

A Condensed Assessment

**Of the Adequacy of Regulations
To Monitor and Report on Toxic Air Emissions
From the Dominion Cove Point Liquefaction Facility
In Calvert County, Maryland**

And

Options

To Protect Public Health

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A detailed version of this assessment, including sources and in-depth analysis, will be completed by September 30, 2018 and be made available on-line. Those wanting a copy or seeking additional information before then may contact the author at: Len@Seaerie.com.

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Executive Summary

In 2014, federal and Maryland regulators gave their final approvals for the Dominion Cove Point LNG, LP application to build a \$3.8 billion methane liquefaction facility near residential communities in Calvert County, Maryland to support the export of 6 million metric tons of LNG (liquefied natural gas) annually. The regulators reported that the facility would emit 2 million tons of greenhouse gases, 300 tons of particulate matter, 432 tons of other harmful chemicals and 33.3 tons of Volatile Organic Compounds per year. Many of the projected emissions are proven carcinogens and others have been shown to cause chronic and acute illnesses. Current regulations require measurement of a limited number of air pollutants in broad regions. However, they do not require timely monitoring, measuring, or reporting of hazardous and toxic pollution that threatens the health of residents near Cove Point.

There are four significant failures in the regulations. They:

1. do not require that the air pollution estimates be validated by measuring “actual” emission levels. Instead, they direct the same air dispersion modeling that regulators used to project likely pollution levels;
2. measure ambient concentrations of air pollution over wide regions, while ignoring toxic air pollution concentrations in residential communities close to major sources of toxic emissions;
3. provide Dominion management discretion in reporting excessive emissions of harmful substances that could require costly down time or expensive repairs;
4. obscure accurate and timely detection, analysis and reporting of surges in hazardous emissions because:
 - a. peak toxic emissions are not routinely reported to regulators or the public, only total amounts rolled into rolling annual averages and
 - b. there are no requirements to notify nearby residents of dangerous surges in pollution that are less than catastrophic incidents.

The result of these regulatory failures is that, even if Dominion complied with all regulations, it could still periodically emit dangerously high levels of toxic materials for extended times without needing to provide timely reports of health risks to nearby residents.

Recommendations

1. **Require that the Maryland Department of the Environment support the installation of a 24/7 system to conduct continuous fence-line monitoring at Cove Point of the kind, density, frequency, and duration of toxic pollution emitted by Dominion’s LNG liquefaction facility;**
2. **Set up the system so that the continuous readings from these pollution monitors be made available on line so that local public health officials and concerned residents can check the status of air quality on a real-time basis.**

Introduction

This study assesses whether federal/state regulations for monitoring and reporting on Dominion's hazardous and toxic emissions at its Cove Point liquefaction facility are adequate for requiring detailed, timely reporting on potential threats to public health and also for determining whether any additional measures are necessary to protect the health of Calvert County residents from hazardous emissions from liquefaction operations.



<https://www.dcmmediagroup.us/tag/lng/page/2/>

**Aerial view of Cove Point LNG dock in foreground,
Dominion shore-based processing facility near top, and
Part of the Cove Point neighborhood at the very top of the photo.**

Section A. Backgrounds of the Dominion Cove Point Liquefaction Facility and Federal and State Air Pollution Regulations

I. Background on Regulatory Approval of Dominion's Request for an LNG Export Facility

- A. On June 6, 1972, federal and state agencies authorized Consolidated Natural Gas and Columbia Gas System to build and operate a liquefied natural gas (LNG) terminal and

processing facility to *import LNG* at Cove Point, Maryland.

- B. On April 1, 2013, Dominion Cove Point applied for a Certificate of Public Convenience and Necessity (CPCN) from the Maryland Public Service Commission (PSC) to permit it to build a new liquefaction facility at Cove Point and *export LNG*.
- C. Regulatory documents reveal that Dominion will add to the atmosphere at Cove Point and other nearby communities an estimated 2 million tons of greenhouse gases, 33.3 tons of volatile organics, 432 tons of other harmful materials, and 300 tons of particles every year when liquefying an estimated 6 million metric tons of LNG annually for export.

II. Air Pollution Regulations Relating to Cove Point Operations

- A. Twenty-four years before Dominion requested its permit, the Environmental Protection Agency (EPA) established a system to monitor over wide areas many of the pollutants that Dominion will emit because of their potential impact on the environment and public health.
- B. The Federal Energy Regulatory Commission (FERC) designated the Maryland Department of the Environment-Air and Radiation Management Administration (MDE-ARMA) as the lead air permitting authority in the state for the liquefaction facility.
- C. In addition to MDE - ARMA's incorporating Federal Regulations into the Maryland Code (COMAR), it issued implementing Guidance Documents that outlined toxic air pollution (TAP) regulations and compliance with COMAR. These documents contained TAP regulations but did not add any additional monitoring or reporting requirements.
- D. In response to EPA guidelines, MDE set up an air-monitoring network to track regional ambient (or regional) air quality and greenhouse gas pollution levels in the Southern Maryland Region.
- E. The system established by EPA to identify pollution that is likely to be emitted in the various regions is Best Available Control Technology (BACT) analyses, but allowed Dominion flexibility in meeting BACT requirements.
- F. Maryland regulations state: "An installation or premises may not be operated or maintained in such a manner that a nuisance or air pollution is created. Nothing in this regulation relating to the control of emissions may in any manner be construed as authorizing or permitting the creation of, or maintenance of, nuisance or air pollution."
- G. MDE and the PSC delegated to Dominion authority to conduct air quality monitoring and report on toxic air pollution (TAP) emissions from liquefaction operations.
- H. Regulations contain exceptions that exempt the monitoring and reporting of some TAP and Hazardous Air Pollution (HAP) emissions.
- I. While MDE regulations are reportedly designed to protect human health in standards named "screening levels" for TAPs, they are not designed to measure health threats from an individual point source for nearby residents, only the degree to which emissions from a given facility contribute to regional pollution levels.
- J. The timeframes for reporting on toxic emissions in federal and state permits vary, but are monthly, quarterly, semi-annual or annual. *Regulations allow some air quality chemicals to exceed specified maximums, as long as they stay within 3-year annual mean averages for a region. There are no regulations that require making 24/7 real-time monitoring and reporting of toxic emission levels available to the public.*

III. Regulations Require Reporting on Only Some of Dominion's Harmful Emissions

- A. Because regulators narrowly focused on monitoring only a few of the chemicals that Dominion will be emitting during its operations, only some of its emissions will be subject to monitoring and reporting under National Ambient Air Quality Standards (NAAQS) and greenhouse gas (GHGRP) reporting requirements.
- B. Regulators require Dominion to do air modeling for some pollutants, but exempt other harmful and toxic emissions.
- C. Dominion is required to perform a stack test within 180 days after initial startup to quantify pollutant emissions and demonstrate compliance with limits for nitrogen oxide, volatile organics, PM, carbon monoxide, ammonia, carbon dioxide and formaldehyde, thus potentially exposing nearby residents to toxic emissions for at least half a year.
- D. Regulatory agencies require Dominion to report Cove Point pollution levels either in tons-per-year or in the average density of pollutants to a given unit of air (parts per million (ppm) or billion (ppb)) rolled into 1 to 3-year rolling annual averages in their reports.
- E. To offset higher than acceptable levels of regional emissions of the most worrisome pollutants, nitrogen oxide and volatile organic compounds in the greater D.C. Ozone Nonattainment Air Quality Zone, Dominion purchased Emission Reduction Credits from Frederick and Baltimore, Maryland. *This will worsen the ozone pollution problem in Calvert County, particularly in those communities closest to the Cove Point Liquefaction Facility.*

IV. Regulators Focused on Regional Pollution Levels, Not Risks to Local Public Health

- A. While FERC relied on the design requirements of the International Building Code and American Society of Civil Engineers 7-05 to set standards to guide Dominion's construction of its Cove Point facility, it neither set nor followed comparable standards for Dominion to protect the health and safety of its workers and nearby residents from emissions during operations.
- B. The Public Service Commission and FERC required Dominion to prepare an Emergency Response Plan (ERP) in accordance with 49 CFR Part 193, but this plan appears structured to respond to a catastrophic accident, such as a fire, explosion or large hazardous fluid leak, not large emissions of toxic, but not necessarily explosive gases or air pollution.
- C. During the 3-year construction period, the EA required Dominion to submit monthly construction reports, but did not impose any comparable requirement for periodic, timely reports on excessive emission of harmful and toxic substances once construction was completed and equipment began being placed in operations.
- D. FERC made 82 recommendations to Dominion for operational safety and effectiveness during construction, but limited its focus to hazardous fluid and methane leaks, not VOC or PM emissions during the initial testing of systems.

Section B. Effectiveness of Pollution Monitoring and Reporting Regulations for Protecting Local Public Health

I. Regulations Report on Ambient (or Regional) Air Quality

- A. Regulators used standard methodologies for estimating the impact of Dominion's NAAQS emissions on regional air quality.
- B. Widely spread monitoring sites are suitable for measuring regional air quality.

II. Regulations Ineffective for Monitoring and Reporting on Toxic Emissions in Communities near Major Sources of Pollution

- A. Dominion provided regulators inaccurate data in its initial permit applications for a CPCN from the PSC for the facility it wanted to build, thereby making it difficult for the commission and other regulators to evaluate the level of Dominion's VOC pollution.
- B. Dominion has demonstrated a history of failing to properly plan for compliance with regulations or of adopting self-serving, but inaccurate interpretations of regulations. In 2015, Dominion construction created loud noise in the Cove Point neighborhood and indicated that it believed it is obligated to observe *average* noise pollution levels, not *higher than allowed one-time incidents*. *The human ear does not average sound – particularly at 3:00 am.*
- C. Dominion has demonstrated a history of either failing to plan properly for compliance with regulations or of adopting self-serving, but inaccurate interpretations of regulations.
- D. Dominion failed to comply with regulations requiring self-reporting of 27 excessive releases of ammonia and was fined by EPA for that failure to report.
- E. Despite presumed compliance with regulations as well as industry design and construction standards, in August 2011, a Dominion natural gas processing facility in Natrium, West Virginia *exploded and caught fire within three months after it had completed construction and begun operations*. *If an explosion and fire can occur at a newly-built natural gas processing facility despite regulated construction standards, so, too, can large leaks of toxic air pollution occur that may not be noted by company managers, but could be dangerous to plant workers and nearby residents.*
- F. The Maryland's PSC consultants, Trinity, report that, for the most harmful pollutants, Dominion is proposing some of the most advanced add-on air pollution control technology that's been demonstrated and determined feasible for the proposed process. *However, regulators are not proposing measurements to verify that emissions are as specified by manufacturers or in compliance with regulated limits.*

Regional (or Ambient) Air Pollution Monitoring Leaves Gaps in Detection of Health Threats to Calvert Residents

- G. Regulators discouraged placement of NCore sensors that could detect densities of multiple pollutants near facilities that emit large amounts of toxic chemicals because their focus was on regional average pollution levels.
- H. There are no federal or Maryland state regulations governing the design of air toxic monitoring networks. In addition, there are no air quality standards established for any of the air toxic compounds.
- I. Because many VOCs are either odorless or can be smelled only at high densities and cannot be seen, scientific instruments are necessary to detect their presence at lower, but nonetheless dangerous, levels, *the only way that residents and officials can confirm that actual emissions are within specified regulatory limits is with calibrated fence-line monitoring that runs 24/7.*
- J. Tracking regional pollution does not measure the intensity or duration of exposure to health risks by plant workers or residents near Cove Point.

Communities within 12 miles of Dominion Exposed to Pollution from Liquefaction Operations					
Wind Direction	Zip Code	Post Office Location	Communities and Facilities in Zip Code	Distance from Dominion	Population
				(In Miles)	(2010 Census)
From East to Southeast	20615	Broomes Island	Broomes Island	8.0 -- 9.0	410
From North to Northeast	20629	Dowell	Dowell	3.0 -- 4.0	535
From Northwest to Northeast	20657	Lusby	Lusby		20,483
			Cove Point	0.75 -- 1.25	
			Park Chesapeake	4.1	
			Chesapeake Ranch Estates	0.1 -- 3.5	
			Cove Point Park	0.1 -- 1.0	
			White Sands	4.0 -- 5.0	
From Southeast to South	20676	Port Republic	Port Republic	9.0 -- 11.0	3,871
			Scientists Cliffs	10.5 -- 11.5	
From Southeast to South	20685	St. Leonard	St. Leonard	8.0 -- 9.0	6,471
			Calvert Beach/Long Beach	6.0 -- 8.0	
From North to Northeast	20688	Solomons	Solomons	4.0 -- 6.0	1,828
			Asbury	4.1	
			U.S. Naval Recreation Center	4.1	
Total Population of Calvert Residents Exposed to Dominion Pollution Plumes					33,598

Note: The above distances were measured on a 2013 map of Calvert County by the Atlantic Communications Group.

- K. MDE delegated to Dominion discretion for reporting hazardous and toxic emissions, but provided vague criteria on when reports need to be made to regulators and local officials when high levels of toxic emissions occur.
- L. The Public Service Commission's directed that Dominion shall "quantify emissions of each Toxic Air Pollutant ... that will be discharged from affected installations and submit that information to the Department of the Environment and the Air and Radiation Management Administration" and, using methodologies in Maryland regulations ... for screening or air dispersion modeling, rather than direct measurements of emissions, *demonstrate that these TAP emissions do not unreasonably endanger human health. Pregnant women, young mothers, children, the elderly, and individuals suffering from respiratory problems who live*

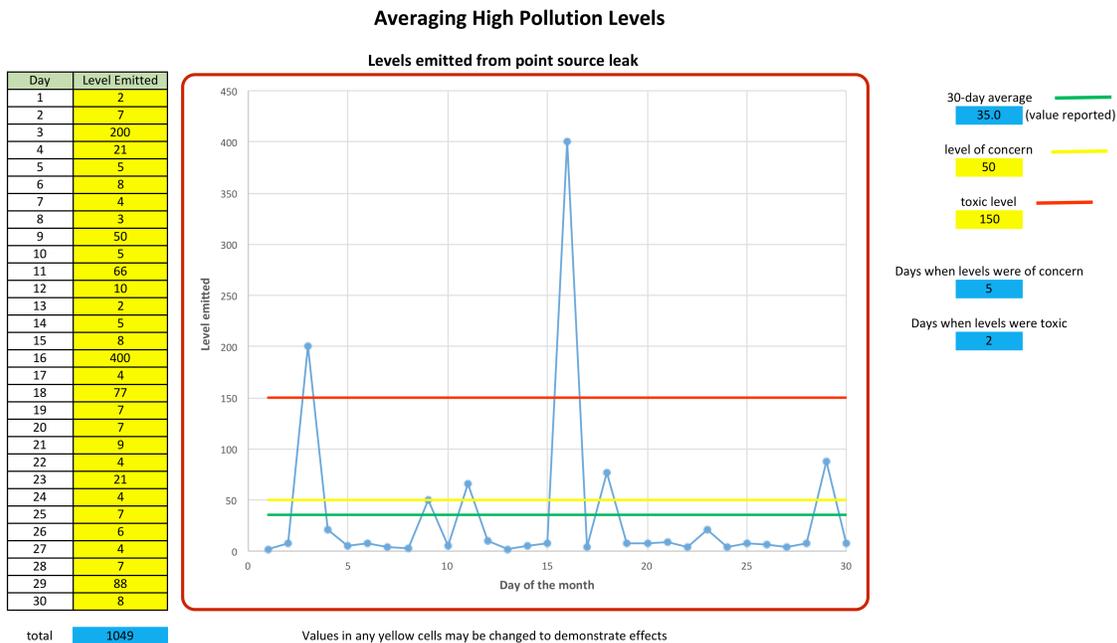
near Cove Point will almost certainly disagree with Dominion managers as to how much toxic pollution constitutes an “unreasonable” threat to public health.

- M. FERC gave Dominion discretion in reporting methane or other hazardous leaks when its management believes the leaks to be dangerous.
- N. No official representative from any federal or state regulatory agency will be permanently stationed at the Cove Point LNG Facility during liquefaction operations to monitor dominion’s compliance with emission limits.

Rolling Averages of Annual Tonnage of Pollution Emissions Do Not Show Short-Term, But Potentially Serious Public Health Risks

- O. Continuous, real-time reporting on pollution levels can show significant variations in levels that can vary widely, even within 24 hours.
- P. Requirements that limit reports to long-term averages of total pollution levels obscure the intensity and duration of harmful exposure. *Averaging emissions over days, weeks or months effectively prevents regulators and public health officials from determining the intensity, frequency, or duration of exposures of nearby residents to surges of toxic materials.*

The following graph illustrates how a facility that stays within an “average” limit of 35 units of pollution could still endanger the health of nearby residents in the 2 days when pollution exceeded toxic levels.



- Q. Long timeframes for reporting on and correcting high emission levels can expose residents to sustained levels of dangerous pollution.
- R. Regulators assumed that initial Dominion operational efficiencies that limit pollution will be sustained, despite wear on machines, equipment malfunctions or operator fatigue/error.
- S. Regulations made no effective requirement for Dominion to quickly reduce excessive

pollution resulting from unanticipated problems, such as accidents.

Regulatory Calculations of Pollution Levels Are Estimates that Require Verification with Measurements of Actual Pollution

- T. Regulators relied on a lengthy, complex series of methodologies, vendor certifications, methodologies from other geographic regions to project the levels of pollution that Dominion was projected to emit. While the system that Dominion and regulators used for estimating Cove Point's pollution levels is necessary for planning purposes, it does not provide a reliable indication of the actual (as opposed to estimated or modeled) levels of pollution that Dominion will produce during operations. *The repeated use of the same methodology for both projecting and confirming pollution levels is fundamentally flawed. If the initial methodology is inaccurate, then using the same models to "validate" compliance with regulated limits will simply repeat the errors that were present in the initial calculations.*
- U. Calculations and modeling of organic and particulate emissions can provide inaccurate readings of actual emission levels.
- V. Regulations are vague regarding actions that Dominion needs to take to reduce excessive pollution in a reasonable timeframe.

III. Findings

- Even if Dominion observed all federal and state regulations, it could still emit dangerously high levels of hazardous materials for extended times without needing to report a public health hazard to regulators, local officials or residents on a timely basis.
- Because federal and state regulations do not provide effective requirements for government agencies or Dominion to report in real time on toxic emissions, plant workers and Calvert residents could face serious health dangers for extended periods of time without knowing that they are being exposed to high levels of harmful chemicals.
- Without effective regulations that require measuring, rather than calculating, actual levels of toxic pollutants, an alternative is needed for determining when hazardous conditions are present in neighborhoods near Cove Point. These real-time monitors would measure the intensity and duration of air toxics and provide data for determining whether harmful levels of pollutants are being emitted.
- In order for this system to be transparent, it should operate 24/7 and track and report on the levels and duration of emissions of volatile organic compounds and particulates.
- There is nothing in federal regulations that would prevent state officials from setting up a system to monitor toxic pollutant concentrations near Cove Point. According to EPA guidelines regarding states' ability to set higher performance standards, Maryland could require Dominion to adhere to stricter compliance with limits on toxic pollution.
- Real-time readings from this system should also be made available on-line so that affected residents can track and respond to surges (for example, by sheltering in place).
- With advances in technology and engineering efficiency, new low-cost sensors are constantly being developed that can provide accurate readings at increasingly affordable cost.

Section C. Recommendations

Rationale for Recommendations

The absence of federal and state regulatory requirements to monitor/report on concentrations of pollution in neighborhoods close to Dominion Cove Point prevents officials and residents from knowing when/if toxic plumes present a serious threat to public health. Given the multiple factors that could result in periodic toxic plumes and the illnesses that these substances could cause, there is a strong justification for reliable measuring/reporting on actual pollution levels near the liquefaction facility. Such data could either confirm that toxic emissions are within planned limits or provide compelling evidence for regulators or state/local officials to require Dominion to take remedial actions. Calvert County has been monitoring local water pollution for more than 20 years and should do the same for air pollution.

The suggested air pollution monitoring and reporting program is technically feasible. A Settlement Agreement between Shell Chemical Appalachia LLC and Clean Air Council and Environmental Integrity Project contained detailed provisions for reporting on the toxic emissions, particularly VOCs, similar to those recommended for Cove Point.

Recommendations

- 1. Require that the Maryland Department of the Environment support the installation of a 24/7 system to conduct continuous fence-line monitoring at Cove Point of the kind, density, frequency, and duration of toxic pollution emitted by Dominion's LNG liquefaction facility;**
- 2. Set up the system so that the continuous readings from these pollution monitors be made available on line so that local public health officials and concerned residents can check the status of air quality on a real-time basis.**