BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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NC DENR, Division of Air Quality
Planning Section, Attainment Planning Branch
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Re: North Carolina Proposed Nonattainment Ozone Boundaries

Dear Mr. Bridgers:

We appreciate that you have permitted us to submit our comments to you after the announced deadline (Jan. 31, 2009), on behalf of the Blue Ridge Environmental Defense League (BREDL), in response to the NC Division Air Quality's request for comments on its Proposed Boundaries for Ozone Nonattainment Areas in North Carolina.

BREDL is a regional, community-based non-profit organization committed to protecting human health and the environment. Our founding principles are Earth stewardship, environmental democracy, social justice and community empowerment. We have over 2,500 members, and over 30 active chapters dedicated to protecting public health and the environment.

BREDL is committed to ensuring that nonattainment boundaries are set in a manner that is consistent with the requirements of the Clean Air Act (CAA) to protect public health. For this reason we strongly support the findings of EPA's National Ambient Air Quality Standards for Ozone: Final Rule (40CFR, Parts 50 and 59, March 27, 2008) that lowers the new primary ozone standard from 0.08 ppm to a level of 0.075 ppm. This new standard was based on numerous epidemiological studies conducted over the past decade in which may of the health effects associated with exposures to ozone were identified. http://www.epa.gov/fedrgstr/EPA-AIR/2008/March/Day-27/a5645.pdf

We request that the NC DAQ support the following recommendations to its Proposed Nonattainment Boundaries:

- Follow the EPA's guidance in adopting a regional approach in determining nonattainment boundaries by including all NC counties in whole as cited in EPA's Presumptive Boundaries.
- Consider combined contributions of air toxics - VOCs, carbonyl compounds and PM components - that contribute to ozone pollution.
- Consider single sources of ozone pollution in rural counties, such as incinerators and coal-fired power plants, in nonattainment boundaries.
- Consider permits from significant ozone contributing industries, such as Fibrowatt LLC, that plan to build incinerators in rural counties.

- Consider combustion sources from industry that are contributors to ozone pollution.
- Consider the impacts of multiple sources of "ozone contributors" in rural counties and adjacent counties.
- Purchase additional ozone air monitors to accurately assess ozone levels in nonattainment areas.

Two decades later: NOx and ozone still an issue

The Clean Air Act Amendments of 1990 identified NOx and other criteria pollutants as major air pollution problems. At that time, the state's approach to air pollution was piecemeal at best. In 1999, BREDL submitted comments on the nitrogen oxide reduction plan proposed by the NC Department of Environment and Natural Resources. We submitted a plan for an 80% reduction in NOx emissions from the 14 large coal-fired power plants operated by Carolina Power & Light and Duke Energy, a reduction plan that was deemed achievable by the NC Division of Air Quality's Technical Services.

The problem of ozone pollution in NC was further delineated in comments made to the Environmental Management Commission (EMC) by Louis Zeller, BREDL, "Reduce Nitrogen Oxide Emissions From Coal-fired Electric Utility Boilers," at a Public Hearing on July 17, 2000:

High ozone levels caused the state to issue health advisories telling people to stay indoors to avoid breathing problems, asthma attacks, and respiratory infections. Ozone inhibits plant growth and damages crops. NOx emissions create ozone, reduce visibility, and contribute to acid rain, nitrate hazards in drinking water, and formation of toxic air pollution. National parks and other Class I areas, which are supposed to have the most pristine air in the country, are more polluted than cities. In fact, the two most polluted national parks in the nation are the Great Smoky Mountain and the Shenandoah National Parks. http://www.bredl.org/air/ncnox070500.htm

Nine years later, we continue to grapple with the same ozone pollution that threatens North Carolina cities, urban neighborhoods and rural areas, as well as the entire mountain region of the state. Our organization is working hard to reduce air pollution from all fossil-fuel burning sources including utility power plants and industrial boilers. As such, we advocate for a regional approach to the effort to reduce air pollution. Air pollutants, including ozone, NOx, SO2, air toxics, and particulate pollution are all part of the same problem for communities. They affect health, visibility, and the economy.

Much of North Carolina is experiencing rapid growth, and with that growth come increased levels of pollution and increased levels of ozone. Nonattainment boundaries should not be limited to urban areas alone; counties that are largely rural are being targeted as sites for big industry, polluting industries that will be contributing to higher levels of ozone as well as other types of pollution.

We know that human activities contribute to various levels of pollution that ultimately result in the formation of ozone. Such activities involve using leaf blowers, furnaces, power boats, jet skis, grilling steaks on charcoal grills, cutting grass using gas-powered lawn mowers, and driving gas-guzzling cars. Businesses that contribute to ozone are dry cleaners, commercial printers, gas stations, lawn mowers, airline industries, waste-to-

energy plants (i.e., incinerators), landfills, and coal-fired power plants. All of these contribute to various levels of ozone formation.

Waste-to-energy - or waste-to-pollution?

For example, Fibrowatt LLC is targeting a number of rural counties in NC for poultry waste burners. So far, two sites have been selected for plants in Surry and Sampson Counties in NC. These so-called clean "waste-to-energy" poultry waste burners produce more ozone pollution than a new coal-fired power plant, and will be major sources of contributors to ozone, emitting enormous amounts of NOx and other pollutants. http://www.bredl.org/energy/fibrowatt.htm

The NC Environmental Management Commission (EMC) supports our findings concerning the threat of burning poultry waste that is listed among other "clean energy" solutions in the state's renewable portfolio. To review the EMC's findings, see the attached document, "Comparison of Emissions from Controlled Coal and Biomass Combustion," NC Environmental Management Commission, Renewable Energy Committee, July 9, 2008. The graphs show that PM and CO emissions from poultry burners are higher than the same emissions from new coal-fired power plants. NOx emissions from poultry manure burning plants are almost four-times the amount of NOx emissions (based on power production) from new coal-fired power plants.

It has been said that the expansion of the auto emissions testing program, and the passing of the Clean Smokestacks Act, in 2002, have tremendously improved North Carolina's air quality. However, despite these improvements, people continue to breathe unhealthy levels of ozone. Poor atmospheric mixing and air inversions can increase ozone concentrations in populated areas to dangerous levels in a matter of hours. The risk to the very young, the elderly, and to people with heart or respiratory disease, and children is especially serious.

Health and environmental impacts from ozone pollution in NC

All children are at risk from ozone exposure because they often spend a large part of the summer playing outdoors, their lungs are still developing, they breathe more air per pound of body weight, and they are less likely to notice symptoms. Health studies have indicated that high ambient ozone concentrations may impair lung function growth in children, resulting in reduced lung function in adulthood. Both children and adults who frequently exercise outdoors are particularly vulnerable to ozone's negative health effects, because they may be repeatedly exposed to elevated ozone concentrations while breathing at an increased respiratory rate.

Asthmatics and other individuals with respiratory disease are especially at risk from elevated ozone concentrations. Ozone can worsen, and may trigger, asthma attacks. Ozone may also contribute to the development of asthma. A recent study published in the British medical journal The Lancet found a strong association between elevated ambient ozone levels and the development of asthma in physically active children. http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(02)07597-9/abstract
Ozone pollutes our surface waters. The nitrogen oxides that contribute to ozone pollution fall back to the earth as nitrogen compounds, contributing to nutrient pollution of streams, rivers, and estuaries. As much as half of the nitrogen pollution in North Carolina's coastal waters may come from air pollution, and nutrient pollution contributes to algal blooms, reduced oxygen content of water, and fish kills.

Ozone pollution can damage plant tissues, reducing growth rates and agricultural yields. Ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. In 1995, ozone pollution caused $2.7 billion in crop loss nationwide, according to the U.S. EPA. Ground-level ozone damages the foliage of trees and other plants, impacting the landscape of cities, national parks and forests, and recreation areas.
http://daq.state.nc.us/airaware/ThinkActBreathe/details2.shtml

In addition to NOx, VOCs contribute to ozone pollution. Ozone is a secondary pollutant, and is formed as a result of a complex interaction between ozone precursors, meteorological conditions and photochemistry. Volatile organic compound (VOCs) concentrations are part of the root causes of ozone formation.

VOCs contribute significantly to ozone pollution

We also wish to emphasize the importance of toxic air pollutants, and specifically, the role of VOCs as contributors to ozone formulation. There are forty-nine (49) air toxics indentified as significant contributors to ozone formation. These include:

Volatile Organic Compounds
1,3-butadioene
Methylene chloride
Methyl *tert* butyl ether
Chloroprene
Carbon tetrachloride
Benzene
Trichloroethylene, and toluene
Tetrachloroethylene
Ethyl benzene
O,m,& p-xylenes
Styrene
1,4-dichlorobenzene
d-limonene
a- and b-pinene

Carbonyl Compounds
Formaldehyde
Acetaldehyde, and acrolein
Crotonaldehyde
Glyoxal
Acetone
Propionaldehyde
Benzaldehyde
Hexaldehyde
Isovaleraldehyde
Valeraldehyde
o-toluladehyde
m&p-tolualdehyde

PM Components
PM 2.5
http://files.harc.edu/Sites/TERC/About/Events/SAC200506/SpecificIssuesAirToxics.pdf

Ozone is not usually emitted directly into the air, but is created by a chemical reaction between oxides of nitrogen (NOx) and VOCs in the presence of sunlight. Many urban areas tend to have high levels of "bad" ozone, but rural areas are also subject to increased ozone levels because wind carries ozone and pollutants that contribute to its formation hundreds of miles away from their original sources.
http://www.epa.gov/air/ozonepollution/

EPA's regional approach to nonattainment areas

A 2008 Memorandum from EPA to Regional Administrators, "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards," notes that Section 107(d)(1) of the CAA defines an area as being in nonattainment if it is violating the National Ambient Air Quality Standards (NAAQS), or if it is contributing to a violation in a nearby area.

The Memorandum further notes that the EPA *"believes it is important to examine ozone-contributing emissions across a relatively broad geographic area;"* therefore, the EPA recommends that the Core Based Statistical Area (CBSA) or Combined Statistical Area (which includes two or more adjacent CBSAs) associated with the violating monitor(s) serve as the starting point for or presumptive boundary for evaluating the geographic areas of an ozone nonattainment area. Where there is not a violating monitor(s) located in a CBSA or CSA, the EPA recommends that the boundary of the county containing the monitor serve as the starting point for considering the extent of the nonattainment area.
http://www.scdhec.gov/environment/baq/docs/OzoneBoundaries/20081204_AreaDesignations2008RevisedOzoneNAAQSGuidanceUpdated.pdf

The EPA's Presumptive Nonattainment Boundaries include the following counties in whole: Stokes, Surry, Yadkin, Harnett, Iredell, Johnston, Chatham, Anson, Stanly, Haywood, Swain, Currituck and Hoke Counties. In contrast, the DAQ's Proposed Non-Attainment Boundaries omit all of these counties, and include only portions of Chatham, Johnston, Caswell, Haywood, Swain and Burke Counties. After a careful review of the EPA's *Green Book*, "Nonattainment Status for Each County by Year Report," it appears that DAQ has merely taken those counties designated as "Part" in the column "County N/A Whole/Part," and used the designation literally by assigning them *partial designations* in its Proposed Nonattainment Boundaries. However, the EPA has included each of these counties in whole in its final Presumptive Nonattainment Boundaries assessment.

We agree with EPA's recommendation that each of these counties be included in NC's Proposed Nonattainment Boundaries in whole due to their locations adjacent to counties currently in nonattainment. It is very likely that many of these counties will soon have industries that will be major contributors to ozone pollution. Others, like Stokes County, already have industries in place that are major contributors to ozone pollution.

Children are exposed to ozone and other air toxics in rural counties

Some of the examples below cite the USA Today report, "The Smokestack Effect: Toxic Air and America's Schools," concerning exposures from toxic air pollutants from industries on school children living in various counties across the nation. We cite the USA Today report for two reasons: 1) to show that some of these industries release compounds known to contribute to ozone formation; and 2) to show that emissions from

some industries, such as coal-fired power plants, know no boundaries and cross county lines to contribute to ozone pollution in other counties.

The measures in the report are based on a model and estimates emissions, thus they are subject to some limitations. Toxicity assessments for each school are based on emissions data collected by the U.S. Environmental Protection Agency as part of its Toxics Release Inventory program (TRI). Generally, only large industrial and government facilities are required to report to the TRI, meaning there are many other potential sources of pollution that are not included in the agency's data. As a result, those sources also are not included in toxicity assessments for schools.

For example, the model makes certain assumptions about topography, the height of smokestacks and the toxicity of certain chemicals, any of which could influence the assessment of toxicity in a particular location. In some cases, the EPA model appeared to underestimate exposure to toxic chemicals. In others, it appeared to overstate it. Also, the model is not meant to assess risk, your chances of getting sick.
http://content.usatoday.com/news/nation/environment/smokestack/methodology

A primary source of NOx in North Carolina is coal-burning in electric utility power plants. Duke Power and Carolina Power & Light operate fourteen (14) coal fired plants which emit a combined total of 490 million pounds of NOx per year; these plants produce 72% of the NOx pollution emitted by all stationary sources in North Carolina. Coal-fired power plants are a major source of ozone pollution.
http://www.bredl.org/air/ncnox070500.htm

As the state's largest coal-fired power plant, the Belews Creek Steam Station in Stokes County is the largest contributor to ozone pollution in Stokes County. Adjacent counties at risk for ozone pollution from the Belews Creek Steam Station include Surry, Yadkin, Forsyth, Guilford and Rockingham. Both Surry and Yadkin have been omitted from NC's Proposed Nonattainment Boundaries.

Additional contributors to ozone

According to a list of statewide combustion sources provided to BREDL by the DAQ, the Belews plant has 4 combustion sources, auxiliary boilers that use a combination of #2 fuel oil, propane and diesel fuels. In addition to the Belews Creek Steam Station, Stokes County has a number of combustion sources that emit VOCs and other pollutants that contribute to ozone formation from industries that include Bill Hanks Lumber; JPS Elastomerics Corp; and Kobe Wieland Copper Products.

In contrast, Surry County has no power plant, but is home to a number of polluting industries with over three-dozen combustion sources at the following industries: Bassett Furniture; Candle Corp of America; Elkin Asphalt Plant; Henredon Furniture; Interface Fabrics Group South; Kentucky Derby Hosiery; RMC Mid-Atlantic; Sara Lee Sock Co; NC Granite Corp; Vaughan- Bassett Furniture; Wayne Farms; and Weyerhaeuser Co. – all contributors at various levels to ozone pollution. Lastly, Surry County may soon be the location of the state's largest contributor to ozone pollution, the Fibrowatt LLC poultry waste burning plant.

Because Surry may soon be home to the state's largest contributor to ozone pollution, we encourage the Division to include Sampson County in the state's Proposed Nonattainment Boundaries. Sampson is also located next to Cumberland County to its

west, and Johnston County to its north, both of which are included in NC's Proposed Nonattainment Boundaries and EPA's Presumptive Nonattainment Boundaries.

Yadkin County should be considered for inclusion as a Nonattainment County because of its strategic location to the southwest of Stokes County's coal-fired power plant, and Surry's three dozen combustion sources.

Iredell County is a veritable industrial center, home to ASMU NC; Bien Fang Products; Bruce hardwood Flooring; Cardinal Glass; Statesville WWTP; Carris Reeling; Donwalt Industries; FoamCOR; G&M Milling; Hexcell Reinforcement; John Boyle & Co.; Kewaunee Scientific Corp.; Lake Norman Regional Medical Center; Matshushita Compressors; Purina Mills; Ready Mixed Concrete; Sara Lee Apparel; Somers Lumber and Manufacturing; Spicer Off-Hwy Products; Thomasville Furniture; Tire Centers, LLC; Transcontinental Gas Pipeline; Troutman Chair Co.; Tyson Foods; Union Grove Moulding and Milling; and last but not least, Warlick Paint Company, Inc. All of these industries have at least one or more multiple combustion sources with emissions that contribute to ozone formation.

Hoke County, located to the west of Cumberland County, is small, but has at least two major industries, Burlington and Conopco, Inc., both located in Reaford. These industries emit numerous pollutants that contribute to ozone pollution. Because Cumberland is home to two major chemical companies, Du Pont and Borden Chemical, and two military bases with multiple combustion sources, ABN Corps & Fort Bragg and Pope Air Force Base, Hoke County should be included on NC's Proposed Nonattainment Boundaries list. Also of note: Fort Bragg will soon be expanding, bringing more people and traffic to surrounding counties, including Hoke County.

Stanly County is home to Alcoa, Inc., as well as several other industries with combustion sources. According to a USA Today report on toxic exposures from industries to school children, the Duke Energy Corp's Buck Steam Station, the oldest coal-fired power plant in the state, is located on the border of Davidson and Rowan Counties adjacent to Stanly County. The Buck Steam Station is cited as a contributor to children's exposures to air toxics at the Albemarle High School in Stanly County. As a coal-fired power plant, it is also a contributor to ozone pollution.
http://content.usatoday.com/news/nation/environment/smokestack/school/66473

Anson County, south of Stanly, has a number of industries that include Wade Manufacturing Co.; Valley Protein; Triangle Brick Co.; and Hornwood, Inc. Air pollutants from these industries include acrolein and formaldehyde, contributors to ozone formation.
http://content.usatoday.com/news/nation/environment/smokestack/school/64789

Harnett County lists a number of industries responsible for toxics outside schools in Harnett County, citing formaldehyde as a toxic pollutant. The report names Fort Bragg; Progress Energy, Inc.; Carolinas Cape Fear Steam Electric in Moncure, North Carolina; Hexion Specialty Chemicals, Inc.; Triangle Brick Co.; and Lee Brick & Tile Co.
http://content.usatoday.com/news/nation/environment/smokestack/school/65597

NC DAQ gave partial designations for Nonattainment Boundaries to Haywood, Swain, Johnston, Caswell, and Burke Counties. Johnston County has Bayer Corp., Andrew Corp., CP&L Generators, Keener Lumber, NC Natural Gas, and PGI Interwovens – as well as the MSW Landfill, all of which have emissions from combustion sources.

Swain and Haywood Counties, located on the western rim of the state, were included for partial designation. Blue Ridge Paper Products resides in Haywood County, the subject of statewide controversy when it was ranked as one of the worst counties in NC in terms of school children's exposures to air toxics. The report named Blue Ridge Paper Products and Blue Ridge Metals as the main contributors to exposures to children at Bethel Christian Academy, ranked in the 1st percentile for high levels of children's exposures to air toxics, specifically from formaldehyde and acetaldehyde, carbonyl compounds that contribute to ozone formation.
http://content.usatoday.com/news/nation/environment/smokestack/school/118297

The report lists chlorine and chlorine dioxide as additional releases from Blue Ridge Paper products. The Union of Concerned Scientists concludes: *When chlorine is released into the atmosphere, it drifts up into the stratosphere, pushed by winds and atmospheric mixing. At that high altitude, energetic light rays (UV-C radiation) can break down such molecules in a reaction that liberates an atom of chlorine (Cl). This chlorine atom can react with ozone and break it down to chlorine oxide and O2. Chlorine oxide will break down as well, releasing the Cl to go on destroying ozone. In fact, one Cl can destroy up to 10,000 ozone molecules!*
http://www.ucsusa.org/global_warming/science_and_impacts/science/faq-about-ozone-depletion-and.html

The report also names Carolina Power & Light Co., in Asheville, as a contributor to exposures to children in Haywood County schools from toxic air pollutants. Swain County is located to the southwest (downstream) of Haywood County. Because of Haywood's location, both Haywood and Swain Counties should be placed on the state's Proposed Boundaries for Nonattainment list in whole.
http://content.usatoday.com/news/nation/environment/smokestack/school/118297

The USA Today report concluded that polluting industries most responsible for toxics outside Johnston schools include Carolina Power & Light Co.'s H.F. Lee Steam Electric Station in Goldsboro, North Carolina, and U.S. Army Base at Fort Bragg, NC.
http://content.usatoday.com/news/nation/environment/smokestack/school/65730

Chatham County had it own numbers of polluting industries (10+); however, once again the USA Today report cited Progress Energy, Inc., Carolinas Cape Fear Steam Electric, as contributing to exposures to children at Chatham Early College in Pittsboro, as well as other schools in other areas of Chatham, as contributing to exposures to children from air toxics. http://content.usatoday.com/news/nation/environment/smokestack/school/65086

Both Burke and Caswell Counties are located next to Alexander and Catawba Counties, which have been listed by EPA and NC DAQ as nonattainment counties. However, Burke is home to dozens of polluting industries, mainly furniture, textile and chemical plants, many with combustion sources contributing to ozone pollution. In contrast,

Alexander County has fewer industries than Burke County, so it is unclear why Alexander is a listed by NC as a nonattainment county, and Caswell County has been given partial nonattainment status by the state.

In lieu of another piecemeal approach that proposes to partially solve the problem through a partial solution, we respectfully request that the NC Division of Air Quality adopt the EPA's Presumptive Nonattainment Boundaries as recommended by the EPA.

A straightforward, regional approach such as that recommended by the EPA will safeguard the health of citizens in urban as well as rural areas that may be impacted by ozone pollution from adjacent counties in nonattainment.

Under the newly proposed standards, there are 21 counties of the 30 counties where DAQ operates air monitors to detect ozone levels, thus we recommend that DAQ purchase more air monitors for its ozone nonattainment program in order to assess ozone pollution levels in additional counties.

Thank you for your consideration. If you have any questions regarding these comments please feel free to contact me at: 336-525-2003.

Sincerely yours,

Susan Dayton, Statewide Coordinator
BREDL NC Healthy Communities