

High Consequence Areas, Blast Zones and Public Safety Along the Atlantic Coast Pipeline



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Clean Water for North Carolina

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Introduction and Background: The Atlantic Coast Pipeline, “High Consequence Areas” and “Blast Zones”

The Atlantic Coast Pipeline in North Carolina

The Atlantic Coast Pipeline in NC would be a 186 mile section of 36 inch pipeline that would cross 8 counties in eastern North Carolina. While Dominion and ACP LLC claim that the pipeline is a response to a “growing need” for energy in the southeast, several reports have pointed out that overall energy demand has been flat for over a decade, and is projected to be flat well into the future—there is simply no urgent need for big investments in either gas fired power plants or the major pipelines that would supply them.

Proponents of the ACP also claim that thousands of jobs and major economic development will come to NC as a result of the pipeline. What isn't mentioned is the fact that the residents whose lands they would build the pipeline across, seizing land by eminent domain where necessary, won't even get to reap any benefits of the pipeline, due to the extremely high cost of installing a connection. That the pipeline is a done deal and the necessary permits have been obtained for its construction is misinformation widely spread by Dominion and pipeline proponents to discourage people from voicing opposition. Claims by of having notified to all residents living within close to the pipeline route in NC have also been discredited by the authors' door to door contacts in several locations along the pipeline, as well as comments at public meetings. To add to the confusion, the topographical maps submitted with the Draft Environmental Impact Statement do not show a many of the homes that currently exist along the pipeline's path.

What are “High Consequence Areas” and “Blast Zones”

The Environmental Impact Statement for the ACP identified 24 **High Consequence Areas** in the NC section of the proposed pipeline, located in 7 counties. These are areas within which the extent of damage to property or the chance of serious injury or death are significant. This is generally taken as 20 or more occupied buildings located within a hazardous distance from the pipeline, or where there are particularly vulnerable populations, such as day care centers, retirement homes, handicapped persons, etc.

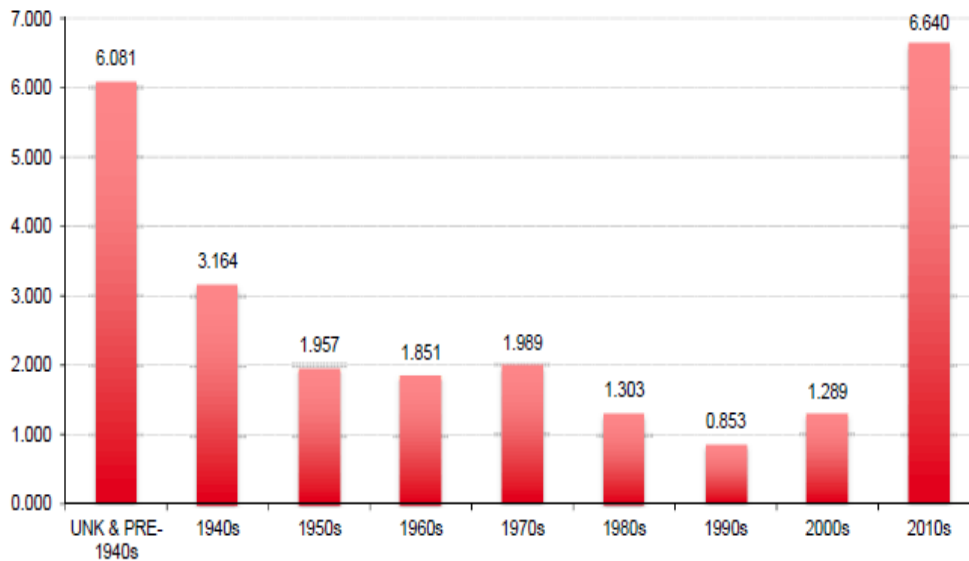
The ‘Potential Impact Radius’, also called the **Blast Zone** or **Incineration Zone** is the distance at which there is a reasonable risk of incineration, injury or even death, and is calculated using a formula developed by C-Fer Technologies in a 2000 technical report, and validated by comparison with damage and injuries resulting from a number of actual pipeline incidents. For a 36 inch pipeline operating at 1440 pounds per square inch, this zone extends at least 943 feet, or 43% greater than the 660 foot radius assumed by Dominion. The **Evacuation zone** for

the pipeline is 3071 feet from the center of the pipe. However, these numbers do not account for wind and other factors, which could further extend the radius of impact.

Significant Pipeline Incidents Have Increased in Pipelines Built Since 2010

According to the Pipeline and Hazardous Materials Safety Administration, whose rules Dominion claims are enough to ensure the safety of the ACP, there has been a dramatic increase in the number of significant incidents occurring along pipelines built since 2010 in the US (see figure below). This coincides with the timeline for an accelerating “rush to build” pipelines, a result of 14 and 15% rates of return granted by the Federal Energy Regulatory Commission, making pipeline **building** more profitable than actually generating power or selling gas from pipelines.

Average number of annual incidents over 2005-2013 per 10,000 miles of onshore gas transmission pipe by decade of pipe installation



As of March 2015.
Sources: U.S. Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Trust

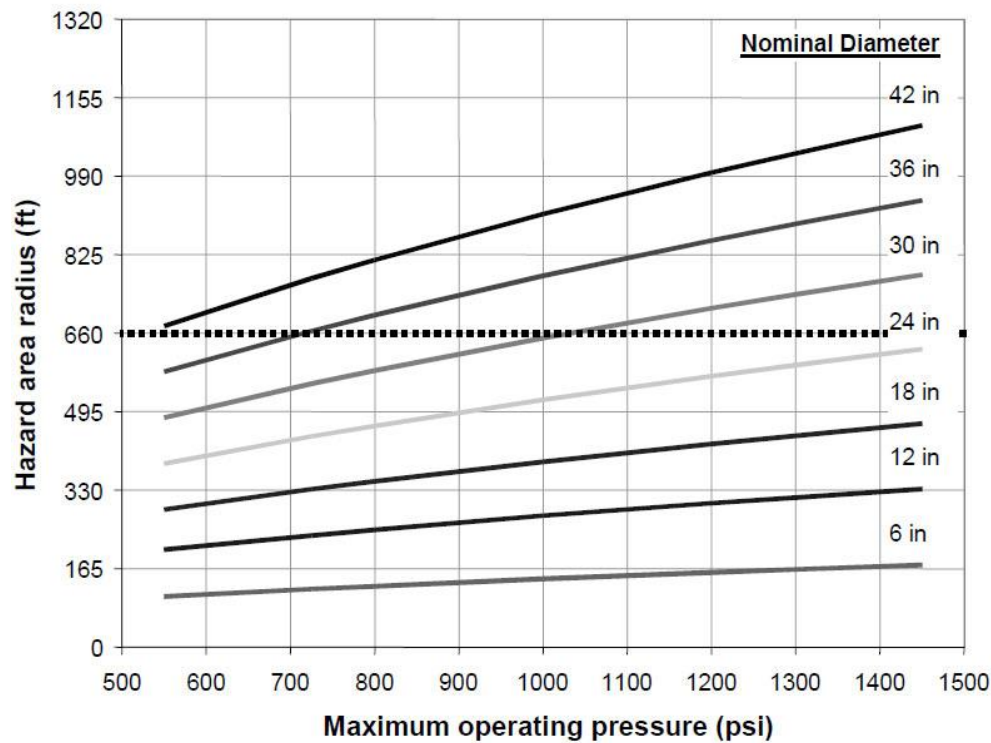
What the Images Show, and Implications for Public Safety and Disproportionate Impact Along the Pipeline.

The images are numbered from HCA 1, the northernmost High Consequence Area in Garysburg, Northampton County through Halifax, Nash, Wilson, Johnston, Cumberland, through HCA 24, near Pembroke in Robeson County (Sampson County doesn't have a High Consequence Area). Each set of Google Earth images of individual High Consequence Areas is preceded by a locational map, to show the HCAs in a larger geographic context. The individual GIS images include indication of the survey corridor for the pipeline through each HCA, as well as color-coded translucent overlays to show the extent of the Blast Zone (943 feet from pipeline center) and Evacuation Zone (3071 feet). Using the underlying Google Earth

image, it is easy to locate neighborhoods and other buildings within the Blast and Evacuation Zones.

Seven of the eight counties through which the ACP would pass have populations of color (African-American or Native American, predominantly) with percentages significantly above the state's average, and the majority of them also have higher percent poverty rates. This means that the pipeline represents a significant Environmental Justice threat of disproportionate impact on populations of color and low income, for any disturbances, impacts to air, land and water. However, the safety impact on residents near the pipeline may constitute the greatest threat of all, particularly as there is inadequate personnel and equipment for fighting pipeline fires or responding to leaks and explosions in these rural counties.

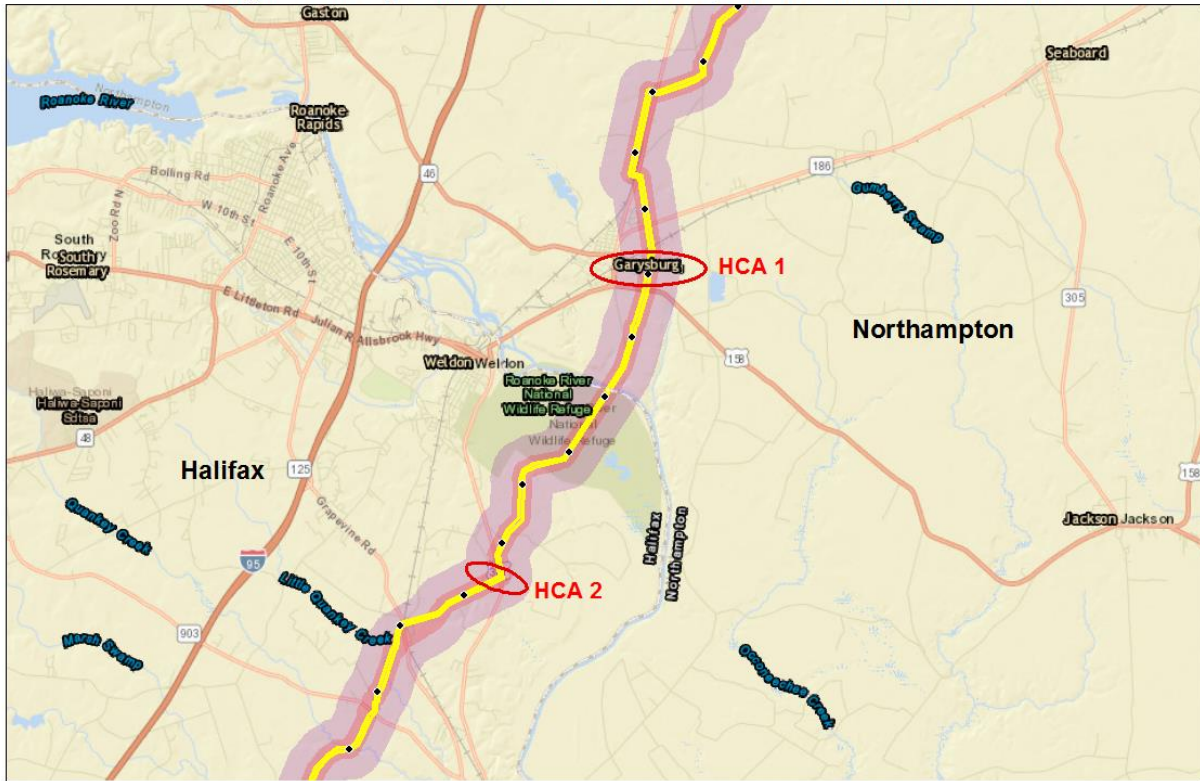
Chart of Blast Zones Calculated Along a Pipeline of a Given Maximum Operating Pressure and Radius



From: A MODEL FOR SIZING HIGH CONSEQUENCE AREAS ASSOCIATED WITH NATURAL GAS PIPELINES Mark J. Stephens, C-FER Technologies, Edmonton, Alberta T6N 1H2

Images of Northampton County and Halifax County High Consequence Areas, Blast Zones and Evacuation Zones

High Consequence Areas - Northampton and Halifax Counties



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

2.5 1.25 0 2.5 Miles



High Consequence Area 1 - Garysburg, Northampton County

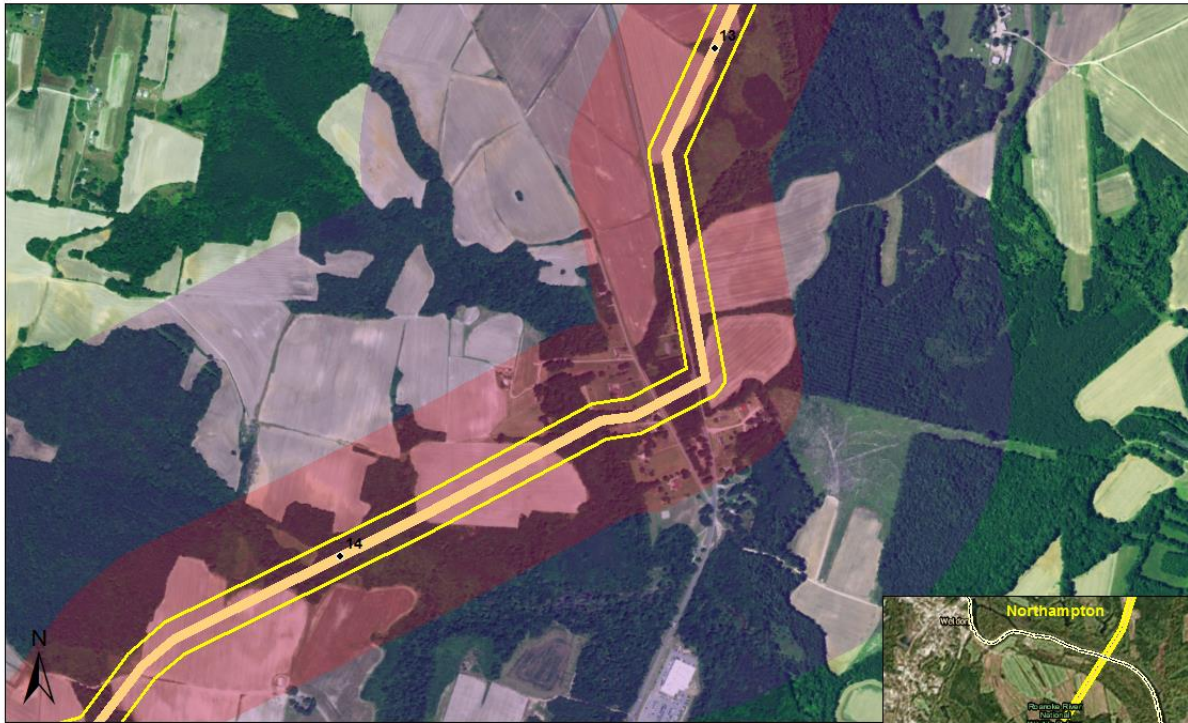


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

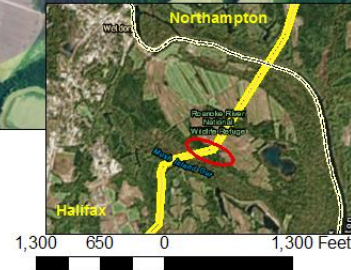


High Consequence Area 2 - White Hill Rd (Near Weldon), Halifax County



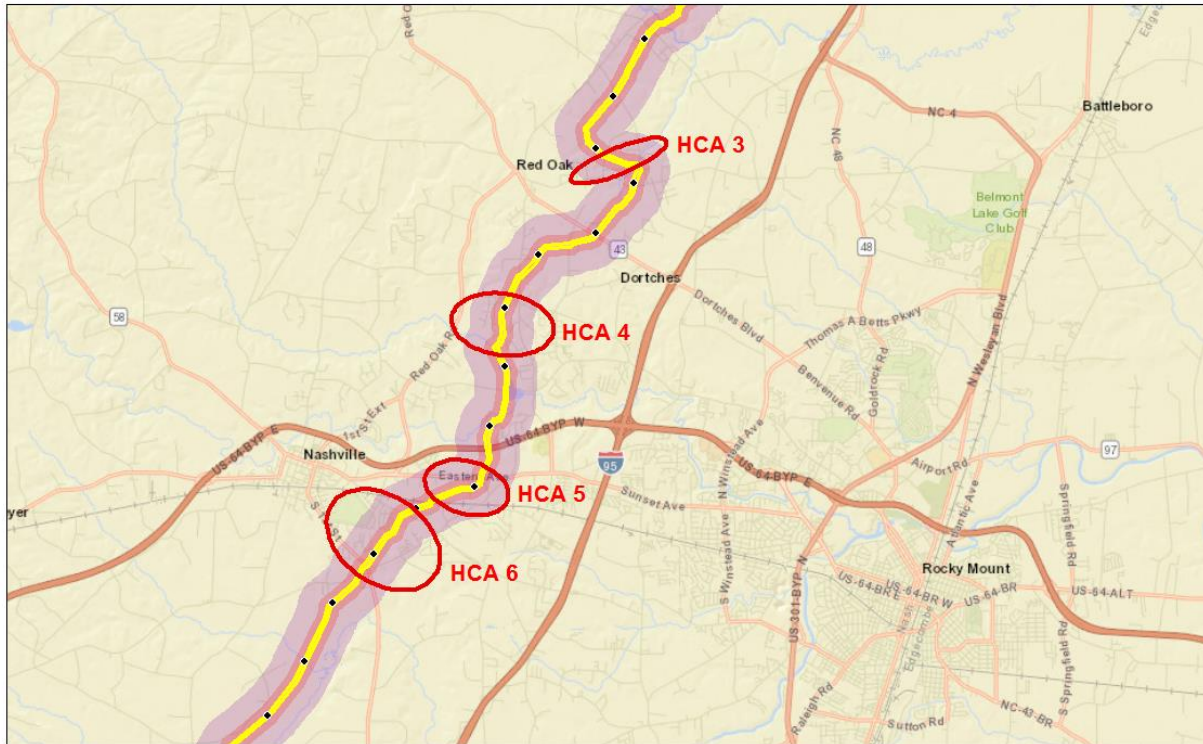
Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



Images of High Consequence Areas, Blast and Evacuation Zones, Nash County

High Consequence Areas - Nash County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

3 1.5 0 3 Miles

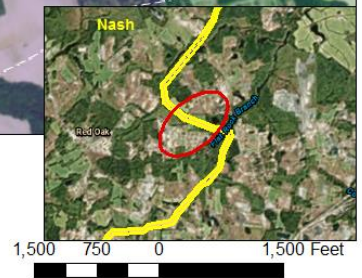


High Consequence Area 3 - Red Oak, Nash County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

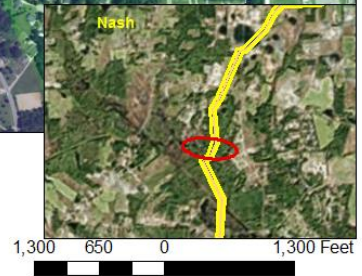


High Consequence Area 4 - Hunter Hill Rd (outskirts of Rocky Mount), Nash County

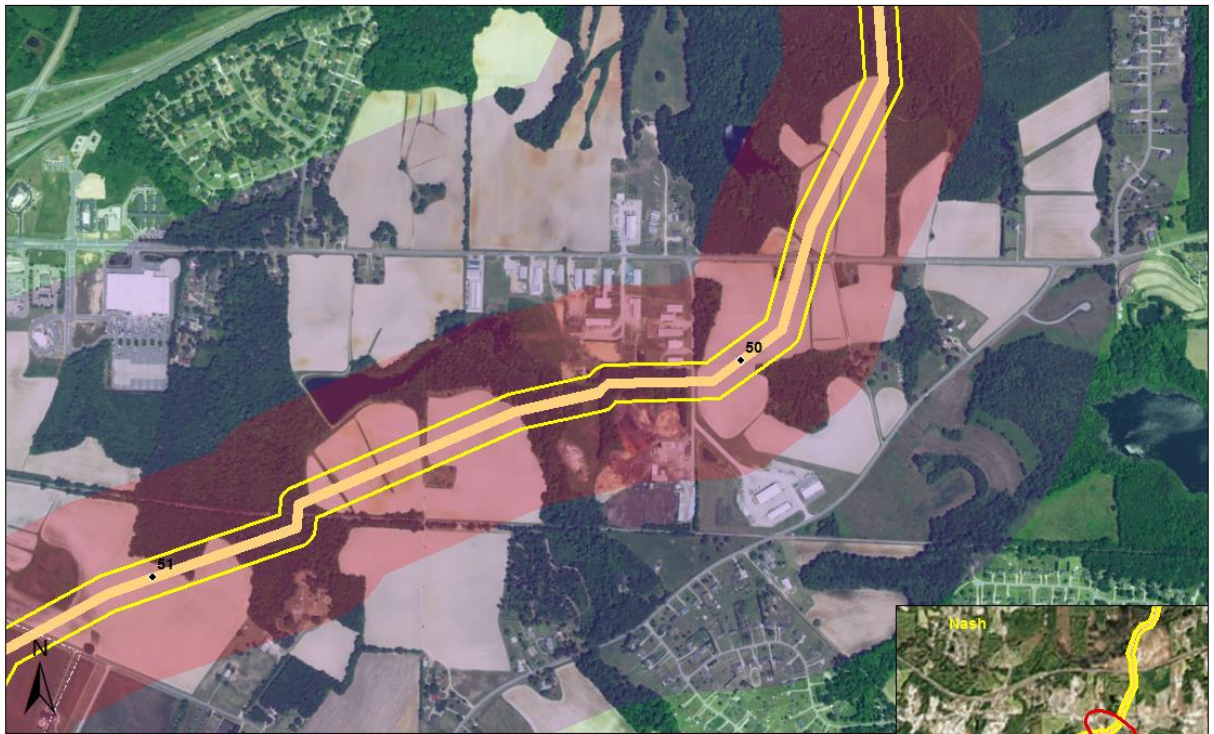


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

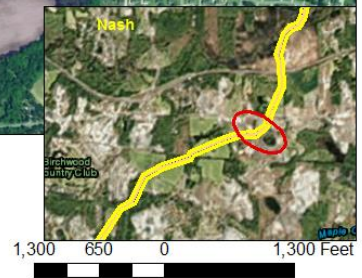


High Consequence Area 5 - Eastern Avenue (Nashville), Nash County



Legend

-  Proposed Survey Corridor
-  Blastzone (943 feet)
-  Approximate Construction Impact
-  Evacuation Zone (3071 feet)

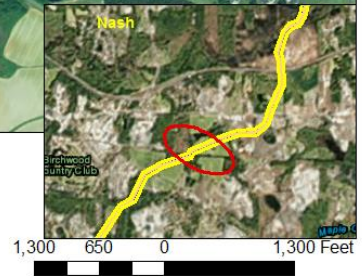


High Consequence Area 6 - Oak Level Rd and S Creek Dr (Nashville), Nash County



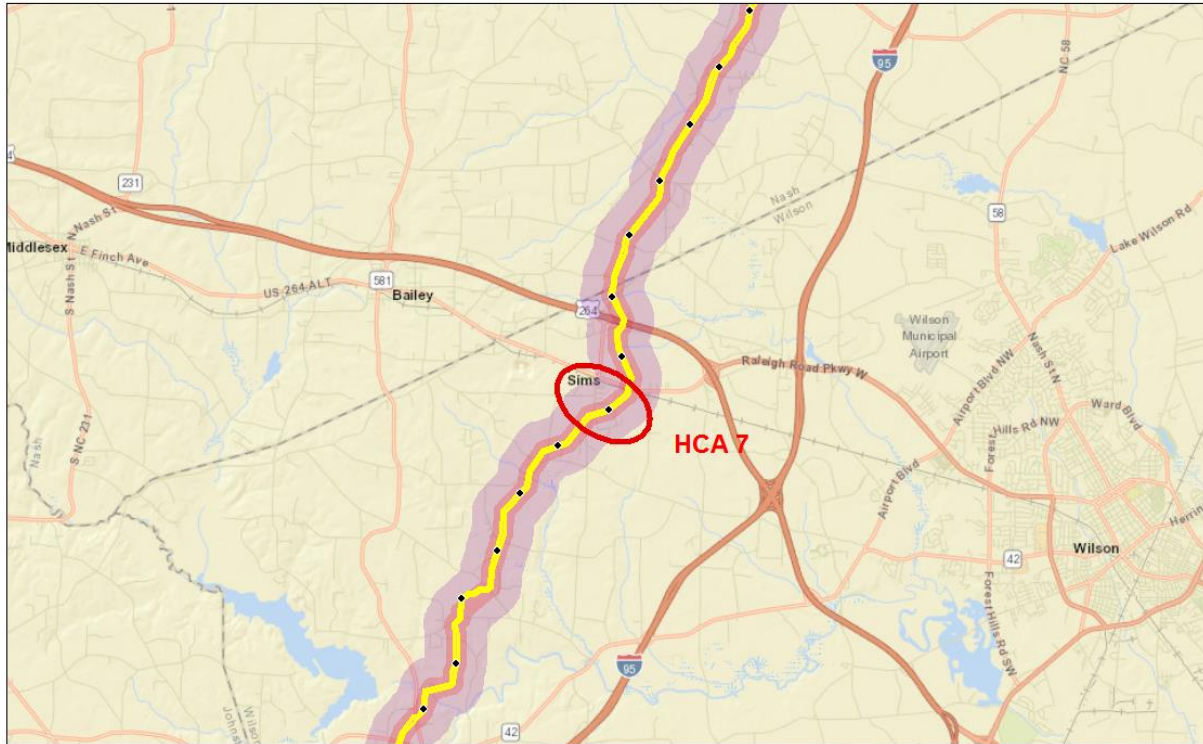
Legend

-  Proposed Survey Corridor
-  Blastzone (943 feet)
-  Approximate Construction Impact
-  Evacuation Zone (3071 feet)



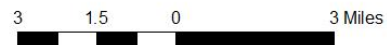
High Consequence Area, Blast and Evacuation Zone for Wilson County

High Consequence Areas - Wilson County

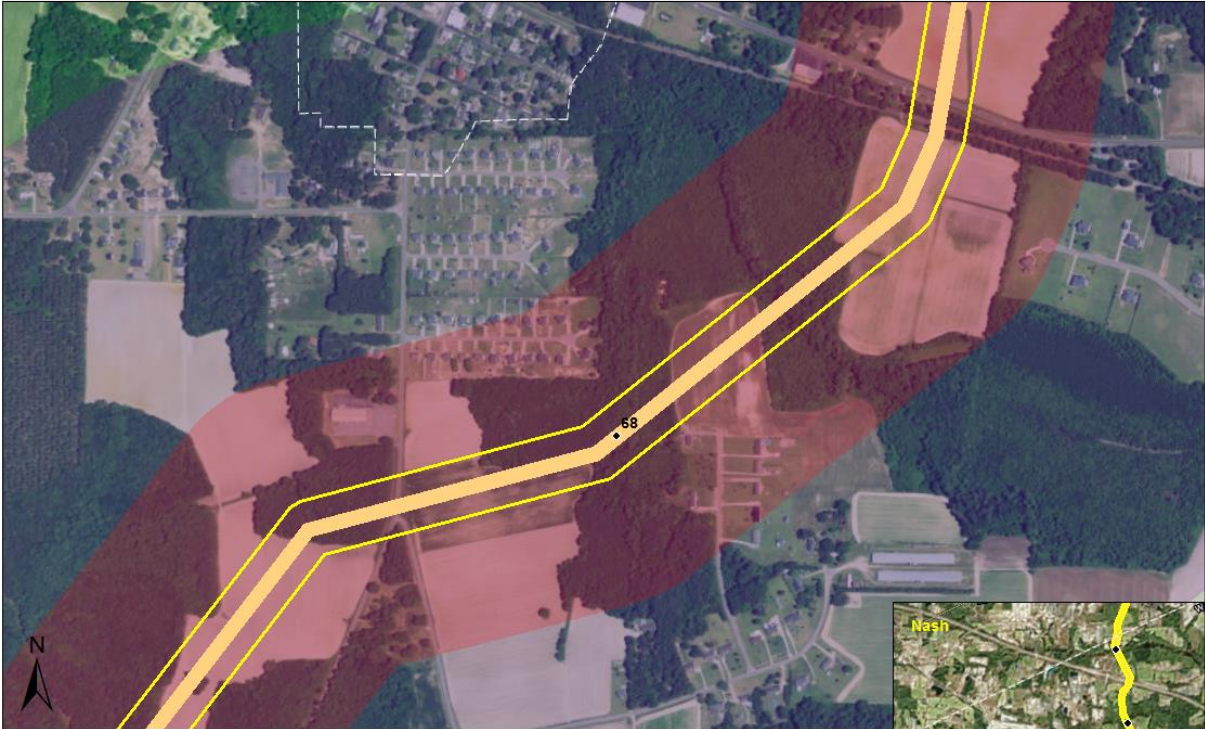


Legend

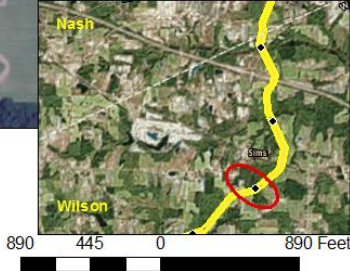
- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 7 - Rock Ridge Sims Road (Sims), Wilson County

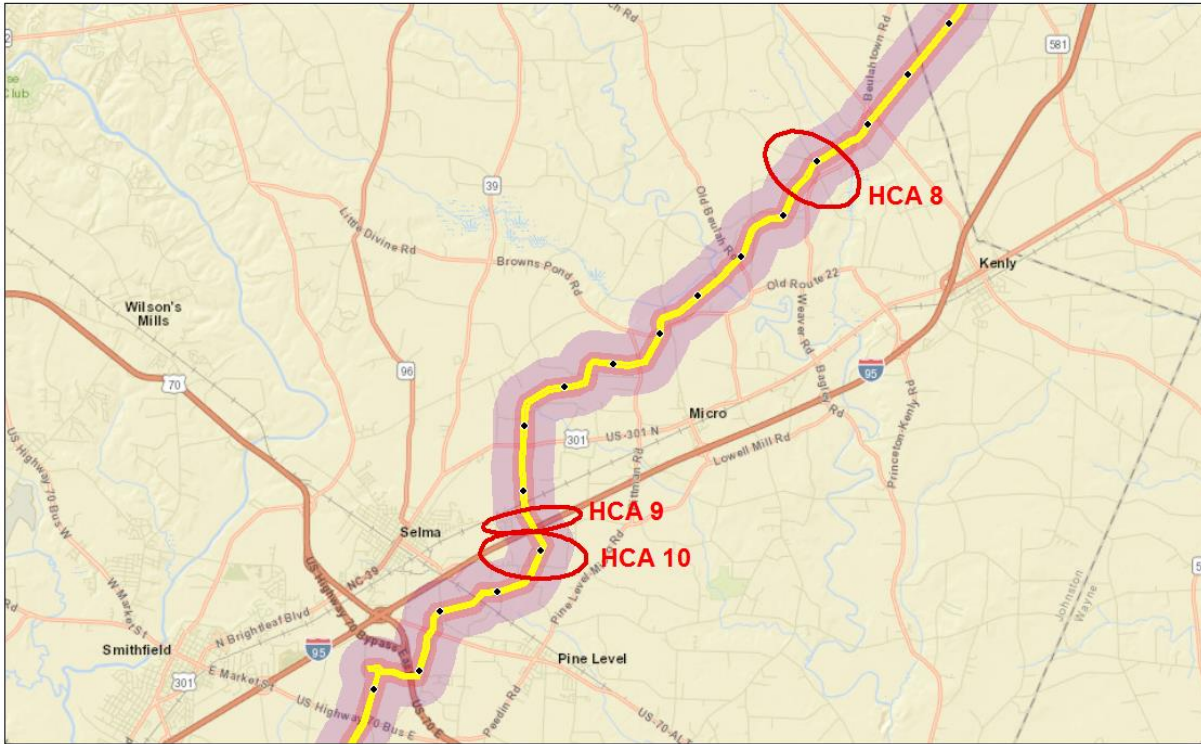


- Legend**
- Proposed Survey Corridor
 - Approximate Construction Impact
 - Blastzone (943 feet)
 - Evacuation Zone (3071 feet)



High Consequence Areas, Blast and Evacuation Zones for Johnston County

High Consequence Areas - Johnston County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

3 1.5 0 3 Miles

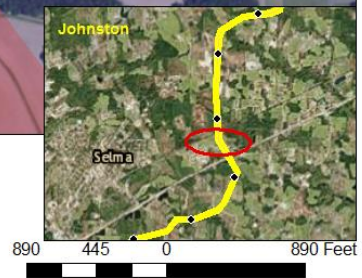


High Consequence Area 9 - Lizzie Mill Rd (Near Selma), Johnston County



Legend

-  Proposed Survey Corridor
-  Blastzone (943 feet)
-  Approximate Construction Impact
-  Evacuation Zone (3071 feet)

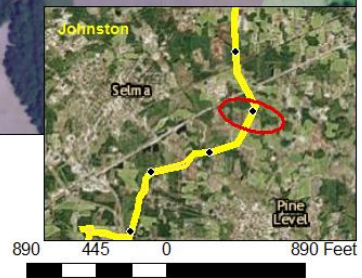


High Consequence Area 10 - Campground Rd (Near Selma), Johnston County

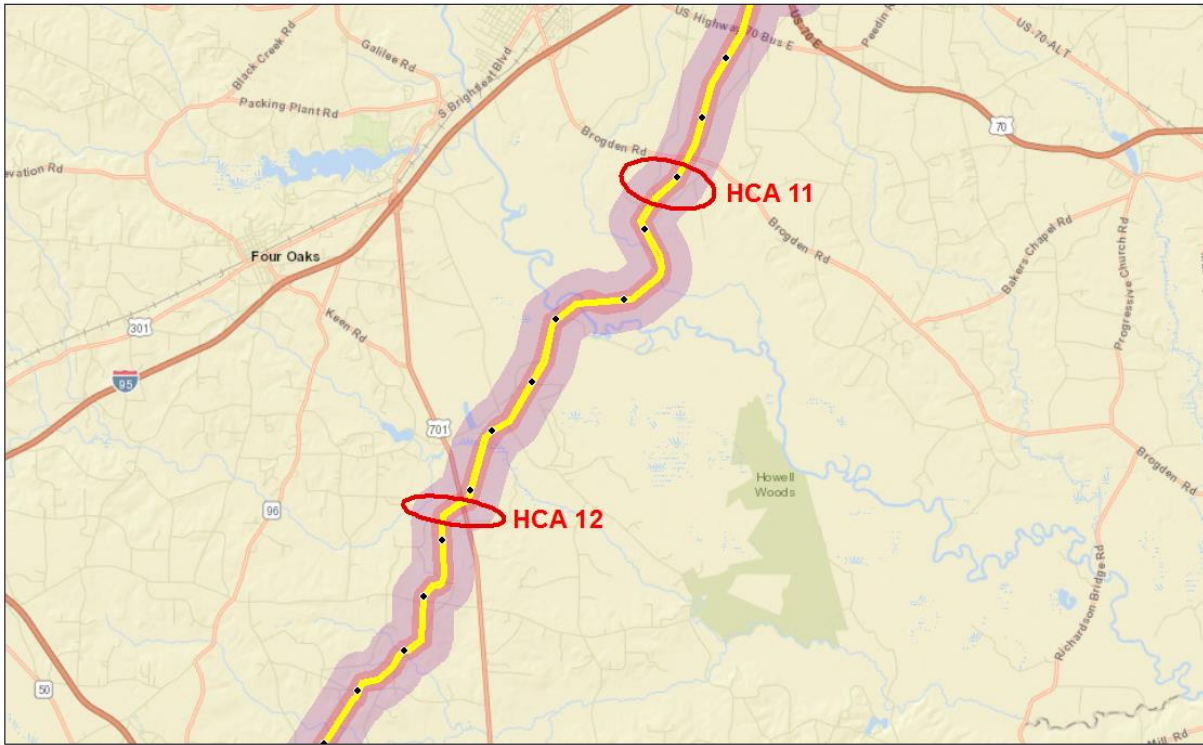


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

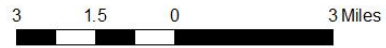


High Consequence Areas - Johnston County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 11 - Stevens Sausage Rd (Near Smithfield), Johnston County

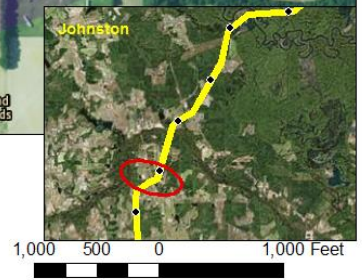


High Consequence Area 12 - Lees Union Church Rd (Near Four Oaks), Johnston County



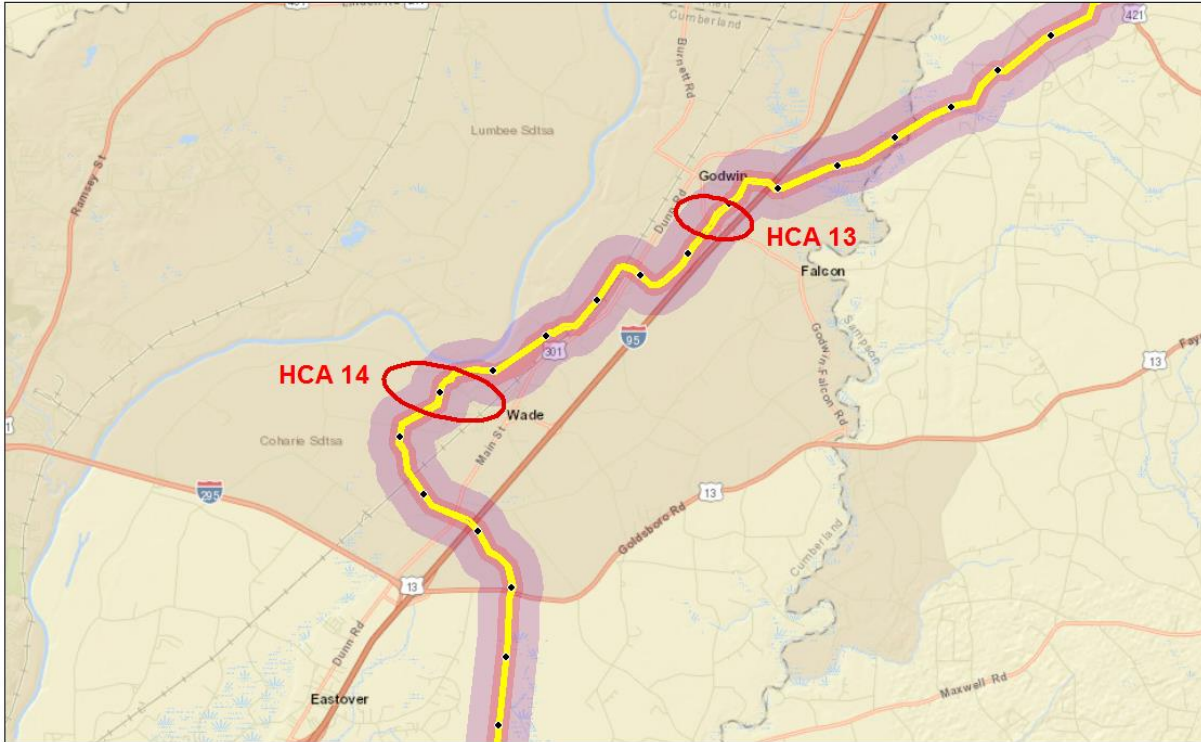
Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



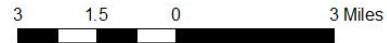
Images of High Consequence Areas, Blast Zones and Evacuation Zones, Cumberland and Robeson Counties

High Consequence Areas - Cumberland County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

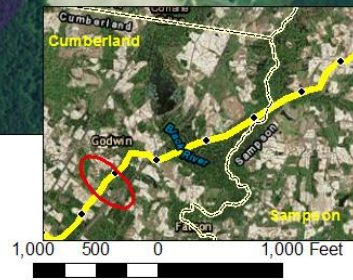


High Consequence Area 13 - Godwin-Falcon Rd (Near Godwin), Cumberland County

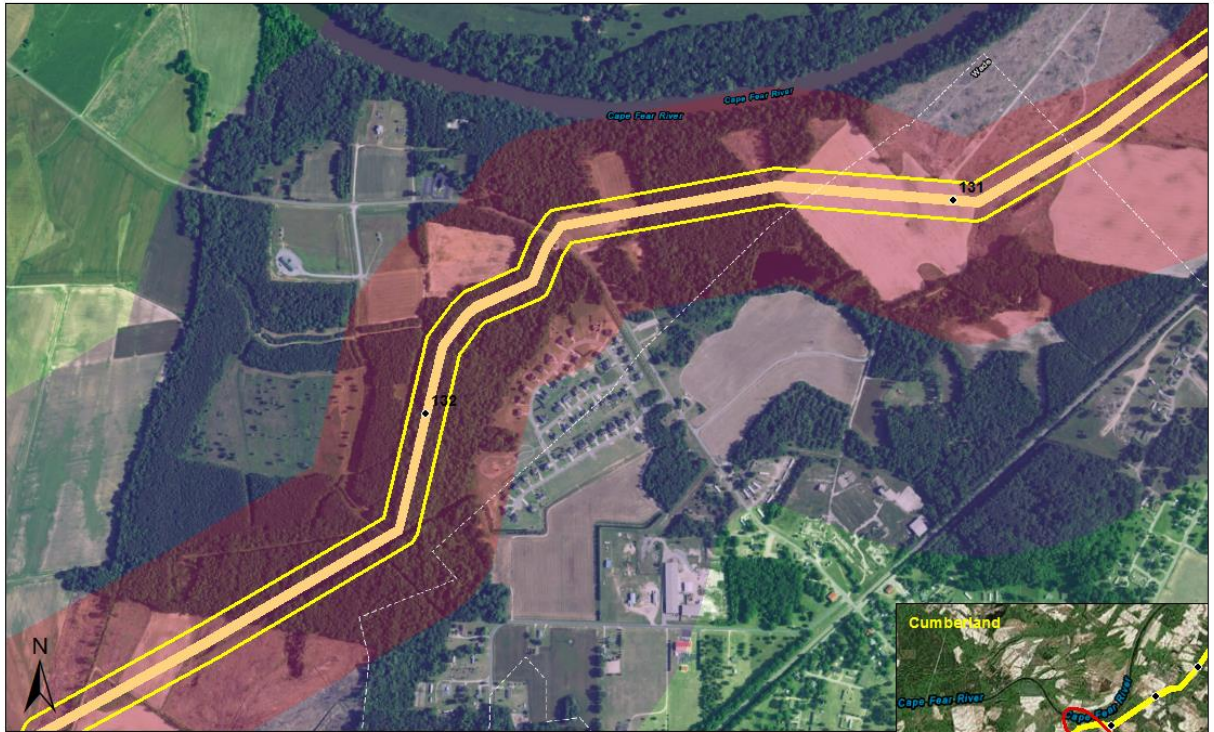


Legend

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- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 14 - River Rd (Wade), Cumberland County

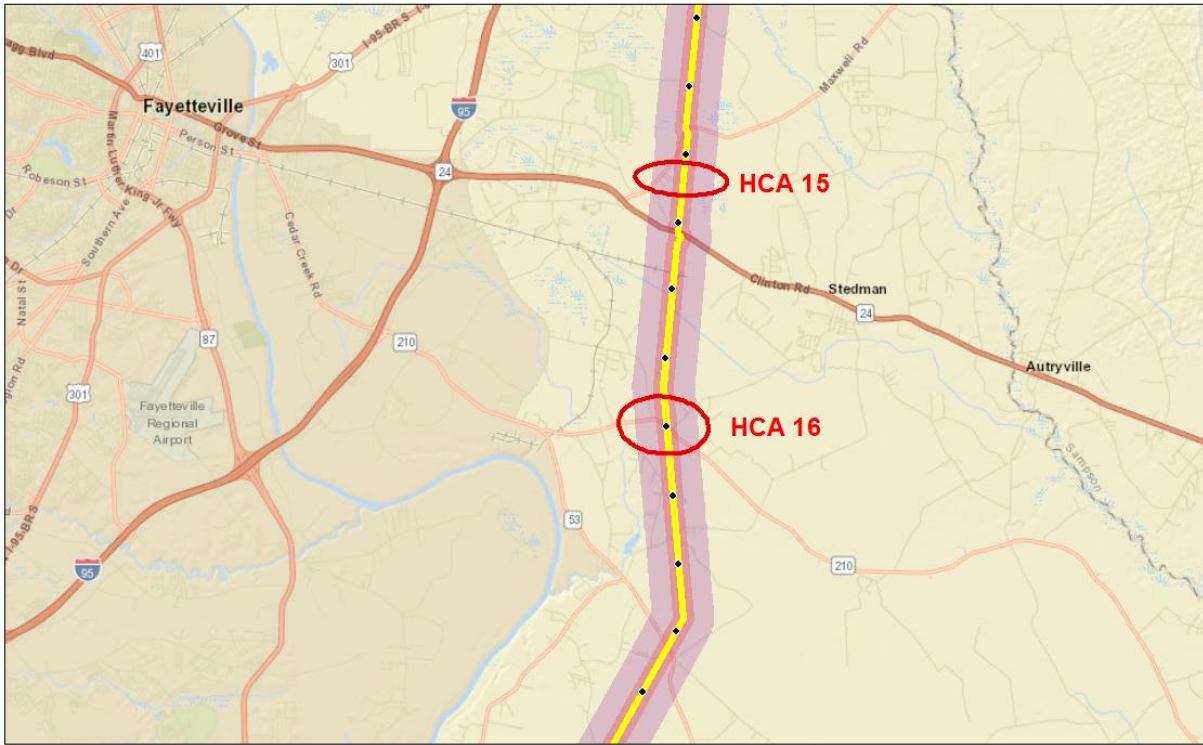


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

1,300 650 0 1,300 Feet

High Consequence Areas - Cumberland County

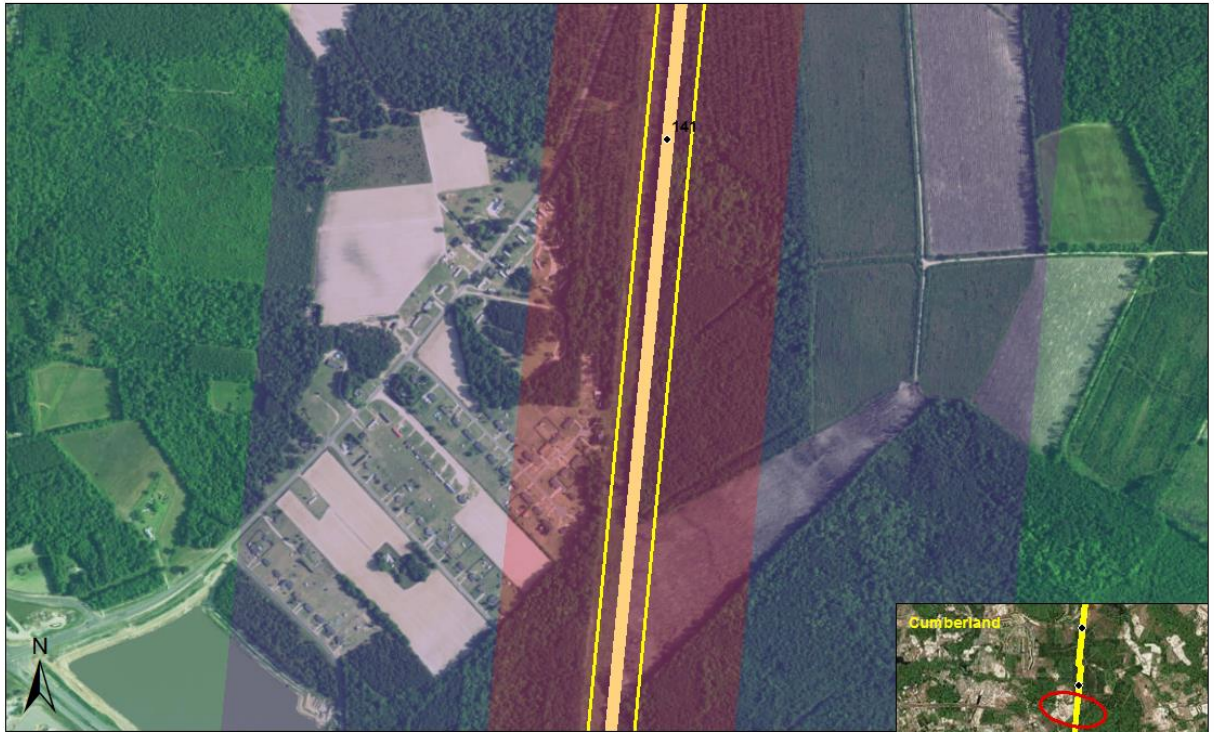


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

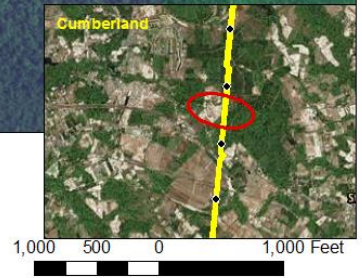


High Consequence Area 15 - Maxwell Rd (Near Stedman), Cumberland County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

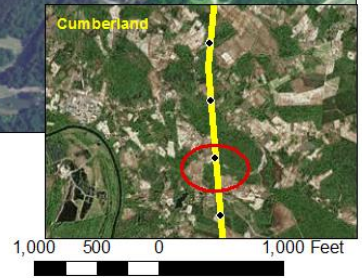


High Consequence Area 16 - Near Macedonia Church Rd (Near Stedman), Cumberland County

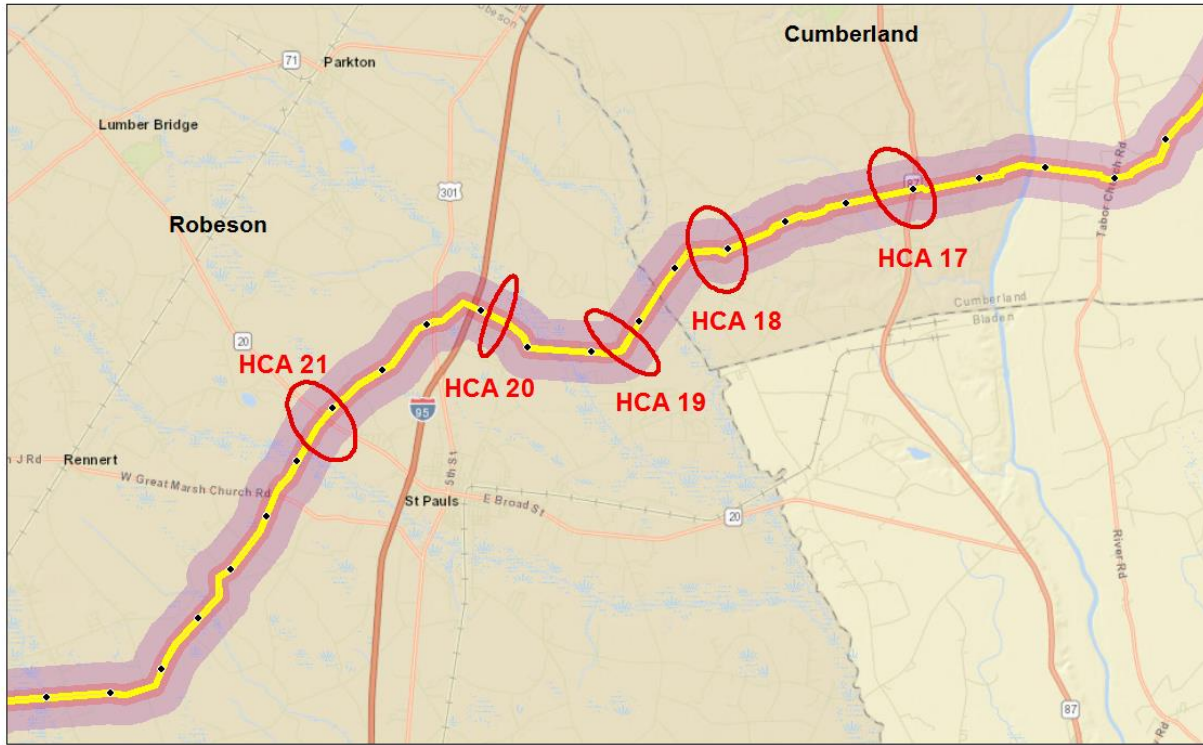


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Areas - Cumberland and Robeson Counties



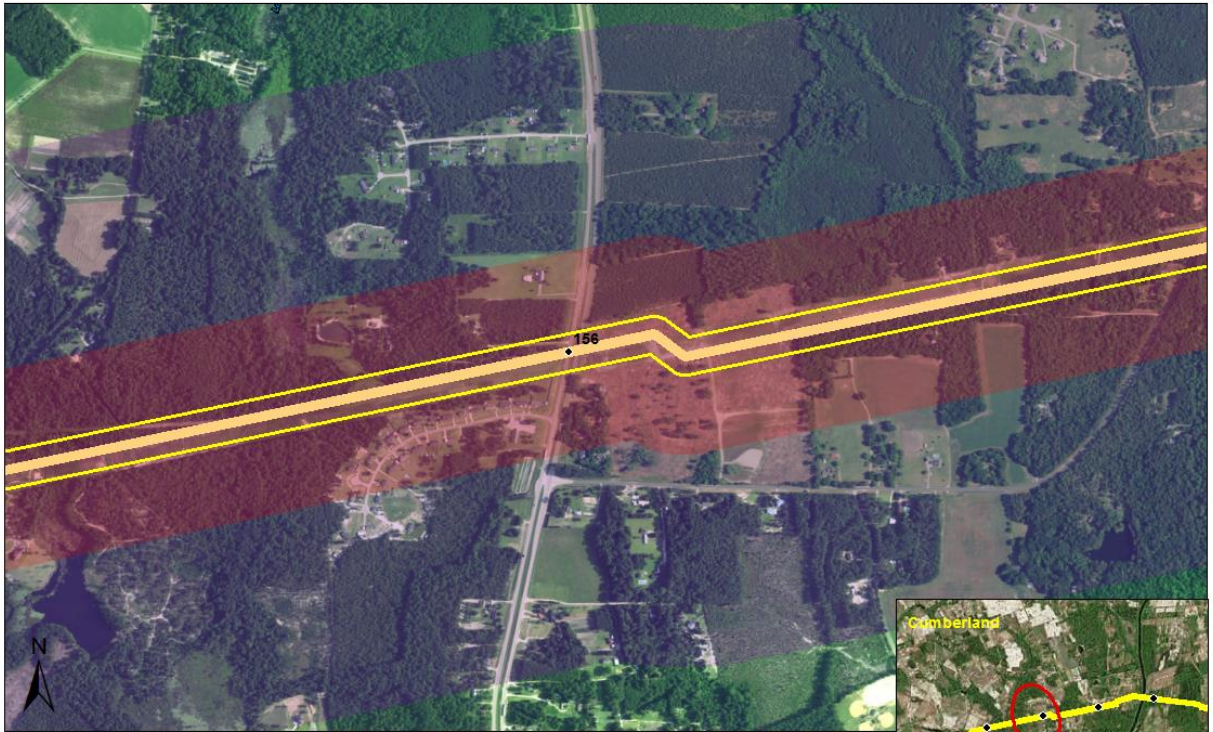
Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

3 1.5 0 3 Miles

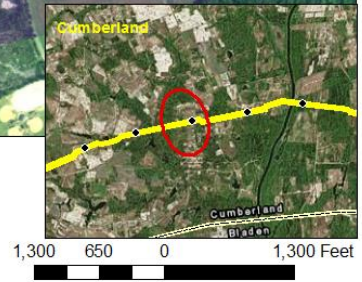


High Consequence Area 17 - Shiloah Church Rd (Near Parkton), Cumberland County

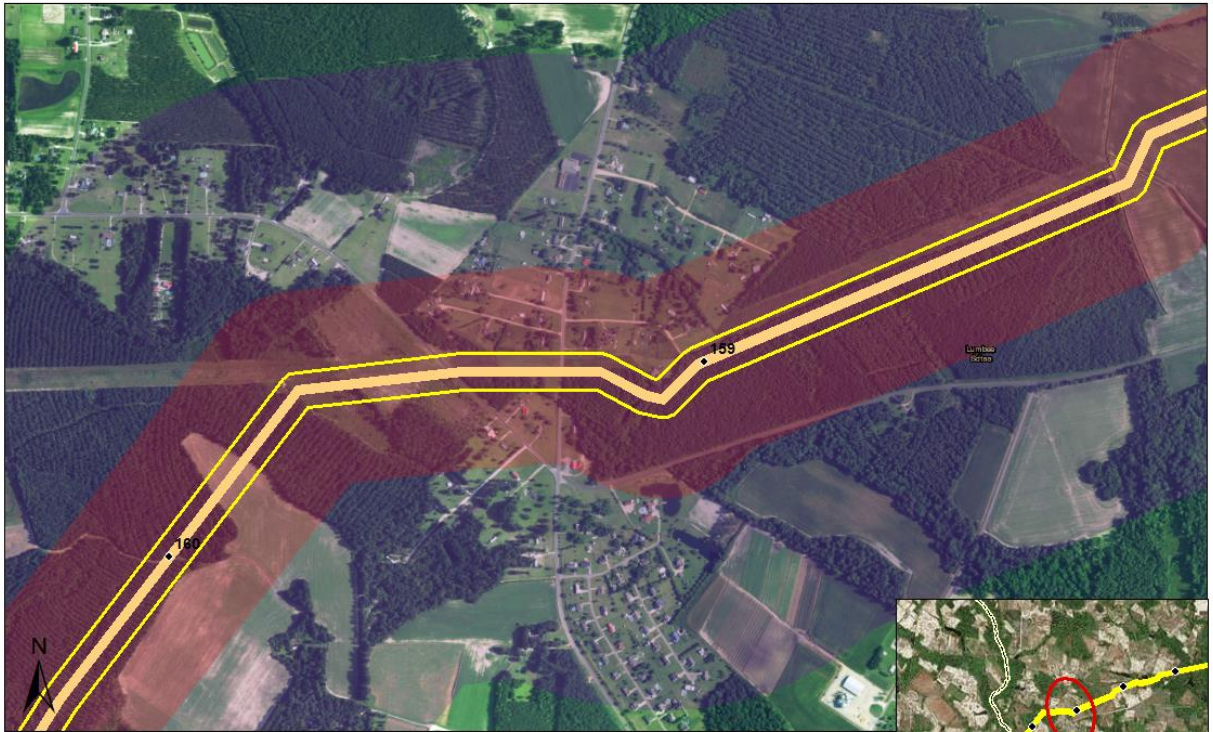


Legend

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- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

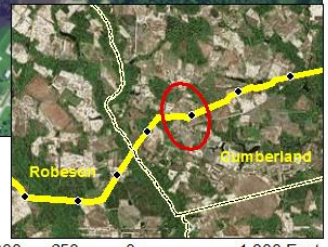


High Consequence Area 18 - Chicken Foot Rd and Yarborough Rd (Near St Pauls), Cumberland County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 19 - Frazer Rd (Near St Pauls), Robeson County

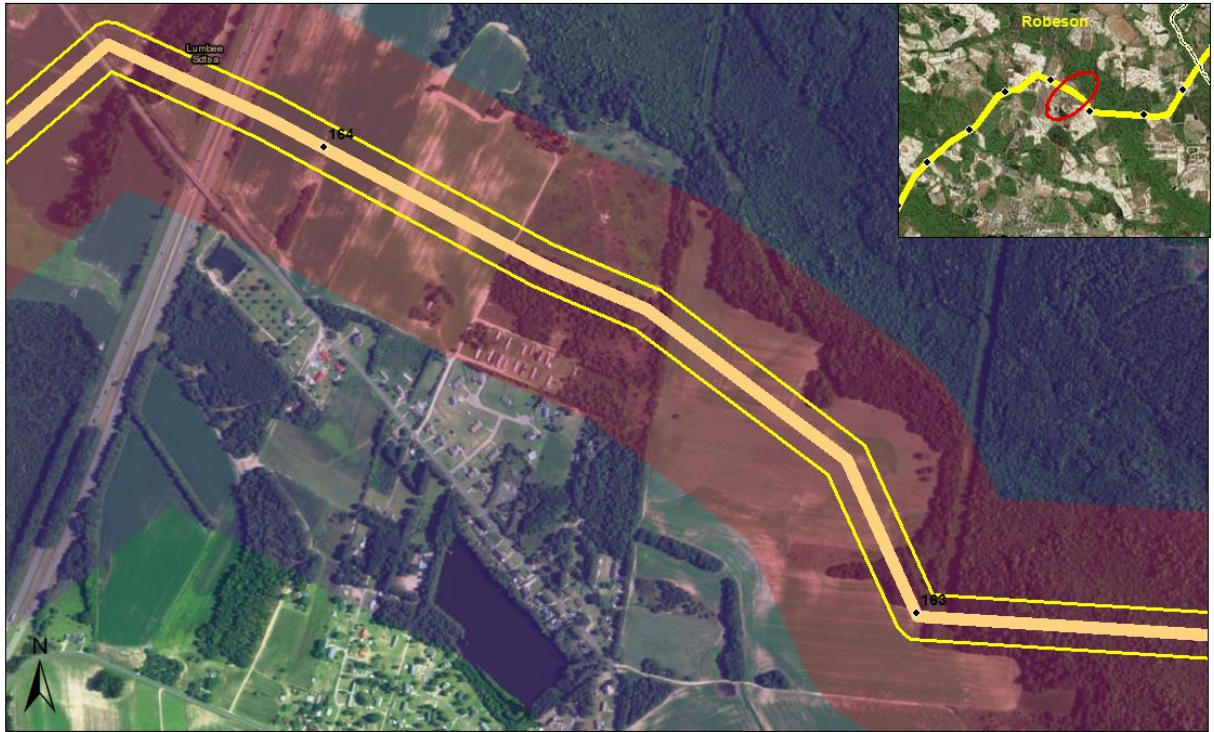


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

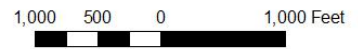
1,000 500 0 1,000 Feet

High Consequence Area 20 - Freedom Dr (St Pauls), Robeson County

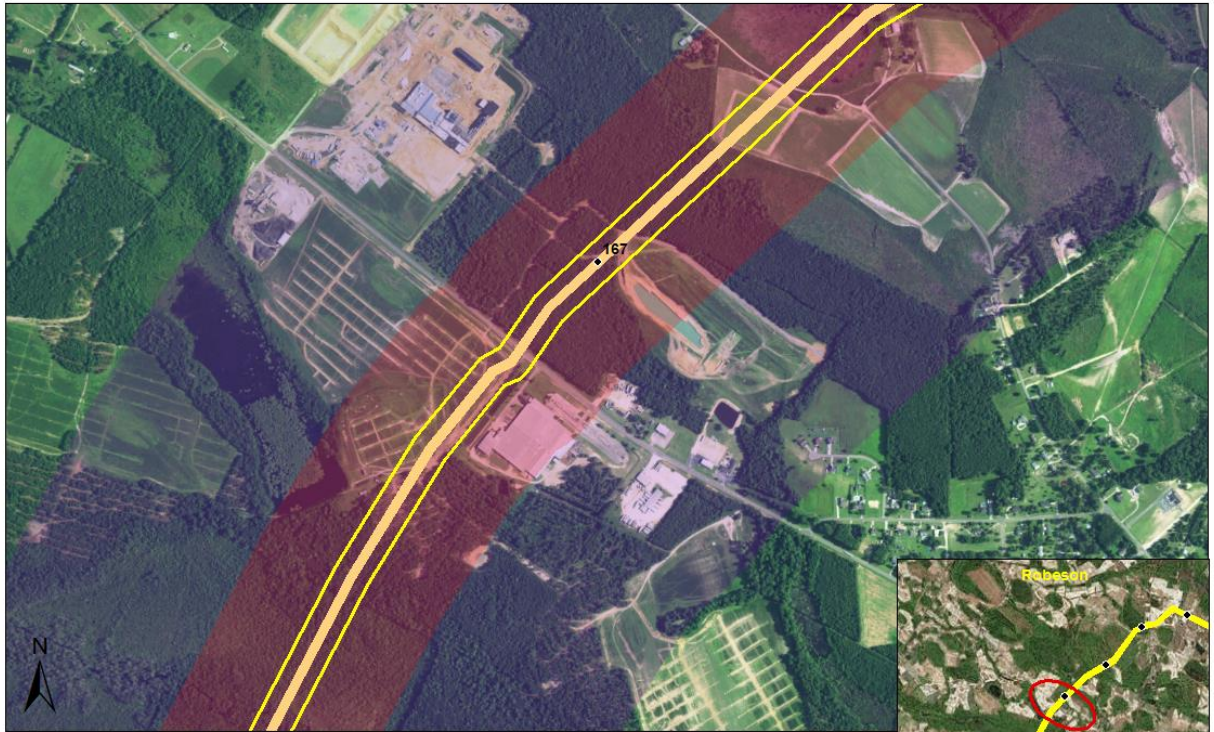


Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 21 - Mueller Steam Specialty (St Pauls), Robeson County

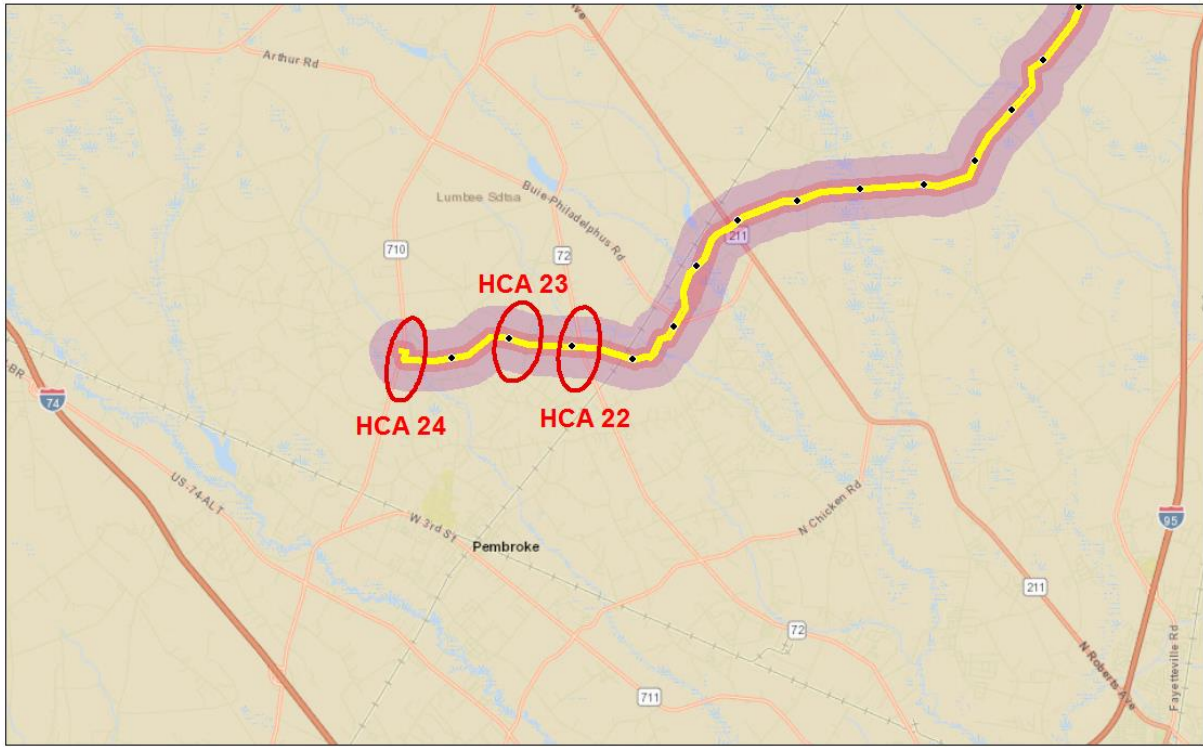


Legend

- | | |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|  Proposed Survey Corridor |  Blastzone (943 feet) |
|  Approximate Construction Impact |  Evacuation Zone (3071 feet) |

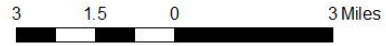
1,300 650 0 1,300 Feet

High Consequence Areas - Robeson County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blast Zone (943 feet)
- Evacuation Zone (3071 feet)

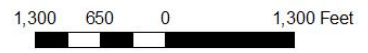


High Consequence Area 22 - Townsend Chapel Rd (Pembroke), Robeson County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

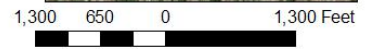


High Consequence Area 23 - Whistling Rufus Rd and Philadelphus Rd (Pembroke), Robeson County

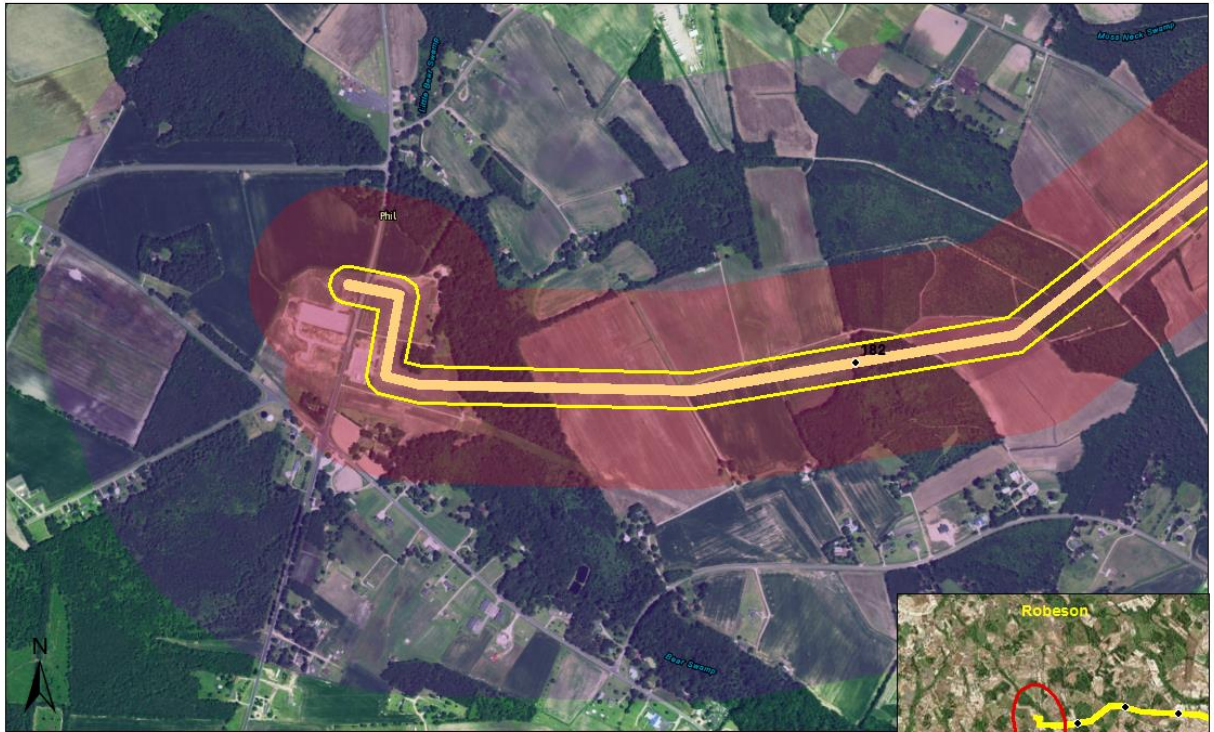


Legend

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- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)



High Consequence Area 24 - Bear Swamp (Pembroke), Robeson County



Legend

- Proposed Survey Corridor
- Approximate Construction Impact
- Blastzone (943 feet)
- Evacuation Zone (3071 feet)

1,300 650 0 1,300 Feet