



TS 6.9.1.8
TS 6.14.1.c

LG-18-052

April 30, 2018

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Limerick Generating Station, Unit 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353 and 72-065

Subject: Annual Radioactive Effluent Release Report No. 43

In accordance with Section 6.9.1.8 of the Limerick Generating Station (LGS) Technical Specifications (TS) and Section 6.2 of the Offsite Dose Calculation Manual (ODCM), Attachment 1 is the Annual Radioactive Effluent Release Report No. 43, 2017 Limerick Generating Station.

In accordance with Section 6.14.1.c of the LGS TS, a copy of the ODCM is submitted with the Annual Radioactive Effluent Release Report if the ODCM was revised during the period. Since the ODCM was not revised a copy of the ODCM is not attached to this submittal.

Limerick has reviewed the Dosimeter of Legal Record (DLR) data for the nearest residence from the ISFSI modules currently loaded. During the period of January 1, 2017 to December 31, 2017, there were no liquid or gaseous effluent releases from the ISFSI at Limerick.

There are no commitments contained in this letter.

If you have any questions or require additional information, please contact Aaron Briggs at 610-718-2701.

Respectfully,

A handwritten signature in black ink, appearing to read "Richard W. Libra".

Richard W. Libra
Vice President-Limerick Generating Station
Exelon Generation Company, LLC

Attachment 1: Annual Radioactive Effluent Release Report No. 43, 2017 Limerick
Generating Station

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Exelon Generation®



**Annual Radioactive Effluent Release Report
No. 43**

2017

Limerick Generating Station

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

NO. 43

January 1, 2017 through December 31, 2017

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION
UNITS NO. 1 AND 2

DOCKET NO. 50-352 (Unit 1)

DOCKET NO. 50-353 (Unit 2)

DOCKET NO. 72-065 (ISFSI)

Submitted to
The United States Nuclear Regulatory Commission
Pursuant to
Renewed Facility Operating License:

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LICENSEE: EXELON GENERATION COMPANY, LLC

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1. Preface

The following sections of the preface are meant to help define key concepts, provide clarity, and give context to the readers of this report.

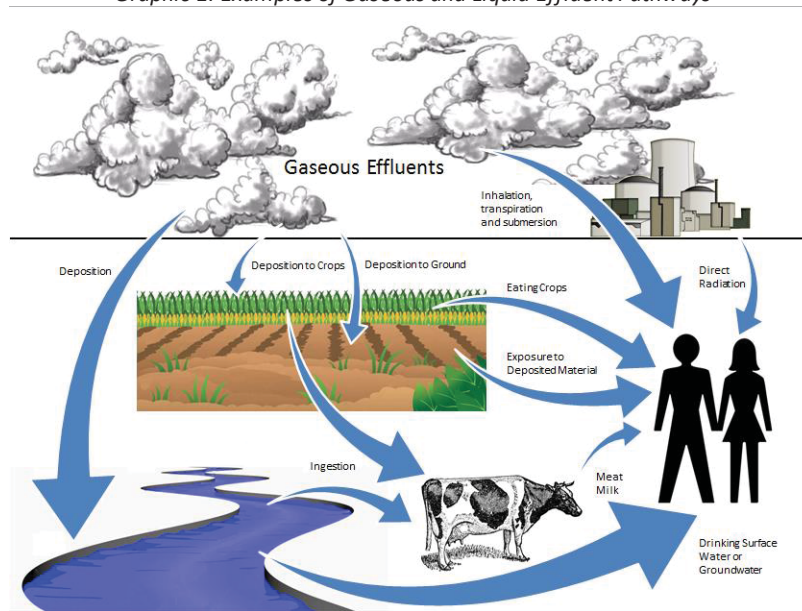
Annual Reports

The Nuclear Regulatory Commission (NRC) is the federal agency who has the role to protect public health and safety related to nuclear energy. Nuclear Power Plants have made many commitments to the NRC to ensure the safety of the public. As part of these commitments, they provide two reports annually to specifically address how the station’s operation impacts the environment of the local community. Then the NRC reviews these reports and makes them available to the public. The names of the reports are the Annual Radioactive Effluent Release Report (ARERR) and the Annual Radiological Environmental Operating Report (AREOR).

The ARERR reports the results of the sampling from the effluent release paths at the station and analyzed for radioactivity. An effluent is a liquid or gaseous waste, containing plant-related radioactive material emitted at the boundary of the facility.

The AREOR reports the results of the samples obtained in the environment surrounding the station and analyzed for radioactivity. Environmental samples include air, water, vegetation, and other sample types that are identified as potential pathways radioactivity can reach humans.

Graphic 1. Examples of Gaseous and Liquid Effluent Pathways

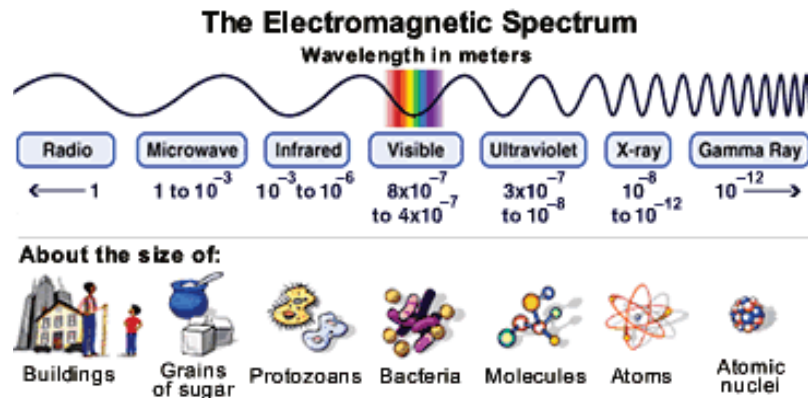


Graphic 1 demonstrates some potential exposure pathways from Limerick Generating Station. The ARERR and AREOR together ensure Nuclear Power Plants are operating in a manner that is within established regulatory commitments meant to adequately protect the public.

Understanding Radiation

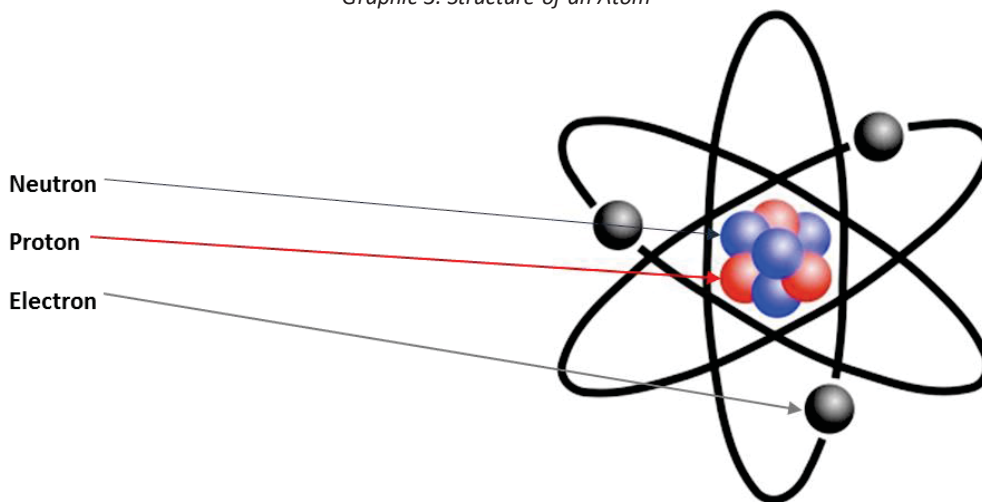
Generally, radiation is defined as emitted energy in the form of waves or particles. If radiation has enough energy to displace electrons from an atom it is termed “ionizing”, otherwise it is “non-ionizing”. Non-ionizing radiation includes light, heat given off from a stove, radiowaves and microwaves. Ionizing radiation occurs in atoms, particles too small for the eye to see. So, what are atoms and how does radiation come from them?

Graphic 2. Types of Radiation, from NASA Hubblesite



An atom is the smallest part of an element that maintains the characteristics of that element. Atoms are made up of three parts: protons, neutrons, and electrons.

Graphic 3. Structure of an Atom



The number of protons in an atom determines the element. For example, a hydrogen atom will always have one proton while an oxygen atom will always have eight protons. The protons are clustered with the neutrons forming the nucleus at the center of the atom. Orbiting around the nucleus are the relatively small electrons.

Isotopes are atoms that have the same number of protons but different numbers of neutrons. Different isotopes of an element will all have the same chemical properties and many isotopes are radioactive while other isotopes are not radioactive. A radioactive isotope can emit radiation because it contains excess energy in its nucleus. Radioactive atoms and isotopes are also referred to as radionuclides and radioisotopes.

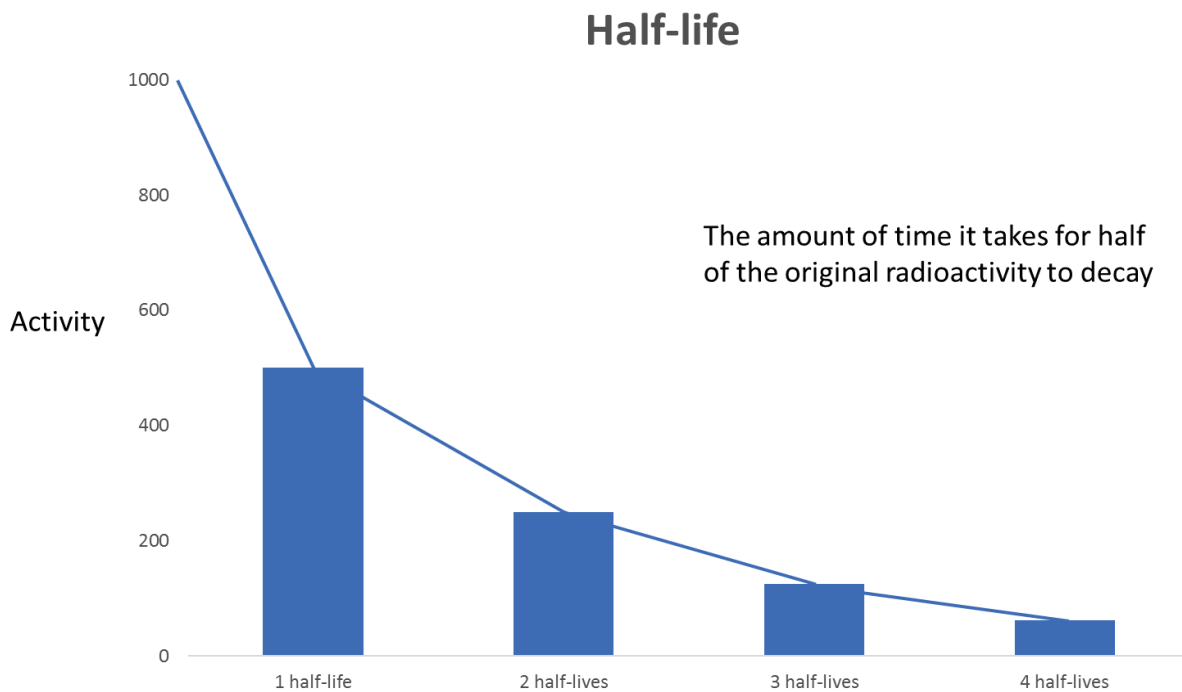
There are two basic ways that radionuclides are produced at a nuclear power plant. The first is fission, which creates radionuclides that are called *fission products*. Fission occurs when a very large atom, such

as Uranium-235 (U-235) or Plutonium-239 (Pu-239), absorbs a neutron into its nucleus making the atom unstable. The unstable atom can then split into smaller atoms. When fission occurs there is a large amount of energy released in the form of heat. A nuclear power plant uses the heat generated to boil water that spins turbines to produce electricity.

The second way a radionuclide is produced at a nuclear power plant is through a process called activation. The radionuclides produced in this method are termed *activation products*. Pure water that passes over the fissioning atoms is used to cool the reactor and also produce steam to turn the turbines. Although this water is considered to be very pure, there are always some contaminants within the water from material used in the plant's construction and operation. These contaminants are exposed to the fission process and may become activation products. The atoms in the water itself can also become activated and create radionuclides.

Over time, radioactive atoms will reach a stable state and no longer be radioactive. To do this they must release their excess energy. This release of excess energy is called radioactive decay. The time it takes for a radionuclide to become stable is measured in units called half-lives. A half-life is the amount of time it takes for half of the original radioactivity to decay. Each radionuclide has a specific half-life. Some half-lives can be very long and measured in years while others may be very short and measured in seconds.

Graphic 4. Radioactive Decay Half-Life



In the annual reports you will see both man made and naturally occurring radionuclides listed, for example Potassium-40 (K-40, natural) and Cobalt-60 (Co-60, man-made). We are mostly concerned about man-made radionuclides because they can be produced as by-products when generating electricity at a nuclear power plant. It is important to note that there are also other ways man-made radionuclides are produced, such as detonating nuclear weapons. Weapons testing has deposited some of the same man-made radionuclides into the environment as those generated by nuclear power, and some are still present today because of long half-lives.

Measuring Radiation

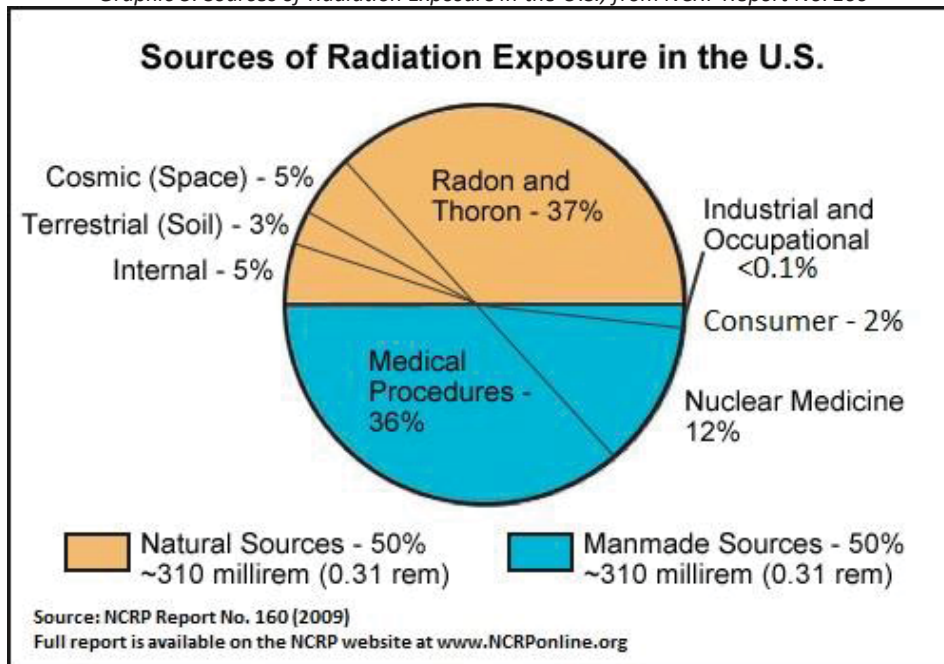
There are four different but interrelated units for measuring radioactivity, exposure, absorbed dose, and dose equivalent. Together, they are used to scientifically report the amount of radiation and its effects on humans.

- Radioactivity refers to the amount of ionizing radiation released by a material. The units of measure for radioactivity used within the AREOR and ARERR are the Curie (Ci). Small fractions of the Ci often have a prefix, such as the microCurie (μCi), which means 1/1,000,000 of a Curie.
- Exposure describes the amount of radiation traveling through the air. The units of measure for exposure used within the AREOR and ARERR are the Roentgen (R). Traditionally direct radiation monitors placed around the site are measured milliRoentgen (mR), 1/1,000 of one R.
- Absorbed dose describes the amount of radiation absorbed by an object or person. The units of measure for absorbed dose used within the AREOR and ARERR are the rad. Noble gas air doses are reported by the site are measured in millirad (mrad), 1/1,000 of one rad.
- Dose equivalent (or effective dose) combines the amount of radiation absorbed and the health effects of that type of radiation. The units used within the AREOR and ARERR are the Roentgen equivalent man (rem). Regulations require doses to the whole body, specific organ, and direct radiation to be reported in millirem (mrem), 1/1,000 of one rem.

Sources of Radiation

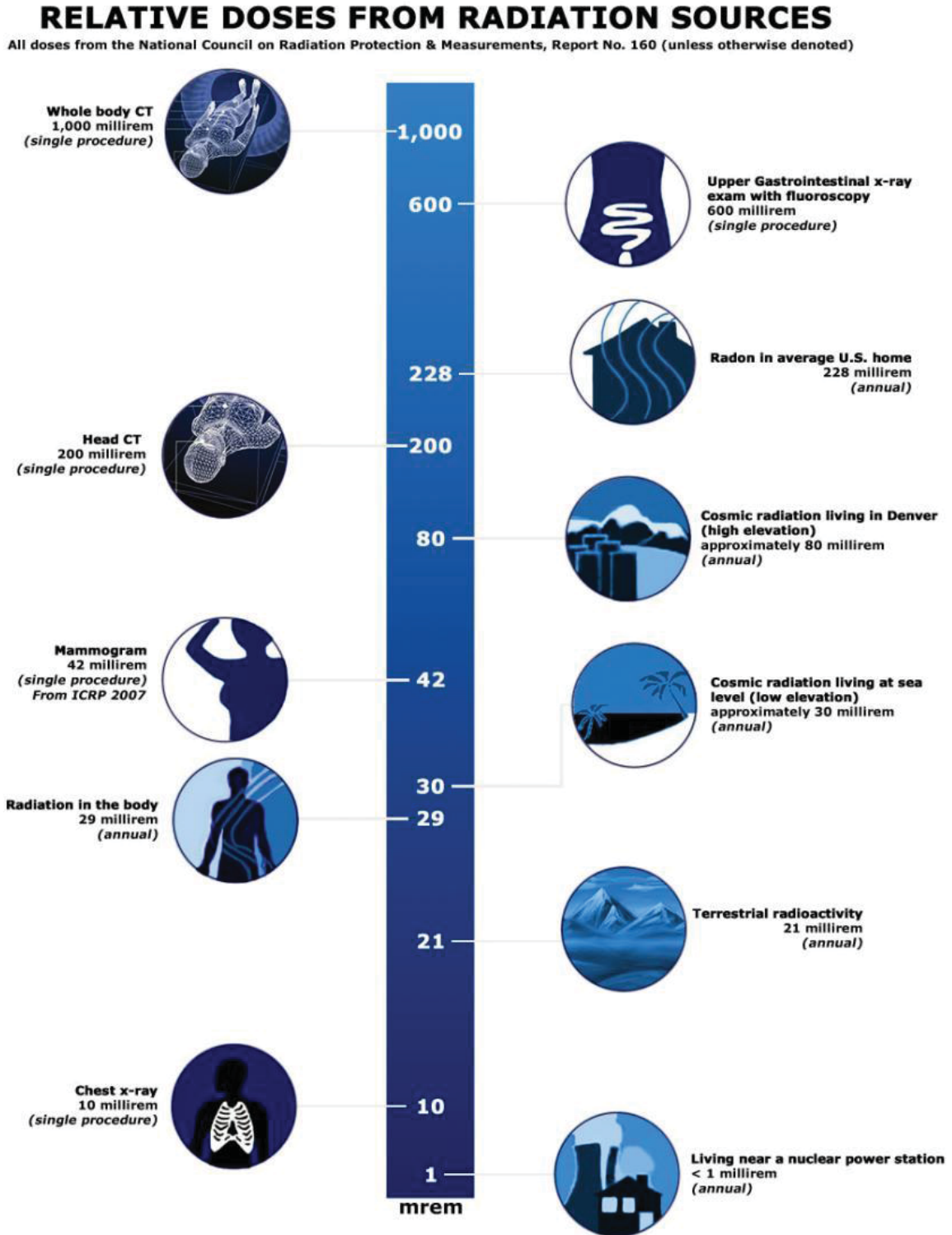
People are exposed to radiation every day of their lives and have been since the dawn of mankind. Some of this radiation is naturally occurring while some is man-made. There are many factors that will determine the amount of radiation individuals will be exposed to such as where they live, medical treatments, etc. The average person in the United States is exposed to approximately 620 mrem each year. 310 mrem comes from natural sources and 310 from man-made sources. The Graphic 5 shows what the typical sources of radiation are for an individual over a calendar year:

Graphic 5. Sources of Radiation Exposure in the U.S., from NCRP Report No. 160



The radiation from a nuclear power plant is included in the chart as part of the “Industrial and Occupational” fraction, <0.1%. The largest natural source of radiation is from radon, because radon gas travels in the air we breathe. Perhaps you know someone who had a CT scan at a hospital to check his or her bones, brain, or heart. CT scans are included in the chart as “Medical Procedures”, which make up the next largest fraction. Graphic 6 on the following page shows some of the common doses humans receive from radiation every year.

Graphic 6. Relative Doses from Radiation Sources, from EPA Radiation Doses and Sources

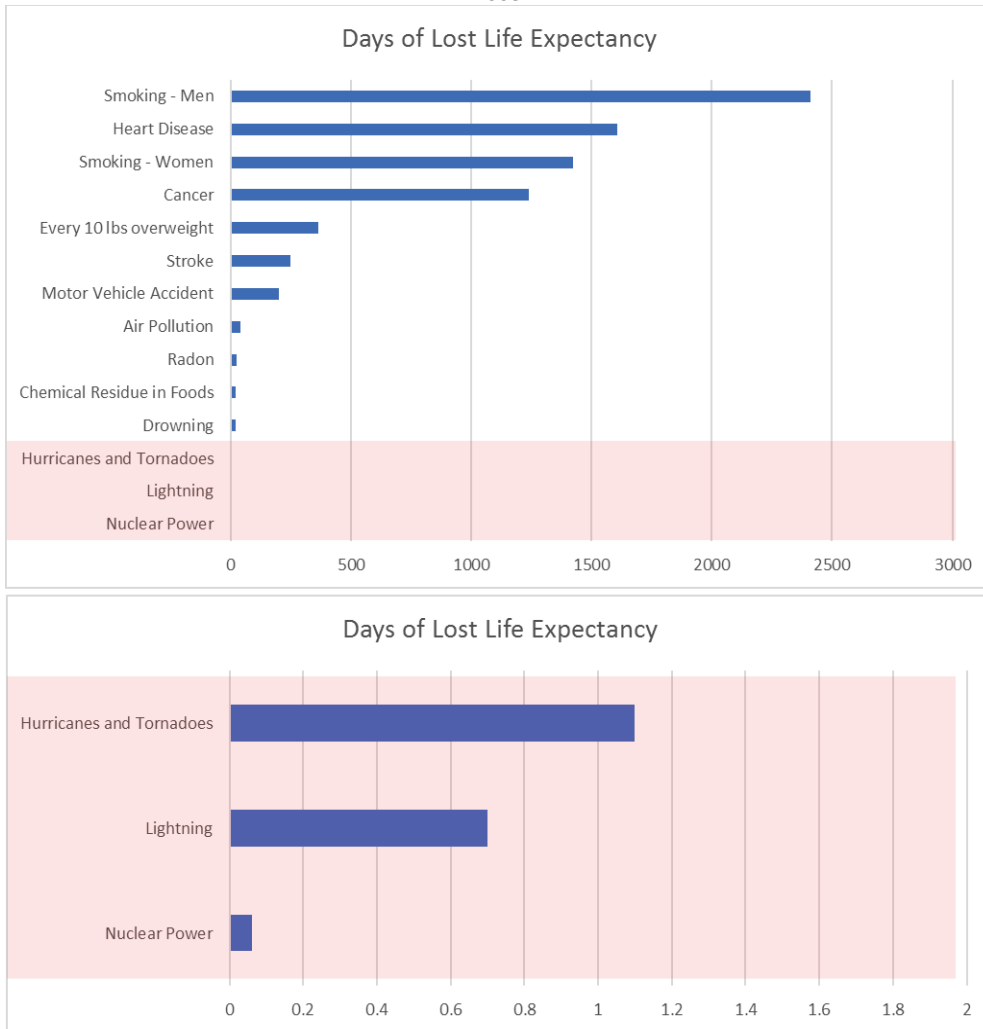


Radiation Risk

Current science suggests there is some risk from any exposure to radiation. However, it is very hard to tell whether cancers or deaths can be attributed to very low doses of radiation or by something else. U.S. radiation protection standards are based on the premise that any radiation exposure carries some risk.

The following graph is an example of one study that tries to relate risk from many different factors. This graph represents risk as “Days of Lost Life Expectancy”. All the categories are averaged over the entire population except Male Smokers, Female Smokers, and individuals that are overweight. Those risks are only for people that fall into those categories. The category for Nuclear Power is a government estimate based on all radioactivity releases from nuclear power, including accidents and wastes.

Graphic 7. Days of Lost Life Expectancy, Adapted from the Journal of American Physicians and Surgeons Volume 8 Number 2 Summer 2003



2. Introduction

In accordance with the reporting requirements of Technical Specification 6.9.1.8 applicable during the reporting period, this report summarizes the effluent release data for Limerick Generating Station Units 1 and 2 for the period January 1, 2017 through December 31, 2017. This submittal complies with the format described in Regulatory Guide 1.21, "Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants", Revision 1, June, 1974.

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Meteorological data was reported in the format specified in Regulatory Guide 1.23, Revision 1, "Meteorological Monitoring Programs for Nuclear Power Plants".

All vendor results were received and included in the report calculations. Therefore, the 2017 report is complete.

3. Supplemental Information

A. Regulatory Limits

	Limit	Units	Receptor	ODCM and 10 CFR 50, Appendix I Design Objective Limits
1. Noble Gases:				
a.	≤ 500 ≤ 3000	mrem/Yr mrem/Yr	Total Body Skin	ODCM Control 3.2.2.1.a
b.	≤ 10 ≤ 20	mRad mRad	Air Gamma Air Beta	Quarterly air dose limits ODCM Control 3.2.2.2.a
c.	≤ 20 ≤ 40	mRad mRad	Air Gamma Air Beta	Yearly air dose limits ODCM Control 3.2.2.2.b
d.	≤ 10 ≤ 30	mrem mrem	Total Body (Gamma) Skin (Beta)	10 CFR 50, Appendix I, Section II.B.2(b) (limits listed here are based on two unit operation)
2. Iodines, Tritium, Particulates with Half Life > 8 days:				
a.	≤ 1500	mrem/Yr	Any Organ	ODCM Control 3.2.2.1.b
b.	≤ 15	mrem	Any Organ	Quarterly dose limits ODCM Control 3.2.2.3.a
c.	≤ 30	mrem	Any Organ	Yearly dose limits ODCM Control 3.2.2.3.b
3. Liquid Effluents				
a.	10 times the concentration limits in 10 CFR 20, Appendix B, Table 2 Col. 2			ODCM Control 3.2.1.1
b.	≤ 3 ≤ 10	mrem mrem	Total Body Any Organ	Quarterly dose limits ODCM Control 3.2.1.2.a
c.	≤ 6 ≤ 20	mrem mrem	Total Body Any Organ	Yearly dose limits ODCM Control 3.2.1.2.b
4. 40 CFR 190, 10 CFR 72.104				
	≤ 25 ≤ 75	mrem mrem	Total Body or Organ Thyroid	Yearly dose limits ODCM Control 3.2.3

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B. Effluent Concentration Limits

Gaseous dose rates rather than effluent concentrations are used to calculate permissible release rates for gaseous releases. The maximum permissible dose rates for gaseous releases are defined in Offsite Dose Calculation Manual (ODCM) Controls 3.2.2.1.a and 3.2.2.1.b as 500 mrem/yr (Total Body), 3000 mrem/yr (Skin), and 1500 mrem/yr (Organ).

The Effluent Concentration Limit (ECL) specified in 10 CFR 20, Appendix B, Table 2, Column 2 for identified nuclides, were used to calculate permissible release rates and concentrations for liquid release per the Limerick ODCM Control 3.2.1.1. The total activity concentration for all dissolved or entrained gases was limited to $< 2E-04 \mu\text{Ci/ml}$.

C. Average Energy (\bar{E})

The Limerick ODCM limits the instantaneous dose equivalent rates due to the release of noble gases to less than or equal to 500 mrem/year to the total body and less than or equal to 3000 mrem/year to the skin. The average beta and gamma energies (\bar{E}) of the radionuclide mixture in releases of fission and activation gases as described in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," may be used to calculate doses in lieu of more sophisticated software. The Limerick radioactive effluent program employs the methodologies presented in U.S. NRC Regulatory Guide 1.109 "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, October 1978. Therefore, average energies are not applicable to Limerick.

D. Measurements and Approximations of Total Radioactivity

1. Fission and Activation Gases

The method used for Gamma Isotopic Analysis is the Canberra Gamma Spectroscopy System with a gas Marinelli beaker. Airborne effluent gaseous activity was continuously monitored and recorded in accordance with ODCM Table 4.2-2. Additional vent grab samples were taken from the North Stack, Unit 1 South Stack, and Unit 2 South Stack and analyzed at least monthly to determine the isotopic mixture of noble gas activity released for the month. The data from the noble gas radiation monitors were analyzed to report net noble gas effluent activity. When no activity was found in the grab isotopic analysis, the isotopic mixture was assumed to be that evaluated in the UFSAR (Section 11.5, Table 11.5-4). If activity was found in the grab isotopic analysis, the isotopic mixture for the Noble Gas Monitor was determined from that isotopic mixture.

Each month a monitor background was determined at the time of the noble gas grab sample and used to determine net radiation monitor activity. When no isotopic activity was identified in the grab noble gas sample, the noble gas radiation monitor 15-minute average data for one-hour prior to and one-hour post noble gas grab sampling were used to determine monitor background for the month. The mean plus two standard deviations was used as background for each Noble Gas Monitor. When activity was identified the background determination was made from the last month that no activity was found.

2. Particulates and Iodines

The method used for Gamma Isotopic Analysis is the Canberra Gamma Spectroscopy System with a particulate filter (47 mm) or charcoal cartridge, respectively. Particulate and iodine activity was continuously sampled and analyzed in accordance with ODCM Table 4.2-2. Charcoal and particulate samples are taken from the North Stack, Unit 1 South Stack, Unit 2 South Stack and Hot Maintenance Shop exhausts and analyzed at least weekly to determine the total activity released from the plant.

3. Carbon-14 in gaseous effluents

Gaseous releases of Carbon-14 were estimated based upon a study by EPRI (EPRI 1021106, Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents). The principal production reaction leading to the release of C-14 during plant operation is the O-17(n,α) C-14 nuclear reaction in reactor coolant. Carbon-14 is also produced by neutron activation of N-14 in the BWR drywell and dissolved nitrogen in the reactor coolant, however these sources are a small fraction of that produced by the O-17(n,α) C-14 reaction and can be neglected since reactor coolant normally contains less than 0.1 ppm by weight nitrogen and the neutron flux in the drywell is low. Most of the C-14 produced in a BWR is released in a gaseous form by the off-gas system, primarily in the form of ¹⁴CO₂

An Exelon fleet-wide spreadsheet was developed using the production factors from the EPRI report. The spreadsheet requires site specific inputs of total reactor power ratings (7030) MWth and Equivalent Full Power Operation days. Using this method, total C-14 released was estimated at 33.06 Curies (Ci). Ninety-five percent or 31.41 Ci was in the form of ¹⁴CO₂, which was the chemical form necessary to be incorporated in the dose pathways of vegetation, meat and milk. Only inhalation pathway uses the full C-14 release value in estimating dose.

To simplify the dose calculations for C-14, the total release value was used in calculating dose via the offsite effluent pathways. Using the total C-14 release value results in a conservative five percent overestimation of dose via the vegetation, meat and milk pathways. In addition, releases of C-14 were assumed to occur only through the North Vent, which is common to both units. The North Vent has the most conservative X/Q factors for calculating dose.

4. Liquid Effluents

Each batch of liquid effluent was sampled and analyzed for gamma isotopic activity in accordance with ODCM Table 4.2-1 prior to release. The total activity of each released batch was determined by multiplying each nuclide's concentration by the total volume discharged and then summing. The total activity released during a quarter was then determined by summing the activity content of all batch releases discharged during the quarter.

5. Tritium in Liquid and Gaseous Effluents

Liquid effluents are analyzed for tritium using a Liquid Scintillation Counter.

Gaseous effluents are analyzed for tritium by passing air from stack effluents through two bubblers in series. An aliquot of the water from each bubbler was analyzed using a Liquid Scintillation Counter.

The monthly liquid radwaste composite was analyzed for tritium using a Liquid Scintillation Counter.

6. Composite Samples

Particulate air samples were composited monthly and analyzed for gross alpha, Sr-89, Sr-90, and Ni-63. Liquid radwaste samples were composited monthly and quarterly and analyzed for gross alpha (monthly) and Fe-55, Sr-89 and Sr-90 (quarterly). These composites were submitted to an offsite vendor laboratory for analysis.

7. Lower Limit of Detection (LLD)

The ODCM required lower limit of detection for airborne and liquid releases as follows:

Airborne:	LLD
Gross Alpha, Sr-89, Sr-90	1E-11 uCi/cc
H-3	1E-06 uCi/cc
I-131	1E-12 uCi/cc
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, I-131, Cs-134, Cs-137, Ce-141, Ce-144)	1E-11 uCi/cc
Noble Gas (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-135m, Xe-138)	1E-04 uCi/cc

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Liquid:	LLD
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, Ce-144)	5E-07 uCi/ml
I-131	1E-06 uCi/ml
Entrained Gases (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-135m, Xe-138)	1E-05 uCi/ml
H-3	1E-05 uCi/ml
Gross Alpha	1E-07 uCi/ml
Sr-89, Sr-90	5E-08 uCi/ml
Fe-55	1E-06 uCi/ml

8. Estimated Total Error Present

Procedure CY-AA-170-2100, Estimated Errors of Effluent Measurements, provides the methodology to obtain an overall estimate of the error associated with radioactive effluents. The sum of errors used in this report was documented in IR 138895-02.

E. Batch Releases

Liquid	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Batch Releases	0.00E+00	3.20E+01	7.00E+00	2.20E+01	6.10E+01
Total time period for batch releases (min)	0.00E+00	3.19E+03	5.85E+02	2.20E+03	5.97E+03
Maximum time period for batch release (min)	0.00E+00	1.10E+02	9.00E+01	1.10E+02	1.10E+02
Average time period for batch release (min)	0.00E+00	9.95E+01	8.36E+01	1.00E+02	9.79E+01
Minimum time period for batch release (min)	0.00E+00	7.50E+01	7.90E+01	7.00E+01	7.00E+01
Average stream flow (Schuylkill River) during periods of release of effluents into a flowing stream (LPM)	0.00E+00	2.06E+07	5.15E+06	1.13E+07	1.56E+07
Average Blowdown Flowrate (LPM)	0.00E+00	2.19E+04	2.08E+04	2.19E+04	2.18E+04

Gaseous	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Batch Releases	3.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+00
Total time period for batch releases (min)	1.22E+05	0.00E+00	0.00E+00	0.00E+00	1.22E+05
Maximum time period for batch release (min)	5.18E+04	0.00E+00	0.00E+00	0.00E+00	5.18E+04
Average time period for batch release (min)	4.08E+04	0.00E+00	0.00E+00	0.00E+00	4.08E+04
Minimum time period for batch release (min)	2.59E+04	0.00E+00	0.00E+00	0.00E+00	2.59E+04

F. Abnormal Releases

1. Liquid	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Releases	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Activity Released (Ci)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2. Gaseous	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Releases	3.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+00
Total Activity Released (Ci)	1.13E-03	0.00E+00	0.00E+00	0.00E+00	1.13E-03

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- Tritiated water was identified in the Aux Boiler Feedwater and released via the Aux Boiler Deaerator Vent during quarter 1. The concentrations released represent a small fraction of the Total Body and Organ Dose limits, and have been included as part of Appendix A in Table 1A (IR 03972846).

G. Insignificant Releases

In January of 2016 new pathways were identified and classified as an Insignificant Effluent Pathway. Gaseous effluents from the Main Turbine and Reactor Feed Pump Turbine lubrication oil vapor extractor exhaust vents to the Turbine Building roof. These pathways are not continuously monitored. Tritium analysis was performed in January and December 2016 of the water vapor exiting the vent and of nearby standing water. The tritium in the water is the result of condensation and direct deposition from the discharge of the entrained water vapor from the exhaust vents. This condensation does occur year-round, but increases during seasonally cold weather.

The lube oil exhaust vents and associated systems were operating as designed to remove accumulated water from the lubricating and seal oil for the various turbine systems. The water was discharged as entrained vapor out the Turbine Building roof vent and a portion of it condensed on lower temperature surfaces. This water includes tritium, as the source is from the primary system. (IR 2606991)

Based on Regulatory Guide 1.21, Rev 1, Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants these release pathways are considered insignificant. As such, the percentage of U1 and U2 MTLO exhaust vent activity in 2017 is relatively small compared to the total activity released from the site in 2017. This percentage is calculated below.

Vent	Tritium Concentration, uCi/cc	Site Gaseous Annual Release of Tritium, Ci	Percentage of Activity Relative to Total Release from the Site
		2017	2017
U1 MTLO extractor exhaust vent	1.30E-08	4.55E+01	5.8E-01%
U2 MTLO extractor exhaust vent	1.03E-08		4.6E-01%
U1 and U2 RFPT extractor exhaust vent	<LLD		N/A

H. Spills

There were no spills in 2017.

I. Revisions to the ODCM

There were no revisions to the ODCM in 2017.

J. Radioactive Effluent Monitoring Instrumentation Out of Service for More Than 30 Days

The 1A and 1B South Stack flow rate monitors were inoperable from 7/26/17 – 9/15/2017. The extended inoperable time of the instrument was due to limited resources available to fix the monitors. During this period, compensatory samples were collected and analyzed to meet the requirements of the ODCM. (IR 04035765).

K. Independent Spent Fuel Storage Installation (ISFSI)

An Independent Spent Fuel Storage Installation (ISFSI) was placed in service starting July 21, 2008. Direct radiation exposure was determined using dosimetry measurements (minus background levels) obtained from the Radiological Environmental Monitoring Program for the nearest residence to the

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Independent Spent Fuel Storage Installation (ISFSI). In 2017 the dose to the nearest resident from the ISFSI was 0.00 mrem.

L. Annual Land Use Census Changes

The 2017 Land Use Survey identified differences in locations for gardens and meat animals. The gardens identified in sectors ENE, E, ESE, SE, and WNW are newly identified and closer than in 2016. The location for meat animals in sectors NNE, SE, and NNW are closer than in 2016 and location for meat animals in sectors NE and SSW are farther away than in 2016.

4. Radiological Impact to Man and Compliance to 40 CFR 190 Limits

A. Dose to Members of the Public at or Beyond Site Boundary

Per ODCM Control 6.2, the Annual Radioactive Effluent Release Report shall include an assessment of the radiation doses to the hypothetically highest exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources. The ODCM does not require population doses to be calculated. For purposes of this calculation the following assumptions were made:

- Long term annual average meteorology X/Q and D/Q and actual gaseous effluent releases were used.
- Gamma air dose, Beta air dose, Total Body and Skin doses were attributed to noble gas releases.
- Critical organ and age group dose attributed to iodine, particulate, carbon-14 and tritium releases.
- 100 percent occupancy factor was assumed.
- Dosimetry measurements (minus background levels) obtained from the Radiological Environmental Monitoring Program for the nearest residence to the Independent Spent Fuel Storage Installation (ISFSI) was used to determine direct radiation exposure.
- The highest doses from the critical organ and critical age group for each release pathway was summed and added to the net dosimetry measurement from nearest residence to the ISFSI for 40CFR190 compliance.

Gaseous Releases (Table 1):

The critical age-organ group was the child-bone. Calculated dose was 1.24E+00 mrem, which represents 4.13E+00 percent of the allowable limits. Carbon-14 represented 99.9% or 1.24E+00 mrem of the total dose.

Liquid Releases (Table 1):

The critical age-organ was the child-liver. Calculated total body dose was 5.43E-02 mrem and organ dose was 5.48E-02 mrem.

40 CFR 190 Compliance (Table 2):

The maximum calculated dose to a real individual would not exceed 3.06E-01 mrem (total body), 1.30E+00 mrem (organ), or 3.05E-01 mrem (thyroid).

All doses calculated were well below all ODCM and 40 CFR Part 190 limits to a real individual.

Table 1 Summary of Gaseous and Liquid Effluent Doses to Members of the Public at the Highest Dose Receptors

Maximum Individual Noble Gas	Applicable Dose	Estimated Dose	Age Group	% of Applicable Limit	Limit	Unit
Nearest Residence	Gamma Air Dose	2.42E-03	All	1.21E-02	20	mRad
Nearest Residence	Beta Air Dose	1.45E-03	All	3.62E-03	40	mRad
Nearest Residence	Total Body	2.29E-03	All	2.29E-02	10	mrem
Nearest Residence	Skin	3.78E-03	All	1.26E-02	30	mrem
Iodine, Particulate, C-14 & Tritium						
Vegetation Pathway	Bone	1.24E+00	Child	4.13E+00	30	mrem
Liquid						
Phoenixville, PA	Total Body	5.43E-02	Child	9.05E-01	6	mrem
Phoenixville, PA	Liver	5.48E-02	Child	2.74E-01	20	mrem

Table 2 Summary of Gaseous and Liquid Effluent Doses to Members of the Public for 40CFR190 Compliance

40 CFR 190 Compliance								
	Gaseous Effluents		Liquid Effluents	Net Direct Radiation	Total	% of Applicable Limit	Limit	Unit
	Noble Gas	Particulate, Iodine, C-14 & Tritium						
Total Body Dose	2.29E-03	2.49E-01	5.43E-02	0.00E+00	3.06E-01	1.22E+00	25	mrem
Organ Dose	3.78E-03	1.24E+00	5.48E-02	0.00E+00	1.30E+00	5.19E+00	25	mrem
Thyroid Dose	2.29E-03	2.49E-01	5.41E-02	0.00E+00	3.05E-01	4.07E-01	75	mrem

B. Dose to Members of the Public Inside the Site Boundary

ODCM Control 6.2 also requires that the Annual Effluent Release Report shall include an assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to activities inside the Site Boundary during the report period. MEMBER OF THE PUBLIC shall include all persons not occupationally associated with the plant. This category does not include employees of the utility or contractors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational education, or other purposes not associated with the plant. A MEMBER OF THE PUBLIC may receive up to 100 mrem in a year (10CFR20.1301). Areas within the site boundary, where radiation dose of this type could occur include the Limerick Information Center on Longview Road, Frick's Lock on the south shore of the Schuylkill River, and the railroad track that runs along the north shore of the Schuylkill River. The radiation doses to Members of the Public have been estimated using methodology stated in the ODCM. The maximum gaseous dose to members of the public at these locations is based on the following assumptions:

- Long term annual average meteorology and actual effluent releases for the sectors encompassing the Railroad Tracks (W), Information Center, and Frick's Lock.
- Dose is from ground plane and inhalation only. No ingestion dose is included.
- The maximum expected occupancy factor is 25% of a working year at all locations.

The maximum calculated dose for activities on site was 3.53E-02 mrem at the Rail Road Tracks in the West sector (Table 3). All Doses calculated were a small fraction of the 10 CFR 20.1301 limits.

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Table 3 Summary of Gaseous Radiation Doses to Members of the Public for Activities on Site

Location	Sector	Approx. Distance (meters)	X/Q s/m ³	D/Q 1/m ²	Total Body Dose, mrem ⁽¹⁾		Organ Dose, mrem ⁽¹⁾	Total
					Noble Gas	Iodine, Particulate, C-14 & H-3	Iodine, Particulate, C-14 & H-3	
R.R. Tracks	W	225	2.66E-06	2.36E-08	2.70E-03	6.41E-03	2.62E-02	3.53E-02
Info. Center	ESE	884	7.32E-07	9.27E-09	7.44E-04	1.89E-03	7.33E-03	9.96E-03
Frick's Lock	WSW	450	5.58E-07	4.78E-09	5.67E-04	1.34E-03	5.48E-03	7.39E-03

(1) The limit for sum of the Total Body Dose and Organ Dose = 100 mrem (ref. 10 CFR 20.1301)

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Appendix A Effluent and Waste Disposal Summary

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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
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TABLE 1A GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

PERIOD 2017

A. Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	6.27E-01	1.54E+01	5.77E+00	1.40E+01	3.58E+01	36.6
Average Release Rate for Period	uCi/sec	8.07E-02	1.96E+00	7.26E-01	1.76E+00	1.14E+00	
Dose - Gamma Air Dose	mrad	5.16E-05	8.01E-04	3.98E-04	1.16E-03	2.42E-03	
- Beta Air Dose	mrad	3.03E-05	4.96E-04	2.38E-04	6.83E-04	1.45E-03	
Percent of ODCM Limit - Gamma Air Dose	%	5.16E-05	8.01E-03	3.98E-03	1.16E-02	1.21E-02	
- Beta Air Dose	%	1.52E-04	2.48E-03	1.19E-03	3.42E-03	3.63E-03	
B. Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total I-131	Ci	< LLD	2.18E-05	< LLD	< LLD	2.18E-05	20.4
Average Release Rate for Period	uCi/sec	< LLD	2.78E-06	< LLD	< LLD	6.93E-07	
Percent of ODCM Limit	%	*	*	*	*	*	
C. Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	< LLD	3.81E-05	5.00E-04	5.36E-06	5.44E-04	22.6
Average Release Rate for Period	uCi/sec	< LLD	4.85E-06	6.30E-05	6.74E-07	1.72E-05	
Percent of ODCM Limit	%	*	*	*	*	*	
D. Gross Alpha	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	22.6
Average Release Rate for Period	uCi/sec	< LLD	< LLD	< LLD	< LLD	< LLD	
Percent of ODCM Limit	%	*	*	*	*	*	
E. Tritium (H-3)	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	1.94E+01	2.09E+01	< LLD	5.21E+00	4.55E+01	15.7
Average Release Rate for Period	uCi/sec	2.49E+00	2.66E+00	< LLD	6.55E-01	1.44E+00	
Percent of ODCM Limit	%	*	*	*	*	*	
F. Carbon-14	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	
Total Release	Ci	6.46E+00	9.23E+00	9.88E+00	7.48E+00	3.31E+01	
Average Release Rate for Period	uCi/sec	8.31E-01	1.17E+00	1.24E+00	9.42E-01	1.05E+00	
Percent of ODCM Limit	%	*	*	*	*	*	
G. Iodine 131 & 133, Particulate, C-14 & H-3	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	
Organ Dose	mrem	2.41E-01	3.45E-01	3.70E-01	2.80E-01	1.24E+00	
Percent of ODCM Limit	%	1.61E+00	2.30E+00	2.47E+00	1.87E+00	4.13E+00	

* ODCM Limit for combined Iodine, Carbon-14, Tritium and particulate only, which is shown in Item G.

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE 1B-1 GASEOUS EFFLUENTS—MIXED-LEVEL RELEASE—BATCH MODE

PERIOD 2017

Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Ar-41	Ci	< LLD	N/A	N/A	N/A	< LLD
Kr-85	Ci	< LLD	N/A	N/A	N/A	< LLD
Kr-85m	Ci	< LLD	N/A	N/A	N/A	< LLD
Kr-87	Ci	< LLD	N/A	N/A	N/A	< LLD
Kr-88	Ci	< LLD	N/A	N/A	N/A	< LLD
Xe-133	Ci	< LLD	N/A	N/A	N/A	< LLD
Xe-135	Ci	< LLD	N/A	N/A	N/A	< LLD
Xe-135m	Ci	< LLD	N/A	N/A	N/A	< LLD
Xe-138	Ci	< LLD	N/A	N/A	N/A	< LLD
Total	Ci	< LLD	N/A	N/A	N/A	< LLD
Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
I-131	Ci	< LLD	N/A	N/A	N/A	< LLD
I-133	Ci	< LLD	N/A	N/A	N/A	< LLD
I-135	Ci	< LLD	N/A	N/A	N/A	< LLD
Total	Ci	< LLD	N/A	N/A	N/A	< LLD
Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Cr-51	Ci	< LLD	N/A	N/A	N/A	< LLD
Mn-54	Ci	< LLD	N/A	N/A	N/A	< LLD
Co-58	Ci	< LLD	N/A	N/A	N/A	< LLD
Co-60	Ci	< LLD	N/A	N/A	N/A	< LLD
Zn-65	Ci	< LLD	N/A	N/A	N/A	< LLD
Sr-89	Ci	< LLD	N/A	N/A	N/A	< LLD
Sr-90	Ci	< LLD	N/A	N/A	N/A	< LLD
Mo-99	Ci	< LLD	N/A	N/A	N/A	< LLD
Ag-110m	Ci	< LLD	N/A	N/A	N/A	< LLD
Cs-134	Ci	< LLD	N/A	N/A	N/A	< LLD
Cs-137	Ci	< LLD	N/A	N/A	N/A	< LLD
Ba-140	Ci	< LLD	N/A	N/A	N/A	< LLD
La-140	Ci	< LLD	N/A	N/A	N/A	< LLD
Ce-141	Ci	< LLD	N/A	N/A	N/A	< LLD
Ce-144	Ci	< LLD	N/A	N/A	N/A	< LLD
Total	Ci	< LLD	N/A	N/A	N/A	< LLD
H-3	Ci	1.13E-03	N/A	N/A	N/A	1.13E-03
Gross Alpha	Ci	N/A	N/A	N/A	N/A	N/A
C-14	Ci	N/A	N/A	N/A	N/A	N/A

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE 1B-2 GASEOUS EFFLUENTS – MIXED-LEVEL RELEASE - CONTINUOUS MODE

PERIOD 2017

Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Kr-85m	Ci	1.17E-02	2.67E-01	1.04E-01	2.62E-01	6.44E-01
Kr-85	Ci	2.94E-02	3.06E-02	1.57E-01	6.74E-01	8.91E-01
Kr-87	Ci	1.75E-02	2.73E-01	1.36E-01	3.96E-01	8.22E-01
Kr-88	Ci	2.80E-02	2.84E-01	1.92E-01	6.36E-01	1.14E+00
Ar-41	Ci	1.64E-02	1.09E+00	2.62E-01	3.48E-01	1.72E+00
Xe-131m	Ci	7.35E-04	7.67E-04	3.94E-03	1.69E-02	2.23E-02
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	8.77E-02	5.61E+00	1.37E+00	1.87E+00	8.94E+00
Xe-135m	Ci	1.29E-01	4.04E+00	1.33E+00	2.85E+00	8.35E+00
Xe-135	Ci	1.52E-01	3.04E+00	1.28E+00	3.41E+00	7.89E+00
Xe-138	Ci	1.56E-01	7.57E-01	9.31E-01	3.56E+00	5.40E+00
Total	Ci	6.27E-01	1.54E+01	5.77E+00	1.40E+01	3.58E+01
Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
I-131	Ci	< LLD	2.18E-05	< LLD	< LLD	2.18E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	2.18E-05	< LLD	< LLD	2.18E-05
Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	1.16E-05	< LLD	1.16E-05
Co-58	Ci	< LLD	< LLD	1.54E-04	< LLD	1.54E-04
Co-60	Ci	< LLD	3.81E-05	1.99E-04	5.36E-06	2.42E-04
Ni-63	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Zn-65	Ci	< LLD	< LLD	1.37E-04	< LLD	1.37E-04
Sr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	3.81E-05	5.00E-04	5.36E-06	5.44E-04
H-3	Ci	1.94E+01	2.09E+01	< LLD	5.21E+00	4.55E+01
Gross Alpha	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
C-14	Ci	6.46E+00	9.23E+00	9.88E+00	7.48E+00	3.31E+01

TABLE 2A LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES

PERIOD 2017

Fission and Activation Products Excluding Tritium, Gasses & Alpha	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	0.00E+00	8.41E-04	1.33E-03	2.13E-04	2.38E-03	21.1
Average Concentration	uCi/ml	0.00E+00	1.17E-08	1.06E-07	4.27E-09	1.77E-08	
Dose - Whole Body	mrem	N/A	4.02E-04	1.35E-02	4.05E-02	5.43E-02	
- Organ	mrem	N/A	4.41E-04	1.40E-02	4.05E-02	5.48E-02	
% of ODCM Limit - Whole Body Dose*	%	N/A	1.34E-02	4.50E-01	1.35E+00	9.05E-01	
- Organ Dose*	%	N/A	4.41E-03	1.40E-01	4.05E-01	2.74E-01	
Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	0.00E+00	9.79E+00	2.49E+00	8.75E+00	2.10E+01	6.4
Average Concentration	uCi/ml	0.00E+00	1.36E-04	1.99E-04	1.75E-04	1.56E-04	
% of ODCM Limit - ECL	%	N/A	1.36E+00	1.99E+00	1.75E+00	1.56E+00	
Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	0.00E+00	1.08E-05	1.58E-06	2.25E-06	1.46E-05	21.1
Average Concentration	uCi/ml	0.00E+00	1.49E-10	1.26E-10	4.51E-11	1.08E-10	
% of ODCM Limit - ECL	%	N/A	7.45E-05	6.30E-05	2.26E-05	5.40E-05	
Gross Alpha	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	0.00E+00	< LLD	< LLD	<LLD	< LLD	23.0
Average Concentration	uCi/ml	0.00E+00	< LLD	< LLD	<LLD	<LLD	
Volume of Waste Released	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total	Liters	0.00E+00	2.27E+06	3.89E+05	1.59E+06	4.25E+06	5.0
Volume of Dilution Water used during period	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total	Liters	0.00E+00	6.98E+07	1.21E+07	4.83E+07	1.30E+08	5.0

* Percent of limit includes gases and tritium.

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE 2A-1 LIQUID EFFLUENTS - BATCH MODE

PERIOD 2017

Fission and Activation Products	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
NA-24	Ci	N/A	3.31E-06	< LLD	7.93E-06	1.12E-05
Cr-51	Ci	N/A	1.68E-04	< LLD	< LLD	1.68E-04
Mn-54	Ci	N/A	4.38E-05	3.40E-06	2.45E-05	7.17E-05
Fe-55	Ci	N/A	< LLD	1.10E-03	< LLD	1.10E-03
Co-58	Ci	N/A	8.88E-05	1.94E-05	4.51E-05	1.53E-04
Fe-59	Ci	N/A	< LLD	< LLD	< LLD	<LLD
Co-60	Ci	N/A	3.71E-04	8.70E-05	1.35E-04	5.93E-04
Zn-65	Ci	N/A	7.14E-05	5.65E-06	< LLD	7.70E-05
Zn-69m	Ci	N/A	1.06E-06	< LLD	< LLD	1.06E-06
Sr-89	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Zr-95	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Nb-97	Ci	N/A	2.54E-06	< LLD	< LLD	2.54E-06
Mo-99	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Tc-99m	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Sb-122	Ci	N/A	6.90E-06	< LLD	< LLD	6.90E-06
Sb-124	Ci	N/A	6.95E-05	6.96E-05	< LLD	1.39E-04
Sb-125	Ci	N/A	1.58E-05	3.66E-05	< LLD	5.24E-05
I-131	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Cs-134	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	N/A	< LLD	6.51E-06	< LLD	6.51E-06
Ba-140	Ci	N/A	< LLD	< LLD	< LLD	< LLD
La-140	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Total	Ci	N/A	8.41E-04	1.33E-03	2.13E-04	2.38E-03
Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Kr-87	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Kr-88	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Xe-133	Ci	N/A	7.82E-06	1.58E-06	< LLD	9.40E-06
Xe-133m	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Xe-135	Ci	N/A	2.93E-06	< LLD	2.25E-06	5.18E-06
Xe-135m	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Xe-138	Ci	N/A	< LLD	< LLD	< LLD	< LLD
Total	Ci	N/A	1.08E-05	1.58E-06	2.25E-06	1.46E-05
H-3	Ci	N/A	9.79E+00	2.49E+00	8.75E+00	2.10E+01
Gross Alpha	Ci	N/A	< LLD	< LLD	< LLD	< LLD

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE 2A-2 LIQUID EFFLUENTS - CONTINUOUS MODE

PERIOD 2017

Fission and Activation Products	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Cr-51	Ci	N/A	N/A	N/A	N/A	N/A
Mn-54	Ci	N/A	N/A	N/A	N/A	N/A
Fe-55	Ci	N/A	N/A	N/A	N/A	N/A
Co-58	Ci	N/A	N/A	N/A	N/A	N/A
Fe-59	Ci	N/A	N/A	N/A	N/A	N/A
Co-60	Ci	N/A	N/A	N/A	N/A	N/A
Zn-65	Ci	N/A	N/A	N/A	N/A	N/A
Sr-89	Ci	N/A	N/A	N/A	N/A	N/A
Sr-90	Ci	N/A	N/A	N/A	N/A	N/A
Zr-95	Ci	N/A	N/A	N/A	N/A	N/A
Nb-95	Ci	N/A	N/A	N/A	N/A	N/A
Mo-99	Ci	N/A	N/A	N/A	N/A	N/A
Tc-99m	Ci	N/A	N/A	N/A	N/A	N/A
Ag-110m	Ci	N/A	N/A	N/A	N/A	N/A
I-131	Ci	N/A	N/A	N/A	N/A	N/A
Cs-134	Ci	N/A	N/A	N/A	N/A	N/A
Cs-137	Ci	N/A	N/A	N/A	N/A	N/A
Ba-140	Ci	N/A	N/A	N/A	N/A	N/A
La-140	Ci	N/A	N/A	N/A	N/A	N/A
Ce-141	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A
Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Xe-131m	Ci	N/A	N/A	N/A	N/A	N/A
Xe-133	Ci	N/A	N/A	N/A	N/A	N/A
Xe-135	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A
H-3	Ci	N/A	N/A	N/A	N/A	N/A
Gross Alpha	Ci	N/A	N/A	N/A	N/A	N/A

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
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Appendix B
Solid Waste and Irradiated
Fuel Shipments

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
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A. Solid waste shipped offsite for burial or disposal (not irradiated fuel) 1/1/17 – 12/31/17

1. Type of waste

Type of waste	Unit	12 Month Period	Estimated Error %
a. Spent resin, filters sludges, evaporator bottoms, etc	m ³	1.11E+02	25%
	Ci	8.92E+02	
b. Dry compressible waste, contaminated equipment, etc.	m ³	8.684E+01	25%
	Ci	1.21E+00	
c. Irradiated components, control rods, etc.	m ³	None	N/A
	Ci	None	
d. Other (Describe)	m ³	None	N/A
	Ci	None	

2. Estimate of Major Nuclide Composition (By Waste Type)

Category A – Spent Resin, Filters, Sludges, Evaporator Bottoms, etc.

Isotope	Waste Class A Curies *	Percent Abundance	Waste Class B Curies *	Percent Abundance
C-14	4.80E+00	7.40E-01%	4.40E-02	2.00E-02%
Mn-54	2.71E+01	4.18E+00%	2.15E-04	1.00E-02%
Fe-55	2.16E+02	3.34E+01%	9.74E+01	4.00E+01%
Co-60	3.31E+02	5.10E+01%	1.40E+02	5.76E+01%
Ni-59	4.49E-02	1.00E-02%	0.00E+00	0.00E+00%
Ni-63	8.82E+00	1.36E+00%	4.63E+00	1.90E+00%
Zn-65	5.23E+01	8.06E+00%	0.00E+00	0.00E+00%
Sr-90	5.19E-02	1.00E-02%	5.26E-02	2.00E-02%
Cs-137	2.86E+00	4.40E-01%	3.90E-01	1.60E-01%
Fe-59	1.30E-01	2.00E-02%	0.00E+00	0.00E+00%
Cr-51	5.19E-01	8.00E-02%	0.00E+00	0.00E+00%
H-3	3.25E-01	5.00E-02%	1.80E-02	1.00E-02%
Ce-144	0.00E+00	0.00E+00%	7.19E-01	2.90E-01%
Co-58	4.54E+00	7.00E-01%	0.00E+00	0.00E+00%
TOTALS	6.49E+02	1.00E+00%	2.43E+02	1.00E+02%

* Activity is estimated

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
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Category B – Dry Compressible Waste, Contaminated Equipment, etc.

Isotope	Waste Class A Curies *	Percent Abundance
H-3	6.64E-03	5.50E-01%
C-14	1.28E-03	1.00E-01%
Mn-54	5.82E-02	4.82E+00%
Fe-55	5.09E-01	4.21E+01%
Co-58	8.04E-03	6.70E-01%
Co-60	5.38E-01	4.45E+01%
Ni-63	1.19E-02	9.80E-01%
Zn-65	4.55E-02	3.76E+00%
Cs-137	2.37E-03	2.00E-01%
Ce-144	4.17E-03	3.40E-01%
Cr-51	2.34E-02	1.94E+00%
TOTALS	1.21E+00	1.00E+02%

* Activity is estimated

3. Solid Waste (Disposition)

Number of Shipments	Mode of Transportation	Destination
29	Truck	Energy Solutions Bear Creek Operations Facility to Energy Solutions / Clive
23	Truck	Limerick Gen. Sta. to Energy Solutions / Clive
1	Truck	Limerick Gen. Sta. to Waste Control Spec./Texas

Comments:

29 Shipments were made from Limerick to Energy Solution Processing Facility for processing
 No solidifications were performed

Category A - 21 shipments Type A LSA
 Category A - 1 shipments > Type A LSA
 Category A - 3 shipments Type B
 Category B - 28 shipments Type A LSA
 Category C - No shipments made
 Category D - No shipments made

B. Irradiated Fuel Shipments (disposition)

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

C. Changes to the Process Control Program

On 10/02/2017, minor revisions to procedure RW-AA-100, "Process Control Program for Radioactive Wastes" were implemented. These changes do not affect Limerick Generating Station.

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Appendix C Meteorological Data

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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	1	0	0	1
S	0	2	2	0	0	0	4
SSW	0	8	7	0	0	0	15
SW	0	3	4	0	0	0	7
WSW	0	1	4	1	0	0	6
W	0	3	4	2	0	0	9
WNW	0	1	4	7	2	0	14
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	19	25	11	2	0	57

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	0	1	0	0	1
SSW	0	1	0	0	0	0	1
SW	0	2	0	0	0	0	2
WSW	0	1	2	1	0	0	4
W	1	1	5	3	1	0	11
WNW	0	2	9	8	1	0	20
NW	0	2	2	0	0	0	4
NNW	0	0	0	2	2	0	4
Variable	0	0	0	0	0	0	0
Total	1	11	18	15	4	0	49

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	2	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	1	2	0	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	2	3	2	0	0	0	7
SSW	2	5	1	0	0	0	8
SW	0	3	2	0	0	0	5
WSW	0	1	3	1	0	0	5
W	0	2	1	2	0	0	5
WNW	0	3	14	16	1	0	34
NW	0	0	9	5	2	2	18
NNW	1	2	6	3	0	0	12
Variable	0	0	0	0	0	0	0
Total	6	26	41	27	3	2	105

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	20	20	25	2	0	0	67
NNE	15	26	20	3	0	0	64
NE	15	20	6	1	0	0	42
ENE	18	52	13	10	0	0	93
E	8	27	46	3	0	0	84
ESE	9	9	8	0	0	0	26
SE	4	11	2	0	0	0	17
SSE	7	13	0	1	0	0	21
S	7	16	4	0	0	0	27
SSW	7	19	2	0	0	0	28
SW	12	14	3	0	0	0	29
WSW	11	21	10	4	0	0	46
W	9	17	32	28	7	0	93
WNW	14	47	72	55	6	0	194
NW	17	44	100	86	15	1	263
NNW	15	22	34	9	1	0	81
Variable	0	0	0	0	0	0	0
Total	188	378	377	202	29	1	1175

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class – Slightly Stable – 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	7	6	0	0	0	0	13
NNE	4	11	1	0	0	0	16
NE	5	3	0	0	0	0	8
ENE	9	10	0	0	0	0	19
E	9	6	0	0	0	0	15
ESE	8	3	0	0	0	0	11
SE	4	4	0	0	0	0	8
SSE	5	13	0	0	0	0	18
S	13	34	3	0	0	0	50
SSW	9	12	2	0	0	0	23
SW	15	26	9	1	0	0	51
WSW	21	17	9	0	0	0	47
W	24	26	3	0	0	0	53
WNW	20	33	4	2	0	0	59
NW	19	27	5	0	0	0	51
NNW	11	7	0	0	0	0	18
Variable	0	0	0	0	0	0	0
Total	183	238	36	3	0	0	460

Hours of calm in this stability class: 8
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	0	0	0	0	0	5
NNE	7	1	0	0	0	0	8
NE	3	0	0	0	0	0	3
ENE	10	0	0	0	0	0	10
E	6	1	0	0	0	0	7
ESE	5	1	0	0	0	0	6
SE	3	0	0	0	0	0	3
SSE	4	0	0	0	0	0	4
S	2	4	0	0	0	0	6
SSW	8	2	0	0	0	0	10
SW	5	1	0	0	0	0	6
WSW	6	2	0	0	0	0	8
W	10	1	0	0	0	0	11
WNW	14	4	0	0	0	0	18
NW	10	4	0	0	0	0	14
NNW	5	1	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	103	22	0	0	0	0	125

Hours of calm in this stability class: 6
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	0	0	0	0	0	4
NNE	7	0	0	0	0	0	7
NE	8	0	0	0	0	0	8
ENE	4	0	0	0	0	0	4
E	6	0	0	0	0	0	6
ESE	3	0	0	0	0	0	3
SE	3	0	0	0	0	0	3
SSE	0	0	0	0	0	0	0
S	2	0	0	0	0	0	2
SSW	4	0	0	0	0	0	4
SW	2	0	0	0	0	0	2
WSW	2	0	0	0	0	0	2
W	4	0	0	0	0	0	4
WNW	8	0	0	0	0	0	8
NW	7	0	0	0	0	0	7
NNW	10	0	0	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	74	0	0	0	0	0	74

Hours of calm in this stability class: 3
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	1	0	1
S	0	0	7	2	0	0	9
SSW	0	0	6	9	0	0	15
SW	0	0	1	5	0	0	6
WSW	0	0	1	1	2	1	5
W	0	0	4	5	3	2	14
WNW	0	0	0	0	0	2	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	19	22	6	5	53

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 4
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	1	0	0	1	0	2
S	0	0	1	0	0	0	1
SSW	0	0	1	0	0	0	1
SW	0	1	0	0	0	0	1
WSW	0	0	1	3	1	0	5
W	0	1	5	6	5	3	20
WNW	1	1	5	2	3	1	13
NW	0	1	0	0	1	0	2
NNW	0	0	0	0	2	1	3
Variable	0	0	0	0	0	0	0
Total	1	5	14	11	13	5	49

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	1	1	1	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	2	1	0	0	0	3
S	1	1	4	2	0	0	8
SSW	0	2	4	4	0	0	10
SW	0	1	1	0	0	0	2
WSW	0	1	1	2	1	0	5
W	0	1	6	2	8	2	19
WNW	0	0	7	14	9	1	31
NW	0	0	3	1	1	3	8
NNW	1	0	4	4	1	0	10
Variable	0	0	0	0	0	0	0
Total	3	13	34	29	20	6	105

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	15	25	11	2	0	58
NNE	9	20	26	11	0	0	66
NE	11	16	26	7	1	0	61
ENE	10	24	40	20	8	0	102
E	4	13	13	29	1	0	60
ESE	8	8	9	2	0	0	27
SE	2	9	7	0	0	0	18
SSE	4	8	6	0	1	0	19
S	1	13	29	8	0	0	51
SSW	3	12	8	5	2	0	30
SW	5	8	6	4	0	0	23
WSW	6	4	17	12	4	1	44
W	9	8	28	45	37	11	138
WNW	2	27	75	82	53	19	258
NW	4	14	34	54	39	8	153
NNW	6	14	21	17	5	0	63
Variable	0	0	0	0	0	0	0
Total	89	213	370	307	153	39	1171

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 5
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class – Slightly Stable – 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	2	7	0	0	0	10
NNE	2	1	7	2	0	0	12
NE	3	8	2	0	0	0	13
ENE	4	12	3	0	0	0	19
E	2	3	2	0	0	0	7
ESE	7	3	0	0	0	0	10
SE	6	9	2	0	0	0	17
SSE	3	5	6	0	0	0	14
S	2	17	39	11	0	0	69
SSW	3	10	23	11	4	0	51
SW	8	11	9	9	2	1	40
WSW	5	10	10	5	5	0	35
W	4	19	25	1	1	0	50
WNW	2	23	36	5	1	0	67
NW	2	14	16	3	0	0	35
NNW	2	5	10	0	0	0	17
Variable	0	0	0	0	0	0	0
Total	56	152	197	47	13	1	466

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 3
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January – March 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	0	2	0	0	0	5
NNE	1	0	0	0	0	0	1
NE	6	4	0	0	0	0	10
ENE	0	7	1	0	0	0	8
E	3	0	0	0	0	0	3
ESE	3	4	0	0	0	0	7
SE	3	2	0	0	0	0	5
SSE	1	2	0	0	0	0	3
S	3	5	3	1	0	0	12
SSW	2	4	8	2	0	0	16
SW	1	9	1	1	0	0	12
WSW	4	3	1	0	0	0	8
W	2	5	4	0	0	0	11
WNW	0	5	11	0	0	0	16
NW	1	5	5	0	0	0	11
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	34	56	36	4	0	0	130

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2017

Limerick Tower 1

Period of Record: January - March 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	0	0	0	0	1
NNE	2	0	0	0	0	0	2
NE	2	3	0	0	0	0	5
ENE	3	2	0	0	0	0	5
E	1	2	0	0	0	0	3
ESE	2	0	0	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	2	1	0	0	0	0	3
S	2	5	0	0	0	0	7
SSW	0	4	1	0	0	0	5
SW	3	6	2	1	0	0	12
WSW	3	4	0	0	0	0	7
W	2	6	0	0	0	0	8
WNW	2	7	1	0	0	0	10
NW	2	2	0	0	0	0	4
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	29	42	4	1	0	0	76

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 95

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	2	2	0	0	0	4
ESE	0	1	5	0	0	0	6
SE	0	3	11	0	0	0	14
SSE	0	1	4	0	0	0	5
S	1	5	4	0	0	0	10
SSW	0	11	11	0	0	0	22
SW	1	10	2	0	0	0	13
WSW	1	13	7	2	0	0	23
W	0	17	15	4	0	0	36
WNW	0	10	9	2	0	0	21
NW	0	1	2	0	0	0	3
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	3	74	72	8	0	0	157

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	2	0	0	0	0	2
NE	0	3	0	0	0	0	3
ENE	0	1	0	0	0	0	1
E	1	2	2	0	0	0	5
ESE	0	9	1	0	0	0	10
SE	0	1	8	0	0	0	9
SSE	2	4	1	0	0	0	7
S	0	3	1	0	0	0	4
SSW	1	1	6	1	0	0	9
SW	0	1	0	0	0	0	1
WSW	0	12	2	0	0	0	14
W	2	10	8	0	0	0	20
WNW	0	16	23	3	0	0	42
NW	0	6	10	7	0	0	23
NNW	0	2	1	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	6	74	63	11	0	0	154

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	1	0	0	0	4
NNE	1	3	0	0	0	0	4
NE	0	8	0	0	0	0	8
ENE	3	2	0	0	0	0	5
E	1	14	4	0	0	0	19
ESE	0	6	3	3	0	0	12
SE	3	2	0	0	0	0	5
SSE	1	3	2	0	0	0	6
S	1	2	1	0	0	0	4
SSW	1	7	3	0	0	0	11
SW	2	4	1	0	0	0	7
WSW	1	12	2	2	0	0	17
W	4	8	5	0	0	0	17
WNW	5	11	13	5	0	0	34
NW	1	7	14	13	0	0	35
NNW	1	4	5	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	25	96	54	23	0	0	198

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	24	11	0	0	0	41
NNE	9	34	7	0	0	0	50
NE	22	26	3	0	0	0	51
ENE	22	54	21	0	0	0	97
E	15	80	41	4	0	0	140
ESE	12	37	47	5	0	0	101
SE	12	20	31	2	0	0	65
SSE	3	12	6	0	0	0	21
S	6	21	8	0	0	0	35
SSW	8	26	8	0	0	0	42
SW	8	13	2	0	0	0	23
WSW	10	10	4	0	0	0	24
W	14	28	26	3	0	0	71
WNW	9	19	24	5	0	0	57
NW	13	37	35	11	0	0	96
NNW	6	15	16	8	0	0	45
Variable	0	0	0	0	0	0	0
Total	175	456	290	38	0	0	959

Hours of calm in this stability class: 5
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	6	0	0	0	0	14
NNE	13	10	3	0	0	0	26
NE	9	0	0	0	0	0	9
ENE	12	0	0	0	0	0	12
E	5	12	2	0	0	0	19
ESE	7	8	3	0	0	0	18
SE	6	6	3	0	0	0	15
SSE	5	3	1	0	0	0	9
S	10	21	2	0	0	0	33
SSW	8	31	2	0	0	0	41
SW	18	15	0	0	0	0	33
WSW	24	14	4	1	0	0	43
W	24	17	8	0	0	0	49
WNW	19	13	7	0	0	0	39
NW	13	15	4	1	0	0	33
NNW	8	5	1	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	189	176	40	2	0	0	407

Hours of calm in this stability class: 7
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	1	0	0	0	0	7
NNE	6	0	0	0	0	0	6
NE	6	1	0	0	0	0	7
ENE	5	1	0	0	0	0	6
E	3	1	0	0	0	0	4
ESE	8	1	0	0	0	0	9
SE	1	0	0	0	0	0	1
SSE	2	0	0	0	0	0	2
S	5	0	0	0	0	0	5
SSW	6	0	0	0	0	0	6
SW	8	1	0	0	0	0	9
WSW	9	0	0	0	0	0	9
W	23	2	0	0	0	0	25
WNW	24	6	0	0	0	0	30
NW	16	4	0	0	0	0	20
NNW	10	0	0	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	138	18	0	0	0	0	156

Hours of calm in this stability class: 7
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	9	0	0	0	0	0	9
NNE	8	0	0	0	0	0	8
NE	6	0	0	0	0	0	6
ENE	5	0	0	0	0	0	5
E	1	0	0	0	0	0	1
ESE	5	0	0	0	0	0	5
SE	2	0	0	0	0	0	2
SSE	1	0	0	0	0	0	1
S	2	0	0	0	0	0	2
SSW	1	0	0	0	0	0	1
SW	3	0	0	0	0	0	3
WSW	3	0	0	0	0	0	3
W	15	0	0	0	0	0	15
WNW	20	3	0	0	0	0	23
NW	12	0	0	0	0	0	12
NNW	13	0	0	0	0	0	13
Variable	0	0	0	0	0	0	0
Total	106	3	0	0	0	0	109

Hours of calm in this stability class: 19
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April - June 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	3	0	0	0	3
ESE	0	0	5	5	0	0	10
SE	0	0	7	3	0	0	10
SSE	0	1	4	1	0	0	6
S	0	5	4	9	0	0	18
SSW	0	5	11	4	1	0	21
SW	0	2	12	4	0	0	18
WSW	0	2	14	7	3	4	30
W	0	0	20	8	1	0	29
WNW	0	0	7	3	1	0	11
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	16	87	44	6	4	157

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	0	0	0	0	2
NNE	0	2	0	0	0	0	2
NE	0	2	1	0	0	0	3
ENE	0	1	0	0	0	0	1
E	0	3	2	0	0	0	5
ESE	0	6	3	0	0	0	9
SE	0	2	3	5	0	0	10
SSE	1	3	2	0	0	0	6
S	0	3	1	3	0	0	7
SSW	0	1	0	4	1	0	6
SW	0	3	3	3	0	0	9
WSW	0	3	9	2	0	0	14
W	0	4	22	17	2	0	45
WNW	0	2	10	9	4	0	25
NW	0	0	7	1	0	0	8
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	1	38	64	44	7	0	154

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	0	0	0	0	3
NNE	1	5	0	0	0	0	6
NE	1	7	0	0	0	0	8
ENE	0	3	3	0	0	0	6
E	0	6	9	1	0	0	16
ESE	0	3	5	3	0	0	11
SE	1	4	1	0	0	0	6
SSE	2	1	3	1	0	0	7
S	0	1	5	1	0	0	7
SSW	3	1	1	5	1	0	11
SW	1	0	6	2	1	0	10
WSW	0	2	7	4	1	0	14
W	2	6	6	9	4	0	27
WNW	2	6	17	11	5	0	41
NW	1	2	3	5	7	0	18
NNW	0	1	6	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	14	51	72	42	19	0	198

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	17	15	2	0	0	40
NNE	2	25	24	2	0	0	53
NE	4	34	18	2	0	0	58
ENE	10	47	37	13	0	0	107
E	8	37	53	40	3	0	141
ESE	5	27	34	17	0	0	83
SE	5	8	21	22	1	0	57
SSE	1	3	16	8	0	0	28
S	6	13	14	10	0	0	43
SSW	4	6	16	19	2	0	47
SW	5	9	6	5	0	0	25
WSW	4	6	12	12	4	0	38
W	4	10	24	17	3	0	58
WNW	2	27	21	35	10	0	95
NW	2	14	19	16	5	0	56
NNW	2	5	19	7	1	0	34
Variable	0	0	0	0	0	0	0
Total	70	288	349	227	29	0	963

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class – Slightly Stable – 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	3	8	3	0	0	15
NNE	1	7	6	1	0	0	15
NE	8	5	0	0	0	0	13
ENE	2	11	0	0	0	0	13
E	2	5	8	2	0	0	17
ESE	1	4	4	5	0	0	14
SE	2	6	6	2	0	0	16
SSE	1	11	8	0	0	0	20
S	0	9	19	10	0	0	38
SSW	3	9	27	22	0	0	61
SW	1	13	20	4	1	0	39
WSW	1	17	12	6	1	0	37
W	2	15	15	6	0	0	38
WNW	3	14	18	7	1	0	43
NW	3	5	9	1	0	0	18
NNW	5	5	6	1	0	0	17
Variable	0	0	0	0	0	0	0
Total	36	139	166	70	3	0	414

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	2	0	0	0	5
NNE	0	2	1	0	0	0	3
NE	1	1	0	0	0	0	2
ENE	0	5	0	0	0	0	5
E	3	5	1	0	0	0	9
ESE	1	1	0	0	0	0	2
SE	2	2	0	0	0	0	4
SSE	2	3	1	0	0	0	6
S	0	3	1	0	0	0	4
SSW	0	4	2	0	0	0	6
SW	0	7	6	0	0	0	13
WSW	4	8	9	0	0	0	21
W	2	12	10	1	0	0	25
WNW	3	18	19	0	0	0	40
NW	3	6	4	0	0	0	13
NNW	1	1	3	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	22	81	59	1	0	0	163

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2017

Limerick Tower 1

Period of Record: April – June 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	0	0	0	0	4
NNE	0	2	0	0	0	0	2
NE	2	1	0	0	0	0	3
ENE	2	1	0	0	0	0	3
E	2	1	0	0	0	0	3
ESE	2	0	0	0	0	0	2
SE	1	3	0	0	0	0	4
SSE	2	0	0	0	0	0	2
S	1	2	0	0	0	0	3
SSW	2	2	1	0	0	0	5
SW	3	0	0	0	0	0	3
WSW	8	4	1	0	0	0	13
W	4	12	1	0	0	0	17
WNW	7	22	17	0	0	0	46
NW	2	8	2	0	0	0	12
NNW	2	4	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	40	66	22	0	0	0	128

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 6

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	2	0	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	1	0	0	0	0	0	1
S	1	7	5	0	0	0	13
SSW	0	18	3	0	0	0	21
SW	3	4	0	0	0	0	7
WSW	1	15	0	0	0	0	16
W	3	20	3	0	0	0	26
WNW	5	10	3	0	0	0	18
NW	1	3	0	0	0	0	4
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	17	82	14	0	0	0	113

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July – September 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	6	0	0	0	0	7
NNE	3	7	0	0	0	0	10
NE	3	4	1	0	0	0	8
ENE	2	4	0	0	0	0	6
E	3	9	3	0	0	0	15
ESE	2	0	1	0	0	0	3
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	3	1	0	0	0	4
SSW	4	8	1	0	0	0	13
SW	3	11	0	0	0	0	14
WSW	1	9	0	0	0	0	10
W	6	14	3	0	0	0	23
WNW	5	8	3	0	0	0	16
NW	4	20	1	0	0	0	25
NNW	2	5	0	1	0	0	8
Variable	0	0	0	0	0	0	0
Total	39	110	14	1	0	0	164

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July – September 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	12	2	0	0	0	16
NNE	4	17	3	0	0	0	24
NE	6	12	3	0	0	0	21
ENE	5	10	1	0	0	0	16
E	11	9	2	0	0	0	22
ESE	4	1	2	0	0	0	7
SE	1	2	0	0	0	0	3
SSE	3	0	0	0	0	0	3
S	4	0	0	0	0	0	4
SSW	4	7	0	0	0	0	11
SW	8	5	0	0	0	0	13
WSW	4	9	0	0	0	0	13
W	9	11	4	0	0	0	24
WNW	9	18	2	0	0	0	29
NW	8	25	14	1	0	0	48
NNW	7	15	3	5	0	0	30
Variable	0	0	0	0	0	0	0
Total	89	153	36	6	0	0	284

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	12	21	18	1	0	0	52
NNE	14	36	10	0	0	0	60
NE	22	26	4	0	0	0	52
ENE	32	37	0	0	0	0	69
E	16	32	7	0	0	0	55
ESE	7	9	6	0	0	0	22
SE	8	3	0	0	0	0	11
SSE	9	10	0	0	0	0	19
S	10	22	0	0	0	0	32
SSW	15	13	1	0	0	0	29
SW	14	3	0	0	0	0	17
WSW	19	13	0	0	0	0	32
W	26	21	4	0	0	0	51
WNW	32	26	4	0	0	0	62
NW	23	42	7	3	0	0	75
NNW	18	23	12	4	0	0	57
Variable	0	0	0	0	0	0	0
Total	277	337	73	8	0	0	695

Hours of calm in this stability class: 6
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	2	2	0	0	0	12
NNE	15	12	1	0	0	0	28
NE	9	8	0	0	0	0	17
ENE	14	15	0	0	0	0	29
E	18	13	0	0	0	0	31
ESE	7	3	1	0	0	0	11
SE	6	4	0	0	0	0	10
SSE	0	1	1	0	0	0	2
S	13	23	0	0	0	0	36
SSW	18	9	1	0	0	0	28
SW	27	2	0	0	0	0	29
WSW	30	7	0	0	0	0	37
W	39	8	0	0	0	0	47
WNW	41	20	1	0	0	0	62
NW	27	16	0	0	0	0	43
NNW	14	14	0	0	0	0	28
Variable	0	0	0	0	0	0	0
Total	286	157	7	0	0	0	450

Hours of calm in this stability class: 12
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	15	0	0	0	0	0	15
NNE	11	1	0	0	0	0	12
NE	8	1	0	0	0	0	9
ENE	10	1	0	0	0	0	11
E	2	1	0	0	0	0	3
ESE	4	0	0	0	0	0	4
SE	2	0	0	0	0	0	2
SSE	1	0	0	0	0	0	1
S	4	1	0	0	0	0	5
SSW	5	1	0	0	0	0	6
SW	8	0	0	0	0	0	8
WSW	27	0	0	0	0	0	27
W	38	1	0	0	0	0	39
WNW	48	5	0	0	0	0	53
NW	47	6	0	0	0	0	53
NNW	18	0	0	0	0	0	18
Variable	0	0	0	0	0	0	0
Total	248	18	0	0	0	0	266

Hours of calm in this stability class: 57
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	16	0	0	0	0	0	16
NNE	9	0	0	0	0	0	9
NE	5	0	0	0	0	0	5
ENE	5	0	0	0	0	0	5
E	1	0	0	0	0	0	1
ESE	1	0	0	0	0	0	1
SE	1	0	0	0	0	0	1
SSE	3	0	0	0	0	0	3
S	1	0	0	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	1	0	0	0	0	0	1
WSW	4	0	0	0	0	0	4
W	16	0	0	0	0	0	16
WNW	26	0	0	0	0	0	26
NW	21	0	0	0	0	0	21
NNW	11	0	0	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	121	0	0	0	0	0	121

Hours of calm in this stability class: 30
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	1	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	1	3	2	0	0	6
S	0	6	9	2	0	0	17
SSW	0	3	5	7	0	0	15
SW	1	5	5	0	0	0	11
WSW	0	6	9	1	0	0	16
W	3	8	17	2	0	0	30
WNW	1	6	1	0	0	0	8
NW	0	3	0	0	0	0	3
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	7	40	52	14	0	0	113

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	7	0	0	0	9
NNE	3	4	2	0	0	0	9
NE	0	4	1	1	0	0	6
ENE	2	7	2	0	0	0	11
E	2	4	3	2	0	0	11
ESE	0	2	0	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	2	0	1	0	0	3
S	0	2	7	0	0	0	9
SSW	0	8	6	2	0	0	16
SW	2	3	6	0	0	0	11
WSW	0	3	10	1	0	0	14
W	4	5	8	1	0	0	18
WNW	1	8	10	2	1	0	22
NW	3	9	6	0	0	0	18
NNW	2	1	0	1	0	0	4
Variable	0	0	0	0	0	0	0
Total	19	65	68	11	1	0	164

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	6	12	0	0	0	21
NNE	2	15	9	1	0	0	27
NE	3	11	3	0	0	0	17
ENE	6	8	4	0	0	0	18
E	3	9	2	1	0	0	15
ESE	1	3	3	0	0	0	7
SE	2	2	0	0	0	0	4
SSE	2	1	0	0	0	0	3
S	3	6	1	0	0	0	10
SSW	1	9	3	2	0	0	15
SW	1	3	3	0	0	0	7
WSW	3	5	6	0	0	0	14
W	5	6	13	5	0	0	29
WNW	3	19	13	5	0	0	40
NW	1	14	16	5	0	0	36
NNW	1	7	10	2	2	0	22
Variable	0	0	0	0	0	0	0
Total	40	124	98	21	2	0	285

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	11	24	6	0	0	49
NNE	7	21	27	9	0	0	64
NE	13	34	9	2	0	0	58
ENE	11	44	17	0	0	0	72
E	9	19	20	5	0	0	53
ESE	3	6	7	2	0	0	18
SE	5	5	1	0	0	0	11
SSE	2	13	18	0	0	0	33
S	4	16	13	1	0	0	34
SSW	6	7	8	3	0	0	24
SW	3	8	8	0	0	0	19
WSW	10	13	17	3	0	0	43
W	10	10	16	4	0	0	40
WNW	11	31	26	5	0	0	73
NW	7	17	20	3	1	0	48
NNW	12	13	25	10	1	0	61
Variable	0	0	0	0	0	0	0
Total	121	268	256	53	2	0	700

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	3	3	1	0	0	11
NNE	3	11	11	2	0	0	27
NE	5	8	10	2	0	0	25
ENE	8	16	3	0	0	0	27
E	3	7	10	0	0	0	20
ESE	7	5	9	1	0	0	22
SE	4	6	4	0	0	0	14
SSE	1	3	1	0	1	0	6
S	2	6	28	1	0	0	37
SSW	1	14	11	4	0	0	30
SW	2	19	9	0	0	0	30
WSW	4	24	11	0	0	0	39
W	6	16	9	0	0	0	31
WNW	4	46	29	1	0	0	80
NW	4	20	8	0	0	0	32
NNW	4	5	21	1	0	0	31
Variable	0	0	0	0	0	0	0
Total	62	209	177	13	1	0	462

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	9	2	0	0	0	14
NNE	3	3	3	0	0	0	9
NE	5	8	0	0	0	0	13
ENE	1	5	1	0	0	0	7
E	5	3	4	1	0	0	13
ESE	3	1	1	0	0	0	5
SE	3	1	0	0	0	0	4
SSE	0	1	0	0	0	0	1
S	2	2	0	2	0	0	6
SSW	3	6	1	0	0	0	10
SW	4	11	1	0	0	0	16
WSW	3	12	5	0	0	0	20
W	6	31	6	0	0	0	43
WNW	21	52	24	0	0	0	97
NW	8	20	9	0	0	0	37
NNW	10	12	5	0	0	0	27
Variable	0	0	0	0	0	0	0
Total	80	177	62	3	0	0	322

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July – September, 2017

Limerick Tower 1

Period of Record: July - September 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	6	0	0	0	0	8
NNE	0	3	1	0	0	0	4
NE	1	2	1	0	0	0	4
ENE	0	2	0	0	0	0	2
E	1	0	2	0	0	0	3
ESE	1	0	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	1	0	0	0	0	0	1
S	2	2	0	0	0	0	4
SSW	0	4	0	0	0	0	4
SW	2	5	0	0	0	0	7
WSW	6	4	2	0	0	0	12
W	5	9	0	0	0	0	14
WNW	2	31	15	0	0	0	48
NW	3	16	3	0	0	0	22
NNW	2	13	1	0	0	0	16
Variable	0	0	0	0	0	0	0
Total	28	98	25	0	0	0	151

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 9

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	2	0	0	0	2
SSW	0	4	4	0	0	0	8
SW	0	5	1	0	0	0	6
WSW	0	3	0	0	0	0	3
W	0	0	0	0	0	0	0
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	14	7	0	0	0	21

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	1	2	0	0	0	0	3
SE	0	3	0	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	2	1	0	0	0	3
SSW	0	3	5	0	0	0	8
SW	0	3	1	0	0	0	4
WSW	1	3	2	0	0	0	6
W	0	1	1	0	0	0	2
WNW	0	1	0	0	0	0	1
NW	0	1	0	1	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	3	21	10	1	0	0	35

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	3	0	0	0	4
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	2	0	0	0	0	2
S	1	1	1	0	0	0	3
SSW	0	1	3	0	0	0	4
SW	0	3	0	0	0	0	3
WSW	0	3	1	0	0	0	4
W	0	4	5	4	0	0	13
WNW	0	5	6	1	0	0	12
NW	0	3	3	0	0	0	6
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	3	27	22	5	0	0	57

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	16	19	9	0	0	0	44
NNE	14	20	3	0	0	0	37
NE	15	2	0	0	0	0	17
ENE	18	27	6	0	0	0	51
E	12	35	8	0	0	0	55
ESE	8	12	2	0	0	0	22
SE	7	7	10	3	0	0	27
SSE	7	11	4	2	0	0	24
S	4	26	6	1	0	0	37
SSW	6	26	11	0	0	0	43
SW	8	30	1	0	0	0	39
WSW	9	18	5	0	0	0	32
W	17	14	20	3	0	0	54
WNW	9	42	53	42	4	0	150
NW	14	48	89	35	0	0	186
NNW	20	20	37	13	0	0	90
Variable	0	0	0	0	0	0	0
Total	184	357	264	99	4	0	908

Hours of calm in this stability class: 3
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	16	14	2	0	0	0	32
NNE	11	5	1	0	0	0	17
NE	17	4	0	0	0	0	21
ENE	24	5	0	0	0	0	29
E	13	11	5	0	0	0	29
ESE	13	12	0	0	0	0	25
SE	8	9	2	0	0	0	19
SSE	9	10	1	1	0	0	21
S	16	30	1	0	0	0	47
SSW	18	24	3	0	0	0	45
SW	19	19	2	1	0	0	41
WSW	32	27	3	1	0	0	63
W	35	27	4	1	0	0	67
WNW	32	41	12	5	1	0	91
NW	19	43	11	1	0	0	74
NNW	13	19	4	0	0	0	36
Variable	0	0	0	0	0	0	0
Total	295	300	51	10	1	0	657

Hours of calm in this stability class: 17
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	12	0	0	0	0	0	12
NNE	11	0	0	0	0	0	11
NE	7	1	0	0	0	0	8
ENE	5	0	0	0	0	0	5
E	15	3	0	0	0	0	18
ESE	7	1	0	0	0	0	8
SE	4	0	0	0	0	0	4
SSE	3	1	0	0	0	0	4
S	4	3	0	0	0	0	7
SSW	8	0	0	0	0	0	8
SW	8	7	0	0	0	0	15
WSW	17	4	0	0	0	0	21
W	17	4	0	0	0	0	21
WNW	30	14	0	0	0	0	44
NW	21	5	1	0	0	0	27
NNW	10	0	0	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	179	43	1	0	0	0	223

Hours of calm in this stability class: 30
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	12	0	0	0	0	0	12
NNE	6	0	0	0	0	0	6
NE	12	0	0	0	0	0	12
ENE	10	0	0	0	0	0	10
E	8	1	0	0	0	0	9
ESE	4	0	0	0	0	0	4
SE	2	1	0	0	0	0	3
SSE	1	0	0	0	0	0	1
S	1	0	0	0	0	0	1
SSW	1	0	0	0	0	0	1
SW	4	0	0	0	0	0	4
WSW	6	1	0	0	0	0	7
W	23	0	0	0	0	0	23
WNW	28	3	0	0	0	0	31
NW	30	0	0	0	0	0	30
NNW	21	0	0	0	0	0	21
Variable	0	0	0	0	0	0	0
Total	169	6	0	0	0	0	175

Hours of calm in this stability class: 70
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October - December 2017
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	1	2	0	0	3
SSW	0	0	9	4	0	0	13
SW	0	0	3	0	0	0	3
WSW	0	0	0	0	0	0	0
W	0	1	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	14	6	0	0	21

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	1	1	0	0	0	2
SE	0	0	3	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	1	3	3	0	0	7
SSW	0	0	3	4	0	0	7
SW	0	0	1	0	0	0	1
WSW	0	4	0	3	0	0	7
W	0	1	0	0	0	0	1
WNW	0	1	0	0	0	0	1
NW	0	0	1	0	1	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	1	11	12	10	1	0	35

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	3	0	0	0	4
ESE	0	2	0	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	1	1	0	0	0	2
S	0	2	2	1	0	0	5
SSW	0	0	3	2	0	0	5
SW	0	0	1	0	0	0	1
WSW	0	4	1	4	1	0	10
W	0	2	2	7	4	0	15
WNW	0	1	5	1	0	0	7
NW	0	0	1	1	0	0	2
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	17	19	16	5	0	57

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	21	11	5	0	0	45
NNE	13	12	11	1	0	0	37
NE	6	22	3	0	0	0	31
ENE	6	27	16	5	0	0	54
E	5	11	31	1	0	0	48
ESE	7	12	4	1	0	0	24
SE	5	7	4	10	2	0	28
SSE	5	9	15	5	3	0	37
S	0	10	20	13	0	0	43
SSW	3	12	26	16	0	0	57
SW	1	8	10	4	0	0	23
WSW	6	14	4	6	0	0	30
W	6	22	25	35	13	9	110
WNW	7	19	42	66	25	10	169
NW	5	18	35	48	16	0	122
NNW	5	12	16	15	4	0	52
Variable	0	0	0	0	0	0	0
Total	88	236	273	231	63	19	910

Hours of calm in this stability class: 2
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	8	14	1	0	0	31
NNE	7	8	3	1	0	0	19
NE	6	10	2	0	0	0	18
ENE	14	15	1	0	0	0	30
E	3	4	6	5	0	0	18
ESE	4	16	14	0	0	0	34
SE	6	6	10	1	1	0	24
SSE	0	17	16	1	0	0	34
S	3	22	28	3	0	0	56
SSW	1	16	26	9	4	1	57
SW	1	19	31	3	0	1	55
WSW	3	21	14	8	0	0	46
W	1	29	27	7	5	2	71
WNW	3	27	42	13	0	0	85
NW	6	16	32	8	1	0	63
NNW	7	11	15	0	0	0	33
Variable	0	0	0	0	0	0	0
Total	73	245	281	60	11	4	674

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	5	2	0	0	0	8
NNE	2	3	3	0	0	0	8
NE	4	6	2	0	0	0	12
ENE	3	7	0	0	0	0	10
E	5	4	0	0	0	0	9
ESE	1	2	0	0	0	0	3
SE	3	4	5	0	0	0	12
SSE	4	2	2	0	0	0	8
S	2	6	2	1	0	0	11
SSW	2	3	9	0	0	0	14
SW	4	16	7	1	0	0	28
WSW	2	10	5	0	0	0	17
W	4	8	10	1	0	0	23
WNW	3	23	17	2	0	0	45
NW	3	15	12	0	0	0	30
NNW	5	9	0	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	48	123	76	5	0	0	252

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October – December, 2017

Limerick Tower 1

Period of Record: October – December 2017
 Stability Class – Extremely Stable – 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	2	0	0	0	0	5
NNE	6	6	2	0	0	0	14
NE	11	2	1	0	0	0	14
ENE	11	1	0	0	0	0	12
E	10	1	0	0	0	0	11
ESE	7	1	0	0	0	0	8
SE	4	4	0	0	0	0	8
SSE	5	6	3	0	0	0	14
S	2	3	0	0	0	0	5
SSW	8	4	0	0	0	0	12
SW	1	10	3	0	0	0	14
WSW	2	9	6	0	0	0	17
W	3	16	2	0	0	0	21
WNW	9	30	10	0	0	0	49
NW	5	18	2	0	0	0	25
NNW	11	4	0	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	98	117	29	0	0	0	244

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 9 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2017

Limerick Tower 1
 30 ft. Wind Speed and Direction

January-December, 2017
 171Ft-26Ft Delta-T (F)

Number of Observations = 8354
 Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES									TOTAL	STABILITY CLASSES									TOTAL				
	N	NNE	NE	ENE	E	ESE	SE	SSE	S		SSW	SW	WSW	W	WNW	NW	NNW	EU	MU		SU	N	SS	MS
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.05	0.02	0.04	0.06	0.01	0.01	0.01	0.24	0.59	1.47	9.86	11.41	8.00	5.63	0.00
MU	0.01	0.04	0.04	0.05	0.04	0.00	0.02	0.00	0.06	0.04	0.02	0.11	0.06	0.05	0.02	0.02	0.59	0.59	1.47	9.86	11.41	8.00	5.63	0.00
1 SU	0.04	0.06	0.07	0.10	0.16	0.05	0.05	0.10	0.08	0.12	0.06	0.16	0.17	0.11	0.12	1.47	0.59	1.47	9.86	11.41	8.00	5.63	0.00	
- N	0.65	0.62	0.89	1.08	0.61	0.43	0.37	0.31	0.32	0.43	0.50	0.59	0.79	0.77	0.80	9.86	0.59	1.47	9.86	11.41	8.00	5.63	0.00	
3 SS	0.47	0.51	0.48	0.71	0.54	0.42	0.29	0.23	0.62	0.63	0.95	1.28	1.46	1.34	0.93	11.41	0.59	1.47	9.86	11.41	8.00	5.63	0.00	
MS	0.45	0.42	0.29	0.36	0.31	0.29	0.12	0.12	0.18	0.32	0.35	0.71	1.05	1.39	1.13	8.00	0.59	1.47	9.86	11.41	8.00	5.63	0.00	
ES	0.49	0.36	0.37	0.29	0.19	0.16	0.10	0.06	0.07	0.07	0.12	0.18	0.69	0.98	0.84	5.63	0.59	1.47	9.86	11.41	8.00	5.63	0.00	
EU	0.02	0.00	0.00	0.00	0.02	0.04	0.06	0.01	0.17	0.49	0.26	0.38	0.48	0.26	0.05	0.01	2.26	2.59	3.62	18.29	10.43	1.21	0.11	38.50
MU	0.08	0.11	0.08	0.06	0.13	0.14	0.07	0.08	0.10	0.16	0.20	0.30	0.31	0.32	0.35	0.08	2.26	2.59	3.62	18.29	10.43	1.21	0.11	38.50
4 SU	0.19	0.25	0.25	0.16	0.31	0.11	0.07	0.07	0.10	0.24	0.18	0.30	0.30	0.44	0.42	0.25	2.26	2.59	3.62	18.29	10.43	1.21	0.11	38.50
- N	1.01	1.39	0.89	2.03	2.08	0.80	0.49	0.55	1.02	1.01	0.72	0.74	0.96	2.05	0.96	18.29	2.59	3.62	18.29	10.43	1.21	0.11	38.50	
7 SS	0.34	0.45	0.18	0.36	0.50	0.31	0.28	0.32	1.29	0.91	0.74	0.78	0.93	1.28	1.21	10.43	2.59	3.62	18.29	10.43	1.21	0.11	38.50	
MS	0.01	0.02	0.04	0.02	0.07	0.04	0.00	0.01	0.10	0.04	0.11	0.07	0.10	0.35	0.23	0.01	1.21	2.59	3.62	18.29	10.43	1.21	0.11	38.50
ES	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.00	0.00	1.21	2.59	3.62	18.29	10.43	1.21	0.11	38.50
EU	0.00	0.00	0.00	0.00	0.02	0.06	0.13	0.05	0.16	0.30	0.08	0.13	0.26	0.19	0.02	0.00	1.41	1.26	1.83	12.02	1.60	0.01	0.00	18.14
MU	0.00	0.00	0.01	0.00	0.06	0.02	0.10	0.01	0.04	0.14	0.01	0.07	0.20	0.42	0.16	0.01	1.41	1.26	1.83	12.02	1.60	0.01	0.00	18.14
8 SU	0.06	0.04	0.04	0.01	0.11	0.07	0.00	0.02	0.05	0.08	0.04	0.07	0.18	0.42	0.48	0.17	1.41	1.26	1.83	12.02	1.60	0.01	0.00	18.14
- N	0.75	0.48	0.16	0.48	1.22	0.75	0.51	0.12	0.22	0.26	0.07	0.23	0.98	1.83	2.77	1.19	1.41	1.26	1.83	12.02	1.60	0.01	0.00	18.14
1 SS	0.05	0.07	0.00	0.00	0.08	0.05	0.06	0.04	0.07	0.10	0.13	0.19	0.18	0.29	0.24	0.06	1.60	1.26	1.83	12.02	1.60	0.01	0.00	18.14
2 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	1.26	1.83	12.02	1.60	0.01	0.00	18.14
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	1.83	12.02	1.60	0.01	0.00	18.14
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.07	0.11	0.00	0.00	0.23	0.34	0.73	4.15	0.18	0.00	0.00	5.63
1 MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.04	0.13	0.10	0.04	0.23	0.34	0.73	4.15	0.18	0.00	0.00	5.63
3 SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.26	0.23	0.10	0.23	0.34	0.73	4.15	0.18	0.00	0.00	5.63
- N	0.04	0.04	0.01	0.12	0.08	0.06	0.06	0.04	0.01	0.00	0.00	0.05	0.41	1.22	1.62	0.41	0.23	0.34	0.73	4.15	0.18	0.00	0.00	5.63
1 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.08	0.02	0.00	0.01	0.23	0.34	0.73	4.15	0.18	0.00	5.63
8 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.34	0.73	4.15	0.18	0.00	5.63
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.34	0.73	4.15	0.18	0.00	5.63

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 9 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2017

Limerick Tower 1
 30 ft. Wind Speed and Direction

January-December, 2017
 171Ft-26Ft Delta-T (F)

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02							
1 MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.05		0.05						
9 SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.04		0.04						
- N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.12	0.18	0.01	0.40			0.40						
2 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01				0.01				
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		0.00
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								0.51
G MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
T SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02		0.02						
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01				0.01				
2 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00			
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.04
TOT	4.67	4.86	3.78	5.81	6.57	3.87	2.77	2.15	4.61	5.34	4.69	6.30	9.88	14.23	14.04	6.44	100.00	4.17	4.81	7.71	44.73	23.63	9.22	5.73	100.00

Wind Direction by Stability

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-STABILITY CLASSES-
0.04	0.00	0.00	0.00	0.05	0.10	0.19	0.08	0.35	0.79	0.40	0.57	0.85	0.65	0.08	0.02	4.17	Extremely Unstable
0.10	0.14	0.13	0.10	0.24	0.20	0.17	0.12	0.14	0.37	0.25	0.41	0.67	0.95	0.65	0.18	4.81	Moderately Unstable
0.29	0.35	0.36	0.26	0.57	0.26	0.12	0.14	0.22	0.41	0.34	0.47	0.71	1.30	1.28	0.63	7.71	Slightly Unstable
2.44	2.53	1.94	3.71	4.00	2.05	1.44	1.02	1.57	1.70	1.29	1.60	3.22	5.54	7.42	3.27	44.73	Neutral
0.85	1.04	0.66	1.07	1.13	0.78	0.62	0.60	1.99	1.64	1.84	2.27	2.59	3.00	2.41	1.15	23.63	Slightly Stable
0.47	0.44	0.32	0.38	0.38	0.32	0.12	0.13	0.28	0.36	0.45	0.78	1.15	1.74	1.36	0.53	9.22	Moderately Stable
0.49	0.36	0.37	0.29	0.20	0.16	0.11	0.06	0.07	0.07	0.12	0.19	0.69	1.05	0.84	0.66	5.73	Extremely Stable

Wind Direction by Wind Speed

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-WIND SPEED CLASSES-
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C A L M
2.12	2.01	2.13	2.56	1.86	1.38	0.92	0.80	1.32	1.60	2.12	2.86	4.30	4.76	3.87	2.59	37.19	< 3.5 mph
1.65	2.23	1.44	2.63	3.14	1.44	0.98	1.05	2.74	2.84	2.21	2.59	3.08	4.33	4.30	1.86	38.50	3.6 - 7.5 mph
0.86	0.59	0.20	0.49	1.50	0.96	0.80	0.24	0.53	0.89	0.34	0.69	1.81	3.15	3.67	1.42	18.14	7.6 - 12.5 mph
0.04	0.04	0.01	0.12	0.08	0.10	0.06	0.06	0.02	0.01	0.02	0.16	0.60	1.81	1.96	0.54	5.63	12.6 - 18.5 mph
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.18	0.20	0.04	0.51	18.6 - 24.5 mph
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	> 24.5 mph

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 11 Annual x/Q and D/Q values for the North Stack, Limerick Generating Station, 2017

Limerick Generating Station
 x/Q and D/Q values

North Stack - Flow = 316000 cfm

Stack ID	Location	Direction	Range (m)	X/Q (s/m ³) Undepleted	D/Q (1/m ²)
N	Site Boundary	S	762	1.04E-07	1.02E-09
N	Site Boundary	SSW	762	1.15E-07	9.86E-10
N	Site Boundary	SW	884	5.27E-08	4.51E-10
N	Site Boundary	WSW	854	1.16E-07	1.12E-09
N	Site Boundary	W	854	1.68E-07	1.66E-09
N	Site Boundary	WNW	793	1.03E-07	1.13E-09
N	Site Boundary	NW	762	8.39E-08	1.12E-09
N	Site Boundary	NNW	884	5.35E-08	5.61E-10
N	Site Boundary	N	884	1.22E-07	1.19E-09
N	Site Boundary	NNE	793	1.69E-07	2.21E-09
N	Site Boundary	NE	793	1.10E-07	1.17E-09
N	Site Boundary	ENE	793	1.58E-07	1.84E-09
N	Site Boundary	E	762	2.97E-07	4.24E-09
N	Site Boundary	ESE	762	5.20E-07	7.33E-09
N	Site Boundary	SE	762	5.62E-07	7.82E-09
N	Site Boundary	SSE	1006	1.39E-07	1.79E-09
N	RR-Inf-Lck-NG	S	300	4.54E-07	3.86E-09
N	RR-Inf-Lck-NG	SSW	225	8.53E-07	5.68E-09
N	RR-Inf-Lck-NG	SW	225	4.78E-07	2.88E-09
N	RR-Inf-Lck-NG	WSW	345	4.53E-07	3.91E-09
N	RR-Inf-Lck-NG	W	225	1.43E-06	1.08E-08
N	RR-Inf-Lck-NG	WNW	345	3.61E-07	3.56E-09
N	RR-Inf-Lck-NG	NW	450	1.68E-07	2.15E-09
N	RR-Inf-Lck-NG	ESE	884	4.31E-07	5.92E-09
N	RR-Inf-Lck-NG	WSW	450	2.84E-07	2.65E-09
N	RR-Inf-Lck-NG	NNE	682	1.94E-07	2.62E-09
N	Inhalation	N	948	1.14E-07	1.09E-09
N	Inhalation	NNE	825	1.63E-07	2.11E-09
N	Inhalation	NE	1057	8.91E-08	8.52E-10
N	Inhalation	ENE	985	1.39E-07	1.42E-09
N	Inhalation	E	873	2.64E-07	3.58E-09
N	Inhalation	ESE	1047	3.55E-07	4.99E-09
N	Inhalation	SE	1202	3.19E-07	4.16E-09
N	Inhalation	SSE	1647	8.52E-08	1.02E-09
N	Inhalation	S	1325	5.57E-08	5.95E-10
N	Inhalation	SSW	1543	5.58E-08	5.54E-10
N	Inhalation	SW	991	4.54E-08	4.12E-10
N	Inhalation	WSW	1158	7.93E-08	8.49E-10
N	Inhalation	W	1105	1.24E-07	1.27E-09

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 11 Annual x/Q and D/Q values for the North Stack, Limerick Generating Station, 2017

Limerick Generating Station
 x/Q and D/Q values

North Stack - Flow = 316000 cfm

Stack ID	Location	Direction	Range (m)	X/Q (s/m ³) Undepleted	D/Q (1/m ²)
N	Inhalation	WNW	1123	6.87E-08	7.59E-10
N	Inhalation	NW	1104	5.69E-08	7.29E-10
N	Inhalation	NNW	1540	4.19E-08	3.32E-10
N	Vegetation	N	1016	1.08E-07	1.00E-09
N	Vegetation	NNE	3779	1.39E-07	3.24E-10
N	Vegetation	NE	5096	1.91E-07	1.67E-10
N	Vegetation	ENE	2512	1.45E-07	4.80E-10
N	Vegetation	E	2399	2.00E-07	1.01E-09
N	Vegetation	ESE	1047	3.55E-07	4.99E-09
N	Vegetation	SE	2175	2.11E-07	2.08E-09
N	Vegetation	SSE	2107	7.90E-08	7.58E-10
N	Vegetation	S	1860	4.81E-08	4.52E-10
N	Vegetation	SSW	1747	5.43E-08	4.95E-10
N	Vegetation	SW	1995	3.79E-08	2.93E-10
N	Vegetation	WSW	1374	6.83E-08	7.76E-10
N	Vegetation	W	2708	9.14E-08	5.62E-10
N	Vegetation	WNW	3665	4.44E-08	2.15E-10
N	Vegetation	NW	2499	3.97E-08	2.86E-10
N	Vegetation	NNW	1973	4.25E-08	2.53E-10
N	Meat	N	7551	8.08E-08	9.82E-11
N	Meat	NNE	7640	8.56E-08	1.35E-10
N	Meat	NE	4890	1.99E-07	1.77E-10
N	Meat	ENE	2271	1.48E-07	5.48E-10
N	Meat	ESE	3775	2.04E-07	8.81E-10
N	Meat	SE	3324	1.54E-07	1.09E-09
N	Meat	S	3722	6.35E-08	2.23E-10
N	Meat	SSW	3167	8.07E-08	3.12E-10
N	Meat	SW	7055	1.80E-07	1.56E-10
N	Meat	WSW	4321	1.09E-07	2.64E-10
N	Meat	W	5223	9.80E-08	2.67E-10
N	Meat	NNW	3677	4.14E-08	1.19E-10
N	Cow	N	7551	8.08E-08	9.82E-11
N	Cow	S	6740	1.14E-07	1.13E-10
N	Cow	SSW	3167	8.07E-08	3.12E-10
N	Cow	WSW	4321	1.09E-07	2.64E-10

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 12 Annual x/Q and D/Q values for the South Stack, Limerick Generating Station, 2017

Limerick Generating Station
 x/Q and D/Q values

South Stack - Flow = 187000 cfm

Stack ID	Location	Direction	Range (m)	X/Q (s/m ³) Undepleted	D/Q (1/m ²)
S	Site Boundary	S	762	5.66E-08	6.52E-10
S	Site Boundary	SSW	762	6.01E-08	6.11E-10
S	Site Boundary	SW	884	2.25E-08	2.73E-10
S	Site Boundary	WSW	854	5.12E-08	6.66E-10
S	Site Boundary	W	854	8.88E-08	1.08E-09
S	Site Boundary	WNW	793	5.60E-08	8.54E-10
S	Site Boundary	NW	762	4.98E-08	9.12E-10
S	Site Boundary	NNW	884	3.16E-08	3.95E-10
S	Site Boundary	N	884	7.01E-08	8.82E-10
S	Site Boundary	NNE	793	1.19E-07	1.84E-09
S	Site Boundary	NE	793	6.33E-08	8.71E-10
S	Site Boundary	ENE	793	9.56E-08	1.65E-09
S	Site Boundary	E	762	1.89E-07	3.54E-09
S	Site Boundary	ESE	762	2.75E-07	5.03E-09
S	Site Boundary	SE	762	2.87E-07	4.75E-09
S	Site Boundary	SSE	1006	7.75E-08	1.20E-09
S	RR-Inf-Lck-NG	S	300	2.42E-07	2.22E-09
S	RR-Inf-Lck-NG	SSW	225	4.39E-07	3.22E-09
S	RR-Inf-Lck-NG	SW	225	1.96E-07	1.37E-09
S	RR-Inf-Lck-NG	WSW	345	1.92E-07	1.88E-09
S	RR-Inf-Lck-NG	W	225	7.15E-07	5.98E-09
S	RR-Inf-Lck-NG	WNW	345	1.82E-07	2.06E-09
S	RR-Inf-Lck-NG	NW	450	8.99E-08	1.41E-09
S	RR-Inf-Lck-NG	ESE	884	2.39E-07	4.28E-09
S	RR-Inf-Lck-NG	WSW	450	1.21E-07	1.31E-09
S	RR-Inf-Lck-NG	NNE	682	1.27E-07	2.14E-09
S	Inhalation	N	948	6.84E-08	8.18E-10
S	Inhalation	NNE	825	1.17E-07	2.08E-09
S	Inhalation	NE	1057	6.35E-08	6.72E-10
S	Inhalation	ENE	985	1.02E-07	1.35E-09
S	Inhalation	E	873	1.83E-07	3.10E-09
S	Inhalation	ESE	1047	2.16E-07	3.60E-09
S	Inhalation	SE	1202	1.96E-07	3.32E-09
S	Inhalation	SSE	1647	6.29E-08	8.28E-10
S	Inhalation	S	1325	3.78E-08	4.68E-10
S	Inhalation	SSW	1543	4.10E-08	4.55E-10
S	Inhalation	SW	991	2.02E-08	2.67E-10
S	Inhalation	WSW	1158	4.08E-08	5.98E-10
S	Inhalation	W	1105	7.20E-08	9.10E-10

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 12 Annual x/Q and D/Q values for the South Stack, Limerick Generating Station, 2017

Limerick Generating Station
 x/Q and D/Q values

South Stack - Flow = 187000 cfm

Stack ID	Location	Direction	Range (m)	X/Q (s/m ³) Undepleted	D/Q (1/m ²)
S	Inhalation	WNW	1123	4.27E-08	5.67E-10
S	Inhalation	NW	1104	3.94E-08	6.55E-10
S	Inhalation	NNW	1540	3.75E-08	2.74E-10
S	Vegetation	N	1016	6.73E-08	7.63E-10
S	Vegetation	NNE	3779	1.47E-07	3.16E-10
S	Vegetation	NE	5096	2.03E-07	1.63E-10
S	Vegetation	ENE	2512	1.54E-07	4.91E-10
S	Vegetation	E	2399	2.10E-07	1.00E-09
S	Vegetation	ESE	1047	2.16E-07	3.60E-09
S	Vegetation	SE	2175	1.85E-07	1.80E-09
S	Vegetation	SSE	2107	6.91E-08	6.49E-10
S	Vegetation	S	1860	4.12E-08	3.91E-10
S	Vegetation	SSW	1747	4.41E-08	4.18E-10
S	Vegetation	SW	1995	3.56E-08	2.63E-10
S	Vegetation	WSW	1374	4.14E-08	6.02E-10
S	Vegetation	W	2708	9.02E-08	5.50E-10
S	Vegetation	WNW	3665	4.53E-08	2.01E-10
S	Vegetation	NW	2499	3.93E-08	2.62E-10
S	Vegetation	NNW	1973	4.21E-08	2.18E-10
S	Meat	N	7551	8.39E-08	9.61E-11
S	Meat	NNE	7640	8.91E-08	1.32E-10
S	Meat	NE	4890	2.11E-07	1.73E-10
S	Meat	ENE	2271	1.56E-07	5.60E-10
S	Meat	ESE	3775	2.12E-07	8.05E-10
S	Meat	SE	3324	1.47E-07	9.80E-10
S	Meat	S	3722	6.78E-08	2.29E-10
S	Meat	SSW	3167	8.56E-08	2.92E-10
S	Meat	SW	7055	1.92E-07	1.71E-10
S	Meat	WSW	4321	1.17E-07	2.80E-10
S	Meat	W	5223	1.03E-07	2.72E-10
S	Meat	NNW	3677	4.40E-08	1.20E-10
S	Cow	N	7551	8.39E-08	9.61E-11
S	Cow	S	6740	1.24E-07	1.16E-10
S	Cow	SSW	3167	8.56E-08	2.92E-10
S	Cow	WSW	4321	1.17E-07	2.80E-10

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

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