

1 Introduction

The Environmental Justice (EJ) Report is an initial look at the demographics and socioeconomics of the Duke Energy Progress, LLC - Mayo Steam Electric Plant surrounding community area. This includes information within a radius, as determined by the North Carolina Department of Environmental Quality (Department or DEQ), race and ethnicity (decennial census year), poverty status, per capita income, and ability to speak English (most current American Community Survey (ACS) census range), the current North Carolina Department of Commerce county tier, and presence of Native American territory.

The primary goal is to encourage EJ Report comments and suggestions from the surrounding community, industry, and environmental groups throughout the comment period.

It is important to keep in mind, that based on the data available, the following limitations of this study exist:

- census data is from 2010 and may be outdated;
- the more recent ACS data through 2017 are estimates;
- EPA's EJSCREEN does not provide all of the data categories that were used in this analysis, so the census tract and county data cannot be compared to the radius evaluating the facility boundary;
- census tracts can be large areas that do not identify exact locations of each population;
- some of the census tracts slightly overlap with the two-mile radius; and
- the Department cannot determine which populations are located within that small area of overlap.

The Department has reviewed the demographic and socioeconomic data of the communities surrounding the Duke Energy Progress, LLC - Mayo Steam Electric Plant in Roxboro (Person County) to foster communication prior to the Division of Air Quality's public hearing for the air quality permit application.

Under the [consent order](#) signed in February of 2020, Duke Energy is required to excavate more than 76 million tons of coal ash from open, unlined impoundments at six facilities. Duke Energy submitted its closure plan for the Mayo Steam Electric Plant on December 31, 2019. The plan details full excavation of 6.6 million tons of coal ash from the Mayo facility impoundment to a lined, onsite landfill. After a thorough review and public comment period, the Department determined on April 29, 2020, that the closure plan submitted by Duke Energy for the Mayo Steam Electric Plant to be protective of public health and the environment.

2 Environmental Justice Evaluation

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (US EPA). This evaluation examines the demographic and environmental conditions in Person County, as well as census tracts 9201 and 9202, and the two-mile radius around the property boundary of the Duke Energy Mayo Steam Electric Plant. Finally, the demographics for the State of North Carolina are also considered as they compare to both the county and local census tract and radius settings. Because the northern portion of the 2 mile radius goes into a portion of Virginia, those census tracts are not included in this report as it is outside of the N.C. DEQ purview.

The Department has assessed the permit application and the potential impact on communities surrounding the requested permit application. Accordingly, the EJ Report will include:

- Permit applications submitted by Duke Energy Progress, LLC to the Division of Air Quality and the Division of Waste Management;
- Modeled emissions rates;
- Study of area demographics [determined by using the EPA Environmental Justice tool (EJSCREEN) <https://ejscreen.epa.gov/mapper/>] <https://ejscreen.epa.gov/mapper/> and current, available census data from <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>;
- Comparison of local area demographics to both county and statewide census data;
- County health assessment;
- Surrounding sensitive receptors; and
- Local industrial sites (using the DEQ Community Mapping System) found at: <https://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=1eb0fbe2bcfb4ccb3cc212af8a0b8c8>.

Demographics (including race and ethnicity, poverty status, and Limited English Proficiency) for Person County and North Carolina will be compared to the local (census tracts and project radius) level data to identify any disparities surrounding the project area. Using standard environmental justice guidelines from the EPA and National Environmental Policy Act (NEPA) documentation, the following conditions will be flagged as potentially underserved communities:

- 10% or more in comparison to the county or state average;
- 50% or more minority; and
- 5% or more in comparison to the county or state average for poverty.

3 Proposed Project

The proposed project to build a new lined landfill for coal ash disposal at the existing Duke Energy Mayo facility is consistent with the Coal Ash Impoundment Closure Plan, approved by DEQ on April 29, 2020. For this project, Duke Energy submitted two separate applications with two different DEQ divisions. The following sections will outline the draft permits under review within the Division of Waste Management – Solid Waste Section (DWM –SWS), followed by the draft permit under consideration by the Division of Air Quality (DAQ).

DWM

The Ash Impoundment Closure Plan, approved by NCDEQ on April 29, 2020, detailed closure-by-excavation of the Ash Basin and placement of the excavated coal combustion residuals (CCR) into one new, permitted onsite, double-lined landfill called the Ash Basin Landfill.

The Ash Basin – approximately 153 acres containing 5.5 million cubic yards – began operation in 1982 and stopped receiving wet sluiced ash in March 2019.

Table 1. Ash Basin Size

Impoundment	Estimated CCR Volume (million cubic yards)	Estimated Maximum CCR Depth (feet)
Basin	5.5	80

Under the approved Ash Impoundment Closure Plan, some excavated CCR will be placed into the existing onsite lined landfill while 5.3 million cubic yards of CCR will be excavated and placed into the new, lined-landfill called the Ash Basin Landfill, located within plant property and partially within the former footprint of the basin. The new landfill will be designed and constructed in accordance with existing state and federal laws and rules. It will be double-lined with geosynthetic material, have a leak detection system and leachate collection system, have environmental monitoring, and be closed with a geosynthetic closure cap.

7307-Ash Basin Landfill

The Ash Basin Landfill will: 1) be located partially within the former footprint of the Ash Basin adjacent to Boston Road, 2) be approximately 42 acres, 3) be designed to contain approximately 5.3 million cubic yards of coal ash, and 4) stand 180 feet tall (from primary liner to top of final closure cap) rising approximately 170 feet above Boston Road.

The Division of Waste Management (DWM) received the Site Suitability Application (Site Study), Volumes I and II and the Permit to Construction (PTC) Application on February 26, 2021. Duke Energy received the Notification of Site Suitability on June 4, 2021.

Table 2. Landfill Size

Landfill	Area (acres)	Designed Volume of CCR (million cubic yards)	Landfill Height (feet)	Height Above Boston Rd (feet)
Ash Basin Landfill	42.1	5.3	180	170

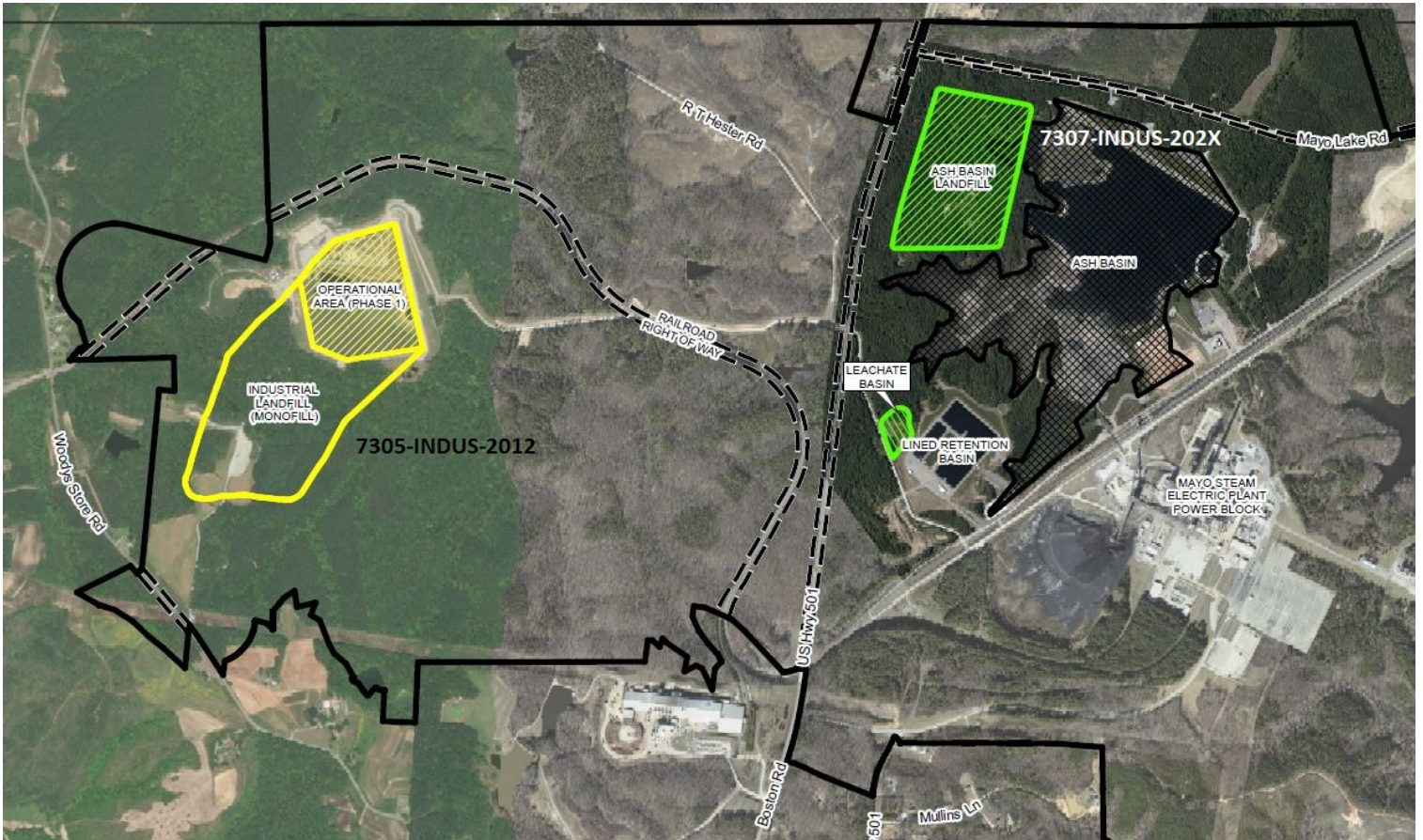


Figure 1. Location of landfills on Duke Energy property.

DAQ

Duke Energy Progress, LLC (DEP) is requesting authorization to close the Mayo Plant Ash Basin and Flue Gas Desulfurization Pond (the Ash Basin) via excavation and place the excavated coal combustion residuals (CCR) in a new lined Closure Landfill. The project will result in increased emissions of particulate matter (PM), PM less than 10 micrometers and PM less than 2.5 micrometers in diameter (PM₁₀ and PM_{2.5}, respectively), NO_x, SO₂, CO, VOCs, lead, carbon dioxide as CO_{2e}, and air toxics.

Table 3. Project Emissions Increase, Tons Per Year

	PM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC	CO _{2e}	Lead
Project emissions increase, TPY	19.34	9.72	3.2	1.37E-03	0.83	0.72	0.32	144	2.91E-03

Air dispersion modeling was performed for the following emissions. The results for each compound fell below the Acceptable Ambient Level (AAL).

Table 4. Potential Emissions

Toxic Compounds	Facility-wide Potential Emission Rates		
	lb/day	lb/yr	Percent of AAL (%)
Arsenic		31.5	25.3
Beryllium		7.45	2.1
Cadmium		6.98	0.2
Chromium VI	0.15		0.4
Manganese	4.61		0.1
Mercury	0.11		0.0
Nickel	3.72		0.3

4 Geographic Area

The Duke Energy Progress, LLC- Mayo Steam Electric Plant is located at 10660 Boston Rd, Roxboro, NC 27574 (Figure 2).



Figure 2. Duke Energy Mayo Steam Electric Plant location with two-mile radius

Regional Setting

The Duke Energy Mayo Steam Electric Plant and the two-mile buffer is located in Person County. Person County is designated as a Tier 2 county in 2021 by the N.C. Department of Commerce. The two-mile buffer enters into Virginia, but since this is outside DEQ jurisdiction, the demographics were not included. Tier 1 counties encompass the 40 most distressed counties based on average unemployment rate, median household income, percentage growth in population, and adjusted property tax per capita. Tier 2 counties encompass the next 40 counties based on this ranking system. The two-mile radius used in this analysis crosses over two census tracts. The facility site falls in Census Tract 9201 in Person County, and the two-mile radius enters into Census Tract 9202, and crosses the state line into Virginia (Figure 3). Census tracts are small, relatively permanent statistical subdivisions of a county with a unique numeric code (US Census Bureau). Census Tract 9201 encompasses land within the state designated tribal statistical area for the Sappony tribe.



Figure 3. Census tracts surrounding facility location

Table 5. Regional Setting - Race and Ethnicity

Subject	North Carolina		Person County	
	Estimate	Percent	Estimate	Percent
Total:	9,535,483	100.00	39,464	100.00
Not Hispanic or Latino:	8,735,363	91.61	37,871	95.96
White alone	6,223,995	65.27	26,354	66.78
Black or African American alone	2,019,854	21.18	10,599	26.86
American Indian and Alaska Native alone	108,829	1.14	244	0.62
Asian alone	206,579	2.17	115	0.29
Native Hawaiian and Other Pacific Islander alone	5,259	0.06	4	0.01
Some Other Race alone	15,088	0.16	51	0.13
Two or More Races:	155,759	1.63	504	1.28
Hispanic or Latino	800,120	8.39	1,593	4.04

Source: US Census Bureau, 2010 Census
 All **bolded and orange** cells indicate a difference that is greater than 10% when compared to the State.

Table 6. Local Setting – Race and Ethnicity

Subject	Census Tract 9202		Census Tract 9201		2-mile facility buffer	
	Total	Percent	Total	Percent	Total	Percent
Total:	6,749	100.0	6,834	100.00	991	100.0
Not Hispanic or Latino:	6,590	97.6	6,667	97.56	971	98.0
White alone	4,886	72.4	4,448	65.09	688	69.4
Black or African American alone	1,602	23.7	2,023	29.60	247	24.9
American Indian and Alaska Native alone	21	0.3	93	1.36	23	2.3
Asian alone	15	0.2	17	0.25	3	0.3
Native Hawaiian and Other Pacific Islander alone	0	0.0	0	0.00	0	0.0
Some Other Race alone	7	0.1	12	0.18	1	0.1
Two or More Races:	59	0.9	74	1.08	8	0.8
Hispanic or Latino	159	2.4	167	2.44	20	2.0

Source: US Census Bureau, 2010 Census
 All **bolded and orange** cells indicate a difference that is greater than 10% when compared to the State.
 All **bolded and blue cells** indicate a greater than 5% difference when compared to the state and county.

Table 7. Poverty Status – Regional Setting

Subject	North Carolina						Person County					
	Total		Below poverty level		Percent below poverty level		Total		Below poverty level		Percent below poverty level	
	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-
Population for whom poverty status is determined	9,881,292	1,522	1,523,949	15,319	15.4%	0.2	38,722	163	6,836	961	17.7%	2.5
AGE												
Under 18 years	2,258,876	1,607	498,013	7,632	22.0%	0.3	8,158	131	2,759	558	33.8%	6.9
18 to 64 years	6,092,009	1,103	884,618	9,282	14.5%	0.2	23,602	98	3,276	516	13.9%	2.2
65 years and over	1,530,407	995	141,318	2,705	9.2%	0.2	6,962	99	801	166	11.5%	2.3
SEX												
Male	4,779,533	2,237	669,307	8,648	14.0%	0.2	18,663	187	2,798	512	15.0%	2.8
Female	5,101,759	2,244	854,642	8,676	16.8%	0.2	20,059	168	4,038	559	20.1%	2.7
RACE AND ETHNICITY												
White	6,829,742	8,193	823,258	11,150	12.1%	0.2	26,395	334	3,628	766	13.7%	2.9
Black or African American	2,096,490	5,812	493,496	8,392	23.5%	0.4	10,359	296	2,559	640	24.7%	6.2
American Indian/ Alaska Native	117,702	1,595	29,577	1,585	25.1%	1.3	193	62	27	40	14.0%	18.2
Asian alone	275,301	1,983	32,712	2,356	11.9%	0.9	168	60	0	26	0.0%	18.7
Native Hawaiian and Other Pacific Islander	6,414	671	1,246	264	19.4%	4.2	1	2	0	26	0.0%	100
Some other race	302,934	7,911	89,305	5,371	29.5%	1.5	720	338	478	317	66.4%	24.4
Two or more races	252,709	6,223	54,355	2,369	21.5%	0.8	886	295	144	112	16.3%	11.9
Hispanic or Latino origin	915,426	901	260,607	5,682	28.5%	0.6	1,634	32	779	266	47.7%	16.1
ALL INDIVIDUALS BELOW												
50 percent of poverty level	663,550	10,829					2,549	818				
125 percent of poverty level	2,034,827	19,447					9,050	1,028				
150 percent of poverty level	2,526,688	21,681					11,131	1,013				
185 percent of poverty level	3,227,889	24,339					13,858	1,069				
200 percent of poverty level	3,513,670	25,035					14,485	1,080				

Source: American Community Survey 5-year Estimates, 2014-2018
 All **bolded and orange** cells indicate a difference that is greater than 5% when compared to the State

Table 8. Poverty Status – Local Setting

Subject	Census Tract 9202, Person County						Census Tract 9201, Person County					
	Total		Below poverty level		Percent below poverty level		Total		Below poverty level		Percent below poverty level	
	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-	Estimate	Margin of Error +/-
Population for whom poverty status is determined	6,612	439	921	366	13.9%	5.5	4,231	361	346	174	8.2%	3.9
AGE												
Under 18 years	1,214	214	215	176	17.7%	14	804	228	47	77	5.8%	8.8
18 to 64 years	4,142	325	544	211	13.1%	5	2,378	234	80	75	3.4%	3
65 years and over	1,256	127	162	89	12.9%	7.1	1,049	124	219	118	20.9%	11
SEX												
Male	3,415	301	411	167	12.0%	4.8	1,936	242	152	87	7.9%	4.3
Female	3,197	275	510	249	16.0%	7.6	2,295	248	194	116	8.5%	5
RACE/ETHNICITY												
White	5,198	444	642	348	12.4%	6.6	2,984	270	138	94	4.6%	3.1
Black or African American	1,173	283	209	103	17.8%	9.6	1,114	228	151	110	13.6%	9.3
American Indian/ Alaska Native	42	39	0	17	0.0%	47.5	0	12	0	12	-	**
Asian alone	0	17	0	17	-	**	0	12	0	12	-	**
Native Hawaiian and Other Pacific Islander	0	17	0	17	-	**	0	12	0	12	-	**
Some other race	82	89	70	84	85.4%	23.6	43	54	0	12	0.0%	45.2
Two or more races	117	88	0	17	0.0%	25.4	90	109	57	93	63.3%	57.4
Hispanic or Latino origin	197	116	78	84	39.6%	29	43	54	0	12	0.0%	45.2
ALL INDIVIDUALS BELOW												
50 percent of poverty level	291	181					148	137				
125 percent of poverty level	1,111	392					394	186				
150 percent of poverty level	1,368	404					583	195				
185 percent of poverty level	1,855	403					723	201				
200 percent of poverty level	1,892	409					910	275				

Source: US Census Bureau, American Community Survey 5-Year Estimates (2014-2018)
 All **bolded and orange** cells indicate a greater than 5% difference when compared to the state.
 All **bolded and blue cells** indicate a greater than 5% difference when compared to the state and county.

5 Limited English Proficiency (LEP)

Per the Safe Harbor Guidelines, should an LEP Group be identified during the permit application process, written translations of vital documents for each eligible LEP language group that constitutes five percent or includes 1,000 members (whichever is less) of the population of persons eligible to be served or likely to be affected or encountered. If there are fewer than 50 persons in a language group that reaches the five percent trigger, then DEQ will not translate vital written materials, but instead will provide written notice in the primary language of the LEP language group of the right to receive competent oral interpretation of those written materials, free of cost. The Safe Harbor provisions apply to the translation of written documents only. Safe Harbor Guidelines are per the EPA guidance for LEP persons, and implemented by DEQ when deemed appropriate. Three potential LEP language groups were identified during this initial screening of demographic data: Spanish or Spanish Creole, German, and other Asian languages. However, none of the languages identified reached the 5 percent threshold. If larger LEP groups are identified during the site visit or specific translation requests are received, then DEQ will revisit the Safe Harbor Guidelines.

Table 9. Limited English Proficiency

Language Spoken at Home	Census Tract 9202		Census Tract 9201	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	6,811	+/- 519	6,539	+/- 483
Speak only English	6,407	+/- 596	6,468	+/- 487
Spanish or Spanish Creole:	402	+/- 303	53	+/- 36
Speak English "very well"	107	+/- 88	47	+/- 36
Speak English less than "very well"	295	+/- 229	6	+/- 6
German:	0	+/- 17	0	+/- 17
Speak English "very well"	0	+/- 17	0	+/- 17
Speak English less than "very well"	0	+/- 17	0	+/- 17
Other Asian languages:	0	+/- 17	3	+/- 4
Speak English "very well"	0	+/- 17	1	+/- 2
Speak English less than "very well"	0	+/- 17	2	+/- 3

Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015)

6. County Health

The University of Wisconsin Population Health Institute, in collaboration with the Robert Wood Johnson Foundation, calculated a County Health Rankings system for all the states in the United States (www.countyhealthrankings.org). This ranking is based on health outcomes (such as lifespan and self-reported health status) and health factors (such as environmental, social and economic conditions). According to this 2020 report, out of all 100 counties in North Carolina (with 1 indicating the healthiest), Person County ranks 53rd in health factors and 72nd in health outcomes (Figure 4).

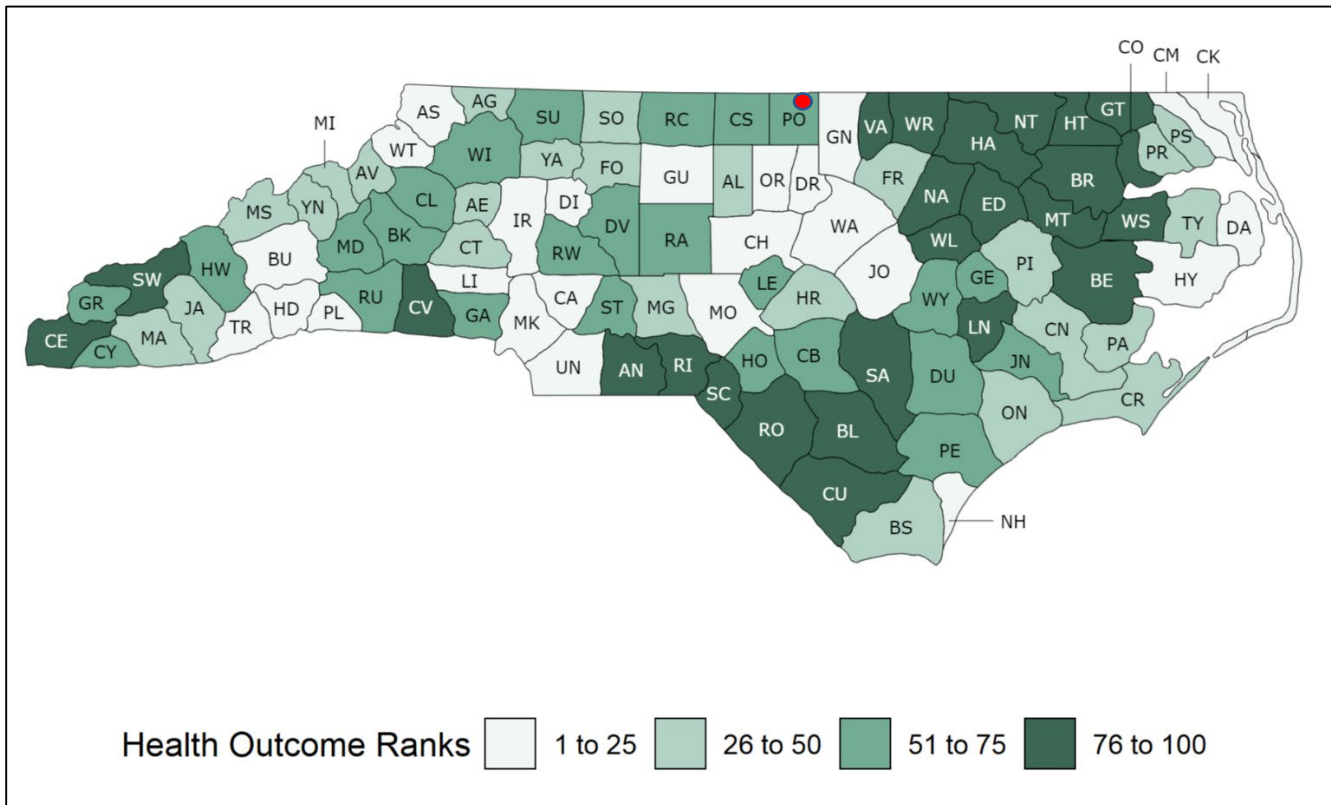


Figure 4. County Health Rankings for Health Factors in North Carolina provided by University of Wisconsin Public Health Institute.

7 Local Sensitive Receptors

The EPA suggests that sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. Extra care must be taken when dealing with contaminants and pollutants in close proximity to areas recognized as sensitive receptors. For instance, children and the elderly may have a higher risk of developing asthma from elevated levels of certain air pollutants than a healthy individual aged between 18 and 64.

Within the two-mile project radius from the facility, the following potential sensitive receptors were identified (Figure 5):

- Bethel Hill Baptist Church,
- Bethel Hill Charter School,
- Prospect Hill Baptist Church,
- Shiloh Primitive Baptist Church, and
- Woodsdale volunteer Fire Department.

Additional sensitive receptors may be identified during the permit application process, such as through public comment.

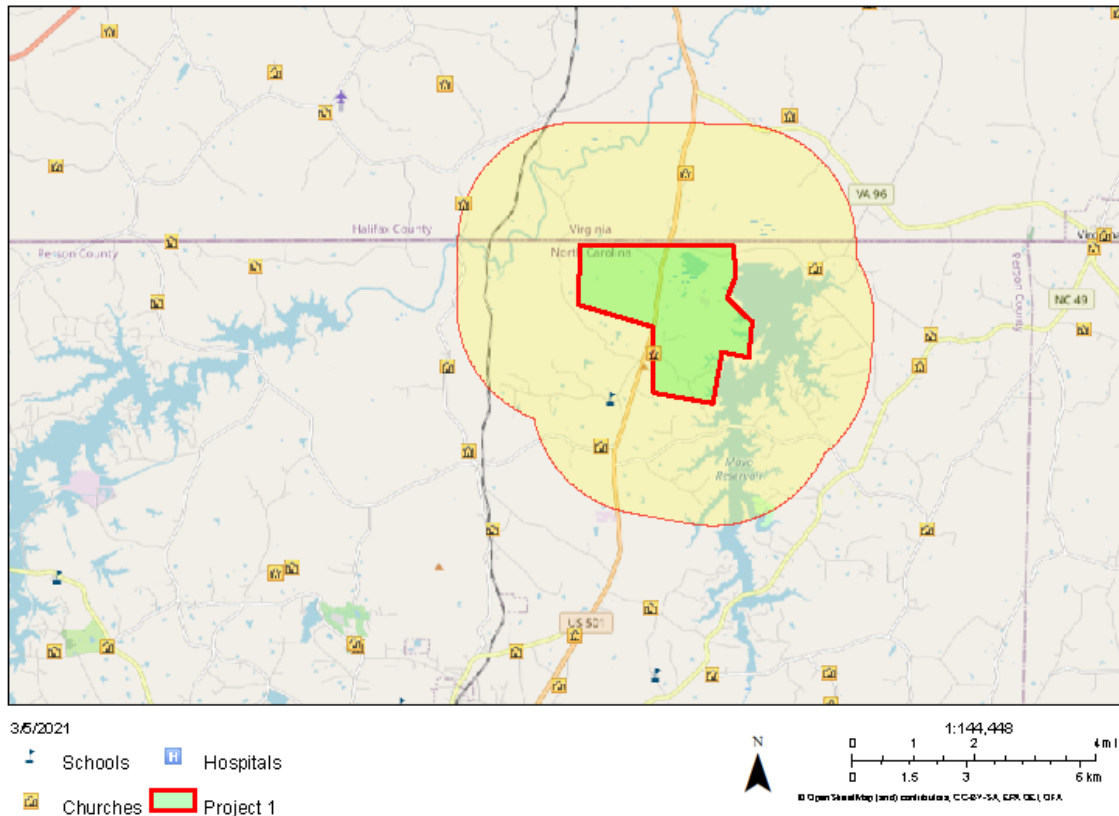


Figure 5. Sensitive receptors surrounding the Duke Energy Mayo Steam Electric Plant.

8. Local Industrial Sites

Within the two-mile radius, there are 11 facility permits or incident reports (as of March 5, 2021). These include two Title V air quality permits (one belonging to the Mayo Steam Electric Power Plant), three National Pollutant Discharge Elimination System wastewater discharge permits (one belonging to the Mayo Steam Electric Power Plant), two solid waste landfills (one belonging to the Mayo Steam Electric Power Plant), two hazardous waste sites (one belonging to the Mayo Steam Electric Power Plant), one underground storage tank (UST) incident from 1990, and one active UST permit (Figure 6).

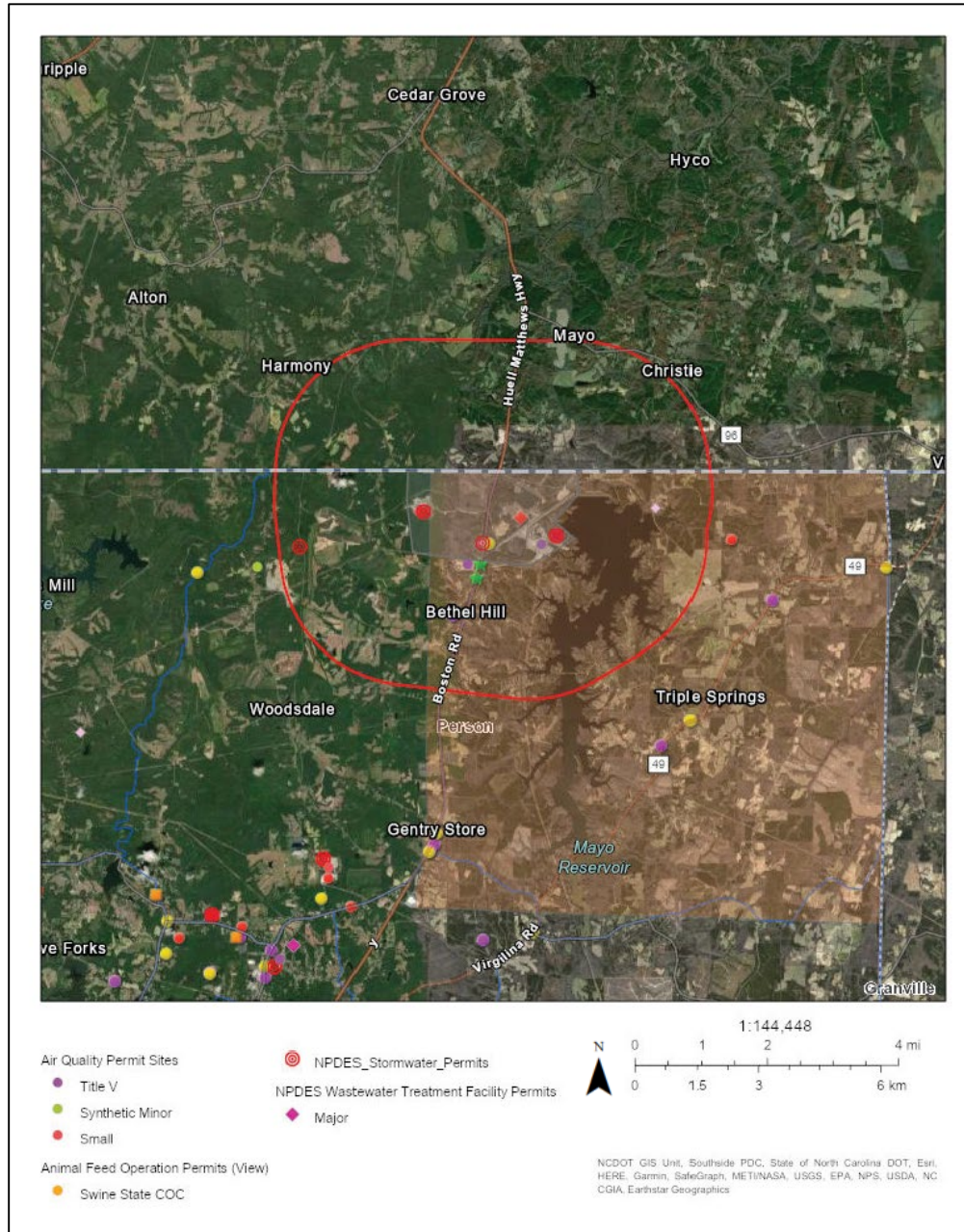


Figure 6. Permitted facilities and incidents with the two-mile radius surrounding the Duke Energy Mayo Steam Station.

Conclusion

This Draft EJ Report is an initial evaluation of the demographics and socioeconomics of the community area surrounding the Duke Energy Progress, LLC- Mayo Steam Electric Plant in Roxboro (Person County). This includes information within a determined radius by the Department (two miles for this project) on race and ethnicity (decennial census year), poverty, per capita income, and ability to speak English (most current ACS census range), current N.C. Department of Commerce county tier, and presence or absence of American Indian Tribal areas. The proposed landfill for coal ash disposal at Duke Energy Mayo Steam Power Plant is in an area designated with moderate health factors and outcomes in comparison to other areas of the State. It is also within state designated tribal statistical areas for the Sappony tribe (Section 6).

Person County has higher levels of poverty compared to the state for several subjects, but the local area displays similar or lower percentages of minority residents and poverty when compared to the state. Three potential LEP language groups were identified during this initial screening, however, none of the language groups identified reached the 5 percent threshold for Safe Harbor Guidelines.

The following additional outreach will be conducted:

- Informing the Sappony Tribe throughout the permitting process;
- Giving additional attention to ensure language data is accurate, and translation or interpretation will be considered if more LEP populations are identified at any point throughout the process; and
- Consulting the list of sensitive receptors while considering additional outreach options that may best fit this community's needs.