From: Bev Edwards [mailto:nadesha@msn.com]
Sent: Monday, February 29, 2016 12:35 PM
To: Monroe, Pamela
Subject: FW: Response to Request for Advance Public Comment on Rules -Site 300

February 29, 2016

NH Site Evaluation Committee
Pamela Monroe, Administrator
21 Fruit St., Suite 10
Concord, NH 03301

Response to Request for Advance Public Comment on Rules Related to Certificates of Site and Facility, Site 300.
RE: Docket # 2015-08

Dear Ms. Monroe,

Thank you for the opportunity to provide Comments on the Rules Related to Certificates of Site and Facility, Site 300, pursuant to
RSA 541-A, relative to the siting of high pressure gas pipelines.

First, I must respectfully request that the SEC extend the time for the comment period. Many stakeholders who earnestly want to comment learned of the committee's request on February 19. The ten days available for comments have not been sufficient to reasonably honor or address this request.

Given that NH is at a pivotal juncture regarding its energy future, the SEC has a unique opportunity to break the grip of the antiquated assessment process, developed in the 20th century for the conventional gas industry infrastructure. The NHSEC can take the lead in creating updated, appropriate 21st century rules for evaluating the siting of high pressure gas pipelines--infrastructure for the high-volume hydraulic fracturing (HVHF) industry.

1) The most critically important new rule that I emphatically recommend is that a Comprehensive Health Impact Assessment (CHIA) be incorporated as a requirement of the SEC siting process.

The need for a CHIA has surfaced as a result of all the health impacts occurring and being documented by epidemiologists, toxicologists, physicians and chemical researchers nation-wide for people living in the vicinity of compressor stations. In fact, Dr. Wilma Subra, McArthur Award winning chemical researcher, has documented the fact that numerous health impacts occur for people who live, work or go to school within a 3 mile radius of a 12,000 horse power (HP) compressor station. NH may be dealing with 2 or more compressor stations if a high pressure gas infrastructure is sited In our state. At least one of them is 41,000 HP and is planned for 1/4 mile from Temple's Elementary School.

Therefore, the rule: "**appropriate setbacks to mitigate potential health and safety impacts"** in reference to compressor stations is entirely inadequate.

2) <u>The next most important rule should be</u>: If it is determined to be harmful, or suspected of potentially being harmful, to the public health of NH citizens, a high pressure gas pipeline should be denied permission for construction in NH.

<u>3) If it is NOT PROVEN by a thorough and independent study of the facts that there is an EXTREME need for the siting of a high pressure gas pipeline in NH, its siting should be denied.</u>

<u>a. As NH's OEP 10 Year Energy Strategy,</u> <u>Appendix A, Chart 3 illustrates:</u>

- NH's need for natural gas will remain flat up to 2032
- NH's energy demand will only rise 1 per cent by 2032 due to fewer exports to MA, as a result of their energy efficiency and renewable Installations.
- Therefore, <u>NH does not need a massive high pressure gas pipeline installation.</u>

b. As the Conservation Law Foundation continues to indicate, LNG is the best "bridge fuel" for NE and NH. And Distrigas has contracted for sufficient LNG to cover NE's winter reliability issues for 10 years! <u>It will not involve the destruction of construction, a tariff on ratepayers, or the rise in natural gas prices that is predicted to result from natural gas exports.</u>

c. As the President of the NE Power Generators Association, Dan Dolan, said in 2015, "The 'energy crisis' was overblown. By January, wholesale prices dropped 60% even though last winter was colder, 2 more major power plants had retired, and not a single new pipeline was built!"

e. As the Energy Information Agency (EIA) has determined from two studies, <u>if natural gas is exported it will raise its domestic price to compete with higher paying foreign markets. NH PRICES will RISE.</u>

<u>f. Given the federal requirements for major reductions in GHG emissions over the next 10 years</u>; given that high pressure gas pipelines are constructed for the purpose of the transmission of natural gas; given that <u>natural gas is predominately methane and that methane is a more potent (80+ % more) GHG for stimulating climate change than the other fossil fuels,</u> NH would be compelled to decommission high pressure gas pipelines and the state would have to pay for taking them out of the ground and detoxifying the soil and water systems again.
<u>There is NO NEED for such a short-lived and expensive (for ratepayers) infrastructure!</u>

<u>4) In 2007, the citizens of 164 NH towns passed Warrant Articles</u> requesting that the federal government and their towns reduce GHG emissions and invest in renewable energy resources. Over 30 towns in southwest NH passed such Warrant Articles, including many that could be affected by the destruction of any massive high pressure gas pipeline that could be sited in

their towns if the SEC were to approve them. It would be unfortunate and disappointing if the SEC would ignore or override the choices and decisions of 164 NH towns' citizens.

In addition, I fully support requesting that the SEC require:

- The gas industry to use technology to control air pollutants at the source to protect public health. At a minimum: Electric motors to run the compressors;
- Air-operated control valves rather than gas-operated valves which vent gas to the air each time they open or shut;
- Sufficient on-site containment for venting events such as blow-downs. To continue industry practices of chronically venting gas to the atmosphere is similar to the days before the Clean Air and Clean Water Acts when factories routinely dumped their waste into our environment.

- All above-ground gas pipeline facilities to be housed in structures with equipment to capture and recover fugitive emissions. The cost of these measures to the applicants would certainly be less than the cost of negative health effects in surrounding communities.

Safety Impacts

- Siting high-pressure gas pipelines alongside high-voltage power lines is dangerous. The electric field accelerates the rate of pipeline corrosion. Large grounding arrays are required to combat corrosion. However, in much of New Hampshire where the power lines pass across shallow-to-bedrock soils, the ground does not offer much grounding. In Mason, for instance, power surges that destroy electrical equipment during thunderstorms are common, due to the general lack of good grounding. The likelihood of accelerated pipeline corrosion where pipelines abut power lines puts two energy systems at risk. A pipeline failure here could destroy two energy supply systems at one blow, which may take some time to repair and have regional economic repercussions. SEC needs to seriously weigh the consequences of such unwise pipeline siting. Without a careful ongoing pipeline grounding maintenance program, overseen by independent contractors, a catastrophic event is foreseeable.

Pipeline decommissioning plan requirements

- SEC should require that all pipelines and infrastructure be removed, all waste and toxic residue properly disposed of, the land restored to original grade, loamed and planted with native plants. This deconstruction would re-run all the trauma of construction but would better serve landowners and communities in the long run.

- Project-related sound and vibration impact assessments. SEC should require high-pressure gas pipelines and their infrastructure to meet the same standards as wind energy systems as specified in Site 301.14(f)(2). If no more than 5dBA above background is appropriate for wind, this should be applied to all energy systems. In addition, SEC should require compressor stations and gas valve and meter stations to be sited within

enclosed buildings constructed to reduce noise and vibration impacts on surrounding properties.

- Application requirements to ensure quality construction that minimizes safety issues. Quality construction seems to be lacking in new pipelines. In light of PST's findings that newer pipelines are failing more frequently than ones 75 years old, the SEC would be prudent to make a rule that no new pipeline construction until the problems are identified. In the absence of such a safety measure, SEC should insist that high-pressure gas pipeline applicants adhere to industry standards for all aspects of pipeline construction, maintenance, and reporting as covered in Code of Federal Regulations title 49 part 192 —TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE: MINIMUM FEDERAL SAFETY STANDARD. SEC should require verification of compliance to these regulations by continued on-site inspections by qualified industry experts independent from but funded by the pipeline company, reporting to the appropriate NH agencies both during and after construction. Since these standards are a minimum, SEC should also require that applicants meet the following requirements for construction·
- Class 4 pipe should be used everywhere, including rural areas.
- Pipelines should be buried below the frost line all along their routes.
- Independent electrical engineers (funded by the applicant) should determine that the grounding arrays for high-pressure gas pipelines that follow power lines are sufficient to prevent corrosion, ·
- Daily inspections by independent contractors (funded by the applicant) for pipe welds, grounding arrays, fill material and placement, blasting, and whatever else needs inspection before the pipeline is buried. X-ray inspection for ALL welds should be required. ·
- Regarding blasting, SEC should require well testing and foundation inspections before and periodically after blasting for all wells and buildings up to 1,000 feet away from pipeline blasting sites. Well tests should be for quantity as well as quality, and include radon, arsenic, benzene, VOCs and chemicals used in blasting among other parameters. Foundation inspections should include basement air testing for radon.
- Not only is quality construction vital for safety, ongoing pipeline maintenance must be responsibly carried out. SEC should insist that high-pressure gas pipeline applicants meet the following requirements for maintenance:·
- Independent electrical engineers (funded by the applicant) should determine that maintenance plans for grounding arrays are sufficient and implemented.·
- Staff present daily at compressor stations to monitor and eliminate leaks. Industry practice appears to be for compressor stations to be unstaffed most of the week.·
- Pigging stations must properly contain and dispose of residue from cleaning pipelines.
- A maintenance plan for all above-ground infrastructure should be approved by independent engineers.

Thank you for your consideration.

Beverly Edwards
Chair, Temple Energy Committee
603-878-3227

COMPRESSOR STATION HAZARDS

The possibilities for health, safety or environmental harm resulting from natural gas compressor stations are many and serious.

Some of these include: **Explosions fires leaks and spills…..**

plus fugitive emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), as well as other potential exposure threats, such as radon 222, radium 226 ,radium 228 and lead.

EMISSIONS

While all of these hazards have been well documented nationwide the most prevalent is the intentional (routine) "blow-downs". Accidental releases of VOCs and NOx also occur. **But all possible threats need to be considered when allowing compressor stations to operate….especially in close proximity to:**

homes, work places, playgrounds,

schools, water resources & farms

The types of VOCs and NOx commonly emitted include:

Formaldehyde, benzene, toluene, ethyl benzene, xylene, hydrogen disulfide, carbon monoxide(CO), carbon dioxide (CO2), sulfur dioxide (SO2), methane (CH4)….

and other compounds or elements that are toxic, carcinogenic or neurotoxic, and which are prone to causing major adverse health effects in humans and animals.

NOISE

Compressor stations are loud. "Blow-downs" can last from 20 minutes to 2-3 hours, from 12 - 40 x yr. The noise is comparable to a commercial jet taking off. They often occur in the middle of the night.

The sound of regular compressor station operation has been compared to four diesel locomotive engines running 24/7. Residents as far as a mile away can hear the racket. This humming can cause hearing impairment and cardiovascular problems.

*All data and statements on this page are from Mina Hamilton's research in Madison County, NY- She is a Research Associate at Radioactive Waste Management Associates.

HEALTH IMPACTS

"Reported by People Living 50 feet to 2 miles from Compressor Stations and Metering Stations." –from research by Wilma Subra, ex-Vice-chair of EPA National Advisory Council for Environmental Policy and Technology http://www.earthworksaction.org/files/publications/SUBRA_3_Shale_Gas_Plays-health_Impacts_sm.pdf

Frequent Nausea*	Throat Irritation*	Eyes Burning*	Nasal Irritation*
Sinus Problems*	Bronchitis*	Persistent Cough	Weakness*
Tiredness*	Chronic Eye Irritation*	Shortness of Breath	Muscle Aches*
Dizziness*	Ringing in Ears	Sores & Ulcers in Mouth	Urinary Infections
Depression*	Decreased Motor Skills*	Falling, Staggering*	Frequent Irritation*
Brain disorders*	Severe Headaches*	Frequent Nose Bleeds	Sleep Disturbances
Difficulty Concentrating	Joint Pain	Nervous System Impacts	Forgetfulness
Irregular/Rapid Heart Beat	Strokes	Allergies	Easy Bruising
Severe Anxiety*	Excessive Sweating	Abnormal EEG*	Spleen
Lump in Breast	Pre-Cancerous Lesions*	Amnesia	Thyroid Problems

*61% of Health Impacts Associated with Chemicals present in Excess of Short and Long Term Effects Screening Levels in the air.

Compressor Station Safety Record

Explosions & Fires at compressor stations are documented throughout the country.

From Mina Hamilton's research for NY State (w/3 comp station explosions added)

Since 2011, there have been 17 accidents - explosions and fires at compressor stations, in the following towns and others:

Lathrop, PA,	Brooklyn Township, PA,	Montrose, PA,
Branchville, NJ,	Langton, OK	Clinton, AK
Windsor, NY,	Pinedale, WY,	Nine Mile Canyon, UT
Marengo County, AL,	Oaktown, IN,	Crockett, Texas
Gray County, TX,	Bradford County, PA, among others……	

Involving evacuations, hospitalizations and 1 fatality

NATURAL GAS PIPELINE SAFETY VIOLATIONS

An average of more than one "significant incident" per week has occurred along high-pressure gas transmission lines nationwide in the last 20 years - Pipeline & Hazardous Material Safety Administration

KINDER MORGAN'S PIPELINE SAFETY RECORD IS ABYSMAL !

Since 2003, Kinder Morgan has had at least "180 spills, fires, evacuations, explosions and fatalities in 24 states"- PHMSA

In 2011, PHMSA cited Kinder Morgan for these safety violation:

Failing to test pipeline safety devices,
Failing to inspect its pipelines as required,
Failing to adequately monitor pipes' corrosion levels.

In 2013, the headline "Wall Street Worries About Kinder Morgan's Safety Record": Pipeline operator slashes and defers maintenance spending-- was a concern to anyone who lived or worked near a Kinder Morgan pipeline.

The Wall Street Journal - "Is Kinder Morgan Scrimping on its Pipelines?" Deferred maintenance may account for the high number of Kinder Morgan pipeline accidents in the last decade.

PHMSA's incident reports for Kinder Morgan's gas transmission pipelines shows: 45% were caused by faulty infrastructure
28.3% were caused by failure of the pipe, a cracked weld, and pipeline equipment,
16.8% were caused by corrosion

Kinder Morgan's SEC 10-K filing:

"**From time to time, despite our best efforts, our pipelines experience leaks and ruptures….**

These leaks and ruptures may cause explosions, fire, and damage to the environment, damage to property and/or personal injury or death."

New Hampshire

Not The Next Minisink!

Although not a KM/TGP project
the story and results here
will be the same!

This story did happen
It continues to happen
and will happen here
unless
we do things differently!

Minisink, NY

- **Small, rural town west of Brewster NY**
- **Compressor station (CS) added to existing Millennium pipeline in 2013…12,260 horse power**
- **Town fought to site CS outside of town on pipeline owned land…far from homes**
- **FERC voted 3-2 to site in town rather than the existing alternative. Dissenters cited air quality would suffer**
- **Town took to court and lost**

Minisink, NY

- **In the fall of 2014 SWPA-EHP initiated a community health and air pollution project in Minisink, New York. SWPA-EHP was fortunate to have a community willing to participate in this first effort at monitoring impacts from a natural gas compressor station. The residents' cooperation in the air monitoring effort and in the health assessment process was a key factor in the project's success**

Minisink, NY

- **Soon after CS operation commences residents report nosebleeds, headaches, asthma, rashes etc.**
- **SWPA-EHP conducts health and air quality study**
- **Volatile Organic Compounds, as expected, are captured in the air canisters**
- **Higher than expected Particulate Matter is present**

Minisink, NY

- **Elevated amounts of Particulate Matter PM 2.5 are found, 17-20 micro grams per cubic meter (mg/cm)**
- **3 TIMES the national average of 6.3 mg/cm**
- **Well above the EPA limit of 12 mg/cm**
- **Multiple episodes of peaks into the hundreds, as high as 426, were also recorded by Speck monitors**
- **One home had a 24-hour average of 64**

Minisink, NY

- June 2015 **Harvard study shows health risks with PM 2.5 levels above 6** include reduced lung function, heart disorders and increased BP

- **Each 1 microgram per cubic meter increases the mortality rate by 1% for people over 65**

- Dec 2014 **Harvard study shows high PM 2.5 levels in the 3rd trimester of pregnancy DOUBLE the risk of newborn autism**

Minisink, NY

- ***No** pre-construction air quality or health assessments were done which nullified request to close Compressor Station*

- **Emissions now total 61,000 tons annually, before blowdowns**

- **Examples of chemicals found in canisters:**

  Volatile Organic Compounds, Methane, Acetone, Ethylbenzene, Dichlorodifluoromethane, Ethanol, Ethylbenzene, Propene, Toluene, Trichlorofluromethane, Trichlorotrifluoroethane

Minisink, NY

- **Radium 226 and 228 are found in large quantities in Marcellus Shale gas**
- **Radium scale builds up in pipeline and CS which must be periodically removed and properly disposed of not dispersed into the environment**
- **Radium is known cause of bone and lung cancer**

Minisink, NY

- **Dr. Wilma Subra's presentation on:**

  "Potential Environmental and Human Health Impacts Associated with the Minisink Compressor Station" summarizes the dangers posed to the communities of New Ipswich, Temple and Greenville if a station over 3 times as large is built

- (The link can be found in bold print on links pg.)

New Hampshire

- **KM newsletter states that hazardous air pollutants have been removed prior to transfer into TGP pipeline system**
- **What is removed is sulfur…not other toxins, VOC's etc., and benzene is actually increased**
- **KM's brochure for Emergency Responders states, Pipeline Incident Response Tactics - Conduct vapor monitoring for H2S, LEL and Benzene, Refer to guidebook 130 Benzene**

Dr. Wilma Subra

- **Speaking on the chemicals released from Compressors**
- **This is not the presentation mentioned on previous slide**
- **https://youtu.be/R403JjaxnTs?t=20**

Minisink, NY

- **Currently, 7 miles from Minisink, in Wawayanda, NY, a gas fired power plant to produce electricity is under construction by Competitive Power Ventures. Citizens of the area have filed suit to stop construction**

- **To compensate for emissions exceeding local limits, CPV bought emission reduction credits (ERCs) from other companies not using their permitted amounts. Those companies are in Philadelphia, 375 miles away.**

- **CPV ERCs include credits for 75 tons of volatile organic compounds (VOC's), which the World Health Organization deems unsafe and carcinogenic in any amount. So CPV's total VOC emissions annually are actually 140 tons, more than twice the local limit. On an average day, the plant would emit a volume of VOCs that could fill a large barn.**

Dr. David O. Carpenter

- **Director of the Institute for Health and Environment at the University of Albany**
- **He is speaking in Nassau NY which has a proposed compressor station similar to New Ipswich**
- https://youtu.be/RPyXaAwHM_8?list=PL8i7qTPiGAF5VSxuf5kSavHGNxbs-JT6D

New Hampshire

- **Now slated to have one CS in New Ipswich with KM already saying they plan to add more CS's along the route…possibly one every 17 miles**
- **Like Minisink the New Ipswich CS would be close to dozens of homes, the Temple Elementary School, numerous wells and the Greenville reservoir**
- **Air pollution would easily reach the centers of Temple, New Ipswich and Greenville…and beyond**
- **How long before WE get a gas fired power plant?**

New Hampshire

- **At 41,000 HP, the New Ipswich CS would be over three times that in Minisink; at 80,000 HP it would be over six times its size**
- **Amount of toxins released and area of dispersion is proportional to size of CS**
- **Expected total emissions (not VOC's) 200,000-400,000 tons annually**
- **Area of dispersion very dependent on height of stack and wind conditions**

What an 80,000 HP Compressor Station looks like Haven, Kansas

https://vimeo.com/139932144

Earth Works

- **A non-profit dedicated to protecting residents from the effects of energy production and transportation**
- **Have worked with SWPA-EHP and Wilma Subra to study Marcellus Shale wells and transportation**
- **Findings include:**
  - **Actual pollutants from Compressor Stations exceed modeling estimates prior to construction**
  - **90% of individuals within a 2-3 mile radius of Compressor Stations experience health impacts**

Are Blowdown Emissions considered in permit applications?

- Blowdowns of raw gas should be counted in “modelling” a CS
- https://youtu.be/yXLD3e7EoI8?list=PL8i7qTPiGAF5VSxuf5kSavHGNxbs-JT6D

- Venting in Union County FL
- https://youtu.be/6a_uV6c-Nu0?list=PL8i7qTPiGAF5VSxuf5kSavHGNxbs-JT6D

Dr. David Brown

- **To attain permits, pipeline companies use analysts who manipulate projected emissions levels to make them acceptable by Environmental Protection Agency standards, Brown says. Those standards are also weakened by industry lawsuits when the EPA tries to tighten them. "They delude themselves about emissions safety," says Brown.**

- **By segmenting and averaging emissions over long periods and shortening technology operation periods, emissions levels can be calculated that fall below a level designated "major source." A project designated "major source" necessitates an Environmental Impact Assessment that requires hazards to be more thoroughly investigated.**

Dr. Wilma Subra

The rules and regulations have minor and major emitters. The companies always make sure they are just below the concentration that would make them major because when you're major you have to comply with a whole lot more modeling. They all want to be minor sources.

FERC, EPA & DES Will Protect Us?

- **FERC system is broken and is under fire to change. Fact is, the existing rules will be what FERC enforces**
- **The EPA has been weakened in recent years due to budget cuts. In addition when they introduce more stringent regulations, big industry lobbies, sues and ultimately negotiates a lowering of the intended requirements**
- **DES – remains to be seen – if like other states, if FERC approves, so will they.**

Dr. Wilma Subra

- **Wetlands, endangered species, bird migrations etc., even schools, don't matter**

- **The only way you're going to stop this is through your Congressional Delegation**

What Our Governor and Congressional Delegation Must Do For Us

- Stop the project if there is no proven NET benefit to NH
- Insist on electric compressors
- Demand air, water, soil and health testing before, during and after construction at KM expense by independent 3rd party
- Demand that the Compressor Station be designated a “Minor or Major Source” via independent 3rd party modeling

Reference Material

Dr. Wilma Subra

- **Has just completed a seven year term as Vice-Chair of the Environmental Protection Agency National Advisory Council for Environmental Policy and Technology (NACEPT)**
- **A five year term on the National Advisory Committee of the U. S. Representative to the Commission for Environmental Cooperation**
- **A six year term on the EPA National Environmental Justice Advisory Council (NEJAC) where she served as a member of the Cumulative Risk and Impacts Working Group of the NEJAC Council, and chaired the NEJAC**
- **Dr. Subra holds degrees in Microbiology/Chemistry from the University of Southwestern Louisiana**
- **She received the MacArthur Fellowship Genius Award from the MacArthur Foundation for helping ordinary citizens understand, cope with and combat environmental issues in their communities and was one of three finalist in the Environmental Category of the 2004 Volvo for Life Award.**

Dr. David Brown

- **Dr. David Brown is the Public Health Toxicologist and Director of Public Health Toxicology for Environment and Human Health, Inc.**
- **He is the past Chief of Environmental Epidemiology and Occupational Health in Connecticut and was previously Associate Professor of Toxicology at Northeastern College of Pharmacy and Allied Health.**
- **He also served as Deputy Director of the Public Health Practice Group of Agency for Toxic Substances and Disease Registry (ATSDR) at the National Centers for Disease Control and Prevention in Atlanta, Georgia**
- **Dr. Brown graduated from Cornell University in Biochemistry, received his MS from the University of California In Environmental Health, and his ScD from Harvard School of Public Health in Toxicology**

Links For Presentation Data

(Right click & select "open hyperlink")

http://www.minisinkmatters.org/?p=147#comment-44

http://www.stopmcs.org/?page_id=383

http://www.utne.com/environment/gas-compressors-and-nose-bleeds-zm0z15fzsau.aspx

http://www.stopmcs.org/?p=1072

http://www.environmentalhealthproject.org/wp-content/uploads/2015/06/Summary-of-Minisink-Results.Public.pdf

https://www.youtube.com/watch?v=RYdrSe-USxg

http://www.environmentalhealthproject.org/wp-content/uploads/2012/03/Compressor-station-emissions-and-health-impacts-02.24.2015.pdf

Links For Presentation Data

(Right click & select "open hyperlink")

http://www.hsph.harvard.edu/news/press-releases/air-pollution-below-epa-standards-linked-with-higher-death-rates/

http://www.hsph.harvard.edu/news/press-releases/fine-particulate-air-pollution-linked-with-increased-autism-risk/

http://www.utne.com/environment/gas-compressors-and-nose-bleeds-zm0z15fzsau.aspx

http://www.catskillcitizens.org/learnmore/subraminisink.pdf

http://www.stopmcs.org/?p=1185

http://www.minisinkmatters.org/?p=242

http://des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-ehp-22.pdf

Links For Presentation Data

(Right click & select "open hyperlink")

http://caselaw.findlaw.com/us-dc-circuit/1675630.html

http://www.minisinkmatters.org/?p=263

http://www.utne.com/environment/effects-of-air-pollution-zm0z15fzsau.aspx?PageId=3#ArticleContent

http://www.kindermorgan.com/content/docs/er_brochure.pdf

http://www3.epa.gov/air/ej/conference2007/Wilma_Subra_Bio.pdf

Please feel free to edit this presentation, changing names to the towns affected in your area!

What is missing from this presentation

- ***This Power Point Presentation should be accompanied by a MS Word Doc - Not the Next Minisink! This document is a 3 page narrative version of the Minisink story with links to supporting data embedded as the story progresses.***

- Other medical related links of interest…..
- John Hopkins Study Pregnancy complications http://marcellus.com/news/id/130030/new-study-links-active-gas-wells-to-pregnancy-complications-preterm-birth/
- Physicians for Social Responsibility latest study http://concernedhealthny.org/wp-content/uploads/2012/11/PSR-CHPNY-Compendium-3.0.pdf

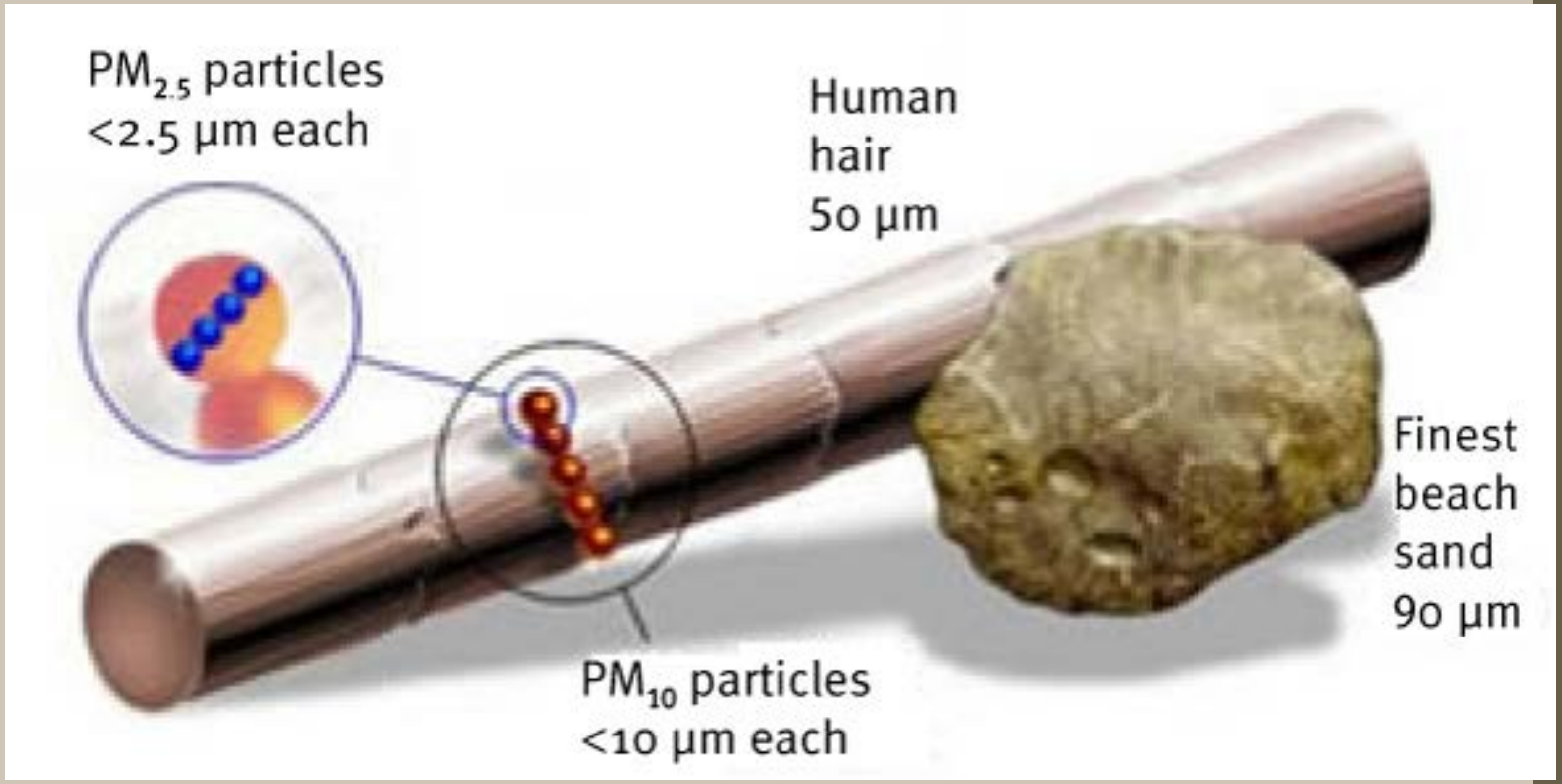
What is missing from this presentation

- Health Professionals open letter to FERC https://docs.google.com/document/d/1aTx7Xf1ISU8S4zUf-ofTifz5b-_C7ZF3F2O8r6cJqBQ/edit
- Doctors urge Cuomo to put brakes on http://www.timesunion.com/business/article/Governor-asked-to-put-brakes-on-natural-gas-6571163.php#
- 100+ studies on health & safety re. fracking just released http://ecowatch.com/2015/10/14/health-risks-fracking/
- UTNE - the real cost of fracking http://www.utne.com/environment/cost-of-fracking-zm0z14fzsau.aspx
- CS & Toxic Gases http://nopipelies.org/compressor-stations/

Next Steps

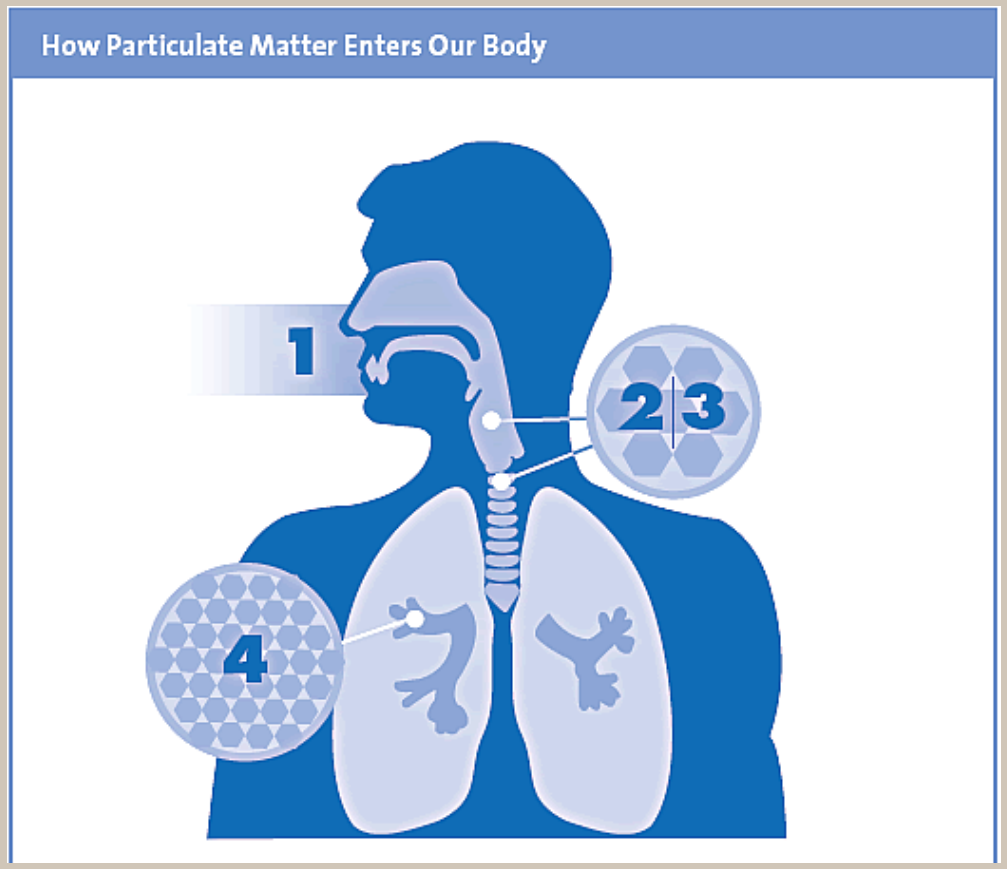
- **Get NH Medical Society to oppose this project…like NYMS**
- **Meet with Congressional Delegation to make this presentation….if you do nothing here's what going to happen to thousands of NH residents…the time to act is now**
- **Hold large informational meetings to inform public**
- **Get this presentation and video out on social media**

Particulate matter



Organic compounds, metals

Particulate matter



2100 premature deaths in one summer*, eastern US cities

Stroke, heart disease, diabetes, stillbirth, low birth weight

* X Hou et al (2015). *Environmental Research*, v137, 475-484

Particulate matter

EPA standards:[1]

Annual limit 12 mcg/m^3

24hr limit 35 mcg/m^3

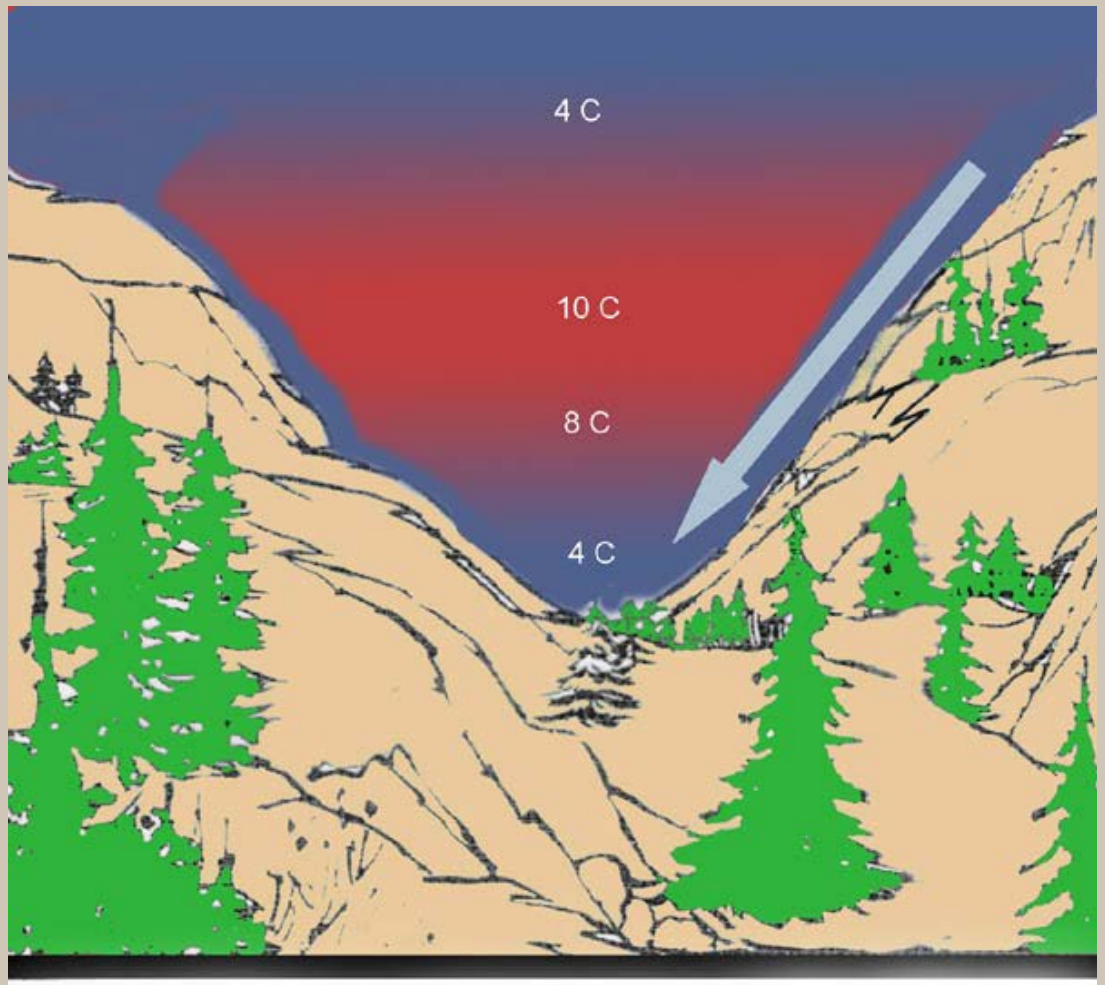
Increase of 10 mcg/m^3 for one day:

Cardiopulmonary mortality up to 5.3% higher [2]

Asthma diagnoses up 10%-12% [3]

1) http://www3.epa.gov/ttn/naaqs/criteria.html
2) Samoli et al (2014). *Environment International*, v67, 54-61
3) JK Wendt et al (2014). *Environmental Research*, v131, 50-58

Inversions



Zone of warm nighttime temperatures above a valley temperature inversion. (From Schroeder and Buck. 1970)

Inversions

Inversions

Inversions

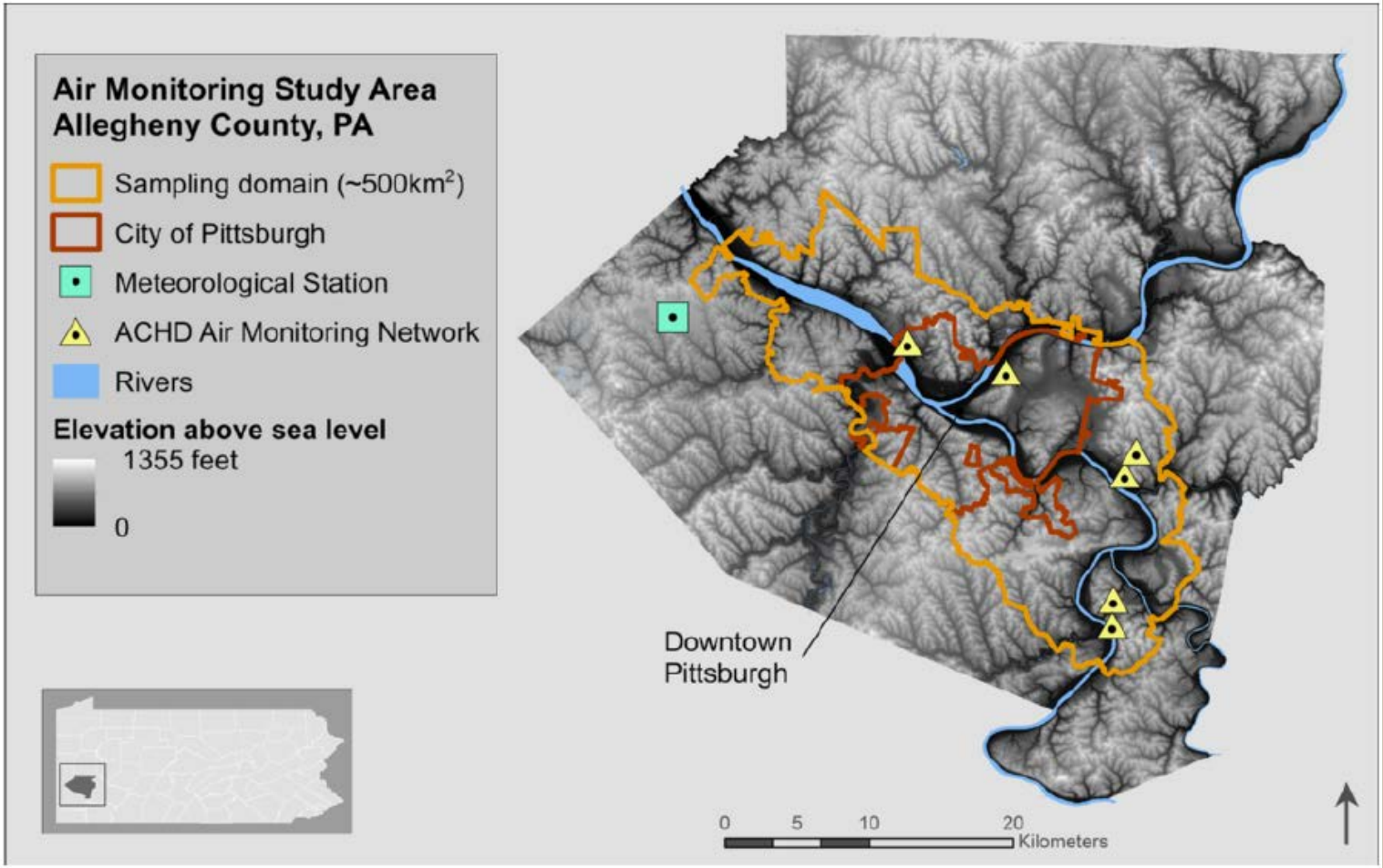


Figure 1 Air monitoring study domain.

Schmool et al (2014). *Environmental Health*, v13, 28-44.

Inversions

Summer:

- No relationship between PM and elevation
- Higher NO_2 levels at lower elevations

Winter:

- Higher PM and NO_2 levels at lower elevations

Schmool et al (2014). *Environmental Health*, v13, 28-44.