GEHitachiUELAPEm Resource

From: Ridge, Christianne
Sent: Tuesday, September 15, 2009 4:01 PM
To: Richard Allen
Cc: GEHitachiHrgFile Resource
Subject: U.S. Nuclear Regulatory Commission environmental review of the proposed General Electric-Hitachi uranium enrichment facility near Wilmington, North Carolina
Attachments: ML092120524.pdf; GLE_ER_Rev_0_Executive_Summary.pdf

Dr. Allen,

Thank you for speaking with me on September 1 regarding the U.S. Nuclear Regulatory Commission environmental review of the proposed General Electric-Hitachi uranium enrichment facility near Wilmington, North Carolina. Per your request, I am sending an electronic version of the letter (and enclosure) we sent requesting information from the Cherokee Nation of Oklahoma.

Please let me know if any additional information or clarification would be useful.

Thank you.

A. Christianne Ridge, PhD
Sr. Environmental Project Manager
Division Waste Management and Environmental Protection
U.S. Nuclear Regulatory Commission
301-415-5673

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September 2, 2009

The Honorable Chadwick "Corntassel" Smith
Principal Chief
Cherokee Nation of Oklahoma
P.O.Box 948
Tahlequah, OK 74465

SUBJECT: REQUEST FOR INFORMATION REGARDING TRIBAL HISTORIC AND CULTURAL RESOURCES POTENTIALLY AFFECTED BY THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Chief Smith:

On June 26, 2009, General Electric-Hitachi (GEH) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to authorize construction and operation of a uranium enrichment facility. The facility, if licensed, would use a laser-based technology to enrich the isotope uranium-235 in uranium hexafluoride (UF_6) up to 8 percent by weight. GEH proposes to locate the facility on the existing General Electric/Global Nuclear Fuel-Americas site near Wilmington, in New Hanover County, North Carolina (Wilmington site).

As established in Title 10 Code of Federal Regulations Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, the NRC is preparing an Environmental Impact Statement (EIS) for the proposed action. The EIS will address the impacts associated with the construction, operation, and decommissioning of the proposed facility. As part of the environmental review, the NRC is requesting input from the Cherokee Nation of Oklahoma to facilitate the identification of Tribal historic sites or cultural resources that may be affected by the proposed action. Specifically, the NRC is interested in learning of any areas on the Wilmington site that you believe have traditional religious or cultural significance. Any input you provide will be used to enhance the scope and quality of our review in accordance with 10 CFR 51 and 36 CFR 800, the implementing regulation for Section 106 of the National Historic Preservation Act.

To support the license application, GEH submitted an Environmental Report (ER) that identifies 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site as the area for the construction, operation, and decommissioning of the proposed facility. The ER is publicly available in the NRC Public Document Room located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://www.nrc.gov/reading-rm/adams.html. The accession number for the ER is ML090910573. For your convenience, we have enclosed the applicant's executive summary, as it appears in the ER, to provide you with background information.

We would appreciate any information you could provide about Tribal historic sites or cultural resources that may be affected by the proposed action. If you have any questions or comments, or need any additional information, please contact Ms. Christianne Ridge of my staff by telephone at (301) 415-5673 or email at christianne.ridge@nrc.gov.

Sincerely,

/RA/

Patrice M. Bubar, Deputy Director
Environmental Protection
and Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 70-7016

Enclosure: GLE Environmental Report
Executive Summary

cc with enclosure:

Dr. Richard Allen, Policy Analyst
Native American Graves Protection
and Repatriation Act Representative
Cherokee Nation of Oklahoma
P.O.Box 948
Tahlequah, OK 74465

We would appreciate any information you could provide about Tribal historic sites or cultural resources that may be affected by the proposed action. If you have any questions or comments, or need any additional information, please contact Ms. Christianne Ridge of my staff by telephone at (301) 415-5673 or email at christianne.ridge@nrc.gov.

Sincerely,

Patrice M. Bubar, Deputy Director
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and Performance Assessment Directorate
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OFFICIAL RECORD COPY

GLE Environmental Report

Executive Summary

Revision 0

December 2008

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ES-1 Wilmington Site location and vicinity.

Executive Summary

GE-Hitachi Global Laser Enrichment LLC (GLE) is the applicant for a license from the U.S. Nuclear Regulatory Commission (NRC) to construct and operate a uranium-enrichment facility (henceforth referred to as the Proposed GLE Facility or the Facility). The license would authorize GLE to possess and use special nuclear, source, and by-product material in the Facility. The National Environmental Policy Act (NEPA) of 1969 requires federal agencies, as part of their decision making process, to consider the environmental impacts of actions under their jurisdiction. The NRC has established regulations to implement the NEPA requirements in 10 Code of Federal Regulations (CFR) 51 (*Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions*). This Environmental Report (Report) is being submitted to the NRC by GLE to comply with the 10 CFR 51 requirements in support of the licensing of the Proposed GLE Facility. The Report is organized according to the guidance for applicants provided by NRC in NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS (Nuclear Material Safety and Safeguards) Programs*, dated August 2003.

Proposed Action

The Proposed Action is to construct and operate a facility that would use a laser-based technology to separate or enrich the naturally occurring isotopes of uranium. GLE proposes to locate the Proposed GLE Facility on the existing General Electric Company (GE)/Global Nuclear Fuel–Americas (GNF-A) property near Wilmington, NC (henceforth referred to as the Wilmington Site), in accordance with the Atomic Energy Act of 1954, as amended; 10 CFR 40 (*Domestic Licensing of Source Material*); 10 CFR 70 (*Domestic Licensing of Special Nuclear Material*); and other applicable laws and regulations. It is GLE's intent that at the end of the Facility's operating life, the planned decommissioning activities would achieve release of the Proposed GLE Facility site for NRC license termination and unrestricted land use pursuant to 10 CFR 20.1401 (*General provisions and scope [Standards for Protection Against Radiation]*) and 10 CFR 20.1402 (*Radiological criteria for unrestricted use [Standards for Protection Against Radiation]*).

The Wilmington Site is situated on a 1,621-acre (656-hectare [ha]) tract of land located in an unincorporated area in northwest New Hanover County. **Figure ES-1** shows the location of the Site in relation to nearby cities, towns, landmarks, highways, and rivers and other waterbodies. The Wilmington Site is approximately 6 miles (9.6 kilometers [km]) north of the city of Wilmington. Industrial land uses are dominant on the opposite (west) side of the Northeast Cape Fear River across from the Site. In the eastern and southern vicinities of the Wilmington Site, residential land uses are dominant. The area north and northwest of the Site is a large, privately owned tract of land currently used for timber management and as a private hunting area. The eastern boundary of the Wilmington Site borders on N.C. Highway 133 (NC 133, also known as Castle Hayne Road and, previously, U.S. Highway 117) near its intersection with U.S. Interstate Highway 140 (I-140). Wilmington International Airport is located approximately 3.5 miles (5.2 km) southeast of the Site.

The Wilmington Site is zoned I-2 for Heavy Industrial land use. The eastern sector of the Wilmington Site is developed and is the location of the two principal on-site industrial operations: the GNF-A Fuel Manufacturing Operation (FMO) facility and the GE Aircraft Engines and Services Components Operation facility. Other on-site facilities in this sector support the manufacture of auxiliary equipment for nuclear reactors, the fabrication of zirconium components for fuel assemblies, and other supporting Site operations, engineering, and administration functions. The western sector of Wilmington Site is predominantly undeveloped, forested land.

Implementation of the Proposed Action would allow GLE to construct and operate a facility with the capability to enrich uranium up to 8% by weight of uranium-235 (^{235}U), with an initial planned maximum target annual production capacity of 6 million Separative Work Units (SWU). The Proposed GLE Facility would use a new uranium-enrichment process that is being developed by GLE in exclusive agreement with Silex Systems Limited. Feed material for the process would be uranium hexafluoride (UF_6), which is transported to the Proposed GLE Facility by truck. The process separates ^{235}U (the fissile isotope) from uranium-238 (^{238}U) in the UF_6 feed material and produces a UF_6 product stream enriched in ^{235}U and a waste stream depleted in ^{235}U (referred to as "UF_6 tails").

The Proposed GLE Facility would occupy approximately 100 acres (40 ha) in the North-Central Site Sector of the Wilmington Site. Within this area would be an approximately 600,000-square-foot (56,000-square-meter) main GLE operations building in which the uranium-enrichment process would be conducted. Other facilities would include several administrative and other Facility-support buildings, a parking lot, outdoor UF_6 cylinder storage pads, and maintained landscaped areas. Within the GLE Study Area, but outside and to the east of the 100-acre (40-ha) Proposed GLE Facility, would be an electrical substation, wastewater lift stations, access roads, guard houses, a water tower, and a stormwater wet detention basin.

Water for the Proposed GLE Facility would be provided by the existing well system at the Wilmington Site. Aboveground electric utility lines would connect the Proposed GLE Facility to the new electrical substation, which would be located on-site near the existing high-voltage electrical power transmission lines that already transect the Site through a utility corridor easement. Access to the Proposed GLE Facility from NC 133 (Castle Hayne Road) would be provided by a road located entirely on the Wilmington Site property near the Site's northeastern boundary (referred to as the proposed North access road). For direct transport (i.e., avoiding public roads) between the Proposed GLE Facility and GNF-A's FMO, an existing on-site service road would be paved and the existing stream crossing along this road would be improved (the improved road is referred to as the proposed South access road). The Proposed Action includes placement of new utility lines within existing utility corridors and/or clearings to the fullest extent practicable to minimize the need for additional wetlands crossings and for the clearing of additional wooded areas at the Site. The Proposed GLE Facility would not require the construction of new roads or new electrical, water, and sewer lines outside of the Wilmington Site boundaries.

The Proposed GLE Facility would use a combination of environmental control systems, treatment processes, monitoring programs, and work practices to protect worker and public health and the environment. Any gaseous releases from areas inside the main operations building in which UF_6 is handled and processed would be captured and routed through a multi-stage air emission control system. Similarly, liquid radiological wastewater would be collected in a closed, dedicated drain system connected to a GLE liquid effluent treatment system. Sanitary wastewater, cooling tower process wastewater, and treated radwaste would be routed from the Proposed GLE Facility to the Wilmington Site's existing permitted wastewater treatment facilities using pumping lift stations constructed adjacent to and east of the 100-acre (40-ha) Proposed GLE Facility. Solid wastes would be managed at the Proposed GLE Facility according to applicable regulations and good management practices and would be shipped off-site for recycling, recovery, or disposal to a licensed facility as appropriate for the waste type. No solid wastes would be land disposed at the Wilmington Site.

The enriched UF_6 produced at the Proposed GLE Facility would be used on-site by GNF-A in its FMO facility and shipped by truck to off-site customers. The UF_6 tails generated by the Proposed GLE Facility operations would be trucked to one of the U.S. Department of Energy's depleted uranium conversion facilities at the Paducah, KY, and Portsmouth, OH, sites or to a commercial depleted UF_6 conversion facility, should one become available. Until these facilities are operational and accept the UF_6 tails for processing, the UF_6 tails would be stored on-site at the Proposed GLE Facility. Low-level radioactive

waste (LLRW) generated by Proposed GLE Facility operations and requiring off-site disposal would be shipped solely by truck to the Energy*Solutions* facility in Clive, UT, or another licensed LLRW disposal facility, should one become available.

Need for Proposed Action

Actual and projected increases in U.S. nuclear power generating capacity indicate an increasing national demand for uranium-enrichment services, given that enrichment is an integral step in the nuclear fuel cycle. Based on current trends, existing U.S. sources alone will not be able to provide a dependable and economical domestic supply to meet the growing U.S. demand for these enrichment services. New domestic sources of enriched uranium are needed to replace the aging, energy-intensive Paducah Gaseous Diffusion Plant, which will need to be retired in the near future. The joint U.S. and Russian governments' "Megatons to Megawatts" Program, in which highly-enriched uranium from dismantled Russian nuclear warheads is being blended-down into low-enriched uranium to produce fuel for U.S. nuclear power plants, is scheduled to end in 2013. These two sources meet approximately half of the current U.S. demand for low-level enriched uranium. The Proposed Action is intended to satisfy the need for additional reliable and economical domestic sources of enriched uranium supply, particularly as existing aging and less-efficient production facilities cease operation. By supplying enrichment services to commercial nuclear fuel manufacturing plants, the Proposed GLE Facility would support the continued operation of existing nuclear power plants and the future operation of proposed new plants. In addition, the Proposed Action is intended to satisfy the need for domestic uranium-enrichment capacity for national energy security and the need to further establish advanced uranium-enrichment technology in the United States.

Consideration of Alternatives to the Proposed Action

The enrichment technology alternatives to using a laser-based technology are to continue using either the gaseous-diffusion or gas centrifuge uranium-enrichment technologies. Both technologies rely on the small difference in mass between ^{235}U and ^{238}U to separate the isotopes using mechanical methods. At present, gaseous-diffusion technology is the only technology in commercial use in the United States; however, due to its relatively large resource requirements, the gas centrifuge technology to be used at the proposed National Enrichment Facility in Eunice, NM, and the American Centrifuge Plant in Piketon, OH, is known to be more efficient and less energy-intensive than the gaseous-diffusion technology.

The laser-based enrichment technology to be used for the Proposed GLE Facility is anticipated to offer distinct advantages over both gaseous-diffusion and centrifuge-enrichment processes. The laser-based enrichment technology is more efficient than either of the mechanical process-based technologies previously discussed. Not only does this higher efficiency lower capital and operating costs of the enrichment operation, but it also allows for more flexibility in product-enrichment levels (the percentage of ^{235}U in the final product) at a given site. The technological advantages of the laser-based enrichment technology also are anticipated to result in reduced environmental impacts compared to gaseous-diffusion and centrifuge enrichment processes due to the smaller facility footprint for the same SWU capacity, lower cooling water requirements, no chlorofluorocarbon use, and lower energy requirements. To achieve these operational and environmental impact advantages, the laser-based enrichment technology was chosen for the Proposed GLE Facility.

Section 102(2)(c) of the NEPA requires that siting alternatives for a proposed action be evaluated. A site-selection process was performed to evaluate a proposed site and the alternative sites to identify the preferred site for the construction and operation of the Proposed GLE Facility. The preferred site was determined by a multi-step process that included the following steps:

- *Identification of 22 candidate sites* for locating the Proposed GLE Facility.
- *Initial screening* of the candidate sites to eliminate from further consideration those sites identified to be located in hazard zones created by seismicity, recent faulting, or flooding that could potentially jeopardize safe operation of the Proposed GLE Facility.
- *Coarse screening* of remaining sites that pass the initial screening using business-decision related criteria.
- *Site-reconnaissance visits* to those remaining sites for which the final determination of the coarse-screening criteria could only be verified by an on-site visit and discussions with site employees and management.
- *Fine screening* of the sites remaining after the previous screening steps using a set of detailed site-level evaluation criteria based on public health and safety factors, as well as potential environmental and socioeconomic impacts.
- *Qualitative cost-benefit analysis (CBA)* comparing the net benefits of locating the Proposed GLE Facility at each of the sites evaluated for the fine screening.

The results of the site-selection process concluded that the Wilmington Site is the preferred site for the Proposed GLE Facility.

Following selection of the Wilmington Site for the Proposed Action, areas within the Site's property boundaries were evaluated to locate the Proposed GLE Facility. Undeveloped locations within the Wilmington Site were considered, but were eliminated from further evaluation due to a variety of factors, including insufficient acreage available for the Proposed GLE Facility or their proximity to floodplains, streams, and/or readily apparent wetlands or rare ecological resources that would likely require a significant degree of mitigation.

Environmental Impacts of Proposed Action

Environmental resource impacts were evaluated for the Proposed Action and the No Action Alternative. Under the No Action Alternative, the Proposed Action would not take place; the No Action Alternative establishes the baseline for assessing the environmental impacts of the Proposed Action. Environmental impacts from an action that are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of an applicable environmental resource are assigned the significance level of SMALL. When the environmental impacts from an action are sufficient to alter noticeably, but not to destabilize, important attributes of a resource, a significance level of MODERATE is assigned. Environmental impacts that are clearly noticeable and are sufficient to destabilize important attributes of a resource are assigned the significance level of LARGE.

The environmental impacts for the No Action Alternative would be SMALL. A uranium-enrichment facility would not be added to the Wilmington Site. The existing industrial facilities at the Wilmington Site would continue to operate.

The types and magnitudes of the environments impacts for the Proposed Action would vary during the Proposed GLE Facility construction, operation, and decommissioning phases. In general, the unavoidable residual adverse impacts for the Proposed Action after implementation of mitigation measures to control and minimize potential adverse impacts would be SMALL, with the exception of MODERATE impacts for transportation, ecological, depleted UF_6 waste management, and noise resources on a localized or temporary basis (i.e., at or in the immediate vicinity of the Proposed GLE Facility or only during the construction phase). On a regional basis, the impacts for these resources also would be SMALL. No LARGE adverse environmental impacts are identified for the Proposed GLE Facility.

The Proposed GLE Facility would be constructed on land already owned by GE and currently not accessible by the public. No identified cultural or historical resources would be impacted by the Proposed Action. The Proposed GLE Facility would create no visual/resource impacts that are out of character with the Wilmington Site vicinity or alter its existing mixed land-use setting. Potential impacts from geological conditions on the Proposed GLE Facility are expected to be SMALL and mitigated through engineering controls.

The Proposed Action would result in SMALL direct impacts on stream channels by creating a crossing for the proposed North access road and modifying an existing crossing to be used for the proposed South access road. Water-quality impacts from construction and operation of the Proposed Action would be SMALL due to the use of best management practices (BMPs) and standard waste treatment operations. The Proposed Action does not use surface water as a source of water. Any impacts from the Proposed Action on groundwater quality are anticipated to be SMALL. Groundwater levels are not anticipated to change significantly in response to changes in pumping required for the Proposed Action; therefore, water consumption by the Proposed GLE Facility would not notably impact the supply of water to other users in the area. Upgrade of the existing stream crossing for the South access road would occur within the floodplain boundary, but no other topographic impacts to floodplains are anticipated. Minor changes in floodwater volume and flow during extreme storm events are anticipated, and these SMALL impacts would be mitigated by natural systems. The Main 100-acre (40-ha) area of the Proposed GLE Facility would not directly impact any wetlands. The proposed North access road would cross two jurisdictional wetland areas and potentially impact two isolated wetlands. The existing gravel service road that would be upgraded to serve as the proposed South access road crosses and abuts another jurisdictional wetland; however, this wetland would not be directly impacted from the modifications to the existing roadway. Direct and indirect impacts to these wetlands would be SMALL and mitigated to the extent practicable and as required by regulations.

Construction and operation of the Proposed GLE Facility and proposed North and South access roads would displace some local wildlife populations to nearby habitat in the western portion of the Wilmington Site and disrupt wildlife travel corridors. Human encounters with some wildlife could increase due to disruption of travel corridors and loss of habitat. No direct impacts to rare or unique habitats or commercially or recreationally valuable species would result from the Proposed Action. The removal of forested biotic communities would noticeably alter the composition of habitat, but would not destabilize the existence of these communities. Overall, wildlife populations on the Wilmington Site would be altered, but the existence of these species would not be destabilized. Therefore, direct and indirect impacts to ecological resources from the Proposed Action would be MODERATE.

Workers at the Proposed GLE Facility would use appropriate safety equipment and procedures to limit to acceptable levels any radiation and chemical exposure that would occur during material handling and maintenance activities required for operation of the uranium-enrichment process. During construction, operation, and decommissioning of the Proposed GLE Facility, air emissions control systems, monitoring programs, and BMPs would be used to limit the amounts of air pollutants released to the atmosphere so as to not significantly affect the ambient air concentration levels to which the public is exposed. Wastewaters generated by the Proposed GLE Facility operations would be treated on-site to meet National Pollutant Discharge Elimination System (NPDES)–permit requirements before being discharged to receiving waterbodies used by the public. Solid wastes would be managed on-site in accordance with good waste storage and handling practices and shipped for recycling, re-use, or final treatment or disposal at licensed facilities appropriate for the waste type.

Overall population, economic, and social adverse impacts from the Proposed GLE Facility are anticipated to be SMALL. The numbers of workers required for construction, operation, and decommissioning of the Proposed GLE Facility are expected not to significantly affect housing, educational, medical, law

enforcement, and fire services in the region. The Proposed Action is not expected to result in disproportionately adverse impacts on low-income or minority residents.

Motor vehicle traffic generated by the construction and operation of the Proposed GLE Facility could increase local traffic congestion during certain times of the day on roadways in the vicinity of the NC 133 (Castle Hayne Road)/I-140 interchange, creating MODERATE impacts; however, overall transportation impacts would be SMALL on a regional basis. Existing residents living adjacent to the northeastern Wilmington Site property boundary near the proposed North access road could be exposed to temporary MODERATE noise impacts for short durations during initial preparation of the GLE Facility site and construction activities for the Proposed GLE Facility. Because most noise-generating sources associated with operation of the Proposed GLE Facility would be located inside structures, noise impacts for the remainder of the operating life of the Proposed GLE Facility would be SMALL.

Cost-Benefits of the Proposed Action

A CBA was performed to assess the overall impact of the Proposed Action on society's well-being, including benefits and costs accruing to GLE, as well as benefits and costs experienced by other members of society. The anticipated benefits of the Proposed GLE Facility include socioeconomic benefits and environmental benefits. Profits earned by GLE from Facility operations and additional jobs and spending in the regional economy may be regarded as external financial benefits. Similarly, the additional tax revenues that may be received by federal, State, and local government as a result of the Proposed Action may also be regarded as a socioeconomic benefit. Environmental benefits of the Proposed Action include increased energy security due to increased quantity and reliability of supply for enriched uranium, possible increases in the share of electric power that is generated by nuclear plants, and the use of a less energy-intensive enrichment technology. In addition, the Proposed GLE Facility would provide enriched uranium to fuel existing and potential new U.S. nuclear power plants. Nuclear power plants provide a critical source of base-load electricity without emitting the air pollutants and greenhouse gasses associated with coal-fired power plants and other combustion-based power generation sources.

The estimated environmental and socioeconomic costs and impacts of the Proposed Action are generally SMALL, and many of the anticipated external impacts may be offset by mitigation measures. These impacts include increases in traffic associated with the Wilmington Site, small increases in releases to surface water, small increases in air emissions, and possible impacts, but not adverse impacts, on some Federal Species of Concern.

Conclusion

The Proposed Action is to construct and operate a facility at the Wilmington Site that would use a laser-based technology to enrich uranium for use by nuclear fuel manufacturing facilities. The licensing of the Proposed GLE Facility is an important step toward advancing the national energy security goals of maintaining a reliable and economical domestic source of enriched uranium. Short-term impacts of the Proposed GLE Facility on the public and the environment would be controlled and minimized to the extent practical with the implementation of mitigation measures and good resource management practices. Considering both private and external benefits and costs, the Proposed GLE Facility would increase society's welfare by producing positive net benefits. The construction, operation, and decommissioning of the Proposed GLE Facility at the Wilmington Site would require short-term uses of environmental resources that would have an overall SMALL adverse impact on the environment and the quality of life for the public.

Figure

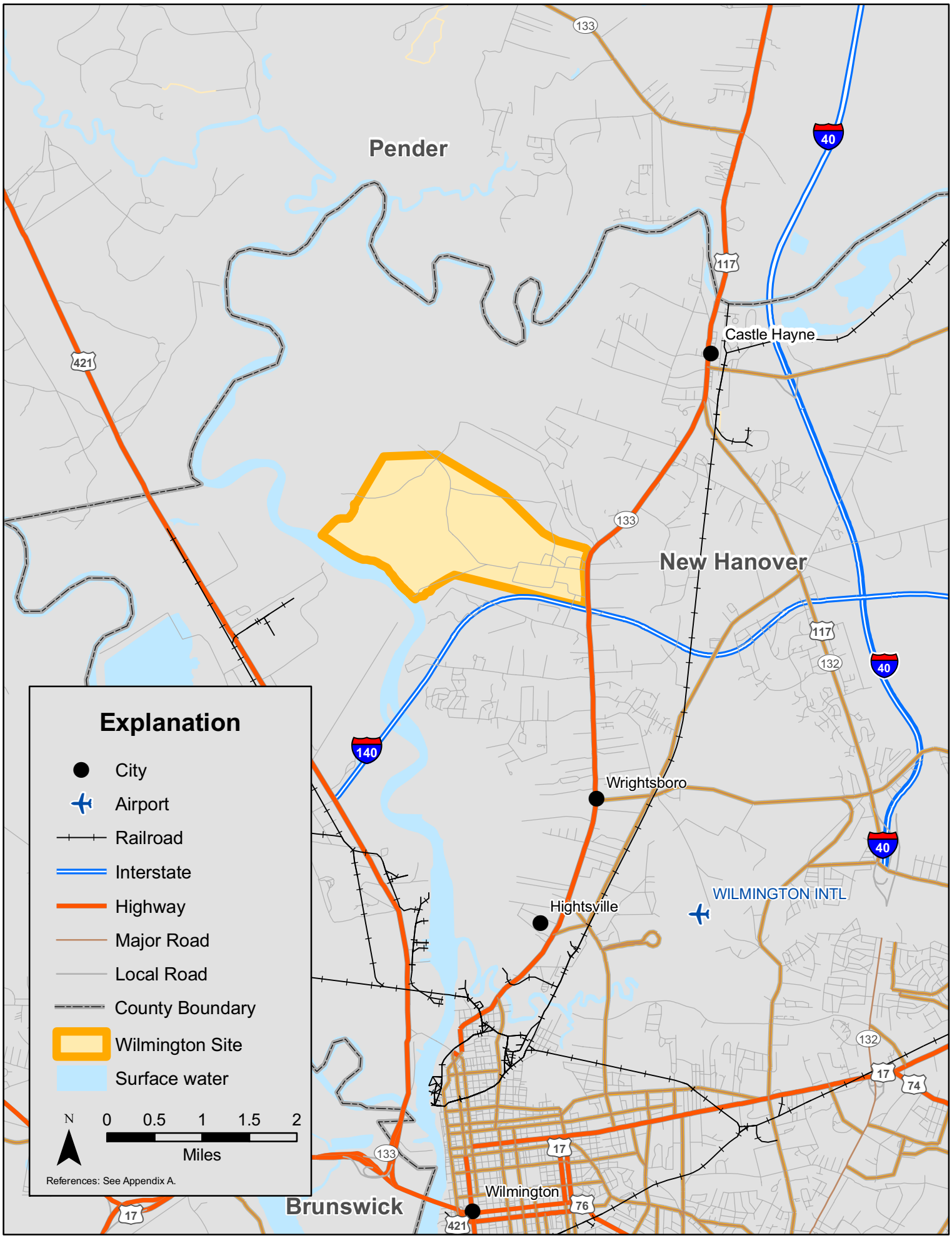

Figure ES-1. Wilmington Site location and vicinity.