

Limerick's Dangerous Air Pollution Harms Health

Limerick Nuclear Plant Is A

MAJOR AIR POLLUTER

Under Health Based Standards Of The Clean Air Act

Limerick Nuclear Power Plant emits so much dangerous air pollution (in addition to radiation) that it's considered a MAJOR AIR POLLUTION source under the Clean Air Act. This dispels nuclear industry myths that nuclear power is emissions free. Limerick Nuclear Power is not emissions-free. It's a major air polluter instead. Nuclear power is clearly NOT safe, clean energy as suggested by the nuclear industry and their supporters. The following facts have been compiled by ACE from Limerick Nuclear Plant's Title V Air Pollution Permit.

LIMERICK NUCLEAR PLANT'S AIR POLLUTION INCLUDES:

1. Radiation - from routine operations and accidental releases
2. Schuylkill River Toxics - from withdrawing 56.2 Million Gallons Per Day
3. Toxic Chemicals - from adding over 300 lbs per day to Cooling Towers
4. Greenhouse Gases, Combustion Chemicals & By-products - from Boilers, Etc.
5. Waste Fuel - from a Boiler

AIR POLLUTANTS from Limerick Nuclear Plant Include:

- Radiation
 - PM10
 - VOCs
 - NOx
 - SO2
 - Arsenic
 - Cadmium
 - Chromium
 - Lead
 - PCBs
 - Halogens
- This dangerous SYNERGISTIC MIX continuously threatens the health of families in the region, especially children. ADDITIVE, CUMULATIVE HEALTH IMPACTS could be significant.

32 SOURCES of Limerick Nuclear Plant's Air Pollution Include:

- 2 Cooling towers
 - 3 Boilers
 - 8 Generators
 - 8 Diesel Oil Tanks
 - 8 Day Tanks
 - Degreasing Unit
 - Emergency Spray Pond
 - Various Waste Oil Sources
- **There is NO FILTRATION FOR TOXICS from any of the sources.**

ACE's review of the permit revealed a shocking number of air pollution sources and pollutants, with extraordinary loopholes.

Limerick's Permit Loopholes are Unprotective and Unacceptable. Almost anything goes.

- Radiation, the signature toxic at a nuclear plant, was excluded even though radiation emissions are regulated by EPA and reported by Exelon to NRC.
- Limerick Nuclear Plant Title V permit renewal lists 32 air pollution sources and a broad range of pollutants, but excludes radiation the signature toxic released from a nuclear plant.
- No air pollution control equipment is required on any of the many sources.
- Reported emissions are based on illusion, not reality. Annual reports are largely based on Exelon's own "calculations" and "estimates", not on actual emissions testing. There is no independent testing.
- Exelon can increase dangerous air pollution from the nuclear plant without going through any kind of review or approval process.
- There are all kinds of exemptions.
- Preapproved permit revisions are allowed under economic incentives.

Limerick Nuclear Plant's additive, cumulative, and synergistic harmful health impacts are unknown, but clearly significant. Children, elderly, and those already sick are most impacted.

Examples of Synergism:

- $\text{NO}_x + \text{SO}_2 =$ acid rain which can jeopardize water, soil and food. When NO_x and SO_2 meet with steam (35 to 42 million gallons per day emitted from Limerick towers), sulfuric and nitric acids can be formed in the air causing major respiratory damage and other health harms when inhaled. Limerick's permit allows automatic (TONS per year) increases in both.
- $\text{NO}_x + \text{VOCs}$ with sunlight increases ozone, which kills thousands of people each year and sends many more for hospital emergency room visits.
- Ozone works synergistically with radiation to enhance the cancer causing effects of radiation.

Synergistic, Additive, and Cumulative Harmful Health Impacts From Limerick's Air Pollution Are Unknown, But Clearly Unprecedented,

When They Include:

1. A Broad Range of Radionuclides
2. Massive Emissions of Many Dangerous Cooling Tower Toxics
3. Combustion Chemicals From Boilers and Generators
4. Waste Derived Liquid Fuel
5. And Various Other Sources of PM-10 Emissions

Families throughout the region are at risk from Limerick Nuclear Plant's radiation emissions and other toxic air pollutants. Consider the following:

- Philadelphia, only about 20 miles away, is in the predominant wind direction.
- Routine radiation releases go in to our air, but are not measured in air or listed in Limerick's Title V permit.
- Limerick's cooling towers and other sources emit massive dangerous PM 10 emissions which are not accurately measured or filtered.
- The effluent stream from the river to the sky through the cooling towers includes all river toxics.
- Cooling tower emissions include toxics added to the towers.
- No toxics are filtered out from any of the 32 air pollution sources listed in Limerick Nuclear Plant's Title V Air Pollution Permit.

- **To protect the health of everyone in the region, Exelon should be required to install the most protective filtration for all Limerick Nuclear Power Plant's air pollution sources, and filtration of Schuylkill River water intake to minimize PM-10 emissions from the cooling towers.**

Join ACE Efforts To Minimize The Region's Air Pollution Threats From Limerick - (610) 326-2387

Biggest Air Pollution Threat From Limerick

COOLING TOWERS

Drastic Increases Permitted In PARTICULATE MATTER (PM-10)

In Limerick Nuclear Plant's Most Recent Title V Air Pollution Permit Renewal Exelon Requested Drastic Increases In Dangerous Particulate Matter (PM-10) from Limerick's Two Cooling Towers.

Instead of requiring filtration of Schuylkill River water intake to minimize PM-10 emissions from Limerick's cooling towers, PA DEP permitted drastic increases in PM-10 emissions (more than 6 times higher original permit limits).¹

How many more people will get sick and die as a result of the nasty witches brew of toxic chemicals massively spewed out in aerosol form from Limerick's cooling towers?

Drastic Increases Permitted For Limerick's PM-10 Are Indefensible.

PM-10 consists of tiny airborne particles that can carry other toxics, penetrate deep into the lungs, enter the bloodstream and lead to serious health threats and healthcare costs.

Long Term PM 10 Health Effects Are Linked To:

- ✓ Increased Heart Attacks
- ✓ Strokes
- ✓ Aggravated Asthma
- ✓ Inflaming Lungs Like Sunburn On Skin
- ✓ Increased Respiratory Disease
- ✓ Decreased Lung Function
- ✓ Increased Hospital Admission
- ✓ Increased Emergency Room Visits
- ✓ Premature Death - Blamed For Thousands Of Deaths Each Year

Instead of increases, Exelon should have been required to reduce PM-10 air pollution from Limerick by filtering Schuylkill River water intake for Total Dissolved Solids.

Limerick Nuclear Plant Emits PM-10 From:

- ✓ 2 Cooling Towers
- ✓ 3 Boilers
- ✓ 8 Generators
- ✓ The Emergency Spray Pond

How Much PM 10 Is Emitting From Limerick's 14 Sources? NO ONE KNOWS

➤ Exelon “ESTIMATES” and “CALCULATES” Limerick's PM10 Emissions. THERE ARE NO RELIABLE AIR MEASUREMENTS.

- Montgomery County is already among the highest for PM-10 emissions in the nation.ⁱⁱ
- PM-10 is regulated under health based standards of the Clean Air Act, because it causes serious harm to health.ⁱⁱⁱ
- Costs to the public will increase with more emergency room visits and hospital admissions
- PA DEP stated that Limerick's cooling towers are an effluent stream from the river to the sky. 35 to 42 million gallons of contaminated water go into the air every day from Limerick's cooling towers. PM 10 carries other dangerous toxics withdrawn with as much as 56 million gallons every day from the highly contaminated Schuylkill River with NO filtration for toxics.
- Toxic chemicals are added to Limerick's cooling towers. Exelon's response to ACE claimed 324 pounds per day. Most chemicals listed were extremely corrosive. All caused health harm. Pounds added per day to cooling towers could be considerably higher. Since reviewing Limerick's NPDES permit renewal we learned over 94,293 to 192,614 Pounds Per Day of Toxic Chemicals are used at Limerick Nuclear Plant.
- Potential Limerick toxics carried into our air with PM10 from the cooling towers include:
 - Radiation
 - Heavy Metals
 - Pathogens
 - Corrosive Chemical Additives

PM 10 Details From Limerick's Title V Permit

In Limerick's Title V Permit Renewal TVOP-46-00038, Exelon requested that PA DEP approve a huge increase in blowdown water from 1,256 ppmw to 10,000 ppmw for each cooling tower.

According to Exelon:

- **Limiting blowdown TDS to 1,256 for each cooling tower restricts particulate matter (PM) and creates an unnecessary risk to Limerick for noncompliance.**

"PA DEP Air Quality Bureau will not set the limit on TDS concentration for the blowdown entering Outfall 001, since this is a Water Quality issue."

- **DEP changed the language of the permit so that Exelon complies with both Air Quality and Water Quality requirements, instead of requiring Exelon to filter Schuylkill River water intake to reduce PM-10 emissions into our air and to enforce Limerick's original PM-10 permit limits.**
- **Limerick Nuclear Plant Was Permitted Conditions That Allow Possibly An 8-Fold INCREASE From The Cooling Towers In PM-10 Emissions, A Dangerous Clean Air Act Pollutant Blamed For Thousands Of Deaths Each Year.**
- **This should NOT have happened, especially in a county which already ranks in the top 10% of the nation for dangerous PM-10 emissions.**

January 2010, ACE presented agency and elected officials with an expose and list of recommendations and requests related to permitted PM-10 increases at Limerick Nuclear Plant. All were ignored.

- Agency regulators and elected officials ignored the increased threats to public health and increased financial health care costs, all to protect Exelon's profits.

Exelon Expressed Concern About Air Pollution If They Would Install Cooling Towers As Requested By N.J. DEP, At Oyster Creek In New Jersey:

- **In Essence, Exelon Admitted Cooling Tower Air Pollution Is Harmful.^{iv}**
Exelon used Cooling Tower Air Pollution, as an excuse to avoid spending millions to build cooling towers at Oyster Creek. Exelon said, "Cooling Towers Would Create Air Pollution".

Limerick's Title V Air Pollution Permit Lists 32 Air Pollution Sources and 10 Dangerous Regulated Toxics.

Air Pollutants Listed In Limerick's Air Permit	Air Pollution Sources In Limerick's Permit
Nox	2 Cooling Towers
VOCs	3 Boilers
PM-10	8 Generators
SO2	8 Diesel Tanks
Arsenic	8 Day Tanks
Cadmium	Degreasing Unit
Chromium	Emergency Spray Pond
Lead	Various Waste Oil Sources
PCBs	
Halogens	

- **NO FILTRATION IS REQUIRED FOR ANY TOXICS LISTED ABOVE**

Numerous Studies Show The Kinds Of Air Pollution Produced By Limerick's 32 Sources Contribute To A Broad Range of Disease and Disabilities.

- World Health Organization Estimated Air Pollution Would Cause About 8 Million Deaths Worldwide by 2020
- American Cancer Society
- Harvard School of Public Health
- John's Hopkins School of Public Health
- Cedars-Sinai Medical Center

Dr. Devra Davis reported that there are more than 1,000 studies from 20 countries all showing you can predict a certain death rate for asthma, heart disease, and lung disorders based on the amount of air pollution.^v

Cooling Towers May Host New Pathogens vi

- Research Shows Health Threats From Cooling Towers Include Pathogens
- ✓ Cooling Towers Spray Infectious Pathogens Into Our Air.
- ✓ The Pathogens Can Cause Disease in Humans, Even Legionella.

Toxics In Drift Synergize and Blow Far Distances

How far is drift carried from Limerick Nuclear Plant?

- 2 Cooling Towers Are 500 Feet High (Comparable to a Building over 40 Stories High)
- Independent measurements are needed over Limerick Nuclear Plant site boundary

Drift Travels Far Distances - Example: From One County to Another

- **Dispute Over Russian Border** - 1 country complained about cooling towers contaminating their side of the border.
- **Levels over site boundary were greater than permitted** - Maine Yankee violations led to company stopping using one chemical after testing

Toxics In Drift Concentrate When They Hit Land and Dry.

- River Bend - Needed a separate parking lot to shelter cars due to active concentrations

Limerick Cooling Tower Emissions Are A Major Threat:

Up to 42 Million Gallons Per Day Of Steam Filled With Toxics Go Into Our Air (Over 15 Billion Gallons Per Year)

What Are Harmful Impacts To Humans, Wildlife, and the Environment?

American Lung Association's 2003 Report Gave Montgomery County A Grade Of "F" For Unhealthy Air

- Montgomery County Had 2nd Dirtiest Air in the State, Far Worse Than Philadelphia, Berks, or Chester Counties, "State of the Air Report for 1999-2001." It's Not Much Better Now.

Still, DEP Permitted INCREASES In Limerick's Title V Permit

PM10	Particulate Matter	+ 3 TONS
VOCs	Volatile Organic Compounds	+ 5 TONS
SO2	Oxides of Sulfur	+ 8 TONS
NOx	Nitrogen Oxides	+ 5 TONS
CO	Carbon Monoxide	+ 20 TONS

Our Region Is Already Overexposed To Air Pollution Compared To The Nation

- ✓ Montgomery County Is In The Top 10% Of The Nation For Emissions Of PM-10 and VOCs
- ✓ Montgomery County Is In The Top 20% For SO2 Emissions

EXELON SHOULD BE REQUIRED:

- **TO FILTER SCHUYLKILL RIVER WATER INTAKE,**
- **NOT INCREASE DANGEROUS AIR POLLUTION**

Examples Of Harmful Health Impacts and Synergism

PM-10 Particulate Matter

- ✓ Increases Heart Attacks and Strokes
- ✓ Aggravates Asthma
- ✓ Inflames Lungs Like Sunburn
- ✓ Increases Respiratory Disease
- ✓ Decreases Lung Function
- ✓ Increases Hospital Admission and Emergency Room Visits
- ✓ Blamed For Thousands Of Premature Deaths Each Year

VOCs Volatile Organic Compounds

- ✓ Cancer
 - ✓ Leukemia
 - ✓ Liver Damage
 - ✓ Kidney Damage
 - ✓ Digestive Disorders
 - ✓ Neurological Disorders
 - ✓ Reproductive Problems
 - ✓ Decreased Immune Function Leading to Many Illnesses
- VOC's Extremely TOXIC In Small Amounts***

NOx Nitrogen Oxides

Toxicant to:

- ✓ Blood
- ✓ Cardiovascular
- ✓ Endocrine
- ✓ Immune System
- ✓ Reproductive
- ✓ Neurological
- ✓ Skin and Sense Organ

NO_x reacts with moisture and other compounds to form nitric acid and related particles.

VOCs + NOx = Ground-Level OZONE

Acute, Short Term Effects include:

- ✓ Shortness of Breath
- ✓ Phlegm Build Up
- ✓ Coughing, Wheezing
- ✓ Watery Eyes, Runny Nose
- ✓ Sore Throat
- ✓ Head Colds
- ✓ Chest Colds
- ✓ Chest Pain

Repeated Exposure Can Result In:

- ✓ Permanent Lung Damage
- ✓ Respiratory Infection
- ✓ Lung Inflammation
- ✓ Aggravate Asthma

RADIATION INTERACTING WITH OZONE

➤ **Enhances Cancer Risks**

From Mc Donnell, M.D. Health Effects Research Laboratory
EPA Testimony, April 9, 1987, to U.S. Senate

➤ **“OZONE WORKS SYNERGISTICALLY WITH RADIATION TO ENHANCE THE CANCER-CAUSING EFFECTS OF RADIATION.”**

Radiation, the most potent carcinogen, is routinely released from Limerick Nuclear Plant. Radiation is the signature, most dangerous toxic released from nuclear plants. Radiation levels released cause more risk of cancer when breathed in with VOCs and NOx.

RADIATION - LIMERICK'S AIR RELEASES

Limerick routinely releases a broad range of radionuclides into the air.

Radioactive air particulates are not listed in Limerick's Title V Air Permit, even though all air pollutants and sources from a major air polluter are supposed to be listed.

Actual data and/or harmful health impacts from Limerick's routine and accidental radioactive releases are unknown.

Radiation Testing and Reporting To NRC Are Deceptive

➤ **RADIATION LEVELS DETECTED BY EXELON FOR LIMERICK'S RELEASES TO OUR AIR ARE ONLY REQUIRED TO BE REPORTED OVER DRASTICALLY INCREASED AND DANGEROUS BACKGROUND LEVELS. THIS RENDERS EXELON'S DECEPTIVE MONITORING MEANINGLESS.**

- Radiation Levels identified by monitoring are only reported for Limerick by Exelon when they are above an arbitrary background level. Above background reporting is deceptive. It allows Exelon to hide actual radiation releases from Limerick and our actual risks.
 - Reporting Only On Radiation Detected Above Background Hides Our Risks From Limerick. Look At The Reality Of What Is Called Background:
 - 80 to 100 Millirems Per Year - Natural background BEFORE Chernobyl
 - 360 Millirems Per Year - AFTER Chernobyl
 - 620 Millirems Per Year - AFTER Fukushima, Japan

In essence, March 16, 2011, After Japan's Nuclear Disaster, NRC Legally Sanctioned Increased Radiation Harm To Regions Like Ours, Routinely Exposed To Nuclear Plant Radiation Releases.

So-Called "Safe Dose Limits" Are Arbitrary, Deceptive, And NOT Protective

The National Academy of Sciences Says There Is NO SAFE DOSE

Other Deceptive Tactics In Radiation Reporting

- Exelon, the company with a vested interest in the outcome that has shown it can't be trusted, controls all radiation monitoring, testing, and reporting.
- Exelon is allowed to "CALCULATE" and "AVERAGE" results.
- The system fails to report on radiation spikes.

Examples From Exelon's 2007 Self-Monitoring Report to NRC

1. **Lower Limit Detection (LLD) – ABOVE BACKGROUND IS DECEPTIVE.**
Defined as smallest concentration of radioactive material in a sample that would yield a net LLD does not mean the actual level detected - Level detected could be far higher
2. **Positive Results Were "CALCULATED"** - Gamma Spectroscopy
Standard deviations represent variability of measured results for different samples rather than single analysis uncertainty.
3. **Net Activity – Calculated by subtracting background from sample.**
MDC was reported in all cases – but they can claim positive activity was not detected.

Radioactive Air Particulates

Continuous air particulate samples were collected weekly in 2007 from 5 locations – 3 Groups.

- Group I represents - locations within site boundary (10S3, 11S1, and 14S1)
- Group II represents - the location at an intermediate distance from the site (13C1)
- Group III represents - the control location at a remote distance from LGS (22G1).

➤ **GROSS BETA WAS DETECTED AT ALL LOCATIONS.**

Beta Emissions Can Include Strontium-90, Tritium, and Other Radionuclides

The results from the On-Site locations

- (Group I) ranged from 6 to 31 E-3 pCi/m³ with a mean of 16 E-3 pCi/m³.
- (Group II) (the Intermediate Distance location) ranged from <8 to 27 E-3 pCi/m³ with a mean of 16 E-3 pCi/m³.
- (Group III) Distant locations ranged from 7 to 25 E-3 pCi/m³ with a mean of 17 E-3 pCi/m³.

Comparison of the 2007 air particulate data indicate no notable differences among the three groups.

➤ **GAMMA WAS DETECTED IN ALL SAMPLES**

Be-7 Beryllium 7: UNstable (1/2 life 53 days) was detected in all samples

- Values ranged from 53 to 136 E-3 pCi/m³.

All other nuclides were less than the MDC - BUT Minimum Detectable Concentration (MDC) Is Only An ESTIMATE and Only Reported IF Above Background

Beta Particles and Gamma Rays Penetrate the Human Body and Environment, Causing Biological, Chemical, and/or Physical Damage.

Cancer, Leukemia, Heart Failure, Neuromuscular Diseases and Many Other Health Effects Can Result From Long-Term Exposures. Harmful Health Impacts Can Take Many Years To Develop.

Examples: Harmful Health Impacts To Specific Parts Of The Body

- **Thyroid / Ovaries** Iodine – 131 Beta / Gamma Emitter
 - **Liver / Ovaries** Cobalt – 60 Beta / Gamma Emitter
 - **Bone / Ovaries** Zinc – 65 Beta / Gamma Emitter
 - **Muscles / Ovaries** Cesium – 137 Beta / Gamma Emitter
 - **Bones / Teeth** **Strontium-90** Beta Emitter 29 year half-life
- **Strontium 90 (SR-90) Attaches To Particulate Matter – Easily Travels With Air**
- **SR-90 Masquerades As Calcium – Absorbs Into Bones and Teeth.**
- **Some of the highest levels of Strontium-90 were found in the teeth of children around Limerick Nuclear Power Plant (Tooth Fairy Study)**

Best Source to Understand Radiation Exposure:

Radioactive Baby Teeth: The Cancer Link

by [Joseph J Mangano](#) March 2008

Radiation and Public Health Project

Barnes&Noble – Amazon.com

All GAMMA Radiation Emitters Attack REPRODUCTIVE ORGANS

- Prostate Cancer Increased in Montgomery County 132% Since Limerick Nuclear Power Plant Started (Mid 1980s to Mid 1990s)
- Other related cancers also drastically increased above the national average since Limerick started operating.

Radiation Can Cause Birth Defects, Mutations, and Miscarriages,

- In 1st and / or Successive Generations After Exposure.
- Infant death and childhood cancer reductions after nuclear plant closings in the United States – **2002 Study** - Deaths among infants who had lived downwind and within 64 km of each plant dropped.
- **Infant and Neonatal Mortality In The Area Around Limerick Are Far Higher Than State Averages and Higher Than Philadelphia or Reading.**

LIMERICK NUCLEAR PLANT'S

AIR POLLUTION IS

A MAJOR PUBLIC HEALTH THREAT
And Obviously A Factor In:

State Data Reported By EPA In 2003 That Showed
FAR HIGHER NUMBERS FOR:

- ✓ **Infant and Neonatal Mortality**
- ✓ **Malignant Tumors**
- ✓ **Cerebrovascular Disease**
- ✓ **Respiratory Diseases**

ALL FAR HIGHER
NEAR LIMERICK NUCLEAR PLANT

Than Philadelphia, Reading,
Or The State Average

ACE Conclusions:

Limerick Nuclear Power Plant Is A Major Air Pollution Source Under Health Based Standards Of The Clean Air Act and Is Clearly A Major Factor In The Health Crisis That Developed After Limerick Started to Operate in 1985.

Yet, NRC Has Repeatedly Attempted To Ignore and/or Dismiss Limerick's Air Pollution Threats To Health and The Environment In Limerick's Updated Environmental Impact Statement (EIS).

Fractured Agency Permitting Is NOT An Excuse To Dismiss Serious Environmental and Health Impacts From Limerick Nuclear Plant's Major Air Pollution For NRC's Updated EIS. Just Because PA DEP Issues Limerick Nuclear Plant's Air Pollution Permit Does Not Eliminate The Harms Our Region Faces From It.

Without a year of independent air monitoring, testing, and reporting for all Limerick Nuclear Plant's radionuclides and other air pollutants, the community should reject any NRC conclusions in NRC's updated Environmental Impact Statement for Limerick Nuclear Plant as invalid.

Unless additive, cumulative, and synergistic harmful health impacts from radiation releases and all other air pollutants from Limerick are accurately determined, including from recent permitted drastic increases, the Precautionary Principle should be followed and Limerick should be closed, NOT RELICENSED.

As long as Limerick Nuclear Plant operates, dangerous air pollution will continue and even increase.

- To protect public health and avoid unnecessary health care costs, Limerick should close now.**
- 20 more years of exposure to the massive toxic brew of air pollution from Limerick is unacceptable. Limerick must close now.**

Documents and Other Information Listed Below Are Available For Review By Appointment At The ACE Office In Pottstown (610) 326-2387

1. Limerick Air Pollution Sources and Pollutants – Graphic. Source: PA DEP Title V Air Pollution Permit summarized in the graphic by ACE 2009.
2. Lists of Limerick Nuclear Plant's kinds of air pollution, air pollutants, and sources. Source: PA DEP Title V Air Pollution Permit - Listed by ACE after review of the permit in 2009.
3. Limerick Nuclear Plant's PA DEP Title V Air Pollution Permit (46-00038) Provides The Proof – Only Major Air Pollution Sources Are Required to Submit Title V Permits. Limerick Nuclear Plant's most recent Title V Air Pollution Permit Renewal was issued to the owner, Exelon, December 2009.
4. "Nuclear Plant is a Major Source of Air Pollution - 2/14/09 Op-ed summary of Limerick Nuclear Power Plant's air pollution permit, informing the public of health risks from the ACE Board of Directors,.
5. ACE's January 2010 Analysis of PA DEP's Public Response Document Identifies Why Limerick's Air Pollution is a Major Health Threat to our region and Why This Permit and the Permitting Process Failed to Protect Public Health.
6. Recommendations and Requests from ACE January 2010 to PA DEP Secretary John Hanger, identifying concerns with the permit and requesting him to take action to reduce specific air pollution threats that his agency permitted to be drastically increased, instead of requiring filtration.
7. Particulate Matter (PM10), the major air pollution threat from Limerick Nuclear Plant to the families in the region. 12/7/09 PA DEP permitted PM 10 emissions to be emitted 6 to 8 times higher than current limits without requirement for filtration and in addition to an automatically permitted 3 Ton Increase.
8. List of PM 10 Harmful Health Effects, Sources: EPA and ATSDR.
9. Toxics Carried With Limerick Nuclear Plant's Massive Cooling Tower Drift.
10. 324 Pounds Per Day Toxic Chemicals Added to Limerick's Cooling Tower's, Source: MSDS Sheets Provided by Exelon In 2004.
11. List of automatically permitted toxics in Limerick's Title V permit.
12. Documented harmful health impacts of pollutants with automatically permitted increases. Source: EPA. These pollutants are regulated by EPA under health standards of the Clean Air Act because of their toxicity to humans.
13. Air in the Region Already in the Top 10% of the worst in the US – For the very pollutants permitted to have automatic increases in Limerick's Title V permit.
14. Exhaust Flow Volumes Were Increased In Limerick's Title V Permit.
15. Lists of Air Pollution Studies, Including A List On Children – Compiled by ACE.

ⁱ Limerick Title V Permit Renewal TVOP-46-00038 12-7-09

ⁱⁱ EPA Air Pollution Data - Compiled At www.scorecard.org

ⁱⁱⁱ <http://epa.gov/air/particlepollution/>

^{iv} AP 3-19-10 Article in Mercury by Wayne Parry "Exelon Threatens to Shut Down N.J. Nuke Plant"

^v Statistics and Facts in Hard Science Show: Air Pollution Kills and Cripples, Net Works 2001

^{vi} Cooling Towers May Host New Pathogens – Research by Sharon G. Berk and colleagues - ScienceDaily 8-28-06
