

# ***Alleghany County Environmental Assessment***

**Report to Stakeholders  
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# ***Why Environmental Assessment***

- Health happens (or not) in a context
- The natural environment is part of that context
  - Air
  - Water
  - Land
  - Climate/weather
- The built environment is also part of that context
- Environmental data in Volume II complements health data in Volume I



# *Environmental Assessment*

- Included in accreditation benchmarks for community assessment
- New concept to most health agencies and Healthy Carolinians coalitions
  - Unfamiliar terminology
  - Unfamiliar information and data sources
  - Probably a baseline process (no previous data for comparison)
  - Data more technical in nature
  - Requires inclusion of definitions and explanations
  - More data-driven than opinion-driven (first effort)



# *Ecological Context*

- **Water**
  - Surface water
  - Ground water
  - Drinking water
- **Air**
  - Outdoor air
  - Indoor air
- **Agriculture**
  - Animals and crops
  - Chemicals
- **Vector animals**



# *Data Focus*

- **Environmental contaminants**
  - Air, water, and land pollution
    - Toxic and hazardous chemicals and particulates
    - Solid waste
    - Wastewater
    - Animal wastes
- **Other hazards and risks**
  - Natural disasters, UV radiation, etc.
- **Health outcomes**
  - Not necessarily cause and effect



# *Water Quality*

- **Surface Waters**

- Fresh flowing and standing waters
- Monitored by NC DWQ against standards set by state to determine impairment (process complies with Federal CWA)
- Surface waters used for:
  - Sources of water for human and industrial consumption
  - Sources of food
  - Sites for recreation
  - Routes for transportation and commerce
  - Sites for disposal of byproducts and wastes of manufacturing and sewage treatment.



# *Water Quality*

- **Waterbodies in the New River Basin (2004 Basinwide Report)**
  - **Subbasin 01**
    - No waterbodies listed as impaired
    - No bioclassification stations in Alleghany County
  - **Subbasin 03 (includes Sparta)**
    - No waterbodies listed as impaired
    - All waterbodies classified as excellent or good
    - Largest discharger in the subbasin is the Sparta WWTP



# *Water Quality*

- **Waterbodies in the Yadkin-Pee Dee River Basin (2007 Basinwide Report)**
  - **Subbasin 01**
    - No impaired waterbodies listed
    - No bioclassification stations in Alleghany County
  - **Subbasin 02**
    - No impaired waterbodies listed
    - No bioclassification stations in Alleghany County



# *Water Quality*

- **Watersheds in Alleghany County**

- **Upper New**

- Better water quality
    - Low vulnerability for impairment

- **Upper Yadkin**

- Better water quality
    - Low vulnerability for impairment

*Main vulnerability: agricultural run-off, population change, hydrologic modification, and aquatic/wetland species at risk*



# *Water Quality*

- **Ground Water**

- **Bacteria in Well Water (2004-2006)**

- None of 3 well water samples submitted to the State Public Health Laboratory was positive for coliforms

- **Ground Water Incidents (2001-2006)**

- No leak/spill incidents were reported



# *Air Quality*

- **Outdoor Ambient Air Quality**

- **Criteria Air Pollutants (CAPs)**

- Carbon monoxide (CO)
    - Lead (Pb)
    - Nitrogen oxide (NO<sub>x</sub>)
    - Ozone (O<sub>3</sub>)
    - Particulate matter (PM)
    - Sulfur dioxide (SO<sub>2</sub>)

- **Effects:** injure human health (harm lung function/organ systems, may cause cancer); harm the environment, cause property damage



# *Air Quality*

- **Outdoor Ambient Air Quality**

- **Criteria Air Pollutants (CAPs)**

- Carbon monoxide – 75% from transportation sources
    - Lead – mostly from gasoline additives
    - Nitrogen oxides – transportation and combustion
    - Ozone – chemical reactions involving VOC and NO<sub>x</sub>
    - Particulate matter – vehicles, factories, power plants
    - Sulfur dioxide – burning sulfur-containing fuels



# *Air Quality*

- **Outdoor Ambient Air Quality**

- Alleghany County **is not** among the 25 NC counties with highest CAPs
- Alleghany County **is not** one of 32 NC counties listed as “non-attainment” for ozone standards, or one of the 3 counties listed as “non-attainment” for particulate matter.
- Alleghany County **is not** among the 48 NC counties that have mandatory vehicle emission testing



# *Air Quality*

- **Outdoor Ambient Air Quality**

- **Hazardous Air Pollutants (HAPs)**

- 200 chemicals that can have adverse effects on human health and the environment
    - Some are known carcinogens
    - Some have respiratory, neurological and reproductive effects in humans
    - Described as contributing to either “added lifetime cancer risk” for carcinogenic CAPs or “cumulative hazard index” for chemicals with non-cancer effects
    - *Exposure* is ultimately a factor in an individual’s risk; this report cannot assess individual exposures



# *Air Quality*

- **Outdoor Ambient Air Quality**
  - **HAPs in Alleghany County with Added Cancer Risk (Goal = 1)**
    - Overall score: 260
      - Average for NC counties = 480
    - Overall state rank: 76<sup>th</sup>
      - Mecklenburg ranks 1<sup>st</sup> (Overall score = 800)
    - Primary increased cancer risk pollutant in Alleghany County
      - *Diesel emissions* from mobile sources



# *Air Quality*

- **Outdoor Ambient Air Quality**

- **HAPs in Alleghany County with Added Non-Cancer Risks (Goal = <1)**

- Overall cumulative hazard index score: 0.96
      - Average for NC counties = 2.0
    - Overall state rank: 85<sup>th</sup>
      - Mecklenburg ranks 1<sup>st</sup> (CHI = 3.5)
    - Primary increased non-cancer risk pollutant in Alleghany County
      - *Acrolein* (in cigarette smoke, auto exhaust, burning plants and oil; building materials; pesticides)



# *Air Quality*

- **Indoor Ambient Air Quality**
  - **Environmental Tobacco Smoke**
    - 2006 Alleghany Region (Alleghany, Ashe, Watauga, Avery and Wilkes) BRFSS
      - 19.6% residents self-identified as “current smokers”
      - 26.6% of residents allowed smoking in their home (down from 34.0% in 2004)



# *Air Quality*

- **Indoor Ambient Air Quality**
  - **Environmental Tobacco Smoke**
    - Tobacco-free schools – Alleghany County Schools are among 86 tobacco-free NC School Districts (September 2007)
    - Smoke-free restaurants – As of July 2007 43% of Alleghany County restaurants were smoke-free



# *Air Quality*

- **Indoor Ambient Air Quality**
  - **Carbon Monoxide**
    - Released in heater and car exhaust
    - No intentional or unintentional deaths from CO in Alleghany County in 2005 or 2006



# *Air Quality*

## • **Indoor Ambient Air Quality**

### – **Radon**

- Radioactive decay product of radium (via uranium)
- Naturally occurring in soil, rock and water
- Gets into homes from substrate below
- Can be in well water (home and community)
- Can be in building materials (concrete, brick, granite and drywall)
- Highest levels in NC: in upper Piedmont and mountains
- Harmful when trapped in buildings
- Major health effect: increased risk of lung cancer



# *Air Quality*

- **Indoor Ambient Air Quality**

- **Radon**

- Alleghany is among the 8 NC counties with predicted average indoor radon levels in the highest range.
    - Average level in Alleghany County in 2004 (n=18) was 5.67 pCi/L (EPA action level = 4 pCi/L)



# *Toxic Chemical Releases*

- **US Toxic Release Inventory**
  - Inventory in existence since 1986
  - Monitors 650 chemicals
  - Based on industry-reported *estimates* of emissions to air, water and land
  - Alleghany County ranked 76th of 80 NC counties in pounds of total emissions in 2002 (288 pounds)
  - 100% of 2002 and 2005 Alleghany emissions were to air



# *Toxic Chemical Releases*

- **Alleghany County TRI Emitters (2005)**
  - Pioneer Eclipse Corporation, Sparta
    - Certain glycol ethers
  - Martin Marietta Composites, Sparta
    - Styrene



# *Toxic Chemical Releases*

- **Alleghany County TRI Releases Cancer Risk Scores (2002)**
  - Alleghany County was **not** among the 66 NC counties ranked for overall cancer risk score for TRI releases



# *Toxic Chemical Releases*

- **Alleghany County TRI Releases  
Non-Cancer Risk Scores (2002)**

- Alleghany County ranked 66<sup>th</sup> in NC for overall TRI non-cancer risk score
- Primary TRI non-cancer risk compounds/sources (2002 and 2005)
  - Copper compounds / Bristol Compressor (2002)
  - Styrene / Martin Marietta (2005)



# *Land Contamination*

- **Superfund Sites (EPA)**
  - Nation's worst toxic waste sites
  - None in Alleghany County
- **Brownfield Sites (EPA)**
  - Properties where contamination hinders development
  - Program alleviates liability for developers
  - 1 such site in Alleghany County: Teapot Museum Site, Sparta
- **Inactive Hazardous Sites (State)**
  - For sites not covered by other programs
  - State oversees remediation
  - None in Alleghany County



# *Lead Hazards*

- Source: deteriorating lead-based paint, lead-contaminated dust and lead-contaminated soil
- Most common in housing built before 1950
- Most commonly involve residents with income below the poverty level
- Children are at greatest risk from lead contamination, especially children in poverty
- Other sources: Decomposing plastic mini-blinds, certain ceramic pots, some herbal medicines



# *Lead Hazards*

- **As of 2000 Census, Alleghany County:**
  - Ranked 31<sup>st</sup> of 50 NC counties for % housing units at high risk for lead contamination: 3% (n=120)
  - Ranked 33<sup>rd</sup> of 50 NC counties for % of housing units with low income: 18% (n=830)
  - Ranked 36<sup>th</sup> of 50 NC counties for % of children under 5 years of age living below the poverty level: 32% (n=180)
- **Alleghany County Children Ages 1 and 2 with Blood Lead Levels >10µg/dL**
  - 2005: 9
  - 2004: 0
  - 2003: 4



# *Agricultural Pollution*

- **Alleghany County Agricultural Census**
  - **Main Crops (2006)**
    - Tobacco – 2,000 acres
    - Corn for silage – 2,100 acres
    - All hay – 11,000 acres
  - **Main Livestock (2002)**
    - Cattle – 18,793 animals
    - Hogs and pigs – 28 animals
    - Poultry – 238 animals
    - Sheep and lambs – 412 animals



# *Agricultural Pollution*

- **Alleghany County Agricultural Census (continued)**
  - **Viticulture**
    - 2 wineries (not necessarily vineyards) in Alleghany County
    - NCSU: grape growing can be chemical intensive (21 commonly used pesticides)
  - **Horticulture**
    - Alleghany County ranks 3<sup>rd</sup> in NC and 12<sup>th</sup> in US for Christmas tree production
    - 4,574 acres of Christmas trees in 2002
    - NCSU: 14 commonly used pesticides



# *Agricultural Pollution*

- ***Estimated Pesticide Applications on Crops (2006)***

- **Corn**

- Herbicides (13 chemicals) – 22,701 pounds
- Insecticides (2 chemicals) – 4,347 pounds



# *Agricultural Pollution*

- **Animal Waste (2002)**
  - Alleghany County ranked 37<sup>th</sup> of 98 NC counties in total weight of waste generated: 210,000 tons
  - Animal waste generation in highest-ranked NC counties (Duplin, Sampson, Bladen and Wayne) ranged between 1.5 – 4.5 *million* tons
  - Percent of waste generated
    - Cattle – 99%
    - Other – <1%



# *Waste Management*

- **Solid Waste Management**
  - FY2004-2005 Alleghany County *per capita* solid waste management rate = 0.81 tons (a 44% **decrease** from FY1991-1992)
  - Overall state *per capita* solid waste management rate **increased** 21% over approximately the same period
  - The county operates no municipal solid waste landfill, but does operate a transfer station



# *Wastewater Management*

- **Wastewater Systems (1990 Census)**

- 999 (19%) housing units on public sewer (mostly municipal, not county systems)
- The Town of Sparta operates the only municipal wastewater system in the county.
- 4,134 housing units (77%) on septic systems
- 211 housing units (4%) on “other” (e.g., straight pipe systems and outhouses)



# *Drinking Water*

- **Drinking Water Systems (1990 Census)**
  - 1,485 (28%) year-round housing units on water from a city or county water department, a water district, a private water company, or a well serving six or more housing units
  - 2,646 (50%) on water from individual wells
  - 1,213 (22%) on “other” (springs, creeks, cisterns)



# *Drinking Water*

- **Drinking Water Systems (2007)**
  - EPA listed 34 water systems in Alleghany
    - 5 are “community” water systems
      - High Meadows S/D (474 served)
      - Johan’s MHP (36)
      - Olde Beau Golf Club (270)
      - Roaring Gap Club Inc. (380)
      - Town of Sparta (1,824)
    - The community systems had had 5 health-based drinking water standards violations between 2000-2006
    - All 5 use a groundwater source



# *Water Usage*

- **Water Usage (total from surface and ground water sources)**
  - Total water usage in Alleghany County remained the same from 1990 to 2000
  - Irrigation use increased
  - Municipal, livestock, industrial and domestic use decreased



# ***Food-, Water- and Vector-Borne Diseases***

- **Food- and Water-Borne**

- One case (*Campylobacter*) reported in Alleghany County between 2002 and 2005

- **Arboviral**

- No human cases of EEE, WNV or LAC in Alleghany County between 2002 and 2006
- 2 wild bird cases of WNV (2002 and 2003)
- Appalachian District Health Department seeking to develop an active mosquito control program



# ***Food-, Water- and Vector-Borne Diseases***

- **Rabies**

- 19 cases in animals from 2001 through 2006
  - 9 raccoon
  - 4 skunk
  - 4 cat
  - 2 fox
- 39 humans received post-exposure treatment for rabies from 2004 through June 2007



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