

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR QUALITY
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Air Quality Management

September 6, 2016

Mr. William Swiatek
850 Library Avenue
Suite 100
Newark, DE 19711

RE: Route 9 Corridor Master Plan Comments from DNREC DAQ

Dear Mr. Swiatek,

The Division of Air Quality (DAQ) appreciates the opportunity to provide comments towards the Route 9 Corridor Master Plan. The comments of the DAQ, in conjunction with WILMAPCO's objectives, are intended to: examine land use and recommend zoning that promotes the use of alternative transportation and manage truck traffic and that also mitigates environmental and health concerns in the area. DAQ encourages sustainable development processes that include mixed and multiuse residential options that promote walkable, bikeable, transit-friendly and livable communities. The DAQ supports WILMAPCO's willingness to coordinate interagency efforts in order to see such alternatives realized.

The DAQ would like to bring to light some chief concerns related to the redevelopment Route 9 Corridor. It has been noted by members of the DAQ that there have been complaints regarding fugitive dust in the area. Fugitive dust refers to any particulate matter that is visible and suspended in the ambient air by wind or human activities. Particulate matter (or PM,) consists of small, microscopic and solid matter that is inhaled and causes a host of health-related problems, especially to those that fall under the "sensitive" and "high-risk" categories. This demographic consists of individuals with pre-existing conditions such as emphysema, asthma or other pulmonary or cardiac conditions. Particulate matter is of the utmost concern as smaller PM particles have the potential to be absorbed directly into the bloodstream.

In regards to the section of Route 9 slated for future development, the DAQ has identified a growing problem of fugitive dust collecting on the roadway. This dust collection is the result of poor road design and storm water management. The resulting dust is carried onto the roadway by outside sources (most likely anthropogenic activity,) which then aggregates and is transferred into the already clogged storm water drains. The amassed material continues to coagulate within the storm water drains causing overflow and flooding in the area. Any excess material floats to the top of the storm

water drain, dries and results in a mud-covered residue that is stirred up by vehicle movement over top of the storm drain and along the existing roadway. This flawed system has the potential to contribute to negative health effects in the area as the excess soil deposits continue to accumulate within the drainage pipes, dry and be suspended into the ambient air. The DAQ recommends that DeIDOT take measures to address the problem of clogged storm water drains along the corridor. That being said, the DAQ is also in agreement that such a problem is not solely attributable to the drainage system itself but instead is symptomatic of a greater problem (there is speculations that it is more than likely an enforcement issue related to uncontrolled soil runoff that is not being properly regulated).

The second concern identified by the DAQ in the study area was related to diesel particulate matter. Route 9 is a designated truck traffic route and therefore, PM emissions are an issue. Such emissions can also be attributed to the problem of truck idling near the Port of Wilmington. The DAQ is currently seeking funding opportunities and alternatives with WILMAPCO and DeIDOT on alleviating contributing factors at the port. Many residents who attended the public workshops had concerns pertaining to truck traffic traveling through the area. It was noted that although proper signage exists and has been posted along the corridor to direct truck traffic away from residential areas, many truck drivers are ignoring the signage, cutting through subdivisions and disturbing residents. Since proper signage has been posted, it is suggested that WILMAPCO and the City of New Castle work together with local law enforcement to address the issue of enforcement of the designated route.

Lastly, the DAQ has identified the fact that the abovementioned corridor is within a known cancer pocket. Further investigation and analysis by DAQ members determined that four HAPs (formaldehyde, benzene, acetaldehyde, and carbon tetrachloride) contribute to 76 to 80% of the modeled cancer risk across the corridor. Formaldehyde and acetaldehyde are combustion products emitted from mobile and stationary sources. Benzene is a combustion product too, but is also emitted from point source (e.g. Magellan) and non-point sources (e.g. gasoline station). Carbon tetrachloride is predominately a background contributor.

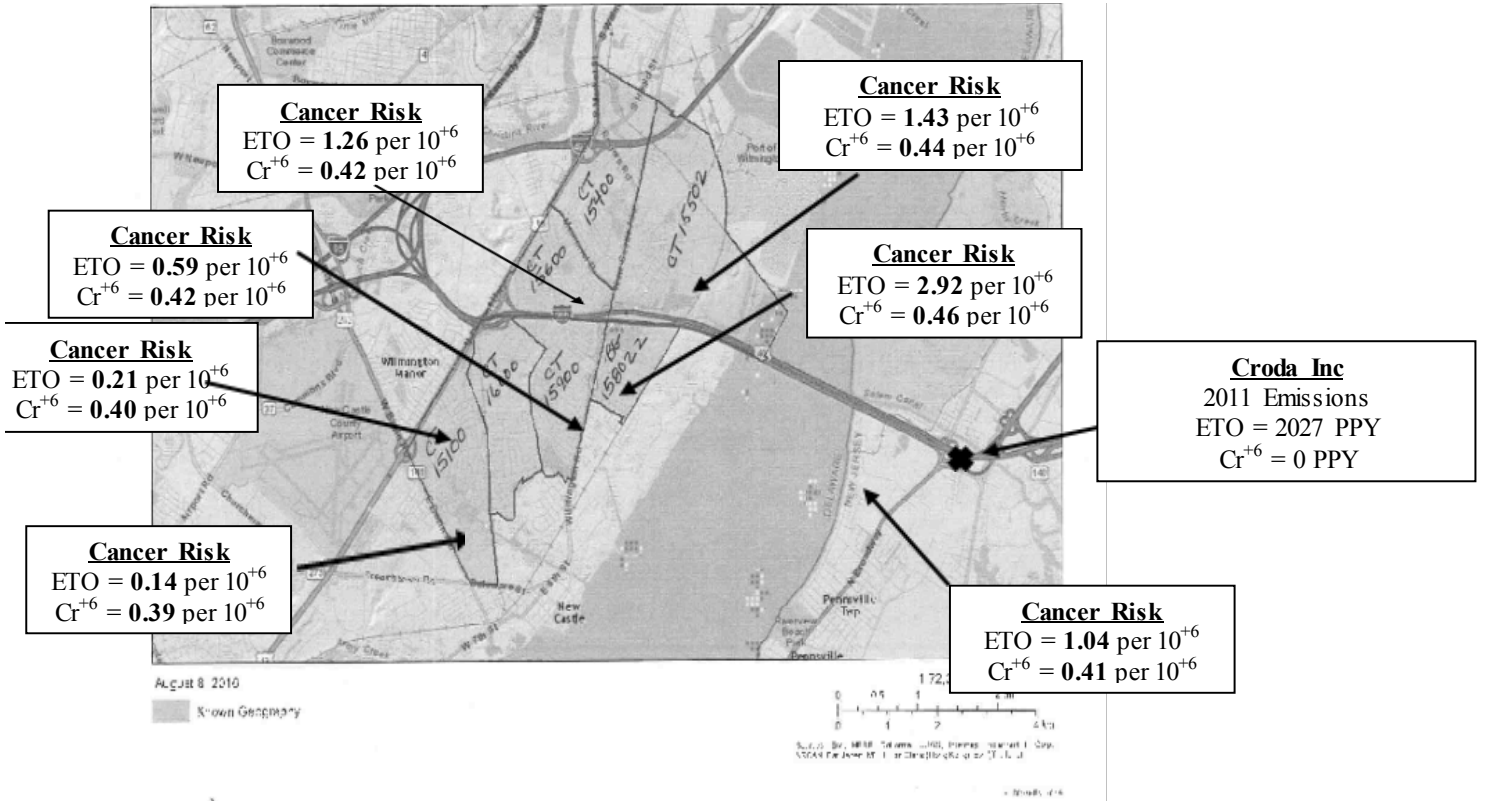
A comparison of the Hazardous Air Pollutants (HAPs) contributing to cancer risk and non-cancer respiratory hazard is shown below.

HAP Contribution to Health Impacts		
HAP of Concern	HI - Related	Cancer Risk Related
- Acrolein	72%	
- Formaldehyde	8%	46%
- Benzene		15%
- Acetaldehyde	11%	10%
- Carbon tetrachloride		8%
- 1,3-Butadiene		5%
- Naphthalene	<0.1%	4%
- Ethylene oxide		2%
- Diesel PM	6%	
Subtotal	97%	90%

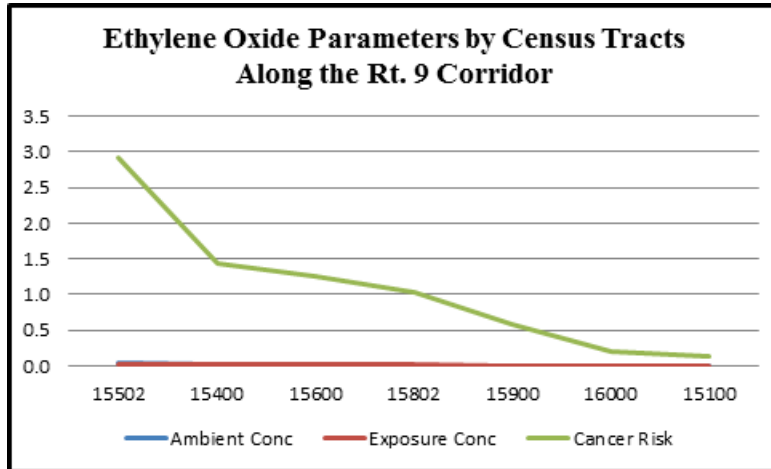
The stationary point source contribution to cancer risk is relatively low along the Rt. 9 corridor, ranging from 0.3 to 7% of the total overall cancer risk in the applicable census tracts. Although the overall cancer risk is low, there are two HAPs emitted from point sources, ethylene oxide and hexavalent chromium, that are significant contributors. Ethylene oxide is emitted from a facility located in the Rt. 9 corridor. While there are no notable hexavalent chromium point sources in the Rt. 9 corridor; there are two facilities that contribute to cancer risk in Rt. 9 corridor. Calpine – Hay Road, which is located

3+ miles NE of the corridor, is probably the more significant to cancer risk and Carney's Point Generation Plant, which is located 3+ miles due east in NJ.

Cancer Risk in the Rt. 9 Corridor Associated with HAPs emitted by Stationary Point Sources

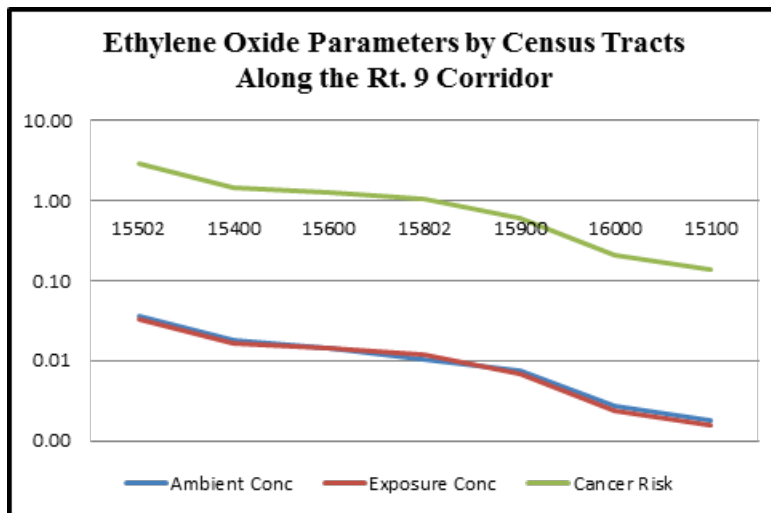


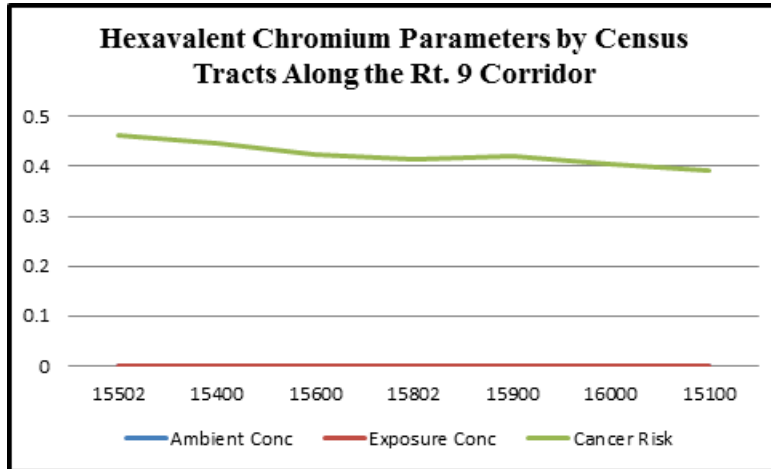
Cancer Risk Associated with HAPs emitted by Stationary Point Sources								
	Point Source Cancer Risk	Ethylene Oxide	Cr ⁺⁶	Napthalene	Benzene	Formaldehyde	Nickel Compounds	All other HAPs
15502	4.62	63%	10%	2%	3%	1%	3%	18%
15400	2.83	51%	16%	2%	4%	2%	5%	21%
15600	2.57	49%	16%	3%	4%	2%	5%	21%
15802	2.32	45%	18%	4%	5%	3%	5%	21%
15900	1.81	33%	23%	5%	6%	4%	6%	23%
16000	1.36	15%	30%	8%	8%	6%	7%	25%
15100	1.30	11%	30%	10%	9%	8%	7%	25%



When plotted on a linear scale both the annual average ambient and exposure concentrations ($\mu\text{g}/\text{m}^3$) appear to be uniform and having near identical values across the corridor, while the cancer risk (# per million) seems to decline in census tracts to the south and west of the probable ethylene oxide source (Croda, Inc).

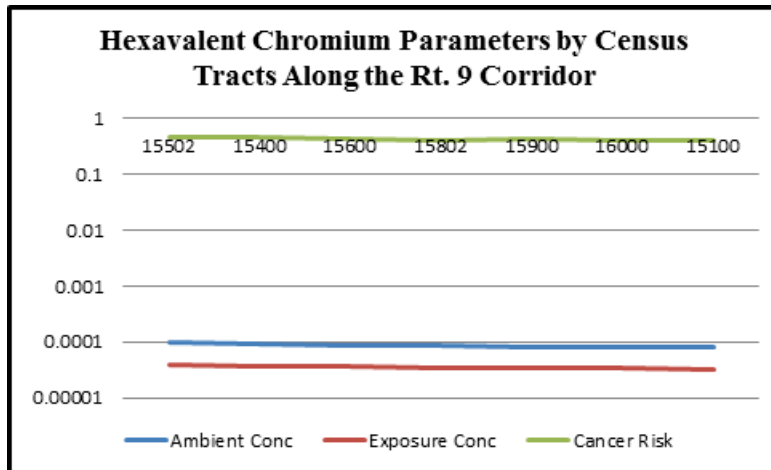
But when plotted on a log₁₀ scale as shown below, the variation in concentrations becomes evident and it can be seen that the ethylene oxide cancer risk declines as the exposure concentration declines. It is unusual for the ambient and exposure concentrations to be so similar.





When plotted on a linear scale both the annual average ambient and exposure concentrations ($\mu\text{g}/\text{m}^3$) appear to uniform and having near identical values across the corridor, while the cancer risk (# per million) seems to slowly decline in census tracts to the south and west.

But when plotted on a log₁₀ scale as shown below, the variation in concentrations becomes evident and it can be seen that the ethylene oxide cancer risk declines as the exposure concentration declines. The spread between the ambient and exposure concentrations is more typical in the modeled results.



The DAQ would like the data included above to be considered in future development along the corridor. DAQ will continue to monitor the point sources above and their contribution to overall ambient air quality levels in New Castle County, Delaware. Even though the total cancer risk is generally low for the area, there are two HAPs that are present and are emitted from point sources, ethylene oxide and hexavalent chromium. These HAPs have the potential to contribute to cancer risks in the area.

DAQ encourages planners, developers and builders to consider all sustainable growth practices in their design, and we believe that the air quality impacts associated with the project should be completely considered. New homes and businesses may emit, or cause to be emitted, additional air contaminants into Delaware's air, which will negatively impact public health, safety and welfare. These negative impacts are attributable to:

- Emissions that form ozone and fine particulate matter; New Castle currently violates federal health-based 2008 air quality standards for ozone and is considered maintenance for particulate matter (PM).
- The emission of greenhouse gases which are associated with climate change, and
- The emission of air toxics.

Air emissions generated from new developments include emissions from the following activities:

- Area sources such as painting, maintenance equipment and the use of consumer products like roof coatings and roof primers.
- The generation of electricity, and
- All transportation activity.

Recommendations:

DAQ encourages sustainable growth practices that:

- Control urban sprawl;
- Preserve rural and forested areas;
- Identify conflicting land use priorities;
- Encourage growth on previously developed sites and denser communities while at the same time protect our diminishing land base;
- Coordinate transportation, housing, environment, and climate protection plans with land use plans; and
- Demonstrate that communities can achieve the qualities of privacy, community, and contact with nature without degrading the natural environment or generating unacceptable environmental costs in terms of congestion, use of natural resources, or pollution.

The DAQ point of contact is Lauren DeVore, and she may be reached at (302) 739-9437 or lauren.devore@state.de.us.

Sincerely,

Ronald A. Amirikian.
Planning Branch Manager

For the purposes of reader clarification, the following definitions apply to the abovementioned language:

- 1.) **“Ambient”** - of or relating to the immediate surroundings of something. (So “Ambient Air Quality” is relating to the local and existing air quality levels.)
- 2.) **“Particulate Matter (PM)”** -Minute airborne liquid or solid particles (such as dust, fume, mist, smog, smoke) that cause air pollution.
- 3.) **“VOC”** –Volatile organic compound and a component of smog.
- 4.) **“Ozone”** –also known as tropospheric ozone and is a greenhouse gas. Formed when nitrogen dioxide, carbon monoxide react with one another and mix in the presence of sunlight.
- 5.) **“Fugitive Dust”** -"Fugitive" dust is PM suspended in the air by wind action and human activities.
- 6.) **“Point Source”** –A localized and stationary pollution source.
- 7.) **“Mobile Source”** –Any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, and locomotives
- 8.) **“Ethylene Oxide”** - Ethylene oxide (EtO) is a flammable, colorless gas at temperatures above 51.3 °F (10.7 °C) that smells like ether at toxic levels. EtO is found in the production of solvents, antifreeze, textiles, detergents, adhesives, polyurethane foam, and pharmaceuticals. Smaller amounts are present in fumigants, sterilants for spices and cosmetics, as well as during hospital sterilization of surgical equipment. (The kind we are referring to is caused by industrial activities.)
- 9.) **“Formaldehyde”** - a colorless pungent gas in solution made by oxidizing methanol. A result of combustion.
- 10.) **“Acetaldehyde”** - a colorless volatile liquid aldehyde obtained by oxidizing ethanol. A result of combustion.
- 11.) **“HAPs”** –Hazardous Air Pollutants are those known to cause cancer and other serious health impacts.
- 12.) **“Sprawl”** - the uncontrolled spread of urban development into neighboring regions.