North Carolina Department of Environment and Natural Resources

Division of Waste Management

Solid Waste Program

POWER PLANT COAL COMBUSTION BYPRODUCTS

The Division of Waste Management's Solid Waste Program regulates coal combustion byproducts (CCB) when they are removed in dry form from coal-fired electric power plants and are disposed of on land. CCBs primarily consist of coal ash and flue gas desulfurization residuals. The program regulates CCB industrial landfills in accordance with the North Carolina Administrative Code 15A NCAC 13B .0503 (Siting and Design Requirements), .0504 (Application Requirements), and .0505 (Operational Requirements) and the beneficial use of CCB in accordance with 15A NCAC 13B .1700.

Industrial landfill regulations require a natural and synthetic bottom liner, a leachate collection system, a natural and synthetic closure cap, and a water quality monitoring plan. Slope stability analysis is also required. Typically, industrial landfills have a single liner, but some have a double liner design allowable under NCGS 130A-295.4. A double-lined landfill has a leachate detection system and a leachate collection system between the two liners, and both systems are continually monitored. A double-lined landfill system may be required for landfills constructed on existing CCB disposal areas such as old dry ash pond impoundments, closed unlined landfills or structural fills. Every landfill must be constructed at least four feet above seasonal high groundwater with a minimum 50-foot buffer to property lines, streams and rivers and a 500-foot buffer to private dwellings and potable wells. Leachate at lined facilities is routed via gravity-fed piping to an active coal ash pond on-site, which then flows to a permitted National Pollutant Discharge Elimination System (NPDES) outfall. DENR's Division of Water Quality issues the NPDES permits.

Environmental Monitoring

All industrial landfills, both active and closed, are required to conduct semi-annual water quality monitoring to ensure groundwater quality standards prescribed by 15A NCAC 2L .0202(g) are met. Single-lined and unlined landfills require groundwater and surface water monitoring, while double-lined landfills require leachate monitoring. The contaminants of concern for CCB landfills are heavy metals, specifically boron, chromium, iron, manganese and selenium.

Coal-Fired Power Plants With Landfills On Site (See Figure 2 on back page):

- Stokes County (Duke Energy Belews Creek)
  - Permit 8503-INDUS-1984 closed
  - Permit 8504-INDUS-
  - Permit 8505-INDUS-
- Catawba County (Duke Energy Marshall)
  - Permit 1804-INDUS-1983 closed
  - Permit 1809-INDUS-
  - Permit 1812-INDUS-2008
- Rutherford County (Duke Energy Cliffside)
  - Permit 8106-INDUS-2009
- Gaston County (Duke Allen)
  - Permit 3612-INDUS-2008
- Person County (Progress Energy Roxboro)
  - Permit 7302-INDUS-1988
- Person County (Progress Energy Mayo)
  - Permit 7305-INDUS-2012
- Halifax County (Westmoreland Partners Roanoke Valley Energy Plant -Virginia)
  - Permit 4204-INDUS-1994

Coal-Fired Power Plants Without Landfills On Site (PE = Progress Energy):

- Buncombe County (PE Asheville)
- New Hanover County (PE Sutton)
- Robeson County (PE Weatherspoon)
- Wake County (PE Cape Fear)
- Gaston County (Duke Riverbend)
- Rockingham County (Duke Dan River)
- Rowan County (Duke Buck Steam)

Quick Facts about the 11 coal combustion byproducts (CCB) landfills:

- Nine active lined landfills
- Two unlined inactive landfills
- All landfills are located at power plants except for Halifax County 4204-INDUS
- The program has regulated CCB landfills since 1983 and the beneficial use of CCB since 1994.
- The program has required lined landfills for CCB since 2002. PE Roxboro CCB Landfill Permit 7302-INDUS-1988 was the first.
- Required buffers:
  - 50 feet between property lines, streams and rivers
  - 500 feet between private dwellings and potable wells
  - 4 feet between bottom of waste and groundwater

News:

CCB rules have been proposed by EPA but there is no effective date or a revised draft available at this time. www.epa.gov/wastes/nonhaz/industrial/special/fossil/

Environmental Assessment

CCB landfills undergo routine monitoring on a semi-annual basis to make sure groundwater contamination does not exceed the 15A NCAC 2L standards at the compliance boundary, which is 250 feet from the edge of waste. If groundwater contamination is found to exceed the 15A NCAC 2L standards at or beyond the compliance boundary, the facility must undergo an environmental assessment. Currently, five CCB landfills (Permits 8503, 8504, 8505, 1804 and 1809) are performing environmental assessments, and no CCB landfills are undergoing corrective action. Two of the assessments (Permit 1809 and 8503) showed that the CCB landfill was not the cause of contamination exceeding the 15A NCAC 2L standards.

In response to the coal ash release at Tennessee Valley Authorities' Kingston Fossil Fuel Plant in December 2008, the program took part in EPA's yearlong inspection of coal ash basins in North Carolina. In cooperation with Duke Energy and the Division of Energy, Mining and Land Resources, the program performed a review of those CCB landfills constructed over retired coal ash basins. The result of the review was stricter compaction monitoring at one of the landfills—Duke Energy, Allen Steam Station, RAB Ash Landfill (Permit 3612-INDUS- 2008).

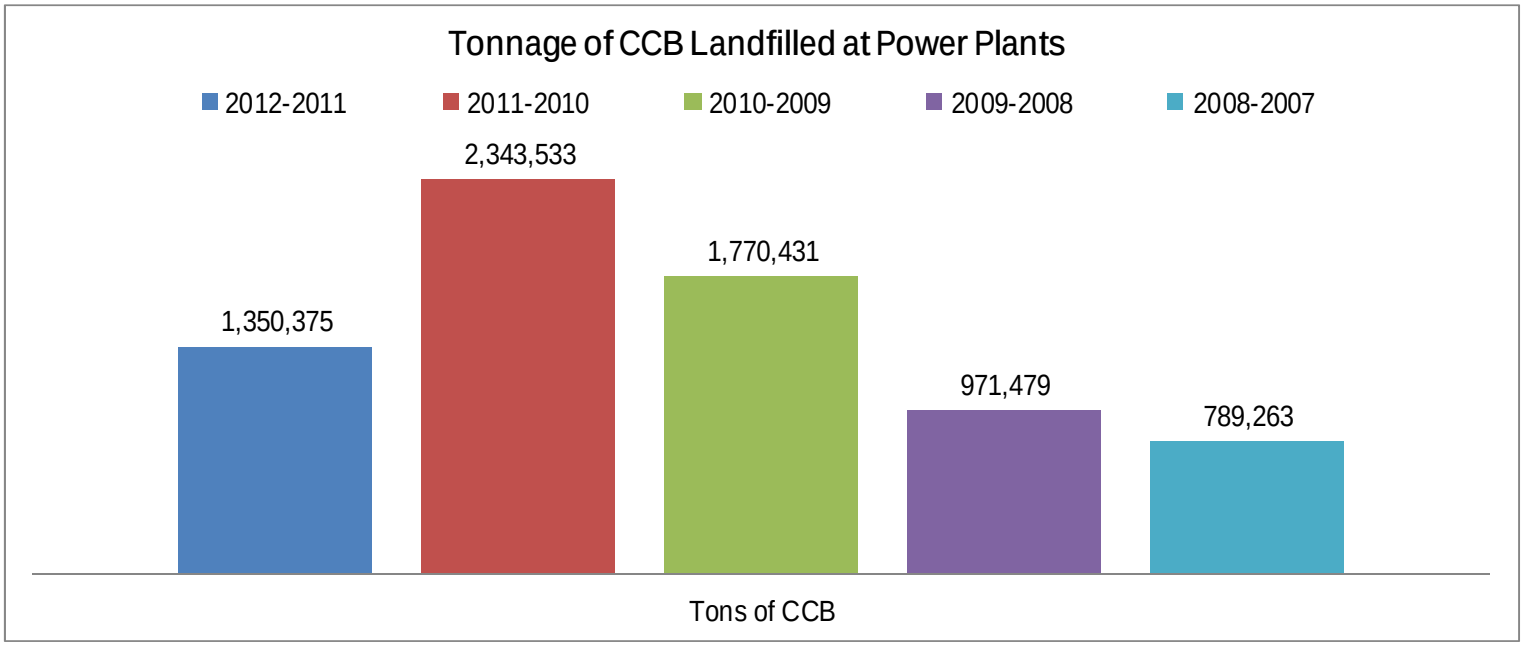

Figure 1— Annual Tonnage of Disposal of Coal Combustion Byproducts at Statewide CCB Landfills

Figure 2 — N.C. County Map with Highlighted Counties Indicating Locations of CCB Landfills