urgent solutions to the climate crisis, I believe I am within my area of expertise to say that the PECO "Natural Gas Reliability Project" should not be approved at this or any site. Climate change is an immediate

threat to the health of children and the adults who love them. This is an objective statement. Any project that involves burning even more fossil fuels than before, even natural gas, is inconsistent with solving the climate crisis.

Q. Is there anything you wish to add to your testimony?

A. The proposed PECO Gate Station facility will bring increased risks to public health and safety. Burning natural gas to operate the plant will produce an array of chemicals and particles: smog-forming VOCs and nitrogen oxides that make breathing difficult, cancer-causing fine particulate matter and possibly radon gas; as well as climate-destroying greenhouse gases emitted into the atmosphere where they will be invisible to the eye even as they do their very grave damage to health and well-being.

Some health symptoms may be felt immediately by some residents living in the neighborhood, workers and customers occupying businesses in close proximity, and elementary students attending school within 500 feet of the facility. The odors and noise coming from the site could reasonably be expected to interfere with students' learning, especially those who struggle in school with learning differences and attention issues like ADHD. In addition to acute exposures to toxic air emissions, cumulative exposures can cause serious health problems, particularly in women who are pregnant, and in children who may not develop chronic heart and respiratory disorders or cancer until years and even decades have passed after exposure.

It is predictable that the air pollution, noise and light pollution, the added vehicular traffic, and knowing of the possibility of an industrial accident at the site are likely to generate stress in the population of adults and children living in proximity to the facility. Stress is a side effect of living near fossil fuel infrastructure and other industrial facilities and has been shown to

exacerbate mental health conditions such as anxiety and depression. Chronic stress also helps contribute to the development of chronic medical conditions.

IV. ALTERNATIVES

Q. Did PECO thoroughly evaluate alternatives for this station?

A. Not to my knowledge.

Q. In your opinion, given potential impact of reduced air quality and emissions resulting from the proposed PECO facility, should this facility be located where proposed?

A. No. This proposed PECO facility is NOT reasonably necessary for the convenience and welfare of the public- on the contrary, it would pose increased degradation and risks to public health and safety.

V. CONCLUSION

Q. How do you conclude your Direct Testimony?

A. This proposed PECO gas heating and transfer station is NOT reasonably necessary for the convenience and welfare of the public. PECO's plan to build and operate a natural gas gate station in such a densely developed, highly populated, high-traffic area is inherently dangerous to people living, working, shopping, and learning nearby. An operational gate station at this site will subject children and adults to toxic air pollution that will not pause and cannot be avoided. Threats to health and safety due to the nature of natural gas's extremely flammable and explosive physical properties will only add to the public health and safety risk people will face every day.

There are alternatives to natural gas. There are no alternatives to clean air. This PECO gate station in this location should not be built. The risk to health and safety is far too high. Building and operating it on this site is irresponsible and unnecessary. In my opinion, as a pediatrician, a father, and a fellow traveler on this planet, I believe this plan should be abandoned.

Allowing this project to proceed would ignore the scope, the severity, and the urgency of the climate crisis — a local, regional, national, and global emergency which is very much happening today. In fact, partly because of Pennsylvania's long history of extracting fossil fuels (today, mostly by the rapid expansion of fracking), climate change is accelerating. Last month, the International Energy Agency (IEA) declared that investment in, and new development of, all fossil fuel infrastructure, including natural gas, must end immediately in order to fully decarbonize by 2050 and limit global average warming to 1.5 degrees Celsius, which is the consensus value of climate scientists everywhere, recorded in the Intergovernmental Panel on Climate Change Special Report (2018), and the minimum goal of the Paris Climate Agreement.

It conflicts directly with Article 1, §27, of the Pennsylvania Constitution. As a Trustee charged with the duty of safeguarding the people of Pennsylvania and from unnecessary and harmful activities, it is the duty of the Public Utility Commission to deny the requested Finding of Necessity.

Q. Is this your professional opinion expressed to a reasonable degree of scientific certainty?

A. Yes. However, I reserve the right to file such additional testimony as may be necessary or appropriate.

EDWARD C. KETYER, M.D., F.A.A.P.

Allegheny Health Network Pediatrics - Pediatric Alliance (Social Media Medical Advisor)
Editor, *The PediaBlog*
American Academy of Pediatrics Council on Environmental Health & Climate Change
Environmental Health Project (Consultant)
Physicians for Social Responsibility Pennsylvania (President)

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EDUCATION:

Undergraduate: University of Vermont 1978-1982
Burlington, VT. (Grad. 5/82 — B.A. Zoology)

Medical School: Far Eastern University 1982-1985
Manila, Philippines

Medical School: Northwestern University 1985-1987
Chicago, IL. (Grad. May 1987 — M.D.)

POST GRADUATE TRAINING: Pediatrics Resident - Children's Hospital of Pittsburgh 1987-1990.

PEDIATRIC PRACTICE: Pediatric Alliance, PC (www.pediatricalliance.com),
— Primary care pediatric practitioner — Chartiers/ McMurray Division — 1990-2016 (retired).

— Editor and principle writer, *The PediaBlog* 2012-present (www.thepediablog.com)

— Social Media Medical Advisor, AHN Pediatrics — Pediatric Alliance — May 2018-present.

ACADEMIC POSITIONS: University of Pittsburgh School of Medicine
Department of Pediatrics

— Clinical Instructor of Pediatrics - 1990-1995.
— Clinical Assistant Professor of Pediatrics - 1996-2017.

BOARD CERTIFICATION: American Board of Pediatrics – Initial Certification - 1990
Recertification - 2004, 2011 "Retired in Good Standing" (2017)

PENNSYLVANIA LICENSE: MD-045079E ("Active-Retired")

FORMER HOSPITAL STAFF AFFILIATIONS:

Children's Hospital of Pittsburgh
3705 Fifth Avenue
Pittsburgh, PA. 15213-2583

Magee-Womens Hospital
300 Halket Street
Pittsburgh, PA. 15213-3180

St. Clair Hospital
1000 Bower Hill Road
Pittsburgh, PA. 15243-1899

ORGANIZATION MEMBERSHIPS:

— American Academy of Pediatrics (AAP), Fellow
— AAP - Pennsylvania Chapter - 1990-present.
— AAP - Council on Environmental Health - 2013-present.
— Pennsylvania Medical Society
— Allegheny County Medical Society
— Physicians for Social Responsibility Pennsylvania (2017-present; Board member and current President-elect)
— Climate Reality Project Leadership Corps. (Pittsbugh 2017)

COMMITTEES:

Pediatric Alliance, P.C.
— President, Board of Directors – 1997-2004.
— Member, Board of Directors — 1996-2016.
— Member, EMR Committee (Electronic Medical Records) — 2006-2016.
— AHN Pediatrics - Pediatric Alliance Social Media Committee — 2017- present.

Children's Hospital of Pittsburgh:
— Children's Health Network (CHN) – Board of Directors - 1995-1996
— Teaching and Education/Residency Curriculum Committee - 1995-97

Magee Women's Hospital:
— Magee Physician Hospital Organization – Board of Directors, MPHO - 1994-1996
— Membership Committee, MPHO - 1994-1996
— Strategic Planning Committee, MPHO - 1994-1996

St. Clair Hospital:
— Infection Control Committee - 1990-1992
— Pediatric Quality Improvement Committee (QIT) — 1993-2014
— Executive Committee (Department Chair) - 2010-2012

CONSULTING: Environmental Health Project - 2015-present.
www.environmentalhealthproject.org.

(Updated: 09/22/23)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY FOR A FINDING OF NECESSITY

PURSUANT TO 53 P.S. § 10619

Docket No. P-2021-3024328

REMAND DIRECT TESTIMONY

WITNESS: TIMOTHY R. MCAULEY, MS, PhD

SUBJECT: PROVIDE EXPERT TESTIMONY REGARDING THE AIR QUALITY IMPACTS AND HUMAN HEALTH EXPOSURE RISK ASSOCIATED WITH PECO'S PROPOSED GAS RELIABILITY STATION TO BE LOCATED AT 2090 SPROUL ROAD, MARPLE TOWNSHP, PA.

DATED: September 22, 2023

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REMAND DIRECT TESTIMONY OF TIMOTHY R. MCAULEY, MS, PhD

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Timothy R McAuley. My business address is 462 Broadway, Suite 200, Saratoga Springs, NY 12866.

II. PURPOSE OF TESTIMONY

Q. Dr. McAuley, what is the purpose of your testimony in this proceeding?

A. I am providing expert testimony regarding the air quality impacts and human health exposure risk associated with the proposed Gas Reliability Station to be located at 2090 Sproul Road, Marple Township, PA. My testimony is based on my experience as a multi-award-winning environmental leader and recognized expert across various environmental disciplines both domestic and globally.

Q. What is your educational background?

A. I received my PhD in Environmental Science and Engineering and MS in Chemistry from Clarkson University, along with a BS in Biochemistry from The College of Saint Rose.

Q. Please describe your work experience relevant to your Direct Testimony.

A. I am currently the Founder and CEO of CHANGE Environmental, LLC (formerly Consulting for Health, Air, Nature, & a Greener Environment, LLC) CHANGE"). CHANGE is a global leader in air quality and human health exposure risk assessment. I started CHANGE in 2008.

Q. What other certifications or experiences further qualify you to provide your expert testimony?

A. I am the recipient of the 2023 International Association of Top Professionals Award, 2023 Cover Story and Awards for Excellence in Industry for The Enterprise World, Inspire Zones, Innovators and Entrepreneur Award CEO Time, and Best Performing CEO's including 2022 Top 100 CEO Environmental Industry Award and Environmental Business Aware for Global Leadership in Climate Change in 2021. CHANGE Environmental, LLC received the Best Environmental Strategy and Compliance award and Albany Business Review Professional Achievement Award for Environmental Consulting in 2020. In 2017, I was awarded Inclusion into Industry Experts Magazine. I received the National Environmental Leadership and Excellence award in 2016. I have served on the Transportation Research Board, Committee on Transportation and Air Quality at the National Academy of Sciences in Washington, the American Chemical Society Committee on Environmental Initiatives, and the United States Environmental Protection Agency Scientific Advisory Board. In addition, I am also a peer elected member of several subcommittees at the National Academies in areas of aviation, transportation, air quality, indoor air quality, exposure assessment, and human health.

Q. Have you previously provided expert testimony?

A. I have been previously and currently engaged in several environmental litigation cases as an expert witness. For almost 20 years, I have supported attorneys and their clients both domestically and internationally on several environmental matters. Expert support has included providing strategic and innovative approaches and professional scientific expertise and experience as a leading a highly respected and recognized air quality and human health and exposure assessment scientist. My work has involved conducting hundreds of air modeling exercises including designing, setting up, collecting, and analyzing hundreds of thousands of data points to assess air quality impacts for point, stationary, areas, non-stationary, mobile, and

agricultural sources. I have written dozens of professional expert reports in all these subject matter areas. This includes providing deposition and trial testimony at both state and federal courts.

Q. What other expert consultancy experience do you have in the air quality and human health assessment?

A. Prior to staring CHANGE Environmental, LLC, formerly Consulting for Health, Air, Nature & a Greener Environment, LLC, I was the State of Massachusetts Toxicologist to leading the Environmental Compliance Group that had a heavy focus on air quality and environmental impacts for a variety of statewide projects seeking permits, application reviews, and new source reviews for proposed gas and/or power stations. Prior to this position, I was the lead investigator of a multi-continental group of air quality and epidemiology scientists studying particulate matter impacts on the first ever study in Ho Chi Minh City, Vietnam across 64 districts that involved air monitoring, air modeling, and exposure assessment techniques.

Q. Dr. McAuley, based upon your education, training, and experience, do you believe that you are capable for expressing an opinion to a reasonable degree of professional certainty as to the environmental impact on air quality as it relates to the proposed gas reliability station that is the subject to this proceeding?

A. Yes, I do.

Q. Dr. McAuley, are you sponsoring any exhibits?

A. Yes. I am sponsoring Exhibit TM-1, which is professional resume of CV. I am also sponsoring Exhibit TM-2, which is my expert report.

III. EMISSIONS

Q. Where are the emission points associated with the gas reliability station?

A. The facility will include several processes and equipment that have the potential to emit regulated pollutants in quantifiable amounts. These processes and equipment include the heater, standby generator, leaks from valves, flanges and connectors, roadways, and tailpipe emissions from automobiles. Our report only evaluates emissions and impacts from the heater and standby generator because they are expected to be the largest sources of emissions at the facility.

Q. **What are the expected potential emissions from the heater and standby generator?**

A. Table 1 of my report, which is below for ease of review, illustrates the estimated emissions from the heaters and standby generator which. Table 1 does not list or quantify emissions of all pollutants potentially emitted by the proposed heater or generator, but it includes those pollutants that are likely to have the greatest air quality impact on nearby communities based on their emission rates.

Table 1. Estimated Emissions from PECO's Proposed Heater and Standby Generator.

Pollutant	Heater Expected Maximum Emissions		Standby Generator Expected Maximum Emissions		
	lb/hr	lb/yr	lb/hr	Typical (lb/yr) (4)	Worst Case (lb/yr) (4)
Nitrogen Oxides (NOx) (1), (2)	0.462	4,047.12	0.3688	184.41	3,230.81
Sulfur Dioxide (SO_2) (3)	0.002772	24.28	0.0002	0.12	2.05
Carbon Monoxide (CO) (1), (2)	0.38808	3,399.58	0.7325	366.25	6,416.62
Total Organic Compounds (3)	0.05082	445.18	0.1428	71.39	1,250.73
Volatile Organic Compounds (VOC) (3)	0.02541	222.59	0.1428	71.39	1,250.73
Particulate Matter ($PM_{2.5}$) (3)	0.035112	307.58	0.0077	3.87	67.81
Acetaldehyde (3)	N/A	N/A	0.0011	0.56	9.75
Acrolein (3)	N/A	N/A	0.0010	0.52	9.19
Benzene (3)	0.000009702	0.08	0.0006	0.32	5.52
Dichlorobenzene (3)	0.000005544	0.05	N/A	N/A	N/A
Formaldehyde (3)	0.0003465	3.04	0.0082	4.09	71.62

Toluene (3)	0.000015708	0.14	N/A	N/A	N/A
Methanol (3)	N/A	N/A	0.0012	0.61	10.69

Q. How were the potential emissions calculated?

A. Potential emissions from the heater assume 8,760 hours per year of operation consistent with EPA's guidance for determining the unrestricted potential to emit (PTE) of a source of emissions. The Clean Air Act defines PTE as the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. The PTE is the appropriate emission rate for estimating potential air quality impacts from a proposed source.

IV. AIR QUALITY IMPACTS

Q. Dr. McAuley, are there potential impacts to the air quality in and around 2090 Sproul Road, Marple Township, PA as a result of PECO's proposed operation of a Gas Reliability Station on that location?

A. Yes, there are.

Q. Can you explain those potential impacts to the air quality?

A. Based on the assessment, we found that air quality impacts from the proposed facility would be experienced by communities as far away as 1 mile from the facility. Specifically, within a one-mile radius from the facility, the facility would cause or contribute to measurable impacts from emissions of nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter ($PM_{2.5}$), benzene and formaldehyde, among others. The most significant air quality impacts would occur within a half-mile of the facility.

Q. How did you perform your assessment?

A. To determine the extent to which the facility's emissions would impact air quality in nearby communities, we modeled the dispersion of representative pollutants using the American

Meteorological Society/EPA Regulatory Model (AERMOD) Version 22112, an EPA-approved dispersion model that EPA uses to support its regulatory programs. Specifically, we modeled potential impacts from emissions of benzene, CO, formaldehyde, NOx (as nitrogen dioxide) and $PM_{2.5}$

Q. How much of an area is likely to be affected by the emissions from the proposed facility?

A. Emissions from the facility are likely to be dispersed into many communities surrounding the facility. Indeed, our analysis found that although the worst air quality impacts would occur close to the facility's boundaries, measurable air quality impacts would occur up to 1 mile away from the facility. However, the worst impacts would be borne by residents living within one-half mile from the facility (approximately one-square mile of area). According to EPA's environmental justice screening and mapping tool (*EJScreen*), this area is home to nearly 3,000 residents at the Preferred Location and approximately 2,000 at the Alternative Location (See Exh. B, figures 6 and 7). The proposed facility is also adjacent to a vibrant shopping center and near an elementary school and playing fields, all located within the area projected to experience the worst impacts from the Preferred Location facility operations. Operations would potentially impact those who work, attend and visit these uses as well.

Q: From your study, do you have any findings regarding projected maximum concentrations of emissions?

A: Yes. Tables 2 through 4 show the modeled maximum concentrations for select pollutants emitted at the Preferred Location, based on 5 years of meteorological data and other model inputs and assumptions as discussed therein, and without accounting for background concentrations. Tables 5 through 7 present the same data for the Alternative Location. These

tables show the peak concentration in micrograms per cubic meter ($\mu g/m^3$), the Universal Transverse Mercator (UTM) coordinates for the location where the peak concentration occurred, and the approximate distance from the centroid of the facility to the location of the peak concentration. This information is provided for each modeled pollutant and three averaging periods: 1 hour (Tables 2 and 5), 24 hours (Tables 3 and 6) and annual (Tables 4 and 7). As shown in Tables 2 through 7, for each pollutant modeled, the peak concentration occurred slightly over 100 feet from the estimated centroid of the facility. This distance suggests that depending on the ultimate installation locations of the equipment, the peak concentrations could occur outside of the facility's fence line, including the immediately surrounding residential properties and the adjacent restaurant.

Q: Do you have an opinion as to whether these emissions and concentrations adversely affect air quality?

A: Yes. In my opinion, this would potentially expose members of the public to unhealthy levels of air pollution at certain times while the facility is operating. For example, our modeling shows that 1-hour averaged Nitrus Dioxide (NO_2) concentrations from the facility could reach 155 and 170 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively, under typical operating conditions and without considering prevailing background concentrations. At worst-case conditions, if the standby generator were to operate year-round, 1-hour averaged NO_2 concentrations from the facility could exceed 1,200 $\mu g/m^3$ at the Preferred Location, but a much lower 1-hour peak concentration of 176 $\mu g/m^3$ would occur at the Alternative Location. For this analysis, we used EPA's Tier 1 screening approach for estimating NO_2 concentrations, which assumes that 100 percent of nitrogen oxides would be converted to NO_2 in the atmosphere.

According to EPA, during the period 2020 through 2022, the NO_2 "design value" (i.e., background concentration) for Delaware County was 41 parts per billion (ppb) (or about 77 $\mu g/m^3$). The annual "design value" for the same period was 10 ppb (or about 19 $\mu g/m^3$). Thus, under projected typical operating conditions, emissions from PECO's proposed facility could cause 1-hour averaged NO_2 concentrations within the vicinity of the facility to exceed background concentrations by over 200 percent at either the Preferred or Alternative Locations, respectively. For the annual average, under typical operating conditions, the facility could add as much as 12.9 and 15.8 $\mu g/m^3$ of NO_2 to the annual background NO_2 concentrations at the Preferred and Alternative Locations, respectively (i.e., about 68 and 150 percent more NO_2 compared to the design value of 19 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively).

With respect to Particulate Matter ($PM_{2.5}$) during the period 2020 through 2022, the $PM_{2.5}$ 24-hour and annual averaged background concentrations for Delaware County were 22 and 9.1 $\mu g/m^3$, respectively. Our modeling shows that under typical operating conditions, the facility could add as much as 5.4 and 6.8 $\mu g/m^3$ of $PM_{2.5}$ (24-hour average) at the Preferred and Alternative Locations, respectively (i.e., about 25 and 31 percent more $PM_{2.5}$ compared to the 24-hour design value of 22 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively). At worst-case conditions, if the standby generator were to operate year-round, 24-hour averaged $PM_{2.5}$ concentrations from the facility could add about 75 percent more 24-hour averaged $PM_{2.5}$ concentrations at either the Preferred or Alternative Locations. For the annual averaged concentrations, annual average peak $PM_{2.5}$ concentrations would exceed the background concentrations by a more modest 10 to 15 percent at the either the Preferred or Alternative Locations.

Similar analyses and conclusions can be made for other averaging periods and pollutants listed in Tables 2 through 7 of my report.

Q: Do you have any findings as to who would be impacted by operations of proposed PECO facility.

A: Yes. CHANGE investigated the number of persons that would be exposed to the highest concentrations of pollutants emitted by the facility. To do this, we determined the numerical distance from the facility where modeled concentrations appeared to taper off to near background levels, created a buffer around the facility based on that distance, and estimated the residential population within that buffer area using EPA's *EJScreen*. The results of our investigation are graphically represented in Figures 8 and 9, and in Appendix B.

Overall, we found that for approximately the same levels of pollutant concentrations, for some pollutants and averaging periods, fewer residents would be exposed to elevated concentrations at the Alternative Location than at the Preferred Location. For other pollutants and averaging periods, the level of exposure does not substantively change although those pollutants tended to be dispersed farther out at the Alternative Location than at the Preferred Location. This additional dispersion contributed to more exposed residents at the Alternative Location than at the Preferred Location for those pollutants or averaging periods. For example, in Figure 8, for a 1-hour NO_2 concentration of about 10 $\mu g/m^3$, approximately the same number of residents would be exposed to that concentration or higher at the Preferred and Alternative Locations under typical operating conditions (Figures 8(a) and (c)). However, under worst case conditions, the same pollutant is dispersed farther at the Alternative Location than at the Preferred Location and significantly more people are exposed to an NO_2 concentration of 10 $\mu g/m^3$ or higher (Figures 8(b) and (d)). In contrast, in Figure 9, for an annual NO_2 concentration of about 0.5 $\mu g/m^3$, more

residents would be exposed to that concentration or higher at the Preferred Location than at the Alternative Location. This is true for both typical (Figures 9(a) and (c)) and worst case (Figures 9(b) and (d)) conditions.

Q: In your opinion do the emissions anticipated from the proposed PECO facility raise any health concerns?

A: Yes: As noted in our report, air modeling was not conducted to specifically evaluate a specific receptor health hazard evaluation via any type of dose/response pathway. Modeling was carried out to evaluate the additional emissions that would likely be coming from the proposed PECO facility into the community. Of the modeled results, most of the pollutants do show emissions being generated. However, modeled concentrations are not able to definitively assess actual ground level concentrations related to actual operations. Therefore, although the modeled results for most of the pollutants do not seem to indicate ambient air concentrations would exceed any levels of direct health concern population, that is not to indicate that actual levels would not be higher as Benzene and Carbon Monoxide and Formaldehyde have been shown across various studies to be higher nearer gas plants and gas stations and that caution to elevated exposures near these locations should be considered like for those residents in the proposed location closest to the proposed PECO facility. It is also recognized that Benzene and Formaldehyde are known human carcinogens and that any contributory levels of these should be avoided especially those residents closest to the facility that modeling showed emissions of these pollutants to the PECO proposed facility.

Although in many cases those pollutants like Benzene and Formaldehyde to tend to be more familiar with the general public, gases like Nitrogen Dioxide (NO2) can often be overlooked and/or not considered to be a pollutant of concern. However, as a professional scientist and past

member of several USEPA advisory and air quality committee, the levels of modeled estimated emissions of Nitrogen Dioxide (NO2) at the Preferred Location is of significant concern for the community as the levels of NO2 that would be produced from the operations of the PECO facility are staggering. As illustrated in Table 1, in evaluating worst case 1-hr conditions at the preferred location, levels of 1-hour ambient concentrations for NO2 exceed the [1]National Ambient Air Quality Standards (NAAQS) by almost 6 times with a possible worst case modeled emissions concentration of 0.632 ppm for 1-hour. The NAAQS 1-hour is 0.1 ppm. The alternative location worst case as shown in Table 5 modeled results was 0.091 ppm, which is below the 1-hour NAAQS standard. Therefore, the alternative site would be significantly more protective of ambient air quality impacts to the community.

Exposure to elevated levels of NO2 above the NAAQS would be expected to be directly correlated to hundreds of studies published in the scientific peer review literature that should exposures to NO2 in children and adults and elderly be elevated acute and chronic health effects can be and have been shown to be directly linked with issues of lung development such as breathing rates and lung volume, throat and lung upper respiratory irritation of airways and asthma exacerbation and development over time. Additional studies have shown evidence of increased inflammation of the airways, wheezing, and coughing leading to elevated emergency room visits and reduction of immunity leading to increased lung infections. Therefore, the 1-hour concentrations found for NO2 modeled would result in adverse health effects both acute and chronic exposures to this concentration of NO2 would unequivocally result in adverse health effects across the community as discussed and described in hundreds of peer reviewed publications on NO2 exposures.

It is also critical to recognize that NO2 is also a precursor to the formation of ground level ozone (O3) and particulate matter. Ozone is recognized by various federal agencies (USEPA, The Centers for Disease Control (CDC)) to cause a significant number of health effects. Health effects include respiratory irritation, throat and airway inflammation, asthma aggravation and increased susceptibility to lung tissue damage, cardiovascular impacts including breathing issues. Therefore, with the extremely high levels of NO2 likely to be produced at levels shown to be deleterious to humans including resulting in formation of Ozone another concern for contribution to adverse health impacts the preferred site location will pose a significant health risk to the community.

Although CHANGE did not conduct a full exposure assessment or health impact assessment, our modeling results suggest that emissions from the facility could substantively increase pollutant concentrations within the vicinity of the facility and residents would be exposed to the additional pollution regardless of the location ultimately selected. In fact, it is probable that the peak pollutant concentrations from facility operations could occur outside of the facility's fence lin. Although the worst air quality impacts would occur close to the facility's boundaries, measurable air quality impacts would occur up to 1 mile away from the facility. However, the worst impacts would be borne by residents living within one-half mile from the facility (approximately one-square mile of area).

Q: In your opinion, given potential impact of reduced air quality and emissions resulting from the proposed PECO facility, should this facility be located where proposed?

A: Given the significant residential, commercial and school population within the area of impact if the facility is located where proposed, this does not appear to be an appropriate location for this facility.

Q: Do you wish to make any qualifying statement regarding your report and testimony herein.

A: Yes. Our report and all information contained therein and my testimony herein is based on my expertise and experience in conducting air quality impact analysis. All scientific analysis presented in our report and herein is in accordance with industry accepted scientific practice methods and all opinions are held with a strong degree of scientific certainty and professionalism.

IV. CONCLUSION

Q. Does this conclude your Direct Testimony?

A. Yes. However, I reserve the right to file such additional testimony as may be necessary or appropriate.

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SUMMARY BIO

Dr. Timothy R. McAuley is the Founder & Chief Executive Officer of CHANGE Environmental, LLC a certified Veteran Owned Small Business headquartered in Upstate, NY. Dr. McAuley is a leading authority and multi- award-winning environmental leader and recognized expert in the fields of air quality, epidemiology, infectious disease, and human health exposure and risk assessment. He has directed, managed, and consulted on numerous cutting edge domestic and global environmental consulting and research studies in his areas of expertise. As a result of his work and contributions to the environmental field, Dr. McAuley has been invited to give several keynote speeches and has become a global resource for environmental forward thinking and a leader in his field. He is also currently an elected member by his peers to several national committees.

Dr. McAuley is a highly sought-after expert for given his extensive background and strong record in particulate matter studies and exposures including designing and managing dozens of particulate studies including being a subject matter expert in areas of epidemiology, and infectious disease along with being a leader in his field around air quality and human health exposure assessment. He has been supporting several clients (attorney's/private clients) recently and over the years regarding viral exposures including over last few years national COVID safety programs and expertise COVID transmission and impacts on human health, and assessment of exposures (e.g., COVID-19, SARS). Additional multiple legal support for expert witness is in areas of bacterial, mold, and various impacts on health (i.e., inhalation, dermal, and ingestion exposures).

Dr. McAuley also provides additional consulting and expert services to dozens of. attorneys across the United States on several high profile dealing with various environmental impacts. Dr. McAuley experience and expertise stretches across 17 years for cases supporting attorneys for plaintiffs, defense teams, community groups, and non-profit organizations.

Dr. McAuley received his PhD. in Environmental Science and Engineering and his MS in Chemistry Clarkson University along with a BS in Biochemistry from The College of Saint Rose, where he is also a member of the Board of Associates and a member of the Alumni of Prominence Cabinet recognizing individuals who have demonstrated exceptional leadership and dedication to their industries.

EDUCATION

2006 PhD, Air Quality, Human Health Exposure and Risk Assessment , Clarkson University, Potsdam, NY

2003 MS, Chemistry, Clarkson University, Potsdam, NY

2001 BS, Biochemistry, The College of Saint Rose, Albany, NY

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EXPERIENCE

Founder and CEO, CHANGE Environmental, LLC, Saratoga Springs, NY, 2008 – Present

Respected by my peers and colleagues as a global leader in air quality and human health exposure assessment.

Developed a highly recognized global network for supporting air quality, sustainability, energy, and human health exposure assessment projects in several countries in over four continents.

Recognized by other business leaders and companies for strategically forming a company comprised of recognized environmental subject matter experts.

Generated and maintained since the inception of the company a positive cash flow by establishing and adhering to strict protocols of quality assurance for ensuring strategic business decisions.

Consulted on several initiatives for promoting and establishing cutting edge research for addressing and promoting new programs aimed at examining domestically and internationally key needs, such as energy use and production, sustainability, and climate change initiatives.

Additional expert support on work history can be provided upon request.

HONORS AND AWARDS :

2022

- Top 100 CEO Environmental Industry Award

2021

- Environmental Business Award for Global Leadership in Climate Change

2020

- CHANGE Environmental, LLC Best Environmental Strategy and Compliance Consultancy Award
- Albany Business Review Professional Achievement Award for Environmental Consulting and Leadership

2019

National Renewable Energy and Policy Climate Change Award, by Environmental Business Journal International.

2017

- National Community Engagement and Business Achievement Award, by Environmental Business Journal International.
- Awarded, Inclusion into Industry Experts Magazine

2016

- Awarded, National Environmental Leadership and Excellence
- Award by Environmental Business Journal International.
- Awarded, Executive of the Year Award, Awarded by National Association of Distinguished Professionals
- Awarded, Distinguished Alumni Award, The College of Saint Rose

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EXPERT SUPPORT AREAS

- Particulate Matter Studies
- Epidemiology and Infectious Disease (transmission pathways of viral, bacteria, air pollution, environmental insurance & exclusion)
- Environmental Toxicology of Air, Soil, and Groundwater Health Risk Assessment (TCE, PCE, PCBs, PFOA, PFOS & Environmental Toxins) Chemical Exposures
- Environmental Remediation Exposure Assessments/Contamination
- Ambient & Indoor Air Quality Modeling & monitoring
- Stationary & Mobile Source Modeling (GHG's, Particulates, Gases) Asbestos Exposure & Mesothelioma
- Lead Assessments and Exposure Pathways
- Water Quality Exposures Assessment (Metals, Gases, Particulates)
- Silica Dust Monitoring/Analysis/Human Health Assessments
- Mold Impacts to Health Exposure & Health Effects
- Multi Path Exposure Assessment (Air, Water, & Soil)
- Medical Records Data Review for Exposure Matching of Symptoms
- Human Health Risk Assessments (RCRA, CERCLA)
- Product Liability & Technologies
- Toxic Tort
- Environmental Litigation
- Data Validation/Third Party Assessments
- Public Health

AIR QUALITY IMPACTS FROM PECO'S PROPOSED NATURAL GAS RELIABILITY STATION IN DELAWARE COUNTY, PENNSYLVANIA

1. Executive Summary

CHANGE Environmental, LLC (CHANGE) has analyzed potential air quality impacts of Philadelphia Electric Company (herein after "PECO") proposed operation of a new natural gas reliability station (facility) at 2090 Sproul Road in Marple Township, Pennsylvania.[1] PECO, Marple Township and Delaware County have also discussed the possibility of locating the facility at an alternate site at the intersection of Sproul Road and Reed Road in Marple Township, Pennsylvania. This report summarizes the results of our evaluation of potential air quality impacts of operations at either location. For this purpose, we refer to the location at 2090 Sproul Road as PECO's "Preferred Location" and the alternative site as the "Alternative Location."

We found that air quality impacts from the proposed facility would be experienced by communities as far away as 1 mile from the facility. Specifically, within a one-mile radius from the facility, the facility would cause or contribute to measurable impacts from emissions of nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter ($PM_{2.5}$), benzene and formaldehyde, among others. The most significant air quality impacts would occur within a half-mile of the facility, regardless of the ultimate location selected. Overall, for some pollutants, fewer residents who live near the Alternative Location would be exposed to the facility's emissions than at the Preferred Location, but this was not always the case. However, this report is not an exposure assessment and should not be construed to present the results of a health impact assessment.

2. Facility Description

The facility will be designed to reduce the pressure of natural gas that is transported from PECO's West Conshohocken LNG Plant to Delaware County.[2]As proposed, the facility will consist of a network of pipes, valves and regulators, two buildings (an approximately 2,000 square-foot "Station Building" and a smaller 160 square-foot "Fiber Building"), a 4.62 million British thermal units per hour (MMBtu/hr) natural gas-fired heater and a natural gas-fired standby electrical generator. The heater will consist of 6 boilers each rated at 0.77 MMBtu/hr. An artist's rendition of the proposed facility is shown in Figure 1.

The proposed site locations are depicted in Figure 2. The Preferred Location is at the south corner of the intersection of Sproul Road (Route 320) and Cedar Grove Road in Broomall, PA. The property was previously home to a gasoline station and is close to restaurants, a shopping area, residences, and a school (Russell Elementary School). The Alternative Location is an open

[1] PECO is Pennsylvania's largest electric and natural gas utility, with more than 1.5 million customers in southeastern Pennsylvania. https://www.peco.com/AboutUs/Pages/Default.aspx

[2] Testimony of Timothy Flanagan Before the Pennsylvania Public Utility Commission, Docket No. P-2021-302432, pp 3-4, May 14, 2021

space on the east side of Sproul Road close to corner with Reed Road in Broomall, PA, within the R-B Residential, R-C Residential, and INS Institutional Districts.

Figure 1. Artist's Rendering of PECO's Proposed Facility.

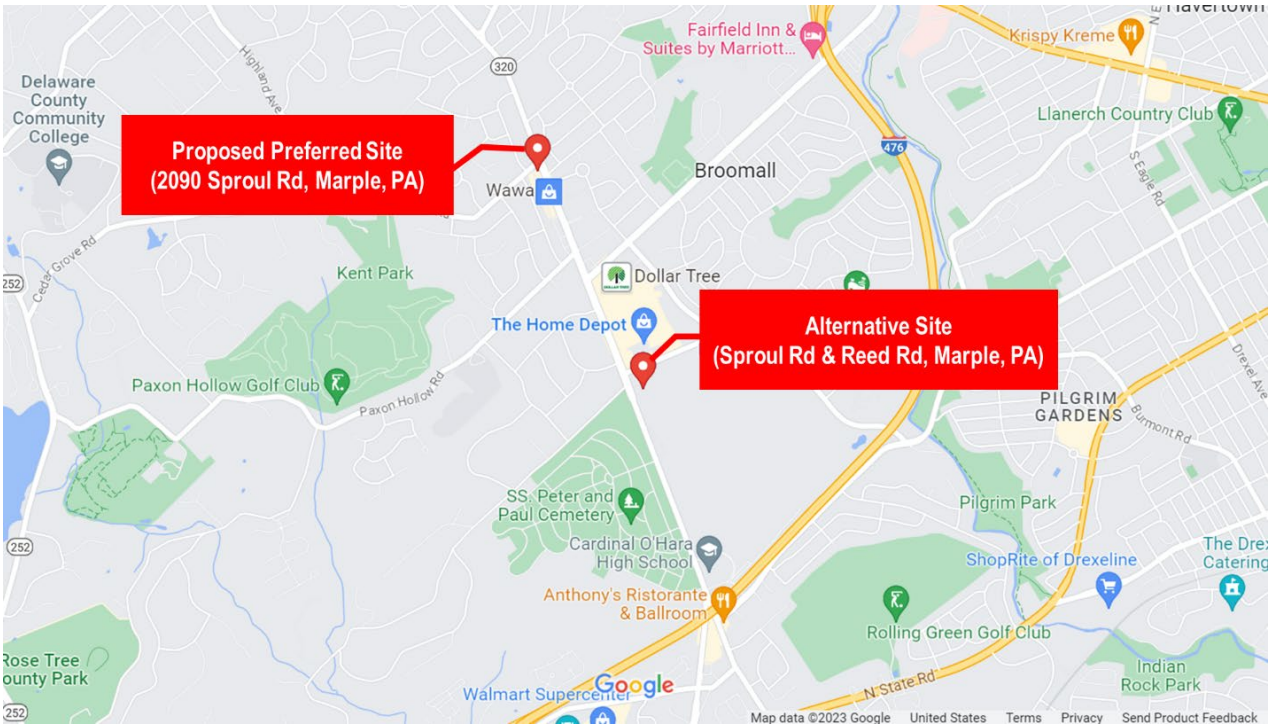

Figure 2. Locations Being Considered for PECO's Proposed Facility.

PECO has provided specifications for two standby generators: a 30 kilowatt (kW) model MTU 4R0063 GS30 Gas Generator Set and a 50 kW model MTU 8V0071 GS50 Gas Generator Set. For this report, we have assumed that the smaller 30 kW MTU natural gas-fired generator would be installed, and the model inputs and assumptions reflect that type and size of standby generator. We do not expect that installation of a 50 kW generator would change our primary conclusions about the project.

3. Existing Meteorological Conditions

CHANGE analyzed 5 years of meteorological data collected at the Philadelphia International Airport's meteorological tower from January 1, 2018 through December 31, 2022. The meteorological station is approximately 9.5 and 9 miles southeast of the preferred and alternative locations, respectively (Figure 3). Due to the Alternative Location's proximity to the Preferred Location, we used one set of meteorological data to evaluate conditions in the vicinity of either of the proposed locations.

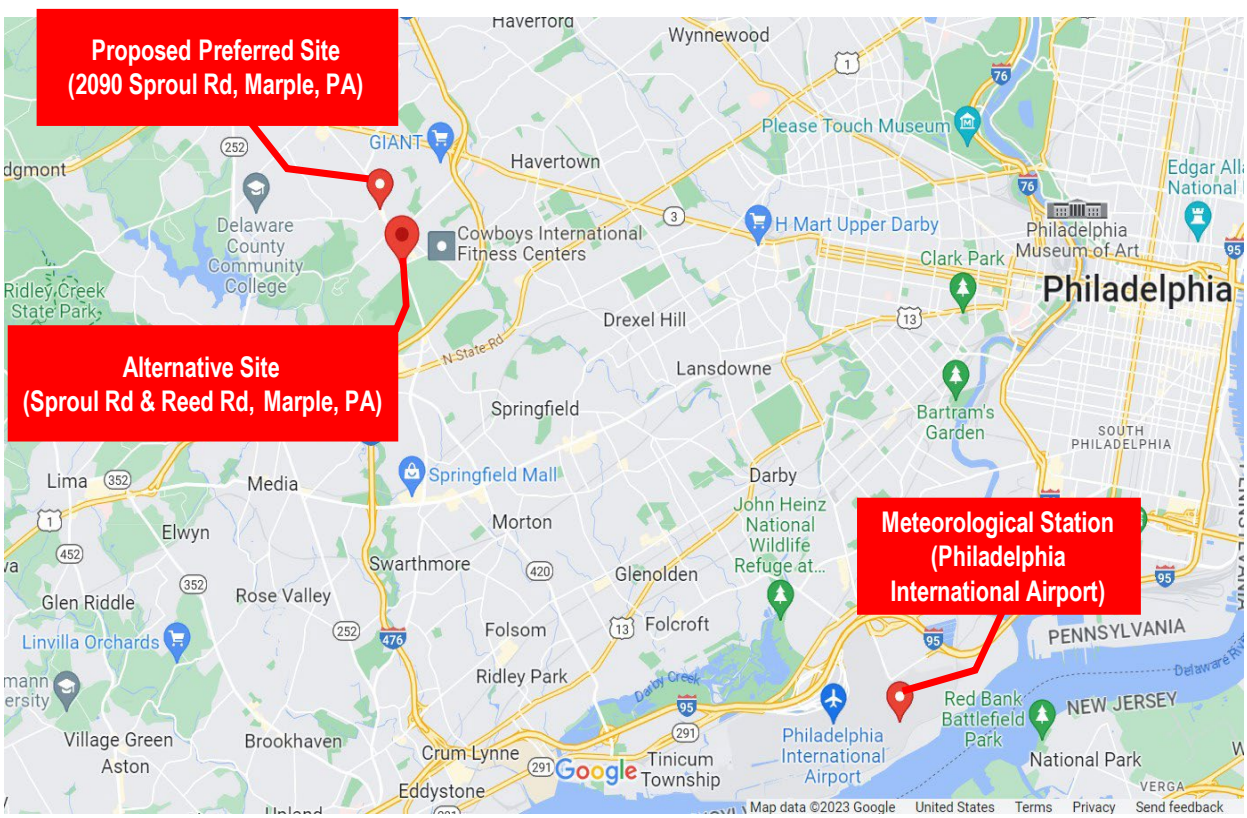

Figure 3. Location of the Meteorological Station Relative to the Facility's Proposed Locations.

The data consisted of hourly summaries of measurements of wind speed, wind direction and many other meteorological parameters made at Philadelphia International Airport (Station ID. 13739) from January 1, 2018 through December 31, 2022. We used the WRPLOT View™

program (Version 11.2.0)[3] to analyze the data. Because a wind direction was typically not reported when winds were "calm" (i.e., a negligible speed of 0 meters per second (m/s)), we excluded from our analysis periods of both calm winds (i.e., wind speeds of 0 m/s) and any periods without a non-zero wind direction.

Figure 4 (top) shows a wind rose of the wind speeds and direction over the entire study period. A wind rose is a graphical representation of how wind speeds and direction are typically distributed at a particular location. Wind direction is represented as the direction from true north using compass directions (e.g., 360 degrees = true north, 90 degrees = east, 180 degrees = south, 270 degrees = west). The wind rose indicates the frequency of winds blowing from particular directions, with the length of each "spoke" around the circle representing the frequency of time that the wind blew from that direction. Each concentric circle represents a different frequency, emanating from zero at the center to increasing frequencies at the outer circles. The colors along the spokes indicate the six categories of wind speed evaluated: 0.5-2, 2-4, 4-6, 6-8, 8-10 and ≥10 m/s. The larger the visible color of the wind speed category on the chart, the more prevalent was that wind speed category.

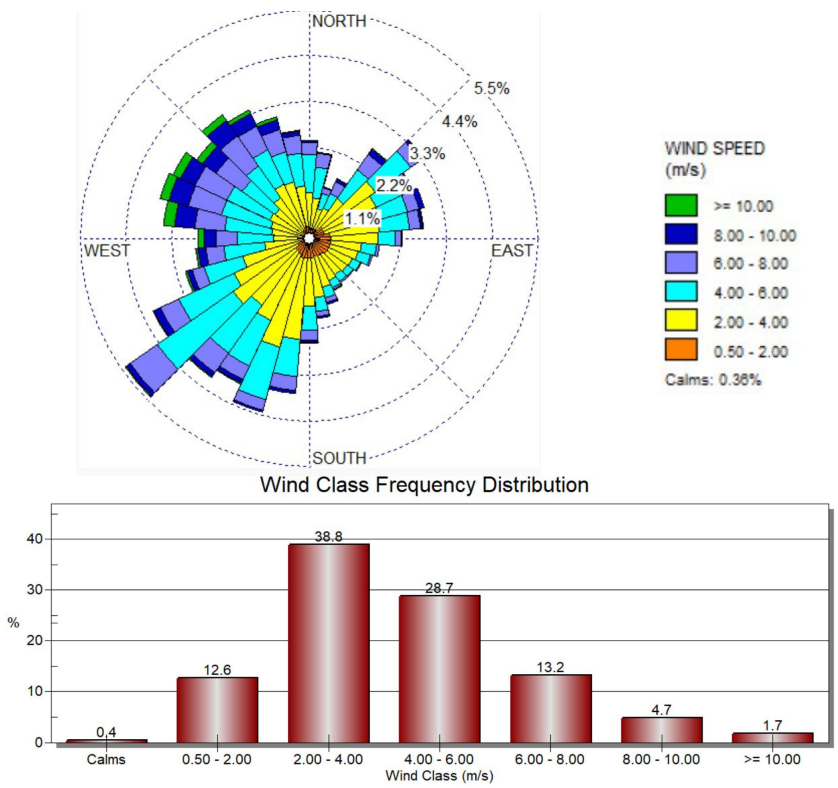

Figure 4. Overall Wind Rose and Wind Class Distribution for the Study Period (2018-2022).

[3] Lakes Environmental Software, Waterloo, Ontario.

As shown in Figure 4 (top), winds generally blew from the southwest, northwest or northeast directions relative to the meteorological station. The average wind direction was 199 degrees over the 5-year period. The average wind speed was 9.6 miles per hour, with wind gusts of up to 35.5 miles per hour. Figure 4 (bottom) shows the distribution of wind speeds, in meters per second (m/s), over the 5-year study period. Wind speeds measuring 2-6 m/s (4.5-13.4 miles per hour) were the most prevalent, accounting for more than two-thirds of the measured winds.

Figure A-1 (Appendix A) shows meteorological profiles for winter (December, January and February), spring (March, April and May), summer (June, July and August) and fall (September, October and November). Overall, there were no significant seasonal (temporal) differences in the meteorological profiles. Like the overall profile depicted in Figure 4, winds measuring between 2 and 6 m/s were predominant in each season as shown in Figure A-2.

We investigated whether the area's meteorology has a diurnal pattern by generating wind roses for various time blocks. We chose four 6-hour time blocks corresponding to midnight to 5:00 am, 6:00 to 11:00 am, noon to 5:00 pm, and 6:00 to 11:00 pm. The resulting wind roses are shown in Figure A-3 (Appendix A). As would be expected, we found that although the prevailing wind direction did not substantially change over the course of a given day, the winds were generally calmer at night than during the day. Figure A-4 (Appendix A) shows wind roses for each of the 5 years studied. As shown in Figure A-4, there was no significant year-over-year variability in the meteorological profiles during the study period.

4. Emissions

The facility will include several processes and equipment that have the potential to emit regulated pollutants in quantifiable amounts. These processes and equipment include the heater, standby generator, leaks from valves, flanges and connectors, roadways, and tailpipe emissions from automobiles. This report only evaluates emissions and impacts from the heater and standby generator because they are expected to be the largest sources of emissions at the facility.

Table 1 provides a summary of the expected potential emissions from the heater and standby generator. We used two sources of information to develop emissions factors used to calculate the emissions in Table 1: PECO's interrogatories and associated submittals, and the United States environmental Protection Agency (EPA)'s Compilation of Air Emissions Factors (AP-42).[4] An emissions factor is a representative value that attempts to relate the quantity of a pollutant emitted to the atmosphere with process emitting that pollutant. in the absence of facility-specific actual emissions measurements, emissions factors are a useful, effective and generally accepted means for estimating potential emissions from a proposed or existing facility.

[4] https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors

Table 1. Estimated Emissions from PECO's Proposed Heater and Standby Generator.

Pollutant	Heater Expected Maximum Emissions		Standby Generator Expected Maximum Emissions		
	lb/hr	lb/yr	lb/hr	Typical (lb/yr) (4)	Worst Case (lb/yr) (4)
Nitrogen Oxides (NOx) (1), (2)	0.462	4,047.12	0.3688	184.41	3,230.81
Sulfur Dioxide (SO_2) (3)	0.002772	24.28	0.0002	0.12	2.05
Carbon Monoxide (CO) (1), (2)	0.38808	3,399.58	0.7325	366.25	6,416.62
Total Organic Compounds (3)	0.05082	445.18	0.1428	71.39	1,250.73
Volatile Organic Compounds (VOC) (3)	0.02541	222.59	0.1428	71.39	1,250.73
Particulate Matter ($PM_{2.5}$) (3)	0.035112	307.58	0.0077	3.87	67.81
Acetaldehyde (3)	N/A	N/A	0.0011	0.56	9.75
Acrolein (3)	N/A	N/A	0.0010	0.52	9.19
Benzene (3)	0.000009702	0.08	0.0006	0.32	5.52
Dichlorobenzene (3)	0.000005544	0.05	N/A	N/A	N/A
Formaldehyde (3)	0.0003465	3.04	0.0082	4.09	71.62
Toluene (3)	0.000015708	0.14	N/A	N/A	N/A
Methanol (3)	N/A	N/A	0.0012	0.61	10.69

(1) For the heater, emissions factors are from EPA's AP-42, Section 1.4-1.
(2) For the standby generator, emissions factors are from fact sheets included in PECO's interrogatories.
(3) Emissions factors are from EPA's AP-42, Sections 1.4-2 and 3.2-3 for the heater and standby generator, respectively.
(4) "Typical" maximum emissions for the generator assume 500 hours per year of operation; "Worst Case" emissions assume 24/7 operation (8,760 hours per year).

Potential emissions from the heater assume 8,760 hours per year of operation consistent with EPA's guidance for determining the unrestricted potential to emit (PTE) of a source of emissions.[5] The Clean Air Act defines PTE as the maximum capacity of a stationary source to emit a pollutant under its physical and operational design.[6] The PTE is the appropriate emission rate for estimating potential air quality impacts from a proposed source. Air pollution controls, including reduced hours of operation, can be considered in the calculation of a facility's PTE if such controls and operational restrictions are enforceable as a practical matter.

For the standby generator, Table 1 includes two estimates of emissions for a 30 kW standby generator: "typical" and "worst case" maximum emissions. "Typical" maximum emissions assume the standby generator would operate for emergency purposes and required readiness testing only. Under those circumstances, EPA allows facilities to estimate unrestricted potential emissions for standby generators assuming 500 hours per year of operation (instead of the usual

[5] See, for example, "Potential to Emit: A Guide for Small Businesses," EPA Office of Air Quality Planning and Standards, EPA-456/B-98-003, October 1998. Available at https://www3.epa.gov/airtoxics/1998sbapptebroc.pdf
[6] See Sections 110, 112 and Title V of the Clean Air Act.

8,760 hours per year).[7] "Worst Case" emissions assume the generator would not be limited to operation under emergencies and required readiness testing and must therefore quantify potential emissions based on 24/7 operation (8,760 hours per year). As previously discussed, PECO has provided specifications for both a 30 kW generator and a 50 kW generator; however, although a 50 kW generator would have slightly more emissions than a 30 kW generator, the difference in emissions and resultant air quality impacts would not change our main conclusions regarding the project's air quality impacts.

Table 1 does not list or quantify emissions of all pollutants potentially emitted by the proposed heater or generator, but it includes those pollutants that are likely to have the greatest air quality impact on nearby communities based on their emission rates. Table 1 also does not include expected emissions from other potential sources of emissions at the facility, such as VOC emissions from leaking valves, flanges and other piping components, or emissions of NOx, CO, $PM_{2.5}$ and other pollutants from roadways and automobiles.

5. Air Quality Impacts

A. Modeling Overview

To determine the extent to which the facility's emissions would impact air quality in nearby communities, we modeled the dispersion of representative pollutants using the American Meteorological Society/EPA Regulatory Model (AERMOD) Version 22112, an EPA-approved dispersion model that EPA uses to support its regulatory programs. Specifically, we modeled potential impacts from emissions of benzene, CO, formaldehyde, NOx (as nitrogen dioxide) and $PM_{2.5}$. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.[8] In estimating impacts from a source of emissions, the model considers effects of the area's meteorology, terrain and nearby buildings or structures.

B. Model Inputs

AERMOD requires many variables as inputs, including design information for the proposed equipment, information on any buildings and other structures that could affect dispersion of pollutants, and data indicating the area's terrain and meteorology, among others. We obtained some of the inputs required by the model from interrogatories and other information supplied by PECO; however, we made assumptions regarding those variables that were not addressed by PECO's submittals. Where we made assumptions, our assumptions were based on publicly available information for similar facilities or equipment, estimates from engineering drawings provided in PECO's submittals (e.g., setback distances) or engineering judgement. Table 2 is a

[7] See EPA Memorandum: "Calculating Potential to Emit (PTE) for Emergency Generators," September 6, 1995, available at: https://www.epa.gov/sites/default/files/2015-08/documents/emgen.pdf
[8] https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

summary of some of the key variables and assumptions we used as model inputs. For the Alternative Location, except for equipment locations where we made assumptions on where the equipment would reasonably be located, we assumed the equipment and stack information at the Alternative Location would be identical to that of the Preferred Location.

Assumed Equipment Locations for the Preferred Locations				Assumed Equipment Locations for the Alternative Location			Stack Information Used for Each Location			
Emission Unit	**UTM Easting (km) (1)**	**UTM Northing (km) (1)**	**Base Elevation (m) (2)**	**UTM Easting (km) (1)**	**UTM Northing (km) (1)**	**Base Elevation (m) (2)**	**Stack Diameter (ft) (3)**	**Stack Height (ft) (4)**	**Exhaust Gas Temp (F) (4)**	**Exit Gas Flowrate (acfm) (3)**
Heater 1	469234.69	4424265.45	113.1	469833.57	4423027.72	89.16	1.8	14.5	250	1000
Heater 2	469236.79	4424266.55	113.08	469835.67	4423028.82	89.14	1.8	14.5	250	1000
Heater 3	469238.89	4424267.65	113.03	469837.77	4423029.92	89.11	1.8	14.5	250	1000
Heater 4	469240.99	4424268.75	112.98	469839.87	4423031.02	89.09	1.8	14.5	250	1000
Heater 5	469243.09	4424269.85	112.92	469841.97	4423032.12	89.06	1.8	14.5	250	1000
Heater 6	469245.19	4424270.95	112.87	469844.07	4423033.22	89.01	1.8	14.5	250	1000
Generator	469216.90	4424281.06	112.99	469815.78	4423043.33	90.66	6.0	0.17 (3)	1283	209 (4)

(1) Estimated based on setback distances from PECO's engineering drawings.
(2) Calculated from terrain information processed by the AIRMAP model.
(3) For the heater, stack diameter and exhaust flowrate are from similar equipment at other facilities. For the generator, stack diameter is from similar equipment at other facilities and engineering judgment while the exhaust flowrate is from engineering specifications contained in PECO's submittals.
(4) From engineering specifications contained in PECO's submittals.

Two types of meteorological datasets must be used with AERMOD: a dataset containing surface level measurements of specific meteorological variables (including wind speed, wind direction, ambient temperature, among others), and a dataset containing upper air measurements that represent atmospheric vertical mixing conditions. For this analysis, we used surface air measurements taken at the Philadelphia International Airport (see Figure 3) and upper air measurements taken at a meteorological station in Sterling (Washington Dulles), Station ID. 93734, because they were the closest stations with 5 full years of meteorological data, and were the most likely available datasets to represent actual meteorological conditions near the facility.

AERMOD uses building dimensions to estimate building downwash effects on pollutant concentrations close to the facility. For this analysis, we modeled downwash effects from the two buildings described in Section 2, above, and depicted in Figure 1 (Station Building and Fiber Building). We estimated building locations and setback distances from PECO's engineering drawings, and assumed similar setback distances and approximate building locations would be retained at the Alternative Location. Figure 5 shows an artist's rendering of the buildings and equipment modeled at the Alternative Location.

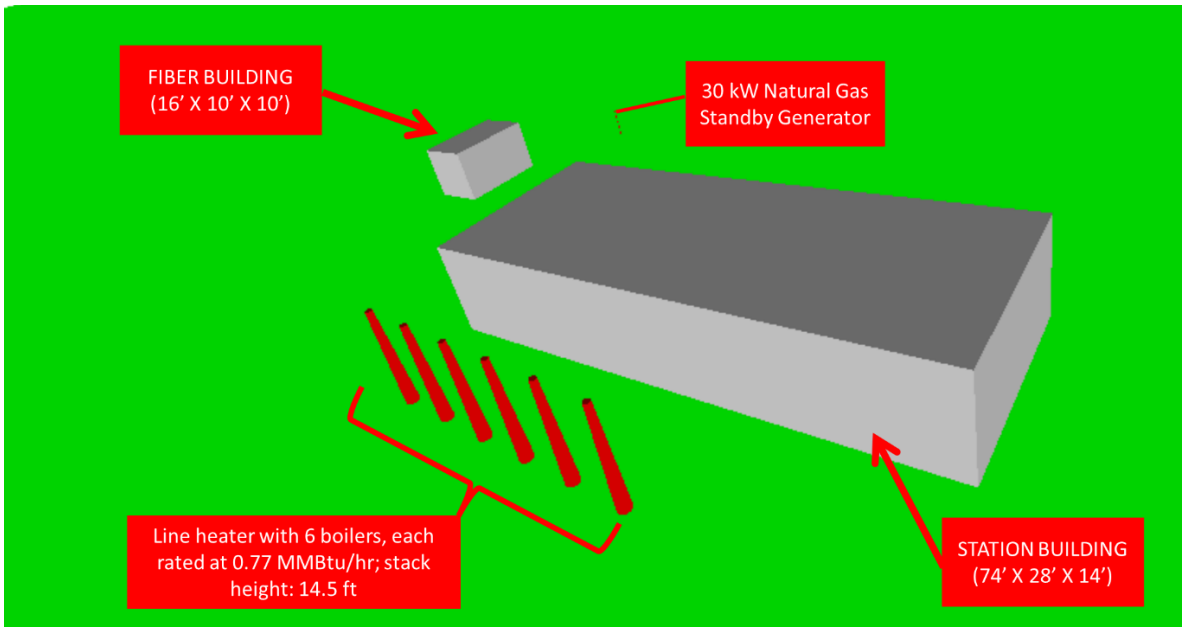

Figure 5. Rendering of the Buildings and Equipment Modeled at the Alternative Location.

C. Impacted Area

As demonstrated by the meteorological analysis discussed in Section 3, above, emissions from the facility are likely to be dispersed into many communities surrounding the facility. Indeed, our analysis found that although the worst air quality impacts would occur close to the facility's boundaries, measurable air quality impacts would occur up to 1 mile away from the facility. However, the worst impacts would be borne by residents living within one-half mile from the facility (approximately one-square mile of area). According to EPA's environmental justice screening and mapping tool (*EJScreen*),[9] this area is home to nearly 3,000 residents at the Preferred Location and approximately 2,000 at the Alternative Location (Figures 6 and 7).

[9] https://www.epa.gov/ejscreen

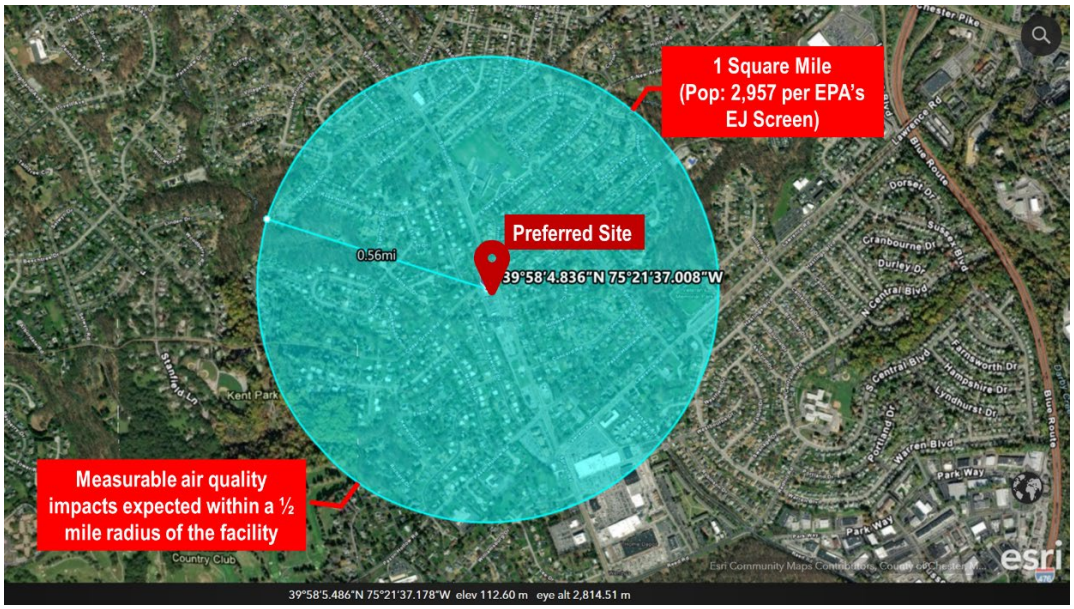

Figure 6. Area Projected to Experience the Worst Impacts from Facility Operations at the Preferred Location.

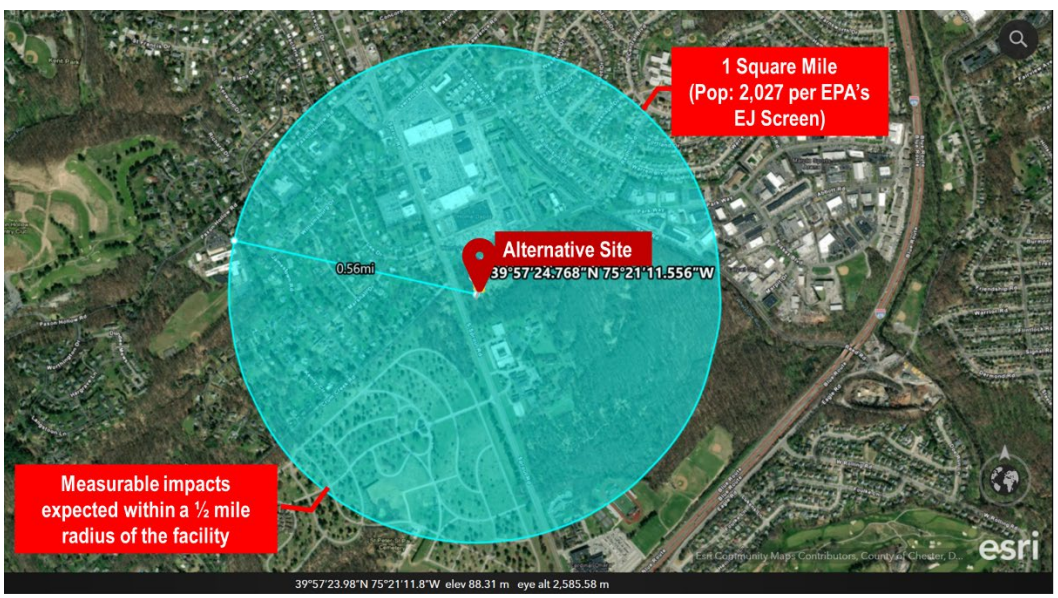

Figure 7. Area Projected to Experience the Worst Impacts from Facility Operations at the Alternative Location.

D. Projected Maximum Concentrations

Tables 2 through 4 show the modeled maximum concentrations for select pollutants emitted at the Preferred Location, based on 5 years of meteorological data and other model inputs and assumptions as discussed above, and without accounting for background concentrations. Tables 5 through 7 present the same data for the Alternative Location. These tables show the peak

concentration in micrograms per cubic meter (µg/m^3), the Universal Transverse Mercator (UTM) coordinates for the location where the peak concentration occurred, and the approximate distance from the centroid of the facility to the location of the peak concentration. This information is provided for each modeled pollutant and three averaging periods: 1 hour (Tables 2 and 5), 24 hours (Tables 3 and 6) and annual (Tables 4 and 7).

As shown in Tables 2 through 7, for each pollutant modeled, the peak concentration occurred slightly over 100 feet from the estimated centroid of the facility. This distance suggests that depending on the ultimate installation locations of the equipment, the peak concentrations could occur outside of the facility's fenceline. This would potentially expose members of the public to unhealthy levels of air pollution at certain times while the facility is operating.

Table 2. Modeled Maximum 1-Hour Averaged Concentrations at the Preferred Location.

Pollutant	Peak Conc.	Location of Peak Conc.		Approx. distance from facility to peak conc.	
	(µg/m^3)	X (m)	Y (m)	(m)	(ft)
Benzene	0.02598	469209.69	4424290.45	31	103
Benzene (Worst Case)	1.94877	469209.69	4424290.45	31	103
Carbon Monoxide	184.0	469209.69	4424290.45	31	103
Carbon Monoxide (Worst Case)	2,329.3	469209.69	4424290.45	31	103
Formaldehyde	0.41624	469209.69	4424290.45	31	103
Formaldehyde (Worst Case)	25.43713	469209.69	4424290.45	31	103
Nitrogen Dioxide (NO_2)	155.2	469259.69	4424290.45	35	115
Nitrogen Dioxide (Worst Case)	1,210.0	469209.69	4424290.45	31	103
Particulate Matter ($PM_{2.5}$)	11.8	469259.69	4424290.45	35	115
Particulate Matter (Worst Case)	28.9	469209.69	4424290.45	31	103

Table 3. Modeled Maximum 24-Hour Averaged Concentrations at the Preferred Location.

Pollutant	Peak Conc.	Location of Peak Conc.		Approx. distance from facility to peak conc.	
	(µg/m^3)	X (m)	Y (m)	(m)	(ft)
Benzene	0.00438	469209.69	4424290.45	31	103
Benzene (Worst Case)	0.33245	469209.69	4424240.45	36	119
Carbon Monoxide	60.7	469259.69	4424290.45	35	115
Carbon Monoxide (Worst Case)	389.3	469209.69	4424240.45	36	119
Formaldehyde	0.08393	469209.69	4424290.45	31	103
Formaldehyde (Worst Case)	4.33494	469209.69	4424240.45	36	119
Nitrogen Dioxide	71.7	469259.69	4424290.45	35	115
Nitrogen Dioxide (Worst Case)	205.2	469209.69	4424290.45	31	103
Particulate Matter ($PM_{2.5}$)	5.4	469259.69	4424290.45	35	115
Particulate Matter (Worst Case)	6.7	469209.69	4424290.45	31	103

Table 4. Modeled Maximum Annual Averaged Concentrations at the Preferred Location.

Pollutant	Peak Conc. ($\mu g/m^3$)	Location of Peak Conc. X (m)	Y (m)	Approx. distance from facility to peak conc. (m)	(ft)
Benzene	0.00048	469209.69	4424290.45	31	103
Benzene (Worst Case)	0.02160	469209.69	4424240.45	36	119
Carbon Monoxide	11.5	469259.69	4424290.45	35	115
Carbon Monoxide (Worst Case)	31.2	469259.69	4424290.45	35	115
Formaldehyde	0.01224	469259.69	4424290.45	35	115
Formaldehyde (Worst Case)	0.28266	469209.69	4424240.45	36	119
Nitrogen Dioxide (NO_2)	12.9	469259.69	4424290.45	35	115
Nitrogen Dioxide (Worst Case)	22.8	469259.69	4424290.45	35	115
Particulate Matter ($PM_{2.5}$)	0.9	469259.69	4424290.45	35	115
Particulate Matter (Worst Case)	1.2	469259.69	4424290.45	35	115

Table 5. Modeled Maximum 1-Hour Averaged Concentrations at the Alternative Location.

Pollutant	Peak Conc. ($\mu g/m^3$)	Location of Peak Conc. X (m)	Y (m)	Approx. distance from facility to peak conc. (m)	(ft)
Benzene	0.00376	469806.11	4423056.06	35	116
Benzene (Worst Case)	0.23612	469806.11	4423056.06	35	116
Carbon Monoxide	143.1	469856.11	4423056.06	35	116
Carbon Monoxide (Worst Case)	306.5	469806.11	4423056.06	35	116
Formaldehyde	0.12310	469856.11	4423056.06	35	116
Formaldehyde (Worst Case)	3.09557	469806.11	4423056.06	35	116
Nitrogen Dioxide (NO_2)	170.3	469856.11	4423056.06	35	116
Nitrogen Dioxide (Worst Case)	176.5	469806.11	4423056.06	35	116
Particulate Matter ($PM_{2.5}$)	12.9	469856.11	4423056.06	35	116
Particulate Matter (Worst Case)	13.0	469856.11	4423056.06	35	116

Our modeling shows that 1-hour averaged NO_2 concentrations from the facility could reach 155 and 170 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively, under typical operating conditions and without considering prevailing background concentrations. At worst-case conditions, if the standby generator were to operate year-round, 1-hour averaged NO_2 concentrations from the facility could exceed 1,200 $\mu g/m^3$ at the Preferred Location, but a much lower 1-hour peak concentration of 176 $\mu g/m^3$ would occur at the Alternative Location. For this

analysis, we used EPA's Tier 1 screening approach for estimating NO_2 concentrations, which assumes that 100 percent of nitrogen oxides would be converted to NO_2 in the atmosphere.

Table 6. Modeled Maximum 24-Hour Averaged Concentrations at the Alternative Location.

Pollutant	Peak Conc. ($\mu g/m^3$)	Location of Peak Conc. X (m)	Y (m)	Approx. distance from facility to peak conc. (m)	(ft)
Benzene	0.00189	469856.11	4423056.06	35	116
Benzene (Worst Case)	0.08925	469806.11	4423006.06	35	116
Carbon Monoxide	75.2	469856.11	4423056.06	35	116
Carbon Monoxide (Worst Case)	105.3	469856.11	4423056.06	35	116
Formaldehyde	0.06516	469856.11	4423056.06	35	116
Formaldehyde (Worst Case)	1.16381	469806.11	4423006.06	35	116
Nitrogen Dioxide (NO_2)	89.3	469856.11	4423056.06	35	116
Nitrogen Dioxide (Worst Case)	91.7	469856.11	4423056.06	35	116
Particulate Matter ($PM_{2.5}$)	6.8	469856.11	4423056.06	35	116
Particulate Matter (Worst Case)	6.8	469856.11	4423056.06	35	116

Table 7. Modeled Maximum Annual Averaged Concentrations at the Alternative Location.

Pollutant	Peak Conc. ($\mu g/m^3$)	Location of Peak Conc. X (m)	Y (m)	Approx. distance from facility to peak conc. (m)	(ft)
Benzene	0.00045	469856.11	4423056.06	35	116
Benzene (Worst Case)	0.01039	469856.11	4423056.06	35	116
Carbon Monoxide	13.6	469856.11	4423056.06	35	116
Carbon Monoxide (Worst Case)	24.7	469856.11	4423056.06	35	116
Formaldehyde	0.01305	469856.11	4423056.06	35	116
Formaldehyde (Worst Case)	0.14245	469856.11	4423056.06	35	116
Nitrogen Dioxide (NO_2)	15.8	469856.11	4423056.06	35	116
Nitrogen Dioxide (Worst Case)	21.4	469856.11	4423056.06	35	116
Particulate Matter ($PM_{2.5}$)	1.2	469856.11	4423056.06	35	116
Particulate Matter (Worst Case)	1.3	469856.11	4423056.06	35	116

According to EPA, during the period 2020 through 2022, the NO_2 "design value" (i.e., background concentration) for Delaware County was 41 parts per billion (ppb) (or about 77 $\mu g/m^3$).[10] The annual "design value" for the same period was 10 ppb (or about 19 $\mu g/m^3$). Thus, under projected typical operating conditions, emissions from PECO's proposed facility could

[10] https://www.epa.gov/air-trends/air-quality-design-values

cause 1-hour averaged NO_2 concentrations within the vicinity of the facility to exceed background concentrations by over 200 percent at either the Preferred or Alternative Locations, respectively. For the annual average, under typical operating conditions, the facility could add as much as 12.9 and 15.8 $\mu g/m^3$ of NO_2 to the annual background NO_2 concentrations at the Preferred and Alternative Locations, respectively (i.e., about 68 and 150 percent more NO_2 compared to the design value of 19 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively).

With respect to $PM_{2.5}$, during the period 2020 through 2022, the $PM_{2.5}$ 24-hour and annual averaged background concentrations for Delaware County were 22 and 9.1 $\mu g/m^3$, respectively.[11] Our modeling shows that under typical operating conditions, the facility could add as much as 5.4 and 6.8 $\mu g/m^3$ of $PM_{2.5}$ (24-hour average) at the Preferred and Alternative Locations, respectively (i.e., about 25 and 31 percent more $PM_{2.5}$ compared to the 24-hour design value of 22 $\mu g/m^3$ at the Preferred and Alternative Locations, respectively). At worst-case conditions, if the standby generator were to operate year-round, 24-hour averaged $PM_{2.5}$ concentrations from the facility could add about 75 percent more 24-hour averaged $PM_{2.5}$ concentrations at either the Preferred or Alternative Locations. For the annual averaged concentrations, annual average peak $PM_{2.5}$ concentrations would exceed the background concentrations by a more modest 10 to 15 percent at the either the Preferred or Alternative Locations.

Similar analyses and conclusions can be made for other averaging periods and pollutants listed in Tables 2 through 7.

E. Impacted Populations

CHANGE investigated the number of persons that would be exposed to the highest concentrations of pollutants emitted by the facility. To do this, we determined the numerical distance from the facility where modeled concentrations appeared to taper off to near background levels, created a buffer around the facility based on that distance, and estimated the residential population within that buffer area using EPA's *EJScreen*.[12] The results of our investigation are graphically represented in Figures 8 and 9, and in Appendix B.

Overall, we found that for approximately the same levels of pollutant concentrations, for some pollutants and averaging periods, fewer residents would be exposed to elevated concentrations at the Alternative Location than at the Preferred Location. For other pollutants and averaging periods, the level of exposure does not substantively change although those pollutants tended to be dispersed farther out at the Alternative Location than at the Preferred Location. This additional dispersion contributed to more exposed residents at the Alternative Location than at the Preferred Location for those pollutants or averaging periods.

[11] https://www.epa.gov/air-trends/air-quality-design-values
[12] https://www.epa.gov/ejscreen

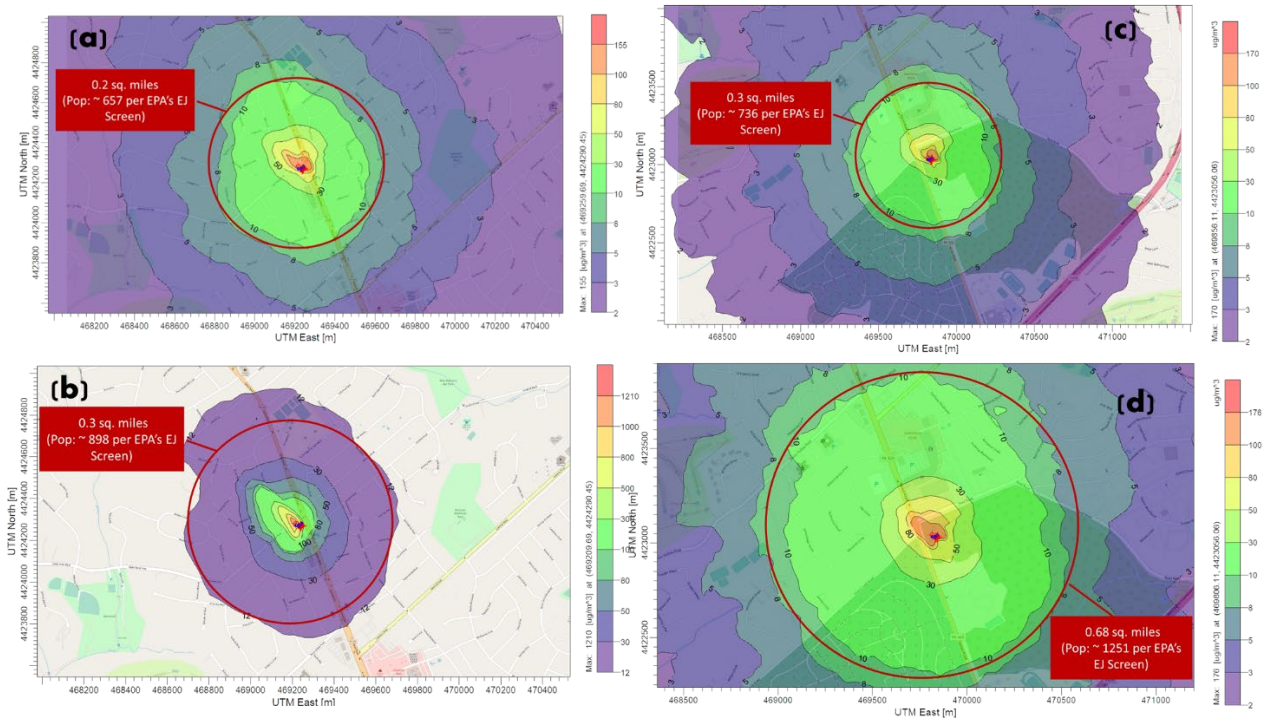

Figure 8. NO_2 1-Hour Averaged Concentrations for the Preferred Location [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

For example, in Figure 8, for a 1-hour NO_2 concentration of about 10 µg/m^3, approximately the same number of residents would be exposed to that concentration or higher at the Preferred and Alternative Locations under typical operating conditions (Figures 8(a) and (c)). However, under worst case conditions, the same pollutant is dispersed farther at the Alternative Location than at the Preferred Location and significantly more people are exposed to an NO_2 concentration of 10 µg/m^3 or higher (Figures 8(b) and (d)). In contrast, in Figure 9, for an annual NO_2 concentration of about 0.5 µg/m^3, more residents would be exposed to that concentration or higher at the Preferred Location than at the Alternative Location. This is true for both typical (Figures 9(a) and (c)) and worst case (Figures 9(b) and (d)) conditions.

The above scenarios were repeated multiple times as shown in Appendix B. For the Alternative Location, *EJScreen* did not provide a population estimate when the distance was about 200 meters from the facility's centroid or less. Moreover, a review of satellite images suggests that there are no or perhaps only a handful of residents within 200 meters from the anticipated facility location.

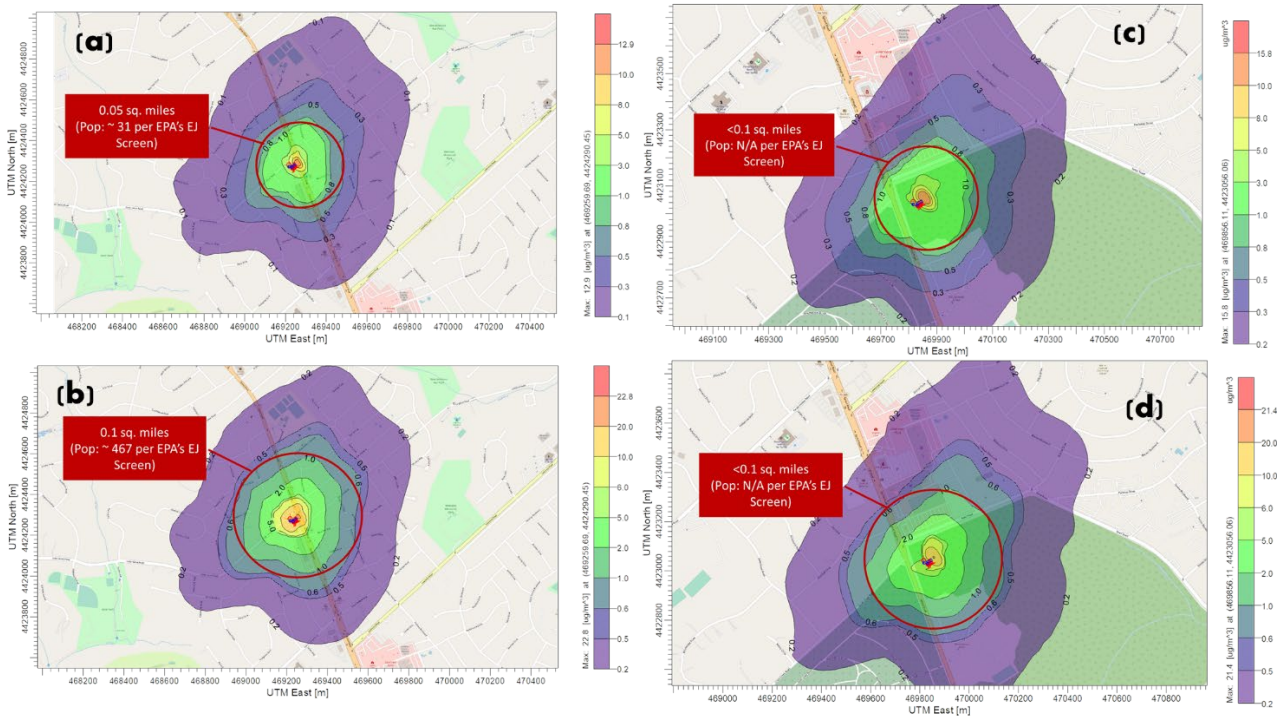

Figure 9. NO_2 Annual Averaged Concentrations for the Preferred Location [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

As discussed earlier air modeling was not conducted to specifically evaluate a specific receptor health hazard evaluation via any type of dose/response pathway. Modeling was carried out to evaluate the additional emissions that would likely be coming from the proposed PECO facility into the community.

Of the modeled results, most of the pollutants do show emissions being generated. However, modeled concentrations are not able to definitively assess actual ground level concentrations related to actual operations. Therefore, although the modeled results for most of the pollutants do not seem to indicate ambient air concentrations would exceed any levels of direct health concern population, that is not to indicate that actual levels would not be higher as Benzene and Carbon Monoxide and Formaldehyde have been shown across various studies to be higher nearer gas plants and gas stations and that caution to elevated exposures near these locations should be considered like for those residents in the proposed location closest to the proposed PECO facility. It is also recognized that Benzene and Formaldehyde are known human carcinogens and that any contributory levels of these should be avoided especially those residents closest to the facility that modeling showed emissions of these pollutants to the PECO proposed facility.

Although in many cases those pollutants like Benzene and Formaldehyde to tend to be more familiar with the general public gases like Nitrogen Dioxide (NO2) can often be overlooked and/or not considered to be a pollutant of concern. However, as a professional scientist and past member of several USEPA advisory and air quality committee the levels of modeled estimated emissions of Nitrogen Dioxide (NO2) at the preferred location is of significant concern for the community as the levels of NO2 that would be produced from the operations of the PECO facility are staggering. As illustrated in Table 1, in evaluating worst case 1-hr conditions at the preferred location, levels of 1-hour ambient concentrations for NO2 exceed the 1National Ambient Air Quality Standards (NAAQS) by almost 6 times with a possible worst case modeled emissions concentration of 0.632 ppm for 1-hour. The NAAQS 1-hour is 0.1 ppm. The alternative location worst case as shown in Table 5 modeled results was 0.091 ppm, which is below the 1-hour NAAQS standard. Therefore, the alternative site would be significantly more protective of ambient air quality impacts to the community.

[1]National Ambient Air Quality Standards are standard set by the USEPA that are designed to protect sensitive populations and the environment and ambient air concentration set for the protection of public health are based on thousands of studies that have showed a direct link of exposure and adverse health effects.

Exposure to elevated levels of NO2 above the NAAQS would be expected to be directly correlated to hundreds of studies published in the scientific peer review literature that should exposures to NO2 in children and adults and elderly are directly linked with issues of lung development such as breathing rates and lung volume, throat and lung upper respiratory irritation of airways and asthma exacerbation and development over time. Additional studies have shown evidence of increased inflammation of the airways, wheezing, and coughing leading to elevated emergency room visits and reduction of immunity leading to increased lung infections. Therefore, the 1-hour concentrations found for NO2 modeled would result in adverse health effects both acute and chronic exposures to this concentration of NO2 would unequivocally result in adverse health effects across the community as discussed and described in hundreds of peer reviewed publications on NO2 exposures.

It is also critical to recognize that NO2 is also a precursor to the formation of ground level ozone (O3) and particulate matter. Ozone is recognized by various federal agencies (USEPA,The Centers for Disease Control (CDC) to cause a significant number of health effects. Health effects include respiratory irritation, throat and airway inflammation, asthma aggravation and increased susceptibility to lung tissue damage, cardiovascular impacts including breathing issues.

Therefore, with the extremely high levels of NO2 likely to be produced at levels shown to be deleterious to humans including resulting in formation of Ozone another concern for contribution to adverse health impacts the preferred site location will pose a significant health risk to the community as discussed a.

6. Conclusions

The following conclusions can be drawn from the above analysis and results:

1) The area's meteorology is such that winds generally blow from the southwest, northwest or northeast directions, with a 5-year average wind direction of about 199 degrees as measured from North. The average wind speed is about 9.6 miles per hour, with wind gusts of up to 35.5 miles per hour. Directionally, the meteorology does not substantially change year-over-year, seasonally or over the course of a given day.

2) Although CHANGE did not conduct a full exposure assessment or health impact assessment, our modeling results suggest that emissions from the facility could substantively increase pollutant concentrations within the vicinity of the facility and residents would be exposed to the additional pollution regardless of the location ultimately selected. In fact, it is probable that the peak pollutant concentrations from facility operations could occur outside of the facility's fenceline.

3) Although the worst air quality impacts would occur close to the facility's boundaries, measurable air quality impacts would occur up to 1 mile away from the facility. However, the worst impacts would be borne by residents living within one-half mile from the facility (approximately one-square mile of area).

4) For approximately the same levels of pollutant concentrations, fewer residents would be exposed to elevated concentrations at the Alternative Location than at the Preferred Location for some pollutants and averaging periods. For other pollutants and averaging

periods, the level of exposure does not substantively change but those pollutants tended to be dispersed farther out at the Alternative Location than at the Preferred Location. This additional dispersion contributed to more exposed residents at the Alternative Location than at the Preferred Location for some pollutants and averaging periods.

5) Our analysis does not account for other potential sources of emissions from the facility such as leaks from valves, flanges and connectors, roadways, and tailpipe emissions from automobiles. Those emissions sources have the potential to increase the ambient concentrations of ozone, NO_2, CO, benzene, formaldehyde, $PM_{2.5}$ and other pollutants.

6) Due to lack of certain information on the proposed equipment, we made several assumptions that may have impacted the accuracy of the model results presented here. Once the facility's final design is and enforceable operating restrictions have been established, CHANGE recommends reanalysis of the scenarios modeled above to confirm the facility's potential air quality impacts.

The following report and all information contained herein is based on my expertise and experience in conducting air quality impact analysis. All scientific analysis presented herein are in accordance with industry accepted scientific practice methods and all opinions are held with a strong degree of scientific certainty and professionalism.

Thank you.

_____

Timothy R. McAuley, MS, PhD
Founder & CEO, CHANGE Environmental, LLC

APPENDIX A: SUPPLEMENTAL METEOROLOGICAL PROFILES

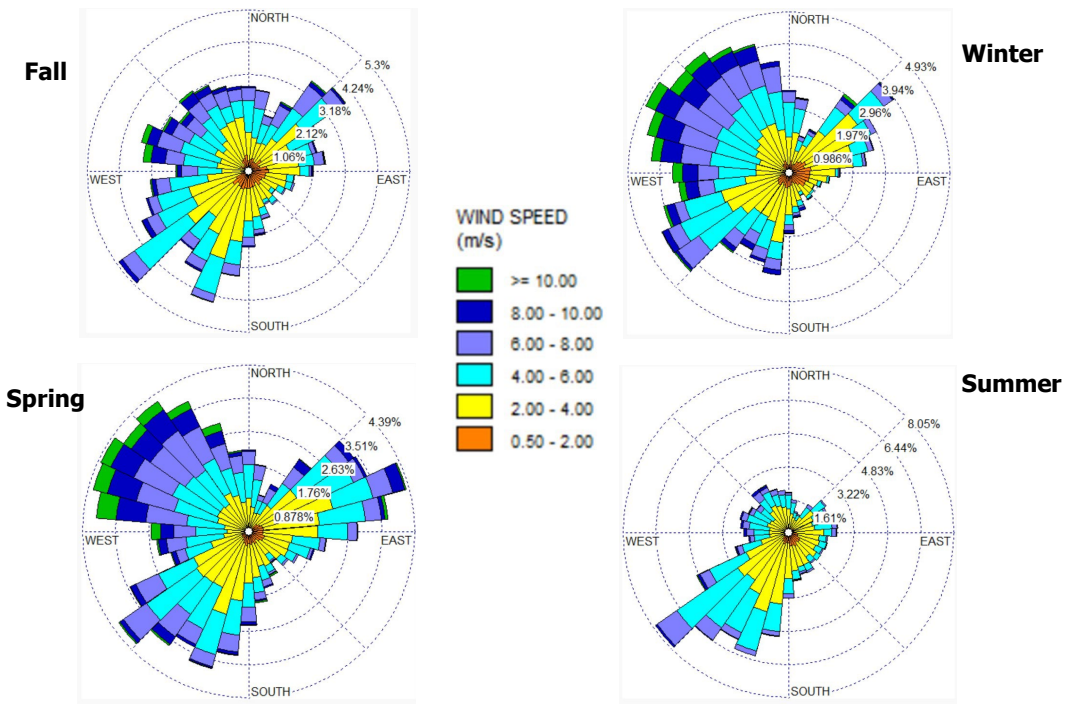

Figure A-1. Seasonal Meteorological Profiles (2018-2022).

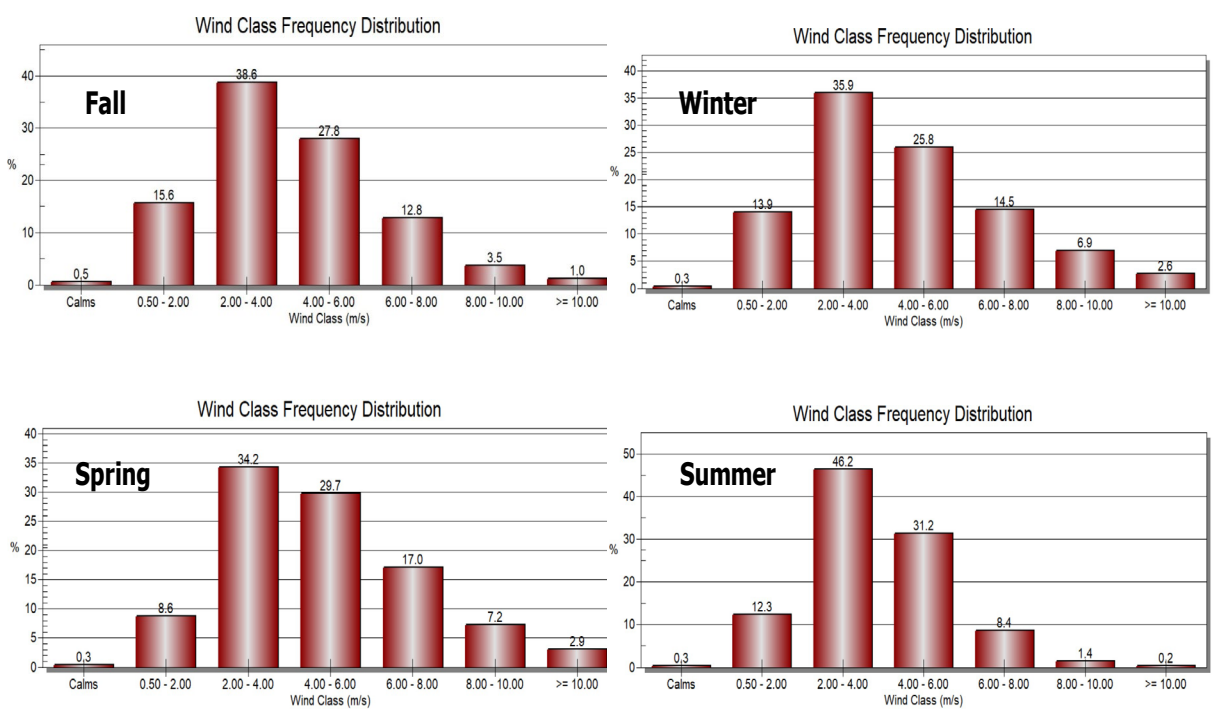

Figure A-2. Wind Class Distribution by Season.

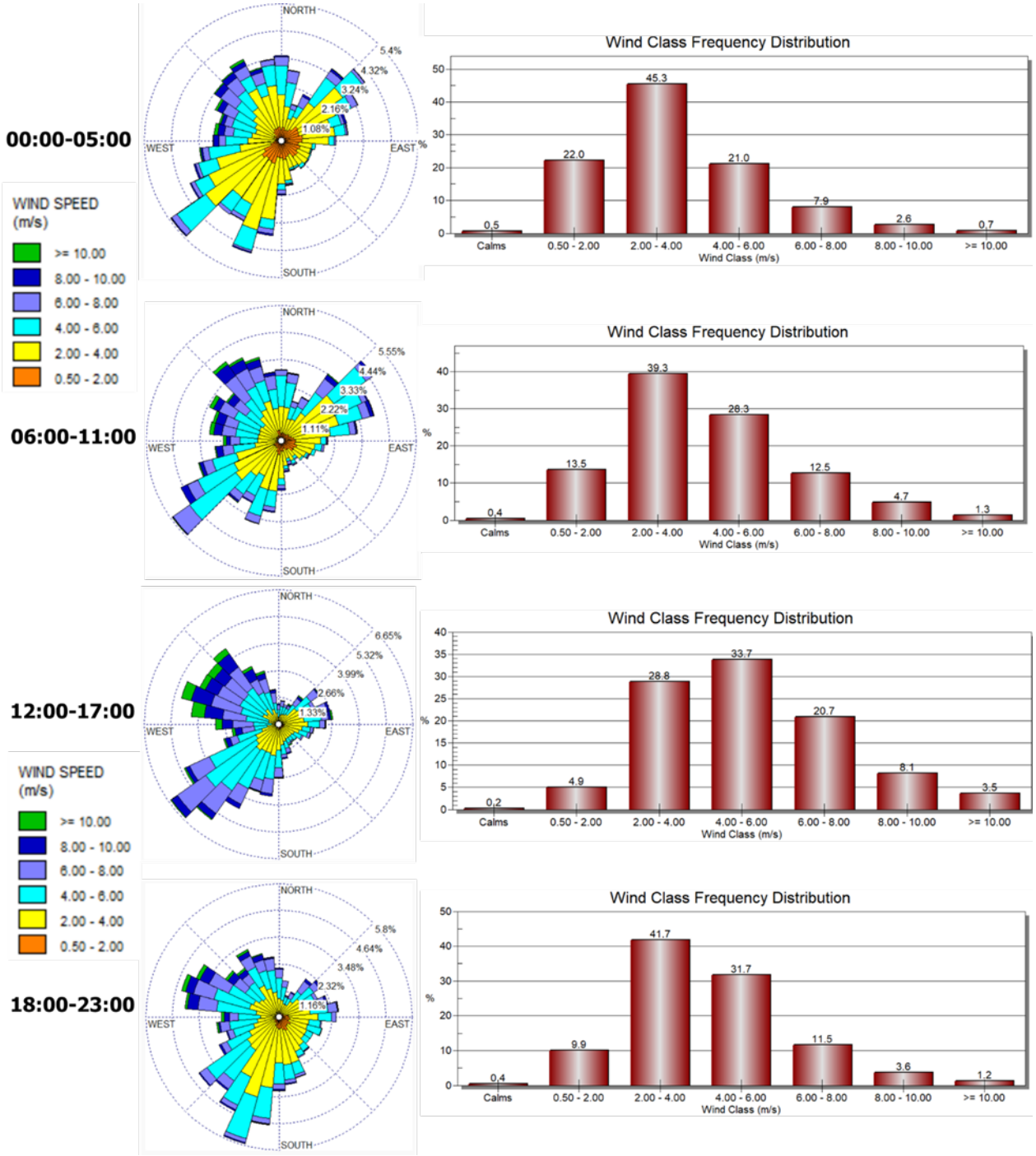

Figure A-3. Diurnal Profiles.

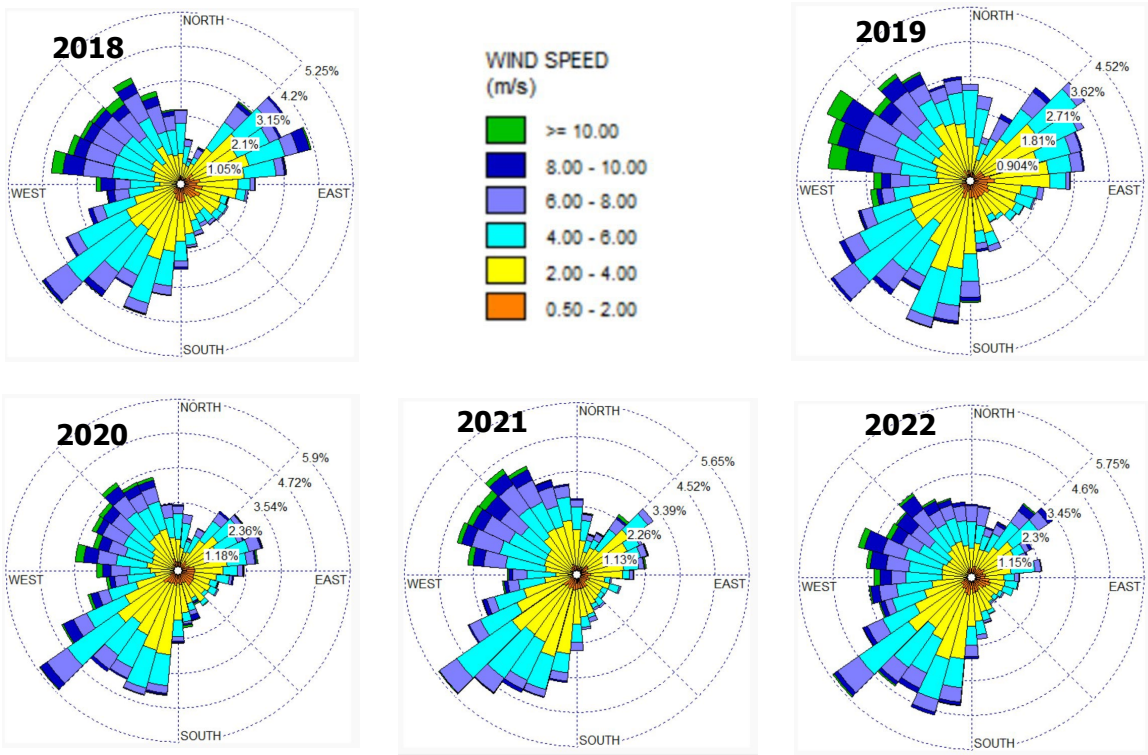

Figure A-4. Annual Profiles.

APPENDIX B: SUPPLEMENTAL MODELED CONCENTRATION ISOPLETHS

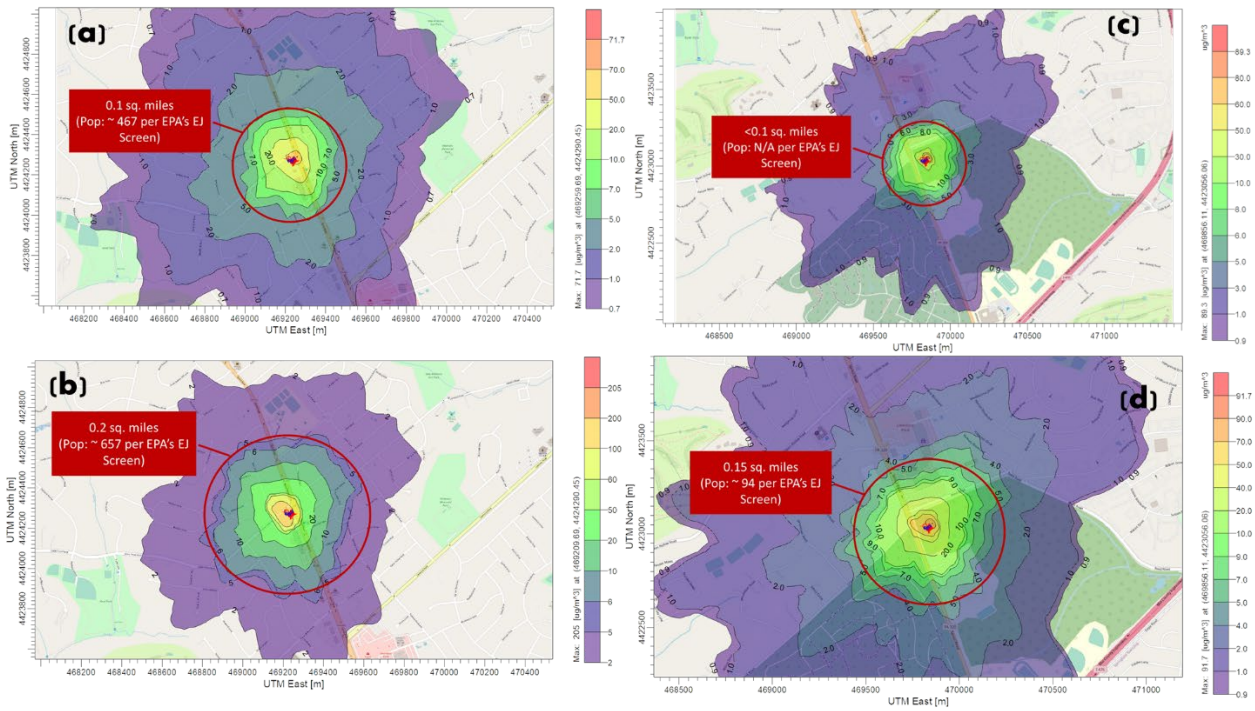

Figure B-1. NO_2 24-Hour Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

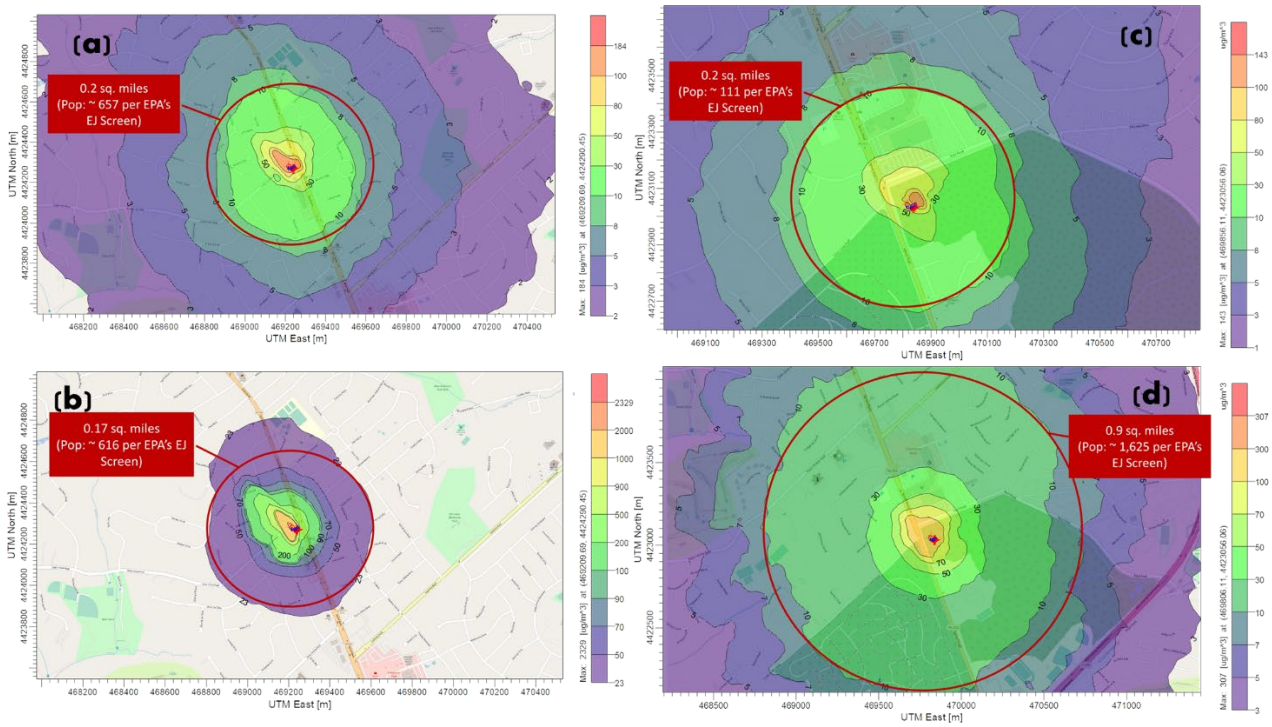

Figure B-2. CO 1-Hour Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

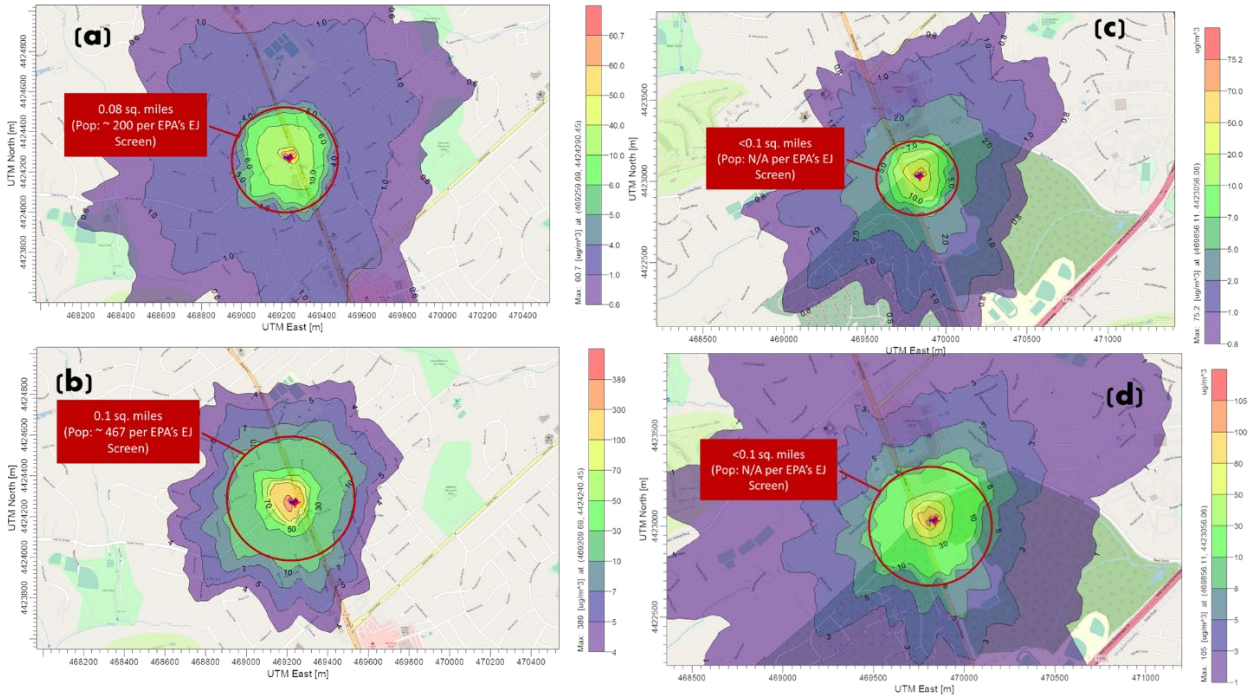

Figure B-3. CO 24-Hour Averaged Concentrations for the Preferred and Alternative Locations.

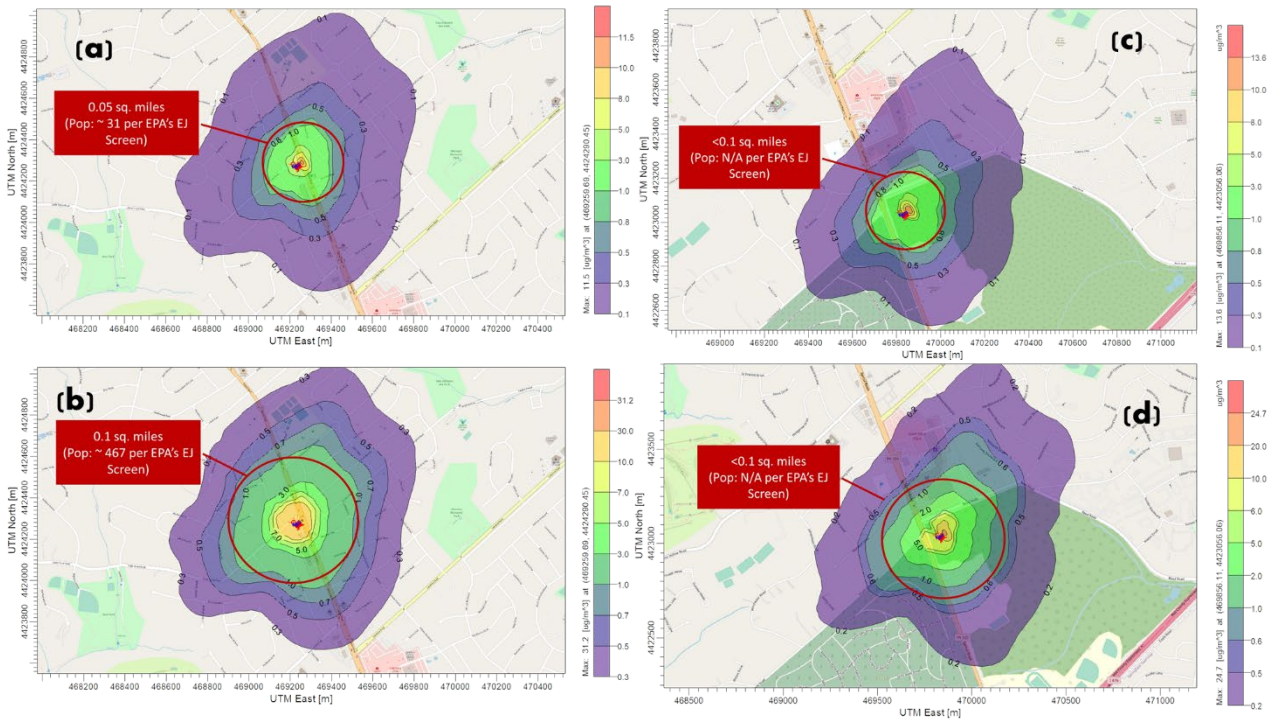

Figure B-4. CO Annual Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

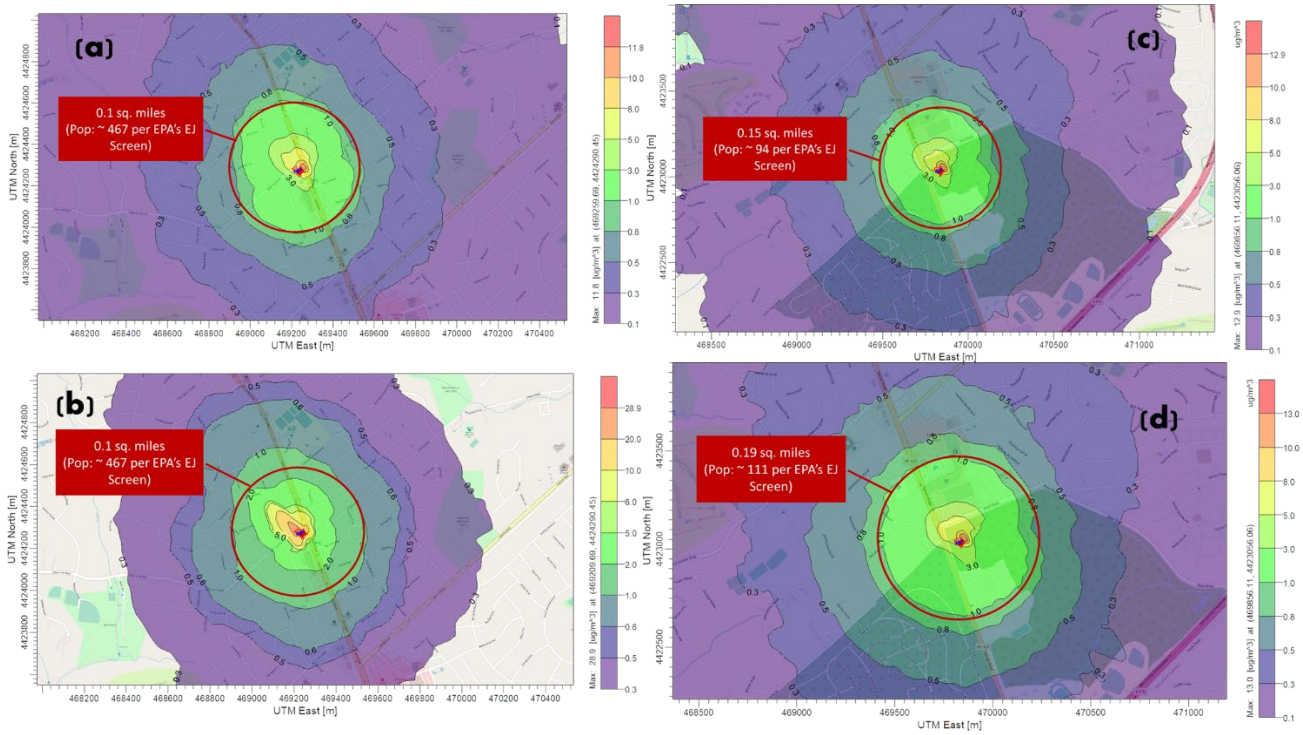

Figure B-5. $PM_{2.5}$ 1-Hour Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

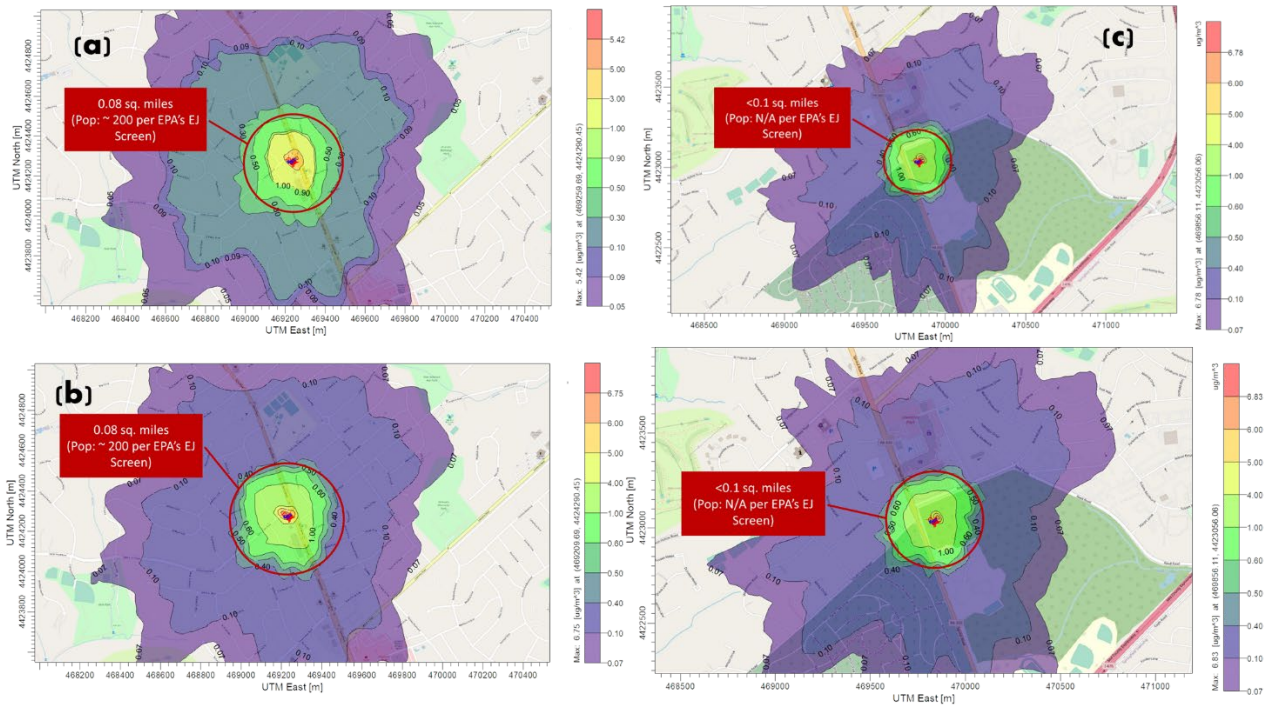

Figure B-6. $PM_{2.5}$ 24-Hour Averaged Concentrations for the Preferred and Alternative Locations.

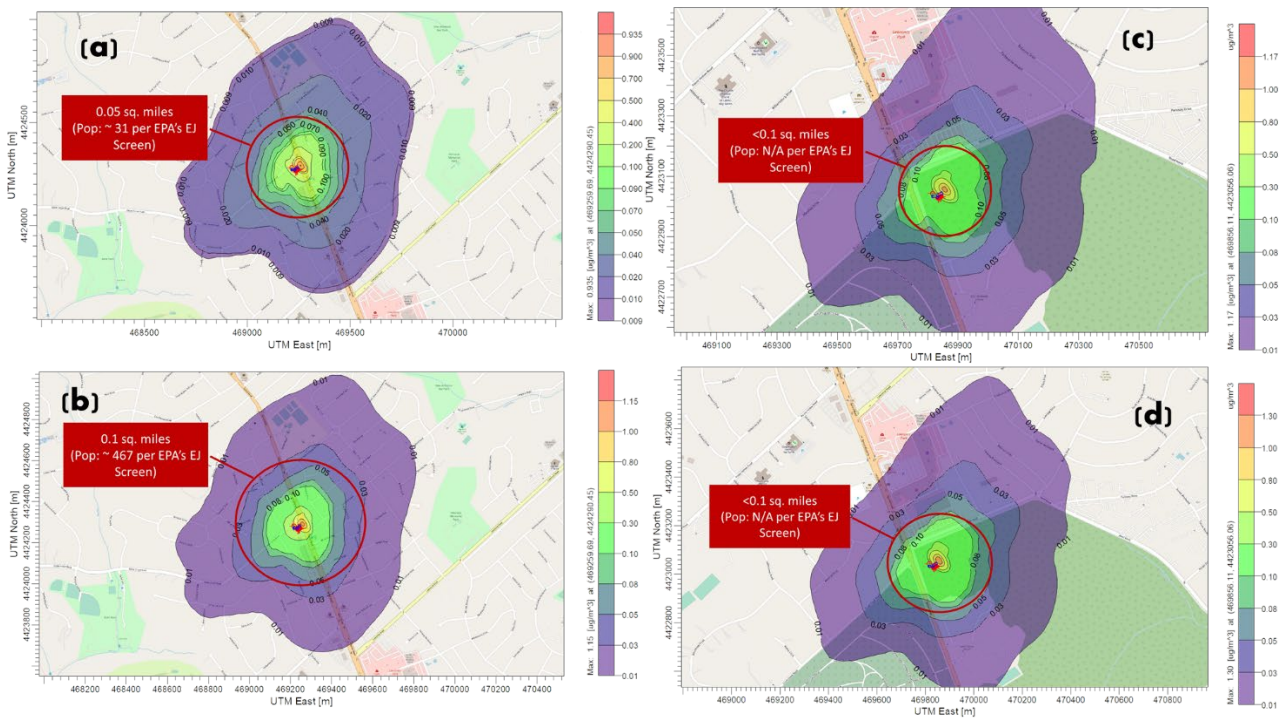

Figure B-7. $PM_{2.5}$ Annual Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

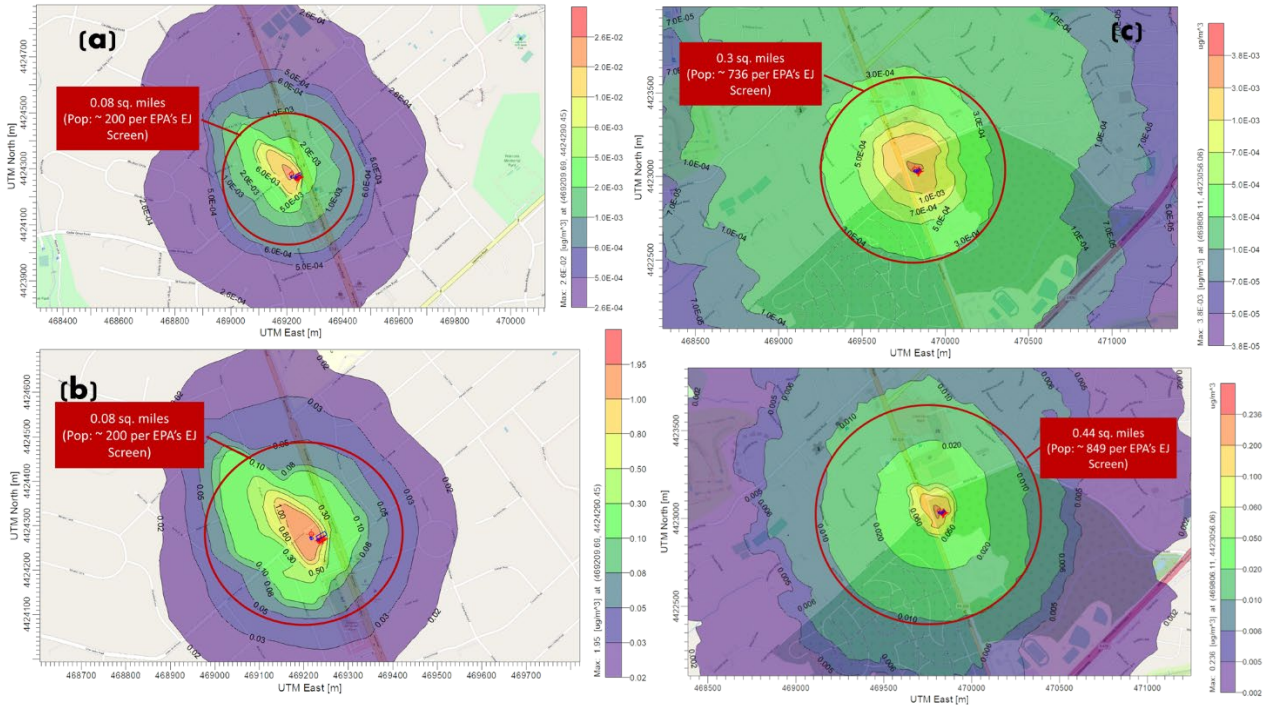

Figure B-8. Benzene 1-Hour Averaged Concentrations for the Preferred and Alternative Locations.

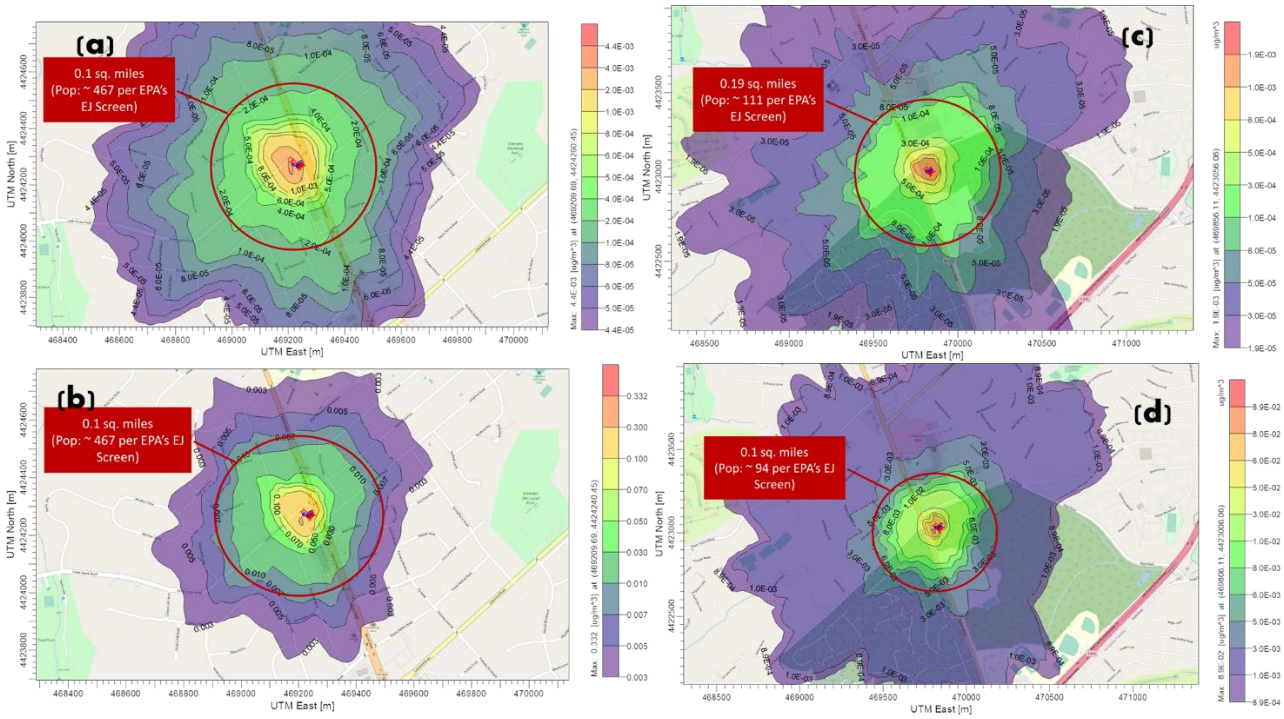

Figure B-9. Benzene 24-Hour Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

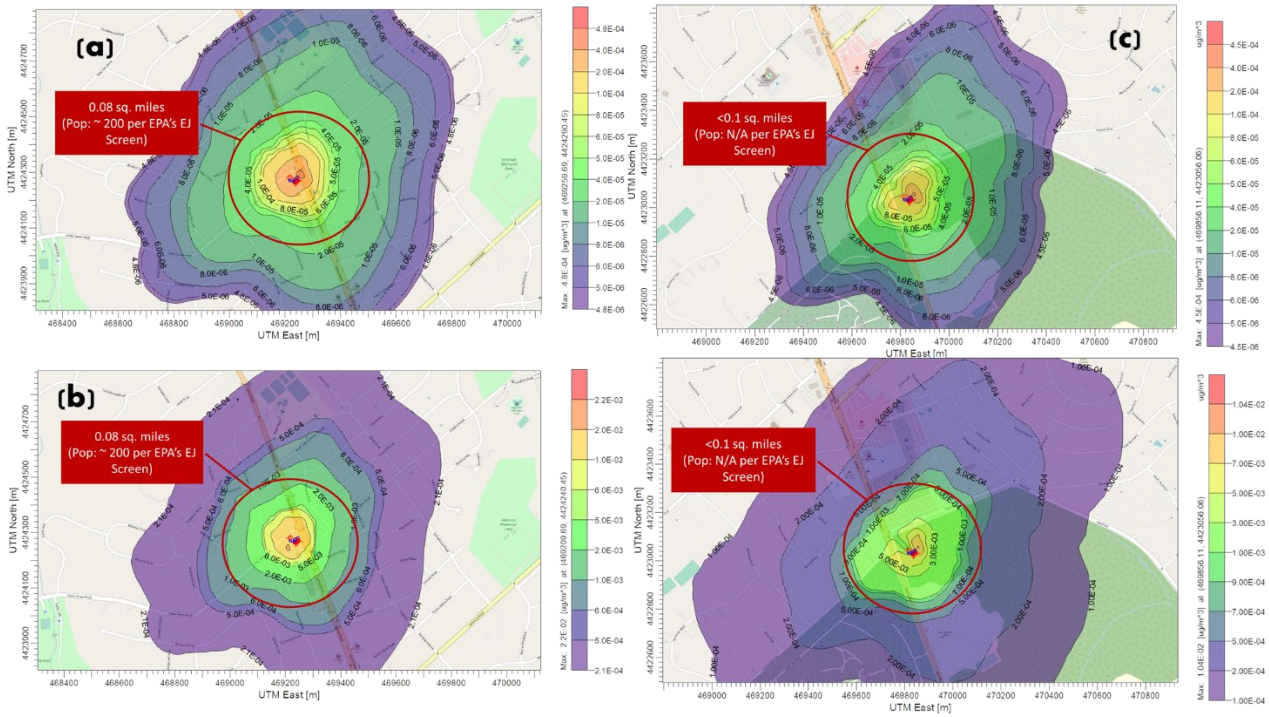

Figure B-10. Benzene Annual Averaged Concentrations for the Preferred and Alternative Locations.

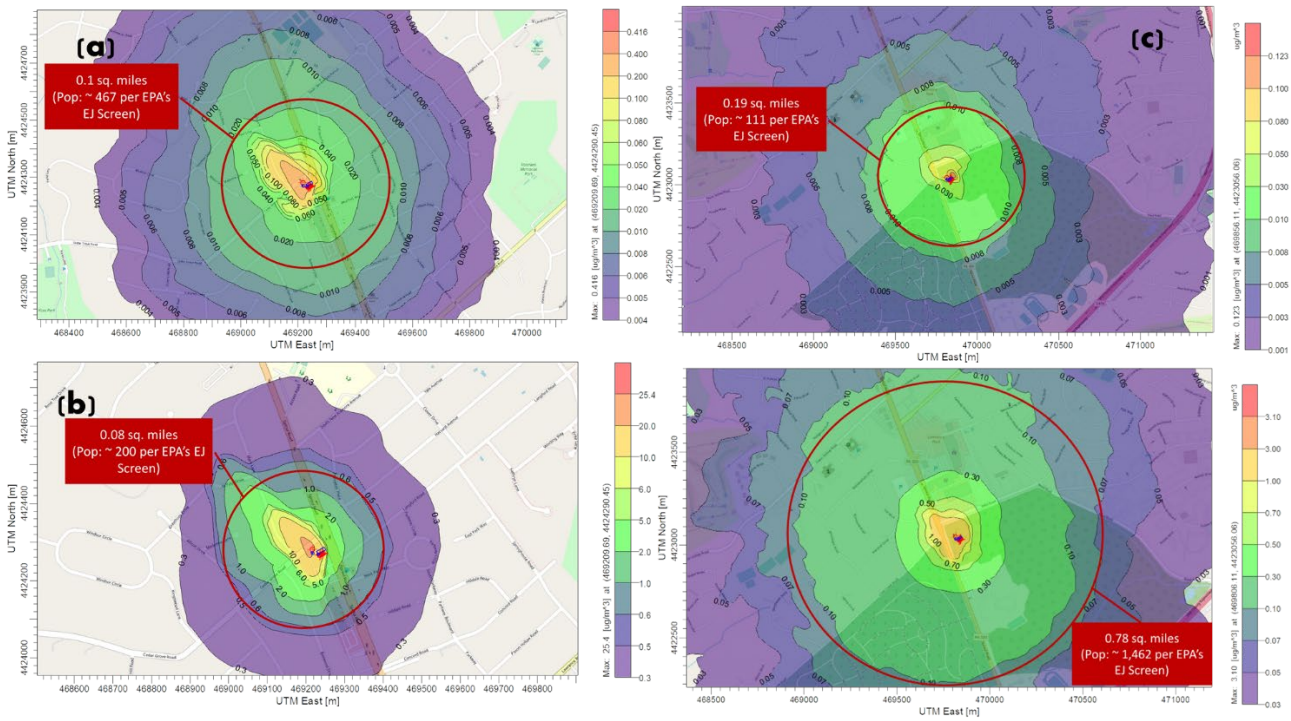

Figure B-11. Formaldehyde 1-Hour Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

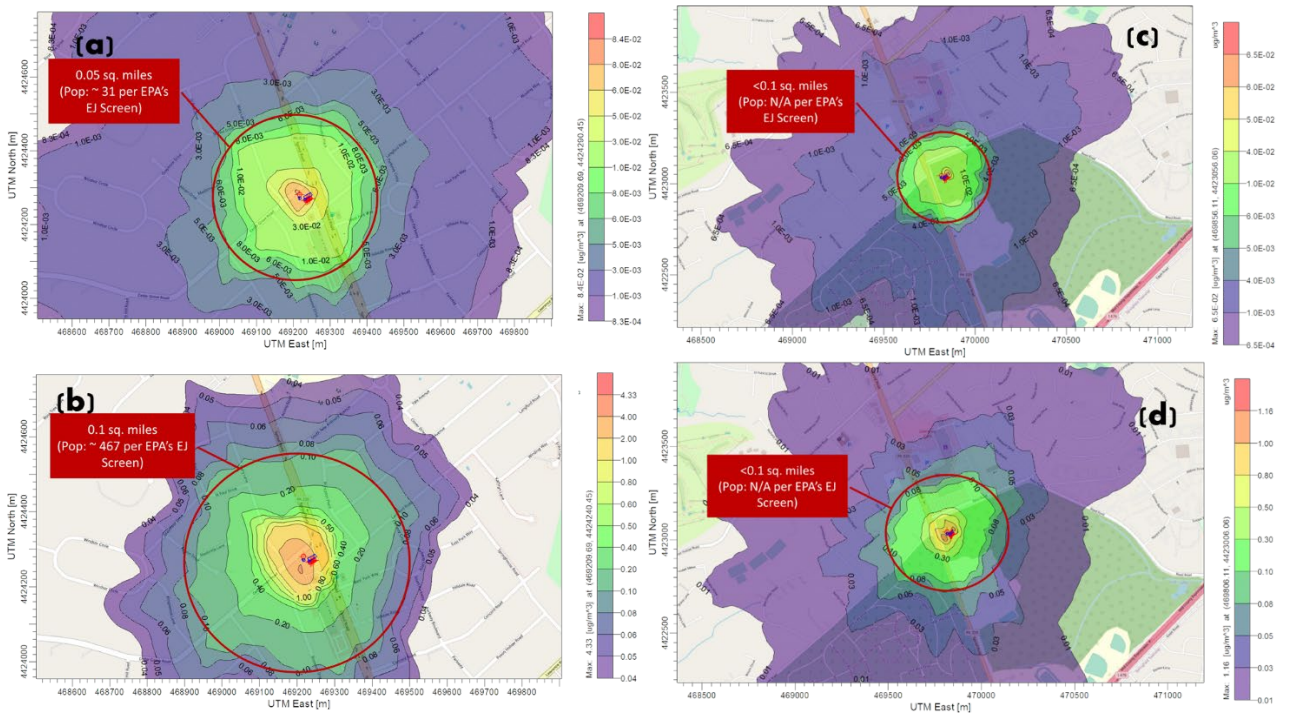

Figure B-12. Formaldehyde 24-Hour Averaged Concentrations for the Preferred and Alternative Locations.

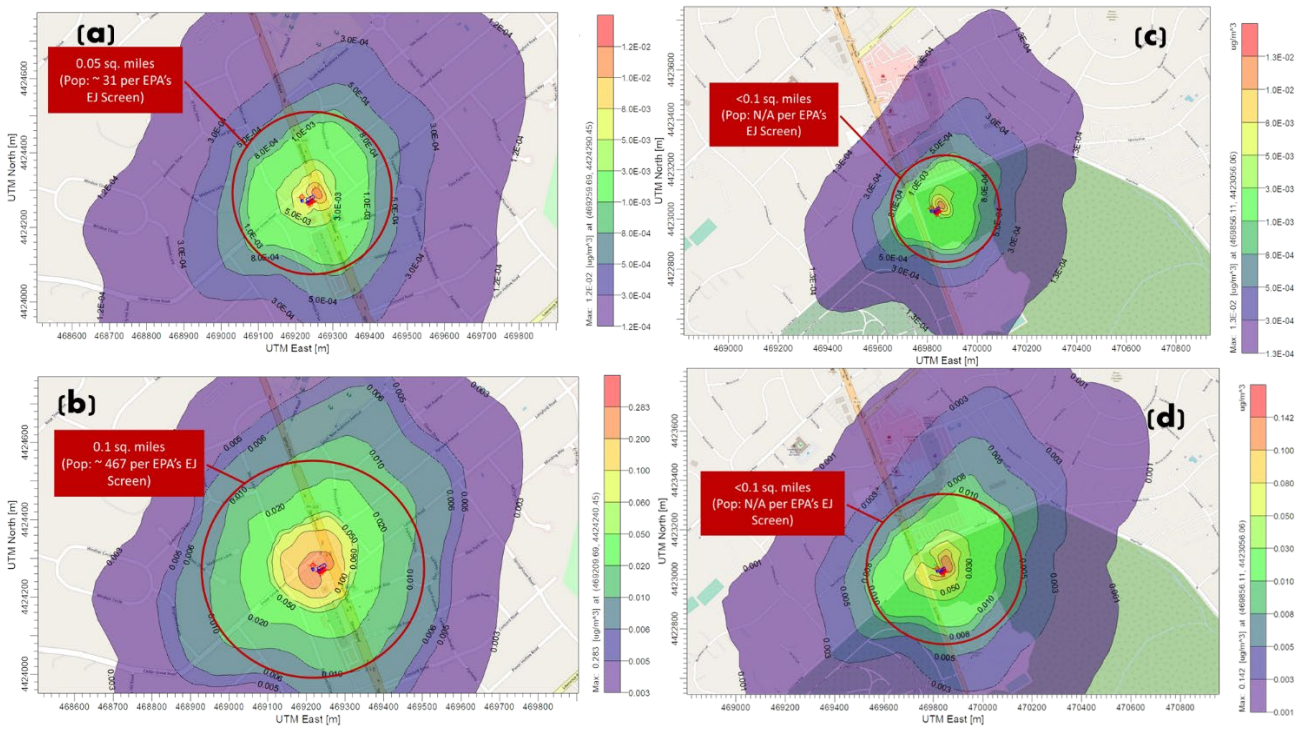

Figure B-13. Formaldehyde Annual Averaged Concentrations for the Preferred and Alternative Locations. [Left; (a) and (b)] and Alternative Location [Right; (c) and (d)]. Figures (a) and (c) are for typical conditions while (b) and (d) are for "worst-case" conditions.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY FOR A FINDING OF NECESSITY

PURSUANT TO 53 P.S. § 10619

Docket No. P-2021-3024328

REMAND REBUTTAL TESTIMONY

WITNESS: TIMOTHY R. MCAULEY, MS, PhD

SUBJECT: RESPOND TO THE AIR QUALITY AND ENVIRONMENTAL ASSESSMENT PROVIDED BY TETRA TECH ON BEHALF OF PECO ENERGY COMPANY

DATED: October 30, 2023

TABLE OF CONTENTS

REMAND REBUTTAL TESTIMONY OF TIMOTHY R. MCAULEY, MS, PhD

I. INTRODUCTION

Q. Please state your name, business address and title.

A. My name is Timothy R McAuley. My business address is 462 Broadway, Suite 200, Saratoga Springs, NY 12866. I am currently the Founder and CEO of CHANGE Environmental, LLC (formerly Consulting for Health, Air, Nature, & a Greener Environment, LLC) CHANGE").

Q. Have you previously submitted testimony in this proceeding?

A. Yes. I submitted direct testimony that is marked as Marple Township Remand Statement No. 1. My educational background and work experience are set forth in my direct testimony.

II. PURPOSE OF TESTIMONY

Q. Dr. McAuley, what is the purpose of your rebuttal testimony in this proceeding?

A. The purpose of my testimony is to respond to the "environmental" and "air quality" assessments and testimony submitted by Jeffrey Harrington of Tetra Tech and my experience with similar hearings of this nature.

Q. Are you sponsoring any exhibits?

A. No. Any exhibit I reference has already been submitted with my direct testimony.

III. RESPONSE TO TETRA TECH'S ENVIRONMENTAL IMPACT REVIEW

Q. Please describe your environmental assessment in comparison to Tetra Tech's which did the following: "review of environmental permit applications; environmental permits and approvals; correspondence with local, state, and federal agencies; environmental due diligence reports; and design and engineering documents for the Station (collectively, "Project Documents")."

A. Tetra Tech simply reviewed PECO's plans and equipment specifications but did not actually *quantify* or otherwise *qualitatively analyze* potential impacts to the air quality from the construction and operation of the facility. For example, Tetra Tech correctly determined that the proposed facility would include two sources of air emissions: (1) the Cold Weather Technologies (CWT) Indirect Line Heater ("Line Heater") and (2) an emergency generator. However, Tetra Tech did not quantify the air quality impacts of the emissions from those emission units considering site-specific characteristics and the proposed operating scenarios.

Q. In your experience, was Tetra Tech's Review a "comprehensive assessment"?

A. No. In my experience, what Tetra Tech provided was more of a regulatory review of permits and how not having to obtain various permits directly results to the false position that emissions would not be an issue. Tetra Tech should have and had time to conduct a series of air quality modeling exercises using AERMOD and/or a combination of industry accepted air quality models provided by USEPA to show that the levels of emissions for those units noted herein would not in fact have any air quality impacts to the immediate community. At no point since the start of the proposed facility location did Tetra Tech validate PECO's position of there will be no offsite air quality impacts related to the operations of the facility.

Q. What is your response to Tetra Tech's conclusions that "there will be no unreasonable environmental impacts to air quality"?

A. This conclusion does not provide anything of substance. Tetra Tech based its conclusion on its determination that the proposed emissions units would not require an air permit, the emergency generator would comply with an applicable federal standard, and "Tetra Tech's experience and review of Project Documents." Site-specific factors were never considered, and

no modelling was conducted. As stated above, there was ample opportunity to validate this presumption.

Q. In your experience, does the requirement or lack thereof for a permit take the place of an environmental assessment?

A. No. Whether or not the proposed emissions units would comply with generally applicable federal or state emissions standards or permit requirements *is not relevant* to a determination of whether site-specific factors exist that could contribute to adverse air quality impacts from the construction and operation of the proposed equipment.

Q. What is the importance of site-specific factors?

A. Site-specific factors such as proximity to residences, schools and other sensitive receptors, stack heights, and local meteorology and topography, among others, affect the extent to which emissions from a proposed facility will impact the local air quality. For this reason, an identical emergency generator can have significantly different air quality impacts depending on where it is installed and how it is operated. Similarly, a larger emergency generator can have lower air quality impacts than a smaller emergency generator due to site-specific factors. This recognition is acknowledged by PaDEP Document Number 275-2101-003 (Page 2) which states: "If the Department determines that any exempted source is causing air pollution in violation of Section 8 of the Air Pollution Control Act, 35 P.S. §4008, or 25 Pa. Code §121.7, the Department may order the installation of additional air cleaning devices. In those cases, plan approvals and operating permits may be required."

Q. Can you describe the impact of individual emissions units being exempt from air permitting under 25 Pa. Code 127.14?

A. Yes. Although individual emissions units may be exempt from air permitting, it is not clear that the facility as a whole would be exempt from air permitting. Document 275-2101-003, Qualification 1 (Page 1) states: "This notice shall not be construed to exempt facilities that include multiple sources or air contaminants, unless specifically stated in the source category." The proposed PECO facility will include *multiple sources of air contaminants*: the line heater and emergency generator. Mr. Harrington has not explained whether the facility as a whole would be exempt from air quality permitting. According to Document Number 275-2101-003, requests for exemptions from the plan approval requirements of Chapter 127 of 25 Pa. Code for multiple course facilities "must be considered on a case-by-case basis, unless otherwise noted within the exemption category."

Q. Did you conduct air quality modeling?

A. Yes, we did.

Q. Why did you conduct air modeling?

A. Air modeling is an integral part and a critical piece to assess air quality impacts from onsite emissions to site specific receptors offsite. It is even more prudent to conduct air modeling for a proposed facility as otherwise there is no way to determine, other than unvalidated statements, the actual impacts from the proposed facility. From my direct experience and expertise, in several cases I have been an expert on, involved proposed facilities. The proponents in all those matters always identified that there would be no impacts related to their operations. In all those cases, the air modeling that I conducted and was accepted by the court clearly did show offsite impacts related to proposed operations of those facilities. Therefore, it is from experience, and to provide direct scientific validation and data, that I conducted air modeling that ensured that my assessment was in fact a full-scale environmental impact assessment.

Q. We note that Mr. Harrington described the line heater as having a heat input capacity of 5.57MMBtu/hr, while CHANGE used 4.6MMBtu/hr heat input capacity in its modeling. Can you explain the impact of the 5.57MMBtu/hr?

A. Mr. Harrington's heat input capacity of 5.57MMBtu/hr is *25 percent higher* than the 4.6MMBtu/hr heat input capacity that CHANGE modeled from its emissions calculations and air quality analysis and therefore, PECO emissions from the unit would be higher. As a result, potential emissions from the line heater would be approximately 25 percent higher than CHAGE's previous emission estimates. Consequently, worst-case air quality impacts would likely be slightly higher than those previously estimated in CHANGE's analysis, and we would be able to quantitatively show those increases in modeling the larger heat input capacity.

Q. In your experience, is it typical for a utility company to not have performed any air modelling in proceedings such as these?

A. No. In my experience, it is very atypical for a utility company to not have performed its own modelling.

Q. Dr. McAuley, based upon your education, training, and experience, what is your opinion as to the effect of the emissions and concentrations from the proposed gas reliability station on the air quality?

A. As detailed in my direct testimony, the emissions and concentrations from the proposed facility create the risk of adverse air quality emissions. For example, there is the risk of exposure of unhealthy levels of air pollution to members of the public.

IV. CONCLUSION

Q. Does this conclude your Rebuttal Testimony?

A. Yes. However, I reserve the right to file such additional testimony as may be necessary or appropriate.

VERIFICATION

I, Timothy R. McAuley, PS, PhD, hereby verify that the facts set forth in the foregoing Remand Rebuttal Written Testimony is true and correct to the best of my knowledge, information and belief, and that these statements are made subject to the penalties of 18 Pa. C.S. §4909, relating to unsworn falsification to authorities.

Date: October 27, 2023

Timothy R. McAuley, PS, PhD

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PECO Energy Company for a Finding of Necessity Pursuant to 53 P.S. § 10619 that the Situation of Two Buildings Associated with a Gas Reliability Station in Marple Township, Delaware County Is Reasonably Necessary for the Convenience and Welfare of the Public	:	P-2021-3024328 (On Remand)

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true and correct copy of the Remand Rebuttal Testimony of Timothy R. McAuley, MS, PhD, in accordance with the requirements of 52 Pa. Code §1.54 (relating to service by a participant) in the manner listed below upon the parties listed below:

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MCNICHOL, BYRNE & MATLAWSKI, P.C.:

Dated: October 30, 2023

/s/ J. Adam Matlawski

By: J. Adam Matlawski, Esq.
Attorney I.D. No.: 41678
1223 N. Providence Road
Media, PA 19063

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY FOR A FINDING OF NECESSITY

PURSUANT TO 53 P.S. § 10619

Docket No. P-2021-3024328

REMAND SURREBUTTAL TESTIMONY

WITNESS: TIMOTHY R. MCAULEY, MS, PhD

SUBJECT: RESPOND TO THE AIR MODELING AND REBUTTAL TESTIMONY OF PECO WITNESS JEFFREY HARRINGTON

DATED: November 24, 2023

REMAND SURREBUTTAL TESTIMONY OF TIMOTHY R. MCAULEY, MS, PhD

I. INTRODUCTION

Q. Please state your name, business address and title.

A. My name is Timothy R McAuley. My business address is 462 Broadway, Suite 200, Saratoga Springs, NY 12866. I am currently the Founder and CEO of CHANGE Environmental, LLC (formerly Consulting for Health, Air, Nature, & a Greener Environment, LLC) CHANGE").

Q. Have you previously submitted testimony in this proceeding?

A. Yes. I submitted direct testimony that is marked as Marple Township Remand Statement No. 1. My educational background and work experience are set forth in my direct testimony. I also submitted rebuttal testimony to respond to the "environmental" and "air quality" assessments and testimony originally submitted by Jeffrey Harrington of Tetra Tech on behalf of PECO and my experience with similar hearings of this nature.

Q. Dr. McAuley, what is the purpose of your surrebuttal testimony in this proceeding?

A. The purpose of my testimony is to respond to the Rebuttal Testimony of PECO Witness, Jeffrey Harrington, PECO Energy Company Statement No. 6-RR. In this surrebuttal I identify numerous errors made by Mr. Harrington in his interpretation of my air modeling and testimony. In fact, Mr. Harrington's own emissions calculations and modeling results for the emergency generator and line heater suggest that my prior emissions calculations and modeling assumptions may have *in fact underestimated potential worst-case impacts* in some situations. Accordingly, based on my review of Mr. Harrington's testimony and other project documents as detailed below, I reiterate my prior conclusion that the construction and operation of the Station will likely cause unreasonable air quality impacts within the vicinity of the proposed facility.

Further, I reiterate my prior conclusion that, in general, air quality impacts at the alternate site would be potentially lower than at the preferred site.

However, it must be noted that, at the time of the original report, Tetra Tech nor Mr. Harrington had conducted any air modeling exercises to show that the proposed facility would not in fact have an impact on air emissions as previously noted. At the time of writing this surrebuttal, it seems that Mr. Harrington and Tetra Tech attempted to conduct an air modeling exercise to which I was provided air modeling files. However, as no additional air modeling was being conducted by me on our emissions inputs nor those of Mr. Harrington's a full critique and evaluation of what exactly was done by Harrington and Tetra Tech was not carried out from the files provided, but only a detailed review and critique from his testimony and Tetra Tech report to which he attached to his testimony. Therefore, my statements and conclusions assumed that Mr. Harrington's modeling results he testified to were consistent with his approach as discussed and described in his testimony and comments were provided based on that information.

Q. Are you sponsoring any exhibits?

A. No. Any exhibit I reference has already been submitted with my direct testimony.

RESPONSE TO JEFFREY HARRINGTON'S REBUTTAL REPORT

Q. Dr. McAuley, did you review the Remand Rebuttal Testimony of Jeffrey Harrington?

A: Yes, I have.

Q. Do you concur with Mr. Harrington's assertion that your air modeling "significantly overestimated" emission estimates from the Station.

A. No, I do not.

Q. Can you explain the incorrect assertions made by Mr. Harrington?

A. This assertion is not supported by the information provided in Mr. Harrington's testimony. In fact, with respect to the emergency generator, the opposite is true: my analysis appears to have underestimated potential emissions from the emergency generator compared to what Mr. Harrington claims to be more accurate. In my previous report, I estimated that potential emissions of nitrogen oxides (NOx) from the emergency generator would be about 0.37 pounds per hour (lb/hr) and 0.09 tons per year (tpy). *See* Table 1 of my report (showing "Typical" Maximum Emissions of 184.4 pounds per year). Conversely, Mr. Harrington claims that the "correct" potential emissions from the emergency generator could be as high as 0.97 lb/hr and 0.24 tpy. *See* Section 3.1, Exhibit JH-4. This suggests that actual potential NOx emissions from the emergency generator could be as much as *167 percent higher than my previous estimates*. This is understandable because my analysis assumed, based on exhibits previously supplied by PECO, that the Station would include a 30 kilowatt (kW) emergency generator instead of the 50 kW generator that Mr. Harrington now says is the "correct" size.

Q: Are there additional environmental concerns with the ultra-low sulfur Diesel engine that Mr. Harrington claims will now be used at the Station?

A: Yes. Mr. Harrington claims the Station will install and operate "[a]n emergency generator with an ultra-low sulfur (ULSD) diesel engine with a rated mechanical capacity of 104.7 bhp (50 kW) and rich-burn engine technology." *See* Section 3.1, Exhibit JH-4. Setting aside the fact that a diesel engine with "rich-burn engine technology" is extremely rare or non-existent, the emissions characteristics of a "diesel engine" are significantly different from those of a natural gas-fired engine. In this regard, *additional pollutants that could cause health impacts, such as diesel particulate matter (DPM),* would need to be evaluated. It must also be noted that PECO's prior submittals stated that a natural gas-fired engine (and not a diesel-fired engine) would be

installed at the Station.

Q: Do you concur with the potential line heater emissions as estimated by Mr. Harrington?

A: No, I do not. Mr. Harrington significantly underestimates potential emissions from the line heater compared to emissions estimated from standard emissions factors. Specifically, as shown below, the emissions rates reported in Tetra Tech's analysis are lower than those I calculated using standard emissions factors from the EPA's AP-42 database. Absent a source-specific test, potential emissions generally must be evaluated using ***worst-case*** theoretical emissions factors unless PECO can adequately justify that lower emissions factors are more appropriate for the facility. Here, *Mr. Harrington has not provided such justification for the line heater.*

As EPA has noted, data from source-specific emission tests or continuous emission monitors are usually preferred for estimating a source's emissions because those data provide the best representation of the tested source's emissions. (AP-42, Introduction, at 1). In the absence of source-specific test data however, emissions factors – such as those contained in the EPA's AP-42 – may and can be used to estimate emissions. However, because emissions factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emissions factor and the other half will have emission rates less than the factor. (AP-42, Introduction, at 2). With respect to NOx emissions from the line heater, Table 1, below, compares the emission rates developed using the EPA's AP-42 emissions factor of 100 pounds per million standard cubic feet of natural gas burned to the emission rates reported by Harrington. (See AP-42, Table 1.4-1). As shown, Mr. Harrington underestimates potential NOx emissions from the line heater by about 45 percent.

Table 1. Extent to Which Mr. Harrington Underestimates NOx Emissions from the Line Heater.

Line Heater Parameter Evaluated	NOx Emissions Reported By Harrington [1]		Emissions Based on AP-42 Emissions Factor [2]		Harrington Heater NOx Emissions Underestimated By:
	Per Burner	Total	Per Burner	Total	
Total Heat Input (MMBtu/hr)	0.77	4.62	0.77	4.62	--
NOx Emission Rate (g/s)	0.0053	0.0318	0.0097	0.0582	45%
Annual Emissions (tpy) [1]	0.18	1.11	0.34	2.02	45%

1. Harrington data from Table 4-1, Exhibit JH-4, with annual emissions calculated using the equation: [Emission Rate (g/s)]*3600*8760/453.6/2000
2. *See* Table 1 of CHANGE report (annual heater emissions of 4,047 lb/yr = 2.02 tpy)

Q. Do you agree with Mr. Harrington when he states that the Station "is not required to conduct air dispersion modeling" to demonstrate compliance with the National Ambient Air Quality Standards ("NAAQS")?

A. No. I disagree with this statement. As an initial matter, I have previously recorded my concerns with whether the Station as a whole would benefit from the same exemption from air permitting that applies to individual emissions units under 25 Pa. Code § 127.14. *See* Attachment A, Paragraph 3. PADEP's Document 275-2101-003, Qualification 1 (Page 1) states: *"This notice shall not be construed to exempt facilities that include* ***multiple sources of air contaminants****, unless specifically stated in the source category."* The Station <u>will include multiple sources</u> of air contaminants: the line heater and emergency generator, and Mr. Harrington has not explained whether the Station as a whole would be exempt from air permitting.

Further, Mr. Harrington fails to state that the lack of a requirement to obtain an air permit does not relieve the Station of its obligation to comply with the NAAQS and any other applicable regulatory health benchmarks. In fact, while state air permitting requirements that are promulgated in a State Implementation Plan (SIP) to meet the requirements of Section 110 of the Clean Air Act (CAA) are the primary means by which states ensure compliance with the NAAQS, states, including the State of Pennsylvania, maintain broad authority to require a

demonstration by any emissions source that *operations of the source do not cause or contribute to a violation of the NAAQS or other provisions of the SIP*. This broad authority is recognized in PADEP's Document Number 275-2101-003 (Page 2), which states: "If the Department determines that any exempted source is causing air pollution in violation of Section 8 of the Air Pollution Control Act, 35 P. S. § 4008, or 25 Pa. Code § 121.7, the Department may order the installation of additional air cleaning devices."

In our experience, such a demonstration is also routinely conducted in one of *two primary ways*: 1) dispersion modeling to demonstrate that a violation would not occur if the facility operated at its potential to emit (PTE) or otherwise allowable emissions, and/or 2) pre- and post-construction monitoring to measure baseline and post-construction ambient concentrations, respectively, for comparison with applicable benchmarks such as the NAAQS or other risk screening thresholds. *Mr. Harrington does not offer alternatives to modeling that the Station would undertake to ensure compliance with the NAAQS and other health benchmarks for nitrogen dioxide (NO2) and other regulated pollutants that would be emitted.*

Q. Do you agree with Mr. Harrington's testimony that conducting air modeling based on worst case scenarios from the continuous use of the emergency generators was not appropriate?

A. No. I do not agree with this statement. Mr. Harrington asserts that it was "incorrect" for me to evaluate "worst case" potential emissions from the emergency generator based on 24/7 operation (that is, 8,760 hours per year) and that this assumption "is unreasonable and is inconsistent" with the EPA's 1995 guidance for emergency generator engines titled "Calculating Potential to Emit (PTE) for Emergency

Generators." (See Response to Question 10). According to Mr. Harrington, "[t]he EPA believes that 500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate under worst-case conditions." Response to Question 10, Page 4, Lines 21-24. Mr. Harrington grossly mischaracterizes the referenced EPA guidance and my analysis.

Q: Can you further explain this gross mischaracterization?

A: As an initial matter, the guidance document referenced by Mr. Harrington ***only applies to*** generators that will operate as "emergency generators" as defined in the EPA's regulations. For this purpose, 40 CFR § 60.4248 defines an "*Emergency stationary internal combustion engine*" as any stationary reciprocating internal combustion engine ("generator") that meets all of the following criteria:

> a. The generator is operated to provide electrical power or mechanical work during an emergency situation. Examples include generators used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary generators used to pump water in the case of fire or flood, etc.
> b. The generator is operated under limited circumstances for non-emergency situations only as specified in 40 CFR § 60.4243(d), including maintenance checks and readiness testing recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine.

A standby generator must comply with the requirements specified in 40 CFR § 60.4243(d) in order to be considered an "emergency generator." If the generator does not comply with the requirements specified in 40 CFR § 60.4243(d), then it is not considered to be an emergency generator and must be considered a non-emergency generator. 40 CFR §§ 60.4243(d) and 60.4248. Additionally, the generator guidance *Mr. Harrington cites also does not apply to any generator "that is used during time periods when power is available from the utility."* PECO has

not provided enforceable documentation that confirms the Station would operate according to the above requirements.

Since the Station is not required to obtain an air permit, as Mr. Harrington claims, the only available enforcement mechanism that would ensure the generator operates as an emergency generator (as defined by the EPA) is via the EPA's or PADEP's enforcement of the EPA's federal criteria rules that are stated above. In the absence of enforceable requirements that ensure the generator will be operated as an "emergency generator," *it is reasonable and appropriate to estimate "worst case" potential emissions from the generator based on 8,760 hours of operation.* This approach to estimating "worst-case" emissions from an unpermitted source is consistent with the EPA's definition of *"potential to emit*," which means "*the maximum capacity of a stationary source to emit a pollutant under its physical and operational design." 40 CFR § 63.2"Potential to emit."* This definition further provides that, "[a]ny physical or operational limitation on the capacity of the stationary source to emit a pollutant, including air pollution control equipment ***and restrictions on hours of operation*** or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design ***if the limitation or the effect it would have on emissions is enforceable***." [emphasis added]. Because the generator to be installed at the Station will not be accompanied by enforceable "restrictions on hours of operation," such as those that would normally be included in an air permit, *we must evaluate worst-case emissions based on unlimited operation*. In other words, although the emergency generator guidance Mr. Harrington cites recognizes "inherent" restrictions on the capacity of an emergency generator to operate, such "inherent" restrictions are based on the generator operating as an emergency generator in an enforceable manner.

Furthermore, Mr. Harrington fails to note that the EPA has not promulgated in a rule the

recommendation contained in the guidance document he cites and therefore is not legally binding on the State of Pennsylvania. In fact, the guidance itself emphasizes this, stating: "The policies set forth in this memorandum are intended solely as guidance, do not represent final Agency action, and cannot be relied upon to create any rights enforceable by any party." As a fully approved permitting authority, PADEP need not follow the above guidance when determining whether the Station's operations could cause adverse health impacts.

It is also worth emphasizing that Mr. Harrington cites guidance that applies to air permitting and "for the determination of a source's PTE under section 112 and title V of the Clean Air Act." However, since an air permit is not required for the operation of the Station, as Mr. Harrington claims, the applicable standard of review is not some procedure that would be followed in the context of an air permit application. This is because the analysis process for an air permit application inherently assumes that the issued air permit would contain enforceable operating restrictions and emissions monitoring requirements that would help constrain emissions and protect communities. Here, because an air permit would not be issued for the Station, it is reasonable and appropriate to evaluate potential air quality impacts under unrestricted operating scenarios.

Q: Did you only evaluate worst case emissions estimates for the generator as stated by Mr. Harrington?

A: No, Mr. Harrington either failed to understand my analysis or chose to misstate it. Mr. Harrington's rebuttal testimony fails to acknowledge that my analysis provided two emissions estimates for the emergency generator: "typical" maximum emissions estimates based on 500 hours per year of operation, and "worst-case" emissions estimates based on 8,760 hours per year.

Mr. Harrington fails to acknowledge our findings that even if the generator were to operate ***for no more than 500 hours per year***, potential air quality impacts from station operations would be significant.

Q. In his response to Questions 15 and others, Mr. Harrington asserts that dispersion modeling for NO_2 must follow the EPA's Tier 2 screening approach as addressed in a March 1, 2011, EPA guidance documented titled, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the I-hour NO_2, National Ambient Air Quality Standard." Do you agree with this assertion?

A: No. The only reason anyone would choose to use the Tier 2 and Tier 3 options is if they are fishing for a lower modeled ambient NO_2 concentration. Conversely, the ***Tier 1 approach yields the most realistic estimates*** in situations where a "worst-case" estimate of *facility impacts is needed to protect communities throughout the lifetime of a proposed facility*.

As explained in that guidance, the *EPA has approved for specific purposes* ***three options or "tiers"*** for calculating NO_2 concentrations based on AERMOD predictions of total NOx concentrations. These options include: Tier 1, which assumes full conversion of nitric oxide to NO_2; Tier 2 (the "Ambient Ratio Method"), which applies a predefined ambient ratio to the Tier 1 result; and Tier 3, which includes two methods ("the Plume Volume Molar Ratio Method" and the "Ozone Limiting Method") that simulate basic chemical reactions between nitric oxide and ambient ozone. The ***EPA has openly admitted that the Tier 2 and Tier 3 approaches are "less***

conservative" than the Tier 1 approach.[1] Further, the EPA has clarified that it does not have "any preference of one option over the other."[2]

Q: Why is the Tier 1 approach appropriate under the circumstances of PECO's proposed Station as opposed to the Tier 2 approach utilized by Mr. Harrington?

A. Mr. Harrington again cites guidance that applies to air permitting (specifically, PSD permitting). Since an air permit – let alone a PSD permit – is not required for the operation of the Station, as Mr. Harrington claims, the applicable standard of review is not some procedure that would be followed in the context of an air permit application. This is because the analysis process for an air permit application inherently assumes that the issued air permit would contain enforceable operating restrictions and emissions monitoring requirements that would help constrain emissions and hence protect communities. Here, because an air permit would not be issued for the Station, it is reasonable to evaluate potential air quality impacts using the most conservative assumptions such as those available under the Tier 1 approach.

Q. Dr. McAuley, if no permit is required, does that mean that the Station would not be subject to enforceable operating and restrictions and emissions monitoring requirements?

A. That's correct.

Q. Mr. Harrington takes issue with your discussion of the 1-hour NO2 NAAQS benchmark for NO2 concentrations, but were you attempting to somehow demonstrate compliance or noncompliance with the NAAQS?

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[1] https://www.epa.gov/sites/default/files/2015-07/documents/appwno2_2.pdf. See page 5: "Given the stringency of the 1-hour NO2 standard relative to the annual standard, many more permit applicants may find it necessary to use the less conservative Tier 2 or Tier 3 approaches in order to demonstrate compliance with the new NAAQS rather than relying on the Tier 1 assumption of full conversion."

[2] Id.

A. No, I was not. In questions 17 and 22, Mr. Harrington takes issue with my purported lack of consideration of the statistical form of the 1-hour NAAQS (i.e., 98th percentile of daily 1-hour maximum values averaged over 3 years) and posits that any comparisons with the standard would require the modeled concentrations to also represent the 98th percentile of daily 1-hour maximum values averaged over 3 years. In *other words, Mr. Harrington suggests that the 1-hour NO_2 NAAQS is only relevant as an air quality benchmark if one has modeled and reported the 98th percentile of daily 1-hour maximum NO_2 values averaged over 3 years*.

As an initial matter, my passing reference to the 1-hour NO_2 NAAQS was intended to qualitatively indicate the *significance of the modeled NO_2 concentrations* compared to readily available air quality benchmarks. Because PECO is not applying for an air permit, and since we have not alleged that PECO would not comply with the NAAQS, it was *not necessary* for us to model for NAAQS compliance. Accordingly, any comparisons to the NAAQS in my analysis should not be interpreted as somehow demonstrating compliance or noncompliance with the NAAQS.

Q. Do you agree with Mr. Harrington's argument for a statistical analysis?

A. I do not agree with his explanation. In arguing for a statistical analysis, Mr. Harrington improperly relies on a June 29, 2010, EPA guidance document entitled "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program," ***which applies exclusively*** to the development of *air permit applications for major construction projects* under the CAA, while continuing to assert that an air permit is not required for the Station. **Mr. Harrington (and PECO) cannot have it both ways**. Since an air permit is not required, guidance that applies to air permitting is irrelevant unless it can be shown that use of the guidance would lead to a conservative estimate of potential health impacts from the

project's operations. *Here, Mr. Harrington is improperly relying on the guidance to support a desired outcome.* Moreover, the EPA has acknowledged that it selected the statistical form of the 1-hour NO_2 NAAQS for regulatory purposes because it was *"desirable"* to have a standard that is *"reasonably stable and insulated from the impacts of extreme meteorological events."* 75 Fed. 8 Reg. 6492. Indeed, when promulgating the 1-hour NO_2 NAAQS, the EPA Administrator noted that "a form that calls for averaging concentrations over three years would provide greater regulatory stability than a form based on a single year of concentrations." 75 Fed. Reg. 6492. The statistical form of the standard was therefore necessary to provide greater regulatory stability and not necessarily for use in localized and project-specific risk assessments. Regulatory agencies and communities, such as communities in Delaware County, are not prohibited from using other non-statistical-based benchmarks during assessments on air quality impacts from proposed NO_2 emissions sources.

For example, the California Office of Environmental Health Hazard Assessment (OEHHA) has developed an acute (1 hour) reference exposure level (REL) for NO_2 based on inhalation studies of persons exposed to NO_2.[9] These studies found that some persons exposed to about 470 micrograms per cubic meter (μg/m^3) of NO_2 for a short duration (e.g., 1 hour) experienced increased airway reactivity following inhalation exposure to NO_2. This implies that exposure to NO_2 at levels equivalent to the acute REL could result in increased airway reactivity in a subset of asthmatics. *Put another way, if the modeled concentration from the Station alone plus the prevailing NO_2 background concentration is greater than or equal to 470 μg/m^3 over any 1 hour, people with asthma could experience adverse health effects such as acute respiratory symptoms.*

Q: Why is that relevant to the proposed PECO Station?

A: It is relevant because for our analysis because here, although the NO_2 concentrations from the Station alone are expected to be less than 470 µg/m3 for any given hour (assuming 500 hours per year of operation), the total NO_2 concentrations near the facility when considering background concentrations at the time of the maximum modeled concentration could in fact **exceed 470 µg/m3**. *Mr. Harrington has not demonstrated that the total NO_2 concentrations near the facility when considering background would never exceed 470 µg/m3 for any given hour.* For this purpose, PECO has not provided ambient monitoring data showing the maximum 1-hour monitored NO_2 concentrations near the Station. Moreover, while the EPA's 1-hour NO_2 "design value" approximates the area-wide "stable" background concentration for regulatory purposes (such as permitting and attainment designations under the CAA), the statistical form of the "design value" means that it does not necessarily represent the potential acute exposure near the Station.

Q. While Mr. Harrington doesn't state it, do his modeling results actually confirm that the communities living near the Station are likely to experience significant increase in air pollution for most of the pollutants modeled?

A. Yes. A close examination of Mr. Harrington's modeling results confirms that the communities living near the Station are likely to experience a significant increase in air pollution for most of the pollutants modeled. Mr. Harrington claims that "erroneous assumptions and inputs" in my modeling resulted in "the estimated ambient air quality impacts that are grossly overstated and unrealistically high;" however, a closer examination of his claims reveals that all Mr. Harrington and Tetra Tech did was utilize less conservative modeling options (those that are applicable in ***permitting situation ONLY, according to Mr. Harrington where permitting is not needed,***) that would result in lower modeled ambient concentrations. *See* Responses to Questions

3, 21 and 23. Unfortunately for Mr. Harrington and Tetra Tech, despite the less conservative assumptions included in their analysis, the communities living near the Station would likely experience a significant increase in air pollution for most of the pollutants modeled, including potentially a 300 percent increase in Carbon Monoxide (CO) concentrations at the preferred site. *See* Tables 2 and 3, below.

Table 2. Tetra Tech's Model Results for the Preferred Site (from Table 4-3, Exhibit JH-4)

Pollutant and Averaging Period Modeled	**Modeled Maximum Concentrations From Project ($\mu g/m^3$)**	**Concentration Rank Compared to Other Modeled Concentrations**	**Modeled Concentrations Considering Background ($\mu g/m^3$)**	**Station Would Increase Background Concentrations By:**
NO_2 (1-Hour)	97.0	8th highest, 5-year average	173.4	**127%**
NO_2 (Annual)	9.6	Highest	27.7	**53%**
CO (1-Hour)	6,409	2nd highest	8,470	**311%**
CO (8-Hour)	3,431	2nd highest	5,149	**200%**
$PM_{2.5}$ (24-hour)	5.5	8th highest	29.1	**23%**
$PM_{2.5}$ (Annual)	1.1	Highest, 5-year average	11.2	**11%**

Table 3. Tetra Tech's Model Results for the Alternate Site (from Table 4-4, Exhibit JH-4)

Pollutant and Averaging Period Modeled	**Modeled Maximum Concentrations From project ($\mu g/m^3$)**	**Concentration Rank Compared to Other Modeled Concentrations**	**Modeled Concentrations Considering Background ($\mu g/m^3$)**	**Station Would Increase Background Concentrations By:**
NO_2 (1-Hour)	105.5	8th highest, 5-year average	181.9	**138%**
NO_2 (Annual)	6.0	Highest	24.1	**33%**
CO (1-Hour)	4,335	2nd highest	6,396	**210%**
CO (8-Hour)	1,804	2nd highest	3,522	**105%**
$PM_{2.5}$ (24-hour)	4.1	8th highest	27.7	**17%**
$PM_{2.5}$ (Annual)	0.7	Highest, 5-year average	10.8	**7%**

Q. In Question 25, Mr. Harrington claims that the pre-existing background concentrations were conservatively calculated. Do you agree with his assertion??

A. No. In fact, for some pollutants, Tetra Tech estimated the "background" concentrations as a statistical measure consistent with the statistical form of the NAAQS against which

comparisons were being made (e.g., 8th highest for NO_2 1-hour and 8th highest for $PM_{2.5}$ 24-hour, etc.). While a statistical percentile rank value for ambient concentrations may represent the area-wide "stable" background concentrations for regulatory purposes (such as permitting and attainment designations under the CAA), a statistical percentile rank value *ignores the highest concentrations that would be responsible for acute health effects, including acute respiratory symptoms for persons with asthma.* Therefore, contrary to Mr. Harrington's assertions, the preexisting background concentrations provided by Mr. Harrington ***were not "conservatively calculated"*** as alleged in response to Question 25.

Q: Is Mr. Harrington's declaration that Tetra Tech's modeling results for *all pollutants* do not indicate a public health concern supported by his modeling?

A: No. This declaration is premature and lacks support. Mr. Harrington prematurely declares that his modeling results for **all** pollutants "do not indicate a public health concern" purportedly because "the impacts of the Station on the community are below NAAQS **for all** pollutants." *See* Response to Question 19. First, Tetra Tech's report (Exhibit JH-4) includes data for four pollutants that have NAAQS and would be emitted by the Station (NO_2, Carbon Monoxide (CO) and Particulate Matter ($PM_{2.5}$)) but omits other pollutants that would also be emitted from Station operations and have NAAQS, including lead and ozone (typically represented by volatile organic compounds (VOC) and nitrogen oxides (NOx)). *Perhaps most importantly, neither Mr. Harrington nor Tetra Tech evaluated the potential health impacts of the dozens of hazardous air pollutants that would be emitted from Station operations.*

Finally, Mr. Harrington has not evaluated expected emissions and associated air quality impacts from other potential sources of emissions at the Station, such as VOC emissions from leaking

valves, flanges and other piping components, or emissions of NOx, CO, $PM_{2.5}$ and other pollutants due to automobiles traveling on Station roadways and parking areas. Mr. Harrington has also not addressed temporary impacts from construction emissions.

Q: Mr. Harrington questions your statement regarding the likelihood of higher actual emissions of benzene, CO and formaldehyde compared to the levels modeled. Can you explain your conclusion?

A: Yes. First, as discussed in my prior testimony, my analysis did not consider all emissions sources that would exist at the Station (such as automobiles and piping components). Additionally, my analysis and conclusions are based on theoretical emissions factors and modeling assumptions that can underestimate emissions estimates and ambient air quality impacts. As the EPA has noted, emissions factors represent an average of a range of emission rates whereby approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor.[3] This uncertainly is particularly pronounced for hazardous air pollutants such as benzene and formaldehyde due to limited availability of actual emissions data. Given the above factors, it is likely that actual emissions of benzene, CO and formaldehyde would be ***higher*** than the ***levels modeled***.

Q: Mr. Harrington disputes your conclusion that air quality impacts from the alternative site are likely to be lower than at the preferred site, but does his testimony and modeling actually support this?

A: No. His conclusion is not supported by his modeling or the rest of his testimony. Mr. Harrington disputes my conclusion that air quality impacts from the alternate site are likely to be

[3] AP-42, Introduction, at 2.

lower than at the preferred site and argues that "dispersion around both sites is expected to be similar because the site configurations and topographic variations are substantially the same." *See* Response to Question 27. However, Mr. Harrington then offers a ***conflicting statement*** in response to Question 35 stating that "unlike the [preferred site], the topography at the alternative site is *hilly*, with *15 to 20 percent slopes mapped within the property*." Mr. Harrington fails to acknowledge that the differences in topography could lead to *lower air quality impacts at the alternate site as demonstrated in my modeling.*

Additionally, Mr. Harrington's own modeling, which only shows statistically-derived ambient concentrations, ***confirms*** that except for the 1-hour 98th percentile NO_2 concentrations, all modeled pollutant concentrations would be lower at the alternate site than at the preferred site. *See* Tables 4-3 and 4-4, Exhibit JH-4. The 1-hour 98th percentile NO_2 concentrations would largely remain unchanged. Indeed, as shown in paragraph 6, Tables 2 and 3, above, the air quality would generally worsen by a lower amount at the alternate site compared to the preferred site.

Q: Do you agree with Mr. Harrington's conclusion that the stack diameter and stack height used in your modeling overestimated potential ambient air concentrations resulting from Station operations?

A: I do not agree with that conclusion. Mr. Harrington incorrectly asserts that I assumed "a stack diameter of 6 feet and "a stack height of 0.17 feet" for the emergency generator, which purportedly overestimated potential ambient air concentrations resulting from Station operations. *See* Response to Question 14. It is unclear where Mr. Harrington got this information as it does not represent the data inputs used in my modeling. In fact, my modeling assumed a stack height of 6 feet and a stack diameter of 2 inches. Based on what Mr. Harrington claims to be the

"correct" stack parameters (i.e., stack height of 5.8 feet and a stack diameter of 3 inches), *my modeling may have in fact underestimated potential air quality impacts from the emergency generator*. Therefore, Mr. Harrington is mistaken in his conclusion that the stack diameter and stack height used in my modeling overestimated potential ambient air concentrations resulting from Station operations.

Q: How would you characterize Mr. Harrington's air quality analysis in comparison to your own?

A: In my opinion, based upon experience, Mr. Harrington's air quality analysis is a blatant attempt to trivialize the potential air quality and health impacts from the Station.

As already discussed, the air quality analysis conducted by Mr. Harrington and Tetra Tech uses *extremely restrictive operating scenarios and emissions estimates* that are ***not supported*** by enforceable restrictions, source-specific emissions test data, a plan to conduct ambient monitoring to confirm assumptions, or a plan to conduct a health impact assessment to ensure nearby communities would not be exposed to unhealthy air quality.

In contrast, my analysis sought to advise using appropriate and scientifically acceptable methods to predict and provide worst-case air quality impacts resulting from realistic unrestricted operating scenarios for the Station. My analysis particularly recognized the fact that the Station would not be operating under an air permit and therefore would not undergo a rigorous air quality and control technology analysis, or public comment, as would generally be ***required*** for projects reviewed by ***PADEP or the EPA***.

IV. CONCLUSION

Q: Has your opinion provided herein been presented with the highest degree of scientific and professional certainty?

A: Yes, it has.

Q. Does this conclude your Rebuttal Testimony?

A. Yes. However, I reserve the right to file such additional testimony as may be necessary or appropriate.

VERIFICATION

I, Timothy R. McAuley, PS, PhD, hereby verify that the facts set forth in the foregoing Remand Written Surrebuttal Testimony is true and correct to the best of my knowledge, information and belief, and that these statements are made subject to the penalties of 18 Pa. C.S. §4909, relating to unsworn falsification to authorities.

Date: November 24, 2023

Timothy R. McAuley, PS, PhD

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of PECO Energy Company for a Finding of Necessity Pursuant to 53 P.S. § 10619 that the Situation of Two Buildings Associated with a Gas Reliability Station in Marple Township, Delaware County Is Reasonably Necessary for the Convenience and Welfare of the Public	:	P-2021-3024328 (On Remand)

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true and correct copy of the Remand Surrebuttal Testimony of Timothy R. McAuley, MS, PhD, in accordance with the requirements of 52 Pa. Code §1.54 (relating to service by a participant) in the manner listed below upon the parties listed below:

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Dated: November 24, 2023

/s/ J. Adam Matlawski

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PECO ENERGY COMPANY
STATEMENT NO. 6-RR

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY FOR A FINDING OF NECESSITY

PURSUANT TO 53 P.S. § 10619

Docket No. P-2021-3024328

REMAND REBUTTAL TESTIMONY

WITNESS: JEFFREY HARRINGTON

SUBJECT: RESPONSES TO CONCERNS RAISED REGARDING AIR QUALITY; ALTERNATIVE SITE SELECTION

DATED: OCTOBER 30, 2023

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REMAND REBUTTAL TESTIMONY OF JEFFREY HARRINGTON

I. INTRODUCTION

1. Q. Please state your name and business address.

A. My name is Jeffrey Harrington. My business address is 451 Presumpscot St., Portland, Maine 04103.

2. Q. Have you previously submitted testimony in this proceeding?

A. Yes. I submitted expert Remand Direct Testimony that is marked as PECO Remand Direct Testimony No. 6-RD. My educational background and work experience are set forth in PECO Statement No. 6-RD.

3. Q. Mr. Harrington, what is the purpose of your Remand Rebuttal Testimony?

A. The purpose of my Remand Rebuttal Testimony is to respond to the Remand Direct Testimony of Marple Township Witness Timothy R. McAuley, Remand Statement No. 1; Marple Township, Ted Uhlman, and Julie Baker witness James A. Schmid, Remand Statement No. 1; and Marple Township, Ted Uhlman and Julie Baker witness Dr. Raymond J. Najjar, Remand Statement No. 2, regarding their respective statements on air quality and greenhouse gas emissions. In this rebuttal testimony, I identify a number of errors and incorrect assumptions made by Mr. McAuley in his air modeling analysis and provide the results of Tetra Tech's modeling analysis that corrects the errors made by Mr. McAuley. Although the Natural Gas Reliability Station (the "Station") is not subject to air permitting requirements and air dispersion modeling is not required to demonstrate compliance with the National Ambient Air Quality Standards ("NAAQS"), Tetra Tech's air dispersion modeling nevertheless demonstrates that the Station will comply with the NAAQS. I also

address statements made by the above witnesses contending that a proposed alternative site is a more appropriate location for the siting of the Station.

4. Q. Based on your education, training, and experience, do you believe that you are capable of expressing an opinion to a reasonable degree of professional certainty as to the environmental impacts of the Fiber Building and Station Building and the Station at the Property?

A. Yes, I am.

5. Q. Are you sponsoring any exhibits?

A. Yes, I am sponsoring Exhibit JH-4, which is Tetra Tech's report containing the calculations and results of its air dispersion modeling. I am also sponsoring Exhibit JH-5, which is Delaware County's Master Plan presentation for the new county park at the former Don Guanella School property.

II. RESPONSE TO REMAND DIRECT TESTIMONY OF TIMOTHY R. MCAULEY, MARPLE TOWNSHIP REMAND STATEMENT NO. 1; AND JAMES A. SCHMID, MARPLE TOWNSHIP, TED UHLMAN, AND JULIA BAKER REMAND STATEMENT NO. 1

6. Q. Mr. Harrington, did you review the Remand Direct Testimony of Timothy R. McAuley?

A. Yes, I have.

7. Q. And did you review the Remand Direct Testimony of James A. Schmid?

A. Yes, I have.

8. Q. Do you concur with Mr. McAuley and Mr. Schmid that the construction and operation of the Station will result in impacts to air quality leading to human health impacts?

A. No, I do not. As an initial matter, as noted in my Remand Direct Testimony, both the line heaters and the emergency generator engine are subject to blanket exemptions to air permitting requirements pursuant to 25 Pa. Code § 127.14(a)(3) and § 25 Pa. Code § 127.14(a)(8), respectively, given their expected low emissions rates. Accordingly, no air permit or air dispersion modeling is required by law to construct or operate these facilities at the Station. I note that both the generator and the line heater are located outside the Station Building and the Fiber Building (collectively, the "Buildings") and the emergency generator is expected to operate only for a limited period during the year. Nevertheless, because Mr. McAuley conducted air modeling for the emergency generator and line heaters and made important errors in his analysis, Tetra Tech completed its own air modeling to correct those errors and apply the proper standards, which I discuss below.

9. Q. In Table 1 on Pages 4 and 5 of Mr. McAuley's testimony, he calculates what he purports are the "Estimated Emissions from PECO's Proposed Heater and Standby Generator." Do you agree with Mr. McAuley's calculations?

A. No. In his calculations, Mr. McAuley used several incorrect parameters and assumptions which resulted in emissions estimates that are significantly overestimated.

10. Q. Can you describe the incorrect assumptions and parameters used by Mr. McAuley?

A. Yes. First, in order to calculate the "worst case" emissions from the emergency generator engine, Mr. McAuley assumed 8,760 hours per year of operation, which is equal to operation 24 hours per day, 365 days per year. This assumption is

unreasonable and is inconsistent with the U.S. Environmental Protection Agency's ("EPA's") guidance for emergency generator engines. The EPA's guidance titled *Calculating Potential to Emit (PTE) for Emergency Generators* (EPA 1995) states as follows:

> Emissions [for emergency generator engines] occur only during emergency situations (i.e., where electric power from the local utility is interrupted), and for a very short time to perform maintenance checks and operator training.
>
> The EPA believes that generators devoted to emergency uses are clearly constrained in their operation, in the sense that, by definition and design, they are used only during periods where electric power from public utilities is unavailable. Two factors indicate that this constraint is in fact "inherent." First, while the combined period for such power outages during any one year will vary somewhat, an upper bound can be estimated which would never be expected to be exceeded absent extraordinary circumstances. Second, the duration of these outages are entirely beyond the control of the source, and when they do occur (except in the case of a major catastrophe) rarely last more than a day.
>
> ***
>
> **The EPA believes that 500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate under worst-case conditions**. [1]

By assuming a worst-case scenario of 8,760 hours per year of operation, Mr. McAuley has far exceeded EPA's recommended default assumption of 500 hours per year of operation by more than 17 times, which contributes to his unrealistically high estimation of air emissions from the emergency generator engine.

11. Q. Can assumptions about the location of the facilities at the site affect modeling?

[1] Available at: https://www.epa.gov/sites/default/files/2015-08/documents/emgen.pdf. (emphasis added).

A. Yes. Site layout of facilities is a critical component of any dispersion modeling analysis. For example, the layout of the Buildings in relation to the emissions sources and fence line is important for determining the predicted concentrations of air emissions near the Station. Site layout is also important for understanding the impacts of building downwash, which occurs when buildings or similar structures create a turbulent wake on the downwind side of the building, causing any emissions to be temporarily trapped in a recirculating cavity, which can cause emissions to concentrate in certain areas. Use of an improper site layout will lead to modeling results which are not reflective of actual impacts.

12. Q. Did Mr. McAuley use the correct site layout?

A. No. The site layout used by Mr. McAuley was identified in Exhibit TM-2, Figure 1, which does not correspond to the current site design. The current design for the Station is described in the Remand Direct Testimony of Jim Moylan, PECO Statement No. 4-RD, and depicted in Exhibit JM-7. Mr. McAuley relies on a prior design layout which was attached to the testimony of Timothy Flanagan, PECO Statement No. 4, Exhibit TF-3, which is dated May 14, 2021. As explained by Mr. Moylan, the design changed pursuant to an agreement with Marple Township to include an "Enhanced Design" which includes a perimeter wall constructed out of brick and concrete. Mr. McAuley did not factor the most recent site layout into his analysis.

13. Q. Did Mr. McAuley use any other incorrect assumptions or parameters in his modeling analysis?

A. Yes. In modeling potential emissions from the heaters, Mr. McAuley used a stack height of 14.5 feet. However, the proposed height of the stack related to the heaters is 15 feet. Similarly, Mr. McAuley used a stack diameter of 1.8 feet for the heaters. The correct diameter for the heater stacks is 1 foot. Using the incorrect stack height and diameter materially impacts the results of the modeling and produces results that overestimate potential ambient air concentrations resulting from Station operations.

14. Q. Did Mr. McAuley use any other incorrect assumptions or parameters in his modeling analysis?

A. Yes. When modeling potential emissions for the emergency generator engine, Mr. McAuley assumed a stack diameter of 6 feet, which is unusually large for this type of engine. He also assumed a stack height of 0.17 feet, which is inexplicably low, and would require an emission from the generator to exhaust two (2) inches above the ground. Rather, the proposed stack height for the emergency generator engine is 5.8 feet with a stack diameter of 3 inches. Here again, use of the incorrect stack diameter and height materially impacts the results of the modeling and produces consequences that overestimate potential ambient air concentrations resulting from Station operations.

15. Q. Did Mr. McAuley use any other incorrect assumptions or parameters in his modeling analysis?

A. Yes. In modeling the 1-hour averaged NO_2 concentrations from the Station, Mr. McAuley used EPA's Tier 1 screening approach for estimating NO_2 concentrations, which assumes 100 percent of nitrogen oxides will be converted to NO_2 in the

atmosphere. This assumption is overly conservative and not reflective of atmospheric conditions. Rather, in a March 1, 2011 Memorandum entitled "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard"[2], EPA has approved the use of the more realistic, yet still conservative, Tier 2 conversion assumption (i.e., the Ambient Ratio Method) when determining the conversion of nitrogen oxide to NO_2 in the atmosphere. Tier 2 is more typically used in modeling for determining NAAQS compliance because it more realistically reflects atmospheric conditions. The use of the overly conservative Tier 1 screening approach materially impacts the results of the modeling and will produce results that overestimate potential ambient air concentrations resulting from Station operations.

16. Q. What are the NAAQS?

A. NAAQS are defined by EPA as the thresholds that demonstrate that emissions from a proposed project are protective of public health and public welfare. EPA's NAAQS regulations are set forth at 40 CFR Part 50. NAAQS include both "primary" ambient air quality standards, which are the level of air quality that the EPA has determined is necessary, with an adequate margin of safety, to protect the public health, and "secondary" which are levels of air quality necessary to protect the public welfare from any known or anticipated effects of a pollutant. As I have already explained, both the line heaters and the emergency generator engine are subject to blanket exemptions to air permitting requirements pursuant to 25 Pa.

[2] Available at: https://www.epa.gov/sites/default/files/2015-07/documents/appwno2_2.pdf.

Code § 127.14(a)(3) and 25 Pa. Code § 127.14(a)(8), respectively. Accordingly, no air permit is required to construct or operate the Station, and no dispersion modeling is required to be performed to demonstrate that Station emissions comply with the NAAQS.

17. Q. Did Mr. McAuley ignore any other EPA guidance?

A. Yes. On June 29, 2010, EPA issued a memorandum entitled "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program." In that guidance, EPA stresses the importance of using the statistical form of the standard for dispersion modeling for 1-hour average NO_2 impacts in support of permit applications. Said another way, the EPA recommends that compliance demonstrations for the 1-hour NO_2 NAAQS address emission scenarios that can be logically assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations. Here, Mr. McAuley ignored EPA guidance for modeling 1-hour NO_2 and instead compared the maximum predicted 1-hour impact from the Station to the NAAQS, instead of implementing the regulatory default mode and allowing the dispersion model to calculate the impacts in the form of the NAAQS (98th percentile concentrations for each year, with those averaged over the duration of the meteorological data [5 years in this case] used in the dispersion modeling), as the American Meteorological Society/EPA Regulatory Model (AERMOD) was designed to do. By comparing the maximum 1-hour predicted concentration over a five-year period to the NAAQS, McAuley's analysis

overestimates predicted impacts and does not reflect EPA's health analysis for the standard.

18. Q. How do these erroneous assumptions and parameters impact Mr. McAuley's modeling analysis?

A. The net result of these erroneous assumptions and parameters is Mr. McAuley's model-estimated ambient air impact levels are unrealistically high for comparison to the NAAQS and cannot be relied upon for any assessment of the limited emissions from PECO's planned facilities, which are already exempt from air permitting requirements.

19. Q. On Page 10 of his Remand Direct Testimony, Mr. McAuley states "[T]he modeled results for most of the pollutants do not seem to indicate ambient air concentrations would exceed any levels of direct health concern population…." Do you agree with this statement?

A. I agree with this statement with one exception: the modeled results for <u>all</u> pollutants (and not <u>most</u> of the pollutants) do not indicate a public health concern. As discussed below, the impacts of the Station on the community are below NAAQS for <u>all</u> pollutants.

20. Q. Mr. McAuley goes on to state "[T]hat is not to indicate that actual levels would not be higher as Benzene and Carbon Monoxide and Formaldehyde have been shown across various studies to be higher nearer gas plants and gas stations and that caution to elevated exposures near these locations should be considered like for those residents in the proposed location closest to the proposed PECO facility." Do you agree with this statement?

A. No, for several reasons. First, Mr. McAuley does not indicate what "various studies" he is referencing. Second, as conceded by Mr. McAuley[3], he did not conduct an any human health evaluation with respect to the Station. Third, Mr. McAuley is making an erroneous correlation because the Station is not a "gas plant" or a "gas station"; the Station is neither. Finally, there is no basis to assume, as Mr. McAuley appears to do here, that the actual concentrations for the limited operation of the emergency generator engine and line heater will be higher than those he modeled, and which he said would not exceed levels of direct health concern.

21. Q. On Page 10 of his testimony, Mr. McAuley states "[t]he levels of modeled estimated emissions of Nitrogen Dioxide (NO_2) at the preferred location is of significant concern for the community as the levels of NO_2 that would be produced from the operations at the PECO facility are staggering." Do you agree with this statement?

A. No. For the reasons mentioned above, Mr. McAuley's model contains numerous erroneous assumptions and inputs that result in estimated ambient air quality impacts that are grossly overstated and unrealistically high. As explained below, when the correct assumptions and parameters are utilized, the modeled ambient air quality concentrations comply with the NAAQS.

22. Q. On page 11 of his testimony, Mr. McAuley states that "As illustrated in Table 1, in evaluating worse case 1-hr conditions at the preferred location, levels of 1-hour ambient concentrations for NO_2 exceed the [NAAQS] by almost 6 times

[3] *See* Marple Remand Statement No. 1, p. 10, lines 6-7.

with a possible worst case modeled emissions concentrations of 0.632 ppm for 1-hour." Do you agree with this statement?

A. No, for multiple reasons. First, as noted above, Mr. McAuley used multiple incorrect assumptions and parameters in his modeling analysis. Second, Mr. McAuley's analysis incorrectly makes the impacts appear to be higher than they would be because they do not appropriately consider EPA's statistical form of the standards, such as the statistical format of the 1-hour NO_2 NAAQS. As described above in my testimony, it is not appropriate to compare maximum predicted 1-hour average NO_2 concentrations to the NAAQS. Instead, the model-predicted 98th percentile 1-hour concentration for each year averaged over the five years of meteorological data should be compared to the NAAQS.

23. Q. On page 11 of his testimony, Mr. McAuley states "Therefore, the 1-hour concentrations found for NO_2 modeled would unequivocally result in adverse health effects across the community as discussed and described in hundreds of peer reviewed publications on NO_2 exposures." Do you agree with this statement?

A. No. As I have explained, Mr. McAuley's model contains numerous erroneous assumptions and inputs that result in estimated ambient air impacts that are grossly overstated and unrealistically high. Furthermore, when the correct assumptions and parameters are utilized, the modeled ambient air quality impacts are below the NAAQS, as discussed below.

III. AIR DISPERSION MODELING DEMONSTRATES THAT THE STATION WILL NOT HAVE ANY UNREASONABLE IMPACT ON AIR QUALITY

24. Q. Did you perform your own air dispersion modeling?

A. Yes. Tetra Tech conducted its own air dispersion modeling using AERMOD Version 22112 (updated April 22, 2022), which is the EPA-approved dispersion model that EPA uses to support its regulatory programs.[4] However, unlike Mr. McAuley, Tetra Tech utilized the current site layout and design for the Station. Tetra Tech also followed EPA's guidance and recommended procedures in its analysis.

25. Q. What were the results of the air dispersion modeling?

A. The results of the air dispersion modeling indicate that ambient air impacts directly attributable to the Station are much less than the NAAQS. Table 1 below shows the modeled ambient air impacts for the Station.

Table 1: Comparison Of Maximum Modeled Project Impacts to NAAQS
(Six Gas Heaters and One 50 kW Emergency Engine)

Pollutant	Averaging Period	Concentration Rank[5]	Maximum Predicted Project-Only Concentration (μg/m^3)	NAAQS (μg/m^3)
NO_2 (ARM2)	1-hour	H8H (5YA)	97.0	188
	Annual	H1H	9.6	100
CO	1-hour	H2H	6,409	40,000
	8-hour	H2H	3,431	10,000
$PM_{2.5}$	24-hour	H8H (5YA)	5.5	35
	Annual	H1H (5YA)	1.1	12

[4] The EPA released new versions of the AERMOD dispersion model and the AERMET meteorological data processor on October 23, 2023. An updated meteorological data set could not be prepared in the time available to submit testimony to the Commission by October 30. To address such timelines, EPA and PADEP typically provide a grace period to implement updated model versions.

[5] Definitions: H1H = highest first high. H8H = highest eighth high, H2H - highest second high. H6H = highest sixth high, 5YA = five year average, ARM2 = Ambient Ratio Method Version 2

Furthermore, even when factoring in conservatively calculated pre-existing background concentrations which are not attributable to the Station, the modeled results still comply with NAAQS as shown in Table 2 below.

Table 2: Comparison Of Maximum Modeled Project Impacts plus Background to NAAQS
(Six Gas Heaters and One 50 kW Emergency Engine)

Pollutant	Averaging Period	NAAQS Assessment					
		Concentration Rank	Maximum Predicted Project-Only Concentration (μg/m^3)	Ambient Monitor Background Concentration (μg/m^3)[6]	Total Predicted Concentration (μg/m^3)	NAAQS (μg/m^3)	Meets NAAQS?
NO_2 (ARM2)	1-hour	H8H (5YA)	97.0	76.4	173.4	188	**Yes**
	Annual	H1H	9.6	18.1	27.7	100	**Yes**
CO	1-hour	H2H	6,409	2,061	8,470	40,000	**Yes**
	8-hour	H2H	3,431	1,718	5,149	10,000	**Yes**
$PM_{2.5}$	24-hour	H8H (5YA)	5.5	23.6	29.1	35	**Yes**
	Annual	H1H (5YA)	1.1	10.1	11.2	12	**Yes**

These results are expected given that, as explained above, the Station does not trigger any state or federal air permitting requirements and further confirm that the Station will not exceed EPA's NAAQS.

26. Q. Would you characterize your air dispersion modeling as "conservative"?

A. Yes, in the sense that the line heaters contain six (6) burners which are not all necessarily operating at the same time. Rather, the burners are designed to throttle up or down as required, such that only one or more burners may be activated at any given time. The modeling does not take this intermittent operation into account and, rather, assumes that all six (6) burners will be operating simultaneously 24

[6] Ambient background concentrations conservatively calculated from measurements obtained from monitors closest to the proposed project location that are representative of the project's surrounding land use. For CO: 4100 Montgomery Drive (monitor number 42-101-0076). For $PM_{2.5}$ and NO_2: Front & Norris St (monitor number: 42-045-0002).

hours per day, 365 days per year. Thus, the model results are conservative and the modeled ambient air impacts are very likely higher than they will actually be.

27. Q. Did you evaluate modeled impacts at the alternate site proposed in Mr. McAuley's testimony and do you agree that ambient impacts at the preferred site are higher than the alternate site as shown in Mr. McAuley's testimony?

A. No. In his analysis Mr. McAuley stated that impacts from 2090 Sproul Road for 1-hour NO_2 are much higher (based on his tables 13 times higher) than the alternate site. This result is suspect since dispersion around both sites is expected to be similar because the site configurations and topographic variations are substantially the same. Furthermore, based on the limited modeling files received (partial receipt of NO_2 modeling files, no receipt of modeling files for other pollutants), Mr. McAuley modeled different emergency generator exhaust temperatures and exit velocities for the 2090 Sproul Road location (1283 K and 4.81 m/s, respectively) and for the alternate location (968.15 K and 46.78 m/s, respectively). Rather, the exhaust temperatures and exit velocities should be identical regardless of location. Such inconsistencies can produce substantially different model results. Additionally, receptors (i.e., locations where the dispersion model predicts concentrations) were placed without accounting for the project fence line, which defines the ambient air boundary, and this could additionally produce substantially different model results. In the modeling I conducted, 1-hour NO_2 impacts were shown to be slightly higher at the alternate location. However, in both locations the predicted ambient air quality impacts are less than the NAAQS.

28. Q. Did you conduct any evaluation with respect to greenhouse gases?

A. Yes. In response to numerous statements in the Remand Direct Testimony from Marple Township witnesses including Mr. Schmid and Dr. Najjar regarding the impact of the Station on global climate change, Tetra Tech calculated the estimated emissions of greenhouse gases, including carbon dioxide, methane, and nitrous oxide.

29. Q. What were the results of the analysis?

A. As a reference point, EPA's 40 CFR Part 98 (Mandatory Reporting of Greenhouse Gases), Subpart C (General Combustion source category) requires facilities with greenhouse gas emissions of 25,000 metric tons or more to annually report emissions. Here, annual greenhouse gas emissions from the Station were calculated to be approximately one-tenth ($1/10^{th}$) of EPA's reporting requirement, which assumes that the line heater's six burners will operate 24 hours per day, 365 days per year, and the emergency generator engine will operate 500 hours per year which, as explained above, are conservative assumptions, and the calculated emissions are very likely higher than they will actually be. Accordingly, the Station's potential greenhouse gas emissions are well below the required reporting threshold. In addition, under Part 98, EPA does not require greenhouse gas reporting for emergency generators due to the low levels of emissions. Furthermore, Pennsylvania Department of Environmental Protection's (PADEP) 2019 greenhouse gas inventory (published in October 2022)[7] reports total gross greenhouse gas emissions of 266 million metric tons (266,000,000 metric tons).

[7] Available at: https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/ClimateChange/PennsylvaniaGreenhouseGasInventory2022.pdf.

The Station's greenhouse gas emissions would represent 0.0008% of the State's greenhouse gas emissions which is a negligible contribution when compared to the statewide totals.

30. Q. Mr. Harrington, have you formed a conclusion as to the impacts to air quality regarding siting the Fiber Building and the Station Building at the Property?

A. Yes. Based on my experience, review of Project Documents, and the above air dispersion modeling, I reiterate my prior conclusion that neither the siting of the Fiber Building or Station Building at the Property, nor the construction and operation of the Station as a whole, will cause any unreasonable impacts to air quality.

31. Q. Mr. Harrington, have you formed a conclusion as to human health impacts from air quality regarding siting the Fiber Building and the Station Building at the Property?

A. Yes. Based on my experience, my review of Project Documents, and the above air dispersion modeling, neither the siting of the Fiber Building or Station Building at the Property, nor the construction and operation of the Station as a whole, will cause any unreasonable human health impacts due to air quality impacts.

IV. <u>ENVIRONMENTAL IMPACTS AT THE PROPOSED ALTERNATIVE SITE</u>

32. Q. Have Marple Township and the intervenors proposed an alternative site for the construction of the Station?

A. Yes, throughout this litigation, Marple Township and the Intervenors have generally not opposed construction of the Station in Marple Township but have proposed that the Station be constructed at an alternative location at the intersection

of Sproul Road and Reed Road in Marple Township. In Marple Township Statement No. 1, Mr. McAuley continues to advocate that locating the Station at the intersection of Sproul Road and Reed Road will have less environmental impacts.[8]

33. Q. Are you familiar with this location?

A. Yes. This location is located on the former Don Guanella School property. This is a 213-acre property that is adjacent to Cardinal O'Hara High School, and which was recently acquired by Delaware County through eminent domain with the involvement of environmental groups including Save Marple Greenspace after several years of litigation involving the property. The property consists of woodlands, wetlands, meadows, and creeks, as well as several buildings from the former Don Guanella School. A Master Plan is currently being developed by the County and its consultants to create a state-of-the-art County Park. The Master Plan envisions conservation of resources, hiking trials, activity mounds, activity centers, and a variety of active and passive recreation opportunities to be developed on the property. According to Delaware County's website, the highest priority of the County is the preservation of the undeveloped lands.[9] Additionally, on October 11, 2023, Tetra Tech conducted a site reconnaissance visit to the property and, in particular, the portion of the property that is proposed as an alternative site for the Station. A map of the park, as depicted in the Delaware County's Master Plan

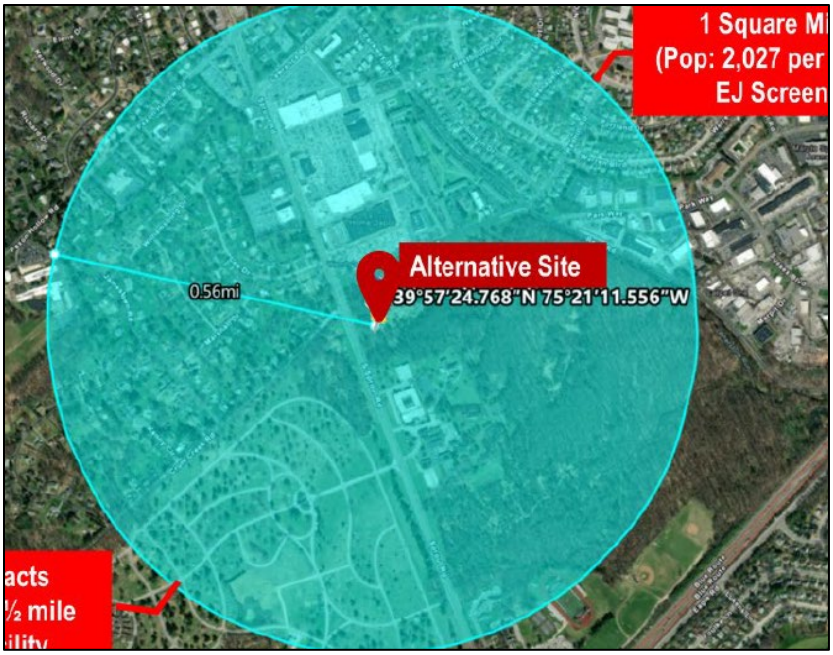
[8] *See, e.g.,* Marple Township Statement No. 1 at pp. 9 and 11 (contending that the "Alternative Location" (Sproul and Reed Road) will have fewer impacts and would be "significantly more protective of ambient air quality impacts" than the "Preferred Location" (2090 Sproul Road)).

[9] *See* https://www.delcopa.gov/departments/parks/newpark.html.

presentation,[10] is provided below. Note that Cardinal O'Hara High School is adjacent to the south, with the track and football field depicted on the map below:

The precise location of the proposed alternative site is in the northwest corner of the Park in proximity to the intersection of Sproul and Reed Roads, as depicted in Mr. McAuley's testimony in Exhibit TM-2, Figure 7, shown below.

[10] A full copy of Delaware County's Master Plan presentation is attached hereto as Exhibit JH-5.



When comparing these maps, the alternative site is located in the dark green shaded area of the Master Plan map, which connotes a "Minimal Activity Zone", which is defined in the Master Plan presentation as areas that will have very limited disturbance because it (1) is an environmentally sensitive area that has slopes greater than 25 percent, (2) is located within a flood plain, and (3) contains soils with high limitations to development.

34. Q. Would constructing the Station at the proposed alternative site location result in a reduction of any environmental impacts from the Station?

A. No. To the contrary, constructing the Station at this location will cause greater environmental impact than at 2090 Sproul Road. As explained in the Remand Direct Testimony of Keith Kowalski, PECO Statement No. 2-RD, it is generally preferrable to redevelop previously developed areas because it reduces the need for land clearing and grubbing, and it preserves natural areas that might otherwise be subject to development. This is a perfect example of those principles in action.

Development of the proposed alternative site will result in greater environmental incursion because it is less developed land.

35. Q. Would any grading and land clearing be necessary to construct the Station at the proposed alternative location?

A. Yes, unlike the 2090 Sproul Road, the topography at the proposed alternative site is hilly, with 15 to 20 percent slopes mapped within the property. Accordingly, significant grading would be necessary to construct a building pad to support the Station at this location. Additionally, the proposed alternative location is wooded, and would require significant clearing of trees. The property at 2090 Sproul Road, by contrast, will require minimal land clearing, grading, or grubbing in light of its prior use as a gasoline service station.

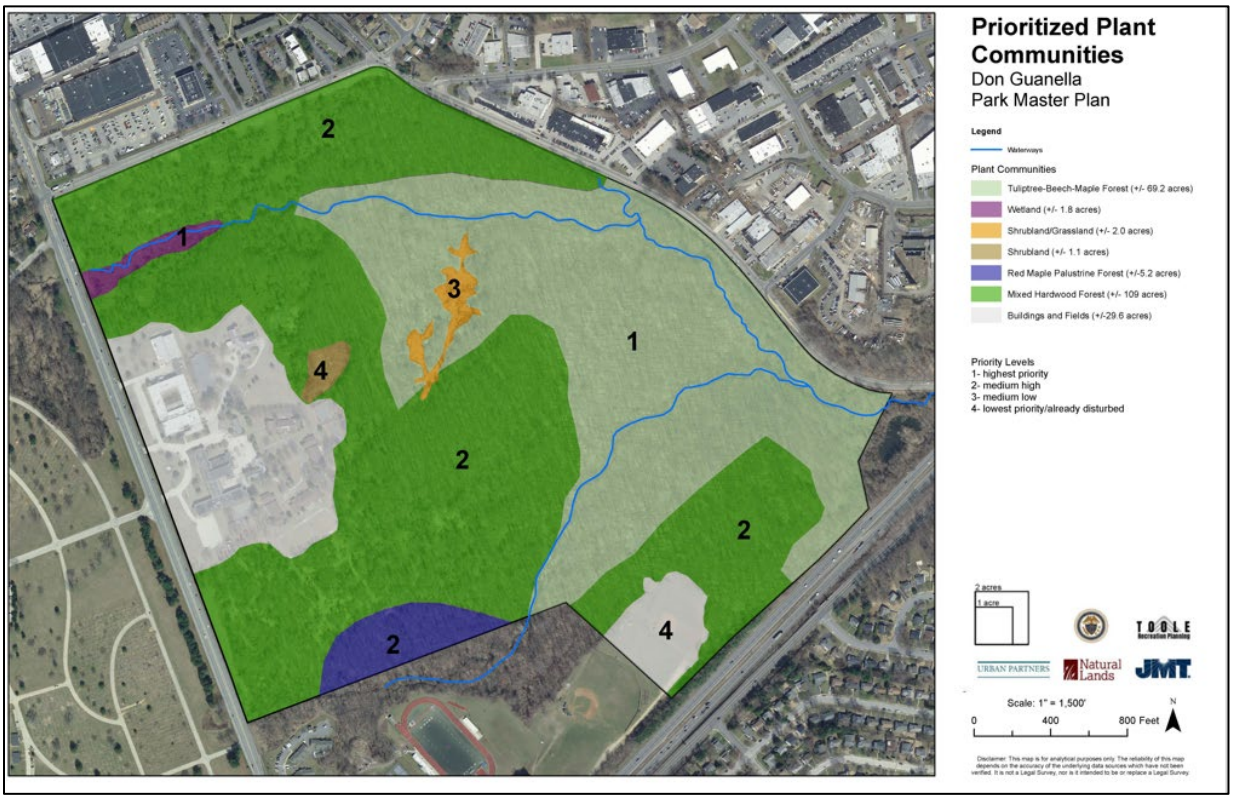
36. Q. Would any surface water bodies be impacted from the construction of the Station at the proposed alternative location?

A. Yes. An unnamed tributary to Whetstone Run flows through the northwest portion of the property at the precise location that has been proposed as an alternative site. This stream is identified on the Master Plan map produced above. Construction of the Station in this area as proposed will necessarily cause significant impacts to this unnamed tributary. Constructing the Station at 2090 Sproul Road, meanwhile, will not cause any disruption to surface waters.

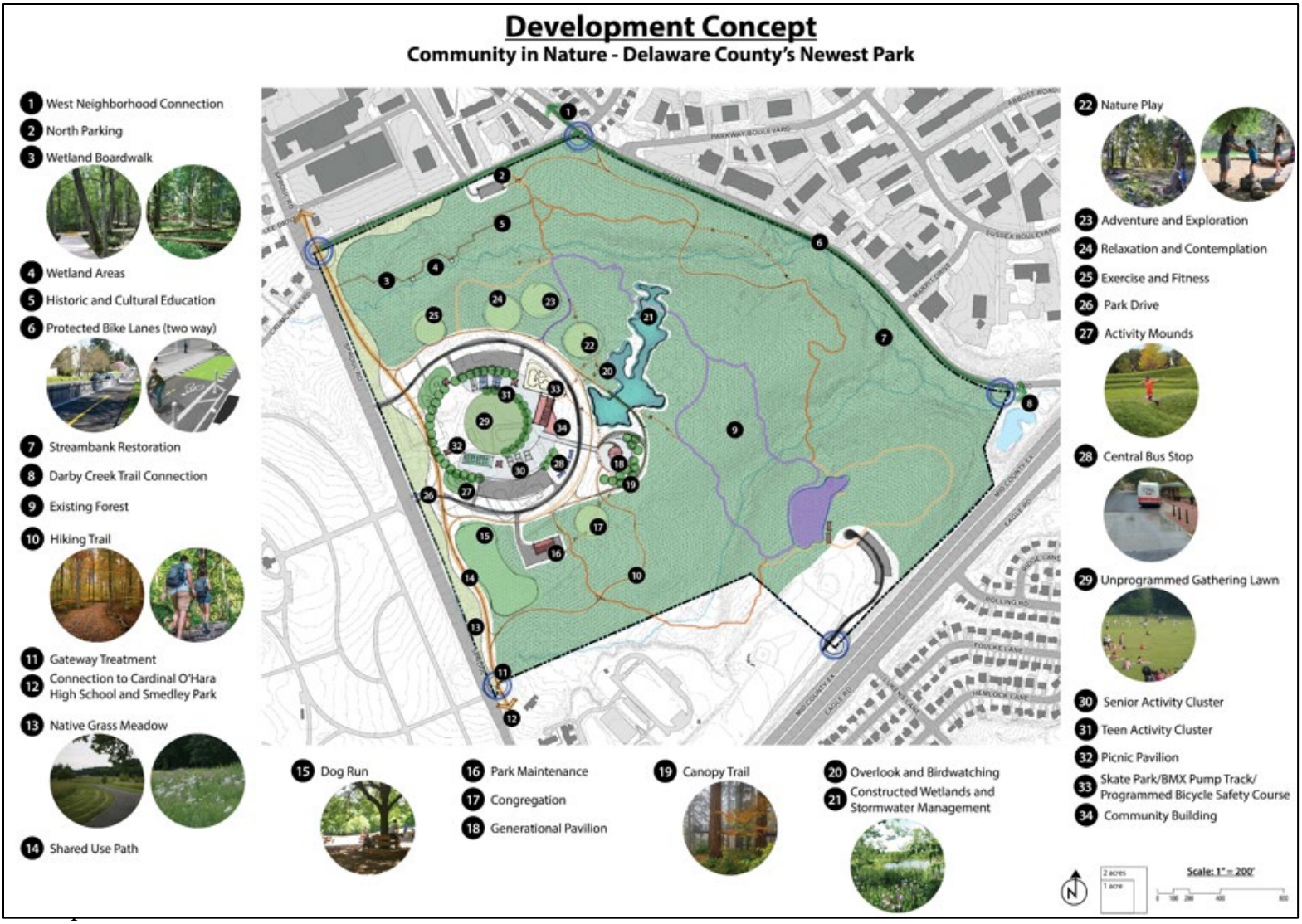
37. Q. Would any wetlands be impacted from the construction of the Station at the proposed alternative location?

A. Yes. The vegetation on both sides of the unnamed tributary is herbaceous and exhibits riparian habitat characteristics and vegetation. Although this area is not

mapped as a wetland on the U.S. Fish and Wildlife Service's ("USF&WS's) Wetland Mapper, it is identified in the County's Master Plan presentation as a wetland area and is assigned the "highest priority" level (see purple area # 1 in the map below):



Further, the County's Master Plan presentation indicates that this area will be converted into a wetland and wetland boardwalk (see areas # 3 and 4 in the map below):



Accordingly, construction of the Station in this area as proposed will necessarily impact the wetlands. Constructing the Station at 2090 Sproul Road, meanwhile, will not cause any disruption to wetlands because that property was previously developed.

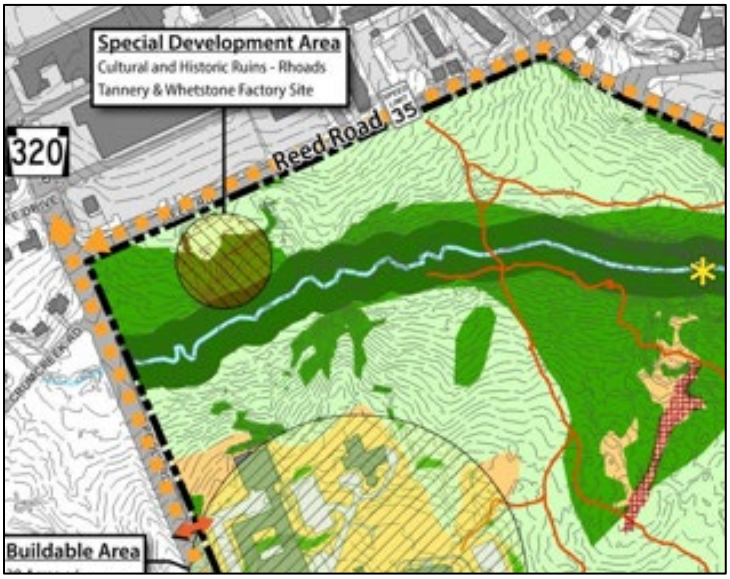
38. Q. Would any habitat be impacted from the construction of the Station at the proposed alternative location?

A. Yes. A review of the USF&WS's Information for Planning and Consultation (IPaC) database indicates that several endangered species may use this area as

habitat at various times of the year. Those species include the Northern Long-eared Bat, the Indiana Bat, and the Tri-colored Bat (which is proposed endangered). Additionally, several migratory birds were identified on IPaC as potentially using this area as habitat, including the bald eagle, black-billed cuckoo, cerulean warbler, chimney swift, golden eagle, Kentucky warbler, prairie warbler, red-headed warbler, rusty blackbird, and wood thrush. The clearing of trees and brush necessary to construct the Station at this proposed location will necessarily impact habitat. Constructing the Station at 2090 Sproul Road, meanwhile, will not cause any disruption to habitat because that property was previously developed.

39. Q. Would any historic structures or historic resources be impacted from the construction of the Station at the proposed alternative location?

A. Likely yes. According to Delaware County's Master Plan presentation, the northwest corner of the Don Guanella Property (i.e. the proposed alternative site) contains the cultural and historic remains of the Rhoads Tannery and the Whetstone Factory Site, the location of which is delineated in the map below:



The Rhoades Tannery was a leather tanning operation founded by the Rhoads family which is recognized as one of the longest continuously operated businesses in the nation, originally founded in 1702.[11] The Whetstone Factory, also founded by the Rhoads family, was built in 1842 and involved the quarrying and cutting of slate and sandstones into desired shapes and sizes.[12] Development in this area will likely impact these historical resources. Conversely, there are no mapped historical buildings or historical resources at or in the vicinity of 2090 Sproul Road.

40. Q. Have you identified any other impediments to constructing the Station at the proposed alternative location?

A. Yes. This property is zoned in the Institutional (INS) District. Unlike 2090 Sproul Road, which is zoned to permit public utility development by special exception, public utility facilities are not considered as either permitted or special exception uses within the INS District.

V. CONCLUSION

41. Q. Mr. Harrington, have you formed a conclusion as to the environmental impacts regarding siting the Fiber Building and the Station Building at the Property?

A. Yes. Based on my experience, my review of Project Documents, and the air dispersion modeling discussed above, I reiterate my prior conclusion that neither the siting of the Fiber Building or Station Building at the Property, nor the

[11] *See* Marple Friends and Neighbors Magazine (April 2020), available at https://issuu.com/bestversionmedia6/docs/2004-m_2988_marple_friends___neighbors_web_april20/s/10395635.
[12] Source: https://marplehistory.com/1850s-industry/.

construction and operation of the Station as a whole, will cause any unreasonable impacts to air, water, historical, or other environmentally sensitive resources.

42. Q. Does this conclude your testimony?

A. Yes. However, I reserve the right to file such additional testimony as may be necessary or appropriate.

EXHIBIT
JH-4

PECO Natural Gas Reliability Station, Marple Township, PA

Air Quality Dispersion Modeling Impact Analysis

October 2023

Prepared for:

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TETRA TECH

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1.0 INTRODUCTION

The PECO Energy Company (PECO) proposes to construct and operate a new natural gas reliability station (Project) at 2090 Sproul Road in Marple Township, Pennsylvania. The Project will include combustion equipment including six 0.77 million British Thermal Unit (MMBtu) per hour natural gas fired gas heater units and a 50 kilowatt (kW) natural gas fired emergency engine. While these small combustion units will emit criteria pollutants their sizes are less than the thresholds requiring air permitting. However, to provide additional assurance the air quality impacts from the Project will be less than the National Ambient Air Quality Standards (NAAQS) designed to protect public health and public welfare, an ambient air quality dispersion modeling analysis was conducted to assess whether the NAAQS would be met.

This report documents the modeling methodology followed in completing the ambient air quality analysis for the proposed Project's emission units. Section 2 of this report provides a discussion of the proposed site location. Section 3 discusses the regulatory requirements for the Project. Section 4 presents the ambient air quality analysis performed for this Project and includes the modeling results.

2.0 PROJECT DESCRIPTION

PECO's proposed reliability station will include a 74-foot by 28-foot steel station building with absorptive layer, six 0.77 MMBtu/hour natural gas heaters, new piping, a 16-foot by 10-foot fiber building, a 50 kilowatt (kW) emergency backup generator, and a security and noise barrier wall around the perimeter. New driveways and stormwater conveyances will also be constructed at the site.

The reliability station will be constructed at the terminus of the new gas distribution main permitted under Phase I and will connect to the existing gas distribution main located along Sproul Road.

2.1 SITE LOCATION

The Project is to be located at 2090 Sproul Road in Marple Township, Delaware County, Pennsylvania. Based on a review of publicly available Delaware County property information, the Project is wholly located on an approximately 23,368 square foot (0.54 acre) parcel owned by PECO Energy Company with Parcel ID: 25000448601 (Map Number 25-19-195:001).

The parcel is located in the southwest corner of the intersection of Sproul Road and Cedar Grove Road. Immediately to the south of the parcel is Freddy's Frozen Custard and Steakburgers (2084 Sproul Road) and additional commercial development, to the east is Sproul Road and single-family residential development, to the north is Cedar Grove Road and single-family residential development, and to the west is a driveway providing access to several businesses along Sproul Road and additional single family residential development.

An alternate site location was also considered for air quality analysis. The alternate site is located at the intersection of Sproul Road and Reed Road in Marple Township. Figure 2-1 shows the general location of the preferred and alternate Project sites.

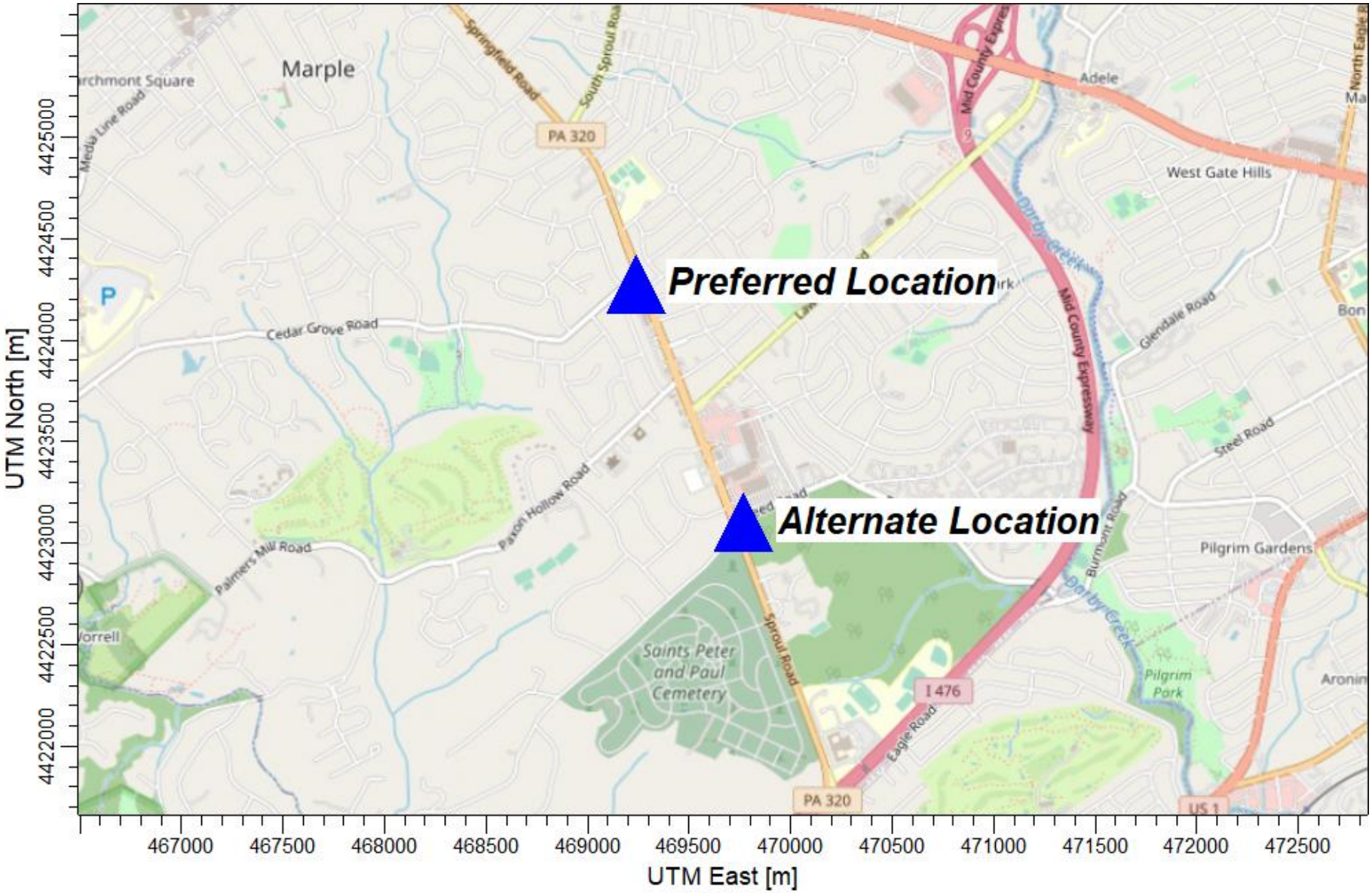

Figure 2-1. Facility Location (Preferred and Alternate Sites)

3.0 REGULATORY REQUIREMENTS

The Pennsylvania Department of Environmental Protection's (PADEP) air quality permitting program is codified at 25 Pa. Code Chapter 127. The purpose of the program is to ensure that new sources conform to applicable emissions standards and do not produce ambient air contaminant concentrations in excess of designated ambient air quality standards. The program defines major sources and minor sources of emissions, and also provides exemptions to new sources that have small enough emissions that ambient air quality impacts are presumed to meet ambient air quality standards.

Any sources claiming an exemption based on rated capacity or emission thresholds must keep adequate records to clearly demonstrate to PADEP that the applicable thresholds are not exceeded. The records must be kept for five years and be made available to PADEP upon request. Although a source may be exempt from PADEP's Chapter 127 Plan Approval and Operating Permit requirements, the source is still subject to all other applicable air quality regulations. For example, combustion units exempt from the requirements of Chapter 127 are not exempt from the opacity (visible emissions) limitations of § 123.41 or the emission limitations of § 123.22. Requests for exemptions from the Plan Approval requirements of Chapter 127 for multiple source facilities must be considered on a case-by-case basis, unless otherwise noted within the exemption category.

PADEP's guidance[1] on air quality permit exemptions under § 127.14(a) and § 127.14(a)(8) provides additional detail on project scenarios that do not require the submission of a Plan Approval Request for Determination (RFD) form. The exemptions relevant to the Project include:

- Combustion units with a rated capacity of less than 10 MMBtu/hour of heat input fueled by natural gas supplied by a public utility.
- Internal combustion engines rated at less than 100 brake horsepower (bhp); this category does not apply to newly installed engines of a model year that is not within five years of the installation date unless the engine meets the applicable 40 CFR Part 60 New Source Performance Standard (NSPS) emission rates that apply to a newly manufactured engine.
- Internal combustion engines regardless of size, with combined actual nitrogen oxides (NO_X) emissions less than 100 pounds per hour (lb/hr), 1000 pounds per day (lb/day), 2.75 tons per ozone season and 6.6 tons per year (tpy) on a 12-month rolling basis for all exempt engines at the site; this category does not apply to newly installed engines of a model year that is not within five years of the installation date unless the engine meets the applicable NSPS emission rates that apply to a newly manufactured engine.[2]

3.1 AIR EMISSION UNITS

The Project is proposed to include the following air emission units:

- A CWT Indirect Line Heater with individual 6 burners, each with a maximum heat input capacity of 0.77 MMBtu/hr for a total maximum heat input capacity of 4.62 MMBtu/hr.
- An emergency generator with an ultra-low sulfur (ULSD) diesel engine with a rated mechanical capacity of 104.7 bhp (50 kW)[3] and rich-burn engine technology.

The total heat input capacity of the heaters of 4.62 MMBtu/hr is less than PADEP's 10 MMBtu/hr exemption threshold for requiring a Plan Approval.

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[1] PADEP Document Number 275-2101-003; July 1, 2021.

[2] The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or the general plan approvals/general operating permits at the facility. This category does not apply if an add-on air cleaning device, such as selective catalytic reduction (SCR), is installed.

[3] The Project had originally proposed a 30 kW emergency generator engine but is now proposing a larger 50 kW emergency generator engine.

The rated mechanical capacity of the emergency generator is 104.7 bhp (50 kW). The engine is larger than 100 bhp, and therefore does not qualify for that exemption. Calculated NO_X emissions for the unit assume the following: the engine would be limited to 500 hours per year of operation, NO_X plus hydrocarbons (HC) emissions of 4.89 grams per horsepower-hour (g/hp-hr) as specified by the proposed emergency generator engine vendor, and an assumed NO_X proportion of those emissions of 86 percent. The calculated NO_X emissions relevant for comparison to the exemption criteria are 0.97 lb/hr, 23.3 lb/day, and 0.24 tpy. The calculated emissions are less than the PADEP exemption thresholds of 100 lb/hr, 1000 lb/day, 2.75 tons per ozone season[4], and 6.6 tpy.

The emergency generator engine is subject to 40 CFR 60.4233(e) which references emissions standards listed in Table 1 of 40 CFR Part 60, Subpart JJJJ for NO_X, HC, and carbon monoxide (CO) and specifically for emergency engines manufactured after January 1, 2009, and with rated maximum engine power between 25 and 130 horsepower (hp). The NO_X+HC and CO emissions standards are 10 and 387 grams per horsepower-hour (g/hp-hr), respectively. These emissions standards represent the state-of-the-art emissions levels for emergency generator engines of the size proposed to be installed at the Project. The rule further requires the emergency generator engine to be run no more than 100 hours per year for non-emergency operation.

The air emission units to be installed at the Project are exempt from PADEP air quality permitting requirements and the Project will be compliant with ambient air quality standards. The emergency generator engine will be subject to federal emissions standards, and PECO will purchase a unit that is certified by the manufacturer to meet those standards.

4.0 AIR QUALITY IMPACT ANALYSIS

As described in Section 3.1, the Project is not required to obtain an air permit or conduct an air quality impact analysis. Nevertheless, an air quality dispersion model impact analysis was conducted to demonstrate that impacts from the Project's proposed emissions would meet the NAAQS. The air quality impact analysis was conducted in accordance with USEPA modeling guidance USEPA's *Guideline on Air Quality Models* specified in 40 CFR 51 Appendix W (USEPA, 2017).

This section provides a description of the modeling analysis methodology and results. Topics covered include emissions, terrain, meteorological data, building downwash parameters, receptor network, and ambient air quality data to be used in the dispersion modeling assessment. The maximum predicted short-term and annual pollutant concentrations have been determined for comparison to the NAAQS..

4.1 MODEL SELECTION

The dispersion modeling analysis has been performed using Version 22112 of AERMOD, from the USEPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) website. AERMOD was processed using the USEPA regulatory default parameters:

- elevated terrain algorithms with terrain height data,
- calms processing routines,
- stack-tip downwash (building downwash automatically overrides), and
- missing data processing routines.

The AERMOD modeling system includes AERMOD, the USEPA-recommended dispersion model (40 CFR 51, Appendix W), the meteorological preprocessor AERMET, and the terrain preprocessor AERMAP. The BPIPPRM preprocessor produces a GEP stack height analysis and building downwash parameters. Program versions used in this analysis were:

- AERMAP (18081)

[4] Because the NO_X emissions of 0.24 tons over an entire year are less than the 2.75 tons per ozone season threshold, the exemption threshold is met.

- AERMOD (22112)
- BPIPPRM (04274)

4.2 SOURCE DESCRIPTION

The proposed reliability station will include six 0.77 MMBtu per hour natural gas heaters and a 50 kW emergency backup generator.

The emissions and stack parameters for the gas heaters and emergency engine are provided in Table 4-1 and were as input to AERMOD. The emergency engine emission rates for annual average concentration modeling were further scaled by 500 hours per year (500/8760). In addition, the emergency engine's emission rate for 1-hour NO_2 modeling are also scaled for 500 hours per year (500/8760) consistent with USEPA guidance for intermittent sources like the proposed project emergency engine.

Table 4-1. Modeled Stack Parameters and Emissions Rates (per Emission Unit)

Source	Gas Heater (per unit)	Emergency Engine (50kW)
Stack Height above ground level (m)	4.572	1.64
Stack Diameter (m)	0.3048	0.0762
Base Elevation (m) – preferred site	112.81	112.28
Base Elevation (m) – alternate site	93.24	93.24
Exhaust Temp (K)	403.15	1018.15
Exhaust Velocity (m/s)	3.414	57.198
Emission rates (g/s)		
NO_X	0.005301	0.1223
CO	0.000467	0.5796
$PM_{2.5}$	0.000737	0.001029

Notes: The location coordinates for the first gas heater and the emergency engine are as follows (UTM NAD83 meters, zone 18):
Heater 1 (Preferred Site): 469,239.382 m UTM-E; 4,424,260.883 m UTM-N,
Emergency Engine (Preferred Site): 469,238.095 m UTM-E; 4,424,290.861 m UTM-N.
Heater 1 (Alternate Site): 469,782.363 m UTM-E; 4,423,101.891 m UTM-N,
Emergency Engine (Alternate Site): 469,752.381 m UTM-E; 4,423,103.096 m UTM-N.

4.3 GOOD ENGINEERING PRACTICE STACK HEIGHT

A GEP stack height analysis was performed to evaluate whether the emissions from facility equipment are subjected to building wake effects. If a stack is sufficiently close to a large building, the plume can be entrained in the building's wake. The winds in the wake of the building cause the plume's rise to be diminished, which results in increased ground level ambient concentrations.

There are two definitions of GEP stack height: formula GEP stack height; and regulatory GEP stack height. The USEPA requires building downwash effects to be evaluated when a stack is less than formula GEP stack height (see Equation 1 below). Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. Sources are not allowed to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height.

An analysis of the stack height with respect to GEP was conducted in accordance with the USEPA's guideline for air quality modeling. The USEPA's Building Profile Input Program for PRIME (BPIPPRM) was used to compute the formula GEP stack height and to generate wind direction specific building profiles for sequential modeling. Formula GEP stack height is defined as:

$$\mathbf{H_{GEP} = H_B + 1.5L} \qquad \mathbf{(1)}$$

Where:

HGEP = formula GEP stack height,

HB = the building's height above stack base, and

L = the lesser of the building's height or maximum projected width.

According to the *Guideline for Determination of Good Engineering Practice Stack Height* (USEPA, 1985), a GEP stack height analysis need only consider buildings within 0.8 kilometer or 5L from the stack, whichever is less.

BPIPPRM requires input of a digitized footprint of the buildings and stacks. The position and height of buildings relative to the stack position must be evaluated in the GEP analysis. The building positions, coordinates, and roof tier heights were obtained using georeferenced Project design plan data.

The layout of the facility, with the building locations provided for reference, is displayed in Figure 4-1a (Preferred Site) and Figure 4-1b (Alternate Site).

4.4 URBAN/RURAL LAND USE ASSESSMENT

40 CFR 51, Appendix W specifies a procedure, based on Auer (1978), to determine whether land usage surrounding the modeled source is primarily urban or rural. Two methods that can be used for performing this procedure are based on:

- Land use classifications
- Population density

The land use classification procedure is USEPA's recommended approach.

The land use classification determination involves assessing land use by Auer's categories within a 3-kilometer radius of the modeled site. Urban dispersion coefficients should be selected if greater than 50 percent of the area consists of Auer urban land use types I1, I2, C1, R2, and R3 (industrial, commercial, compact/compact residential); otherwise, rural coefficients should be applied. Figure 4-2a and Figure 4-2b show the 3-kilometer radius centered on the facility for both the Preferred and Alternate project sites, respectively. As shown in the figure, the area is primarily rural under the Auer classification scheme and therefore rural coefficients were used in the analysis.

4.5 TERRAIN AND RECEPTOR DATA

The facility will be enclosed by a property fence line that restricts public access. Discrete receptors were placed at 25 meter intervals along the facility's fence line. In addition, a nested Cartesian grid extended out from the fence line at the receptors intervals and distances.

- 50-meter spacing from facility center out to 500 meters;
- 100-meter spacing from 500 meters out to 2 kilometers; and
- 250-meter spacing from 2 kilometers out to 5 kilometers;

Over 3,550 receptors were defined for the modeling (3,563 for the preferred site and 3,554 for the alternate site). The receptor grids are shown for both the preferred and alternate site in Figures 4-3a/b and 4-4a/b, respectively, including far-field (full grid) and near-field (close to the facility) views.

Terrain elevations at receptors were obtained using Lakes Environmental' s AERMOD View program and USGS Digital terrain data. AERMOD View implements USEPA's AERMAP terrain preprocessor to assign terrain elevations for the receptors and base elevations for emissions sources. Two 1/3 arc-second National Elevation Dataset (NED) files, in GeoTIFF format, were downloaded from the United States Geologic Survey (USGS) using Lakes' Terrain Processor.

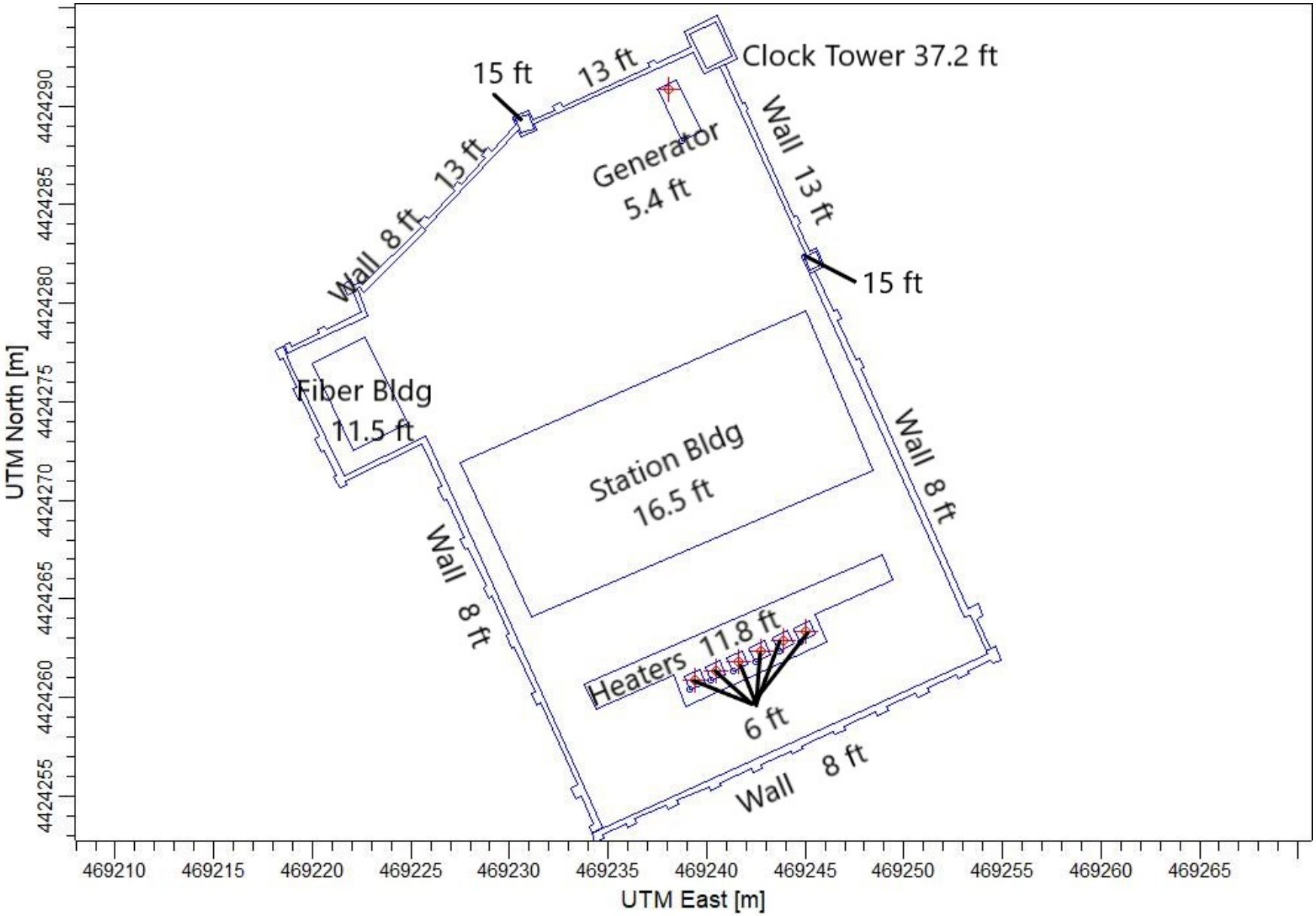

Figure 4-1a. BPIP Analysis Facility Layout Schematic (Preferred Site)

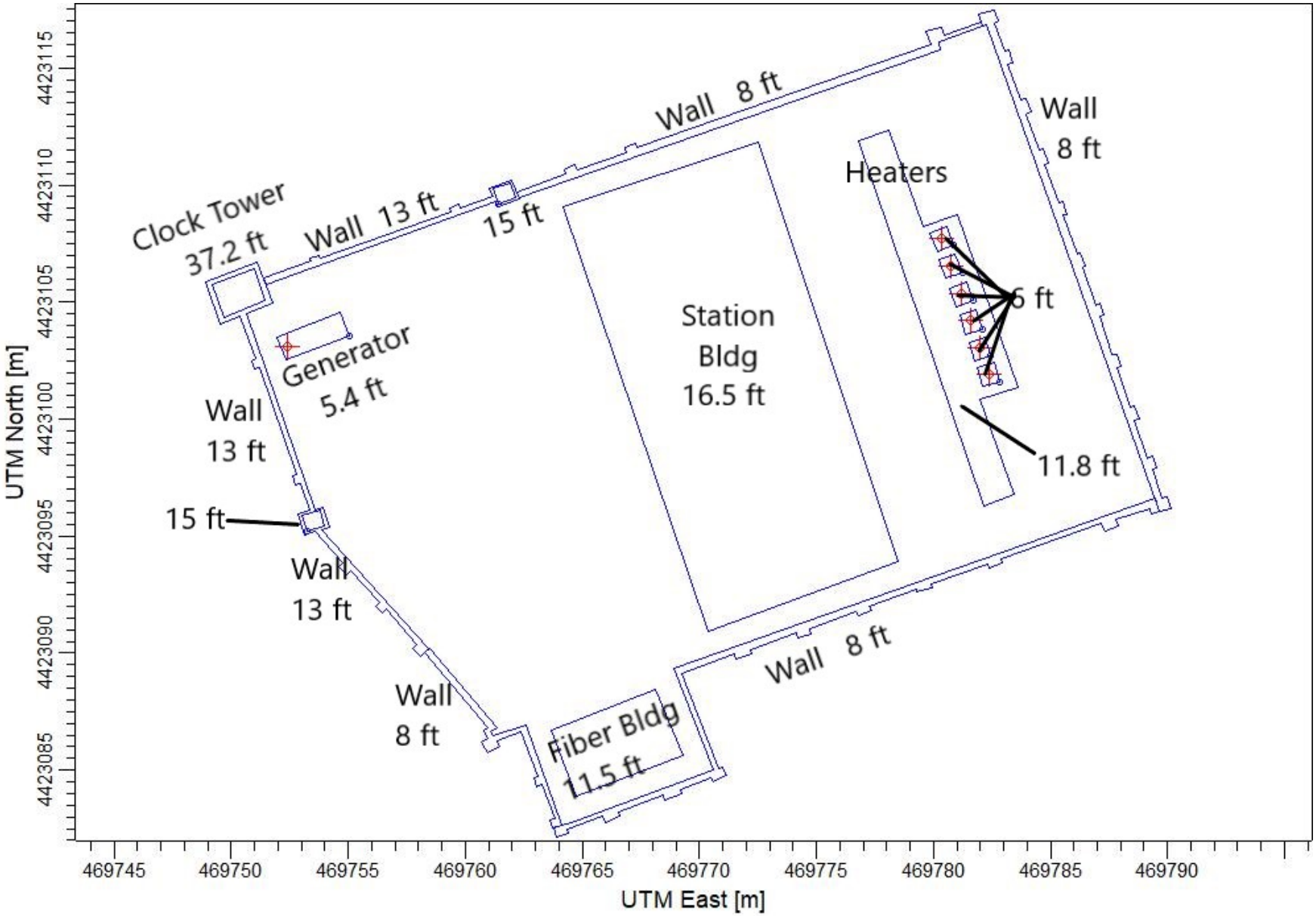

Figure 4-1b. BPIP Analysis Facility Layout Schematic (Alternate Site)

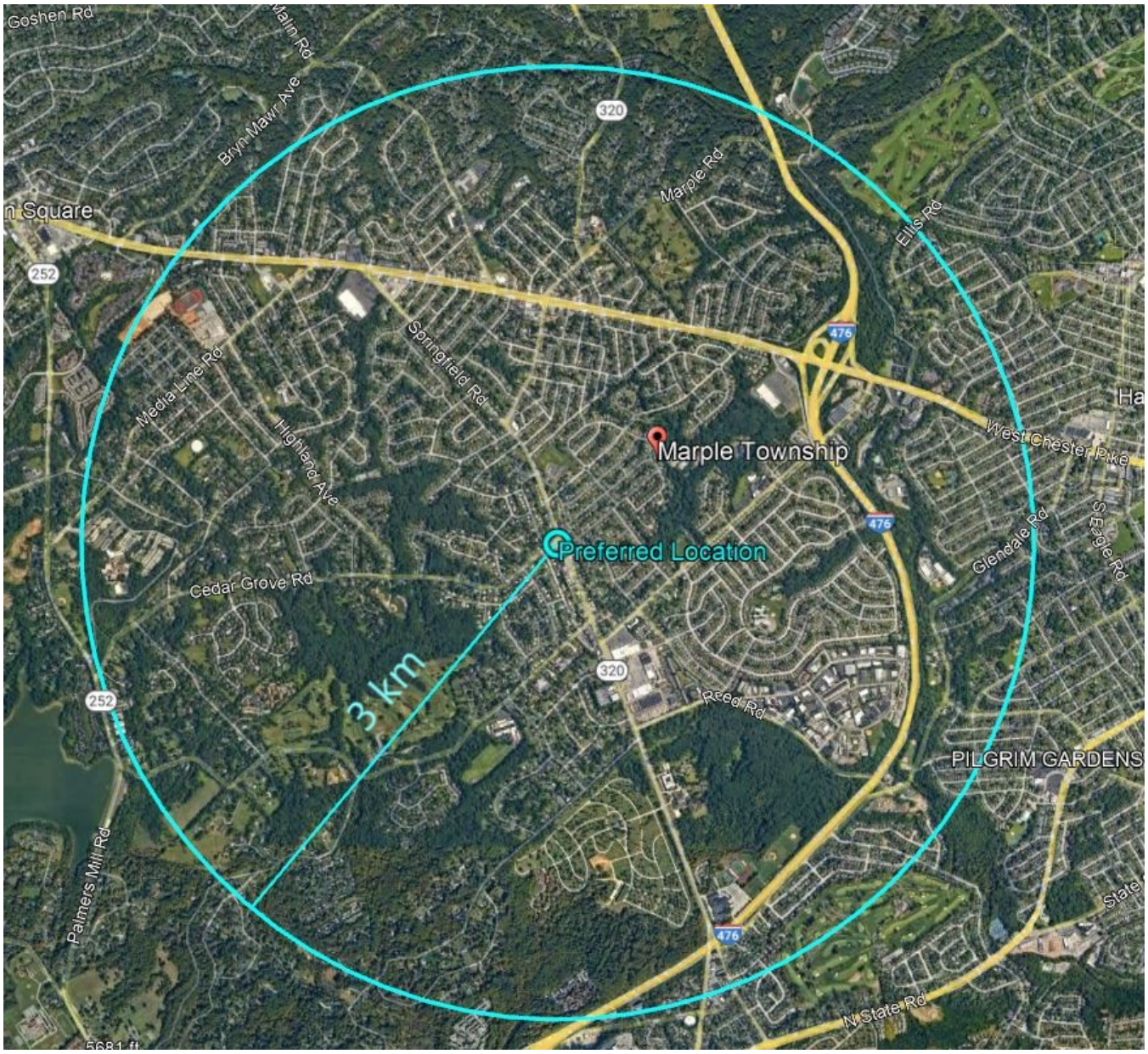

Figure 4-2a. 3-km Radius Distance from Facility (Preferred Site)

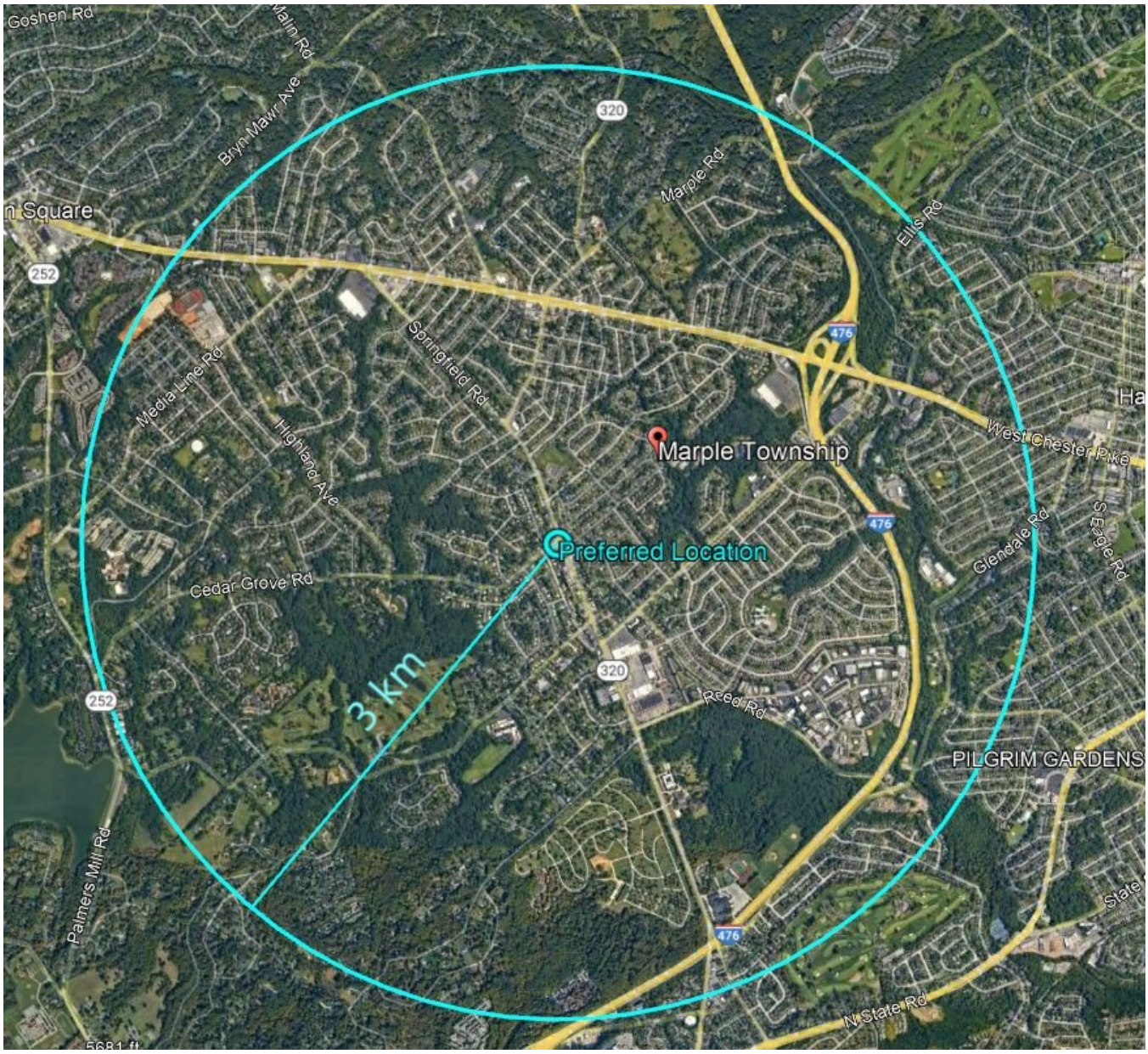

Figure 4-2b. 3-km Radius Distance from Facility (Alternate Site)

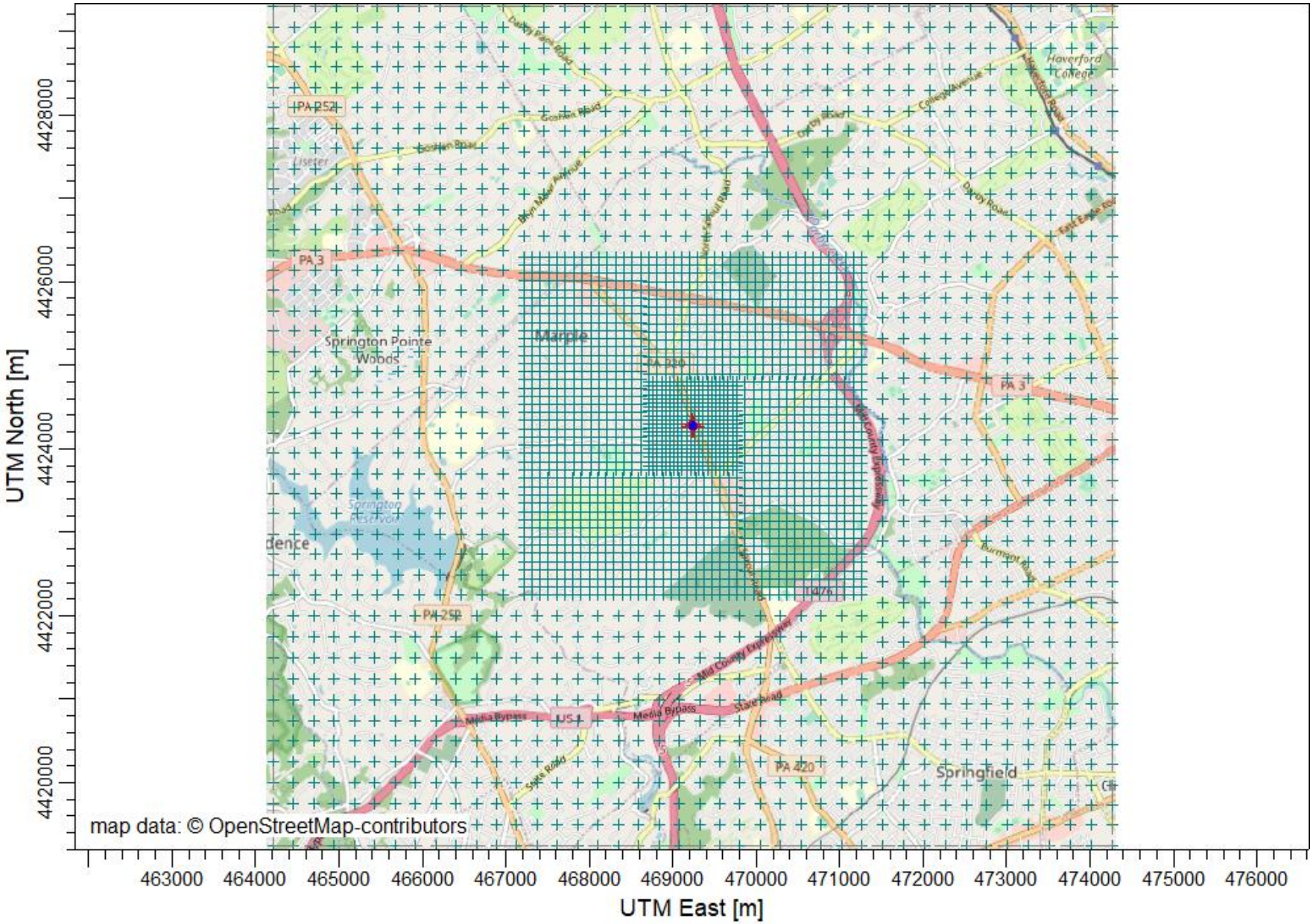

Figure 4-3a. Full Multi-Tier Receptor Network (Preferred Site)

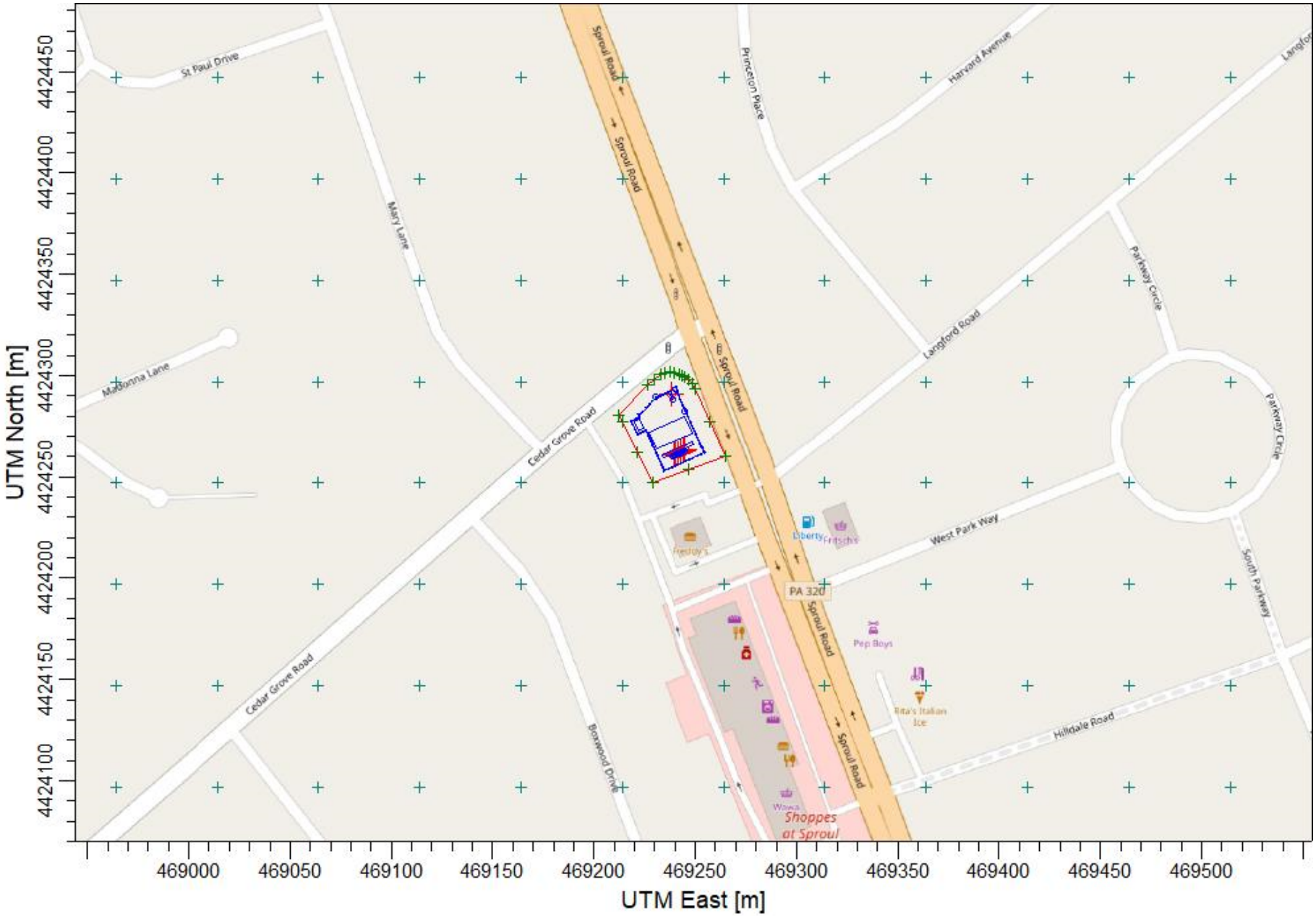

Figure 4-3b. Near-Field Receptors (Preferred Site)

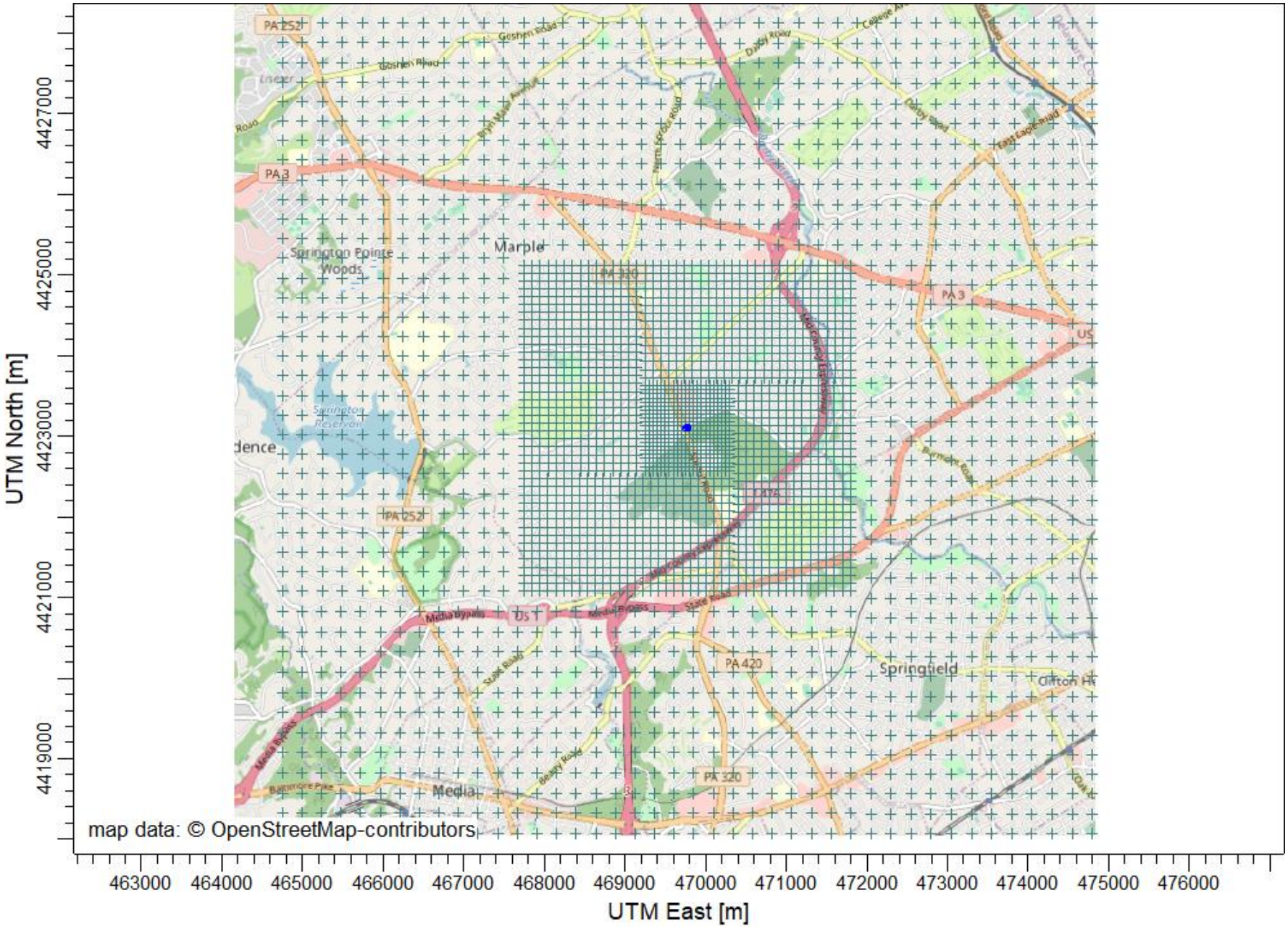

Figure 4-4a. Full Multi-Tier Receptor Network (Alternate Site)

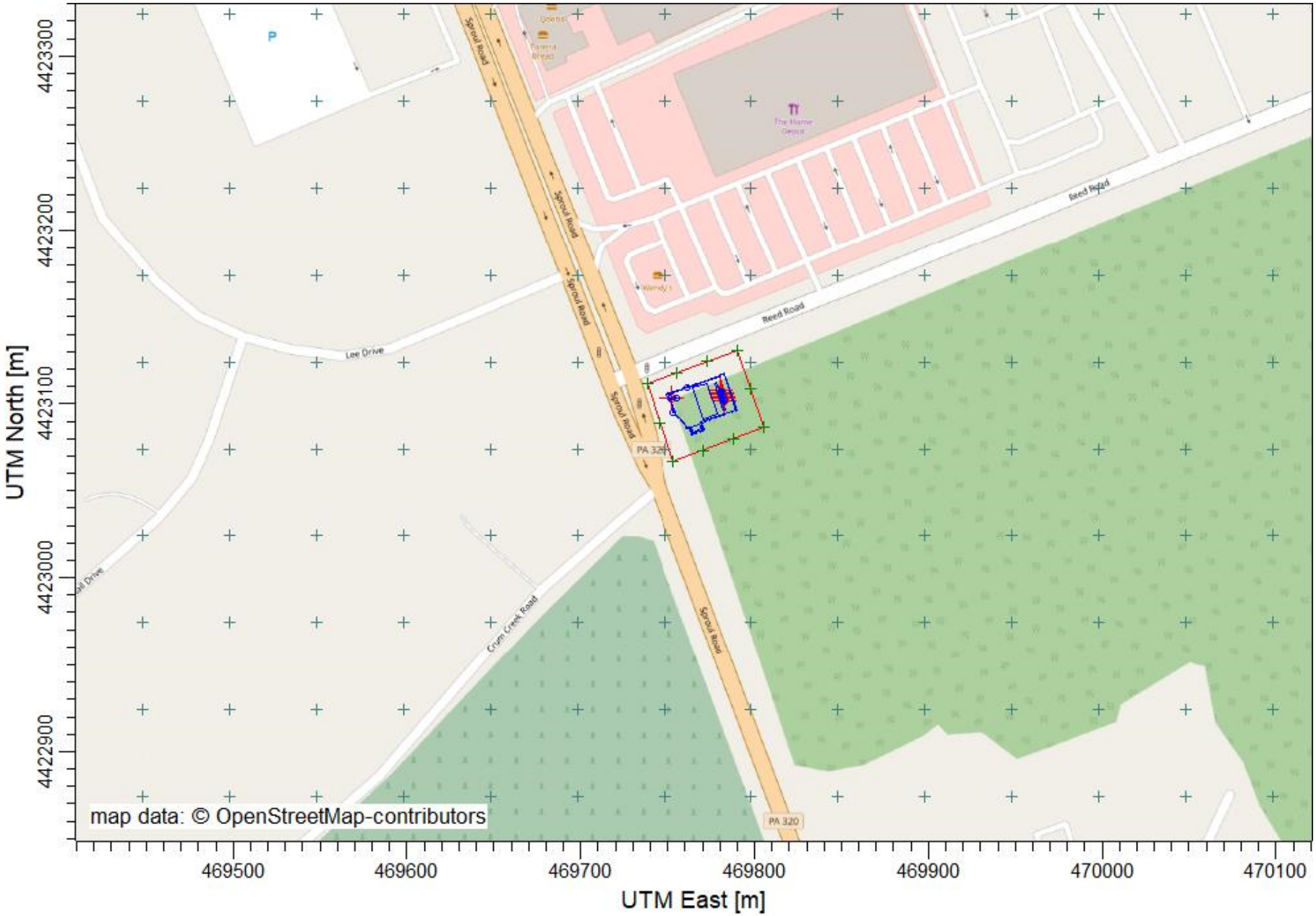

Figure 4-4b. Near-Field Receptors (Alternate Site)

4.6 METEOROLOGICAL DATA

The air quality dispersion modeling used five years (2017-2021) of AERMOD-ready hourly meteorological data. The data was developed from hourly surface observations collected at Philadelphia International Airport (KPHL) National Weather Service (NWS) station located approximately 14.8 kilometers southeast of the project. The hourly surface observations were processed in conjunction with upper air data collected at Washington Dulles International Airport (KIAD).

PADEP processed and provided the meteorological data set for input to AERMOD. The data were processed with the AERMET processor (v22112). The hourly wind data (wind speed and direction) were obtained from the NWS Automated Surface Observing System one-minute observations and processed with the USEPA AERMINUTE tool for input into AERMET. The files incorporate land use data centered on the surface meteorological monitoring site and surface characteristics were determined on a monthly basis. The surface characteristics for input into AERMET were obtained by running the USEPA's AERSURFACE program based on the area surrounding the surface monitoring. A wind rose diagram describing the winds for the meteorological dataset is provided in Figure 4-5.

4.7 NO_2 MODELING METHODOLOGY

The NO_2 impact analysis is consistent with recent USEPA guidance on 1-hour NO_2 dispersion modeling described in the Guideline on Air Quality Models (USEPA January 2017). The January 2017 USEPA guidance describes a three-tiered screening approach for modeling 1-hour NO_2. The key issue is that NO_X emissions are released primarily in the form of nitric oxides (NO_x) which converts to NO_2 in the atmosphere. Tier 1 in the three-tiered screening approach assumes that all NO_x converts to NO_2. Tier 2 assumes NO_x converts to NO_2 at a rate consistent to an appropriate NO_2/NO_x ambient ratio derived from ambient measurement data. The Tier 2 Ambient Ratio Method 2 (ARM2) conversion methodology was used with the default minimum (0.5) and maximum (0.9) NO_2/NO_x ratios.

4.8 BACKGROUND AMBIENT AIR QUALITY

PADEP collects ambient air monitoring data at locations throughout the state. The two nearest monitoring stations to the Project are the Car-Barn Montgomery I-76 monitoring site (Site ID#42-101-0076, measuring CO, NO_2, and $PM_{2.5}$) located approximately 13.3 kilometers (km) to the east northeast of the Project, and the Chester monitoring site (Site ID#42-045-0002 measuring NO_2 and $PM_{2.5}$) located approximately 15.0 kilometers (km) to the south of the Project. The Chester monitor is considered more representative of the Project site area since the Car-Barn monitoring site is located directly adjacent to the I-76 highway, and therefore heavily impacted by highway traffic emissions. Therefore, the Chester ambient background data was used for the pollutants measured at the site (NO_2 and $PM_{2.5}$) and the Car-Barn site was used conservatively used for CO. The next closest CO monitoring site (MLK Corner, Site ID#10-003-2004) is located approximately 30.5 km away and has ambient concentrations comparable to the Car-Barn site. Table 4-2 presents the measured background ambient air quality concentrations.

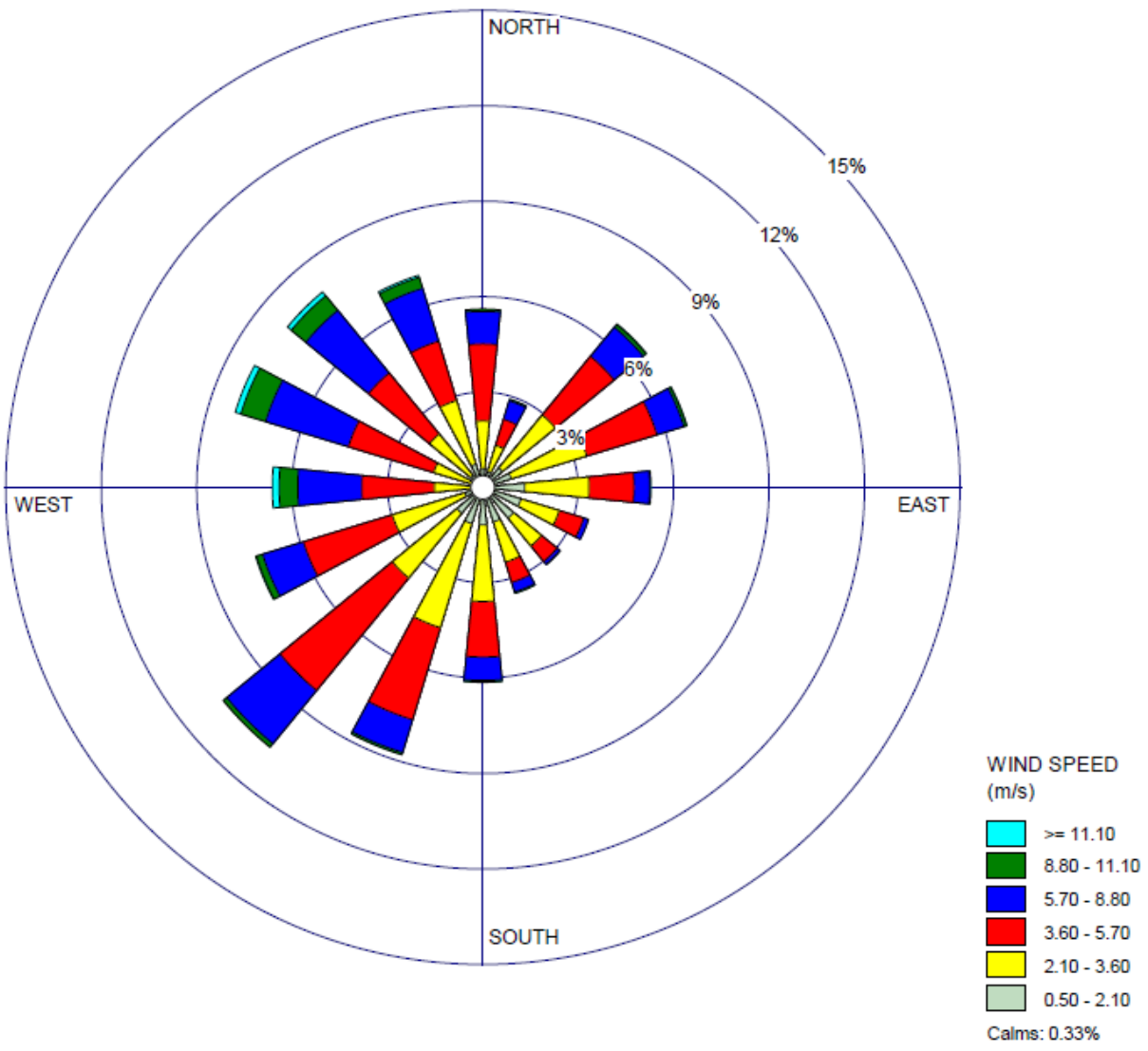

Figure 4-5. Wind Rose Plot for Philadelphia International Airport (2017 – 2021)

Table 4-2. Background Ambient Air Quality Data

Pollutant	Averaging Period	2020 (unit)[a]	2021 (unit)[a]	2022 (unit)[a]	Rank	Form	Concentration (unit)[a]	Concentration (µg/m³)
CO	1-hour	1.7	1.4	1.8	H2H	Max.	1.8	2,061
	8-hour	1.5	1.1	1.2	H2H	Max.	1.5	1,718
NO_2	1-hour	38	44	40	98th %ile	Average	40.6	76.4
	Annual	8.27	9.49	9.64	Mean	Max.	9.6	18.1
$PM_{2.5}$	24-hour	23	25	23	98th %ile	Average	23.6	23.6
	Annual	9.7	10.1	9.5	Mean	Average	10.1	10.1

[a] Pollutant units of measure are parts per million (ppm) for CO, parts per billion (ppb) for NO_2, and micrograms per cubic meter (µg/m³) for $PM_{2.5}$.

4.9 MODELING RESULTS

The modeling results are provided in Table 4-3 and Table 4-4, for the preferred and alternate sites, respectively. The maximum predicted Project concentrations are listed for each pollutant and averaging period along with ambient background concentrations. The total concentrations include maximum project impacts plus ambient background. The total concentrations are compared to the NAAQS and demonstrate that the Project will meet the NAAQS for all pollutants and averaging periods. The maximum concentrations are predicted to occur at the facility fence line.

Table 4-3. AERMOD Predicted Modeling Results (Preferred Site)

Pollutant / Averaging Period	Concentration Rank	Max. Project Impact (µg/m³)	Ambient Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)
CO 1-HR	H2H	6,409	2061	8,470	40,000
CO 8-HR	H2H	3,431	1718	5,149	10,000
NO_2 1-HR	H8H (5-Year Avg.)	97.0	76.4	173.4	188
NO_2 ANNUAL	H1H	9.6	18.1	27.8	100
$PM_{2.5}$ 24-HR	H8H	5.5	23.6	29.1	35
$PM_{2.5}$ ANNUAL	H1H (5 year Avg.)	1.1	10.1	11.2	12

Note: The emissions for the emergency engine have been scaled for 500 hours per year operation (500/8760) for the assessment of annual NO_2 and $PM_{2.5}$, as well as 1-hour NO_2.

Table 4-4. AERMOD Predicted Modeling Results (Alternate Site)

Pollutant / Averaging Period	Concentration Rank	Max. Project Impact (µg/m³)	Ambient Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)
CO 1-HR	H2H	4,335	2061	6,396	40,000
CO 8-HR	H2H	1,804	1718	3,521	10,000
NO_2 1-HR	H8H (5-Year Avg.)	105.5	76.4	181.9	188
NO_2 ANNUAL	H1H	6.0	18.1	24.2	100
$PM_{2.5}$ 24-HR	H8H	4.1	23.6	27.6	35
$PM_{2.5}$ ANNUAL	H1H (5 year Avg.)	0.7	10.1	10.7	12

Note: The emissions for the emergency engine have been scaled for 500 hours per year operation (500/8760) for the assessment of annual NO_2 and $PM_{2.5}$, as well as 1-hour NO_2.

5.0 GREENHOUSE GAS EMISSIONS CALCULATIONS

In addition to the calculation of emissions presented in Section 4.2 for dispersion modeling purposes, emissions of greenhouse gases (GHG0 were also calculated. The emission unit assumptions used for calculating the GHG emissions, specifically:

- The proposed reliability station will include six 0.77 MMBtu per hour natural gas heaters and a 50 kW emergency backup generator.
- The natural gas heaters were assumed to operate 8,760 hours per year.
- The emergency generator engine was assumed to operate 500 hours per year.

Table 5-1. Calculated GHG Emissions

Source	Gas Heaters (total)	Emergency Engine	Total Emissions
Assumed Operating Hours	8,760	500	
Emission rates (metric tons per year)			
CO_2	2,157.2	21.8	2,179.0
CH_4	0.041	0.00041	0.0414
N_2O	0.0041	0.000041	0.00414
GHG (as CO_2e)	2,159.4	21.8	2,181.2

As a reference point, EPA's 40 CFR Part 98 (Mandatory Reporting of Greenhouse Gases), Subpart C (General Combustion source category) requires facilities with greenhouse gas emissions of 25,000 metric tons or more to annually report emissions. As can be seen in Table 5-1, annual greenhouse gas emissions from the Station were calculated to be approximately one-tenth (1/10th) of EPA's reporting requirement, which conservatively assumes that the line heater's six burners will operate 24 hours per day, 365 days per year, and the emergency generator engine will operate 500 hours per year which are conservative assumptions. Accordingly, the Station's potential greenhouse gas emissions are well below the required reporting threshold. In addition, under Part 98, EPA does not require greenhouse gas reporting for emergency generators due to the low levels of emissions. Furthermore,

Pennsylvania Department of Environmental Protection's (PADEP) 2019 greenhouse gas inventory (published in October 2022) reports total gross greenhouse gas emissions of 266 million metric tons (266,000,000 metric tons). The Station's greenhouse gas emissions would represent 0.0008% of the State's greenhouse gas emissions which is a negligible contribution when compared to the statewide totals.

6.0 REFERENCES

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EXHIBIT
JH-6

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Air Quality

DOCUMENT NUMBER:	275-2101-003
TITLE:	Air Quality Permit Exemptions
EFFECTIVE DATE:	July 1, 2021
AUTHORITY:	Air Pollution Control Act (APCA), 35 P.S. § 4001 et seq. and 25 Pa. Code § 127.14 (relating to exemptions)
POLICY:	Plan Approval and Operating Permit Exemptions
PURPOSE:	This document provides criteria for sources and physical changes to sources determined to be eligible for permitting exemptions as sources of minor significance.
APPLICABILITY:	Staff/Regulated Public
DISCLAIMER:	The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. DEP does not intend to give this guidance that weight or deference. This document establishes the framework, within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.
PAGE LENGTH:	24 pages

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

NOTICE
Plan Approval and Operating Permit Exemptions

Consistent with the applicable provisions of the Pennsylvania Air Pollution Control Act (APCA), 35 P.S. § 4001 et seq. and 25 Pa. Code § 127.14 (relating to exemptions), the Department of Environmental Protection (Department or DEP) may determine sources or classes of sources to be exempt from the plan approval and permitting requirements of 25 Pa. Code Chapter 127 (relating to construction, modification, reactivation and operation of sources). This guidance document identifies the following:

- exemptions under § 127.14(a) and exemptions under § 127.14(a)(8) that do not require submission of a Request for Determination (RFD) form;
- exemption criteria that the Department may use when an owner or operator of a source or facility is seeking an exemption from plan approval;
- further qualifications regarding plan approval exempted sources; exemptions under § 127.14(a)(9) related to physical changes; and
- exemption criteria for operating permits.

This amended guidance document is applicable to sources that will be constructed as new or modified sources after the effective date of this document. It does not apply to sources that were constructed or modified prior to the effective date of this guidance document and operating lawfully without a permit. Sources exempted from plan approvals are not automatically exempted from operating permit requirements.

A Plan Approval is written approval from DEP's Air Quality Program required before an owner or operator of a facility can begin to construct, modify, or operate a source, emissions unit or equipment emitting air contaminants in Pennsylvania. Plan approval applications are submitted to the appropriate DEP regional office and are required to be approved before construction or modification commences. However, not all air contamination sources require a plan approval or operating permit; some may be exempt under Department regulations, and some may be granted an exemption on a case-by-case basis. The process used to obtain a case-by-case exemption requires that an RFD form be submitted, which is the mechanism by which the Department evaluates a case-by-case exemption request.

Some exemptions require prior written notification. Written notifications are not RFDs and have no fee associated with them. The notifications must contain all information necessary for DEP to evaluate the exemption status of the project, including identification of the sources and/or control devices, emission calculations, and operating parameters, as well as any necessary supporting documentation. All notifications are to be submitted through mail or e-mail to the appropriate DEP Regional Air Program Manager.

Some exemptions allow for alternative methods based on Department approval ("Any other method approved by the Department"). A request to use an alternative method not yet approved by the Department is to be submitted to the appropriate DEP Regional Air Program Manager. The owner or operator cannot use the alternative method until written approval from DEP has been granted.

Words and terms that are not defined in this document have the meaning set forth in 25 Pa. Code § 121.1 (relating to definitions) or the APCA (35 P.S. § 4003), 25 Pa. Code Chapters 121 - 145 and applicable definitions codified in the Code of Federal Regulations (CFR), including 40 CFR Parts 60 and 63.

Qualifications Regarding Exempted Sources

1. This notice shall not be construed to exempt facilities that include multiple sources of air contaminants, unless specifically stated in the source category.

2. The addition of any source that would subject the facility to major source New Source Review or Prevention of Significant Deterioration, Title V or Reasonably Available Control Technology (RACT) requirements shall comply with plan approval requirements, even if such sources are within a category in the below list.

3. Sources exempt from plan approval may be required to be included in the operating permit if the source is not included in the trivial activity listing.

4. Sources located in Allegheny and Philadelphia Counties may be subject to different permitting requirements. Please contact the Allegheny County Air Quality Program or the Philadelphia Air Management Services for information applicable to sources located in those counties.

5. Any sources claiming an exemption based on rated capacity or emission thresholds must keep adequate records to clearly demonstrate to the Department that the applicable thresholds are not exceeded. The records must be kept for five (5) years and be made available to the Department upon request.

6. All air contamination sources, and air pollution control devices must be operated in a manner consistent with the manufacturer's specifications and good engineering practice.

   These determinations do not exempt the below-listed sources from compliance with the emission limitations, work practice, and other applicable requirements contained in Chapters 121, 122, 123, 124, 127, 129, and 135. Although a source may be exempt from the plan approval and operating permit requirements of Chapter 127, the source is subject to all other applicable air quality regulations. For example, combustion units exempt from the requirements of Chapter 127 are not exempt from the opacity limitations of § 123.41 or the emission limitations of § 123.22. Storage vessels for organic compounds with capacities between 2,000 gallons to 40,000 gallons, not subject to the requirements of Chapter 127, must install pressure relief valves in accordance with the requirements of § 129.57. (Note: Storage vessels in this size range would also not be subject to the requirements of §§ 129.59 and 129.60.)

   If the Department determines that any exempted source is causing air pollution in violation of Section 8 of the Air Pollution Control Act, 35 P. S. § 4008, or 25 Pa. Code § 121.7, the Department may order the installation of additional air cleaning devices. In those cases, plan approvals and operating permits may be required.

   Requests for exemptions from the plan approval requirements of Chapter 127 for multiple source facilities must be considered on a case-by-case basis, unless otherwise noted within the exemption category.

As noted in Category 44 of the list, additional exemptions, when appropriate, may be obtained through the submission of a completed RFD form. These forms are available from any of the Department's Air Program offices and on the DEP website at www.dep.pa.gov under the Air Quality page.

Listing of Plan Approval Exemptions

Section 127.14(a) Exemptions that do not require the submission of an RFD form

In accordance with § 127.14(a), approval is not required for the construction, modification, reactivation, or installation of the following:

1. Air conditioning or ventilation systems not designed to remove pollutants generated by or released from other sources.

2. Combustion units rated at 2.5 million or less Btus per hour of heat input.

3. Combustion units with a rated capacity of less than 10 million Btus per hour of heat input fueled by natural gas supplied by a public utility or by commercial fuel oils which are No. 2 or lighter - viscosity less than or equal to 5.82 C St -- and which meet the sulfur content requirements of § 123.22 (relating to combustion units). Combustion units converting to fuel oils which are No. 3 or heavier-viscosity greater than 5.82 C St or contain sulfur in excess of the requirements of § 123.22 require approval. For the purpose of this section, commercial fuel oil shall be virgin oil which contains no reprocessed, recycled, or waste material added. *See Section 127.14(a)(8) Exemption Category #39 for combustion units fired by LPG/propane or pipeline quality natural gas.*

4. Sources used in residential premises designed to house four or less families.

5. Space heaters which heat by direct heat transfer.

6. Mobile sources.

7. Laboratory equipment used exclusively for chemical or physical analyses.

8. Other sources and classes of sources determined to be of minor significance by the Department.

Section 127.14(a)(8) Exemptions that do not require the submission of an RFD form

The following is a list of those sources and classes of sources determined, in accordance with § 127.14(a)(8), to be exempt from the Plan Approval requirements of §§ 127.11 and 127.12. The commencement of construction of sources is exempted from the plan approval requirements provided the following exemption criteria are met. Unless labeled otherwise, emission rates are to be considered actual tons per year (tpy). Note that certain exceptions and qualifications regarding this list are contained in the discussion that precedes the list.

1. Reserved.

2. Sources of only particulate matter with fabric collectors, cartridge collectors or scrubbers designed using good engineering practices and manufactured as an integral part of the design and

which have exhaust volumes equal to or smaller than 5,000 scfm. Concentration of particulate matter emissions may not exceed 0.01 gr/dscf from the fabric collector, cartridge collector, or scrubber stack. Hazardous Air Pollutant (HAP) emissions may not exceed 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs that does not include chromium, mercury (Hg) or lead (Pb).

3. Combustion turbines rated at less than 1,000 horsepower. This category does not apply to newly installed turbines of a model year that is not within five years of the installation date unless the turbine meets the applicable New Source Performance Standard emission rates that apply to a newly manufactured turbine.

4. Internal combustion engines rated at less than 100 brake horsepower. This category does not apply to newly installed engines of a model year that is not within five years of the installation date unless the engine meets the applicable New Source Performance Standard emission rates that apply to a newly manufactured engine.

5. Portable, temporary internal combustion engines used for 14 days or less at special events (such as county fairs, circuses, and concerts).

6. Internal combustion engines regardless of size, with combined NOx actual emissions less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season and 6.6 tons per year on a 12-month rolling basis for all exempt engines at the site. This category does not apply to newly installed engines of a model year that is not within five years of the installation date unless the engine meets the applicable New Source Performance Standard emission rates that apply to a newly manufactured engine. The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or the general plan approvals/general operating permits at the facility. This category does not apply if an add-on air cleaning device, such as selective catalytic reduction (SCR), is installed. Note Category 38 addresses oil and gas facilities.

7. Natural gas-fired heat-treating furnaces with less than 10 million Btus per hour heat input (fuel burning emissions only). HAP emissions may not exceed 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans.

8. Steam aspirated vacuum degassing of molten steel.

9. Coal-handling facilities processing less than 200 tons per day. (Thermal coal dryers and pneumatic coal cleaners remain subject to the requirements of § 127.11). This exemption includes internal combustion engines meeting the criteria for plan approval exemption described in Category 6 above.

10. Wet sand and gravel operations (screening only) and dry sand and gravel operations (including crushers) processing unconsolidated materials with a rated capacity of less than 150 tons per hour.

11. Coal and non-metallic mineral-handling activities directly associated with either deep or surface mines that consist only of conveyors and non-vibratory screens (aka grizzlies). This exemption includes internal combustion engines meeting the criteria for plan approval exemption described in Category 6 above.

12. Portable crushers that are controlled with properly located water sprays or with fabric filters, operated during daylight, and located on a site for less than 60 calendar days provided, however, that the crushers do not process materials containing asbestos. This exemption includes associated screens and drop points; tub grinders used to mulch grubbing waste; and internal combustion engines meeting the criteria for plan approval exemption described in Category 6 above.

13. Concrete batch plants and associated storage vessels that are equipped with fabric collectors designed using good engineering practices. Concentration of particulate matter emissions may not exceed 0.01 gr/dscf from the fabric collector stack.

14. Bulk material storage bins, except those associated with a production facility with total actual facility particulate emissions greater than 10 tpy.

15. Storage vessels for volatile organic compounds which have capacities less than 40 m^3 (10,000 gallons) based on vessel dimensions, unless subject to § 129.57 (storage tanks less than or equal to 40,000 gallons capacity containing VOCs), § 129.59 (bulk gasoline terminals) or § 129.60(b) and (c) (bulk gasoline plants). HAP emissions may not exceed 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans.

16. Storage vessels containing non-VOC, non-malodorous, or non-hazardous air pollutant materials.

17. Diesel fuel; Nos. 2, 4, and 6 fuel oils; or kerosene and jet fuel storage and dispensing facilities as long as the stored or dispensed product has a vapor pressure less than 1.5 psia.

18. Covered wastewater transfer systems such as covered junction boxes, sumps, and tanks at industrial sites.

19. Plastic bead or pellet milling, screening, and storage operations (does not include handling and storage of resin powders).

20. Plastic parts casting ovens and injection molding processes. HAP emissions may not exceed 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans.

21. Tire buffing.

22. Paper trimmers/binders.

23. Vocational education shops. Chemistry laboratories at schools and colleges.

24. Bench-scale laboratory equipment used for kinetic studies, mass/energy transport studies, chemical synthesis and physical or chemical analysis.

25. Research and development activities as defined in 25 Pa. Code Chapter 121 with the following annual emission rates. See Category No. 45 which specifies emission rates where the owner or operator of a source or a facility needs to submit RFD.

    i. less than or equal to 10 tpy of CO;
    ii. less than or equal to 1.5 tpy of non-HAP PM10;
    iii. less than or equal to 4 tpy of SO2 or non-HAP VOC;
    iv. less than or equal to 5 tpy of NOx;
    v. less than or equal to 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans.

26. Woodworking facilities including sawmills and pallet mills which process green wood; or, small woodworking facilities processing kiln-dried wood or wood products (flakeboard, particleboard, etc.) associated with pattern shops, retail lumber yards, shipping and packing departments, etc. This category also includes woodworking facilities of any size processing kiln-dried wood or wood products equipped with fabric collectors designed to have emission rates that are less than 0.01 gr/dscf.

    This exemption does not apply to woodworking facilities processing wood that has been treated with a wood preservative of any kind. The term "woodworking facilities" refers only to operations in which wood or a wood product is sawed, sanded, planed, or similarly shaped or reshaped. The term does not include such activities as painting, finishing, hardboard manufacturing, plywood manufacturing, and the like.

27. Smokehouses.

28. Slaughterhouses (rendering cookers remain subject to the requirements of § 127.11).

29. Restaurant operations.

30. Degreasing operations at a facility emitting less than 2.7 tons of VOCs on a 12-month rolling basis and not subject to the Federal NESHAP for halogenated solvent cleaners under 40 CFR Part 63.

31. Sources of uncontrolled VOC emissions from a project that are less than 2.7 tons on a 12-month rolling basis. Uncontrolled HAPs emissions from a project may not exceed 1000 lbs of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans. Facilities claiming this exemption must provide a 15-day prior written notification with calculations and supporting documents to DEP.

32. Dry-cleaning facilities that are not subject to NSPS, MACT, PSD or NSR requirements.

33.

    a. Retail gasoline dispensing facilities and similar vehicle-fueling operations at industrial facilities.

b. Compressed natural gas dispensing facilities meeting the following requirements:

i. Combined NO_x emissions from the stationary internal combustion engines at a facility less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season (the period beginning May 1 of each year and ending on September 30 of the same year) and 6.6 tons per year on a 12-month rolling basis. The emissions criteria do not include emissions from sources which are approved by the Department in plan approvals, general plan approval/general operating permits or emissions from sources at the facility approved under Category No. 33a.

ii. Combined VOC emissions from all the sources at the facility less than 2.7 tons on a 12-month rolling basis. If the VOCs include HAPs, the HAP exemption criteria in this paragraph must be met. Compliance with this criterion will be determined using any generally accepted model or calculation methodology. Combined HAP emissions [not including Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins and Furans] at the facility less than 1000 lbs. of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period. The emissions criteria do not include emissions from sources which are approved by the Department in plan approvals, general plan approval/general operating permits, or emissions from sources approved under Category No. 33a. at the facility.

iii. The owner or operator of the compressed natural gas fueling station will annually perform a leak detection and repair (LDAR) program that includes either the use of an optical gas imaging camera such as a FLIR camera or a gas leak detector capable of reading methane concentrations in air of 0% to 5% with an accuracy of +/- 0.2% or other leak detection monitoring devices approved by the Department. The LDAR program will be conducted on valves, flanges, connectors, storage vessels/storage tanks, and compressor seals in natural gas or hydrocarbon liquids service. Leaks are to be repaired no later than 15 days after leak detections unless facility shutdowns or ordering of replacement parts are necessary for repair of the leaks. For the storage vessel, any leak detection and repair are to be performed in accordance with 40 CFR Part 60, Subpart OOOO.

A. A leak is considered repaired if one of the following can be demonstrated:

1. No detectable emissions consistent with Method 21 specified in 40 CFR Part 60, Appendix A;

2. A concentration of 2.5% methane or less using a gas leak detector;

3. No visible leak image when using an optical gas imaging camera;

4. No bubbling at leak interface using a soap solution bubble test specified in Method 21. A procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts and that do not have a surface temperature greater

than the boiling point or less than the freezing point of the soap solution; or

5. Any other method approved by the Department.

B. Leaks, repair methods, and repair delays are to be recorded and those records should be maintained for five years. If a gas leak detector is used, a leak is to be detected by placing the probe inlet at the surface of a component. The Department may grant an extension for leak detection deadlines or repairs upon written request from the owner or operator of the facility documenting the justification for the requested extension.

34. Sources of particulate matter (not subject to NESHAPs, NSPS, PSD, or major source requirements) that are controlled by a baghouse, have an emission rate which meets the limits of Chapter 123, and are exhausted indoors and cannot be bypassed to exhaust to the outdoor atmosphere. These sources should not emit more than 1000 lbs/yr of a single HAP or one tpy of a combination of HAPs. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans. Multiple sources within this category may be exempt from plan approval requirements.

35. Sources emitting only inert gases [such as argon (Ar), helium (He), krypton (Kr), neon (Ne), and xenon (Xe)], nitrogen (N_2), oxygen (O_2), carbon dioxide (CO_2), or ethane (C_2H_6).

36. Source(s) qualifying under § 127.449 as de minimis emission increases.

37. Reserved. See Category 46.

38(a). Existing oil and gas exploration, development, and production facilities and associated equipment and operations constructed prior to August 10, 2013. Any modification of an existing source or construction of a new source after August 8, 2018, is subject to 38(c).

38(b). Existing oil and gas exploration, development, and production facilities and associated equipment and operations authorized to operate under exemption criteria dated August 10, 2013, but prior to August 8, 2018, of this exemption criteria that meet any of the following provisions (a – d). This exemption criteria also apply to a well that was spudded (drilled) on or after August 10, 2013, but before August 8, 2018, and an air contamination source that was constructed, reconstructed or modified on or after August 10, 2013, but before August 8, 2018:

a. Site preparation, well drilling, hydraulic fracturing, completion, and work-over activities for conventional and unconventional well sites.

b. Conventional wells, wellheads, and all other associated equipment. A conventional well is any well that does not meet the definition of unconventional gas well in 58 PA.C.S § 3203.

c. Non-road engines as defined in 40 CFR § 89.2.

d. Unconventional wells, wellheads, and associated equipment provided the applicable exemption criteria specified in subparagraphs i, ii, iii, iv, and v are met.

i. Within 60 days after the well is put into production, and annually thereafter, the owner/operator will perform a leak detection and repair (LDAR) program that includes either the use of an optical gas imaging camera, Method 21 of 40 CFR Part 60, or other leak detection monitoring devices approved by the Department. LDAR is to be conducted on valves, flanges, connectors, storage vessels/storage tanks, and compressor seals in natural gas or hydrocarbon liquids service. Leaks are to be repaired no later than 15 days after leak detections unless facility shutdowns or ordering of replacement parts are necessary for repair of the leaks. The optical gas imaging camera, Method 21, or other Department-approved gas leak detection equipment is to be operated in accordance with manufacturer-recommended procedures. For the storage vessel, any leak detection and repair will be performed in accordance with 40 CFR Part 60, Subpart OOOO.

A. A leak is considered repaired if one of the following can be demonstrated:

1. No detectable emissions consistent with Method 21 specified in 40 CFR Part 60, Appendix A;

2. A concentration of 2.5% methane or less using a gas leak detector and a VOC concentration of 500 ppm or less;

3. No visible leak image when using an optical gas imaging camera;

4. No bubbling at leak interface using a soap solution bubble test specified in Method 21; or a procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts and that do not have a surface temperature greater than the boiling point or less than the freezing point of the soap solution; or

5. Any other method approved by the Department.

B. Leaks, repair methods and repair delays will be recorded and those records should be maintained for five years. If a gas leak detector is used, a leak is to be detected by placing the probe inlet at the surface of a component. The Department may grant an extension for leak detection deadlines or repairs upon the receipt of a written request from the owner or operator of the facility documenting the justification for the requested extension.

ii. Storage vessels/storage tanks or other equipment equipped with VOC emission controls achieving emissions reduction of 95% or greater. Compliance will be demonstrated consistent with 40 CFR Part 60, Subpart OOOO, as applicable, or an alternative test method approved by the Department.

iii. Combined VOC emissions from all the sources at the facility less than 2.7 tons on a 12-month rolling basis. If the VOCs include HAPs, the HAP exemption criterion in this paragraph will be met. Compliance with this criterion is to be determined using any generally accepted model or calculation methodology. Combined HAP emissions [not including Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins and Furans] at the facility less than 1000 lbs of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period. The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or general plan approvals/general operating permits at the facility and the emissions from sources meeting the exemption criteria in subparagraphs i, ii, and iv.

iv. Flaring activities as outlined below:

A. Flaring used at exploration wells to determine whether oil and/or gas exists in geological formations or to appraise the physical extent, reserves and likely production rate of an oil or gas field.

B. Flaring used for repair, maintenance, emergency, or safety purposes.

C. Flaring used for other operations at a wellhead or facility to comply with 40 CFR Part 60, Subpart OOOO requirements as applicable.

D. Enclosed combustion device including enclosed flare will be used for all permanent flaring operations at a wellhead or facility. These flaring operations will be designed and operated in accordance with the requirements of 40 CFR § 60.18.

v. Combined NOx emissions from the stationary internal combustion engines at wells, and wellheads less than 100 lbs./hr., 1000 lbs./day, 2.75 tons per ozone season (the period beginning May 1 of each year and ending on September 30 the same year), and 6.6 tons per year on a 12-month rolling basis. The emission criteria do not include emissions from sources which are approved by plan approvals or the general plan approvals/general operating permits at the facility.

The owner or operator will comply with all applicable state and federal requirements including notification, recordkeeping, and reporting requirements as specified in 40 CFR Part 60 Subpart OOOO as applicable. The owner or operator will also demonstrate compliance with the exemption criteria to the Department using any generally accepted model or calculation methodology within 180 days after the well completion or installation of a source.

The owners and operators of sources not meeting the provisions of subsections a.- d. of this category may submit an RFD to the Department. If the RFD is not approved by the Department, an application for authorization to use a general permit or a plan approval application is to be submitted to the Department, as appropriate.

If drilling a new well or hydraulically refracturing an existing well, or adding new, reconstructed or modified equipment to an existing facility previously exempt under Category 38(a) or 38(b),

the owner or operator can meet the exemption criteria under 38(c); submit and obtain approval for an RFD; or apply for, and receive, authorization to use GP-5A.

If the source does not meet the exemption criteria under 38(c), an authorization cannot be granted under GP-5A and an RFD is not approved by the Department, a plan approval and/or an operating permit issued in accordance with 25 Pa. Code, Chapter 127, Subchapter B (relating to plan approval requirements) and/or Subchapter F (relating to operating permit requirements) will be required, as appropriate.

38(c). Oil and gas exploration, development, and production facilities and associated equipment and operations for which construction or reconstruction commenced on or after August 8, 2018, of this Exemption criteria meeting the following provisions **or** drilling (spudding) a new well; hydraulically refracturing an existing well; or adding new, reconstructed, or modified equipment to an existing facility previously exempted from plan approval and operating permit, meeting the following provisions:

a. Conventional wells, wellheads, and all other associated equipment. A conventional well is any well that does not meet the definition of unconventional gas well in 58 PA.C.S. § 3203.

b. Site preparation, well drilling, hydraulic fracturing, completion, work-over activities, and associated temporary flaring operations for conventional and unconventional well sites.

c. Unconventional natural gas well site operations or remote pigging stations, provided they meet the following criteria:

i. The owner or operator must comply with the following leak detection and repair (LDAR) program.

Within 60 days after the well is put into production, and semi-annually thereafter, the owner/operator will perform LDAR that includes the use of an optical gas imaging camera calibrated according to 40 CFR § 60.18 and a detection sensitivity level of 60 grams/hour, Method 21 of 40 CFR Part 60, or other leak detection monitoring devices approved by the Department. LDAR is to be conducted on valves, flanges, connectors, storage vessels/storage tanks, and compressor seals in natural gas or hydrocarbon liquids service. Leaks are to be repaired no later than 15 days after leak detections unless facility shutdowns or ordering of replacement parts are necessary for repair of the leaks. The optical gas imaging camera, Method 21, or other Department-approved gas leak detection equipment is to be operated in accordance with manufacturer-recommended procedures. For the storage vessel, any leak detection and repair will be performed in accordance with 40 CFR Part 60, Subpart OOOO or Subpart OOOOa, as applicable.

A. A leak is considered repaired if one of the following can be demonstrated:

1. No detectable emissions consistent with Method 21 specified in 40 CFR Part 60, Appendix A;

2. A leak of less than 500 ppm calibrated as methane is detected when the gas leak detector probe inlet is placed at the surface of the component;

3. No visible leak image when using an optical gas imaging camera;

4. No bubbling at leak interface using a soap solution bubble test specified in Method 21; or a procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts and that do not have a surface temperature greater than the boiling point or less than the freezing point of the soap solution; or

5. Any other method approved by the Department.

B. Leaks, repair methods and repair delays will be recorded and maintained for five years. If a gas leak detector is used, a leak is to be detected by placing the probe inlet at the surface of a component. The Department may grant an extension for leak detection deadlines or repairs upon the receipt of a written request from the owner or operator of the facility documenting the justification for the requested extension.

ii. Combined VOC emissions from all sources including tanker truck loadouts at the facility less than 2.7 tons on a 12-month rolling basis. If the VOCs include HAPs, the HAP exemption criterion in this paragraph will be met. Compliance with this criterion is to be determined using any generally accepted model or calculation methodology. Combined HAP emissions [not including Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins and Furans] at the facility less than 1000 lbs of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period. The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or general plan approvals/general operating permits at the facility.

iii. Methane emissions from each individual source at the facility less than 200 tpy.

iv. Non-road engines as defined in 40 CFR § 89.2.

v. Internal combustion engines regardless of size, with combined NOx emissions less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season and 6.6 tons per year on a 12-month rolling basis for all exempt engines at the site. The emission criteria do not include emissions from sources which are approved by the Department in plan approvals or the general plan approvals/general operating permits at the facility. For control of NO_x emissions with a technology that uses ammonia or urea as a reagent, the exhaust ammonia slip is limited to 10 ppmvd or less corrected to 15% O_2.

vi. The owner or operator that conducts pigging operations shall employ best management practices to minimize the liquids present in the pig receiver chamber and to minimize emissions from the pig receiver chamber including, but not limited to, installing liquids ramps, installing liquids drains, routing high-pressure chambers to a low-pressure line or vessel, using ball valve type chambers, or using multiple pig chambers. The selection of the appropriate best management practices must be documented.

The owners and operators of sources not meeting the provisions of subsections a.- c. of this category may submit an RFD form to the Department. If the RFD is not approved by the Department, an application for authorization to use a general permit or a plan approval application is to be submitted to the Department, as appropriate.

The owner or operator will also comply with all applicable state and federal requirements including notification, recordkeeping, and reporting requirements as specified in 40 CFR Part 60 Subpart OOOO or Subpart OOOOa, as applicable.

The owner or operator shall keep adequate records for five years, including but not limited to, a representative fractional analysis of the gas processed by the facility to demonstrate compliance with the exemption criteria using any generally accepted model or calculation methodology.

39. Combustion units with a rated capacity of less than 10 million Btus per hour of heat input fueled by LPG/Propane or pipeline quality natural gas.

40. Any source qualifying for exemption based on criteria contained in a general permit developed in accordance with the procedures described in §§ 127.601 through 127.642.

41. Reserved. See Category No. 47.

42. Facilities engaged primarily in collision repair and refinishing of automobiles and light-duty trucks.

43. Reserved. See Category No 48.

44. Any source granted an exemption by the Department through the execution of an RFD form.

Section 127.14(a)(8) exemptions that require the submission of an RFD form.

The following is a list of sources where the owner or operator of a source or a facility seeking an exemption must submit an RFD form. The Department may use the criteria specified in the category for review of the RFD form.

45. Research and development activities as defined in 25 Pa. Code Chapter 121 with annual emission rates:

i. CO emissions greater than 10 tpy but less than or equal to 20 tpy
ii. Non-HAP PM_{10} emissions greater than 1.5 tpy but less than or equal to 3 tpy
iii. SO_2 or non-HAP VOC emissions greater than 4 tpy but less than or equal to 8 tpy
iv. NOx emissions greater than 5 tpy but less than or equal to 10 tpy

v. Single HAP emissions greater than 1000 lb/yr but less than or equal to 1 tpy or Combined HAP emissions greater than one tpy but less than or equal to 2.5 tpy. The HAPs may not contain Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins or Furans.

46. Sources that exhaust to a filter/baghouse and have particulate loading (before control) below limits specified in Chapter 123.

47. Powdered metal sintering furnaces using only organic lubricants equal to or less than 0.75% organic lubricant by weight. The furnace atmosphere must contain hydrogen (H2) at 3% volume or greater. The furnace must also maintain an operating flame curtain between the part entry and pre-heat zone. In the absence of an operating flame curtain, the furnace must operate an afterburner.

A sintering furnace using only metal containing lubricants may be exempted if the furnace emits particulate matter not exceeding 0.15 lb. /hr. (determined by mass balance or stack tests). Note: for mass balance purposes, the following conversion factors are to be used:

Zinc Stearate to Zinc Oxide particulate matter = 0.129,
Lithium Stearate to Lithium Carbonate particulate matter = 0.15.

The Department may approve alternate conversion factors provided a satisfactory written justification is submitted to the Department.

The owner/operator of a sintering furnace exempt from permitting requirements must notify the Department within 30 days of the furnace installation. For sintering furnaces using metal containing lubricants, records must be maintained to demonstrate compliance with the particulate matter emission limit of 0.15 lb/hour for each product.

Facilities that use both organic and/or metal-containing lubricants are exempted if the lubricants are less than 0.75% organic lubricant by weight; and, the furnace is designed and operated as described in the preceding paragraph and emits particulate matter at rates less than 0.15 lb./hr (determined by mass balance or stack tests).

48. Remediation of gasoline or fuel oil contaminated soil, groundwater or surface water by equipment installed, maintained, and operated as provided herein. All air exhaust points are controlled by dual, activated carbon beds operating in series or a thermal/catalytic oxidizer. For activated carbon beds, monitoring (e.g. intrinsically safe ionization detector) at an appropriate frequency (e.g., one-fourth the predicted time to breakthrough of the first bed) must be performed at the inlet, between the first and second beds and after the second bed. If breakthrough of the first bed is detected, the first bed is removed, the second bed is shifted to the first position and the new bed is placed in the second position. Monitoring, operating, and maintenance records are maintained and available to the Department upon request. Equipment installed and operated as described above must be designed to achieve a minimum VOC control efficiency of 90% and shall emit actual annual emissions after control less than one tpy of VOC or HAPs.

49. Bulk material storage bins (not subject to NESHAPs, NSPS, PSD, NSR, or major source requirements) that are equipped with fabric collectors designed to have particulate matter emission rates that are less than 0.01 gr/dscf.

Physical Changes Qualifying for Exemption Under Section 127.14(a)(9)

In accordance with § 127.14(a)(9), the Department has determined that the following physical changes qualify for plan approval exemption if the change: a) would not violate the terms of an operating permit, the Air Pollution Control Act, the Clean Air Act or the regulations adopted under the acts; b) would not result in emission increases above the allowable limit in the operating permit; and c) would not result in an increased ambient air quality impact for an air contaminant. These changes may be made without notification or submission of an RFD to the Department.

Caution: Do not make determinations regarding the following list without consideration of the preceding criteria.

1. Changes in the supplier or formulation of similar raw materials, fuels, paints, and other coatings which do not affect emissions, and which meet all applicable standards and limitations.

2. Changes in product formulations that do not affect air emissions.

3. Changes that result in different speciation of pollutants but fall within permit limitations.

4. Changes in the method of raw material addition.

5. Changes in the method of product packaging.

6. Changes in temperature, pressure, or other operating parameters that do not adversely affect air cleaning device performance or air emissions.

7. Additions of or changes to sampling connections used exclusively to withdraw materials for testing and analysis including air contaminant detection and vent lines.

8. Changes to paint drying oven length designed to alter curing time, so long as capture efficiencies of control equipment are not altered.

9. Routine maintenance, inspection, and cleaning of storage tanks and process vessels or the closure or dismantling of a storage tank or process.

10. Changing water sources to air cleaning devices when there is no effect on air cleaning device performance or air emissions.

11. Moving a source from one location to another at the same facility with no change in operation or controls.

12. Installation of an air-cleaning device when there is no obligation to install an air-cleaning device under any applicable requirement and will not be used to generate emission reduction credits. Owners and operators claiming this exemption must provide a 30-day prior written notification to DEP. This exemption does not apply to the installation of catalytic or reagent-based

reduction, thermal oxidation (including open flares), catalytic oxidation, scrubbing for SO_2 or acid gas control, electrostatic precipitation, or any air-cleaning devices that increases air contaminant emissions.

13. Repairing, replacing, upgrading, maintaining, or installing pollution control device instrumentation or component equipment including pumps, blowers, burners, filters, filter bags, devices for measuring pressure drop across an air cleaning device or a filter breakage detector for a baghouse, provided such changes would not violate an operating permit term or condition.

14. Installing a fume hood or vent system for industrial hygiene purposes or in a laboratory.

15. The temporary (no longer than six months) replacement of a source with a source of equal or less emission potential.

16. Turbine core replacement is allowed for a turbine, provided the following conditions are met:

    a) The owner or operator shall provide thirty (30) days written notification to the Department of a planned turbine core replacement, or within seven (7) days after an unplanned replacement is commenced. The turbine core consists of the compressor, combustor, and power sections together.

    b) The written notice shall identify the location, the manufacturer, model, and serial number of the turbine, and the manufacturer, model, and serial number of the turbine core to be installed, or which has been installed, in the turbine and the air contaminant emission rates which will exist following the turbine core replacement, including NO_X, CO and NMNEHC.

    c) The written notice shall also contain a certification from the owner or operator that any turbine core to be installed will be a lower emitting turbine core or, if the core will be replaced with an identical core, that a lower emitting core is not available. The notice shall indicate whether the turbine core has been manufactured by either the existing turbine manufacturer or other manufacturer. Existing turbine manufacturers shall include companies that maintain the turbine cores of the existing turbines at the facility. If the permittee decides to install a turbine core obtained from a manufacturer other than the existing turbine manufacturer, the notice shall contain a certification, signed by a "responsible official" as defined in 25 Pa. Code Section § 121.1, that the permittee has examined the turbine cores that are available from all such manufacturers and will install, or has installed, the lowest emitting turbine core available from any manufacturer.

    d) The core to be installed, or which has been installed, shall be an identical turbine core or lower emitting turbine core.

    e) The notice shall be accompanied by a vendor-provided guarantee of the achievable air contaminant emission rates of the new turbine core. If such a guarantee is not available, the notice shall include certification that the permittee attempted to obtain such guarantee and an explanation as to why the vendor will not provide such a guarantee.

    f) All certifications shall be signed by a responsible official and shall acknowledge that the certifying party is aware of the penalties for unsworn falsification to governmental

authorities as established under 18 Pa.C.S. § 4904. The certification shall also state that based on information and belief formed after reasonable inquiry, that the information in the notice is true, accurate and complete.

g) A turbine core is a "Lower Emitting Turbine Core" if it is commercially available, has the same operating characteristics as the core being removed and the rate of NO_X emissions, expressed as either parts per million by volume dry basis ("ppmvd") or pounds per hour ("lb/h") would be lower than the rates of emission achievable by any commercially available alternative turbine core when the respective turbine was operating at the same level of performance. If the horsepower, firing rate, and operating speed of the core being removed falls within the ranges of horsepower, firing rate, and operating speed for the Lower Emitting Turbine Core, the Lower Emitting Turbine Core is considered to have the same operating characteristics as the core being removed. A turbine core is an "Identical Turbine Core" if the rate of NOX emissions is no higher than the emission rates of the turbine core being replaced when the respective turbine is operating at the same level of performance.

h) After a turbine core has been replaced, the permittee shall perform NOx, CO, and NMNEHC emissions testing for the respective turbine compressor engine(s) within one-hundred twenty (120) days of completing the replacement if no emissions testing is required by the operating permit. Stack testing shall be performed in accordance 25 Pa. Code Title 25, Chapter 139.

i) The fixed capital cost of turbine core replacement shall not exceed 50% of the fixed capital cost that would be required to construct a comparable entirely new source; fixed capital cost means the capital needed to provide the depreciable components.

In accordance with § 127.14(c), additional physical changes may be determined to be of minor significance and not subject to plan approval requirements through the following procedure:

1. If the changes do not involve the installation of equipment, the changes may be made within 7 calendar days of the Department's receipt of a written request provided the Department does not request additional information or objects to the change within the 7-day period.

2. If the changes involve the installation of equipment, the changes may be made within 15 calendar days of the Department's receipt of a written request provided the Department does not request additional information or objects to the change within the 15-day period.

3. If the change would violate the terms of an operating permit, the plan approval exemption may be processed contemporaneously with the minor operating permit modification under the procedures described in § 127.462.

Exemption Criteria for Operating Permits

A Title V operating permit is needed by all facilities that have the potential to emit (PTE) exceeding the levels described in the definition of "Title V facility." A state-only operating permit is needed for facilities that do not have a PTE which exceeds the Title V facility thresholds, but which has actual emissions equal to or exceeding the facility levels summarized below. An existing facility which does not have a PTE exceeding the Title V facility thresholds

and which does not have actual emissions exceeding the levels shown below is exempt from the requirement to obtain an operating permit. The exemption criteria for operating permits are not applicable to facilities which have sources that require plan approvals or should have required plan approvals. The Department may exempt a facility from operating permit requirements on a case-by-case basis as appropriate.

State-Only Operating Permit Facility Exemptions*

Pollutant	PTE<	Actual Emission <
CO	100 TPY	20 TPY
NO_x	100 TPY**	10 TPY
SO_x	100 TPY	8 TPY
PM_{10}	100 TPY	3 TPY
VOCs	50 TPY**	8 TPY
Single HAP	10 TPY	1 TPY
Multiple HAPs	25 TPY	2.5 TPY

* Sources located in Allegheny and Philadelphia Counties may be subject to different permitting requirements. Please contact the Allegheny County Air Quality Program or the Philadelphia Air Management Services for information applicable to sources located in those counties.

** 25 tpy for Bucks, Chester, Delaware, and Montgomery Counties.

Consistent with the list and criteria established in this guidance document, sources that are exempt from plan approval should be included in a facility-wide operating permit application unless that source is also included in the listing of trivial activities as set forth below.

When an RFD is issued for a source not included on the list of trivial activities, the source need not be brought into the facility-wide operating permit until the renewal of the operating permit; provided that all applicable requirements are met and there is no need to revise the facility-wide operating permit prior to renewal. In the case where physical changes of minor significance would violate the terms of a facility-wide operating permit, a plan approval exemption and a permit modification should be processed contemporaneously. All air contamination sources and air pollution control devices must be operated in a manner consistent with the manufacturer's specifications and good engineering practice.

Exempted Facility and Source Categories for Operating Permits

Unless precluded by the CAA or the regulations thereunder, the following facilities and source categories are exempted from the operating permit requirements of § 127.402.

1. Residential wood stoves.

2. Asbestos demolition/renovation activities.

3. Facilities engaged primarily in collision repair and refinishing of automobiles and light-duty trucks.

4. Retail gasoline stations.

Trivial Activities

For trivial activities, owners and operators are not required to submit notifications, RFD forms, or Plan Approval applications. In addition, these activities do not need to be described in a Title V or state-only operating permit application. Trivial activities are those located within a facility which do not create air pollution in significant amounts. By way of comparison, sources listed in the plan approval exemption list may require a notification or RFD to be submitted, and should be included in an operating permit application.

1. Combustion emissions from propulsion of mobile air contamination sources. The term "mobile air contamination source" means an air contamination source, including, but not limited to, automobiles, trucks, tractors, buses, and other motor vehicles; railroad locomotives; ships, boats, and other waterborne craft. The term does not include a source mounted on a vehicle, whether the mounting is permanent or temporary, that is not used to supply power to the vehicle. Examples might include lawn mowers, tow, and lift vehicles, and the like.

2. Air-conditioning units used for human comfort that do not have applicable requirements under Title VI of the CAA.

3. Ventilating units used for human comfort that do not exhaust air pollutants into the ambient air from any manufacturing, industrial, or commercial process.

4. Electric space heaters. Propane and gas-fired space heaters with a plant-wide capacity less than 2.5 million Btus per hour heat input and which have not been subject to RACT requirements.

5. Electrically heated furnaces, ovens and heaters, and other electrically operated equipment from which no emissions of air contaminants occur.

6. Non-commercial food preparation.

7. Use of office equipment and products, not including printers or businesses primarily involved in photographic reproduction.

8. Any equipment, machine, or device from which emission of an air contaminant does not occur.

9. Janitorial services and consumer use of janitorial products.

10. Internal combustion engines used for landscaping purposes.

11. Garbage compactors and waste barrels.

12. Laundry activities, except for dry-cleaning and steam boilers.

13. Bathroom/toilet vent emissions.

14. Emergency (backup) electrical generators at residential locations.

15. Tobacco smoking rooms and areas.

16. Blacksmith forges.

17. Plant maintenance and upkeep activities (such as grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, not related to the source's primary business activity, and not otherwise triggering a permit modification.[i]

18. Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.

19. Reserved.

20. Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning, or machining wood, metal, or plastic.

21. Brazing, soldering, and welding equipment, and cutting torches related to maintenance and construction activities that do not result in emission of HAP metals.[ii]

22. Air compressors and air-driven pneumatically operated equipment, including hand tools.

23. Batteries and battery charging stations, except at battery manufacturing plants.

24. Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP.

25. Propane or natural gas tanks and containers.

26. Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.

27. Equipment used to mix and package soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.

28. Drop hammers or hydraulic presses for forging or metalworking.

29. Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.

30. Vents from continuous emissions monitors and other analyzers.

31. Reserved.

32. Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.

33. Equipment used for surface coating, painting, dipping or spraying operations, except those that will emit PM, VOC, or HAP.

34. CO_2 lasers used only on metals and other materials that do not emit HAP in the process.

35. Consumer use of paper trimmers/binders.

36. Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.

37. Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants.

38. Laser trimmers using dust collection to prevent fugitive emissions.

39. Reserved.

40. Sources emitting only inert gases [such as argon (Ar), helium (He), krypton (Kr), neon (Ne), and xenon (Xe)], nitrogen (N_2), oxygen (O_2), carbon dioxide (CO_2), or ethane (C_2H_6).

41. Routine calibration and maintenance of laboratory equipment or other analytical instruments.

42. Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.

43. Hydraulic and hydrostatic testing equipment.

44. Environmental chambers not using HAP gases.

45. Shock chambers.

46. Humidity chambers.

47. Solar simulators.

48. Fugitive emissions related to movement of passenger vehicles, provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.

49. Process water filtration systems and demineralizers, but not including air strippers.

50. Demineralized water tanks and demineralizer vents.

51. Boiler water treatment operations, not including cooling towers.

52. Oxygen scavenging (de-aeration) of water.

53. Potable water treatment systems.

54. Ozone generators.

55. Fire suppression systems and activities involved in fire protection training, first aid or emergency medical training.

56. Emergency road flares.

57. Steam vents and safety relief valves.

58. Steam leaks.

59. Steam cleaning operations.

60. Steam sterilizers.

61. Reserved.

62. Typesetting, image-setting, and plate-making equipment used in the preparatory phase of printing.

If an applicant conducts an activity that is believed trivial but not covered by this listing, the applicant may list the activity in an operating permit application and provide a written justification for listing the activity as trivial. If the Department accepts the applicant's justification, no further information will be required on the activity. If the Department rejects the justification, additional information must be included in an operating permit application submitted to the Department.

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[i] Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit.

[ii] Brazing, soldering, and welding equipment, and cutting torches related to manufacturing and construction activities that emit HAP metals are more appropriate for treatment as insignificant activities based on size or production level thresholds. Brazing, soldering, welding, and cutting torches directly related to plant maintenance and upkeep and repair or maintenance shop activities that emit HAP metals are treated as trivial and listed separately in this appendix.