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United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1938, Vol. 2

Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment, LLC Facility in Wilmington, North Carolina

Final Report

Appendices

Office of Federal and State Materials and
Environmental Management Programs

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ABSTRACT

On January 30, 2009, General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) submitted an environmental report to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct and operate the GLE Global Laser Enrichment Facility. GLE submitted the remainder of the license application on June 26, 2009. The proposed GLE Facility would be located in the North-Central Sector of the existing GE property near Wilmington, North Carolina. The proposed GLE Facility, if licensed, would enrich uranium for use in manufacturing nuclear fuel for commercial power reactors. Feed material for the proposed GLE Facility would be comprised of non-enriched uranium hexafluoride (UF_6). GLE would employ a laser-based enrichment process to enrich uranium to up to 8 percent uranium-235 by weight, with an initial planned maximum target production of 6 million separative work units (SWU) per year. GLE could begin preconstruction activities prior to the NRC's licensing decision in 2012. If the license is granted, GLE expects to begin facility construction in 2012, and continue construction activities through 2020. GLE anticipates commencing initial production in 2014 and reaching peak production in 2020. Prior to license expiration in 2052, GLE would seek to renew its license to continue operating the facility, or plan for the decontamination and decommissioning of the facility per the applicable licensing conditions and NRC regulations. The proposed GLE Facility would be licensed in accordance with the provisions of the *Atomic Energy Act*. Specifically, an NRC license under Title 10, "Energy," of the *U.S. Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70 would be required to authorize GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility site.

This Environmental Impact Statement (EIS) was prepared in compliance with the *National Environmental Policy Act of 1969,* as amended (NEPA), and the NRC regulations for implementing NEPA (10 CFR Part 51). This EIS evaluates the potential environmental impacts of the proposed action and reasonable alternatives. This EIS also describes the environment potentially affected by GLE's proposal, presents and compares the potential environmental impacts resulting from the proposed action and alternatives, describes GLE's environmental monitoring program and mitigation measures, and evaluates the costs and benefits of the proposed action.

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EXECUTIVE SUMMARY

BACKGROUND

Pursuant to Title 10 of the *U.S. Code of Federal Regulations* (10 CFR) Parts 30, 40, and 70, the U.S. Nuclear Regulatory Commission (NRC) is considering whether to issue a license that would allow General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) to possess and use special nuclear material, source material, and byproduct material at a proposed laser-based uranium enrichment facility near Wilmington, North Carolina. The scope of activities to be conducted under the license would include the construction and operation of the proposed GLE Facility. GLE submitted its Environmental Report (GLE, 2008) to the NRC on January 30, 2009, and the license application was submitted on June 26, 2009. To support its licensing decision on the proposed GLE Facility, the NRC's implementing regulations in 10 CFR Part 51 for the *National Environmental Policy Act* (NEPA) require the preparation of an Environmental Impact Statement (EIS). The development of this EIS is based on the NRC's review of information provided by GLE, the NRC's independent analyses, and consultation with other Federal agencies, American Indian tribes and organizations, State agencies, and local agencies.

The enriched uranium produced at the proposed GLE Facility would be used to manufacture nuclear fuel for commercial nuclear power reactors. Enrichment is the process of increasing the concentration of the naturally occurring and fissionable uranium-235 isotope. Uranium ore usually contains approximately 0.72 percent uranium-235 by weight. To be useful in nuclear power plants as fuel for electricity generation, uranium must be enriched to approximately 3–5 percent uranium-235 by weight.

THE PROPOSED ACTION

The proposed action considered in this EIS is the NRC issuing a license that would allow GLE to construct, operate, and eventually, decommission (under a separate NRC action) a laser-based uranium enrichment facility on existing GE property near Wilmington, North Carolina. The license would authorize GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility for a period of 40 years. If the license is granted, the proposed GLE Facility would be located on the North-Central Sector of the GE property.

The proposed GLE Facility would employ a laser-based process to enrich uranium up to 8 percent uranium-235 by weight (although nuclear power reactors normally require 3–5 percent uranium-235 by weight), with an initial planned maximum target production of 6 million separative work units (SWU) per year. GLE could begin preconstruction activities at GE's Wilmington Site prior to the NRC licensing decision in 2012. If the license is approved, GLE expects to begin facility construction in 2012, and continue through 2020. Initial production would commence in 2014 and reach peak production in 2020. Prior to license expiration in 2052, GLE would decide whether or not to renew its operating license, or decontaminate and decommission the facility.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is for GLE to construct, operate, and decommission a facility to enrich uranium up to 8 percent uranium-235 by weight, with a production capacity of

6 million SWU per year, using laser-based technology at the proposed GLE Facility. This facility would provide an additional domestic source of low-enriched uranium to be used in commercial nuclear power plants.

Nuclear power supplies approximately 20 percent of the nation's electricity. Currently, domestic production of low-enriched uranium accounts for approximately 16 percent of U.S. demand. The United States Enrichment Corporation (USEC) is the primary domestic supplier of low-enriched uranium for nuclear fuel in the United States through its operation of an enrichment plant near Paducah, Kentucky. Under the Megatons-to-Megawatts Program (which is scheduled to expire in 2013), USEC also imports the enriched portion of downblended (diluted) weapons-grade uranium from Russia to supply an additional 37 percent of the U.S. demand. Foreign suppliers, other than Russia, meet the remaining 47 percent of the current U.S. demand for low-enriched uranium.

Commencing in 2013, USEC will import, under a new 10-year agreement, low-enriched uranium from Russia at levels initially expected to reach (in 2015) approximately one-half the level of the Russian downblended, weapons-grade materials. The agreement includes an option to increase the quantities to the same level as the Megatons-to-Megawatts Program. USEC will deliver a portion of this enriched uranium to U.S. utilities.

The Louisiana Energy Services (LES) National Enrichment Facility (NEF, doing business as [d/b/a] URENCO USA) in Lea County, New Mexico, which began initial operations in June 2010, may provide additional enrichment services in the future as construction continues and the facility reaches capacity. USEC's American Centrifuge Plant (ACP) in Piketon, Ohio, and AREVA's Eagle Rock Enrichment Facility (EREF) in Bonneville County, Idaho, may also provide additional domestic enrichment services in the future.

The current dependence on a single U.S. supplier and foreign sources for low-enriched uranium imposes reliability risks for the nuclear fuel supply to U.S. nuclear power plants. The production of enriched uranium at the proposed GLE Facility would be equivalent to about 40 percent of the current and projected demand (15–16 million SWU) for enrichment services within the United States.

ALTERNATIVES

The NRC considered a reasonable range of alternatives, including the no-action alternative, in this EIS. Under the no-action alternative, the proposed GLE Facility would not be constructed. Enrichment services would continue to be performed by existing domestic and foreign uranium enrichment suppliers. Paducah Gaseous Diffusion Plant (GDP) and the NEF would continue to provide enrichment services. The ACP and EREF could also provide enrichment services in the future.

GLE considered 22 sites throughout the United States, evaluating them based on various technical, safety, economic, and environmental criteria. GLE concluded that the site considered in the proposed action met all of the criteria and that none of the other candidate sites were obviously superior to the preferred site near Wilmington, North Carolina. The NRC reviewed the GLE site selection process and determined that it is rational and objective, and that its results are reasonable. Therefore, no other site was evaluated in this EIS.

The NRC considered three alternatives to the proposed action for satisfying domestic enrichment needs, including (1) reactivation of the Portsmouth Gaseous Diffusion Plant near Piketon, Ohio, (2) downblending of high-enriched uranium, and (3) purchase of low-enriched uranium from foreign sources. These alternatives were eliminated from detailed study due to reliability issues, excessive energy consumption, national energy policy objectives, and national energy security concerns.

The NRC also evaluated several alternative technologies to the laser-based enrichment process, including electromagnetic isotope separation, liquid thermal diffusion, gaseous diffusion, atomic vapor laser isotope separation, molecular laser isotope separation, and gas centrifuge. All of these technologies, except gas centrifuge, were eliminated from detailed study due to the fact that some technologies are still in development and/or not economically viable. The environmental impacts of gas centrifuge technology were qualitatively evaluated, relative to those of the proposed laser-based technology. Although gas centrifuge is a technologically and economically viable alternative, it is not obviously superior to the laser-based technology that GLE has chosen to pursue for the proposed action.

The NRC also evaluated alternative conversion and disposition methods for depleted uranium hexafluoride (UF_6), including (1) beneficial use of depleted UF_6 and (2) conversion at facilities other than the new U.S. Department of Energy (DOE) facilities at Portsmouth, Ohio, and Paducah, Kentucky. For the purposes of this analysis, because the current available inventory of depleted uranium exceeds the current and projected demand for the material, the depleted UF_6 generated by the proposed GLE Facility was considered a waste product, and disposition alternatives involving its use as a resource were not evaluated. In addition, existing fuel fabrication facilities are currently not interested in depleted UF_6, and the cost for the conversion could not be estimated. Therefore, this alternative was also eliminated from detailed study. However, International Isotopes, Inc., submitted a license application to the NRC on December 31, 2009, to construct and operate a depleted uranium hexafluoride (UF_6) conversion facility near Hobbs, New Mexico. This facility would deconvert depleted UF_6 into fluoride products (for commercial resale) and depleted uranium oxides (for disposal). On February 23, 2010, the NRC accepted the license application for detailed technical review.

NRC EXEMPTION TO CONDUCT CERTAIN PRECONSTRUCTION ACTIVITIES

The NRC has approved an exemption request from GLE to conduct certain preconstruction activities prior to NRC's decision to issue a license for the construction and operation of the proposed GLE Facility. The exemption covers the following activities and facilities:

- Clearing of 47 hectares (117 acres) for the proposed GLE Facility;
- Site grading and erosion control;
- Installing a stormwater retention system;
- Constructing main access roadways and guardhouse(s);
- Installing utilities (electricity, potable water, process water, water for fire suppression, sanitary sewer, and natural gas);

- Constructing parking lots and minor roadways; and
- Constructing administrative building(s).

The NRC granted the exemption on May 8, 2009. This exemption authorizes GLE to conduct the stated activities, provided that none of the facilities or activities subject to the exemption would be components of GLE's Physical Security Plan or its Standard Practice Procedures Plan for the Protection of Classified Matter, or otherwise be subject to NRC review or approval. For the purposes of this EIS, these activities are assumed to occur prior to NRC's decision to grant a license to GLE, and therefore, are assumed to occur under both the proposed action and no-action alternatives.

POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

This EIS evaluates the potential environmental impacts of the proposed action. A standard of significance has been established for assessing environmental impacts based on Council on Environmental Quality (CEQ) terminology for "significantly" (see 40 CFR 1508.27). Since the significance and severity of an impact can vary depending on the proposed action, both "context" and "intensity" as defined in CEQ regulations 40 CFR 1508.27 were considered. Context is the environment surrounding the location where action(s) would occur. Intensity refers to the severity of the impact, in whatever context it occurs. Based on this, the NRC established three levels of significance for potential impacts: small, moderate, and large. The definitions of these three significance levels follow:

- *Small impact*: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- *Moderate impact*: Environmental effects are sufficient to alter noticeably, but not destabilize, important attributes of the resource.
- *Large impact*: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Land Use

Small Impact. The Wilmington Site is owned by GE and zoned for heavy industrial use; construction of the proposed GLE Facility would be consistent with current zoning. The project area currently consists of mostly mixed-pine forest, and is bordered by existing GE facilities, the Northeast Cape Fear River, and residential development. Preconstruction activities would occur under the proposed action, removing the undeveloped forest. Construction of the proposed GLE Facility would not alter current land use at the Wilmington Site or affect surrounding land use.

Operation of the proposed GLE Facility at the Wilmington Site could affect nearby residential development. However, facility operations would be consistent with other industrial activities at the Wilmington Site. These industrial activities have had no effect on residential development.

Decommissioning would not alter current land use at the Wilmington Site or affect surrounding land use.

Historical and Cultural Resources

Small to Moderate Impact. The location for the proposed GLE Facility (study area) comprises 106 hectares (263 acres). Under the proposed action, preconstruction activities would have an impact on historic and cultural resources. NRC-authorized construction would take place on ground previously disturbed by preconstruction. No construction activities are expected to occur in the portion of the Wilmington Site where historic and cultural resources are known to exist.

GLE Facility operations would have the potential to affect historic and cultural resources. While GLE has no plans to alter the site during operations, there is a high potential for additional historic and cultural resources to be discovered during routine maintenance activities. The Wilmington Site is located within a region containing high concentrations of historic and cultural resources. Operational impacts would depend largely on procedures employed to protect historic and cultural resources. The Middle Woodland archaeological site 31NH801 would not be affected by facility operations. The North Carolina State Historic Preservation Office (SHPO) requested that GLE develop procedures to protect site 31NH801. In response, the NRC proposed a license condition that would require GLE to consider the potential effects on historic and cultural resources from any ground-disturbing activities in unsurveyed areas of the GLE Facility site. GLE also developed Common Procedure CP-24-201 to address the unanticipated discovery of human remains or artifacts. The SHPO concurred that a determination of “no adverse effect” is appropriate with the inclusion of the proposed license condition. Based on this information, the NRC determined that the impact level would be SMALL to MODERATE given the close proximity of significant historic and cultural resources and high potential for additional historic and cultural resource materials to be discovered during routine operations. The NRC's determination is based on the license containing the proposed license condition.

Decommissioning impacts on historic and cultural resources are expected to occur primarily during ground-disturbing activities; the need to clear previously undisturbed land is not expected as a part of decommissioning activities.

Visual and Scenic Resources

Small Impact. The project area has low scenic quality and the environment in the project area is not unique for the area. Under the proposed action, preconstruction activities would include clearing vegetation. The proposed GLE Facility would be located adjacent to existing industrial facilities and would be consistent with the existing industrial character of the Wilmington Site. Likewise, the project area is not in a location that is sensitive to visual intrusions.

Construction activities would be limited to the Wilmington Site. The greatest visual impacts would occur from increased truck and worker traffic, but these impacts would be temporary. The main project area is surrounded by a vegetation barrier, so construction activities would be largely screened. Construction cranes would be visible from greater distances, but this impact would be temporary.

The two most visible (i.e., tallest) structures would be the water tower and a portion of the operations building referred to as the operations building tower. The operations building tower will have front and side profiles of 37 meters (120 feet) by 200 meters (660 feet), and could reach up to 49 meters (160 feet) above grade. The proposed water tower is the same height as the existing Wilmington Site water tower, the top of which is visible from south of Interstate 140

(I-140). Although the operations building tower could be 10 meters (30 feet) taller than the existing water tower, it would be visible primarily from Castle Hayne Road and the residential subdivision to the northeast, because it would be further from I-140 than the existing water tower. The water tower, facility, and operations building tower would not represent a major alteration of the existing visual environment. Portions of the proposed facility may be visible from I-140, and the planting of additional vegetation may minimize visual impacts.

Decommissioning impacts on visual and scenic resources would be minimal and of short duration. Temporary visual impacts could result from the use of heavy equipment and the increase in worker traffic. Once decommissioning is complete, most of the visual impacts would cease. The vegetation screen surrounding the Wilmington Site would make changes imperceptible to all but the closest residences.

Air Quality

Small to Moderate Impact. Under the proposed action, preconstruction activities would have an impact on ambient air quality conditions at the Wilmington Site. Air quality impacts would be the highest during preconstruction activities (not a part of the proposed action) and the initial two years of GLE Facility construction. Criteria pollutants, volatile organic compounds (VOCs), greenhouse gases, hazardous air pollutants (HAPs), fugitive dust emissions, and engine exhaust emissions would be released during these activities. Emissions of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO) would have a SMALL impact on ambient air quality (well below applicable standards). Impacts from lead and ozone-precursor emissions from GLE Facility construction are expected to be negligible and would have SMALL impacts on surrounding areas.

Total 24-hour concentrations of particulate matter equal to or smaller than 10 micrometers (PM_{10}) and particulate matter equal to or smaller than 2.5 micrometers ($PM_{2.5}$), mostly resulting from fugitive dust emissions, are predicted to exceed air quality standards during preconstruction and construction phases. Since preconstruction and construction activities would last about nine months and two years, respectively, the potential air quality impacts during the preconstruction phase would be MODERATE but temporary. Aggressive dust control measures would be implemented during the preconstruction and construction phases to reduce the impact.

Because the proposed GLE Facility would not employ any continuous combustion activities during operation, emission rates for criteria pollutants and HAPs would be SMALL. Uranium-related and/or hydrogen fluoride (HF) stack emissions would be minimal, and emissions from diesel fuel handling would be very low. Fugitive dust emissions would be minimal, as most working areas and roads would be paved. Potential impacts from GLE Facility operations on regional ozone would also be SMALL.

Decontamination activities would mostly occur inside GLE Facility buildings, where emission controls would minimize atmospheric releases. Standard dust suppression techniques could be employed during the demolition of structures and other hard surface areas to control dust emissions. Work areas would be monitored for airborne dust, and a small, temporary shelter or tent with portable high-efficiency particulate air (HEPA) filtration could be used to minimize the release of contaminated dust. The number of workers would be fewer than those required during construction or operations, but truck traffic on the North access road would be comparable to that experienced during GLE Facility construction. Air emission rates and associated air quality impacts of decontamination and decommissioning activities at the proposed GLE Facility would be comparable to or less than those experienced during construction.

Geology and Soils

Small Impact. Under the proposed action, preconstruction activities would have an impact on soil conditions at the Wilmington Site. Approximately 91 hectares (226 acres) of land would be disturbed under the proposed action, including the proposed GLE Facility site, support structures, and road construction. Construction vehicles and equipment could leak fuel, oil, or grease to site soils. Construction activities would include soil excavation, soil storage and removal, and stormwater management. Construction would not impact geologic resources because the site lacks significant geologic resources.

Soil disturbance during GLE Facility operations would continue at reduced levels, as some construction would continue after start-up. Impervious surfaces such as roads, parking lots, and roofs would increase stormwater runoff, increasing erosion potential. Large storm events could create erosion along drainages or at culverts, requiring maintenance or drainage system improvement. Vehicles and equipment used in unpaved areas during facility operations could leak fuel, oil, or grease to site soils. Groundwater pumping is expected to have a minimal effect on groundwater levels, and the associated degree of subsidence is expected to be negligible. Other geologic hazards (e.g., volcano, tsunami, landslides, radon gas, methane gas, subsidence due to mining) to the site are not anticipated.

Foundations, roads, and utility lines would likely be undisturbed during decontamination and decommissioning. Erosion may increase, as portions of the site are disturbed by heavy equipment.

Surface Water Resources

Small Impact. Under the proposed action, preconstruction activities would have an impact on water quality in streams located on the Wilmington Site. Excavation during construction could affect surface water quality. The access road for the proposed GLE Facility would require a new stream crossing and possibly change a jurisdictional channel, which could lead to erosion and increased sediment load. Construction vehicles and equipment pose the possibility of leaks or spills of fuels, oil, or grease, which could run off and impact nearby surface water. However, it is unlikely that a minor spill would reach the Northeast Cape Fear River or Prince George Creek. Infiltration into site soil would likely reduce or eliminate the potential for runoff.

Process wastewater effluent would be discharged at an existing outfall during GLE Facility operations, increasing the site's process wastewater volume by about 7 percent. Liquid radioactive waste would be pretreated to reduce uranium to acceptable levels before transfer to the existing wastewater treatment facility. Treatment would produce an effluent similar to current process wastewaters. Treated sanitary wastewater effluent would be reused in site cooling towers.

No consumption of surface water would occur during GLE Facility operations. Stormwater runoff would collect in a State-permitted detention basin before discharge and would be regulated by a National Pollutant Discharge Elimination System (NPDES) permit. Stormwater runoff from the UF_6 cylinder storage pads would collect in a lined retention pond. If monitoring demonstrates a lack of radioactivity, pond effluent would be discharged to the stormwater detention basin and ultimately, to the effluent channel. Any increase in turbidity and sediment loading to streams as a result of construction would subside during GLE Facility operations. Oil, grease, metals, and other automotive-related contaminants would be present in limited quantities due to onsite vehicular traffic. Herbicides used in landscaped areas of the Wilmington Site would also be present.

GLE Facility process wastewater flow would cease during decontamination and decommissioning, but decontamination effluent could be generated. If the Wilmington Site treatment and industrial reuse facility could not receive sanitary discharge during the decontamination and decommissioning of the proposed GLE Facility, portable toilets would be required for workers. The collection, treatment, monitoring, and discharge of decontamination water would be designed to avoid significant environmental impact. Erosion may increase as portions of the site are disturbed by heavy equipment, and BMPs would reduce the impact.

Groundwater Resources

Small Impact. Under the proposed action, preconstruction activities would have an impact on groundwater quality in shallow aquifers at the Wilmington Site. Implementation of best management practices (BMPs) during the construction of the proposed GLE Facility would reduce the potential for leaks of fuel, oil, and grease to soil and groundwater. The use of portable toilets during construction would eliminate sanitary system impacts on groundwater. Tanker trucks would provide potable and nonpotable construction water.

During GLE Facility operations, stormwater collected from the UF_6 cylinder storage pad is expected to have no more than trace amounts of radiological contaminants, and the liner is expected to limit infiltration to groundwater. Discharge at site outfalls would be from process and sanitary wastewater. Some portion of these effluents may potentially infiltrate the Peedee sand aquifer. However, treatment and monitoring are expected to result in no significant contaminant concentrations in the effluent channel. The proposed facility will obtain additional groundwater for potable purposes from existing production wells at the Wilmington Site. Water level data show these wells to be cross-gradient of the overall Wilmington Site, and they do not result in significant drawdown. Groundwater will also be needed as a source of process water for the proposed GLE Facility. A small amount of increased drawdown is expected, without significant effect on flow directions, water quality, or availability for offsite users. Diesel tanks at the facility would have appropriate leak detection equipment. In addition, a groundwater monitoring plan would be developed after the facility is constructed.

The removal of structures, utilities, materials, and products during the decommissioning of the proposed GLE Facility is not expected to have an impact on site groundwater resources.

Ecological Resources

Small to Moderate Impact. Under the proposed action, most impacts on ecological resources would occur during preconstruction activities and would be SMALL to MODERATE. Preconstruction impacts on wetlands, environmentally sensitive areas, and aquatic biota would be SMALL. Most construction activities would occur in areas that would have already been disturbed by preconstruction activities. Impacts on vegetation would occur primarily from vegetation clearing, habitat fragmentation, alteration of topography, changes in drainage patterns, and soil compaction. Remaining potential impacts on vegetation include decline or mortality of trees near the construction boundary, effects related to hydrologic changes, deposition of dust and other particulate matter, introduction of invasive plant species, and accidental releases of hazardous materials (e.g., fuel spills).

Wetlands could be impacted by alteration of surface water runoff patterns, soil compaction, or groundwater flow. No wetlands would be directly impacted by construction of the proposed facility, but three jurisdictional wetlands and one isolated wetland occur within the corridor for the revised entrance and roadway. It is probable that the isolated wetland would be directly impacted, resulting in a wetland loss. However, impacts on, or loss of, this wetland would not be significant, given the apparent low value of the wetland under State rating guidelines. Indirect impacts on wetlands could occur from increased stormwater runoff, decreased groundwater recharge, disconnected hydrologic conductivity, or changes in groundwater or surface water flow patterns. Impacts from increased or decreased runoff are expected to be negligible.

Except for the probable impact on wetlands, no environmentally sensitive areas would be directly impacted by construction. Only minor, localized indirect impacts on environmentally sensitive areas may occur from erosion and sedimentation or from changes in drainage patterns.

Impacts on wildlife from construction would include habitat disturbance, wildlife disturbance, and injury or mortality of wildlife. Habitats within the footprint disturbed by construction would be reduced or altered, and construction activities would result in habitat fragmentation. Construction would cause a loss of habitat, which could result in a long-term reduction in wildlife abundance and richness. Although habitats adjacent to the proposed facility site would mostly remain unaffected, wildlife might make less use of these areas due to disturbance (indirect habitat loss). Habitat disturbance, including roads, could facilitate the spread and introduction of invasive plant species. Wildlife habitat could be adversely affected if invasive vegetation became established in the disturbed areas and adjacent offsite habitats. If exposure of wildlife to fugitive dust was of sufficient magnitude and duration, the effects could be similar to those on humans. A more probable effect would be the dusting of plants, which could make forage less palatable. Construction activities could cause wildlife disturbance, including interference with behavioral activities. Wildlife could respond in various ways, including attraction, habituation, and avoidance. Principal sources of noise would include vehicle traffic and operation of machinery. Regular or periodic noise could cause adjacent areas to be less attractive to wildlife and result in a long-term reduction in use. Construction activities could result in the direct injury or death of certain wildlife species. Wildlife could also be exposed to accidental fuel spills or releases of other hazardous materials.

No aquatic habitats are located within the footprint of the areas that will be cleared for the proposed facility, and no significant adverse impacts on aquatic biota are expected from construction activities.

No impacts would be expected on any Federally listed threatened, endangered, or other special status species from construction activities. Similarly, no impacts would be expected on any State-listed species.

During operation, impacts on vegetation would include moving, hand-cutting, and chemical control of vegetation around the proposed facility, support facilities, utility corridors, and access road. No effects on vegetation would be expected from the cooling tower or air emissions, wastewaters, and solid wastes generated during operation. It is unlikely that radionuclide releases would have adverse effects on ecological resources. Facility operation would not encroach upon or have any other adverse effect on wetlands. Impervious surfaces generally result in increased runoff and reduced infiltration, but routing drainage to the stormwater detention and retention basins would minimize the potential for wetland water-level fluctuations. No environmentally sensitive areas would be impacted by operations. Potential impacts on wildlife from operations would include ongoing habitat disturbance (i.e., reduction, alteration, and fragmentation of habitat), and wildlife injury or mortality.

No natural water bodies occur within the immediate area of the proposed facility. During operations, aquatic habitats and biota could be affected by continued erosion and sedimentation and exposure to contaminants. Increased liquid effluent discharges could increase turbidity and sedimentation until the stream channel adjusts. Wastewater would be treated to meet NPDES permit requirements, so aquatic biota would not be adversely impacted. The potential exists for toxic materials (e.g., fuel, lubricants, and herbicides) to be accidentally introduced into aquatic habitats, but an uncontained spill would probably affect only a limited area, and lubricants and fuel would not be expected to enter wetlands or waterways (due to soil infiltration and the distance from the main work area to drainages). Only trace levels of radiological contamination would be released to surface waters during operation, so adverse radiological impacts on aquatic biota would not be expected.

No adverse impacts on threatened, endangered, or other special status species would be expected from facility operations due to the lack of suitable habitats within the immediate project area.

Most decontamination activities would occur inside buildings, so large-scale ecological resource impacts are not expected. Removal of facilities could impact vegetation adjacent to the facilities and cause offsite erosion and sedimentation. The plant community established where facilities are removed would depend on subsequent use of the project area, and revegetation of the removed facility areas could increase wildlife habitat diversity. Decommissioning activities are not expected to directly impact wetlands or environmentally sensitive areas. There would be a temporary increase in disturbance to wildlife associated with vehicle, equipment, and worker activities. Other potential impacts would include the disposal of solid wastes and hazardous materials and the remediation of any contaminated soils. After decommissioning is complete, there would be no fuel or chemical spills associated with the facility.

Impacts on wildlife from decommissioning are expected to be similar to those experienced during construction. Removal of wildlife habitat (primarily landscaped lawns) would have minor impacts on wildlife populations. There would be a temporary increase in noise and visual disturbance associated with the removal and subsequent restoration of facilities. Removal of the impervious areas would decrease runoff and discharge, ceasing impacts on aquatic biota. Decommissioning would not directly impact threatened, endangered, or other special status species.

Noise

Small to Moderate Impact. Under the proposed action, noise impacts associated with preconstruction activities would be short-term and limited to the immediate vicinity of the proposed GLE Facility site. During construction, vehicular traffic to and from the proposed GLE Facility would generate intermittent noise along local roadways. However, the noise contribution from these sources would be limited to the immediate vicinity of the Wilmington Site. Major activities would include building construction and equipment installation. Potential noise impacts on the nearest subdivision would be moderate but temporary in nature when road construction (a preconstruction activity) occurs.

During GLE Facility operations, exterior equipment, such as pumps, heat pumps, transformers, and cooling towers, would generate noise. Other sources of noise would include commuter vehicular and delivery truck traffic. Noise levels at the fenceline nearest to the Wooden Shoe residential subdivision would be below day and night ambient sound levels that correspond to the New Hanover County Noise Ordinance.

Most decontamination activities would occur inside the GLE Facility buildings. If decommissioning includes demolition, heavy construction equipment may be required. Salvaged materials and waste/debris would be hauled offsite by truck. Noise from truck traffic on site access roads would be comparable to that experienced during construction. Noise levels at the fenceline from truck traffic on the North access road nearest the Wooden Shoe subdivision are expected to be below the New Hanover County Noise Ordinance.

Transportation

Small to Moderate Impact. Under the proposed action, preconstruction activities would have an impact on traffic conditions. These impacts would be short-term and limited to site access roads and roads in the vicinity of the Wilmington Site. Construction traffic would involve the movement of personnel, equipment, and material to and from the proposed GLE Facility site, and the removal of construction debris and waste. The number of truck shipments would vary over the course of construction. Construction activities are estimated to add an average of approximately 35 trucks per day, with a small impact on local traffic. Prior to start-up, an average increase of up to 1428 daily trips by construction personnel is anticipated, with the heaviest traffic occurring in the immediate vicinity of the site entrance. Impacts on roads in the vicinity of the Wilmington Site could be SMALL to MODERATE; regional impacts would be SMALL. Impacts would be reduced if shift changes do not coincide with peak traffic volume periods.

GLE Facility operations would overlap with the construction period for 5–6 years, during which time vehicular traffic from commuting operations personnel would be combined with traffic from construction workers and shipments. An average of approximately six additional truck shipments per day to and from the Wilmington Site would occur during GLE Facility operations. The average number of workers (construction and operations personnel) commuting on a daily basis during start-up and construction completion is anticipated to be 590, with about 350 permanent operations personnel employed over the remainder of the operational period. The average number of additional daily vehicle trips from facility activities will increase by about 1239 at the Wilmington Site during the period of construction and operations overlap. Once construction is complete, the average number of daily trips associated with operations personnel is estimated to be approximately 735. The range of additional daily vehicle trips from facility operations (735 to 1239) would have a MODERATE impact on the local road network. However, the impact on regional traffic flow would be SMALL.

Operations of the proposed GLE Facility would require the shipment (by truck) of various radioactive materials to and from the facility. Vehicle-related risks result from a vehicle moving from one location to another (independent of cargo characteristics), while cargo-related risk refers the risk from the cargo being shipped. In the case of the uranium, cargo-related risks would include exposure to ionizing radiation during normal transportation and accident conditions, as well as chemical hazards during accident conditions. Less than one latent cancer fatality is anticipated for the public and transportation crews from all shipments on an annual basis. No latent fatalities from vehicle emissions are anticipated on an annual basis.

Overall annual transportation accident impacts from the proposed action are expected to be SMALL. Chemical impacts would be negligible, as past analyses of depleted UF_6 shipments have shown the estimates of irreversible adverse effects to be approximately 1 to 3 orders of magnitude lower than the estimates of public latent cancer fatalities from radiological accident exposure. No fatalities are expected from accidents (direct physical trauma) on an annual basis.

Initial decommissioning activities during the last year of operations would increase the total number of workers. The number of truck shipments to offsite locations during this period is expected to be approximately the same as during construction. Local and regional transportation impacts would be SMALL after operations cease due to the decrease in workers during decommissioning. Radioactive waste from decommissioning would be sent to the appropriate storage, treatment, and disposal facilities. Impacts from radioactive waste shipments would be SMALL due to the low levels of external radiation and the low number of shipments.

Public and Occupational Health

Small Impact. Occupational exposures during preconstruction activities would be minor and minimized using work practices and personal protective equipment. Preconstruction activities are not expected to cause any exceedances of ambient air quality criteria, with the possible exception of short-term criteria for particulate matter from fugitive dust. Occupational exposures during construction of the proposed GLE Facility would be minor and minimized using work practices and personal protective equipment. Construction activities are not expected to cause any exceedances of ambient air quality criteria, with the possible exception of short-term criteria for particulate matter from fugitive dust.

Construction activities would not generate radiological contamination but could disturb areas previously contaminated by past and current operations. Construction workers could also be exposed to emissions from the proposed GLE Facility during the overlap of construction and operation. The maximum possible dose would be a small fraction of background radiation exposure and less than 1 millisievert per year (100 millirem per year). Dose to the offsite public would be significantly less, as there is no potential for measurable exposure from existing site contamination.

A total of 324 total recordable incidents, 197 lost workday incidents, and less than one fatal injury are projected for 38 years of GLE Facility operation. Lasers would normally be operated within enclosures and equipped with interlocks to prevent inadvertent worker exposure.

The greatest potential for occupational exposure in the main process building would be from connecting and disconnecting UF_6 cylinders. Airborne concentrations of HF and uranyl fluoride inside facilities are expected to be insignificant, and workers would use ventilation equipment to minimize exposures. Concentrations near the release point could be as high as 10 percent of the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit and would be limited by ventilation equipment. Large volumes of UF_6 would be present as feed and product material, but there would be no routine exposures to solid or liquid UF_6. Exposure to industrial chemicals would be limited by minimizing airborne releases and use of protective equipment.

Potential long-term, low-level HF and uranium exposure to the public would be the primary offsite chemical exposures of concern. However, only minor quantities of UF_6 or HF would escape the facility ventilation system, and the quantity of HF passing through the emissions control devices would be below levels established in the facility air permit and protective of public health. UF_6 and HF levels at the site boundary and the location of the nearest resident would be lower than onsite levels. HF concentrations at all exposure locations are far below the most stringent state or Federal ambient air quality standards for the general public. No criteria air pollutants would be produced by the enrichment process.

Facility operation could result in radiation exposure to the public via uranium releases or direct external radiation exposure. UF_6 gas released in the main process building would pass through a ventilation system to minimize external release. Liquid effluents would be treated and sampled to limit releases. Direct exposure to the public could occur from onsite uranium and transportation both onsite and offsite. Direct radiation and skyshine from airborne releases would be undetectable at offsite areas. The NRC public release limits for uranium in air and liquid effluents would be met.

Radioactive materials at the proposed GLE Facility would present the possibility for onsite members of the public to receive a direct radiation dose. Because of cylinder shielding and the distance to receptors, stored cylinders of depleted uranium are expected to have only a minor effect on the exposure rate at the site boundary.

Radioactive process wastewater would be collected and sampled before routing to a liquid effluent treatment system. Treated liquid effluent would be discharged to the existing final process lagoon facility. Water from the lagoon facility would be discharged through a permitted outfall to the site effluent channel. Sanitary wastewater would be treated in the existing sanitary wastewater treatment facility, and treated effluent would replace cooling tower blowdown. Stormwater runoff would drain into a stormwater wet detention basin before discharge. A separate holding pond would collect stormwater runoff from the UF_6 storage pads, where the runoff would be monitored before discharge to the wet detention basin. Discharges from all liquid effluent streams would be released into the Wilmington Site effluent channel and flow to the Northeast Cape Fear River through Unnamed Tributary #1.

There are no public water intakes on the Northeast Cape Fear River downstream of the discharge point, so the only exposure pathways of concern are fish ingestion and those relating to recreational water use. Calculated doses to a maximally exposed individual and the surrounding population from liquid effluent releases are well below 1 millisievert per year.

Decommissioning plans would involve decontamination of structures and selected facilities to free-release levels before allowing them to remain in place for future use. Leaving the buildings would minimize the number of workers required for decommissioning, which would reduce the number of injuries compared to building removal. Occupational injuries would be reduced in number in accordance with the reduced effort required for decommissioning. Residual contamination would be decontaminated to free-release levels or removed from the site and disposed of in a low-level radioactive waste facility.

The annual occupational dose during decontamination and decommissioning is expected to be in the range of 0.05–1.5 millisievert (5–150 millirem), which is comparable to the average dose from the operating fuel facilities (1.3–1.5 millisievert [130–150 millirem]). Therefore, the occupational dose during decontamination and decommissioning would be bounded by potential exposures during operations. Similar uranium handling would be involved during operations that purge the laser-enrichment lines. Once this decontamination is completed, the remaining quantity of UF_6 would be residual and significantly less than handled during operations. Because systems containing residual UF_6 would be opened, decontaminated, and dismantled, an active environmental monitoring and dosimetry (external and internal) program would be conducted to maintain doses as low as reasonably achievable (ALARA). Chemical exposures would be similarly limited.

Waste Management

Small Impact. Under the proposed action, preconstruction activities would occur and generate construction-related waste streams. Solid nonhazardous wastes generated during construction would be similar to wastes from other industrial construction sites and transported offsite to an approved local landfill. Construction activities would generate less than 2 percent of the waste that the New Hanover County Landfill receives annually from all other sources. Small quantities of organic solvent-based residuals could be used and may require management as hazardous waste. Hazardous wastes from construction would be packaged and shipped offsite to licensed facilities.

Facility operations would result in the generation of wastewaters that would be treated onsite before discharge and solid wastes that would be treated (onsite or offsite) and shipped for disposal offsite. Sanitary wastewater would be collected by a sewer system connected to the existing Wilmington Site sanitary wastewater treatment facility, increasing the load on the existing system by about one-third. Treated sanitary wastewater effluent could be used as makeup water in onsite cooling towers. Should discharges to surface waters be necessary, the existing NPDES discharge permit would be adequate to cover the additional effluent volume. Cooling tower blowdown would be sent to the Wilmington Site's final process lagoons. Radioactive process wastewater from facility operations would be collected and treated to remove uranium, other metals, and fluoride. The treated effluent would be discharged to the process wastewater aeration basin and final process lagoon facility. Impacts from radiological exposure to depleted UF_6 in the cylinder storage pad would be SMALL, and impacts from the conversion of depleted UF_6 generated by the proposed GLE Facility would be SMALL.

The waste management facilities used during operations would also be used during decontamination and decommissioning. With the decrease in workers from operations to decommissioning, sanitary wastewater treatment volumes would decline. Materials and equipment eligible for recycling or nonhazardous disposal would be sampled or surveyed to ensure that contaminant levels are below release limits. Buildings and other structures would be decontaminated and the debris shipped offsite for disposal. Radioactive material from decontamination and contaminated equipment would be packaged and shipped offsite to an appropriately licensed disposal facility. Staging and laydown areas would be segregated and managed to prevent contamination of the environment and creation of additional wastes.

Socioeconomics

Small Impact. Under the proposed action, preconstruction activities would increase the number of onsite construction workers and could result in a short-term increase in the demand for rental housing and public services in the vicinity of the Wilmington Site. Two types of jobs would be created by the proposed action: (1) construction and start-up related jobs, which are transient, short in duration, and less likely to have a long-term socioeconomic impact; and (2) operations-related jobs in support of the proposed GLE Facility operations, which have the greater potential for permanent, long-term socioeconomic impacts within the socioeconomic region of influence (ROI). The ROI covers three counties in North Carolina – Brunswick County, New Hanover County, and Pender County. During the peak year of construction (2012), 680 construction workers would be at the proposed GLE Facility site and there would be an additional 3131 indirect jobs created in the ROI. Construction activities would generate $139.8 million in income in the ROI, including $1.7 million in State income taxes and $1.2 million in State sales taxes. The number of construction workers relocating from outside the region could cause a short-term increase in the demand for temporary (rental) housing and services in the ROI.

Facility start-up activities would create 200 new jobs in the ROI. Start-up activities would generate $28.0 million in income in the ROI, including $1.3 million in State income taxes and $0.92 million in State sales taxes. Again, the number of start-up workers relocating from outside the region could cause a short-term increase in the demand for temporary (rental) housing and services in the ROI.

GLE Facility operations would create 350 new jobs in the ROI. GLE Facility operations would generate $51.5 million in income in the ROI, including $2.3 million in State income taxes and $1.7 million in State sales taxes. The number of operations workers relocating from outside the region could affect local housing markets and increase the demand for public services. However, the relatively small number of operations workers (161 to 210) estimated to relocate to the ROI would limit the impact.

Decontamination and decommissioning activities in the first year would create 50 new jobs at the GLE Facility site. Decommissioning would generate $6.1 million in income in the ROI in the first year. Facility decommissioning would produce less than $0.3 million in direct State income taxes and less than $0.2 million in direct State sales taxes. Decommissioning activities would constitute less than 1 percent of total ROI employment in the first year.

Environmental Justice

Under the proposed action, preconstruction activities would result in impacts on minority and low-income populations, mostly consisting of environmental and socioeconomic effects (e.g., noise, dust, traffic, employment, and housing impacts). Noise and dust impacts would be short-term and limited to onsite activities. Minority and low-income populations residing along site access roads could experience increased commuter vehicle traffic during shift changes. Increased demand for rental housing could disproportionately affect low-income populations. However, due to the short duration of preconstruction activities and the availability of rental housing, impacts to minority and low-income populations would be short-term and limited.

The majority of environmental impacts associated with the construction and operation of the proposed GLE Facility would be SMALL to MODERATE (SMALL for all resource areas during decommissioning) and would generally be mitigated. Because impacts to the general population within 4 miles of the proposed facility would be SMALL to MODERATE, the various phases of facility development are not expected to result in disproportionately high and adverse impacts on low-income or minority residents.

Even when environmental impacts are anticipated to be SMALL for the general population, some population groups, such as those participating in subsistence hunting and fishing, could experience disproportionate exposure. However, air and liquid radiological releases from the proposed GLE Facility are projected to be extremely low, and exposure through fish consumption would be even lower. Preconstruction, construction, operation, and decommissioning of the proposed GLE Facility is not expected to result in disproportionately high and adverse impacts to minority, low-income, or subsistence consumption populations.

Accidents

Small Impact. Representative accident scenarios vary in severity from intermediate- to high-consequence events and include accidents initiated by natural phenomena, operator error, and equipment failure. Two of the accidents involve criticality and the other three involve the release of UF_6. If the higher-consequence-criticality accident were to occur, the consequence for a worker in close proximity would be high (fatality), but GLE has committed to various preventive and mitigating measures to significantly reduce these consequences. Worker health consequences are low for scenarios involving the release of UF_6. Worker health consequences are low to high for scenarios involving HF exposure. Worker health consequences are intermediate to high for scenarios involving uranium chemical exposure. Radiological consequences to a maximally exposed individual at the Controlled Area Boundary are low for the criticality accidents and all UF_6 release scenarios. Risk to the offsite public in the direction of highest exposure is estimated to be less than one lifetime cancer fatality for all accident scenarios. Plant design, passive and active engineered controls, and administrative controls would reduce the likelihood of accidents. Therefore, the probability-weighted consequence (or risk) from accidents under these conditions is expected to be SMALL. No facility accidents would occur after the cessation of operations, so there would be no potential for facility accidents during decommissioning.

POTENTIAL ENVIRONMENTAL IMPACTS OF THE NO-ACTION ALTERNATIVE

This EIS also considers the potential environmental impacts of the no-action alternative, which are summarized below. Preconstruction activities are assumed to take place under both the proposed action and the no-action alternative, regardless of the NRC decision to issue a license for the proposed GLE Facility.

Under the no-action alternative, enrichment services would continue to be performed by existing domestic and foreign uranium enrichment suppliers. Paducah GDP and the NEF would continue to provide enrichment services. The ACP and EREF may also provide enrichment services in the future. Impacts from these other domestic enrichment facilities have been evaluated in other NRC environmental reviews.

Land Use

Small Impact. Under the no-action alternative, preconstruction activities would occur even if the proposed GLE Facility is not constructed. Preconstruction would alter the undeveloped forest within the Wilmington Site but is not expected to affect surrounding land use. Other uses of the land at the Wilmington Site would not be precluded.

Historical and Cultural Resources

Small Impact. Under the no-action alternative, ground disturbance caused by preconstruction activities could impact historic and cultural resources at the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, no further impacts on historic and cultural resources would occur.

Visual and Scenic Resources

Small Impact. Under the no-action alternative, preconstruction activities would include clearing vegetation. The vegetation screen along the northern part of the Wilmington Site would not be altered by preconstruction activities. Since the proposed GLE Facility would not be constructed under the no-action alternative, the visual appearance of the Wilmington Site would not change.

Air Quality

Small Impact. Under the no-action alternative, preconstruction activities would have an impact on ambient air quality conditions at the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts on air quality.

Geology and Soils

Small Impact. Under the no-action alternative, preconstruction activities would have an impact on soil conditions at the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts to geologic and soils conditions at the site.

Surface Water Resources

Small Impact. Under the no-action alternative, preconstruction activities would have an impact on water quality in streams located on the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts on surface water resources on or near the Wilmington Site.

Groundwater Resources

Small Impact. Under the no-action alternative, preconstruction activities would have an impact on groundwater quality in shallow aquifers at the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts on groundwater resources on or near the Wilmington Site.

Ecological Resources

Small Impact. Under the no-action alternative, most impacts on ecological resources would occur during preconstruction activities. Preconstruction impacts on wetlands, environmentally sensitive areas, and aquatic biota would be SMALL. Impacts on Federally threatened and endangered species and impacts on the Federal species of concern or State-listed species that occur within New Hanover County would also be SMALL (i.e., no adverse impacts on these species would result from the no-action alternative). Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts on ecological resources on or near the Wilmington Site.

Noise

Small Impact. Under the no-action alternative, noise impacts associated with preconstruction activities would be short-term and limited to the immediate vicinity of the proposed GLE Facility site. Since the proposed GLE Facility would not be constructed under the no-action alternative, noise from existing GE operations at the Wilmington Site would remain unchanged.

Transportation

Small Impact. Under the no-action alternative, preconstruction activities would have an impact on traffic conditions. These impacts would be short-term and limited to site access roads and roads in the vicinity of the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further traffic-related impacts on site access roads and roads in the vicinity of the Wilmington Site.

Public and Occupational Health

Small Impact. Occupational exposures during preconstruction activities would be minor and minimized using work practices and personal protective equipment. Preconstruction activities are not expected to cause any exceedances of ambient air quality criteria, with the possible exception of short-term criteria for particulate matter from fugitive dust. Since the proposed GLE Facility would not be constructed under the no-action alternative, public and occupational health risks to onsite workers and the general public would remain unchanged.

Waste Management

<u>Small Impact.</u> Under the no-action alternative, preconstruction activities would occur and generate construction-related waste streams. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no additional waste generated at the Wilmington Site beyond that generated by existing GE activities.

Socioeconomics

<u>Small Impact.</u> Under the no-action alternative, preconstruction activities would increase the number of onsite construction workers and could result in a short-term increase in the demand for rental housing and public services in the vicinity of the Wilmington Site. Since the proposed GLE Facility would not be constructed under the no-action alternative, population and employment in the ROI would change in accordance with current projections. Activities completed prior to the no-action alternative (i.e., preconstruction activities) would not have a noticeable effect on county services.

Environmental Justice

Under the no-action alternative, preconstruction activities would result in impacts to minority and low-income populations, mostly consisting of environmental and socioeconomic effects (e.g., noise, dust, traffic, employment, and housing impacts). Noise and dust impacts would be short-term and limited to onsite activities. Minority and low-income populations residing along site access roads could experience increased commuter vehicle traffic during shift changes. Increased demand for rental housing could disproportionately affect low-income populations. However, due to the short duration of preconstruction activities and the availability of rental housing, impacts to minority and low-income populations would be short-term and limited. Since the proposed GLE Facility would not be constructed under the no-action alternative, there would be no further impacts to minority and low-income populations residing in the vicinity of the Wilmington Site

Based on this information, there would be no disproportionately high and adverse human health and environmental effects on minority and low-income populations residing in the vicinity of the Wilmington Site as a result of the no-action alternative.

Accidents

<u>Small Impact.</u> Under the no-action alternative, the proposed GLE Facility would not be constructed. Therefore, no accidents would result from GLE Facility operations or decommissioning.

COSTS AND BENEFITS OF THE PROPOSED ACTION

While there are national energy security and fiscal benefits associated with the proposed action, and local socioeconomic benefits in the ROI in which the proposed GLE Facility would be located, there are also direct costs associated with the construction, operation, and decommissioning phases of the proposed action, as well as impacts associated with the proposed action on various resource areas. However, these impacts are estimated to be small in magnitude and small in comparison to the local and national benefits of the proposed action.

In addition, many of the impacts on environmental resources associated with the proposed action relate to preconstruction activities at the proposed site, and would also occur under the no-action alternative. The principal socioeconomic impact or benefit of the proposed GLE Facility would be an increase in employment and income in the ROI. Although the majority of the costs, and most of the socioeconomic impacts, of the various phases of GLE Facility development would occur in the ROI, there would be economic, fiscal, and, in particular, energy security benefits, which would occur at both the local and national levels.

Employment created in the ROI in the peak construction year (2012) is estimated at 3811 direct and indirect jobs, and State income tax revenues would be approximately $0.5 million per year during construction. During the GLE operations phase (2020 to 2051), 732 direct and indirect jobs would be created. During this period, the State would benefit from $2.3 million annually in income taxes and $8.7 million annually in property taxes. Although it can be assumed that some portion of State sales and income taxes paid would be returned to the ROI under revenue-sharing arrangements between each county and State government, the exact amount that would be received by each county cannot be determined. Although there are economic and fiscal benefits associated with the proposed action in the ROI, these beneficial impacts are expected to be SMALL.

The direct costs associated with the proposed action may be categorized by the following life-cycle stages: construction, facility operation, depleted uranium disposal, and decommissioning. In addition to the costs of the proposed action, costs would be incurred for preconstruction activities under both the proposed action and no-action alternatives. In addition to monetary costs, the proposed action would result in impacts on various resource areas, which are summarized above. For all resource areas, the impact of the proposed action is estimated to be SMALL or SMALL to MODERATE.

The proposed action would result in the annual production, in peak years, of six million SWU of enriched uranium, which would augment the supply of enriched uranium and, along with other planned new enrichment facilities, would meet the national energy security need for increased domestic supplies of enriched uranium. Thus, the proposed action would generate national and regional benefits and costs. The national benefit would be an increase in domestic supplies of enriched uranium that would assist the national energy security need. The regional benefits would be increased employment, economic activity, and tax revenues in the ROI. Costs associated with the proposed project are, for the most part, limited to the resource areas in the ROI.

COMPARISON OF THE PROPOSED ACTION AND THE NO-ACTION ALTERNATIVE

Under the no-action alternative, the proposed GLE Facility would not be constructed. However, preconstruction activities, such as land clearing, grading, and construction of support structures, would occur on the proposed site. These activities could affect some resource areas, including historic and cultural resources, air quality, ecological resources, noise, and transportation. Since the proposed GLE Facility would not be constructed, no further impacts on these resource areas would occur as a result of the no-action alternative. Under the no-action alternative, the costs and benefits of constructing, operating, and decommissioning the proposed GLE Facility would not occur. Denying the license would result in no further land disturbance or activity related to the proposed action at the Wilmington Site; therefore, no further impacts would occur for any resource area.

Under the no-action alternative, the Paducah GDP in Paducah, Kentucky, would remain the primary source of domestically generated low-enriched uranium for U.S. commercial nuclear power plants (supplying 16 percent of U.S. demand). The NEF in Lea County, New Mexico (d/b/a URENCO USA), which is operational but still under construction, the ACP, and the EREF may provide enrichment services in the future. Foreign enrichment sources from the downblending of highly enriched uranium under the Megatons-to-Megawatts Program and other foreign sources would be expected to continue to supply approximately 84 percent of the U.S. demand.

Under the proposed action (construction, operation, and eventual decommissioning of the proposed GLE Facility), there would be SMALL impacts on land use, visual and scenic resources, geology and soils, water resources, socioeconomic conditions, minority and low-income populations, public and occupational health, and waste management. The proposed action would have SMALL to MODERATE adverse impacts on historic and cultural resources, air quality, ecological resources, noise, and transportation; these impacts would be largely attributable to preconstruction activities. Impacts from the most serious accidents that might occur under the proposed action are expected to be SMALL. If constructed, the proposed GLE Facility would provide additional domestic uranium enrichment capacity.

CUMULATIVE IMPACTS

This EIS also considers cumulative impacts that could result from the proposed action when added to other past, present, and reasonably foreseeable future actions (Federal, non-Federal, or private). Identified activities include planned facilities and new processes at the Wilmington Site, as well as offsite industrial development. Two projects for the Wilmington Site include the recently constructed Advanced Technology Center II complex and the planned Tooling Development Center. Offsite projects include the Carolinas Cement Company manufacturing plant, the River Bluffs residential development, and the North Carolina International Terminal.

Impacts from preconstruction activities for the proposed GLE Facility are addressed as cumulative impacts in this EIS, as these actions are not part of the proposed action. In this sense, preconstruction activities would be considered past activities for the purposes of cumulative impacts. These impacts are presented alongside similar impacts from construction of the facility that are included in the proposed action. With the exception of socioeconomic impacts (i.e., local job creation), cumulative impacts associated with the no-action alternative would generally be less than those for the proposed action, except in terms of local job creation.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Preconstruction activities and the proposed action would result in unavoidable adverse impacts on the environment. These impacts would generally be small, and would, in most cases, be mitigated. The disturbed area would be cleared of vegetation and would lead to the displacement of some local wildlife populations. There would be temporary impacts from the construction of new facilities, including increased fugitive dust, increased potential for soil erosion and stormwater pollution, and increased vehicle traffic and emissions. Water consumption from onsite wells during the proposed action would be relatively small and the risk for significant adverse impacts on neighboring residential wells or public supply wells is expected to be small. During operations, workers and members of the public could be exposed to radiation and chemicals.

This EIS defines short-term uses as generally affecting the present quality of life for the public (i.e., the 40-year license period for the proposed GLE Facility); and long-term productivity as affecting the quality of life for future generations on the basis of environmental sustainability. Preconstruction and the proposed action would necessitate short-term commitments of resources and would permanently commit certain other resources (such as energy and water). The short-term use of resources would result in potential long-term socioeconomic benefits to the local area and the region.

Workers, the public, and the environment would be exposed to increased amounts of hazardous and radioactive materials over the short term from operations of the proposed GLE Facility. Construction and operation would require a long-term commitment of terrestrial resources, such as land, water, and energy. Short-term impacts would be minimized by the application of appropriate mitigation measures. Upon the closure of the proposed GLE Facility, GLE would decontaminate and decommission the buildings and equipment and restore them for unrestricted use. Continued employment, expenditures, and tax revenues generated during the proposed action would directly benefit the local, regional, and State economies.

Irreversible commitment of resources refers to resources that are destroyed and cannot be restored, whereas an irretrievable commitment of resources refers to material resources that once used cannot be recycled or restored for other uses by practical means. The proposed action would include the commitment of land, water, energy, raw materials, and other natural and human-generated resources. Following decommissioning, the land occupied by the proposed facility would likely remain industrial beyond license termination. Water required during preconstruction and the proposed action would be obtained from existing wells at the Wilmington Site and would be replenished through natural mechanisms. Wastewaters would be treated to meet applicable standards and released to local receiving surface waters. Energy used in the form of electricity, natural gas, and diesel fuel would be supplied through existing systems in the Wilmington area. The specific types of construction materials and the quantities of energy and materials used cannot be determined until final facility design is completed, but it is not expected that these quantities would strain the availability of these resources.

Even though the land used to construct the proposed GLE Facility would be returned to other productive uses after the facility is decommissioned, there would be some irreversible commitment of land at offsite locations used to dispose of solid wastes generated by the facility. In addition, wastes generated during the conversion of depleted UF_6 produced by the facility and the depleted uranium oxide conversion product from the conversion of depleted UF_6 would be disposed at an offsite location. Land used for disposal of these materials would represent an irreversible commitment of land. No solid wastes or depleted uranium oxide conversion product originating from the proposed GLE Facility would be disposed of at the Wilmington Site. When the facility is decommissioned, some building materials would be recycled and reused. Other materials would be disposed of in a licensed and approved offsite location, and the amount of land used to dispose of these materials would be an irretrievable land resource.

During operation of the proposed GLE Facility, natural UF_6 would be used as feed material, requiring the mining of uranium and several other operational steps in the uranium fuel cycle. This use of uranium would be an irretrievable resource commitment.

ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic
AAL	Acceptable Ambient Level
ac	acre
ACHP	Advisory Council on Historic Preservation
ACP	American Centrifuge Plant
ADAMS	Agencywide Documents Access and Management System
ADT	average daily vehicle trips
AE/SCO	Aircraft Engines/Services Components Operation
AEA	*Atomic Energy Act*
AEGL	Acute Exposure Guideline Level
AERMOD	AMS/EPA Regulatory MODel
AES	AREVA Enrichment Services, LLC
ALARA	As Low As Reasonably Achievable
AMA	American Medical Association
ANSI	American National Standards Institute
AQRV	air quality-related value
ASA	Acoustical Society of America
ATC II	Advanced Technology Center
ATSDR	Agency for Toxic Substances and Disease Registry
AVLIS	atomic vapor laser isotope separation
BLM	U.S. Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
BOD	biochemical oxygen demand
C	Celsius
CAA	*Clean Air Act*
CAB	Controlled Area Boundary
CAL/EPA	California Office of Environmental Health Hazard Assessment
CAMA	Coastal Area Management Act
CaOH	lime
CAS	Chemical Abstracts Service
CAST	Horticultural Crops Research Station (Castle Hayne, NC)
CBA	cost-benefit analysis
cDCE	cis-1,2 dichloroethylene
CDC	Centers for Disease Control and Prevention
CaF_2	calcium fluoride
CEDE	committed effective dose equivalent
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFC	chlorofluorocarbon
CFR	U.S. *Code of Federal Regulations*
CH_4	methane
Ci	Curie

ACRONYMS AND ABBREVIATIONS (Cont.)

CO	carbon monoxide
COL	combined license
COLA	combined license application
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPC	Center for Plant Conservation
CSC	Coastal Services Center
CWA	*Clean Water Act*
CZM	Coastal Zone Management
D&D	decontamination and decommissioning
dB	decibel
dBA	A-weighted decibel
d/b/a	doing business as
dbh	diameter at breast height
DC	design certification
DCE	dichloroethylene
DCF	dose conversion factor
DCM	Division of Coastal Management
DCP	dry conversion process
DDE	deep dose equivalent
DEIS	Draft Environmental Impact Statement
DFP	decommissioning funding plan
DMT	Dundalk Marine Terminal
DNA	deoxyribonucleic acid
DNFSB	Defense Nuclear Facilities Safety Board
DNL	day-night average noise level
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DU	depleted uranium
DUF_4	depleted uranium tetrafluoride
DUF_6	depleted uranium hexafluoride
DWQ	Division of Water Quality
EA	environmental assessment
EAC	Early Action Compact
EF	Enhanced Fujita
EHS	Environmental, Health, and Safety
EIA	Energy Information Administration
EIS	environmental impact statement
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
ER	Environmental Report

ACRONYMS AND ABBREVIATIONS (Cont.)

EREF	Eagle Rock Enrichment Facility
ESA	*Endangered Species Act*
ESI	Environmental Services, Inc.
F	Fahrenheit; Fujita
FAA	Federal Aviation Administration
FCO	Fuel Components Operation
FBI	Federal Bureau of Investigation
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FLM	Federal Land Manager
FMO/FMOX	Fuel Manufacturing Operation
FPLTF	Final Process Lagoon Treatment Facility
FR	*Federal Register*
ft	foot/feet
FTE	full-time equivalent
FWS	U.S. Fish and Wildlife Service
g	gram
gal	gallon
GDP	Gaseous Diffusion Plant
GE	General Electric
GEH	General Electric-Hitachi
GHG	greenhouse gas
GLE	GE-Hitachi Global Laser Enrichment LLC
GNEP	Global Nuclear Energy Partnership
GNF-A	Global Nuclear Fuel-Americas
gpd	gallons per day
GWh	gigawatt-hour
GWP	global warming potential
H_2O	water vapor
ha	hectare
HAP	hazardous air pollutant
HDDV	heavy-duty diesel vehicle
HEGA	high-efficiency gas absorption
HEPA	high-efficiency particulate air
HEU	highly enriched uranium
HF	hydrogen fluoride or hydrofluoric acid
HFC	hydrofluorocarbon
HFC-23	trifluoromethane
HMTA	*Hazardous Materials Transportation Act*
HNO_3	nitric acid
HVAC	heating, ventilation, and air conditioning
HUD	U.S. Department of Housing and Urban Development
HWS	Hazardous Waste Section
Hz	hertz

ACRONYMS AND ABBREVIATIONS (Cont.)

I	Interstate
ICRP	International Commission of Radiological Protection
IDLH	Immediately Dangerous to Life and Health
IHSB	Inactive Hazardous Sites Branch
IMPLAN	Impact Analysis for Planning
in.	inch(es)
IROF	item relied upon for safety
ISA	integrated safety analysis
ITE	Institute of Transportation Engineers
kHz	kilohertz
km	kilometer
l	liter
lb	pound
LCF	latent cancer fatality
LDGV	light-duty gasoline vehicle
L_{dn}	day-night maximum average sound level
L_{eq}	equivalent sound level
$L_{eq(24)}$	24-hour equivalent sound level
LEDPA	least environmentally damaging practicable alternative
LES	Louisiana Energy Services, LLC
LEU	low-enriched uranium
LLRW	low-level radioactive waste
lpd	liters per day
LSA	low specific activity
m	meter
MDC	minimum detectable concentration
MEI	maximally exposed individual
mg	milligram
mi	mile(s)
mg/m^3	milligrams per cubic meter
MLIS	molecular laser isotope separation
MMt	million metric tons
MNA	monitored natural attenuation
MOX	mixed oxide fuel
mph	miles per hour
mrem	millirem
m/s	meters per second
MSA	Metropolitan Statistical Area
MSL	mean sea level
mSv	millisievert
MSW	municipal solid waste
MT/yr	metric tons per year
MWe	megawatt electric

ACRONYMS AND ABBREVIATIONS (Cont.)

MWh	megawatt-hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NaOH	sodium hydroxide
NC	North Carolina
NCAC	*North Carolina Administrative Code*
NCDAQ	North Carolina Division of Air Quality
NCDC	National Climatic Data Center
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEHNR	North Carolina Department of Health, Environment, and Natural Resources
NCDMF	North Carolina Division of Marine Fisheries
NCDOL	North Carolina Department of Labor
NCDOT	North Carolina Department of Transportation
NCDWQ	North Carolina Division of Water Quality
NCES	National Center for Education Statistics
NCGS	*North Carolina General Statutes*
NCIT	North Carolina International Terminal
NCNHP	North Carolina Natural Heritage Program
NCOSBM	North Carolina Office of State Budget and Management
NCRP	National Council on Radiation Protection and Measurements
NCWRC	North Carolina Wildlife Resources Commission
NEF	National Enrichment Facility
NELAC	National Environmental Laboratory Accreditation Conference
NEMA	National Electric Manufacturers Association
NEPA	*National Environmental Policy Act*
NERC	North American Reliability Corporation
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHC	National Hurricane Center
NHPA	National Institute for Occupational Safety
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NLCD92	National Land Cover Data 1992 archives
NMFS	National Marine Fisheries Service
NMSS	Office of Nuclear Materials Safety and Safeguards
NMTOC	nonmethane total organic compound
NMVOC	nonmethane volatile organic compound
NO_2	nitrogen dioxide
NO_x	nitrogen oxide, oxide of nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOV	Notice of Violation
NPCR	National Program of Cancer Registries
NPDES	National Pollutant Discharge Elimination System

ACRONYMS AND ABBREVIATIONS (Cont.)

NRC	U.S. Nuclear Regulatory Commission
NRCS	U.S. Natural Resources Conservation Service
NRHP	*National Register of Historic Places*
NSSL	National Severe Storms Laboratory
NWS	National Weather Service
O_3	ozone
OSHA	Occupational Safety and Health Administration
OSTV	onsite transfer vehicle
PA	Programmatic Agreement
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PFC	perfluorocarbon
PM	particulate matter
$PM_{2.5}$	particulate matter equal to or smaller than 2.5 micrometers in diameter
PM_{10}	particulate matter equal to or smaller than 10 micrometers in diameter
PMT	Portsmouth Marine Terminal
ppm	parts per million
PSD	Prevention of Significant Deterioration
PWR	pressurized water reactor
RAI	Request for Additional Information
RCRA	*Resource Conservation and Recovery Act*
RCW	red-cockaded woodpecker
rem	roentgen equivalent man
RLETS	Radiological Liquid Waste Treatment System
ROI	region of influence
ROW	right-of-way
RPS	North Carolina Radiation Protection Section
RSL	Regional Screening Level
RTI	Research Triangle Institute
RVP	Reid vapor pressure
SAAQS	State Ambient Air Quality Standards
SAM	Social Accounting Matrix
SCONC	State Climate Office of North Carolina
SER	Safety Evaluation Report
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office(r)
SILEX	separation of isotopes by laser excitation
SNF	spent nuclear fuel
SO_2	sulfur dioxide
SO_x	sulfur oxide
SPCC	Spill Prevention Control and Countermeasure

ACRONYMS AND ABBREVIATIONS (Cont.)

SUV	sport-utility vehicle
Sv	Sievert
SVOC	semivolatile organic compound
SWU	separative work unit
TAP	toxic air pollutant
TCE	trichloroethylene
TEDE	total effective dose equivalent
Tg	teragram
TLD	thermoluminescent dosimeter
TSDF	treatment, storage, and disposal facility
TSP	total suspended particulates
TSS	total suspended solids
TWA	time-weighted average
U_3O_8	triuranium octaoxide
UO_2	uranium dioxide
UO_2F_2	uranyl fluoride
UF_6	uranium hexafluoride
UNFCCC	United Nations Framework Convention on Climate Change
USACE	U.S. Army Corps of Engineers
U.S.C.	*United States Code*
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEC	United States Enrichment Corporation
USGCRP	United States Global Change Research Program
USGS	U.S. Geological Survey
UV	ultraviolet
VC	vinyl chloride
VMT	vehicle miles traveled
VOC	volatile organic compound
VRM	visual resource management
WFSC	Wilmington Field Services Center
WMA	Wildlife Management Area
WSA	Wilderness Study Area
WWTF	Wastewater Treatment Facility
μg	microgram
μm	micrometer

APPENDIX A
SCOPING FOR THIS ENVIRONMENTAL IMPACT STATEMENT

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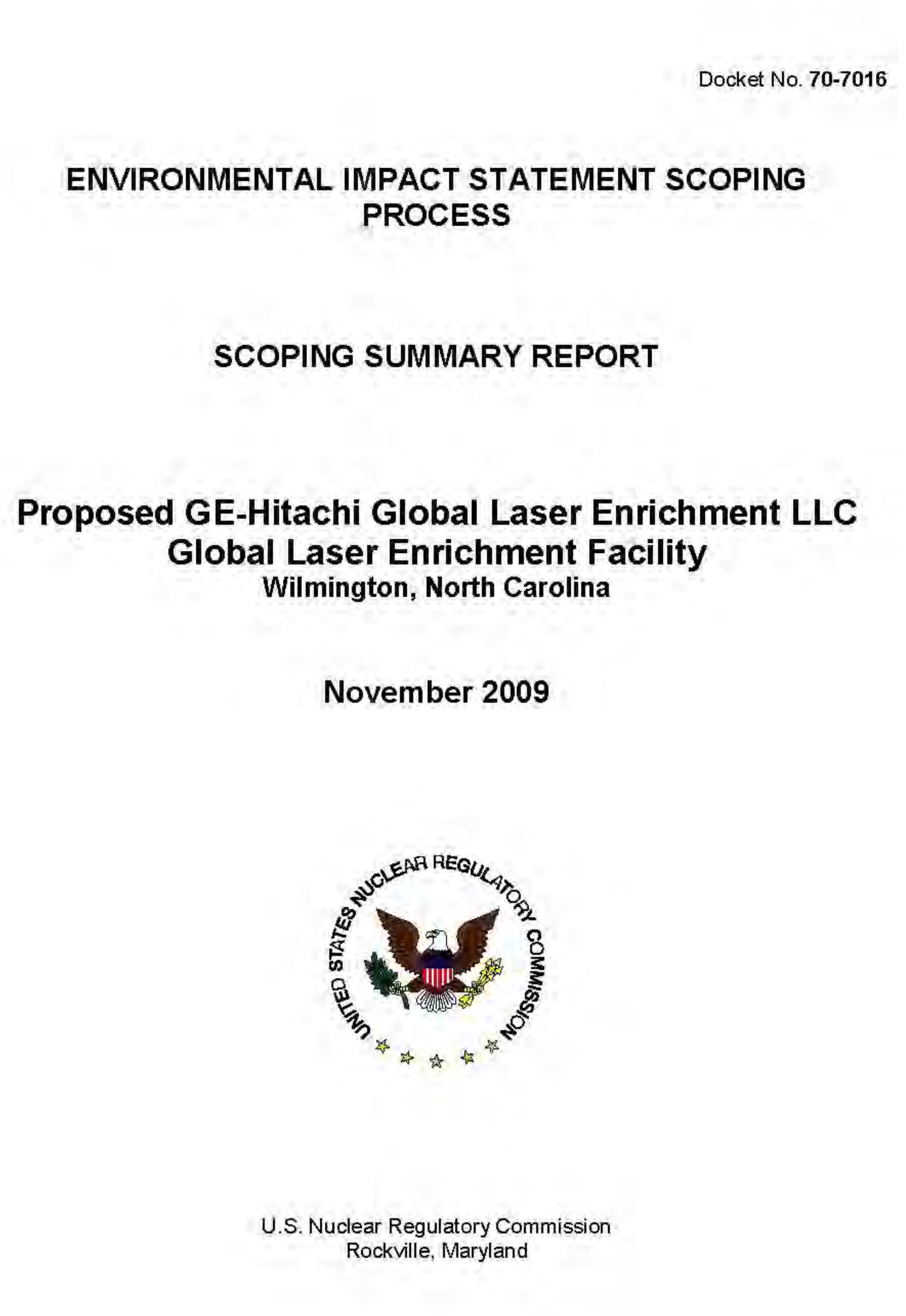


Docket No. **70-7016**

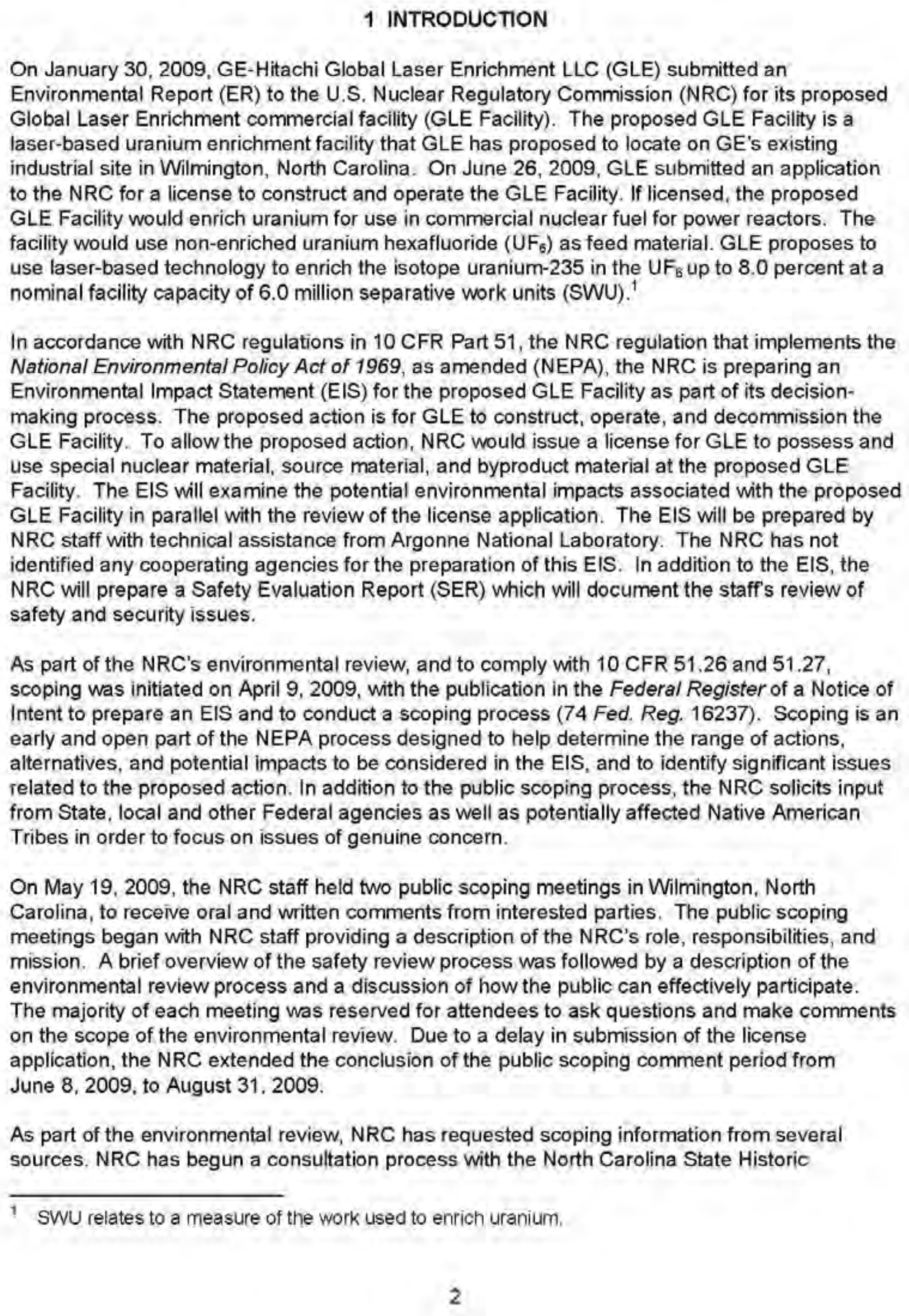
ENVIRONMENTAL IMPACT STATEMENT SCOPING PROCESS

SCOPING SUMMARY REPORT

Proposed GE-Hitachi Global Laser Enrichment LLC
Global Laser Enrichment Facility
Wilmington, North Carolina

November 2009

U.S. Nuclear Regulatory Commission
Rockville, Maryland



1 INTRODUCTION

On January 30, 2009, GE-Hitachi Global Laser Enrichment LLC (GLE) submitted an Environmental Report (ER) to the U.S. Nuclear Regulatory Commission (NRC) for its proposed Global Laser Enrichment commercial facility (GLE Facility). The proposed GLE Facility is a laser-based uranium enrichment facility that GLE has proposed to locate on GE's existing industrial site in Wilmington, North Carolina. On June 26, 2009, GLE submitted an application to the NRC for a license to construct and operate the GLE Facility. If licensed, the proposed GLE Facility would enrich uranium for use in commercial nuclear fuel for power reactors. The facility would use non-enriched uranium hexafluoride (UF_6) as feed material. GLE proposes to use laser-based technology to enrich the isotope uranium-235 in the UF_6 up to 8.0 percent at a nominal facility capacity of 6.0 million separative work units (SWU).[1]

In accordance with NRC regulations in 10 CFR Part 51, the NRC regulation that implements the *National Environmental Policy Act of 1969*, as amended (NEPA), the NRC is preparing an Environmental Impact Statement (EIS) for the proposed GLE Facility as part of its decision-making process. The proposed action is for GLE to construct, operate, and decommission the GLE Facility. To allow the proposed action, NRC would issue a license for GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility. The EIS will examine the potential environmental impacts associated with the proposed GLE Facility in parallel with the review of the license application. The EIS will be prepared by NRC staff with technical assistance from Argonne National Laboratory. The NRC has not identified any cooperating agencies for the preparation of this EIS. In addition to the EIS, the NRC will prepare a Safety Evaluation Report (SER) which will document the staff's review of safety and security issues.

As part of the NRC's environmental review, and to comply with 10 CFR 51.26 and 51.27, scoping was initiated on April 9, 2009, with the publication in the *Federal Register* of a Notice of Intent to prepare an EIS and to conduct a scoping process (74 *Fed. Reg.* 16237). Scoping is an early and open part of the NEPA process designed to help determine the range of actions, alternatives, and potential impacts to be considered in the EIS, and to identify significant issues related to the proposed action. In addition to the public scoping process, the NRC solicits input from State, local and other Federal agencies as well as potentially affected Native American Tribes in order to focus on issues of genuine concern.

On May 19, 2009, the NRC staff held two public scoping meetings in Wilmington, North Carolina, to receive oral and written comments from interested parties. The public scoping meetings began with NRC staff providing a description of the NRC's role, responsibilities, and mission. A brief overview of the safety review process was followed by a description of the environmental review process and a discussion of how the public can effectively participate. The majority of each meeting was reserved for attendees to ask questions and make comments on the scope of the environmental review. Due to a delay in submission of the license application, the NRC extended the conclusion of the public scoping comment period from June 8, 2009, to August 31, 2009.

As part of the environmental review, NRC has requested scoping information from several sources. NRC has begun a consultation process with the North Carolina State Historic

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[1] SWU relates to a measure of the work used to enrich uranium.

Preservation Officer (SHPO) as required by Section 106 of the *National Historic Preservation Act*. In accordance with 36 CFR 800.3(f), NRC has requested information from Native American Tribal members identified by the SHPO and NRC staff. NRC staff also has consulted with representatives of the New Hanover County Planning Department, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service, and the U.S. Fish and Wildlife Service as required by Section 7 of the *Endangered Species Act*.

This scoping summary report only addresses public comments and is included as Appendix A of the EIS. Input from consulting agencies and potentially affected Native American Tribes was used as a basis for the impact assessments performed for each resource area.

This report has been prepared to summarize the determinations and conclusions reached in the scoping process as required in 10 CFR 51.29(b). After publication of the draft EIS, the public will be invited to submit additional comments. Availability of the draft EIS, the dates of the public comment period, and information about a public meeting to be held to discuss the draft EIS will be announced in the *Federal Register*, on NRC's website (http://www.nrc.gov/public-involve.html), and in the local news media when the draft EIS is distributed. After evaluating comments on the draft EIS, the NRC staff will issue a final EIS that will serve as the basis for the NRC's consideration of environmental impacts in its decision on the proposed GLE Facility.

This report is organized into four main sections. Section 1 provides an introduction and background information on the environmental review process. Section 2 summarizes the comments and concerns expressed by government officials, agencies, and the public. Section 3 identifies the issues that the draft EIS will address and Section 4 describes those issues that are not within the scope of the draft EIS. Where appropriate, Section 4 also identifies other places in the decision-making process where issues that are outside the scope of the draft EIS may be considered.

2 ISSUES RAISED DURING THE SCOPING PROCESS

2.1 Overview

Approximately 55 individuals not affiliated with the NRC attended the May 19, 2009, afternoon and evening public scoping meetings, respectively, concerning the environmental impact statement for the GLE Facility. The scoping meeting attendance list is available on NRC's Electronic Reading Room website, hppt://www.nrc.gov/reading-rm/adams/web-based.html, as ML0914706500; six individuals attended both meetings. During the meeting, one individual asked specific questions about the scoping process. Six individuals offered specific oral comments related to the proposed GLE Facility. In addition, six written comments, including one duplicate, were received from various individuals during the public scoping period, which ended on August 31, 2009. Some of the individuals who submitted written comments also provided oral comments at the scoping meetings. The scoping meeting transcripts (ML0915202420 and ML0915202440) and the five written comments received by the NRC are available on the NRC website, electronic reading room, at http://www.nrc.gov/reading-rm/adams/web-based.html.

The active participation of the public in the scoping process is an important component in determining the major issues that the NRC should address in the draft EIS. Individuals providing oral and written comments addressed several subject areas related to the proposed GLE Facility and the draft EIS development. In addition to private citizens, the various commenters included:

- A New Hanover County Commissioner, and
- A representative of the Wilmington County Council.

The following general topics categorize the comments received during the public scoping period:

- General support or opposition;
- NEPA and public participation;
- Alternatives;
- Need for the proposed facility;
- Land use;
- Water resources;
- Climate, noise, visual resources;
- Socioeconomics and environmental justice;
- Transportation;
- Waste management;
- Historic and cultural resources;
- Safety and risk;
- Terrorism; and
- Nonproliferation concerns.

In addition to raising important issues about the potential environmental impacts of the proposed facility, some commenters offered opinions and concerns that typically would not be included in the subject matter of an EIS; these include general opinions about the use of nuclear energy. Comments of this type do not fall within the scope of environmental issues to be analyzed.

Other statements may be relevant to the proposed action, but they have no direct bearing on the evaluation of alternatives or on the decision-making process involved in the proposed action. For instance, general statements of support for or opposition to the proposed action fall into this category. Again, comments of this type have been noted but are not used in defining the scope and content of the draft EIS.

Section 2.2 summarizes the comments received during the public scoping period. Most of the issues raised have a direct bearing on the NRC's analysis of potential environmental impacts.

2.2 Summary of Issues Raised

As noted above, a number of commenters expressed support for the facility. Several individuals, on the other hand, raised concerns regarding the construction and operation of the proposed GLE Facility. The following summary groups the comments received during the scoping period by technical area and issue.

2.2.1 General Support or Opposition

Several commenters expressed general support for the GE and the GLE Facility.

One commenter expressed general support for licensing of the proposed GLE Facility and expressed the view that it would provide benefits to the region and the nuclear power industry. He also expressed confidence in GE and its safety record, noting that GE has been operating in Wilmington since the late 1960s (and before that, California) without impacting the environment. Another commenter expressed confidence in GE and acknowledged that the past safety record of the existing GE facility has been well demonstrated.

One commenter expressed general support for the proposed GLE Facility and expressed the opinion that it would be an asset to the local community and nation. Another commenter expressed general support for the proposed GLE Facility, as well as GE's history of safe operation and benefit to the Wilmington area. He noted that the area needs jobs, that GE has proven that they can deliver products safely, and that GE is a good steward of their property.

One commenter noted the positive public image that GE has in the surrounding community and expressed hope that the proposed GLE Facility would be successful. Another commenter expressed general support for GE-Hitachi and its commitment to the community and environment.

2.2.2 NEPA and Public Participation

Several commenters asked for information about the proposed project. One commenter asked for information regarding the duration of the licensing action (finite or indefinite), whether GLE pays a fee with the license application, and the fee amount. He also asked whether the EIS process relates to the test loop or the proposed GLE Facility, whether the license is dependent on evaluation of the test loop, and which entity will perform the test loop evaluation. Another commenter inquired about the duration of construction. Other questions about the project are noted in sections about specific topic areas below.

Three commenters expressed views about the environmental review process. One noted that reassuring local citizens that environmental issues (air, water, wildlife, and public safety) are studied and no negative impacts will result is most important. He requested that the EIS contain as much information as possible, as presenting the facts will help dispel misunderstandings and uncertainty about the proposed GLE Facility. Another commenter expressed the view that the NRC process has been open and informative, while a third commenter noted that the public scoping meeting that he attended was well-managed and informative.

One commenter noted that the report (assumed to refer to the GLE Environmental Report) is well done, but questioned the methods of communicating it to the public and surrounding communities. The commenter stated that few people seemed to know about the proposed project. He expressed the view that a forum should be conducted closer to the affected area(s).

One commenter expressed disagreement with GE's decision to pursue boiling water reactor technology and noted his inability to get in contact with the appropriate contacts at GE.

2.2.3 Alternatives

One commenter noted the sensibility of co-locating the proposed GLE Facility near GE's existing fuel fabrication facility, reducing the need for shipping between the two facilities.

2.2.4 Need for the Proposed Facility

Two commenters noted the need for the proposed GLE Facility. One commenter expressed general support for the proposed facility, noting that it would be an important element of the nation's drive for energy independence and national security. The second commenter expressed the view that the United States must become less dependent on foreign oil, and that the proposed facility will be instrumental in making nuclear energy more economical.

2.2.4 Land Use

One commenter suggested that a graphic of the construction plan and timeframe would be helpful. Another commenter noted the beautiful and unusual environment (ocean, tidal zones, and river) that surrounds the proposed GLE Facility.

2.2.5 Water Resources

Three commenters expressed concern with water resources, two of whom requested upgrade of water and sewer service for surrounding communities.

One commenter noted that sewer and water in an adjacent residential development are local for each home. He suggested that GLE or the City of Wilmington should consider funding or installing sewer and water infrastructure in the development (replacing the existing well and septic systems) to prevent the possibility (or perception) that drinking water could be contaminated by the proposed GLE Facility or existing septic systems. He believes that municipal or GLE waste and drinking water treatment would eliminate the potential hazard posed by a potential increase in groundwater contaminants. He also requested a graphic of the intakes and outputs of the existing GE facilities and the proposed GLE Facility to help nearby residents assess the potential increase in discharge of contaminants to their communities.

Finally, he suggested real-time or periodic monitoring in the absence of local sewer and water treatment.

Another commenter noted the absence of a public sewer system in the area. He is planning an 800-unit residential subdivision to the south of the GE site, which will discharge treated effluent via a drip system. He expressed opposition to any potential increase of sewer discharge to the Northeast Cape Fear River as a result of the proposed GLE Facility, noting that the river is already compromised. This commenter also noted the absence of a municipal water system capable of supplying water for industrial growth in the area, and that a large tract of land to the east of the GE site is currently zoned industrial. He suggested that, if GE satellite support businesses will be located outside of but near the GE site, GE should be expected or required to partner with area developers and contribute to building new municipal water supply and sewer infrastructure in the area.

The third commenter requested that the EIS consider the effects of the proposed GLE Facility on groundwater supply and quantity, and surface water quantity.

2.2.6 Climate, Noise, and Visual Resources

Climate: One commenter noted the region's susceptibility to hurricanes and recommended that the EIS consider the potential for hurricanes, their effects, and site preparation for hurricanes.

Noise: Two commenters expressed concern with noise from construction and operation of the proposed GLE Facility. One commenter inquired about the noise level in the nearby residential development during construction. He recommended that onsite traffic routes to the proposed GLE Facility could be routed with a 200- to 300-foot buffer or sound barrier (depending on the anticipated noise level) to assure nearby residents that their quality of life will be maintained. The second commenter requested that audible alarm testing (current and future) be conducted later in the day.

Visual Resources: One commenter expressed concern over potential plans to clear trees or other vegetative buffer along the GE site boundary and construct a fence, and the resulting cosmetic and financial impacts to a proposed residential development to the south of the GE site. Another commenter noted that it would be difficult to know that the proposed GLE Facility exists, because it will fit so well on the existing GE site.

2.2.7 Socioeconomics and Environmental Justice

Property Value: One commenter expressed concern about the value of property in the vicinity of the proposed facility (asserting that this could be the first time that an enrichment facility has been located in such close proximity to an exiting residential development) and requested that present and future property values be considered in the EIS. He recommended that the EIS consider economic impacts, environmental impacts (current and future), and their effect on property resale values. He expressed concern that potential buyers may not be informed of GE's safety record and may choose not to settle in the neighborhood due to the location of the proposed GLE Facility. He recommended that GLE consider guaranteeing property values as a means of preventing potential devaluation.

Environmental Justice: One commenter requested that the EIS consider the conclusion of small negative effect stated in the Environmental Justice section (assumed to refer to Section 4.11 of the GLE Environmental Report).

2.2.8 Transportation

Three commenters expressed concerns regarding transportation. One commenter expressed concern that, although the GE site is probably well-protected, the flow of materials to and from large projects represents a vulnerability and potential security issue. He recommended that all potential transportation modes (including rail, water, and air) be considered in the EIS, along with potential transportation security issues.

Another commenter suggested that GLE conduct a Traffic Impact Analysis and be responsible for any recommended road improvements. The third commenter recommended that Sledge Road on the northern boundary of the GE site should be off-limits to construction and delivery vehicles and left unimproved, with all traffic routed to the proposed GLE Facility through the North or South Gate. He also inquired if it is possible to build direct ramps to I-140.

2.2.9 Waste Management

One commenter suggested that a schematic comparison of the present and future site be available to help members of the public assess the plan for waste discharges from the proposed GLE Facility.

2.2.10 Historic and Cultural Resources

One commenter noted GE's recent efforts to help locate and preserve a historic plantation and cemetery on the GE site.

2.2.11 Safety and Risk

One commenter suggested that a graphic or website showing the current and planned onsite radiation monitoring systems would be helpful. He also asked if real-time radiation assessments will be possible (collected) and if nearby residents would be informed and protected in case of accidents. Another commenter asked if the proposed GLE Facility will cause any safety risks to a proposed residential development to the south of the GE site.

2.2.12 Terrorism

One commenter expressed concern about the attractiveness of the proposed GLE Facility and its incoming and outgoing shipments as targets of terrorism and recommended that this be considered in the EIS.

2.2.13 Nonproliferation Concerns

One group of commenters expressed concerns that licensing the proposed GLE Facility would raise significant proliferation issues.

3 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The NEPA (Public Law 91-190, as amended), and the NRC's Implementing Regulations for NEPA (10 CFR Part 51), specify in general terms what should be included in an EIS prepared by the NRC staff. Regulations established by the Council on Environmental Quality (40 CFR Parts 1500-1508), while not binding on NRC staff, provide useful guidance. Additional guidance for meeting NEPA requirements associated with licensing actions can be found in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Office of Nuclear Material Safety and Safeguards (NMSS) Programs."

Pursuant to 10 CFR 51.71(a), in addition to public comments received during the scoping process, the contents of the draft EIS will also address the matters discussed in the GLE Environmental Report. In accordance with 10 CFR 51.71(b), the draft EIS will consider major points of view and objections concerning the environmental impacts of the proposed action raised by other Federal, State, and local agencies, by any affected Indian Tribes, and by other interested persons. Pursuant to 10 CFR 51.71(c), the draft EIS will list all Federal permits, licenses, approvals, and other entitlements that must be obtained in implementing the proposed action, and will describe the status of compliance with these requirements. Any uncertainty as to the applicability of these requirements will be addressed in the draft EIS.

Pursuant to 10 CFR 51.71(d), the draft EIS will include a preliminary analysis that considers and weighs the environmental effects of the proposed action; the environmental impacts of alternatives to the proposed action; and alternatives available for reducing or avoiding adverse environmental effects. In the draft analysis, due consideration will be given to compliance with environmental quality standards and regulations that have been imposed by Federal, State, regional, and local agencies having responsibilities for environmental protection. The environmental impact of the proposed action will be evaluated in the draft EIS with respect to matters covered by such standards and requirements, regardless of whether a certification or license from the appropriate authority has been obtained. Compliance with applicable environmental quality standards and requirements does not negate the requirement for NRC to weigh all environmental effects of the proposed action, including the degradation, if any, of water quality, and to consider alternatives to the proposed action that are available for reducing adverse effects. While satisfaction of NRC standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the *Atomic Energy Act*, the draft EIS will also, for the purposes of NEPA, consider the radiological and nonradiological effects of the proposed action and alternatives.

The following documents are environmental assessments and other EISs which have been prepared that are related to the action under consideration. The following list is not intended to be comprehensive:

- Programmatic EIS for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride (DOE/EIS-0269, March 1999)
- Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (DOE/EIS-0359, December 2003)

- Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at Portsmouth, Ohio Site (DOE/EIS-0360, December 2003)
- Environmental Impact Statements for the American Centrifuge Plant (ACP) and National Enrichment Facility (NEF).

Pursuant to 10 CFR 51.71(e), the draft EIS will include a preliminary recommendation by NRC staff with respect to the proposed action. Any such recommendation would be reached after considering the environmental effects of the proposed action and reasonable alternatives, and after weighing the costs and benefits of the proposed action.

The scoping process summarized in this report will help determine the scope of the draft EIS for the proposed facility. The draft EIS will contain a discussion of the cumulative impacts of the proposed action as referenced in NUREG-1748. The development of the draft EIS will be closely coordinated with the SER prepared by the NRC staff to evaluate the health and safety impacts of the proposed action.

One goal in writing the draft EIS is to present the impact analyses in a manner that makes it easy for the public to understand. This draft EIS will provide the basis for the NRC decision with regard to potential environmental impacts. Significant impacts will be discussed in greater detail in the draft EIS. This should allow readers of the draft EIS to focus on issues that were determined to be important in reaching the conclusions supported by the draft EIS. The following topical areas and issues will be addressed in the draft EIS.

- *Alternatives.* The draft EIS will describe and assess the no-action alternative and other reasonable alternatives to the proposed action. Other alternatives may include alternative sites, enrichment sources, or technological alternatives to the proposed laser technology.
- *Need for the Facility.* The draft EIS will provide a discussion of the need for the proposed GLE Facility.
- *Compliance with Applicable Regulations* . The draft EIS will present a listing of the relevant permits and regulations that are believed to apply to the proposed GLE Facility. These would include air, water, and solid waste regulations and disposal permits.
- *Land Use.* The draft EIS will discuss the potential land use impacts associated with the proposed site preparation, construction, and operating activities.
- *Transportation.* The draft EIS will discuss the impacts associated with the transportation of construction materials, feed material, product, and waste tails during both normal transportation and under credible accident scenarios. The impacts on local transportation routes due to workers, delivery vehicles, and waste removal vehicles will be evaluated.
- *Geology and Soils.* The draft EIS will assess the potential impacts to the geology and soils of the proposed GLE Facility site due to soil compaction, erosion, contamination, landslides, and disruption of natural drainage patterns. Evaluation of the potential for earthquakes or any other major ground motion considerations will be addressed mainly in the SER and only in terms of possible environmental impacts in the draft EIS.

- *Water Resources*. The draft EIS will assess the potential impacts on surface water and groundwater quality and water use due to the proposed action and alternatives.

- *Ecological Resources*. The draft EIS will assess the potential environmental impacts on ecological resources including plant and animal species. Threatened and endangered species and critical habitats that may occur in the area will also be discussed, along with the appropriate consultation as required by Section 7 of the *Endangered Species Act of 1973* (16 USC Section 1536(a)(2)). As appropriate, the assessment will include an analysis of mitigation measures to address potential adverse impacts.

- *Air Quality*. The draft EIS will make determinations concerning the meteorological conditions of the site location, the ambient air quality, the contribution of other sources, and the impacts of site preparation, construction, and operation of the proposed GLE Facility on local air quality. In addition, the draft EIS will consider the impact of the proposed facility on climate change, as well as the impact of climate change on the proposed facility.

- *Noise*. The draft EIS will discuss potential impacts associated with noise levels generated from site preparation, construction, operation, and decommissioning of the proposed GLE Facility.

- *Historic and Cultural Resources*. The draft EIS will address the potential impacts of the proposed GLE Facility on the historic and archaeological resources of the area.

- *Visual and Scenic Resources*. Potential impacts to the overall visual and scenic character of the area will be addressed.

- *Socioeconomics*. The draft EIS will address the demography, economic base, labor pool, housing, utilities, public services, education, and recreation as impacted by the proposed action and alternatives. The hiring of new workers from the outside area could lead to impacts on the regional housing, public infrastructure, and economic resources. Population changes leading to changes to the housing market and demands on the public infrastructure will be assessed.

- *Costs and Benefits*. The draft EIS will address the potential costs and benefits of constructing and operating the proposed GLE Facility, and will discuss the costs and benefits of tails disposition options.

- *Resource Commitments*. The draft EIS will identify the unavoidable adverse impacts and irreversible and irretrievable commitments of resources. It will also address the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity. Associated mitigative measures and environmental monitoring will be presented, if applicable.

- *Public and Occupational Health*. The draft EIS will include a determination of potentially adverse effects on human health that result from chronic and acute exposures to ionizing radiation and hazardous chemicals as well as from physical safety hazards. These potentially adverse effects on human health might occur during site preparation, construction, or operation. Impacts associated with the implementation of the proposed action will be assessed under normal operation and credible accident scenarios.

- *Waste Management.* The draft EIS will discuss the management of wastes, including by-product materials, generated from the site preparation, construction, and operation of the proposed GLE Facility to assess the impacts of generation, storage, and disposal.

- *Depleted Uranium (DU) Disposal.* The draft EIS will discuss the depleted uranium hexafluoride (DUF_6) material, or tails, that results from the enrichment operation over the operating lifetime of the proposed GLE Facility. Topics addressed will include the safe and secure storage and ultimate removal of the material from the site, and the potential conversion of the DUF_6 to DU oxide and ultimate disposition.

- *Decommissioning.* The draft EIS will include a discussion of facility decommissioning and associated impacts.

- *Cumulative Impacts.* The draft EIS will address the potential cumulative impacts from past, present, and reasonably foreseeable activities at and near the site, including site preparation.

- *Environmental Justice.* The draft EIS will address environmental impacts of the proposed GLE Facility on low-income or minority populations. The EIS will assess whether disproportionately high and adverse impacts on low-income or minority populations are identified.

4 ISSUES CONSIDERED TO BE OUTSIDE THE SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The purpose of an EIS is to assess the potential environmental impacts of a proposed action in order to assist in an agency's decision-making process – in this case, NRC's licensing decision. As noted in Section 2.2, some issues and concerns raised during the scoping process are not relevant to the draft EIS because they are not directly related to the assessment of potential impacts or to the decision-making process. The lack of in-depth discussion in the draft EIS, however, does not mean that an issue or concern lacks value. Issues beyond the scope of the draft EIS either may not yet be at the point where they can be resolved, or are more appropriately discussed and decided in other venues.

Some of the issues raised during the public scoping process (e.g., GE's pursuit of boiling water reactor technology) will not be addressed in the draft EIS. Other issue areas including nonproliferation concerns, and security and safety issues are also beyond the scope of the EIS. The mission of the NRC is to license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials in order to protect public health and safety, promote the common defense and security, and protect the environment. The NRC's regulations are designed to protect both the public and workers against radiation hazards from industries that use radioactive materials. The NRC's scope of responsibility includes regulation of commercial nuclear power plants; research, test, and training reactors; nuclear fuel cycle facilities; medical, academic, and industrial uses of radioactive materials; and the transport, storage, and disposal of radioactive materials and wastes.

Regarding the nonproliferation issue, these activities are not within NRC jurisdiction and as such are beyond what the NRC can regulate.

Some of the issues raised during the public scoping process for the proposed facility are outside the scope of the draft EIS, but they will be analyzed in the SER. For example, health and safety issues will be considered in detail in the SER prepared by NRC staff for the proposed action and will be summarized in the EIS. The draft EIS and the SER are related in that they may cover the same topics and may contain similar information, but the analysis in the draft EIS is focused on an assessment of potential environmental impacts. In contrast, the SER deals primarily with safety evaluations and procedural requirements or license conditions to ensure the health and safety of workers and the general public. The SER also covers other aspects of the proposed action such as demonstrating that the applicant will provide adequate funding for the proposed facility in compliance with NRC's financial assurance regulations.

APPENDIX B
CONSULTATION LETTERS

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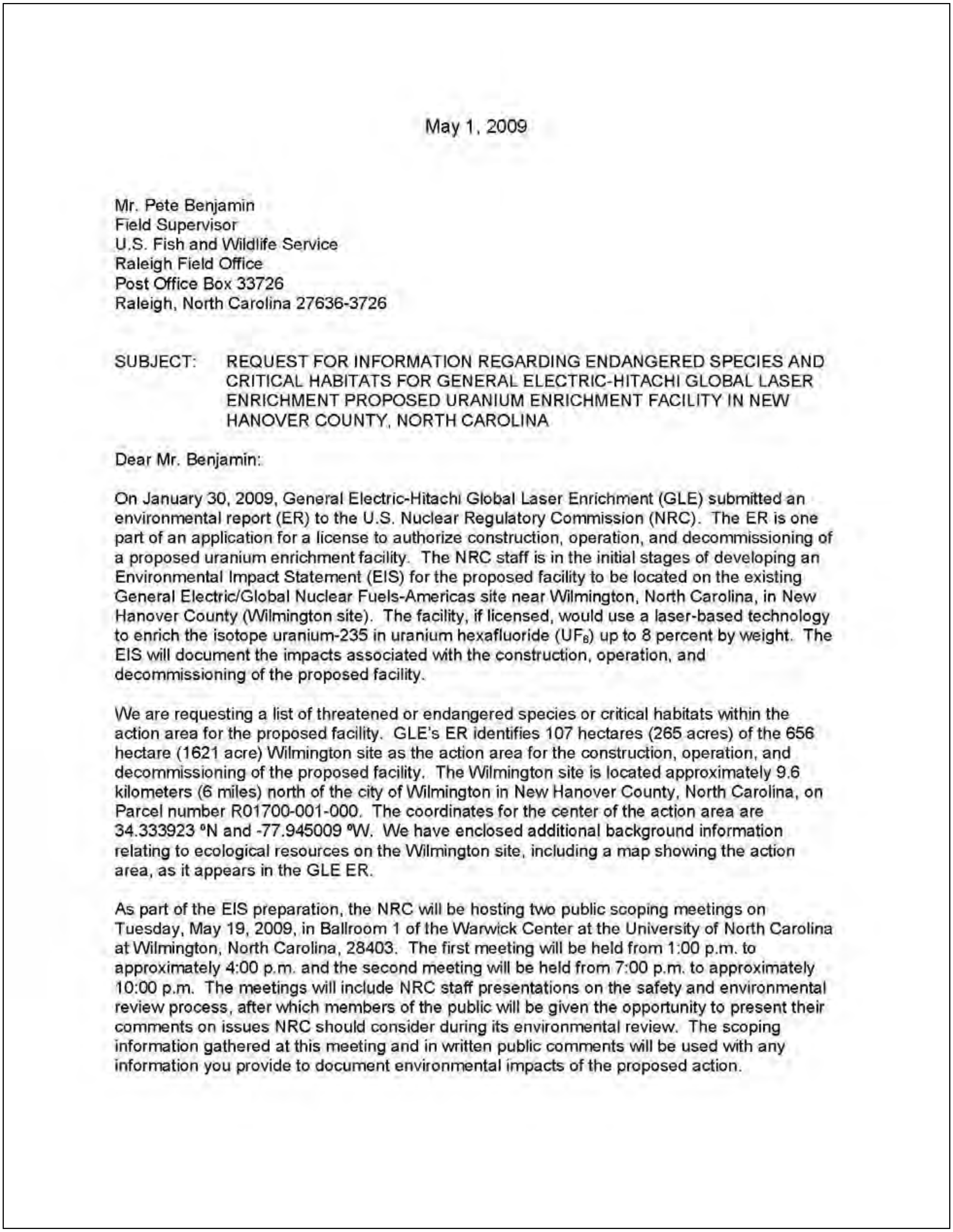
CONSULTATION LETTERS

B.1 *Endangered Species Act* Consultation Letters

The U.S. Nuclear Regulatory Commission (NRC) sent coordination letters to the U.S. Fish and Wildlife Service (Raleigh Field Office) and the National Marine Fisheries Service (Southeast Regional Office) related to threatened and endangered species and critical habitats. All of the NRC letters and agency responses can be accessed via NRC's online document retrieval system (ADAMS) using the accession numbers in Table B-1.

Table B-1 Consultations with Government Agencies Related to Threatened and Endangered Species and Critical Habitats

Agency (Date)	ADAMS Accession Number(s)
NRC letter to U.S. Fish and Wildlife Service, Raleigh Field Office (May 1, 2009)	ML091100107
Response from U.S. Fish and Wildlife Service, Raleigh Field Office (June 8, 2009)	ML091700024
NRC letter to National Oceanic and Atmospheric Administration (NOAA) Fisheries, Southeast Regional Office (June 18, 2009)	ML091660499
Response from NOAA Fisheries, Southeast Regional Office (August 3, 2009)	ML092170775
NRC letter to U.S. Fish and Wildlife Service, Raleigh Field Office (August 10, 2009)	ML092030404
NRC letter to U.S. Fish and Wildlife Service, Raleigh Field Office (June 17, 2010)	ML101241315
NRC letter to NOAA Fisheries, Southeast Regional Office (June 17, 2010)	ML101260503
Response from U.S. Fish and Wildlife Service, Raleigh Field Office (August 10, 2010)	ML102420377
Response from NOAA Fisheries, Southeast Regional Office (April 20, 2011)	ML111110808



May 1, 2009

Mr. Pete Benjamin
Field Supervisor
U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

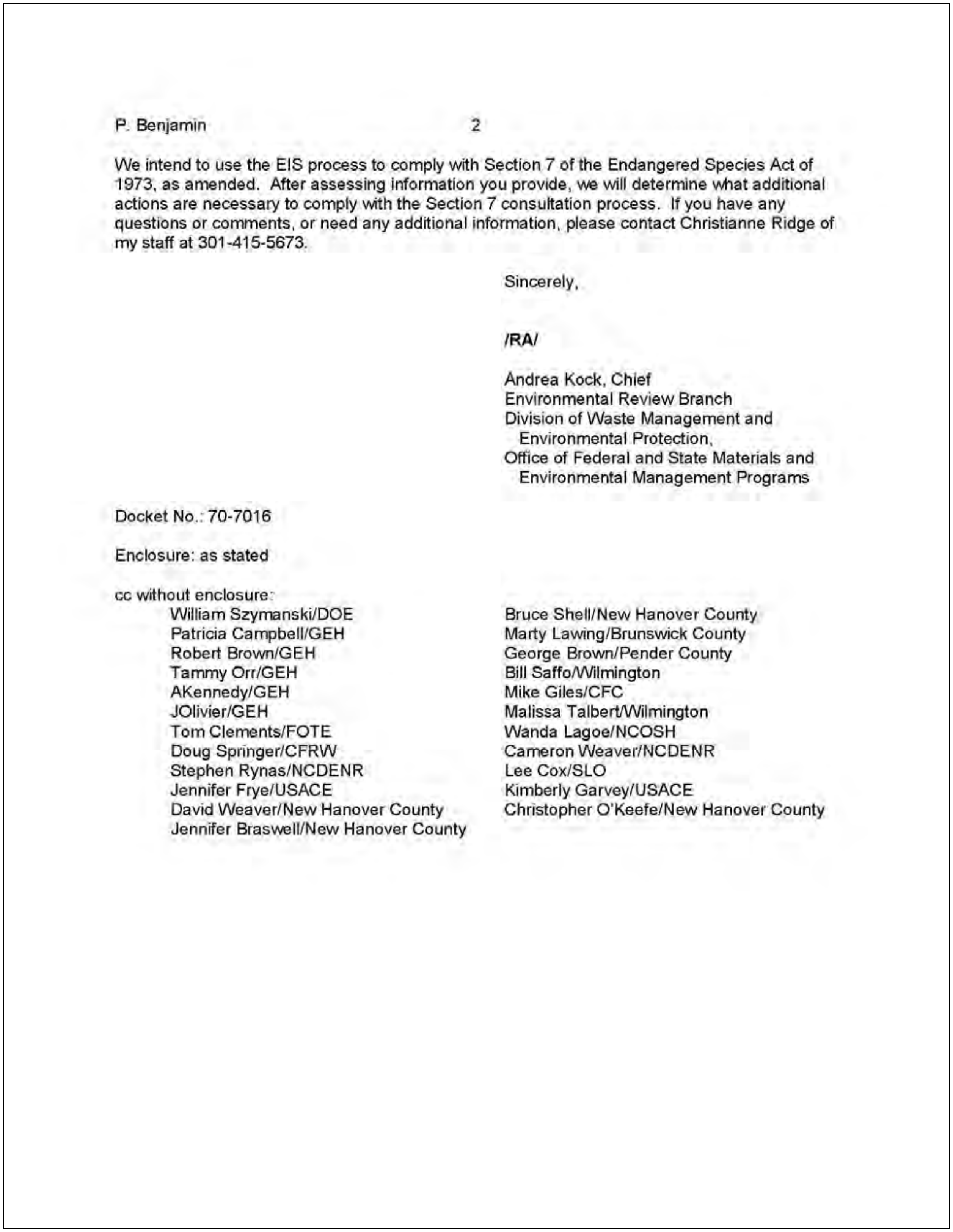
SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED SPECIES AND CRITICAL HABITATS FOR GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT PROPOSED URANIUM ENRICHMENT FACILITY IN NEW HANOVER COUNTY, NORTH CAROLINA

Dear Mr. Benjamin:

On January 30, 2009, General Electric-Hitachi Global Laser Enrichment (GLE) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located on the existing General Electric/Global Nuclear Fuels-Americas site near Wilmington, North Carolina, in New Hanover County (Wilmington site). 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. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

We are requesting a list of threatened or endangered species or critical habitats within the action area for the proposed facility. GLE's ER identifies 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site as the action area for the construction, operation, and decommissioning of the proposed facility. The Wilmington site is located approximately 9.6 kilometers (6 miles) north of the city of Wilmington in New Hanover County, North Carolina, on Parcel number R01700-001-000. The coordinates for the center of the action area are 34.333923 °N and -77.945009 °W. We have enclosed additional background information relating to ecological resources on the Wilmington site, including a map showing the action area, as it appears in the GLE ER.

As part of the EIS preparation, the NRC will be hosting two public scoping meetings on Tuesday, May 19, 2009, in Ballroom 1 of the Warwick Center at the University of North Carolina at Wilmington, North Carolina, 28403. The first meeting will be held from 1:00 p.m. to approximately 4:00 p.m. and the second meeting will be held from 7:00 p.m. to approximately 10:00 p.m. The meetings will include NRC staff presentations on the safety and environmental review process, after which members of the public will be given the opportunity to present their comments on issues NRC should consider during its environmental review. The scoping information gathered at this meeting and in written public comments will be used with any information you provide to document environmental impacts of the proposed action.



P. Benjamin 2

We intend to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process. If you have any questions or comments, or need any additional information, please contact Christianne Ridge of my staff at 301-415-5673.

Sincerely,

/RA/

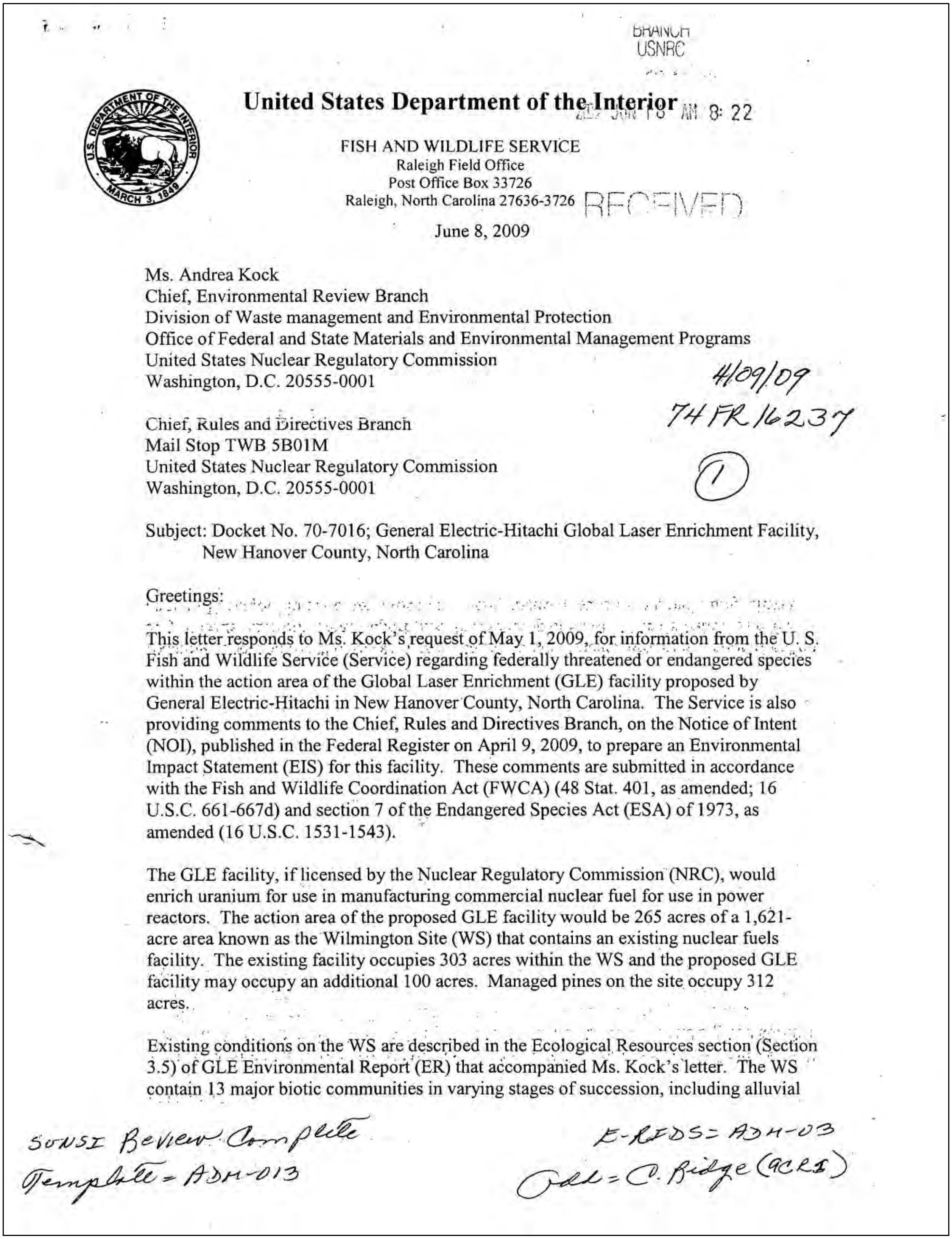
Andrea Kock, Chief
Environmental Review Branch
Division of Waste Management and
Environmental Protection,
Office of Federal and State Materials and
Environmental Management Programs

Docket No.: 70-7016

Enclosure: as stated

cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
AKennedy/GEH
JOlivier/GEH
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Frye/USACE
David Weaver/New Hanover County
Jennifer Braswell/New Hanover County
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Mike Giles/CFC
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Lee Cox/SLO
Kimberly Garvey/USACE
Christopher O'Keefe/New Hanover County



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USNRC

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

June 8, 2009

Ms. Andrea Kock
Chief, Environmental Review Branch
Division of Waste management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

4/09/09
74 FR 16237
①

Chief, Rules and Directives Branch
Mail Stop TWB 5B01M
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Docket No. 70-7016; General Electric-Hitachi Global Laser Enrichment Facility, New Hanover County, North Carolina

Greetings:

This letter responds to Ms. Kock's request of May 1, 2009, for information from the U. S. Fish and Wildlife Service (Service) regarding federally threatened or endangered species within the action area of the Global Laser Enrichment (GLE) facility proposed by General Electric-Hitachi in New Hanover County, North Carolina. The Service is also providing comments to the Chief, Rules and Directives Branch, on the Notice of Intent (NOI), published in the Federal Register on April 9, 2009, to prepare an Environmental Impact Statement (EIS) for this facility. These comments are submitted in accordance with the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

The GLE facility, if licensed by the Nuclear Regulatory Commission (NRC), would enrich uranium for use in manufacturing commercial nuclear fuel for use in power reactors. The action area of the proposed GLE facility would be 265 acres of a 1,621-acre area known as the Wilmington Site (WS) that contains an existing nuclear fuels facility. The existing facility occupies 303 acres within the WS and the proposed GLE facility may occupy an additional 100 acres. Managed pines on the site occupy 312 acres.

Existing conditions on the WS are described in the Ecological Resources section (Section 3.5) of GLE Environmental Report (ER) that accompanied Ms. Kock's letter. The WS contain 13 major biotic communities in varying stages of succession, including alluvial

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Add = C. Bridge (9CRI)

forest, swamp forest, ephemeral ponds, and pocosin/bay forest. These communities provide habitat for resident and migratory birds. The site contains two unnamed tributaries to the Northeast Cape Fear River. The North Carolina Natural Heritage Program (NCNHP) has identified the swamp forest on the WS as part of a natural area of national significance that includes one of the best examples of the tidal cypress-gum communities in North Carolina.

Federally Protected Species

The action area of the GLE facility appears to be in the northeastern portion of the WS (Figure 3.5-2). A list of all federally-protected endangered and threatened species with known occurrences in North Carolina is now available on the U.S. Fish and Wildlife Service's (Service) web page at < http://www.fws.gov/raleigh/es_tes.html > along with a link to the "County List." Additional information on special status species is available from the NCNHP on special status species at the county level and individual topographic quads. The project is within the Castle Hayne quad. The NCNHP database can be accessed at < http://www.ncnhp.org/Pages/heritagedata.html >.

More site specific information on special status species, both State and federal, can be obtained through the Virtual Workroom of the NCNHP at the same intranet address given above. The Virtual Workroom is a web-based GIS application that allows users to obtain information on rare species, natural communities, and natural areas. This site allows the public to generate a list of all NCNHP records (designated as element occurrences) within two miles of the location specified by the user, and reflects the data as it currently exists in the program's database. Before using the Virtual Workroom, users should review the User's Manual (available through the "Help" link at the upper right of the Web page).

The Service's review of the ER indicates that the nine species listed in Table 3.5-7 as the federally threatened or endangered species known to occur in New Hanover County is accurate at this time. This table presents an assessment of whether habitat is present for each species within the WS. The Service concurs that the three coastal species would not be present in the action area. These are the two sea turtles and the piping plover (*Charadrius melodus*). There is no formally designated critical habitat in the project area.

The Service does not concur that the federally endangered West Indian manatee (*Trichechus manatus*) could not use the tidal creeks on the site. The Northeast Cape Fear River and some of its tributaries may provide suitable habitat for manatees that move along the Atlantic Coast and into inland waters during summer months and are seasonal transients in North Carolina, primarily from June through October. While the ER states (p. 3.5-15) that manatees use waters at least five feet deep, the species may occur in water as shallow as one to two meters (3.3 -6.6 feet) deep. The species moves extensively when in North Carolina waters and past occurrence records cannot be used to precisely determine the likelihood that it will be presence at a particular construction site. Therefore, potential impacts to this species should be assessed if construction and operation of the facility would produce any direct or indirectly impacts on waters of sufficient depth and with a direct, unobstructed connection to the river.

The American alligator (*Alligator mississippiensis*) in North Carolina does not require ESA consideration. The species is only listed as threatened due to similarity of appearance (TS/A) with the American crocodile (*Crocodylus acutus*) which only occurs in southern Florida. From the federal perspective, the alligator is not biologically threatened and does not have protection under the ESA. However, the alligator has a State status of threatened.

The federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is under the jurisdiction of the National Marine Fisheries Service (NMFS). That agency should be contacted for potential impacts to this species which may occur in the lower Cape Fear River watershed.

While the biotic communities that would be impacted by the proposed GLE facility are not identified, Table 3.5-7 indicates that there is habitat for two federally endangered species under the jurisdiction of the Service in the action area. The endangered rough-leaved loosestrife (RLL) (*Lysimachia asperulaefolia*) is considered in the ER (pp. 3.5-15 to 16). This perennial herb generally occurs in the ecotones, or edges, between longleaf pine uplands and pond pine pocosins (areas of dense shrub and vine growth usually on a wet, peaty, poorly drained soil), on moist to seasonally saturated sands, and on shallow organic soils overlaying sand. It has also been found on deep peat soils in the low shrub community of Carolina bays. The grass-shrub ecotone, where RLL is found, is fire-maintained, as are the adjacent plant communities (longleaf pine-scrub oak, savanna, flatwoods, and pocosin). Suppression of naturally-occurring fire in these ecotones allows shrubs to increase in density and height. Shrubs may eliminate the open edges required by this plant.

The portion of the ER available to the Service is unclear on the current status of RLL habitat in the WS. While Table 3.5-7 states that habitat is present, Section 3.5.8.1.2 states that naturally occurring habitat for the RLL "may have occurred naturally on the Wilmington Site in the past, but the pocosin habitat that could have supported this plant has been drained." Furthermore, the fire regime necessary for the species is not currently present on the site. If suitable burning and hydrology were reestablished, the ER concludes that habitat is potentially available on the site.

The evaluation of impacts to this species in the EIS should state whether RLL habitat currently exists on the site. Surveys for the presence of suitable RLL habitat (as opposed to the actual plants) can generally be performed year round.

If these surveys reveal that suitable habitat exists within the project area, then actual RLL surveys should be done. This work should be performed during the period when RLL is detectable. The optimal period is mid-May through June (refer to < http://www.nc-es.fws.gov/plant/optimal_survey_window_for_plants.htm >), but can extent to October. Most RLL populations are small, both in area covered and in number of stems. If RLL plants are discovered within areas that would be impacted, the Service should be contacted in order to develop a conservation plan.

The ER states (p. 3.5-15) that one active colony of the endangered red-cockaded woodpecker (RCW) (*Picoides borealis*) is located within a five-mile radius of the WS. While no cavity (nesting) trees have been observed on the site, some birds "may occasionally forage in the Site." As noted, Table 3.5-7 states that RCW habitat is present on the site.

Prior to licensing, the NRC must require the company to determine the impact of the proposed facility on the RCW. The second revision of the Service's Recovery Plan for the RCW (U. S. Fish and Wildlife Service [hereafter USFWS] 2003) provides survey protocols (Appendix 4) for nesting and foraging habitat. The first step in the survey procedure is to determine if suitable nesting or foraging habitat exists within the area to be impacted. If no suitable nesting or foraging habitat is present within the project impact area, further assessment is unnecessary and a "no effect" determination is appropriate.

The EIS should provide information to support the finding that no RCW cavity trees occur on the site. The recovery plan discusses the identification of suitable nesting habitat and survey methods for RCW cavity trees (USFWS 2003, p. 289-290). For the purpose of surveying, suitable nesting habitat consists of pine, pine/hardwood, and hardwood/pine stands that contain pines 60 years in age or older. Additionally, pines 60 years in age or older may be scattered or clumped within younger stands. Older pine trees within younger stands must be considered as potential RCW nesting sites. These characteristics do not necessarily describe good quality nesting habitat; rather, this is a conservative description of potential nesting habitat. Determination of suitable nesting habitat may be based on existing stand data, aerial photo interpretation, and/or field reconnaissance. All stands meeting the above description, regardless of ownership, should be considered as suitable nesting habitat.

If suitable nesting habitat is identified on the site, this habitat must be surveyed for cavity trees (nest sites) of the RCW by personnel experienced in management and/or monitoring of the species (USFWS 2003, pp. 289-290). Potential nesting habitat is surveyed by running line transects through stands and visually inspecting all medium-sized and large pines for evidence of cavity excavation by the RCW. Transects must be spaced so that all trees are inspected. Necessary spacing will vary with habitat structure and season from a maximum of 91 m (100 yards) between transects in very open pine stands to 46 m (50 yards) or less in areas with a dense mid-story. Transects should run north-south, because many cavity entrances are oriented in a westerly direction, and can be set using a hand compass. If RCW cavity trees are found, these trees must not be cut and this office should be contacted before work commences to develop plans for avoiding take of the species.

Even if no cavity trees are present in the project area, surveys should establish whether RCW foraging habitat is present for those birds that "may occasionally forage in the site." Suitable foraging habitat consists of a pine or pine/hardwood stand of forest, woodland, or savannah in which 50 percent or more of the dominant trees are pines and the dominant pine trees are generally 30 years in age or older (USFWS 2003, pp. 288-289). These characteristics do not necessarily describe good quality foraging habitat; rather, this is a conservative description of potentially suitable habitat. Identification of pine and pine/hardwood stands can be made using cover maps that identify pine and pine/hardwood stands, aerial photographs interpreted by standard techniques, or a field survey conducted by an experienced forester or biologist. Age of stands can be determined by aging representative dominant pines in the stands using an increment-borer and counting annual growth rings. Stand data describing size classes may be substituted for age if the average size of 30 year-old pines is known, i.e., at least 20.3 cm (8 in) diameter breast height (dbh) or larger, for the local area and habitat type.

Stands cannot be considered suitable as RCW foraging habitat unless they have an "open" character. A pine stand that is 30 years in age and has an average tree dbh of 20.3 cm (8 in) or more does not necessarily qualify as suitable foraging habitat (USFWS 2003, p. 294). If such a stand has not been prescribed burned (or otherwise treated to control hardwood mid-story) and has not been thinned to a basal area of 16.1 m^2/ha (70 ft^2/ac) or less, it will not satisfy the "open" condition criterion. Dense stands of young pine and pine/hardwood are typical of unmanaged plantations and natural regeneration areas (particularly loblolly seed tree harvests) that have not been thinned or frequently burned. Such stands cannot be considered suitable foraging habitat simply because they have the required total and stand basal area and average stem diameter. Stand quality, as measured by an open structure, is a critical factor determining suitability and use of foraging habitat and must be considered when acceptable foraging habitat is identified.

If suitable foraging habitat is present and would be impacted, potential use of this foraging habitat by RCW clusters outside the actual construction corridor must be determined. This is accomplished by identifying any potential nesting habitat within 0.8 km (0.5 mile) of the suitable foraging habitat that would be impacted. Surveys of potential nesting habitat for RCW cavity trees should be made in the area one-half mile from the foraging habitat. If active clusters are located in this area, surveys must be made to determine if clearing foraging habitat within the project area would adversely affect these birds.

If no active clusters are found that could potentially use the forage habitat in the project corridor, then a "no effect" determination is appropriate. If one or more active clusters are found within 0.5 mile of foraging habitat in the project area, a foraging habitat analysis must be conducted (see Section 8I of the recovery plan) to determine whether sufficient amounts of foraging habitat will remain for each group after construction.

As stated in the ER (p. 3.5-20), if the proposed action may affect a listed species, then formal consultation with the Service would be required. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. Information on completing a biological assessment or evaluation and can be found on our web page at <

http://www.fws.gov/raleigh/es_consultation.html >. Please check the web site often for updated information or changes.

Other Special Status Species

The site contains potential habitat for several Federal Species of Concern (FSC), a term referring to those species which the Service believes might be in need of concentrated conservation actions. These species receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. As noted in the ER (p. 3.5-16) the federal status of these species may change at any time. For this reason, the Service supports their consideration in project planning and recommends that all practicable measures be taken to avoid or minimize adverse impacts to any FSC.

Table 3.5-8 lists the 31 FSCs that are known to occur in New Hanover County. The ER discusses (pp. 3.5-16 to 20) the FSCs that have been observed on the WS or in the immediate vicinity. These species include the southern hognose snake (*Heterodon simus*), the southeastern myotis (*Myotis austroiparius*), Venus flytrap (*Dionaea muscipula*), spring-flowering goldenrod (*Solidago verna*), and coastal goldenrod (*S. villosicarpa*). The two goldenrods have a state status of endangered. Pondspice (*Litsea aestivalis*) is known to occur in the North-Central Sector, but altered hydrologic conditions do not favor recruitment of new plants. The Service recommends that planning consider that the coastal plain subspecies of Rafinesque's big-eared bat (*Corynorhinus rafinesquii macrotis*) may occur within the WS. The virtual workroom of the NCNHP shows that this FSC has been reported within two miles of the site. This species roosts in hollow trees, old buildings, and beneath bridges, usually near water.

Service Recommendations for the Environmental Impact Statement

The NOI provides the environmental aspects to be considered in the EIS. The list is comprehensive and a thorough evaluation of each should form a sound basis for choosing a course of action. We encourage a careful consideration of the cumulative impacts of any development along the Northeast Cape Fear River.

The Service seeks to foster the recovery and delisting of federally listed species and conserve FSCs in order to prevent their formal listing as threatened or endangered. As a means of achieving these goals, the Service sees an opportunity to conserve and restore areas within the WS that are not now being used by the company or would not be developed for the proposed GLE facility. As part of the consideration of indirect, or secondary, impacts of the GLE facility, the Service recommends that the EIS consider the likelihood that those areas of the site that are now undeveloped would retain their natural ecological functions. We encourage the company to develop a long-term conservation plan for the undeveloped areas, especially wetland forests along the river, tidal creeks, and ponds. There may be opportunities for restoration of degraded habitats such as the altered conditions that prevent the recruitment of pondspice. The naturally occurring habitat for the RLL that once occurred on the WS could be restored by eliminating artificial drainage and implementing a natural fire regime through carefully controlled burns. Local, conservation groups could be contacted to assist in the development and management of conservation areas. This office can provide general advice on developing a conservation plan for the site.

The Service appreciates the opportunity to provide these scoping comments and technical assistance on the proposed work. If you have questions regarding these comments, please contact Howard Hall at 919-856-4520, ext. 27 or by e-mail at < howard_hall@fws.gov >.

Sincerely,

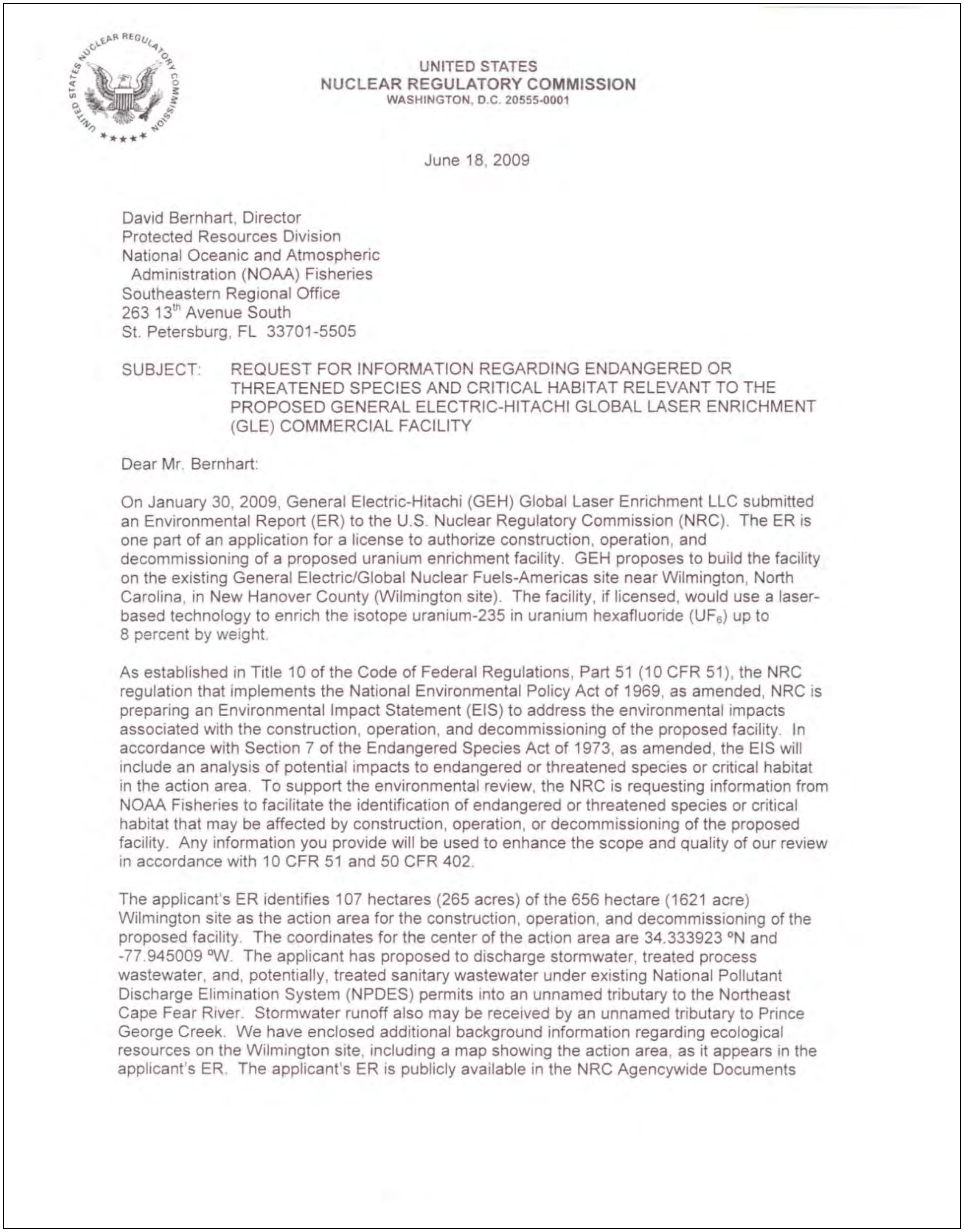
Howard F. Hall

for Pete Benjamin
Field Supervisor

U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U.S. Fish and Wildlife Service, Atlanta, GA. 296 pp. available at < http://ecos.fws.gov/docs/recovery_plan/030320_2.pdf >.

cc:

Jennifer Frye, U. S. Army Corps of Engineers, Wilmington, NC
Stephen Rynas, NC Division of Coastal Management, Morehead City, NC
Molly Ellwood, NC Wildlife Resources Commission, Wilmington, NC



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 18, 2009

David Bernhart, Director
Protected Resources Division
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
Southeastern Regional Office
263 13th Avenue South
St. Petersburg, FL 33701-5505

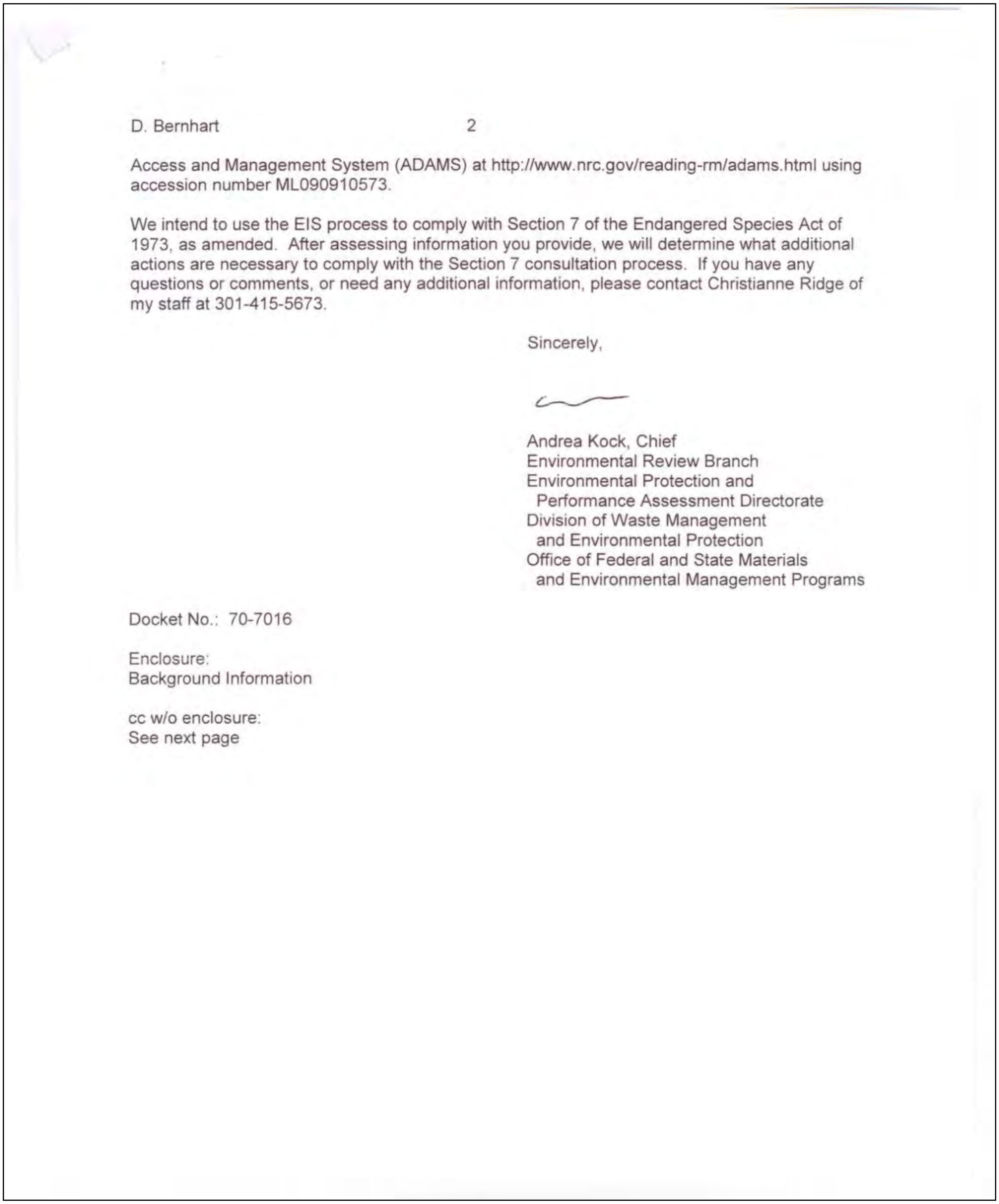
SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED OR THREATENED SPECIES AND CRITICAL HABITAT RELEVANT TO THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT (GLE) COMMERCIAL FACILITY

Dear Mr. Bernhart:

On January 30, 2009, General Electric-Hitachi (GEH) Global Laser Enrichment LLC submitted an Environmental Report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. GEH proposes to build the facility on the existing General Electric/Global Nuclear Fuels-Americas site near Wilmington, North Carolina, in New Hanover County (Wilmington site). 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.

As established in Title 10 of the Code of Federal Regulations, Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, NRC is preparing an Environmental Impact Statement (EIS) to address the environmental impacts associated with the construction, operation, and decommissioning of the proposed facility. In accordance with Section 7 of the Endangered Species Act of 1973, as amended, the EIS will include an analysis of potential impacts to endangered or threatened species or critical habitat in the action area. To support the environmental review, the NRC is requesting information from NOAA Fisheries to facilitate the identification of endangered or threatened species or critical habitat that may be affected by construction, operation, or decommissioning of the proposed facility. Any information you provide will be used to enhance the scope and quality of our review in accordance with 10 CFR 51 and 50 CFR 402.

The applicant's ER identifies 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site as the action area for the construction, operation, and decommissioning of the proposed facility. The coordinates for the center of the action area are 34.333923 °N and -77.945009 °W. The applicant has proposed to discharge stormwater, treated process wastewater, and, potentially, treated sanitary wastewater under existing National Pollutant Discharge Elimination System (NPDES) permits into an unnamed tributary to the Northeast Cape Fear River. Stormwater runoff also may be received by an unnamed tributary to Prince George Creek. We have enclosed additional background information regarding ecological resources on the Wilmington site, including a map showing the action area, as it appears in the applicant's ER. The applicant's ER is publicly available in the NRC Agencywide Documents



Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html using accession number ML090910573.

We intend to use the EIS process to comply with Section 7 of the Endangered Species Act of 1973, as amended. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 7 consultation process. If you have any questions or comments, or need any additional information, please contact Christianne Ridge of my staff at 301-415-5673.

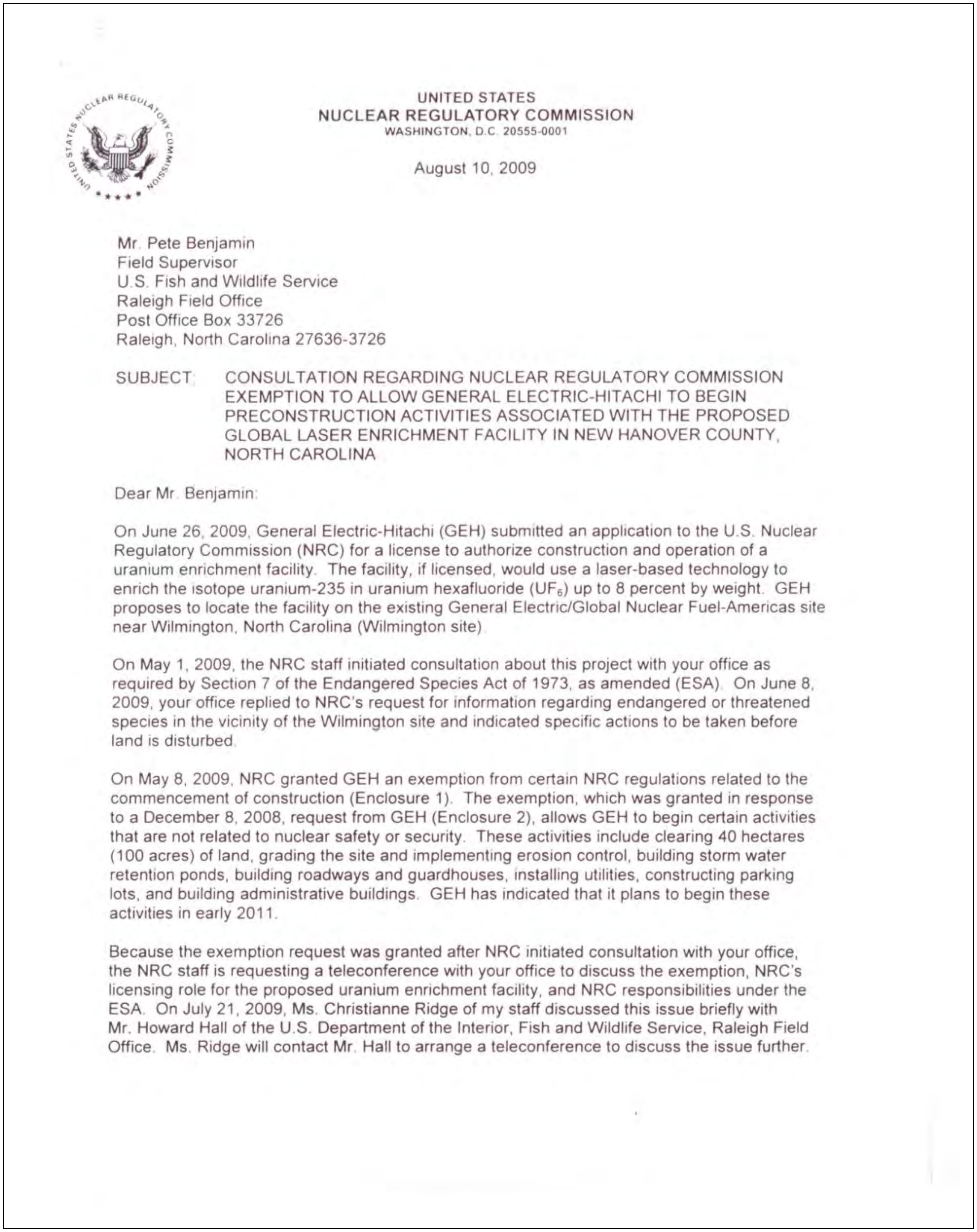
Sincerely,

Andrea Kock, Chief
Environmental Review Branch
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:
Background Information

cc w/o enclosure:
See next page



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 10, 2009

Mr. Pete Benjamin
Field Supervisor
U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

SUBJECT: CONSULTATION REGARDING NUCLEAR REGULATORY COMMISSION EXEMPTION TO ALLOW GENERAL ELECTRIC-HITACHI TO BEGIN PRECONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROPOSED GLOBAL LASER ENRICHMENT FACILITY IN NEW HANOVER COUNTY, NORTH CAROLINA

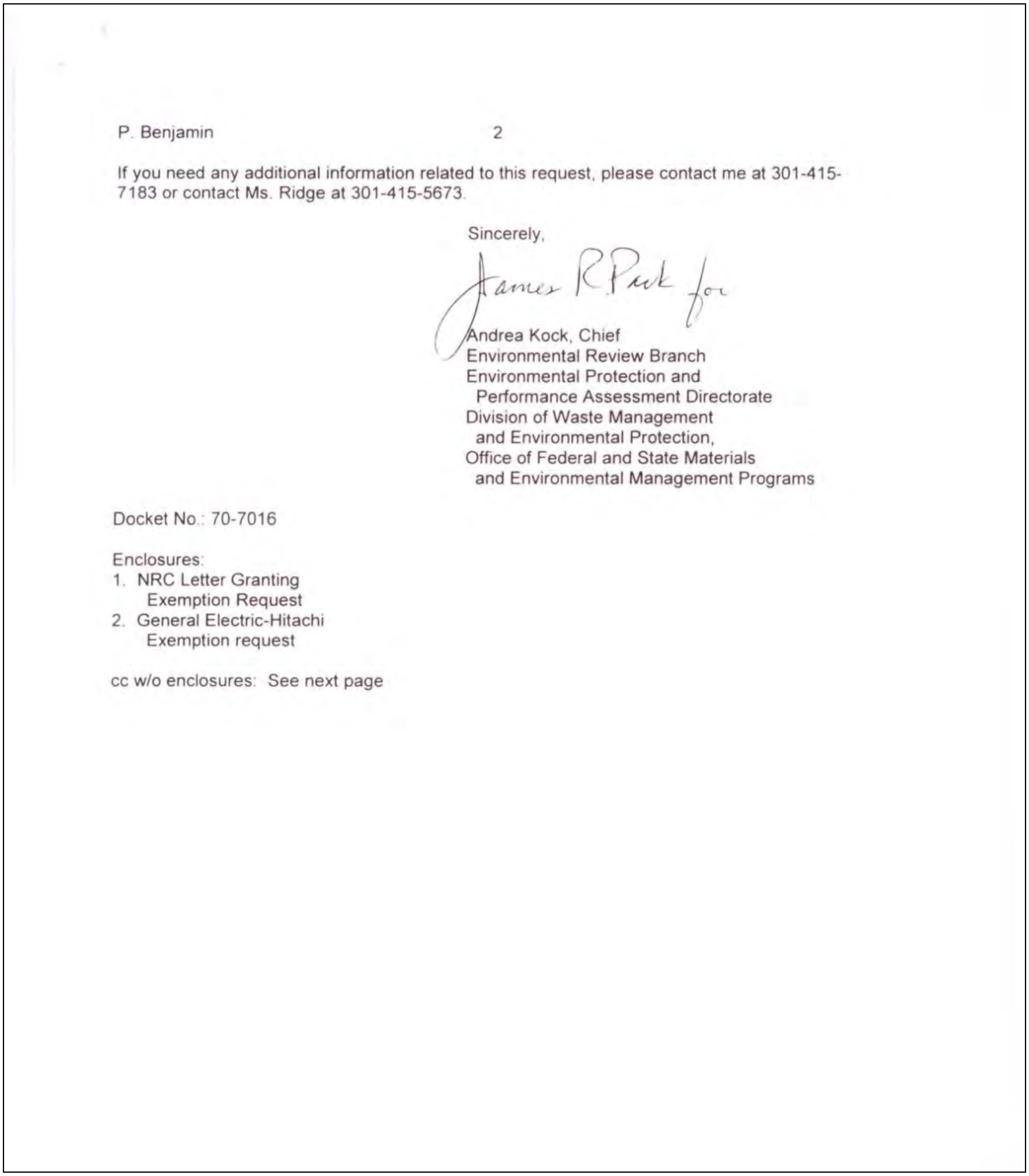
Dear Mr. Benjamin:

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, North Carolina (Wilmington site).

On May 1, 2009, the NRC staff initiated consultation about this project with your office as required by Section 7 of the Endangered Species Act of 1973, as amended (ESA). On June 8, 2009, your office replied to NRC's request for information regarding endangered or threatened species in the vicinity of the Wilmington site and indicated specific actions to be taken before land is disturbed.

On May 8, 2009, NRC granted GEH an exemption from certain NRC regulations related to the commencement of construction (Enclosure 1). The exemption, which was granted in response to a December 8, 2008, request from GEH (Enclosure 2), allows GEH to begin certain activities that are not related to nuclear safety or security. These activities include clearing 40 hectares (100 acres) of land, grading the site and implementing erosion control, building storm water retention ponds, building roadways and guardhouses, installing utilities, constructing parking lots, and building administrative buildings. GEH has indicated that it plans to begin these activities in early 2011.

Because the exemption request was granted after NRC initiated consultation with your office, the NRC staff is requesting a teleconference with your office to discuss the exemption, NRC's licensing role for the proposed uranium enrichment facility, and NRC responsibilities under the ESA. On July 21, 2009, Ms. Christianne Ridge of my staff discussed this issue briefly with Mr. Howard Hall of the U.S. Department of the Interior, Fish and Wildlife Service, Raleigh Field Office. Ms. Ridge will contact Mr. Hall to arrange a teleconference to discuss the issue further.



If you need any additional information related to this request, please contact me at 301-415-7183 or contact Ms. Ridge at 301-415-5673.

Sincerely,

James R Park for

Andrea Kock, Chief
Environmental Review Branch
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

Enclosures:
1. NRC Letter Granting
   Exemption Request
2. General Electric-Hitachi
   Exemption request

cc w/o enclosures: See next page

From: Andrew.Herndon [mailto:Andrew.Herndon@noaa.gov]
Sent: Monday, August 03, 2009 8:33 AM
To: GLE_EIS Resource
Subject: NOAA Fisheries Protected Species Information

To Whom it May Concern,

Per your request, attached and included here is information on the protected species under NOAA Fisheries' purview that may by affected by the proposed project.

Attachment 1: List of all Endangered Species Act (ESA)-listed species known to occur off North Carolina.
Attachment 2-4: Information on Shortnose Sturgeon. Additional information on shortnose sturgeon can be found in its recovery plan at:
http://www.nmfs.noaa.gov/pr/pdfs/recovery/sturgeon_shortnose.pdf
Attachment 5: A guide to how best analyze potential impacts to ESA-listed species.

Below are links to information on the species of sea turtles that may be affected by the project. The first link to the NOAA Fisheries-Protected Resources webpage for each species, the second link is to the most recent version of the recovery plan for each species. Please note links to other useful documents may be available on each species' webpage.

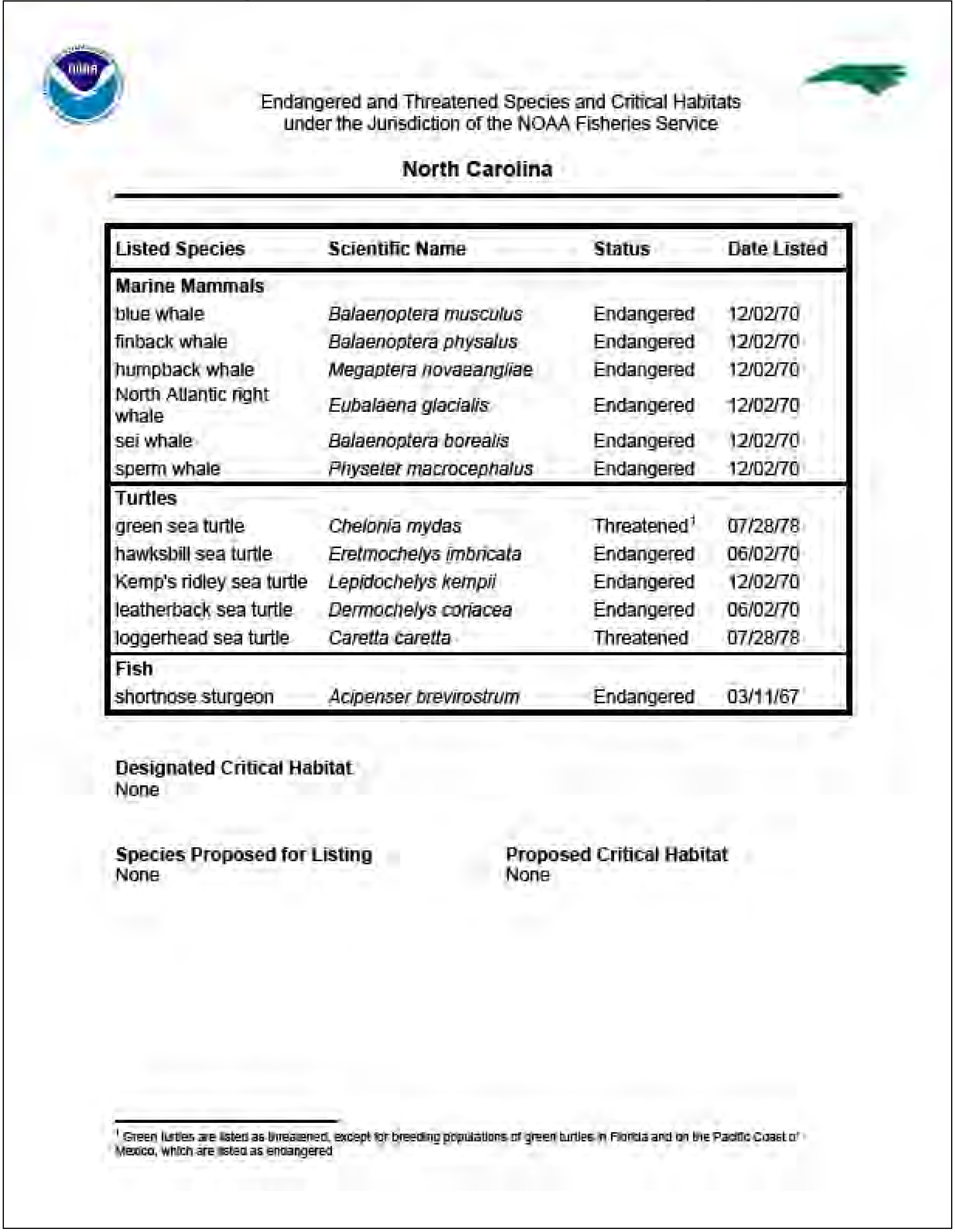
Loggerhead:
http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm;
http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_atlantic.pdf
Leatherback:
http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm;
http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_leatherback_atlantic.pdf
Hawksbill: http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm;
http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_hawksbill_atlantic.pdf
Green: http://www.nmfs.noaa.gov/pr/species/turtles/green.htm;
http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf
Kemp's ridley:
http://www.nmfs.noaa.gov/pr/species/turtles/kempsridley.htm;
http://www.nmfs.noaa.gov/pr/species/turtles/kempsridley.htm

Please remember that providing your determination of why an ESA-listed species may or may not be affected by the proposed action with your request for consultation will increase the speed with which it can be processed.

Feel free to contact this office at any time if you have additional questions.

Andy

[Attachment 1 of e-mail from Andrew Herndon]



Endangered and Threatened Species and Critical Habitats
under the Jurisdiction of the NOAA Fisheries Service

North Carolina

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/02/70
finback whale	*Balaenoptera physalus*	Endangered	12/02/70
humpback whale	*Megaptera novaeangliae*	Endangered	12/02/70
North Atlantic right whale	*Eubalaena glacialis*	Endangered	12/02/70
sei whale	*Balaenoptera borealis*	Endangered	12/02/70
sperm whale	*Physeter macrocephalus*	Endangered	12/02/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened[1]	07/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	06/02/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/02/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	06/02/70
loggerhead sea turtle	*Caretta caretta*	Threatened	07/28/78
Fish			
shortnose sturgeon	*Acipenser brevirostrum*	Endangered	03/11/67

Designated Critical Habitat
None

Species Proposed for Listing
None

Proposed Critical Habitat
None

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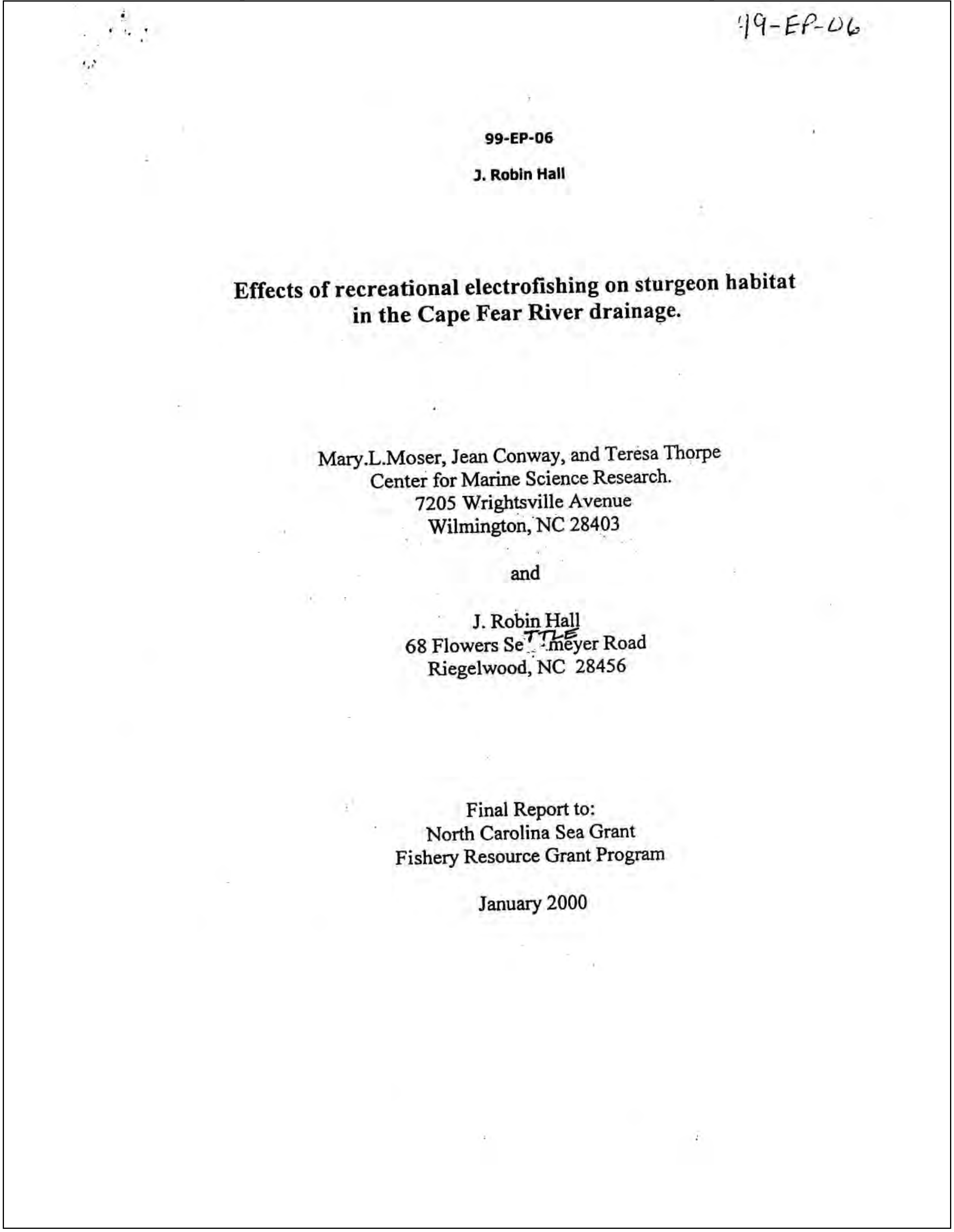
[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered

[Attachment 2 of e-mail from Andrew Herndon]

Moser, M.L., and S.W. Ross. "Habitat Use and Movements of Shortnose and Atlantic Sturgeons in the Lower Cape Fear River, North Carolina." *T AM Fish Soc* 124:225–234, 1995. ADAMS Accession No. ML092170775.

[Attachment 3 of e-mail from Andrew Herndon]



99-EP-06

99-EP-06

J. Robin Hall

Effects of recreational electrofishing on sturgeon habitat in the Cape Fear River drainage.

Mary.L.Moser, Jean Conway, and Teresa Thorpe
Center for Marine Science Research.
7205 Wrightsville Avenue
Wilmington, NC 28403

and

J. Robin Hall
68 Flowers SeTTLEmeyer Road
Riegelwood, NC 28456

Final Report to:
North Carolina Sea Grant
Fishery Resource Grant Program

January 2000

INTRODUCTION

The shortnose sturgeon (*Acipenser brevirostrum*) is a federally-listed endangered species. This fish was reportedly abundant in North Carolina waters in the early 1900s, but due to overfishing and habitat degradation it now occurs only rarely in the Cape Fear River and Albemarle Sound drainages and has apparently been extirpated from other state waters (Ross et al. 1984, NMFS 1998). In spite of Endangered Species Act (1973) protections and a moratorium on Atlantic sturgeon (*A. oxyrinchus*) harvest in North Carolina (1991), shortnose sturgeon are still very rare in state waters. Consequently, concerns about habitat quality and the possible need for enhancement with cultured fish are current shortnose sturgeon management issues in North Carolina.

The Shortnose Sturgeon Recovery Plan (NMFS 1998) outlines priority tasks for recovery of each shortnose sturgeon population segment. In addition, it provides general guidelines for conditions that must be met for stock enhancement or restoration using cultured shortnose sturgeon. Among these recommendations for the Cape Fear River population is the need to assess sturgeon bycatch in other fisheries and the impacts of non-indigenous species. Enhancement or restoration of shortnose sturgeon populations cannot be considered until it has been established that essential habitats are available to sustain the species, and that mortalities from bycatch or from predation by non-indigenous fishes are not a significant threat to these efforts (NMFS 1998).

The 1966 introduction of flathead catfish (*Pylodictis olivaris*) and blue catfish (*Ictalurus furcatus*) into the Cape Fear River (Moser and Roberts in press) had several potentially significant repercussions for already rare sturgeon populations. Both catfish species attain very large sizes and occur in shortnose sturgeon spawning and nursery habitats. The flathead catfish is piscivorous and is known to feed on other demersal species (particularly other catfishes). The blue catfish is omnivorous and could act as both a potential predator on and/or a competitor for food of the shortnose sturgeon juveniles. The rapid expansion of these non-indigenous catfishes heralded the demise of native icatlurids in the upper Cape Fear River and the 1981 establishment of a novel recreational electrofishing fishery to target non-native catfish (Moser and Roberts 1999).

Sturgeon, like catfish, possess exceptional electro-sensory capabilities. Consequently, they are likely to be significantly impacted by electrofishing developed to target catfish (Morris and Novak 1968). Avoidance of electroshocking and the results of being shocked could reduce feeding or alter spawning behavior and subsequently reduce sturgeon fitness. In this study, we examined both the effects of catfish predation on shortnose sturgeon and the potential impact of recreational electrofishing, which is prosecuted intensively in the Cape Fear River main stem from the mouth of the Black River to Lock and Dam #3 (Figure 1).

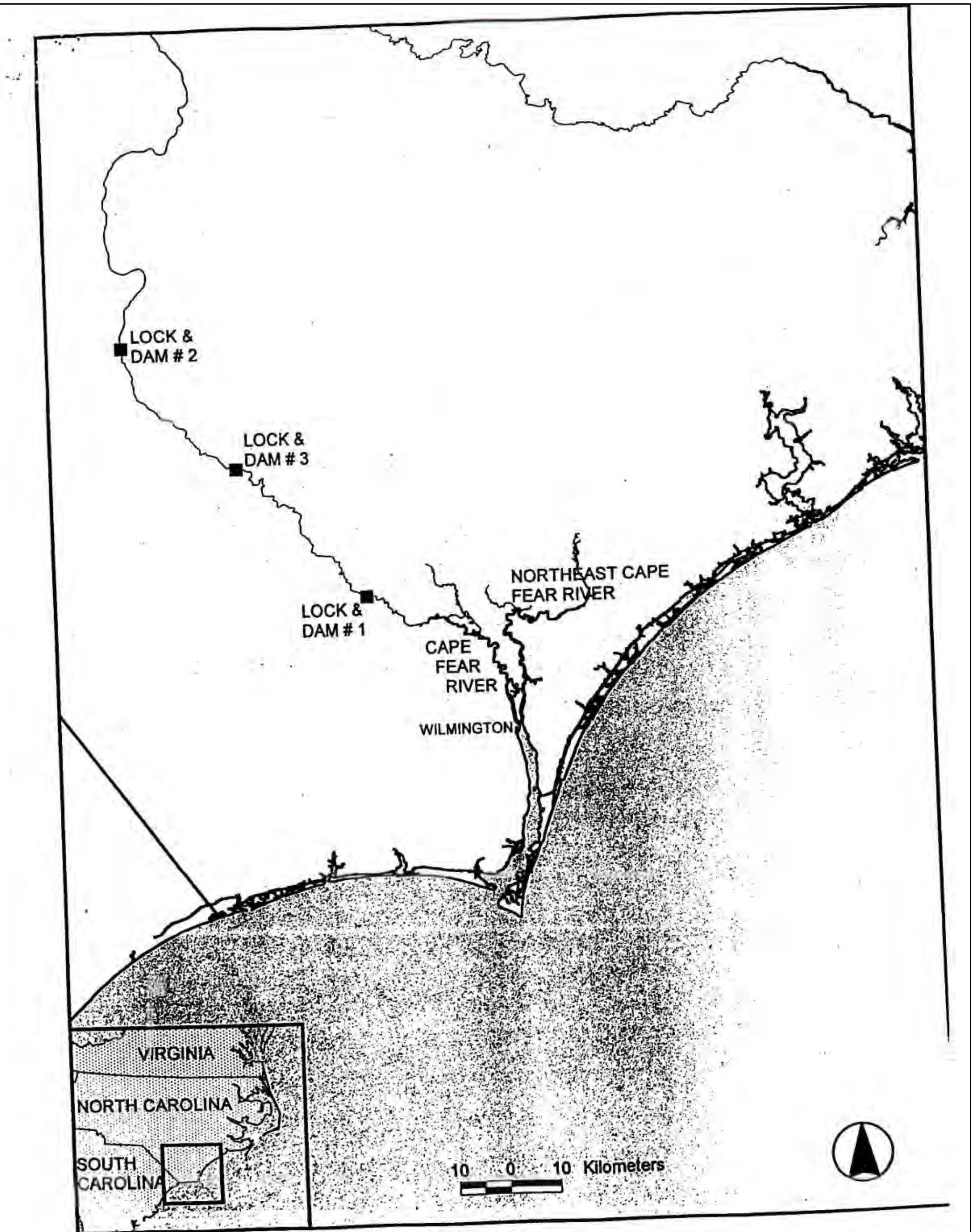


Figure 1. Lower Cape Fear River drainage, North Carolina.

MATERIALS AND METHODS

Electrofishing

Juvenile hatchery-reared shortnose sturgeon and channel catfish were exposed to simulated electrofishing conditions while being held in ambient Cape Fear River water. The electrofishing device was a hand-cranked "telephone" generator supplied by a local recreational fisherman. It consisted of a 5-bar telephone generator wired to a capacitor. A pulley connected the generator to a bicycle wheel that permitted hand-cranking at approximately 80 revolutions per minute during a one minute treatment. This use of the gear was consistent with that of local electrofishers. Two insulated wires were connected to the capacitor and acted as electrodes, which were positioned along the bottom of the treatment area in each experiment. We also observed behavioral responses of fish when they were subjected to a variety of DC frequencies and pulse widths by using a commercially available back-pack electroshocker (Smith Root Model 12A). This enabled us to empirically determine the frequency and pulse width that elicited the same response as that produced by the hand-cranked generator.

Shortnose sturgeon juveniles were obtained from the U.S. Fish and Wildlife Service fish hatcheries at Warm Springs, Georgia and Bear's Bluff , South Carolina. Blue catfish juveniles were obtained from Southeastern Pond Stocking and Aquatic Maintenance. Fish were maintained in aerated 8, 800 gallon tanks with water circulated from the Cape Fear River for over eight months prior to testing, to allow adequate acclimation to their new setting and for water quality to approximate conditions when electrofishing is prosecuted most intensely. Unfortunately, during this period an electrical storm caused a power outage and the backup generation system for tanks housing the sturgeon failed, resulting in mass mortality. Consequently, scaled down experiments were conducted with a small number of fish held in a backup facility (Cape Fear Community College). The experiments were conducted in two, 800 gal tanks: one treatment and one control tank. Fish were fed ad libitum (approximately 72 g) on Hi-Pro #3 every evening. Salinity, conductivity, dissolved oxygen and water temperature were recorded prior to each electroshocking test and these parameters were also recorded continuously in the control tank using a data logger (Yellow Springs Instruments 6600).

On the first day of electroshock experiments, all fish were weighed and measured. The tank containing the experimental fish was lined with a seine net, which, when raised, allowed us to observe fish behaviors. These fish were then exposed to the output from the "telephone" generator four to five times a day for two weeks. During the one minute exposure, the following behaviors were recorded, the second at which it occurred, how long it lasted and the recovery time:

- Twitching – rapid twitching/swimming usually accompanied by heightened operculation.
- Lateral roll – fish rolls over to one side. This behavior was often preceded by a period of rigor when the fish would form a rigid "S" shaped curve and remains motionless.
- Belly up – fish completely rolls upside-down.
- Avoidance.

Fish in the control tank were not exposed to the output from the "telephone" generator, but were regularly disturbed to replicate activities associated with the electroshocking treatment. After two weeks, all fish were again weighed and measured. The electroshock experiment was conducted a second time; however, the seine net was removed and no observations were made during shocking. This test was conducted to insure that disturbance associated with making the observations was not confounding the results. After two weeks, the fish were again weighed and measured. All electroshock experiments were conducted in October and November 1999. Weights and total-lengths of experimental and control fish were compared before and after the electroshock experiments to determine any deleterious effects of electroshocking on shortnose sturgeon. The instantaneous growth rate (G) was computed as: $G = (\ln W_t - \ln W_0)t^{-1}$ where W_t was the mean weight at the end of the experiment, W_0 was the mean weight at the start of the experiment, and t was the length of the experiment in days.

Catfish predation

Large adult flathead catfish (> 3000 g) were collected from the Cape Fear River using gillnets (Mallin et al. 1999). They were held in the River in floating net pens and were not fed for one week prior to experimentation. Hatchery-reared shortnose sturgeon, channel catfish (*Ictalurus punctatus*) and striped bass (*Morone saxatilis*) juveniles were held in aerated 800 gal tanks with flow-through Cape Fear River water for over three months prior to experimentation and were fed ad libitum during this period. Temperature, salinity and dissolved oxygen were recorded daily.

To initiate experiments, one flathead catfish was moved to an empty aerated 800 gallon tank with water circulated from the Cape Fear River and allowed to acclimate to the tank for 24 h. Then, ten each of shortnose sturgeon, channel catfish and striped bass were placed in fish cages and lowered into the tank containing the flathead catfish. They remained in the cage for 24 hours to acclimate and were then released. Every day for a period of two weeks, the fish were counted in order to determine consumption rates and preferential prey species of the flathead catfish. After two weeks, the flathead catfish was returned to the Cape Fear River and replaced with a new one. This experiment was repeated four times; however, in the last three replicates striped bass were not available. The first three replicates were conducted between February 17th and April 19th 1999, the fourth from November 30th to December 14th 1999.

Moser
206-860-3351
who was technician?

RESULTS

Electrofishing

Water quality in the control and experimental tanks was very similar (Figure 2 and 3). The temperature ranged from 14.5 – 18.1 ^{0}C. Dissolved oxygen was also within a narrow range. At the end of November, the salinity began to rise from 0.00 ‰ to a maximum of 4.1 ‰ in the control tank and 3.4 ‰ in the experimental tank. Thus conductivity increased from an average of 101.8 µmols/cm in the control tank and 95.4 µmols/cm in the experimental tank when salinity was 0.00, to a maximum of 5057 and 5042.5 µmols/cm respectively.

Average lengths and weights of fish used were similar in the control and experimental tanks, although shortnose sturgeon were larger and heavier than channel catfish (Figure 4 and 5). Both species increased in length and weight over the four week experimental period. Instantaneous daily growth rates for shortnose sturgeon in the first replicate were lower (0.013 d^{-1}) for fish exposed to electroshocking and .0214 d^{-1} for controls. In contrast, electroshocked sturgeon in the second replicate grew faster (0.024 d^{-1} than controls (0.022 d^{-1}). As for sturgeon, electroshocked catfish in the first replicate grew more slowly (0.003 d^{-1}) than controls (0.016 d^{-1}), but in the second replicate, the shocked catfish grew faster (0.034 d^{-1}) than controls (0.007 d^{-1}). Consequently, there were similar growth rates observed between treatments when the growth rate was calculated over the entire four week time period for each species (Figure 4 and 5).

Using the back-pack electroshocker, we were able to elicit the same type of sturgeon and catfish responses as obtained with the hand cranked generator when 100 volt output was produced at 10 Hz and 10 pulses/second (as in Quinn 1986). Sturgeon were initially more responsive to the electroshocking treatment than catfish; however, they recovered quickly and moved to avoid the stimulus (Figure 6). More sturgeon than catfish rolled onto their side or completely rolled upside-down within the first 15 seconds. They also exhibited more twitching, rigor and avoidance behaviors than did catfish (Table 1). But, sturgeon generally recovered immediately after the experiment. Over 75% of the sturgeon recovered immediately, with maximum recovery times of 5 minutes. In contrast, catfish tended to display electronarcosis and as the shocking continued, more catfish lost equilibrium. Catfish also took longer to recover than sturgeon, sometimes up to 8 minutes after the experiment had ended (Figure 6). The average recovery time for catfish was 3.5 min and only 7 fish recovered immediately.

Figure 2. Water quality in control tanks during electroshocking experiments.

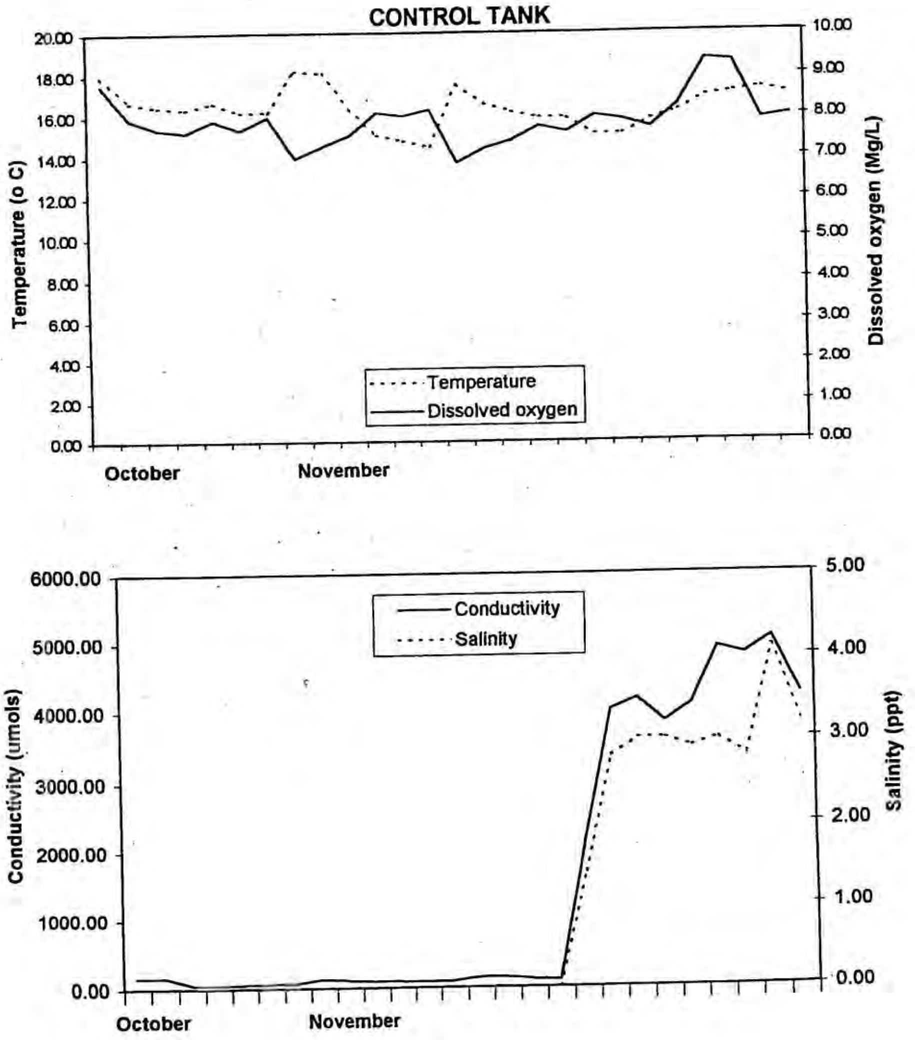
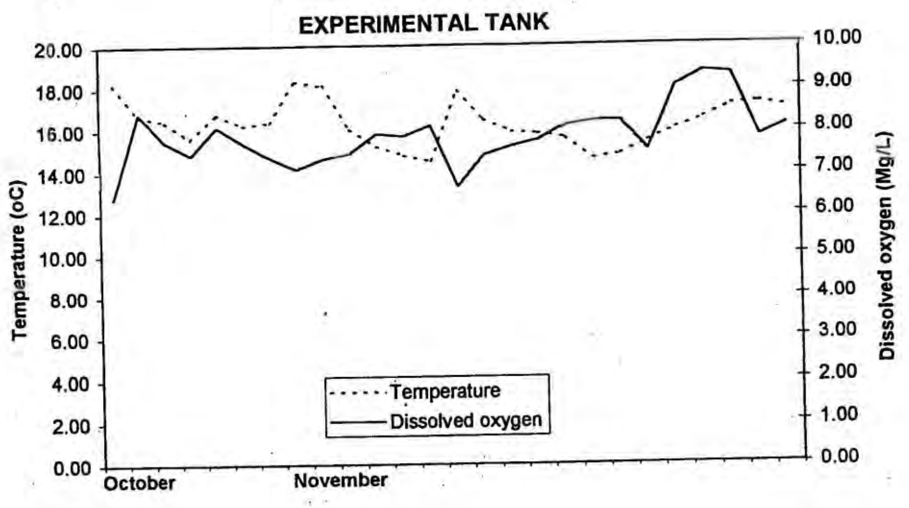


Figure 3. Water quality in experimental tanks during electroshocking experiments.



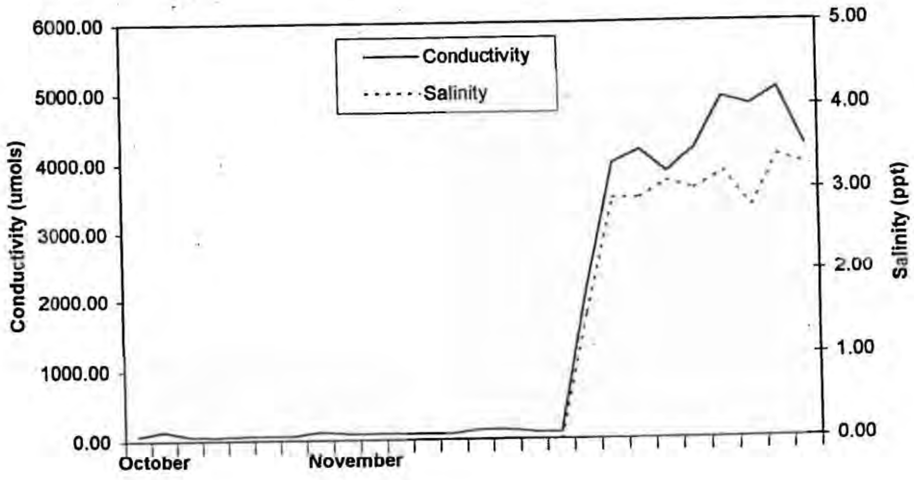


Figure 4. Mean total length (mm) and weight (g) of shortnose sturgeon in control (upper panel) and electroshocking treatments (bottom panel) conducted over the 32 day period from 10/22/99 – 11/23/99.

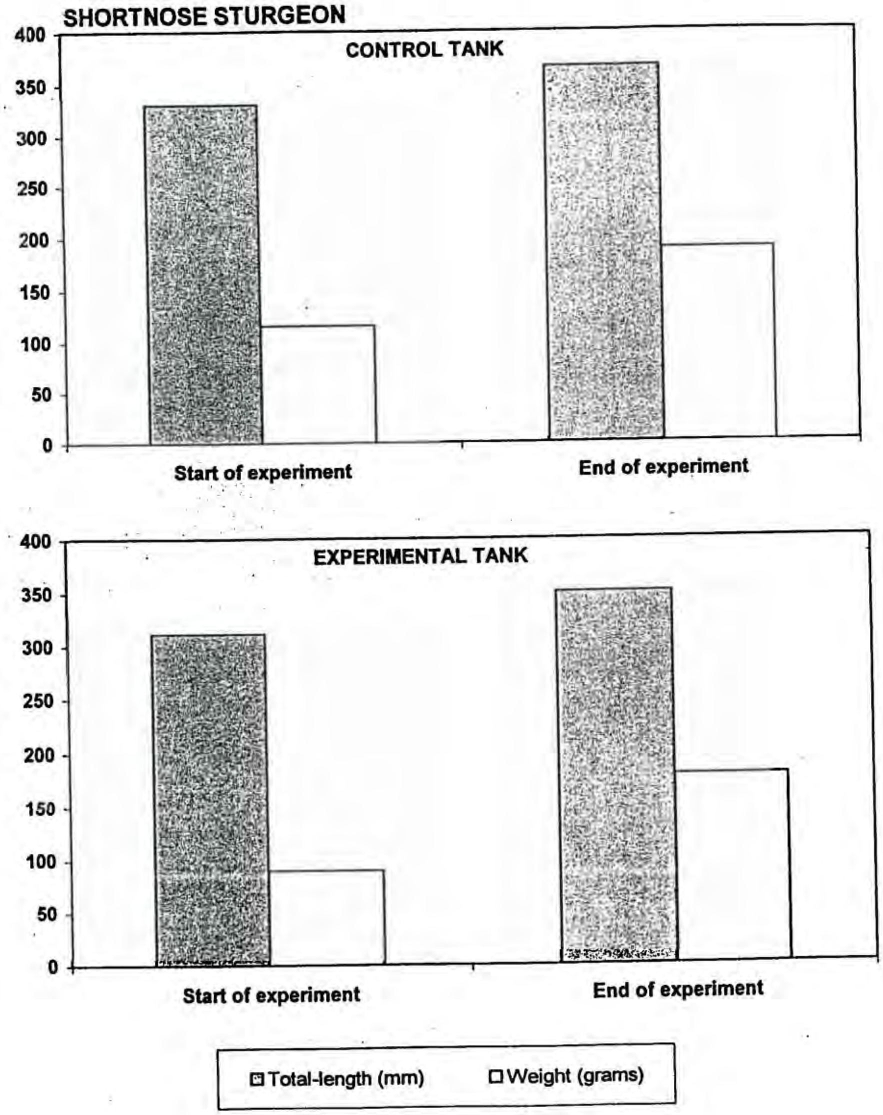


Figure 5. Mean total length (mm) and weight (g) of channel catfish sturgeon in control (upper panel) and electroshocking treatments (bottom panel) conducted over the 32 day period from 10/22/99 – 11/23/99.

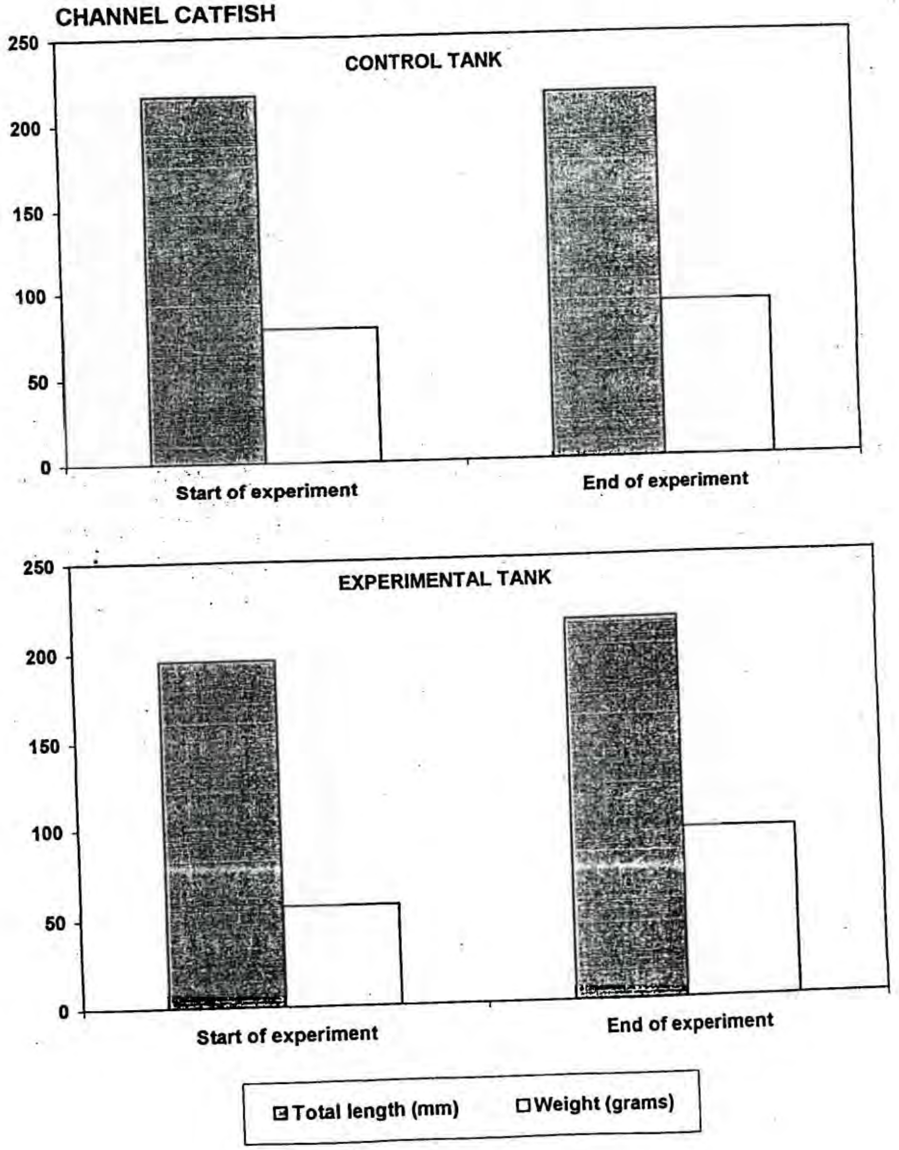


Figure 6. Total number of shortnose sturgeon (top panel) and channel catfish (bottom panel) that exhibited either a lateral roll (dark bars) or complete loss of equilibrium (open bars) during 28 observation periods of 60 seconds each.

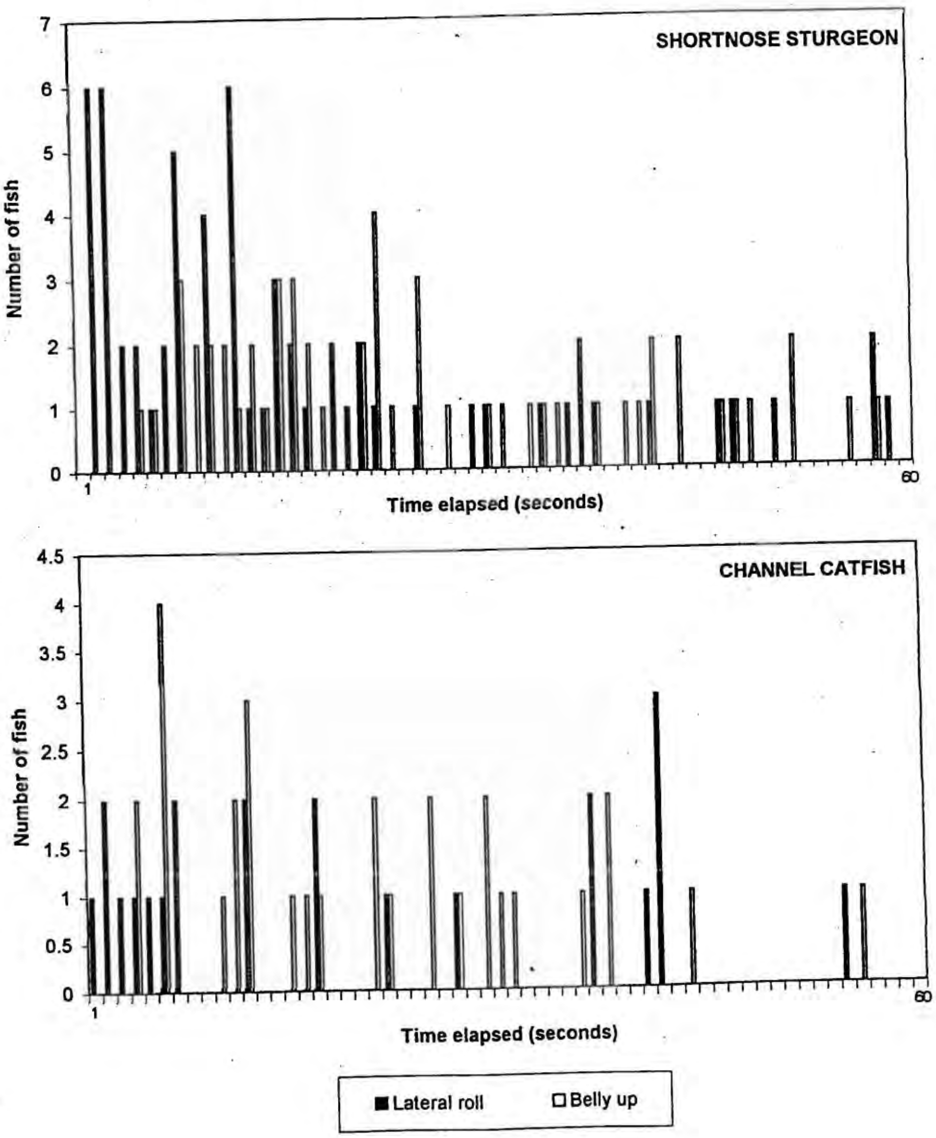


Table 1. Percent of all shortnose sturgeon and channel catfish that exhibited twitching, partial (roll) or complete (belly up) loss of equilibrium or avoidance in response to electroshocking during the first two week experiment (n=8 fish of each species observed during 48 electroshocking bouts).

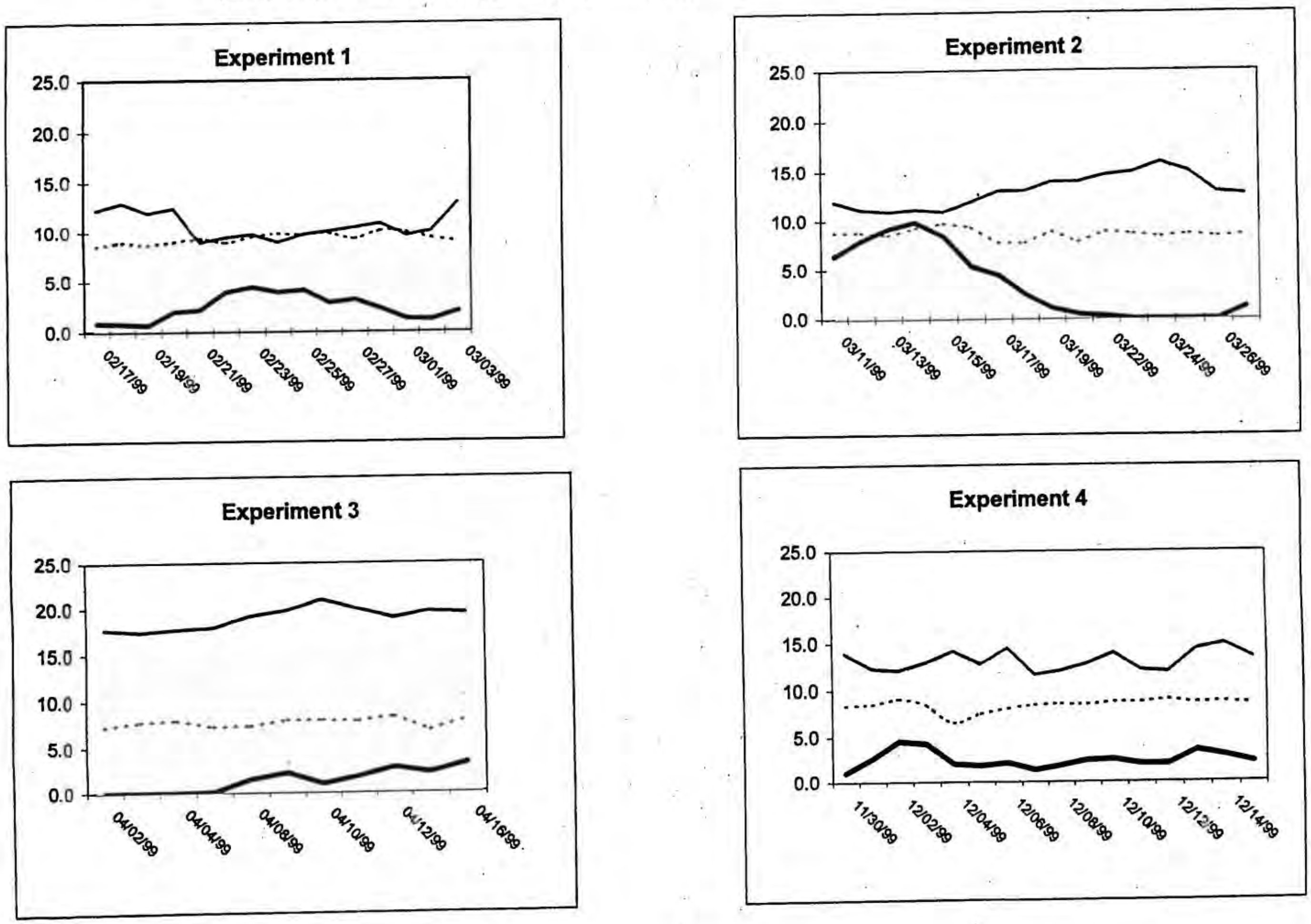
	Twitch	Roll	Belly up	Avoidance
Sturgeon	12.5	16.1	17.1	10.0
Channel catfish	8.3	6.0	8.8	5.5

Catfish predation.

Salinity and temperature were the most variable water quality parameters during the catfish predation study (Figure 7). The temperature during experiment three was higher than in experiments one and two, although the temperature dropped below 10 ^{0}C only during experiment one. Salinity was generally lower during experiment three, and was elevated at the start of experiment two, peaking at 9.9 ‰ (Figure 7).

Size ranges of prey used in catfish predation studies differed among experiments due to availability of each size class (Table 2). Although sturgeon were longer than catfish in experiments 2-4, they were similar in weight and girth due to their long heterocercal tails. When striped bass were available, these were eaten first (Table 3). In experiment two, when striped bass were removed, channel catfish were missing from the tank. Flathead catfish did not eat any of the shortnose sturgeon in our experiments.

Figure 7. Water quality conditions during the four flathead catfish predation experiments: temperature °C (light line), salinity ppt (heavy line), and dissolved oxygen mg/L (dotted line).



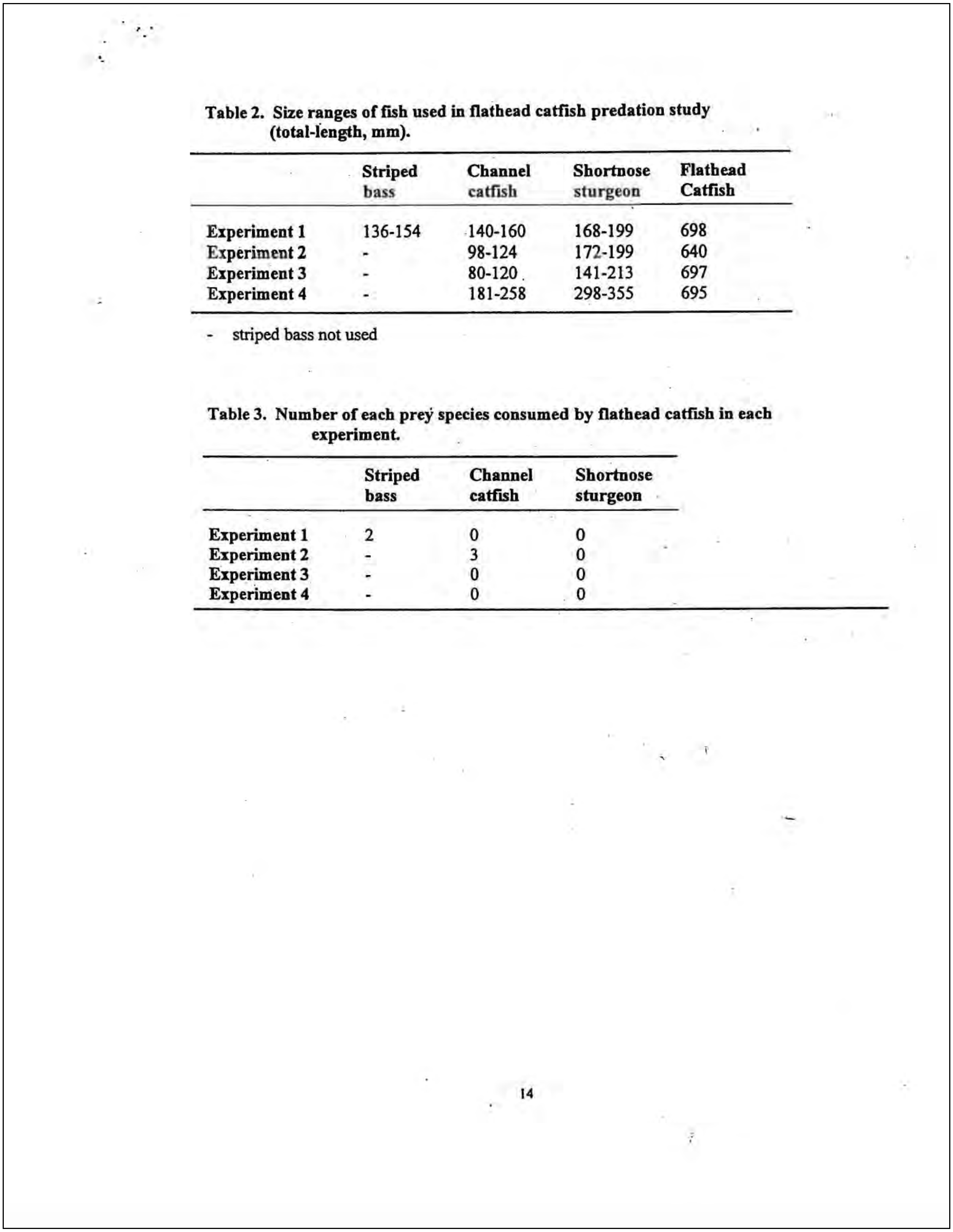


Table 2. Size ranges of fish used in flathead catfish predation study (total-length, mm).

	Striped bass	Channel catfish	Shortnose sturgeon	Flathead Catfish
Experiment 1	136-154	140-160	168-199	698
Experiment 2	-	98-124	172-199	640
Experiment 3	-	80-120	141-213	697
Experiment 4	-	181-258	298-355	695

- striped bass not used

Table 3. Number of each prey species consumed by flathead catfish in each experiment.

	Striped bass	Channel catfish	Shortnose sturgeon
Experiment 1	2	0	0
Experiment 2	-	3	0
Experiment 3	-	0	0
Experiment 4	-	0	0

DISCUSSION

Shortnose sturgeon are very sensitive to electrical currents produced by hand-held generators used for recreational electrofishing. We documented a variety of behaviors that sturgeon exhibited more frequently than did catfish (the species targeted by this gear) including: avoidance, twitching, rigor, and loss of equilibrium. However, the sturgeon recovered very rapidly during the one minute treatments they were exposed to in our experiments. The one minute treatments are conservative in that it is unlikely that the fish would be exposed to shocking of this duration during normal electrofishing. Moreover, it is unlikely that sturgeon would ever be subjected to four-five electroshocking events on a single day, even during periods of intensive fishing pressure. The fact that both experimental and control sturgeon exhibited similar positive growth rates indicates that sturgeon are able to recover from even excessive amounts of electroshocking of this type and are able to feed normally. However, subtle changes in feeding behavior would not have been detected in our tank experiments. Sturgeon were fed ad libitum and had to expend very little effort to feed; whereas in natural conditions a relatively short period of inactivity due to shocking could result in missed feeding opportunities. Moreover, behavior associated with courtship and spawning could easily be disrupted by electroshocking, as evidenced by the sensitivity of sturgeon to very low level electrical output.

We found no evidence that flathead catfish fed preferentially on shortnose sturgeon juveniles. The flathead catfish in our experiments seemed to feed most readily on striped bass, with channel catfish preferred over sturgeon when the bass were not available. A number of studies have documented predation of flathead catfish on other ictalurids, which has led to extirpation of native catfishes in rivers where flathead catfish have been introduced (reviewed in Moser and Roberts in press). While we found no evidence that flathead catfish fed as readily on sturgeon as on other catfish, we were also disappointed that so few prey were taken by the flathead catfish in our experiments. The flathead catfish were starved prior to experimentation and were allowed extended periods to recover from gillnetting and to acclimate to experimental tanks. One possible reason for the low feeding rates of our predators may have been the relatively low water temperatures during experimental periods. Yet, feeding was observed during the periods of lowest temperature, and no feeding occurred during experiment 3, which had the highest temperature (Figure 7). Future experiments could limit food choices to only sturgeon to determine whether flathead catfish will take them if nothing else is available. Moreover, the ability of flathead catfish to feed on sturgeon of a variety of sizes should be examined to insure that they are not able to target a size range of sturgeon juveniles that was not available in our experiments.

In summary, we found that the direct effects of electroshocking are more likely to negatively impact shortnose sturgeon than the indirect effect of removing potential flathead catfish predators. Unfortunately, due to unavoidable reductions in the number of fish available for the experiments and the time periods when they could be conducted (due to hurricanes), these experiments represent a pilot effort. Nevertheless, they clearly indicated that extensive periods of electroshocking could negatively effect shortnose sturgeon, particularly during critical, easily disrupted behaviors, such as courtship and spawning. Moreover, the energy expended to avoid shocking in summer could depress fitness of sturgeon already stressed by low oxygen and high temperature conditions. Further research to assess these issues should be conducted before restoration of shortnose sturgeon in the Cape Fear River drainage is considered.

ACKNOWLEDGEMENTS

We thank the U.S. Army Corps of Engineers for supplying the sturgeon and striped bass used in our experiments. The personnel of Warm Springs, Bears Bluff and Edenton fish hatcheries accommodated our needs for fish and Southeastern Pond Stocking and Aquatic Maintenance delivered them in fine condition. Special thanks to Cape Fear Community College for making space, and their expertise, available throughout the study. Without their help, this work would have ended with the deaths of fish at our primary fish holding facility. Michael Williams was instrumental in providing catfish for the predation study and the North Carolina National Estuarine Research Reserve kindly provided office support. This project was funded by a North Carolina Sea Grant, Fishery Resource Grant.

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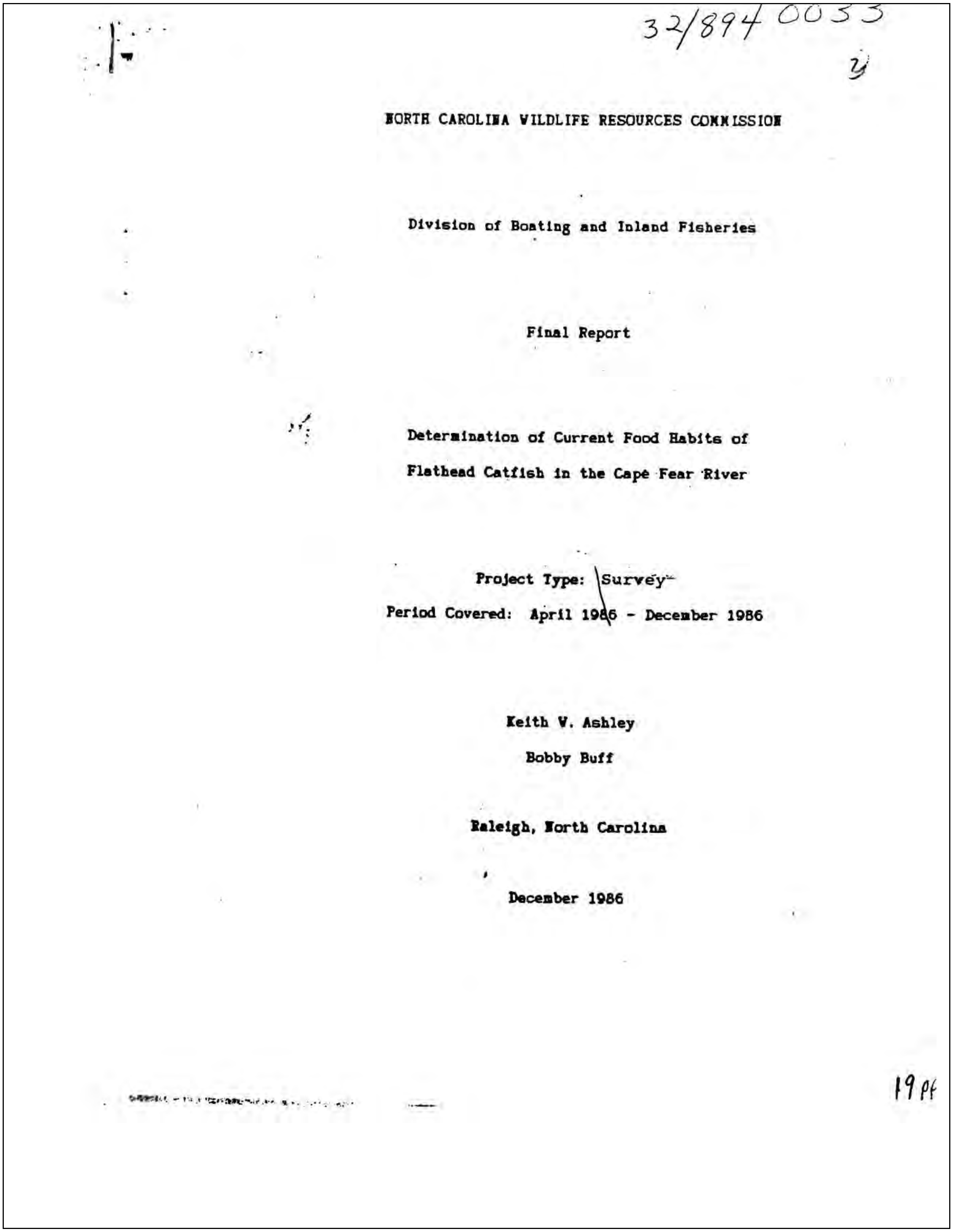
I have permission from Mr. Ashley to give you a copy of his report and would appreciate it if you would put it in with my final report. I think the information Mr. Ashley has obtained is also beneficial.

Thank you,

Robin



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NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Division of Boating and Inland Fisheries

Final Report

Determination of Current Food Habits of Flathead Catfish in the Cape Fear River

Project Type: Survey

Period Covered: April 1986 - December 1986

Keith V. Ashley

Bobby Buff

Raleigh, North Carolina

December 1986

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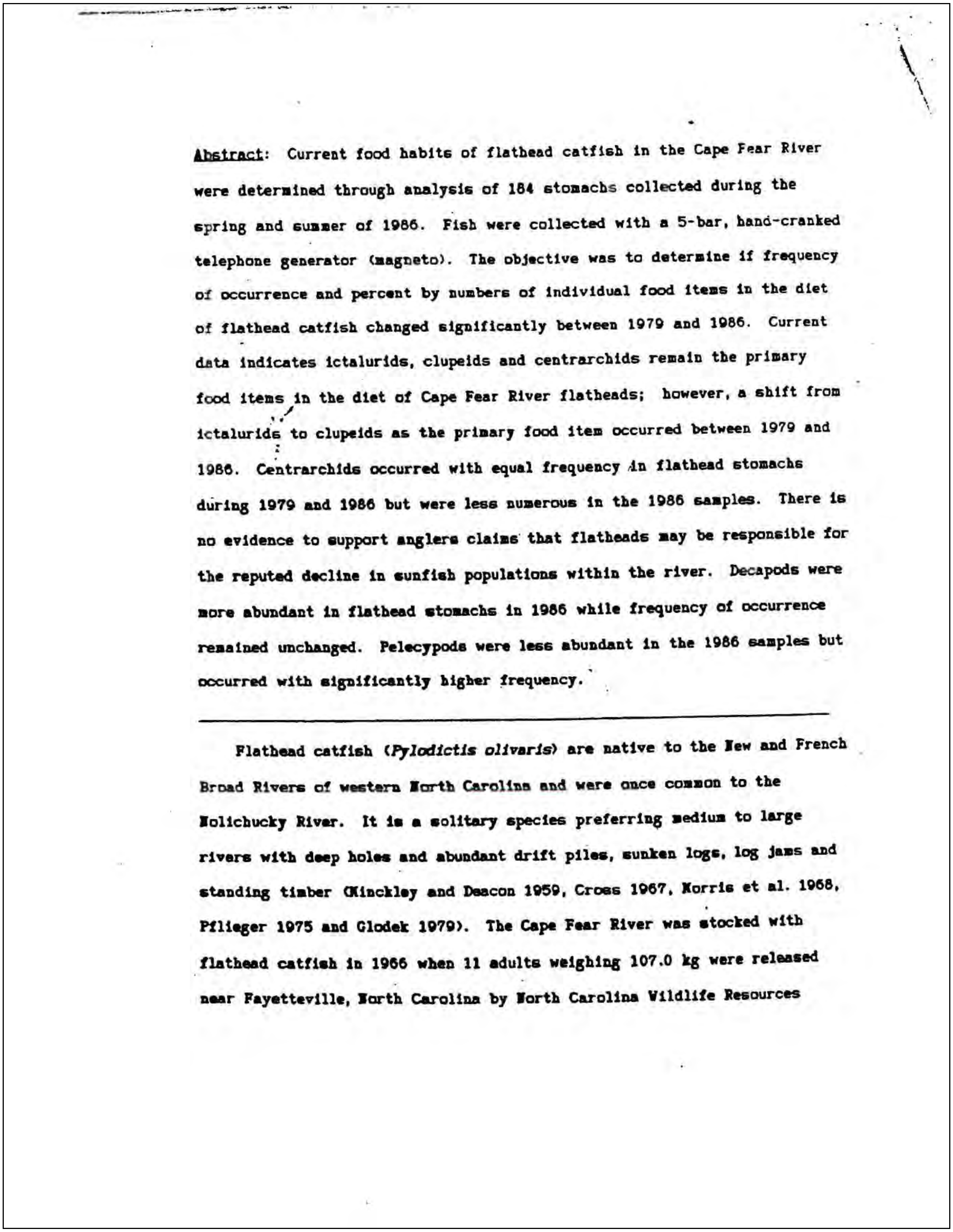


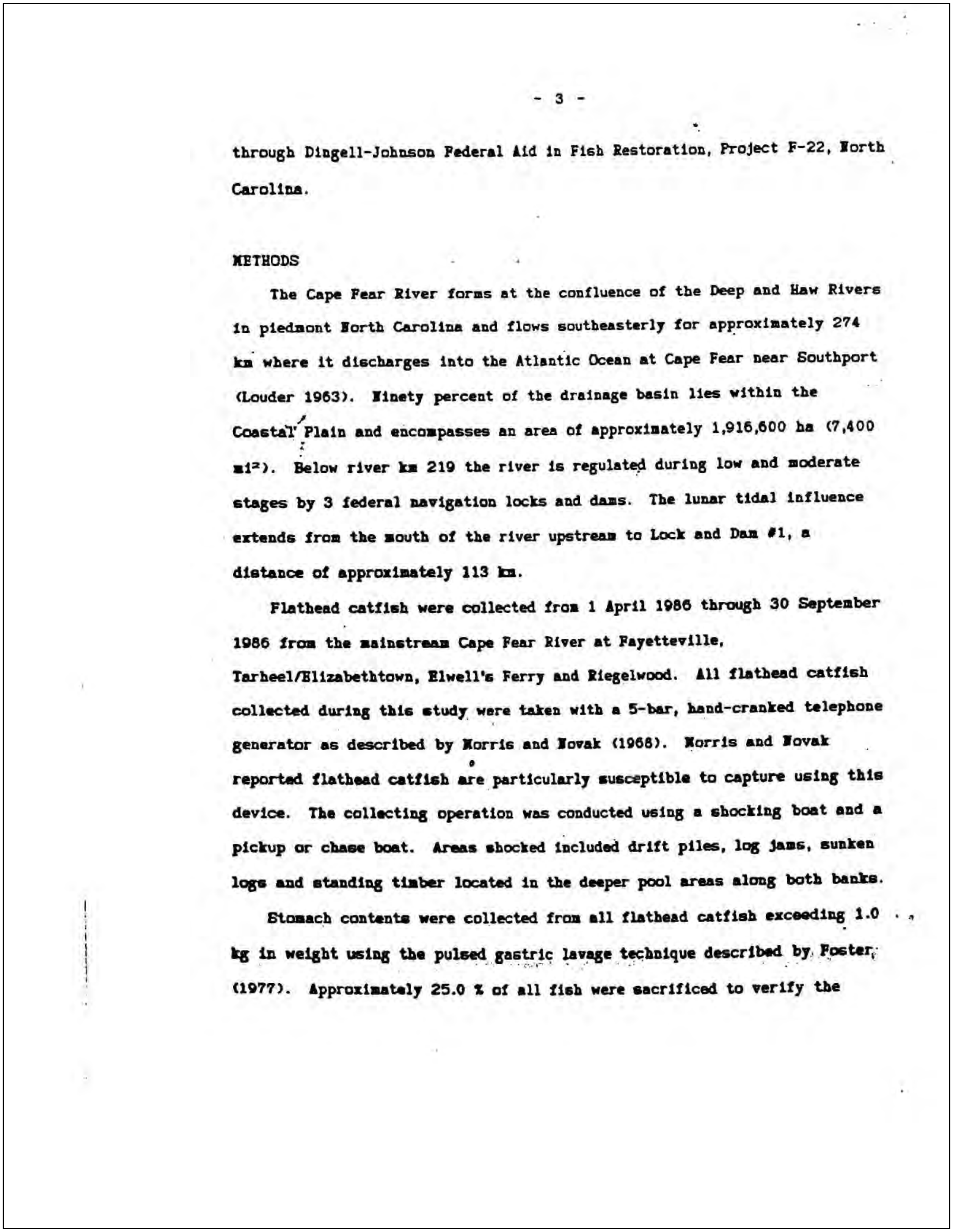
Abstract: Current food habits of flathead catfish in the Cape Fear River were determined through analysis of 184 stomachs collected during the spring and summer of 1986. Fish were collected with a 5-bar, hand-cranked telephone generator (magneto). The objective was to determine if frequency of occurrence and percent by numbers of individual food items in the diet of flathead catfish changed significantly between 1979 and 1986. Current data indicates ictalurids, clupeids and centrarchids remain the primary food items in the diet of Cape Fear River flatheads; however, a shift from ictalurids to clupeids as the primary food item occurred between 1979 and 1986. Centrarchids occurred with equal frequency in flathead stomachs during 1979 and 1986 but were less numerous in the 1986 samples. There is no evidence to support anglers claims that flatheads may be responsible for the reputed decline in sunfish populations within the river. Decapods were more abundant in flathead stomachs in 1986 while frequency of occurrence remained unchanged. Pelecypods were less abundant in the 1986 samples but occurred with significantly higher frequency.

Flathead catfish (*Pylodictis olivaris*) are native to the New and French Broad Rivers of western North Carolina and were once common to the Nolichucky River. It is a solitary species preferring medium to large rivers with deep holes and abundant drift piles, sunken logs, log jams and standing timber (Minckley and Deacon 1959, Cross 1967, Morris et al. 1968, Pflieger 1975 and Glodek 1979). The Cape Fear River was stocked with flathead catfish in 1966 when 11 adults weighing 107.0 kg were released near Fayetteville, North Carolina by North Carolina Wildlife Resources

Commission personnel. This is the only known introduction of flathead catfish into the Cape Fear system. Guier and Nichols (1977) documented the establishment of a reproducing flathead population in 1976 with the collection of 5 specimens representing several age groups. Fourteen additional specimens, ranging in size from 10.0 g to 22.7 kg, were collected during 1977 providing further evidence of flathead reproduction within the Cape Fear River (Guier et al. 1980). Since its initial introduction the flathead population has expanded to inhabit 201 km of the mainstream Cape Fear and is considered the top level predator within the system (Guier et al. 1980).

The highly predatory feeding habits of flathead catfish were suspected of having adverse effects on the native fish species of the Cape Fear River. As early as 1970 NCWRC fisheries biologists received reports from local fishermen that native bullhead populations were declining. The fishermen attributed this decline to flathead predation. Apparently, rapid expansion of the flathead population during the mid 1970s resulted in a tremendous reduction in the bullhead population. This study was initiated in response to complaints from local fishermen concerning a perceived decline in sunfish populations within the river. The objective of this study was to determine if frequency of occurrence and percent by numbers of individual food items of flathead catfish in the Cape Fear River have changed significantly since 1979.

We wish to thank Mr. and Mrs. Earl Russell and Mr. James D. Davis for their assistance with data collection. This study was funded in part



through Dingell-Johnson Federal Aid in Fish Restoration, Project F-22, North Carolina.

METHODS

The Cape Fear River forms at the confluence of the Deep and Haw Rivers in piedmont North Carolina and flows southeasterly for approximately 274 km where it discharges into the Atlantic Ocean at Cape Fear near Southport (Louder 1963). Ninety percent of the drainage basin lies within the Coastal Plain and encompasses an area of approximately 1,916,600 ha (7,400 mi^2). Below river km 219 the river is regulated during low and moderate stages by 3 federal navigation locks and dams. The lunar tidal influence extends from the mouth of the river upstream to Lock and Dam #1, a distance of approximately 113 km.

Flathead catfish were collected from 1 April 1986 through 30 September 1986 from the mainstream Cape Fear River at Fayetteville, Tarheel/Elizabethtown, Elwell's Ferry and Riegelwood. All flathead catfish collected during this study were taken with a 5-bar, hand-cranked telephone generator as described by Morris and Novak (1968). Morris and Novak reported flathead catfish are particularly susceptible to capture using this device. The collecting operation was conducted using a shocking boat and a pickup or chase boat. Areas shocked included drift piles, log jams, sunken logs and standing timber located in the deeper pool areas along both banks.

Stomach contents were collected from all flathead catfish exceeding 1.0 kg in weight using the pulsed gastric lavage technique described by Foster (1977). Approximately 25.0 % of all fish were sacrificed to verify the effectiveness of the pulsed gastric lavage technique. All flatheads were weighed (kg) and measured (cm) prior to removal of the stomach contents. Individual food items were identified (if possible), sorted, counted and weighed.

Food habit data (frequency of occurrence, percent by numbers) collected during this study were statistically compared ($\alpha = 0.05$) with food habit data collected by Guier et al. (1980) using the following statistical test for comparing the equality of 2 percentages (Sokal and Rohlf 1969):

$$t_s = \frac{\arcsin\sqrt{p_1} - \arcsin\sqrt{p_2}}{\sqrt{820.8\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

where: p_1 = the proportion of food item 1 in the 1979 samples

p_2 = the proportion of food item 1 in the 1986 samples

n_1 = sample size for 1979

n_2 = sample size for 1986

820.8 = a constant representing the parametric variance of a distribution of arcsine transformations of proportions or percentages.

RESULTS

Examination of stomachs from sacrificed fish indicated pulsed gastric lavage removed approximately 100.0 % of all material present. Occasionally, a large particle would become lodged in the esophagus and require removal with forceps. It is an excellent technique for collecting stomach contents without injury to the fish.

Contents from 184 flathead catfish stomachs were examined and analyzed (Table 1). Fifty-five percent (102) of the stomachs were empty. Fish were the dominant food item in the diet of Cape Fear River flathead catfish during 1986 by frequency of occurrence, percent by numbers and percent by weight (Table 1). Fish accounted for 65.5 % by number and 97.0 % by weight of all food items consumed by flatheads during 1986. Unidentified fish remains occurred in 28.0 % of the stomachs.

Clupeids (12.1 % by number; 57.1 % by weight) were the most dominant food item group comprising the diet of Cape Fear River flathead catfish (Table 1). They occurred in approximately 18.0 % of the stomachs containing food (Table 2). White shad (*Alosa sapidissima*) accounted for approximately 51.0 % by weight of the diet during 1986; however, they occurred in stomachs collected during April and May suggesting their consumption may be related to seasonal influences (distribution and abundance). It is interesting to note the occurrence of white shad weighing 1.1 kg and 1.5 kg in the stomachs of flathead catfish weighing 6.5 kg and 17.2 kg, respectively. Gizzard shad (*Dorosoma cepedianum*) represented an additional 7.5 % by number and 6.4 % by weight of the diet.

Ictalurids, most notably white catfish (*Ictalurus catus*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*) and flathead catfish (*Pylodictis olivaris*), were the second most preferred forage items consumed by flatheads. They occurred in approximately 20.0 % of the stomachs containing food (Table 2). Two specimens of snail bullhead (*Ictalurus brunneus*), representing 1.2 % by number and 1.3 % by weight of the diet, accounted for the only other ictalurid comprising the food habits of Cape Fear River flatheads.

Centrarchids occurred in only 8.5 % of the stomachs containing food (Table 2) and accounted for only 4.6 % by number and 3.5 % by weight of the diet. Largemouth bass (*Micropterus salmoides*) were not found in any of the 82 stomachs containing food.

Cyprinids represented 16.1 % by number but less than 1.0 % by weight of the flathead diet during 1986. Longnose gar (*Lepisosteus osseus*) and yellow perch (*Perca flavescens*) accounted for an additional 4.6 % by number and 1.1 % by weight of all food items consumed (Table 1). The occurrence of 1 southern flounder (*Paralicthys lethostigma*), 2 spot (*Leiostomus xanthurus*) and 3 crabs (Brachyura) in stomachs of fish collected at the Riegelwood station is a reflection of saltwater intrusion resulting from the extensive and prolonged drought which occurred during the summer of 1986.

Decapods (crayfish) accounted for 11.5 % by number but only 1.2 % by weight of the flathead diet and occurred in 12.0 % of the stomachs containing food (Tables 1 and 2). Pelecypods (freshwater clams) represented an even higher percentage of the diet by percent number (18.4 %) but less than 1.0 % by weight and occurred relatively infrequently in the diet (8.5 % of the stomachs).

DISCUSSION

Food habit data collected by Guier et al. (1980) included data collected from flathead catfish taken near Lillington, NC; however, since there was no comparable station during this study the Lillington data was not included in the data analysis. In addition, individual weights for the food items examined and analyzed by Guier et al. (1980) could not be located making it impossible to compare the data from both studies on a percent by weight basis. Figures 1 and 2 compare the frequency of occurrence and percent total numbers, respectively, of individual food items comprising the diet of flathead catfish, collected from the Cape Fear River during 1979 and 1986.

Flathead catfish exceeding 300 mm feed primarily on fish (Minckley and Deacon 1959, Turner and Summerfelt 1970, Pflieger 1975 and Borawa 1982). In an earlier study, in which they examined and analyzed the stomach contents of 105 Cape Fear River flathead catfish, Guier et al. (1980) reported they fed predominantly on ictalurids (39.0 %), clupeids (12.0 %) and centrarchids (10.0 %) during 1979 (Figure 1). Data collected during the present study indicates flatheads are still utilizing these forage items heavily; however, there was a significantly higher proportion, both in frequency of occurrence and percent by numbers, of clupeid food items in the 1986 samples. This coincides with a significant reduction, again, both in frequency of occurrence and percent by numbers, of ictalurid food items indicating a shift in food habits from ictalurids to clupeids between 1979 and 1986.

Shad availability is dependent upon the annual shad run up the river which normally occurs between March 15 and May 1 in any given year. Guier et al. (1980) conducted their sampling in May and June and August and September of 1979 while sampling was conducted from April through September during the present study. The shift in food habits from ictalurids to clupeids could be the result of the temporal difference in sampling schedules between the 2 studies. By beginning their sampling in May Guier et al. (1980) may have missed the majority of the shad run up the river in 1979 and therefore their food habit data would not adequately reflect the true percentage of shad (especially white shad) in the flathead diet for 1979. In addition, the shad forage base (especially white shad) available to flathead catfish in 1986 could have been much larger than that available in 1979 and could be another explanation for the shift in food habits. According to Mr. Earl Russell (personal communication), more white shad were observed coming back down the river in 1986 than in the past 5 to 6 years. Furthermore, the majority of adult white shad returning down river die and sink to the bottom becoming easy prey for flathead catfish.

Edmundson (1974) reported sunfish were the dominant forage consumed by flathead catfish in Bluestone Reservoir, West Virginia and they occurred in approximately 23.0 % of the flathead stomachs examined by Guier et al. (1980). However, there was no significant difference in the frequency of occurrence of centrarchid food items in the flathead diet between 1979 and 1986 (Figure 1). There was a significantly lower number of sunfish food items in the 1986 diet indicating sunfish were not as heavily foraged upon in 1986 (Figure 2). A decline in the available sunfish forage base between 1979 and 1986 could explain the lower number of sunfish in the 1986 diet; however, there is no data to support anglers' claims that flatheads are responsible for the reputed decline in sunfish populations within the Cape Fear River.

Ictalurids and cyprinids were the principal food items consumed by flathead catfish in a riverine system (Morris et al. 1968). There was a significantly higher proportion (both in frequency of occurrence and percent total numbers) of cyprinid food items in the 1986 diet; however, since they accounted for less than 1.0 % by weight of the food items consumed (Table 1), their occurrence would be considered insignificant.

According to Hackney (1965), flathead catfish selected centrarchids and ictalurids over cyprinids in experiments conducted in plastic-lined pools and earthen ponds. There was no significant difference in the proportion of unidentified fish remains comprising the diet between 1979 and 1986.

Previous studies (Morris et al. 1968, Edmundson 1974 and Pflieger 1975) have indicated crayfish can serve as a major food item in the diet of flathead catfish. The number of decapods consumed in 1986 was significantly higher than the number consumed during 1979 (Figure 2) but frequency of occurrence remained the same indicating more crayfish may have been available for consumption during 1986. Frequency of occurrence of pelecypods was significantly higher in the 1986 samples while the percent total numbers was significantly lower. This may indicate either preference for clams by flathead catfish increased during 1986 or that there may have been fewer clams available for consumption.

In summary, the diet of flathead catfish in the Cape Fear River between 1979 and 1986 remained fairly constant regarding the consumption of primary food items (ictaluirds, clupeids and centrarchids). A shift in food habits from catfish to shad as the primary food item occurred between 1979 and 1986 and was probably the result of temporal differences between sampling schedules between 1979 and 1986 or the result of a larger shad forage base in 1986 or both. Sunfish were consumed with equal frequency in 1979 and 1986 but occurred in fewer numbers in the 1986 samples indicating a possible decline in the sunfish forage base since 1979. There is no data to support anglers claims that flatheads are responsible for the reputed decline in sunfish populations within the Cape Fear River. Crayfish were more abundant in flathead stomachs during 1986 while frequency of occurrence remained unchanged. Finally, freshwater clams were less abundant in flathead stomachs in 1986 but occurred with significantly higher frequency.

RECOMMENDATIONS

1. Flathead catfish should not be stocked in any system dominated by ictalurids and clupeids unless it is to be used as a predator to control these species.
2. Food habits of flathead catfish in the Cape Fear River should be examined in the near future (within the next 5 - 10 years) to determine if dietary preference has changed or has stablilized.

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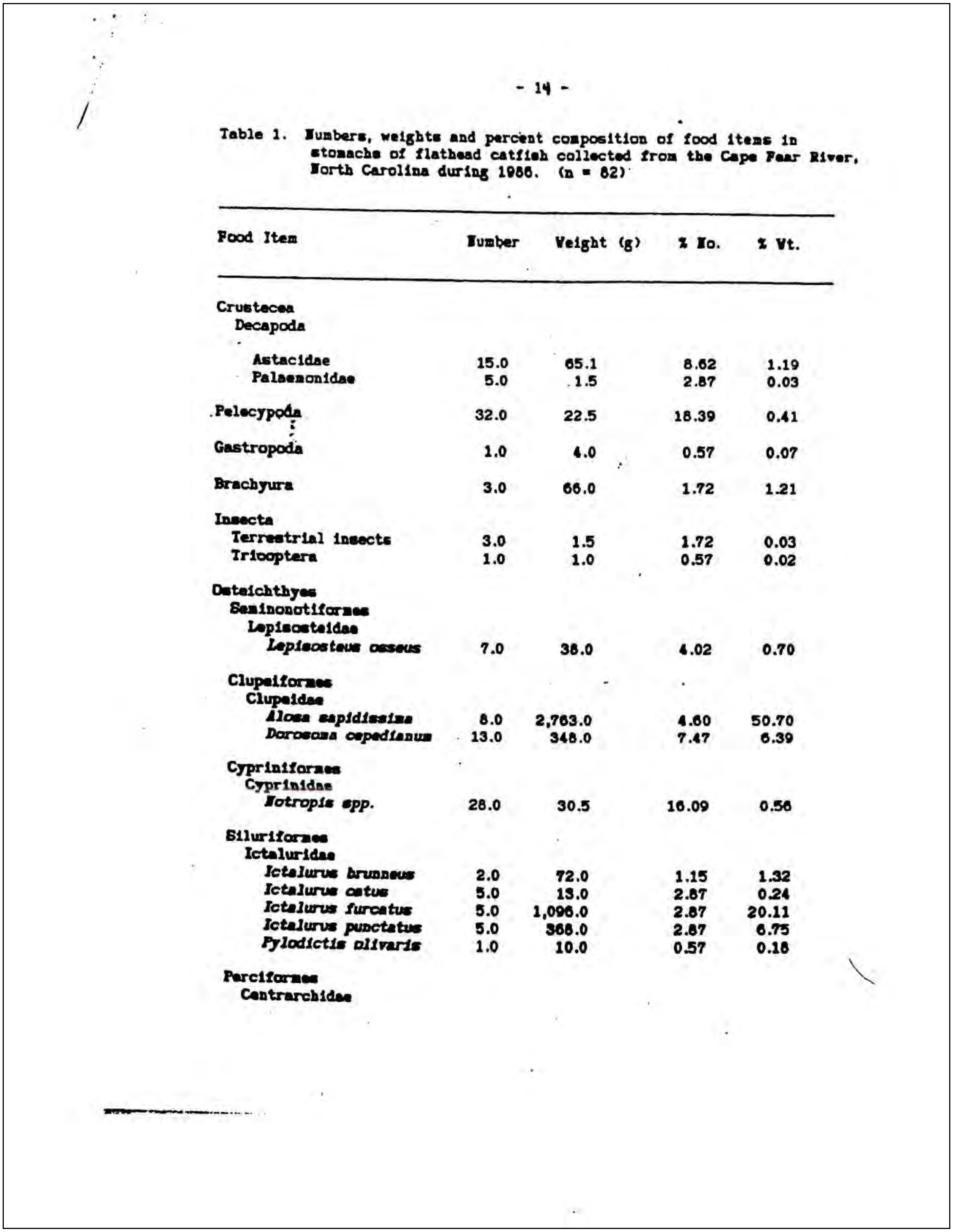

Table 1. Numbers, weights and percent composition of food items in stomachs of flathead catfish collected from the Cape Fear River, North Carolina during 1986. (n = 82)

Food Item	Number	Weight (g)	% No.	% Wt.
Crustecea				
Decapoda				
Astacidae	15.0	65.1	8.62	1.19
Palaemonidae	5.0	1.5	2.87	0.03
Pelecypoda	32.0	22.5	18.39	0.41
Gastropoda	1.0	4.0	0.57	0.07
Brachyura	3.0	66.0	1.72	1.21
Insecta				
Terrestrial insects	3.0	1.5	1.72	0.03
Tricoptera	1.0	1.0	0.57	0.02
Osteichthyes				
Seminonotiformes				
Lepisosteidae				
Lepisosteus osseus	7.0	38.0	4.02	0.70
Clupeiformes				
Clupeidae				
Alosa sapidissima	8.0	2,763.0	4.60	50.70
Dorosoma cepedianum	13.0	348.0	7.47	6.39
Cypriniformes				
Cyprinidae				
Notropis spp.	28.0	30.5	16.09	0.56
Siluriformes				
Ictaluridae				
Ictalurus brunneus	2.0	72.0	1.15	1.32
Ictalurus catus	5.0	13.0	2.87	0.24
Ictalurus furcatus	5.0	1,096.0	2.87	20.11
Ictalurus punctatus	5.0	368.0	2.87	6.75
Pylodictis olivaris	1.0	10.0	0.57	0.18
Perciformes				
Centrarchidae				

Table 1. Cont.

Food Item	Number	Weight (g)	% No.	% Wt.
Lepomis macrochirus	6.0	172.0	3.45	3.16
Lepomis microlophus	2.0	16.0	1.15	0.29
Percidae				
Perca flavescens	1.0	23.0	0.57	0.42
Sciaenidae				
Leiostomus xanthurus	2.0	93.0	1.15	1.71
Pleuronectiformes				
Bothidae				
Paralicthyes lethostigma	1.0	12.0	0.57	0.22
Unidentified fish remains	28.0	234.0	16.09	4.29
Totals	174.0	5,450.1	99.95	100.00

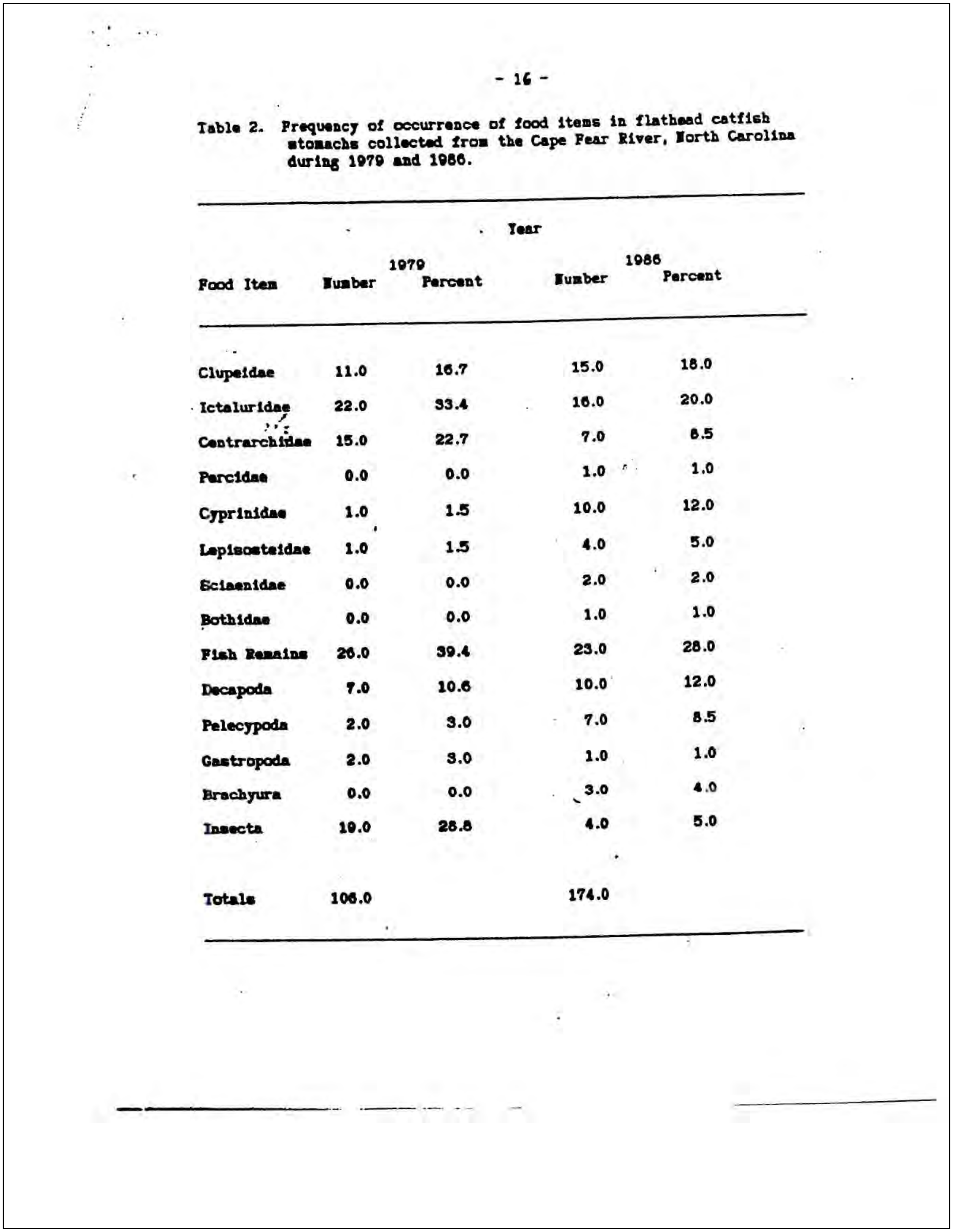

Table 2. Frequency of occurrence of food items in flathead catfish stomachs collected from the Cape Fear River, North Carolina during 1979 and 1986.

	Year			
	1979		1986	
Food Item	Number	Percent	Number	Percent
Clupeidae	11.0	16.7	15.0	18.0
Ictaluridae	22.0	33.4	16.0	20.0
Centrarchidae	15.0	22.7	7.0	8.5
Percidae	0.0	0.0	1.0	1.0
Cyprinidae	1.0	1.5	10.0	12.0
Lepisosteidae	1.0	1.5	4.0	5.0
Sciaenidae	0.0	0.0	2.0	2.0
Bothidae	0.0	0.0	1.0	1.0
Fish Remains	26.0	39.4	23.0	28.0
Decapoda	7.0	10.6	10.0	12.0
Pelecypoda	2.0	3.0	7.0	8.5
Gastropoda	2.0	3.0	1.0	1.0
Brachyura	0.0	0.0	3.0	4.0
Insecta	19.0	28.8	4.0	5.0
Totals	106.0		174.0	

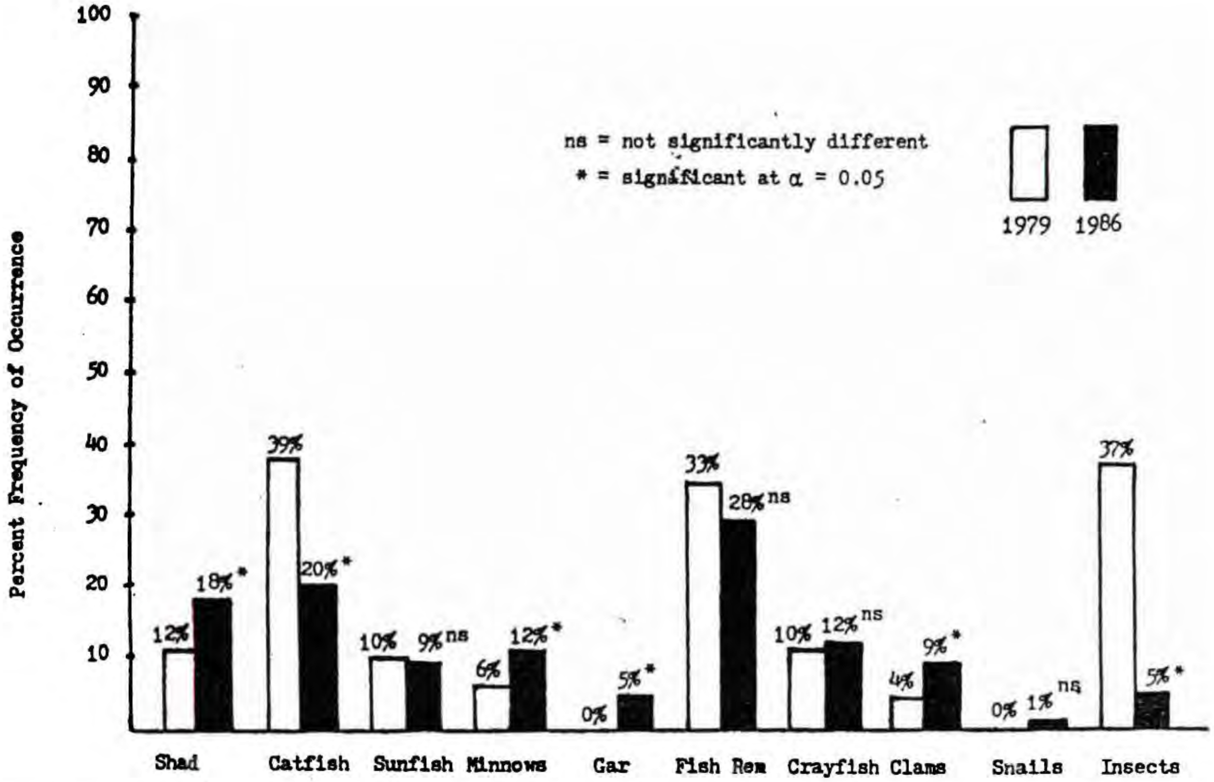

Figure 1. Percent frequency of occurrence of food items occurring in flathead catfish stomachs collected from the Cape Fear River, North Carolina during 1979 and 1986.

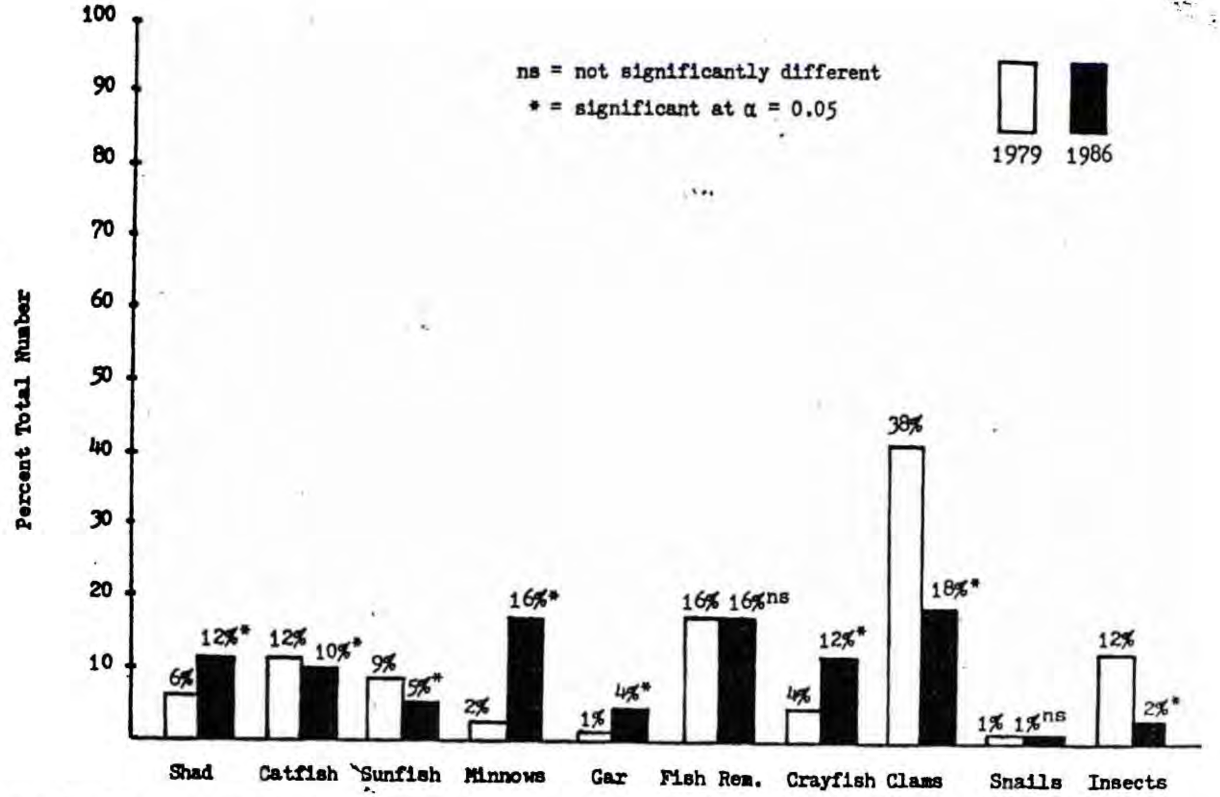

Figure 2. Percent total numbers of food items occurring in flathead catfish stomachs collected from the Cape Fear River, North Carolina during 1979 and 1986.

[Attachment 4 of e-mail from Andrew Herndon]

A Protocol for Use of Shortnose and Atlantic Sturgeons

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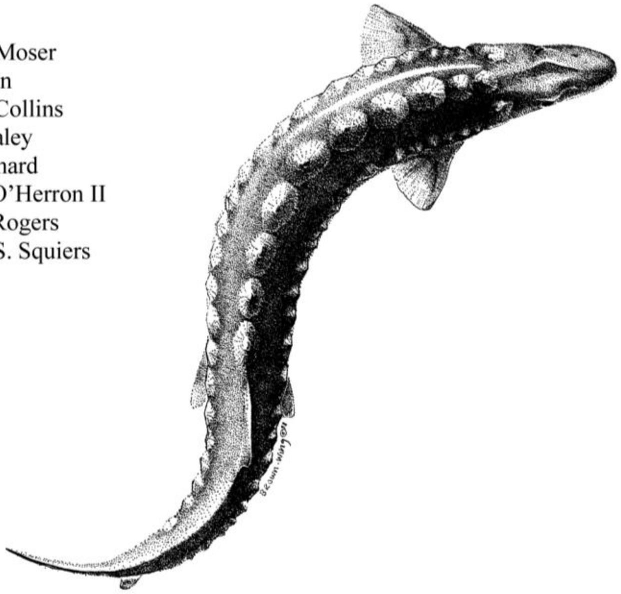
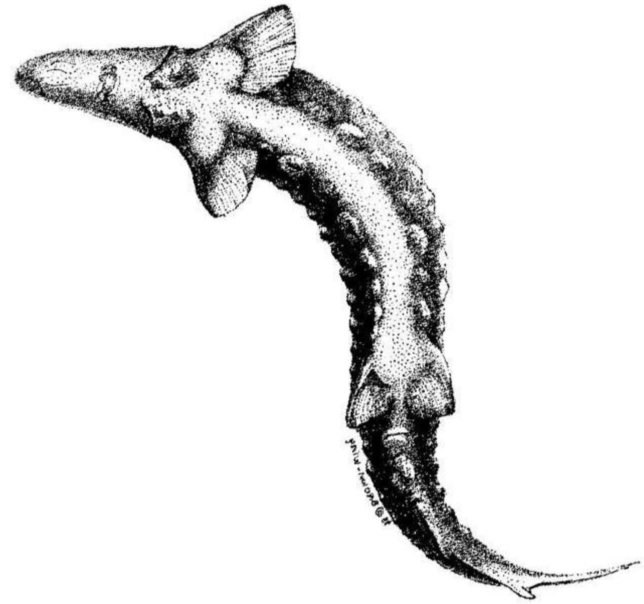


U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

NOAA Technical Memorandum NMFS-OPR-18
May 2000



A copy of this report may be obtained from:

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A Protocol for Use of Shortnose and Atlantic Sturgeons

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May 2000

U.S. Department of Commerce
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National Marine Fisheries Service
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Abstract

Guidelines for handling and sampling of Atlantic coast sturgeons are needed to protect these fishes and to facilitate standardization of methodologies used by sturgeon researchers. The shortnose sturgeon, *Acipenser brevirostrum*, is a federally listed endangered species and the Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*, is considered a species of special concern. Consequently, special techniques have been developed to reduce stress and mortality resulting from sampling and handling these species. In this document we review the most acceptable methods for short-term holding, identification and measurement, tagging, tissue sampling, gastric lavage, and collection using a variety of gear types. In addition, we provide a protocol for sampling to establish whether shortnose sturgeon are present in systems where their status is unknown.

Introduction

In recent years, a need has developed for standardization of sampling and handling methods for Atlantic coast sturgeons: shortnose (*Acipenser brevirostrum*) and Atlantic (*A. oxyrinchus oxyrinchus*). The shortnose sturgeon has been federally-listed as an endangered species since the Endangered Species Act of 1973. In the past few years the Atlantic sturgeon has been petitioned for listing and has been designated as a candidate species. Because the shortnose sturgeon has been listed for so long, it has been the subject of a relatively large number of research projects; however, this research has been conducted by only a handful of individuals. The Shortnose Sturgeon Recovery Plan (National Marine Fisheries Service 1998) specified the need for a sampling and handling protocol because of: 1) the likely increases in research on sturgeon in future years by a larger number of scientists and the concomitant need for standardization of methods, 2) the need for guidance in permitting research activities that may harm sturgeon, and 3) the need for minimum sampling requirements to determine that sturgeon are extant in a given system.

Sturgeon present some unique challenges for development of standardized methods. Both shortnose and Atlantic sturgeon may occur in a variety of habitats in Atlantic drainages from southern Canada (Saint John River) to northern Florida (St. Johns River). The differences in habitat both within and among river systems, and latitudinal differences in temperature and sturgeon life history, have resulted in sampling methods that are often specific to a given region or time of year. To make this document as comprehensive as possible, we have incorporated methodologies from research conducted across the entire range of habitats where these sturgeons occur and for the all sturgeon life stages that have been studied in the wild. We make no attempt here to suggest methodology for culture or long-term maintenance of sturgeon. In reviewing the literature and incorporating our own experiences in this protocol, we noted that innovations in research occur rapidly. Consequently, we emphasize that this protocol should be a living document that incorporates new techniques as they are developed and perfected. This protocol represents many years of collective experience in sampling and handling sturgeons and should provide useful guidelines for future research. Our intent is not to discourage development of new techniques or to limit or restrict sturgeon research.

Handling Methodologies

Both shortnose and Atlantic sturgeons are very hardy species. The ability of sturgeon to survive under extremely stressful conditions is well established and was exploited during early fisheries for their flesh and roe. The sturgeon's hardy nature also permits the use of research practices that stress these fish, potentially resulting in negative, but sub-lethal, impacts. For example, excessive handling of pre-spawning adults during their migration can result in interruption or even abandonment of upstream migration (Moser and Ross 1995). Moreover, sturgeon are very sensitive to handling during periods of high water temperature or low dissolved oxygen, and sturgeon can be lethally stressed in a short time if handled improperly during these conditions. The following handling protocol therefore includes guidelines for a variety of conditions.

Short-term holding

It is frequently necessary to hold sturgeon for short periods while fishing nets, tagging or collecting tissue samples. If possible, sturgeon should be held in floating net pens or live cars during processing. When fish are held on board the research vessel, they should be placed in flow-through tanks that allow total replacement of the water volume every 15 - 20 min. While total water volume in the tanks is not critical, adequate control of temperature and oxygen levels is absolutely essential. Fish should not be held on board for longer than 2 h when water temperatures are equal to or less than 27°C. If water temperature exceeds 27°C, sturgeon should never be held on board for longer than 30 min. Dissolved oxygen levels below 3 ppm are also stressful to sturgeon (Jenkins et al. 1993). Therefore, oxygenation of the water in holding tanks may be necessary during periods of high temperature or low dissolved oxygen and handling should be minimized. The use of an electrolyte bath (such as Stress Coat, marketed by aquaculture suppliers) can also help to reduce stress and restore the slime coat when fish are collected in fresh water. Sturgeon are very sensitive to chlorine; so, very thorough flushing is required if holding tanks are sterilized with bleach between sampling periods.

Sturgeon are physostomous and tend to inflate their swim bladder when stressed and in air. If this occurs, efforts should be made to return the fish to neutral buoyancy prior to or during release. This can often be achieved by propelling the fish rapidly downward during release. If the fish still has air in its bladder it will float and be susceptible to sunburn or bird attacks. Often the remaining air can be released by gently applying ventral pressure in a posterior to anterior direction.

Identification and measurement

Identification of sturgeon to species, sex and reproductive condition may involve use of both external and internal morphology. Juvenile Atlantic sturgeon and juvenile or adult shortnose sturgeon are easily confused and care should be taken in use of morphological characters for identification. The most consistently accurate external character is the ratio of bony inter-orbital width to mouth width (Moser et al. 1998). Use of other characters such as snout length and scute patterns can be misleading. For weight measurements, sturgeon should be supported using a sling or net and handling should be minimized throughout processing. Use of smooth rubber gloves is recommended to reduce abrasion of skin and removal of mucus.

Neither sturgeon species can be sexed on the basis of external morphology. A close magnifier at the end of a light beam (Bioscope) can be used to distinguish sexes and even to stage eggs without surgery. This instrument is gently inserted through the genital opening and rotated to view the gonads internally. This technique is quick, far less intrusive than surgical procedures, and with experience its use will allow differentiation of females that will spawn during the next spawning period from immature and post-spawned females. However, it cannot provide maturity stage data for males, nor differentiate between males and immature females.

Tagging

The life history, morphology, behavior, and physiology of sturgeons present a plethora of challenges for tagging studies. Sturgeon are long-lived; so, for many studies it is essential that tags be retained for extended periods. In addition, they exhibit very rapid juvenile growth rates and, in the case of Atlantic sturgeon, can achieve very large sizes (> 3 m). Therefore, tags must be retained even as the tag placement area changes size and shape. Moreover, sturgeon are adept at rubbing off external tags and can actually extrude internal tags through the body wall to rid themselves of tags placed in the body cavity (Kynard and Kieffer 1994). Our collective experiences with a variety of tagging methods and materials, in addition to laboratory studies of tag retention, were drawn upon to provide the following recommendations for tagging.

External tags generally have lower retention rates than internal tags, but are often needed in studies that require participation of people other than the researcher (such as tag-recapture studies that rely on tag returns from fishermen). A variety of external tag designs and placement sites have been used on both Atlantic and shortnose sturgeon. The first laboratory studies of tag retention by shortnose sturgeon indicated that Carlin tags placed just below the dorsal fin and internal anchor tags inserted laterally into the abdomen had the highest retention rates of the tags tested (Smith et al. 1990). More than 50 shortnose sturgeon marked with Carlin tags in the Hudson River from 1979-80 were recovered in recent research, indicating that these tags can have long retention times. About half of the tag disks were clearly legible and provided valuable data on fish at large for over 15 years. However, Carlin tag retention in both the Connecticut River and Delaware River has been poor when compared to passive integrated transponding (PIT) and anchor tags, respectively. Anchor tags placed at the base of the dorsal fin in 1981-87 are now being recovered in the Delaware River over a decade later. Collins et al. (1994) tested a variety of external tag designs in the laboratory and found that a T-anchor tag inserted into the lateral abdominal wall provided the greatest retention. However, it was noted that healing of the insertion wound was slow (or did not occur) for all tags that protruded through the skin. While external tags clearly have lower retention than internal tags, anchor tags in the dorsal musculature show the most promise for greatest longevity with least impact to the fish.

A number of sturgeon studies use PIT tags in addition to an external tag. These tags are injected just below the skin along the dorsal mid-line anywhere from the posterior edge of the fourth dorsal scute to the posterior edge of the dorsal fin. Due to the lack of standardization in placement of PIT tags, we recommend that the entire dorsal surface of each fish be scanned with a waterproof PIT tag reader to insure detection of fish tagged in other studies. We note that juvenile Atlantic sturgeon may grow around the PIT tag, making it difficult to get close enough to read the tag in later years. For this reason, the largest (highest power) PIT tags should be used for both sturgeon species, and tags should be placed posterior to the dorsal fin, where tissue growth is least. PIT tags far out perform external tags. However, laboratory studies indicate that sturgeon smaller than 200 mm TL shed PIT tags at a rate of over 50%, due to the lack of musculature at this size. The likelihood of high PIT tag loss should therefore be considered when marking sub-yearling sturgeon.

A variety of methods have been used to outfit sturgeon with sonic or radio transmitters. Due to their large body size, sturgeon can carry large transmitters having extended battery life. Consequently, it is important that these tags be retained for as long as possible. External attachment of the transmitters is the least intrusive method; however, a number of field studies have indicated that both sonic and radio tags are shed at rates of 15 - 60% within the first 4 – 6 mo. of external attachment (Smith 1988, Moser and Ross 1993, Kieffer and Kynard 1993, Rogers and Weber 1995). In a tank study using cultured shortnose sturgeon, externally-attached transmitter loss began on day 2, and 100% were lost by day 60. It was obvious that the sturgeon actively rubbed the transmitters on any available surface.

In spite of the problems with tag loss, only external attachment of transmitters should be used for pre-spawning fish in spring or those on the spawning ground. In addition, surgical implants should not be attempted when water temperature exceeds 27°C (to reduce handling stress) or is less than 7°C (incisions do not heal rapidly in low temperatures). External transmitters are retained longest when they are as small as possible and are attached through the dorsal fin using monofilament line or stainless steel leader and a PVC backing plate (Rogers and Weber 1995). The addition of a neoprene pad between the fish's body and the transmitter or backing plate helps to protect the fish.

Internal implantation of radio or sonic transmitters provides greater retention than external attachment. Radio range is maximized with a trailing antenna, however, there is less chance of infection if the antenna is also implanted internally. In a recent tank study, radio transmitters were surgically implanted in cultured shortnose sturgeon, but the antennas were externally trailing. After 90 days, all of the fish had openings around the antenna exit area and were still bleeding or obviously infected. In some cases the antenna had cut large wounds through the abdominal wall and the transmitter and internal organs were visible. Field trials using this method of attachment indicated less significant impacts to wild shortnose sturgeon in the upper Connecticut River. Eight fish tagged internally with transmitters having a trailing radio antenna were recaptured after 12 months at large. While the tissue at the antenna exit area was darkened, there was no sign of infection or of abrasion to the fins on any of these fish (Kynard et al. 1999). We conclude that radio transmitter antennas should be internally implanted whenever possible to minimize injury to the fish. However, when it is absolutely necessary to obtain maximal signal range (aerial surveys, passage studies around dams, etc.), trailing antennas may be used with caution. This method should not be used when tagging a significant percentage of a given population.

Surgery to implant transmitters should only be attempted when fish are in excellent condition. Methods of Summerfelt and Smith (1990) should be used as general guidelines for sturgeon anesthesia using tricaine methane sulfonate (MS-222); however, the dose should be reduced to only that needed to immobilize the fish during surgery, if at all. Placing fish upside down in a cradle or trough during surgery is often sufficient to immobilize them. Also, sturgeon may be safely immobilized using galvanonarcosis (low voltage DC). The transmitters and internally implanted coiled antennas can be coated with an inert elastomer (Silastic MDX4.4210) to reduce tissue irritation and subsequent tag rejection. However, some transmitter coatings are quite inert and do not need this treatment, and some transmitter models coated with Silastic have been expelled by cultured shortnose sturgeon in tank studies. Also, transmitters with externally trailing antennas should not be coated to allow sturgeon tissue to adhere to the tag and hold it in place in the body cavity (Kynard et al. 1999).

The transmitter and all surgical instruments should be sterilized immediately prior to use. A lateral incision approximately 30 mm long should be made 40 - 60 mm anterior to the pelvic fin and about 10 - 20 mm above the ventral row of scutes (although the specific location will vary with fish size). This location reduces abrasion of the transmitter on the incision. However, lateral muscle tissue in large adults may be quite thick, so a ventral incision is recommended for them. The incision should be closed with either absorbable or non-absorbable suture material (absorbable material is superior for tying knots but there has been no documented differences in healing of wounds with either suture type) and a large cutting needle. Individual sutures should be closed with separate, double, square knots so that the muscle tissue firmly touches but is not drawn tightly. After surgery the fish should be released as soon as it recovers from the anesthesia.

Tissue sampling

Tissue sampling is required for genetic evaluation, studies of contaminant loading, assays of physiological condition, and ageing. A 1 cm^2 pelvic fin clip is recommended for genetic analysis. Muscle samples for contaminant analysis or energetic evaluation should be taken from the thickest dorsal musculature using a mammalian tissue punch. First, a v-shaped flap of skin should be peeled back using a sterilized scalpel. The punch is then used to cut a small core of tissue, which may be removed with cutting pliers. The flap of skin should then be replaced and two sutures used to close the wound. Blood samples may be taken from the ventral caudal peduncle. Egg samples may also be removed using a large gauge hypodermic needle (as used for PIT tag insertion). The needle is inserted through a small ventral incision in the abdomen and a small number of eggs drawn out, if the female has ovulated (i.e., eggs are loose in the abdomen). A gonad biopsy for histological analysis can be obtained from either sex at any point in the reproductive cycle by making a small incision and inserting an Eppendorfer biopsy punch. These techniques should not be used in systems having small populations and should be limited to only a few individuals.

The removal of pectoral fin rays for ageing studies is controversial. Concerns raised include potential impacts to fish swimming performance in high current velocity areas and the equivocal data that may be obtained from these structures. In tank tests, ray regeneration was rapid and sturgeon swimming performance was unaffected (Collins and Smith 1996). Continued study of the impacts of ray removal on sturgeon performance, validation of annuli, and investigations into alternative methods of ageing are sorely needed.

Gastric lavage

A safe and effective technique for flushing food items from the stomach of live sturgeons has recently been developed (Haley 1998). Due to the morphology of the gut tract and the physostomous swim bladder, gastric lavage of sturgeons was previously considered a risky procedure. Consequently, diet information was only available from fish that had been killed. The new lavage method requires the careful use of a flexible, small diameter tubing (intramedic polyethylene, 1.57-mm inner diameter and 2.08 mm outer diameter). The fish is lightly anesthetized using MS-222 and the tube is directed past the pneumatic duct and into the alimentary canal until it can be felt on the ventral surface of the fish. Water is slowly injected into the tubing to flush the stomach. After lavage the fish are allowed to recover and are immediately released. This method is not recommended when water temperature exceeds 27°C and extreme caution should be taken to avoid damage to the swim bladder, which can result in mortality.

Sampling Methodologies

Preferred sampling methods for sturgeon are dictated by the habitat where they occur, season of capture, and life stage. In general, large juvenile and adult sturgeon are efficiently captured in stationary or drifting gillnets or trammel nets (Buckley and Kynard 1985, Hoff et al. 1988, Dovel et al. 1992, Geoghegan 1992, Kieffer and Kynard 1993, Moser and Ross 1995, Collins et al. 1996). Trawl sampling is also an effective means of capturing sturgeon, but much of the time this gear is not feasible for use, due to the rapid current conditions and excessive amount of bottom structure in riverine or estuarine sturgeon habitat. Sturgeon are also susceptible to pound nets, but this gear has not been used for research purposes, other than to assess commercial capture rates. Similarly, sturgeon are occasionally captured on hook and line (usually baited trotlines or via snagging); however, this gear has not been employed for research sampling. Baited trotlines are a safe and effective method for capturing white sturgeon (*A. transmontanus*), and this method probably has potential for shortnose and Atlantic sturgeon research as well (Elliott and Beamesderfer 1990).

Very small juveniles (larvae and young-of-the-year) are rarely captured in traditional survey sampling. Young sturgeon seek cover in gravel crevices and amongst structure for about 9 d after hatching and then the larvae move downstream. Sturgeon eggs and/or larvae have successfully been collected in some rivers using D-shaped drift nets (Kynard et al. 1999), epibenthic sleds, and textured pads to which the eggs adhere. Recent studies have been conducted to confirm that light traps are not effective for capture of sturgeon larvae.

Electrofishing has not proven to be an effective method for capture of sturgeon in most systems because the fish tend to sink immediately upon being stunned. This is unfortunate, because many resource agencies conduct regular survey sampling with this gear. In very shallow areas with clear water it may be possible to retrieve stunned sturgeon from the bottom with a long handled dipnet. The more widespread use of sophisticated electrofishing equipment that allows control of amperage, voltage, and waveform may result in development of electrofishing methods that are specific to sturgeon (such as those for specific collection of catfish). Moreover, Aadland and Cook (1992) have developed an electric trawl for use in sampling benthic river fishes that may be very useful for collecting sturgeon. Studies to examine the efficacy of electrofishing gear should be undertaken using hatchery fish.

Gillnets and trammel nets

Both shortnose and Atlantic sturgeon are very susceptible to gillnets and trammel nets as adults or large juveniles. These gears (especially gillnets) are size selective and therefore should be used with caution when determining sturgeon size or age distributions. However, length frequencies from studies using gillnets having different mesh sizes indicate that there is considerable overlap between size distributions of sturgeon collected with different mesh sizes (Figure 1). Sub-yearling sturgeon (200 –300 mm FL) have been captured using 5 cm (2") stretched mesh nets in the Hudson, Cape Fear, Edisto and Savannah rivers but in all cases the catch rates were low. This was probably due to low abundance of

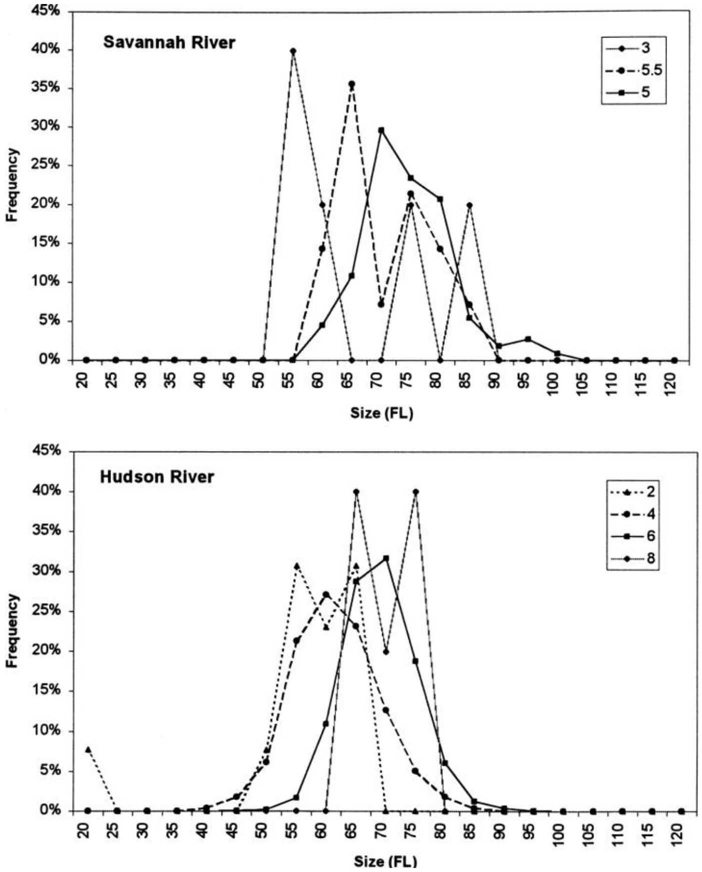
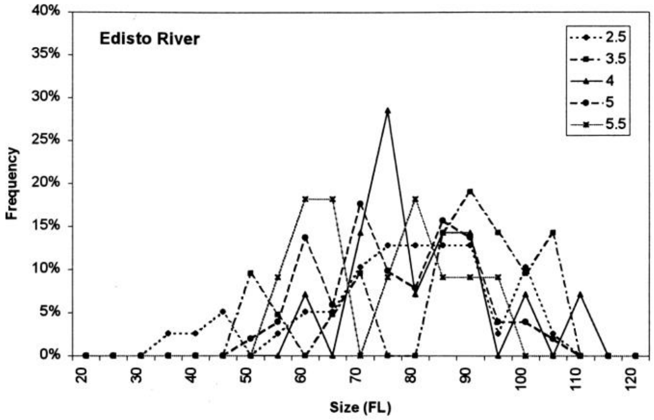
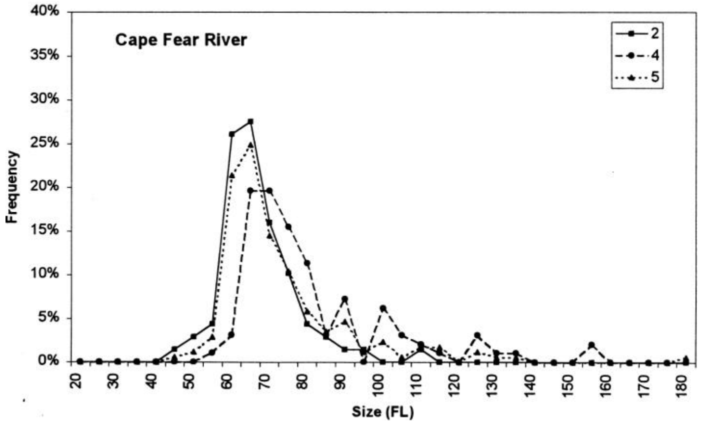


Figure 1. (Above and facing page) Size frequencies (in cm fork length) of shortnose and Atlantic sturgeon captured using various gillnet mesh sizes (in inches stretched mesh): 2 (5.1 cm), 2.5 (6.4 cm), 3 (7.6 cm), 3.5 (8.9 cm), 4 (10.2 cm), 5 (12.7 cm), 5.5 (14.0 cm), 6 (15.2 cm), and 8 (20.3 cm). Data from the Savannah River, S.C. and the Hudson River, N.Y. are for shortnose sturgeon captured in stationary gillnets. Data from the Edisto River, S.C. (J. McCord, S.C. Department of Natural Resources, unpubl. data) are for shortnose sturgeon caught in drifting gillnets. Data from the Cape Fear River, N.C. are for Atlantic sturgeon caught in stationary gillnets.

small size classes in these rivers, rather than gear selectivity. For post-yearlings, all mesh sizes greater than 6.4 cm (2.5") stretched mesh result in similar length frequencies (Figure 1). Trammel nets collect a wider size distribution than gillnets and are often less stressful than gillnets because the fish are frequently entangled rather than gilled.

Both monofilament and braided nylon mesh are effective for capture of sturgeon; however, twine size should be increased if large fish are targeted. Although fish are captured more effectively with light twine, sturgeon can easily break through webbing that is too light. Also, light twine is more likely to cut into the fish and cause injury. When targeting adults, heavy multifilament nylon (size 208 – 233) with 15 cm (6") stretched mesh can be used to reduce sturgeon injury.





Sturgeon are benthivores and generally are captured near the bottom unless they are actively migrating (McCleave et al. 1977, Moser and Ross 1995). Therefore stationary gillnets or trammel nets should be heavily weighted and allowed to contact the bottom. In low velocity areas, nets should be set perpendicular to the current. However, in areas of high velocity or having heavy debris loading, this is not feasible. In this case, nets should be set in back eddies, on the downstream side of islands, or parallel to the current in mid-channel (Buckley and Kynard 1985, Kieffer and Kynard 1993, Moser and Ross 1993, Kynard et al. 1999). In many southern rivers, trammel nets are set during slack tide periods only, to reduce stress on fish and debris loads.

Drifting gillnets can be used very effectively to capture sturgeon by drifting through relatively snag-free areas while dragging near or on the bottom (O'Herron and Able 1990, McCord 1998). Often this method results in lower debris loading because the nets drift along with the debris and do not intercept it. Generally, the short soak times and reduced pressure on driftnets also result in less injury to captured fish. This method can be used through upriver runs and pools without large entanglements by using very light leadline (just enough to take the net to the bottom). The net should be buoyed at the ends with large floats (8-15 L displacement) to facilitate operating the net and to avoid snags. In tidal areas, buoyancy should be reduced and the net dragged along the bottom wherever possible (McCord 1998).

Entanglement in gillnets or trammel nets can result in sturgeon mortalities (Kieffer and Kynard 1993, Moser and Ross 1993, Collins et al. 1996, Kynard et al. 1999). To reduce the risk of mortality, precautions should be taken to reduce stress to fish during netting. Gillnets and trammel net soak times should never exceed 2 hrs in water temperatures > 27°C. During lower water temperatures, soak times up to 24 h are acceptable, but soak times should be reduced as much as possible as temperature rises. Sturgeon should also not be exposed to air temperatures below 0°C for more than a few minutes. In these conditions, fish should be processed while held underwater to reduce the risk of freezing tissue. Every effort should be made to reduce stress during removal of fish from nets and net meshes should be cut to facilitate rapid removal of fish.

Trawls

Where conditions permit the use of trawls, this gear can be effective for the capture of sturgeon. Collins et al. (1996) found that 39% of all juvenile Atlantic sturgeon and 8% of the adult shortnose sturgeon tag returns from fish tagged in the Altamaha River, Georgia were from the commercial trawl fishery. Sampling of shortnose and Atlantic sturgeon was conducted in the tidal portion of the Hudson River from 1975 - 80 using a 6.4 m and 10.7 m semi-balloon otter trawl having mesh sizes of 1.3 – 6.5 cm (Dovel and Berggren 1983, Dovel et al. 1992). Fish >200-mm total length were regularly caught, with most fish around 500 mm. These trawls were fished for variable lengths of time (up to 50 min) at tow speeds of 4-km h^{-1} (2.2 knots). The Hudson River Utilities Monitoring Program has also conducted a standardized trawling survey since 1985 using a 3 m beam trawl with 1.3 - 3.8 cm mesh. This gear is towed for 5 min against the current and adult shortnose sturgeon (500 - 1000 mm fork length) are caught regularly. This sampling indicates that even a small trawl effectively captures sturgeon.

Drift nets

D-shaped or rectangular drift nets have been used effectively to catch shortnose sturgeon eggs and larvae in both northern (Kynard et al. 1999) and southern (Smith et al. 1993) rivers. Mesh sizes of 2 mm^2 trap sturgeon eggs and larvae while letting some debris pass through. The net is attached to a weighted and floated, 1 m diameter steel ring that has been flattened to maximize contact with the substrate (D-shaped, Kynard et al. 1999). A 1m square or 2 m 1m Neuston net can also be used. The net is attached to a Danforth or grapnel-type anchor via a short bridle. This arrangement allows the net to stand upright in currents of up to 1.0 m s^{-1}. Depending on the current velocity and amount of debris accumulation, such gear should be fished for 10 min – 1 h in areas of suspected spawning. A flow meter should be positioned in the mouth of the net to allow calculation of egg or larval densities per volume of water sieved. Such studies are best conducted with the aid of telemetry data from pre-spawning adults to identify likely spawning locations (Collins and Smith 1993, Kynard et al. 1999). Little to no mortality occurs with this gear type if the samples are processed in the field . The D-shaped nets have been used to capture eggs of Chinese sturgeon in the Yangtze River for four years. Tens of thousands of eggs have been captured when the nets have been set in areas occupied by telemetered fish. These eggs are reared to juvenile stages and released into the river (Wei and Kynard 1996). Egg samples can also be collected using artificial substrates to which they adhere (anchored buffer pads, Moser et al. 1998).

Minimum Sampling Required to Confirm Presence of Shortnose Sturgeon

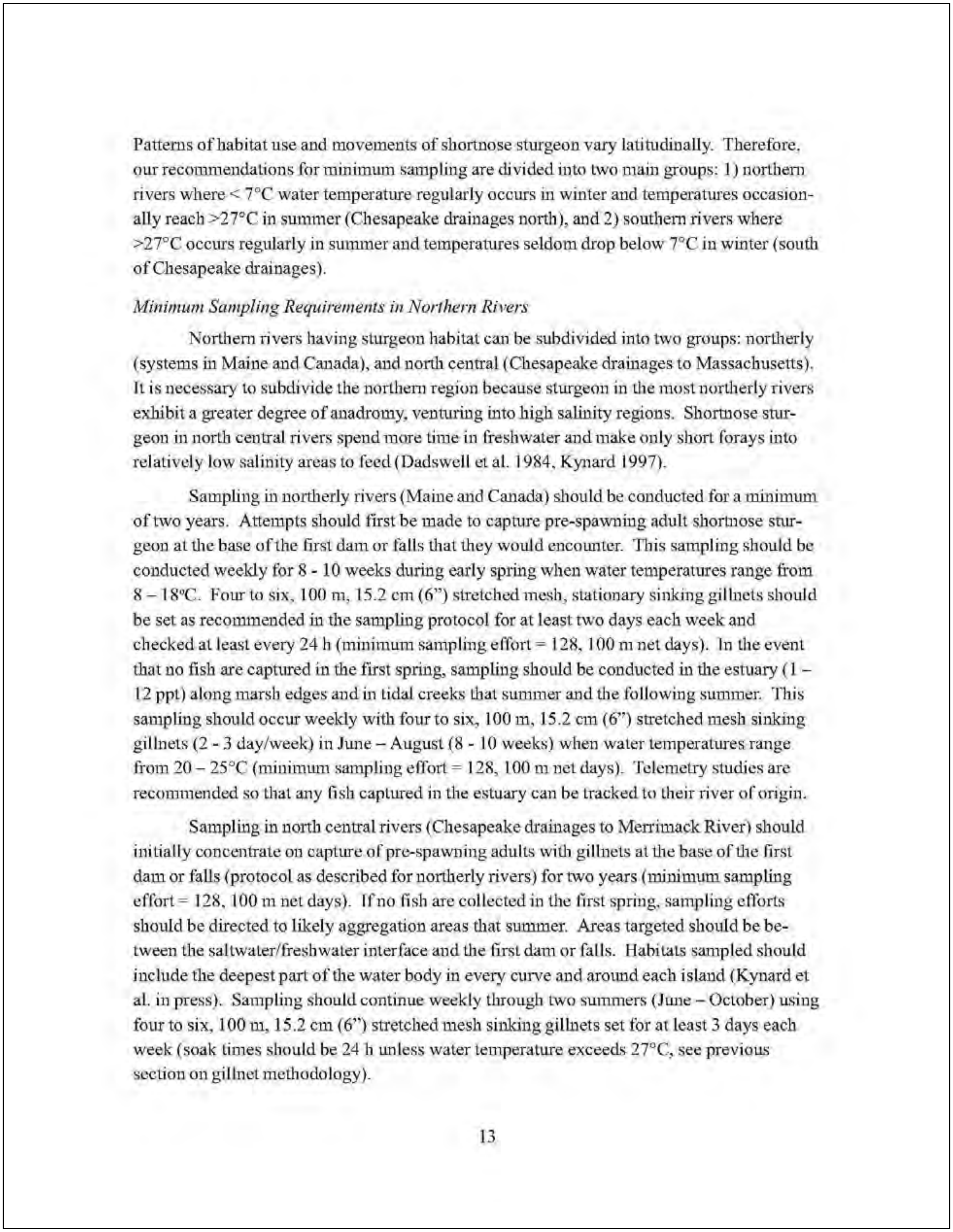
Guidelines for minimum sampling necessary to confirm that shortnose sturgeon still exist in a system are desperately needed for management of this species. Shortnose sturgeon are no longer extant in many rivers where they historically occurred (Dadswell et al. 1984). However, the Shortnose Sturgeon Recovery Plan (NMFS 1998) stipulates that restoration efforts (stocking of cultured fish) should not be undertaken until it is confirmed that wild fish have been extirpated. In addition, sampling for the presence of shortnose sturgeon is often required when activities that jeopardize the existence of this fish are proposed in an area where their status is unknown. Consequently, the National Marine Fisheries Service and other regulatory agencies require guidelines for sampling efforts that are adequate to address such questions.

Unfortunately, it is impossible to absolutely confirm that shortnose sturgeon no longer exist in a given system due to their life history and problems associated with sampling them. Shortnose sturgeon are long-lived (over 30 yrs) and do not spawn every year (Dadswell et al. 1984). Therefore, sampling over multiple years is needed to insure that a strong year class has not been missed. Moreover, sturgeon are rarely captured using traditional survey sampling, so specialized sampling methods in specific habitats are needed, particularly in systems where sturgeon are very rare. Even studies specifically designed to capture sturgeon can only confirm their presence, as negative data does not necessarily indicate that the fish are extirpated. However, given adequate sampling, an acceptable degree of confidence that the fish are extirpated (or functionally extirpated) can be gained. Based on the types and amounts of effort conducted in other systems to date, we developed the following sampling guidelines as the best available approach to assessing shortnose sturgeon presence in areas where they historically occurred.

Research Survey

The first step in any system is to conduct a literature survey and to contact people who currently or historically fished in the area using gear that captures sturgeon. Often museum records, archeological remains (scutes in middens), or patterns in historical collections can provide vital clues to appropriate areas and times to sample for shortnose sturgeon. Personal contact with local fishers is also essential. They can provide detailed information on exact sampling locations that were historically productive, tricks to effective use of gear, and observations on the timing of sturgeon movements. In addition, people currently fishing in the system may have recently captured shortnose sturgeon as bycatch and be willing to provide anecdotal information on these captures or actual specimens (Collins and Smith 1993, Moser and Ross 1993, Collins et al. 1996, Moser et al. 1998). The U.S. Fish and Wildlife Service has successfully obtained shortnose sturgeon specimens by offering monetary rewards for live fish in Chesapeake Bay (J. Skejeveland, Maryland Fisheries Resources, personal communication). While this technique may put more fish at risk or result in targeted fishing for sturgeon, the ability to enlist the help of commercial fishers greatly increases the chances of documenting the presence of fish in areas where they are thought to be extirpated.

Finally, prior to any fieldwork, literature from neighboring systems should be reviewed. Patterns of sturgeon habitat use and movements are similar over small spatial scales (Dadswell et al. 1984). By mapping suspected aggregation areas (spawning grounds, wintering areas, summering sites) from adjoining systems, sites to sample in the study area can be more accurately identified. Any available maps of water quality or bottom substrate in the study area should be collected to help identify likely spawning sites and aggregation areas.



Patterns of habitat use and movements of shortnose sturgeon vary latitudinally. Therefore, our recommendations for minimum sampling are divided into two main groups: 1) northern rivers where < 7°C water temperature regularly occurs in winter and temperatures occasionally reach >27°C in summer (Chesapeake drainages north), and 2) southern rivers where >27°C occurs regularly in summer and temperatures seldom drop below 7°C in winter (south of Chesapeake drainages).

Minimum Sampling Requirements in Northern Rivers

Northern rivers having sturgeon habitat can be subdivided into two groups: northerly (systems in Maine and Canada), and north central (Chesapeake drainages to Massachusetts). It is necessary to subdivide the northern region because sturgeon in the most northerly rivers exhibit a greater degree of anadromy, venturing into high salinity regions. Shortnose sturgeon in north central rivers spend more time in freshwater and make only short forays into relatively low salinity areas to feed (Dadswell et al. 1984, Kynard 1997).

Sampling in northerly rivers (Maine and Canada) should be conducted for a minimum of two years. Attempts should first be made to capture pre-spawning adult shortnose sturgeon at the base of the first dam or falls that they would encounter. This sampling should be conducted weekly for 8 - 10 weeks during early spring when water temperatures range from 8 – 18ºC. Four to six, 100 m, 15.2 cm (6") stretched mesh, stationary sinking gillnets should be set as recommended in the sampling protocol for at least two days each week and checked at least every 24 h (minimum sampling effort = 128, 100 m net days). In the event that no fish are captured in the first spring, sampling should be conducted in the estuary (1 – 12 ppt) along marsh edges and in tidal creeks that summer and the following summer. This sampling should occur weekly with four to six, 100 m, 15.2 cm (6") stretched mesh sinking gillnets (2 - 3 day/week) in June – August (8 - 10 weeks) when water temperatures range from 20 – 25°C (minimum sampling effort = 128, 100 m net days). Telemetry studies are recommended so that any fish captured in the estuary can be tracked to their river of origin.

Sampling in north central rivers (Chesapeake drainages to Merrimack River) should initially concentrate on capture of pre-spawning adults with gillnets at the base of the first dam or falls (protocol as described for northerly rivers) for two years (minimum sampling effort = 128, 100 m net days). If no fish are collected in the first spring, sampling efforts should be directed to likely aggregation areas that summer. Areas targeted should be between the saltwater/freshwater interface and the first dam or falls. Habitats sampled should include the deepest part of the water body in every curve and around each island (Kynard et al. in press). Sampling should continue weekly through two summers (June – October) using four to six, 100 m, 15.2 cm (6") stretched mesh sinking gillnets set for at least 3 days each week (soak times should be 24 h unless water temperature exceeds 27°C, see previous section on gillnet methodology).

Minimum Sampling Requirements in Southern Rivers

Adult and juvenile shortnose sturgeon in southern rivers aggregate in deep areas near the saltwater/freshwater interface in summer (Hall et al. 1990, Weber 1996, Moser and Ross 1995, Collins et al. in press). Sampling for shortnose sturgeon should initially be focused in these summer aggregation areas, but extreme caution must be exercised to avoid killing any fish captured during high water temperatures. Sampling should begin in summer when temperature exceeds 27°C (July in most southern rivers) and continue until the temperature drops below 27°C (October in most southern rivers).

Three sinking gillnets of 13 –14 cm stretched mesh (5 – 5.5 in) or trammel nets with 5 – 8 cm (2 – 3 in) stretched mesh inner panels and 35 cm (14 in) stretched mesh outer panels should be set as specified in this sampling protocol. Nets should be 100 m long, or else shorter nets with the equivalent combined length of 300 m should be used (e.g., six, 50 m nets). All nets should be set for 2 h during the slack tide (neap tides are preferred) in the deepest part of the water body near the upper extent of the salt wedge (0 - 3 ppt) or up to 2 km above the saltwater-freshwater interface. In deltaic systems there may be more than one area that fits this definition. In this case all candidate sites should be sampled in random order during the summer. Sampling should be conducted 3 times per week for 8 - 10 weeks (minimum sampling effort = 288 net hours).

If no shortnose sturgeon are collected in the first summer of sampling at the saltwater/freshwater interface, sampling for pre-spawning adults should be initiated at the base of the first dam or falls in January – April. Some rivers on the coastal plain do not present such obstacles to migration and possible aggregation areas are unknown. In such cases, likely spawning habitats based on research in other southern rivers (as identified in Hall et al. 1993) should be identified and sampled. Three, 100 m sinking gillnets of 13 –14 cm stretched mesh (5 – 5.5 cm) or 100 m trammel nets with 5 – 8 cm (2 – 3") stretched mesh inner panels and 35 cm (14") stretched mesh outer panels should be set bi-weekly as specified in the sampling protocol. In many upriver areas it may be necessary to use shorter nets, in which case their total length should equal 100 m. Sampling should be conducted for at least 8 weeks in two years, with three days of effort per week (24 h sets) from January until the water temperature exceeds 18°C (minimum sampling effort = 144, 100 m net days).

Conclusion

Sampling and handling procedures for Atlantic coast sturgeons have evolved over the past 30 years and differ among systems and sampling situations. Minimum sampling requirements also vary across systems. While we have addressed latitudinal differences in developing sampling guidelines, inter-system differences in sturgeon abundance can also affect minimum sampling requirements. The amount of effort required to document sturgeon presence is negatively correlated with sturgeon abundance (Figure 2). Therefore, we have attempted to provide conservative estimates of effort required so that sturgeon presence may be detected in systems where these fish are rare.

The minimum sampling protocols will certainly be affected by the availability of reliable anecdotal/historical information on sturgeon occurrence. With this information, sampling can be directed to specific sites within the protocol framework. We emphasize that obtaining this information is critically important. Sturgeon fishing has become an activity of the past, and sturgeon fishers are aging. When they die, a wealth of information about historical occurrences of sturgeon, movement patterns, and capture methods will be lost.

New sampling and handling methodologies may be developed on the basis of information from fishers or via research innovations and experimentation. We reiterate that this protocol is to serve as a current set of guidelines for use with Atlantic Coast sturgeons, and should in no way restrict testing of new techniques. However, we recommend that cultured sturgeon be used first when testing new and potentially harmful methods.

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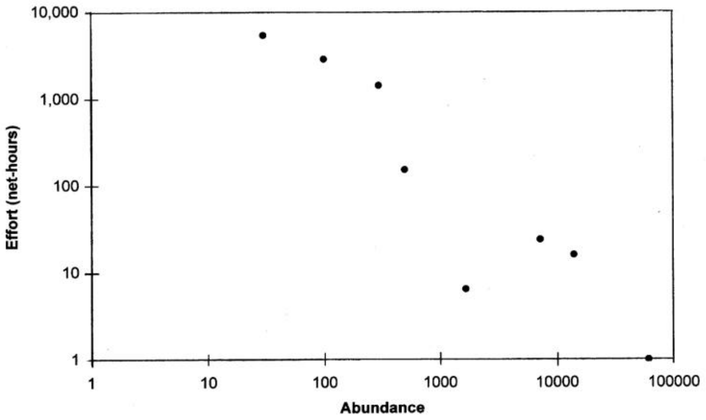

Figure 2. Effort expended (100 m gillnet set for 1 hour) to capture the first shortnose sturgeon in each of eight different systems vs. estimated shortnose sturgeon abundance in each system.

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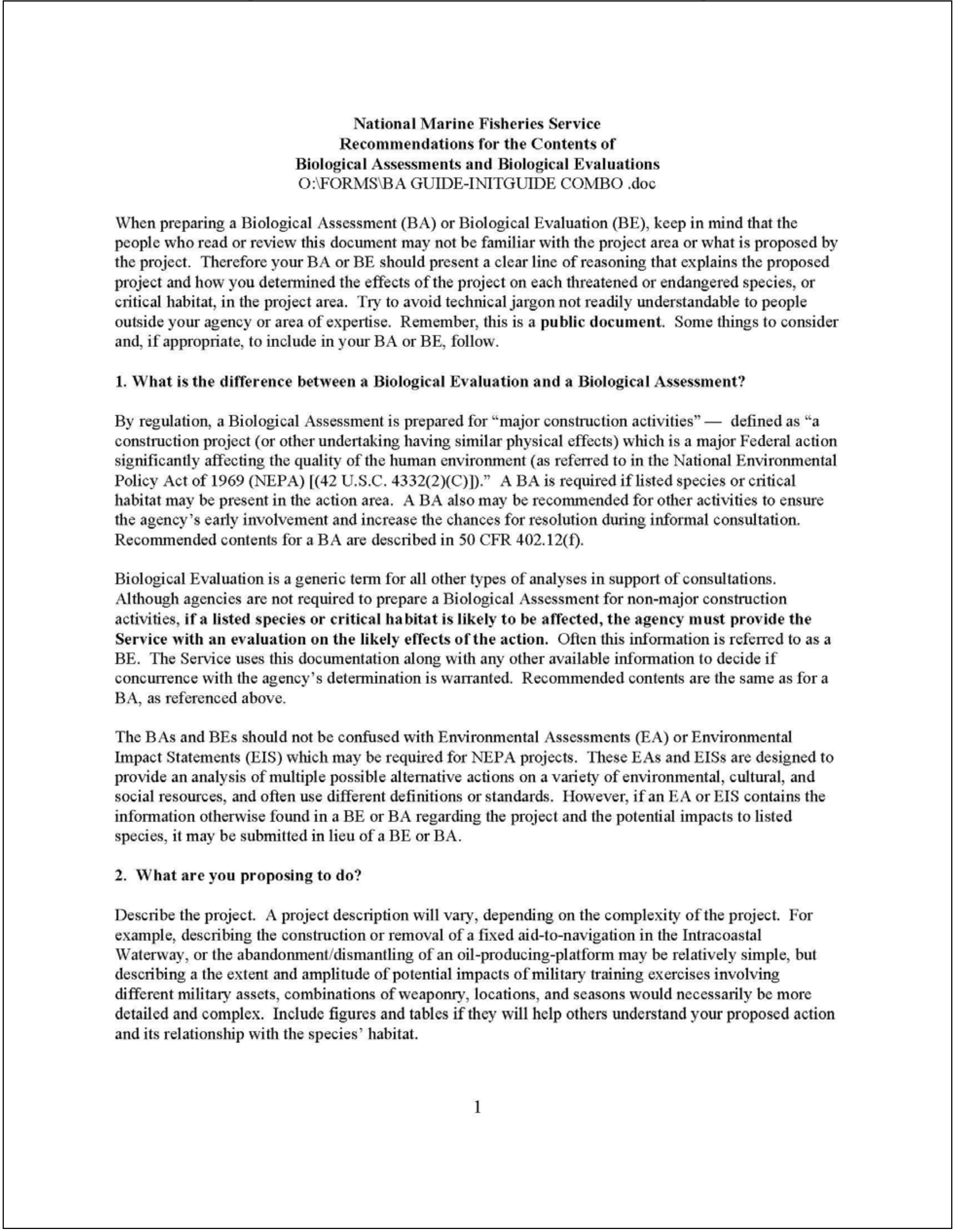
[Attachment 5 of e-mail from Andrew Herndon]



National Marine Fisheries Service
Recommendations for the Contents of Biological Assessments and Biological Evaluations

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When preparing a Biological Assessment (BA) or Biological Evaluation (BE), keep in mind that the people who read or review this document may not be familiar with the project area or what is proposed by the project. Therefore your BA or BE should present a clear line of reasoning that explains the proposed project and how you determined the effects of the project on each threatened or endangered species, or critical habitat, in the project area. Try to avoid technical jargon not readily understandable to people outside your agency or area of expertise. Remember, this is a **public document**. Some things to consider and, if appropriate, to include in your BA or BE, follow.

1. What is the difference between a Biological Evaluation and a Biological Assessment?

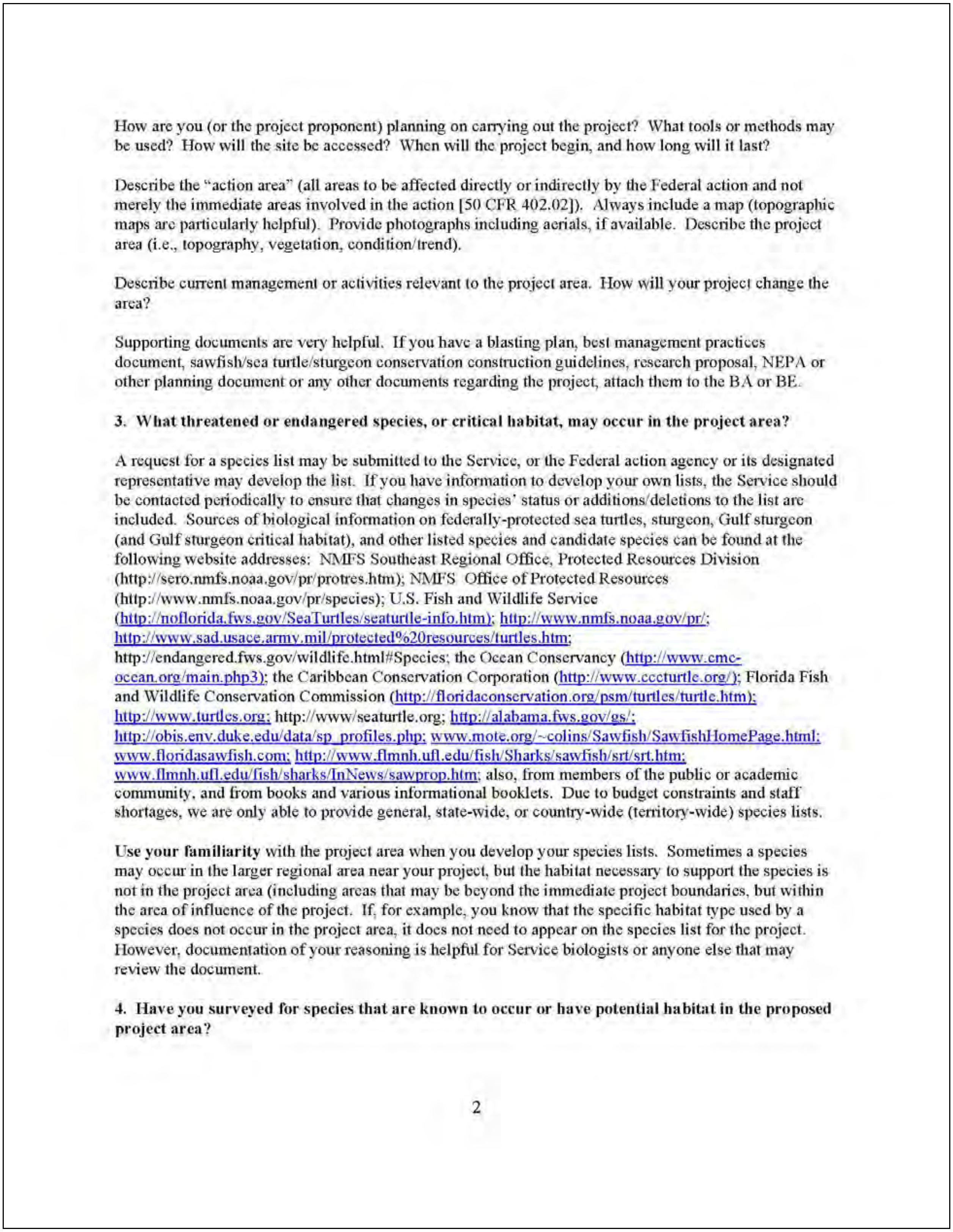
By regulation, a Biological Assessment is prepared for "major construction activities" — defined as "a construction project (or other undertaking having similar physical effects) which is a major Federal action significantly affecting the quality of the human environment (as referred to in the National Environmental Policy Act of 1969 (NEPA) [(42 U.S.C. 4332(2)(C)])." A BA is required if listed species or critical habitat may be present in the action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR 402.12(f).

Biological Evaluation is a generic term for all other types of analyses in support of consultations. Although agencies are not required to prepare a Biological Assessment for non-major construction activities, **if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action.** Often this information is referred to as a BE. The Service uses this documentation along with any other available information to decide if concurrence with the agency's determination is warranted. Recommended contents are the same as for a BA, as referenced above.

The BAs and BEs should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS) which may be required for NEPA projects. These EAs and EISs are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, and often use different definitions or standards. However, if an EA or EIS contains the information otherwise found in a BE or BA regarding the project and the potential impacts to listed species, it may be submitted in lieu of a BE or BA.

2. What are you proposing to do?

Describe the project. A project description will vary, depending on the complexity of the project. For example, describing the construction or removal of a fixed aid-to-navigation in the Intracoastal Waterway, or the abandonment/dismantling of an oil-producing-platform may be relatively simple, but describing a the extent and amplitude of potential impacts of military training exercises involving different military assets, combinations of weaponry, locations, and seasons would necessarily be more detailed and complex. Include figures and tables if they will help others understand your proposed action and its relationship with the species' habitat.



How are you (or the project proponent) planning on carrying out the project? What tools or methods may be used? How will the site be accessed? When will the project begin, and how long will it last?

Describe the "action area" (all areas to be affected directly or indirectly by the Federal action and not merely the immediate areas involved in the action [50 CFR 402.02]). Always include a map (topographic maps are particularly helpful). Provide photographs including aerials, if available. Describe the project area (i.e., topography, vegetation, condition/trend).

Describe current management or activities relevant to the project area. How will your project change the area?

Supporting documents are very helpful. If you have a blasting plan, best management practices document, sawfish/sea turtle/sturgeon conservation construction guidelines, research proposal, NEPA or other planning document or any other documents regarding the project, attach them to the BA or BE.

3. What threatened or endangered species, or critical habitat, may occur in the project area?

A request for a species list may be submitted to the Service, or the Federal action agency or its designated representative may develop the list. If you have information to develop your own lists, the Service should be contacted periodically to ensure that changes in species' status or additions/deletions to the list are included. Sources of biological information on federally-protected sea turtles, sturgeon, Gulf sturgeon (and Gulf sturgeon critical habitat), and other listed species and candidate species can be found at the following website addresses: NMFS Southeast Regional Office, Protected Resources Division (http://sero.nmfs.noaa.gov/pr/protres.htm); NMFS Office of Protected Resources (http://www.nmfs.noaa.gov/pr/species); U.S. Fish and Wildlife Service (http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm); http://www.nmfs.noaa.gov/pr/; http://www.sad.usace.army.mil/protected%20resources/turtles.htm; http://endangered.fws.gov/wildlife.html#Species; the Ocean Conservancy (http://www.cmc-ocean.org/main.php3); the Caribbean Conservation Corporation (http://www.cccturtle.org/); Florida Fish and Wildlife Conservation Commission (http://floridaconservation.org/psm/turtles/turtle.htm); http://www.turtles.org; http://www/seaturtle.org; http://alabama.fws.gov/gs/; http://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; http://www.flmnh.ufl.edu/fish/Sharks/sawfish/srt/srt.htm; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm; also, from members of the public or academic community, and from books and various informational booklets. Due to budget constraints and staff shortages, we are only able to provide general, state-wide, or country-wide (territory-wide) species lists.

Use **your familiarity** with the project area when you develop your species lists. Sometimes a species may occur in the larger regional area near your project, but the habitat necessary to support the species is not in the project area (including areas that may be beyond the immediate project boundaries, but within the area of influence of the project. If, for example, you know that the specific habitat type used by a species does not occur in the project area, it does not need to appear on the species list for the project. However, documentation of your reasoning is helpful for Service biologists or anyone else that may review the document.

4. Have you surveyed for species that are known to occur or have potential habitat in the proposed project area?

The "not known to occur here" approach is a common flaw in many BA/BEs. The operative word here is "known." Unless adequate surveys have been conducted or adequate information sources have been referenced, this statement is difficult to interpret. It begs the questions "Have you looked?" and "How have you looked?" Always reference your information sources.

Include a clear description of your survey methods so the reader can have confidence in your results. Answer such questions as:

How intensive was the survey? Did you look for suitable habitat or did you look for individuals? Did the survey cover the entire project area or only part of it? Include maps of areas surveyed if appropriate.

Who did the surveys and when? Was the survey done during the time of year/day when the plant is growing or when the animal can be found (its active period)? Did the survey follow accepted protocols?

If you are not sure how to do a good survey for the species, the Service recommends contacting species experts. Specialized training is required before you can obtain a permit to survey for some species.

Remember that your evaluation of potential impacts from a project does not end if the species is/are not found in the project area. You must still evaluate what effects would be expected to the habitat, even if it is not known to be occupied, because impacts to habitat that may result indirectly in death or injury to individuals of listed species would constitute "take".

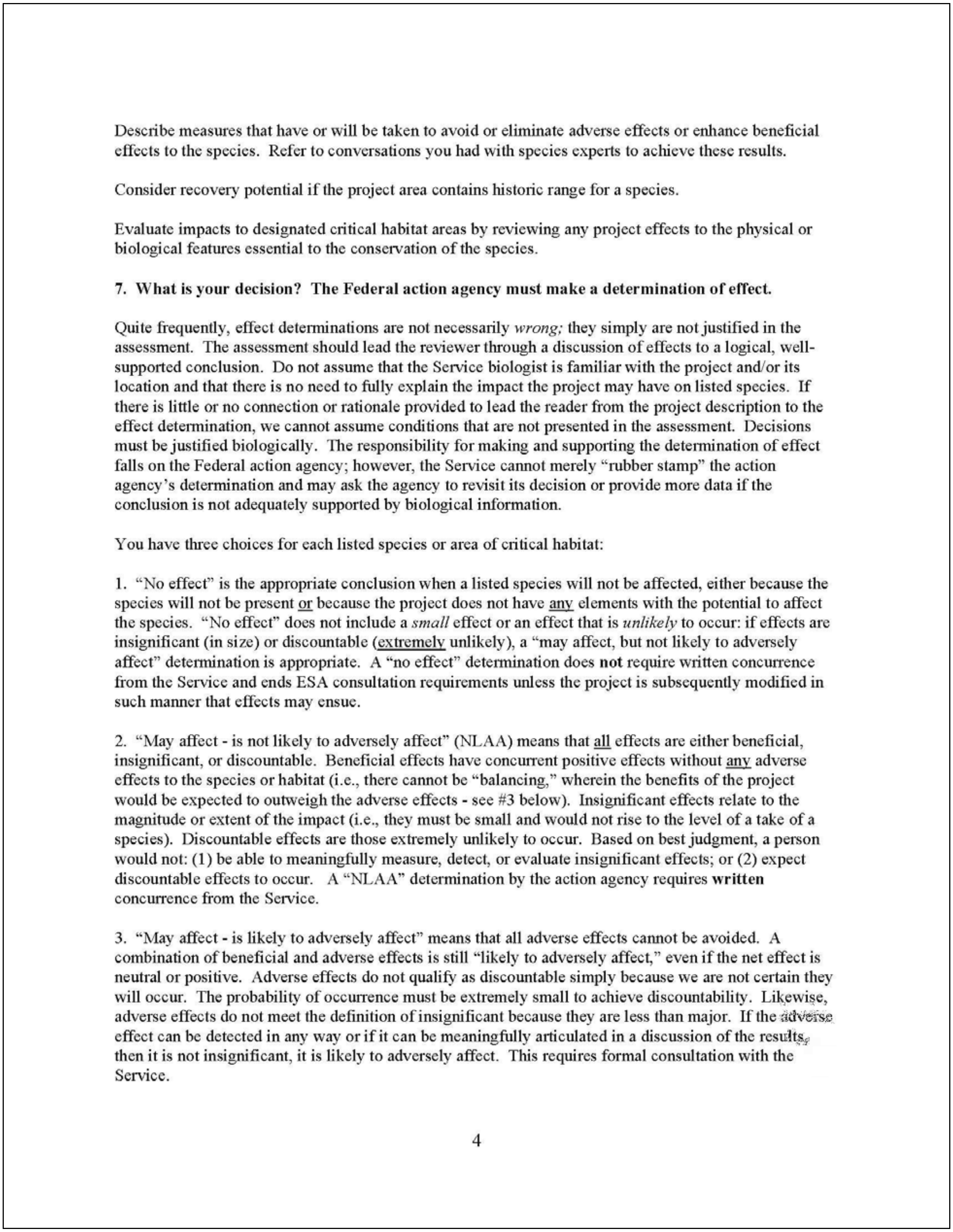
5. Provide background information on the threatened or endangered species in the project area.

Describe the species in terms of overall range and population status. How many populations are known? How many occur in the project area? What part of the population will be affected by this project? Will the population's viability be affected? What is the current habitat condition and population size and status? Describe related items of past management for the species, such as stocking programs, habitat improvements, or loss of habitat or individuals caused by previous projects.

6. How will the project affect the threatened or endangered species or critical habitat that occur in the project area?

If you believe the project will not affect the species, explain why. Effects analyses must include evaluating whether adverse impacts to species' habitats, whether designated or not, could indirectly harm or kill listed species.

If you think the project may affect the species, explain what the effects might be. The Endangered Species Act requires you consider all effects when determining if an action funded, permitted, or carried out by a Federal agency may affect listed species. Effects you must consider include direct, indirect, and cumulative effects. Effects include those caused by interrelated and interdependent actions, not just the proposed action. Direct effects are those caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the action under consideration. Interrelated or interdependent actions can include actions under the jurisdiction of other federal agencies, state agencies, or private parties. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal actions subject to consultation.



Describe measures that have or will be taken to avoid or eliminate adverse effects or enhance beneficial effects to the species. Refer to conversations you had with species experts to achieve these results.

Consider recovery potential if the project area contains historic range for a species.

Evaluate impacts to designated critical habitat areas by reviewing any project effects to the physical or biological features essential to the conservation of the species.

7. What is your decision? The Federal action agency must make a determination of effect.

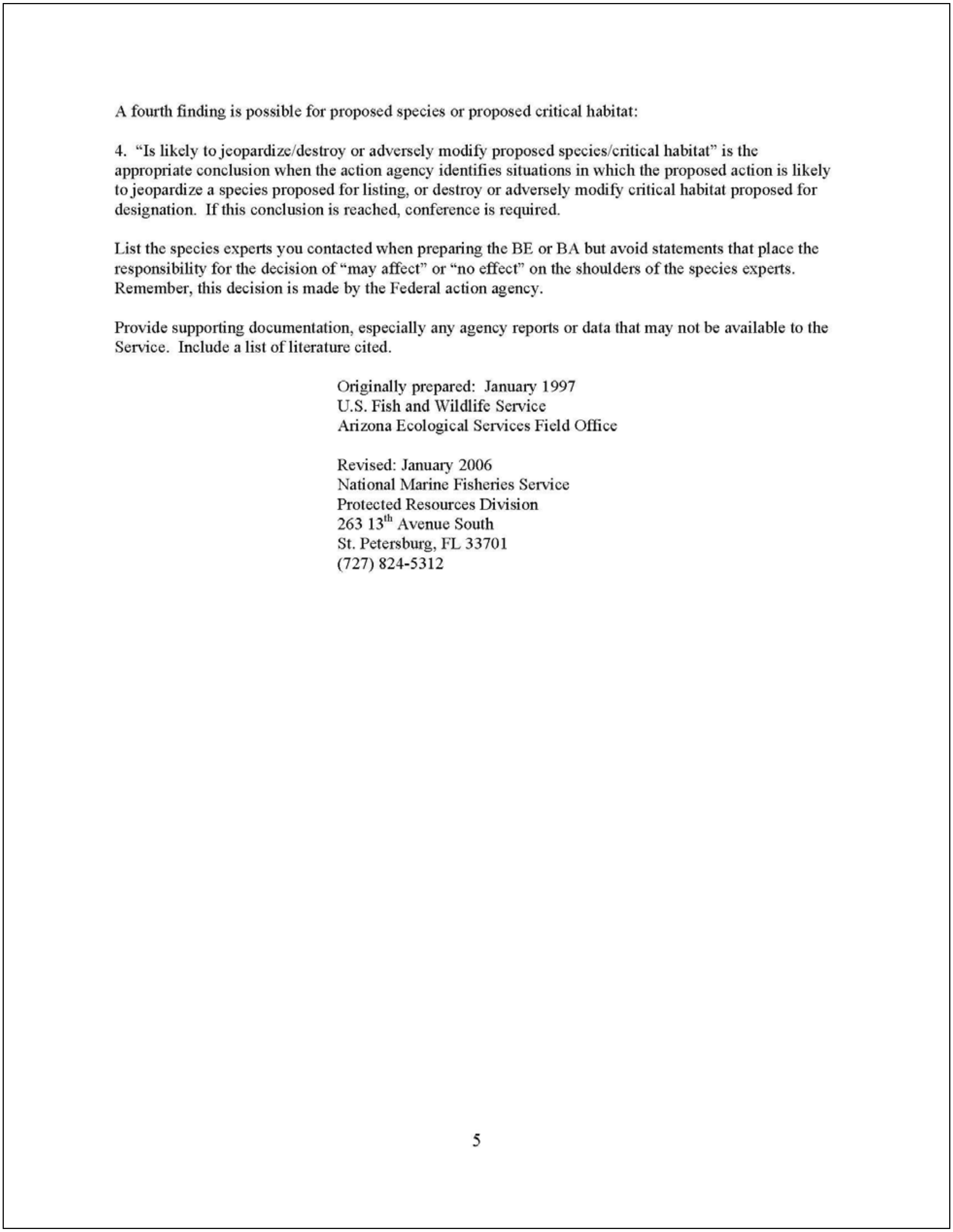
Quite frequently, effect determinations are not necessarily *wrong;* they simply are not justified in the assessment. The assessment should lead the reviewer through a discussion of effects to a logical, well-supported conclusion. Do not assume that the Service biologist is familiar with the project and/or its location and that there is no need to fully explain the impact the project may have on listed species. If there is little or no connection or rationale provided to lead the reader from the project description to the effect determination, we cannot assume conditions that are not presented in the assessment. Decisions must be justified biologically. The responsibility for making and supporting the determination of effect falls on the Federal action agency; however, the Service cannot merely "rubber stamp" the action agency's determination and may ask the agency to revisit its decision or provide more data if the conclusion is not adequately supported by biological information.

You have three choices for each listed species or area of critical habitat:

1. "No effect" is the appropriate conclusion when a listed species will not be affected, either because the species will not be present or because the project does not have any elements with the potential to affect the species. "No effect" does not include a *small* effect or an effect that is *unlikely* to occur: if effects are insignificant (in size) or discountable (extremely unlikely), a "may affect, but not likely to adversely affect" determination is appropriate. A "no effect" determination does **not** require written concurrence from the Service and ends ESA consultation requirements unless the project is subsequently modified in such manner that effects may ensue.

2. "May affect - is not likely to adversely affect" (NLAA) means that all effects are either beneficial, insignificant, or discountable. Beneficial effects have concurrent positive effects without any adverse effects to the species or habitat (i.e., there cannot be "balancing," wherein the benefits of the project would be expected to outweigh the adverse effects - see #3 below). Insignificant effects relate to the magnitude or extent of the impact (i.e., they must be small and would not rise to the level of a take of a species). Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. A "NLAA" determination by the action agency requires **written** concurrence from the Service.

3. "May affect - is likely to adversely affect" means that all adverse effects cannot be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect," even if the net effect is neutral or positive. Adverse effects do not qualify as discountable simply because we are not certain they will occur. The probability of occurrence must be extremely small to achieve discountability. Likewise, adverse effects do not meet the definition of insignificant because they are less than major. If the adverse effect can be detected in any way or if it can be meaningfully articulated in a discussion of the results, then it is not insignificant, it is likely to adversely affect. This requires formal consultation with the Service.



A fourth finding is possible for proposed species or proposed critical habitat:

4. "Is likely to jeopardize/destroy or adversely modify proposed species/critical habitat" is the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize a species proposed for listing, or destroy or adversely modify critical habitat proposed for designation. If this conclusion is reached, conference is required.

List the species experts you contacted when preparing the BE or BA but avoid statements that place the responsibility for the decision of "may affect" or "no effect" on the shoulders of the species experts. Remember, this decision is made by the Federal action agency.

Provide supporting documentation, especially any agency reports or data that may not be available to the Service. Include a list of literature cited.

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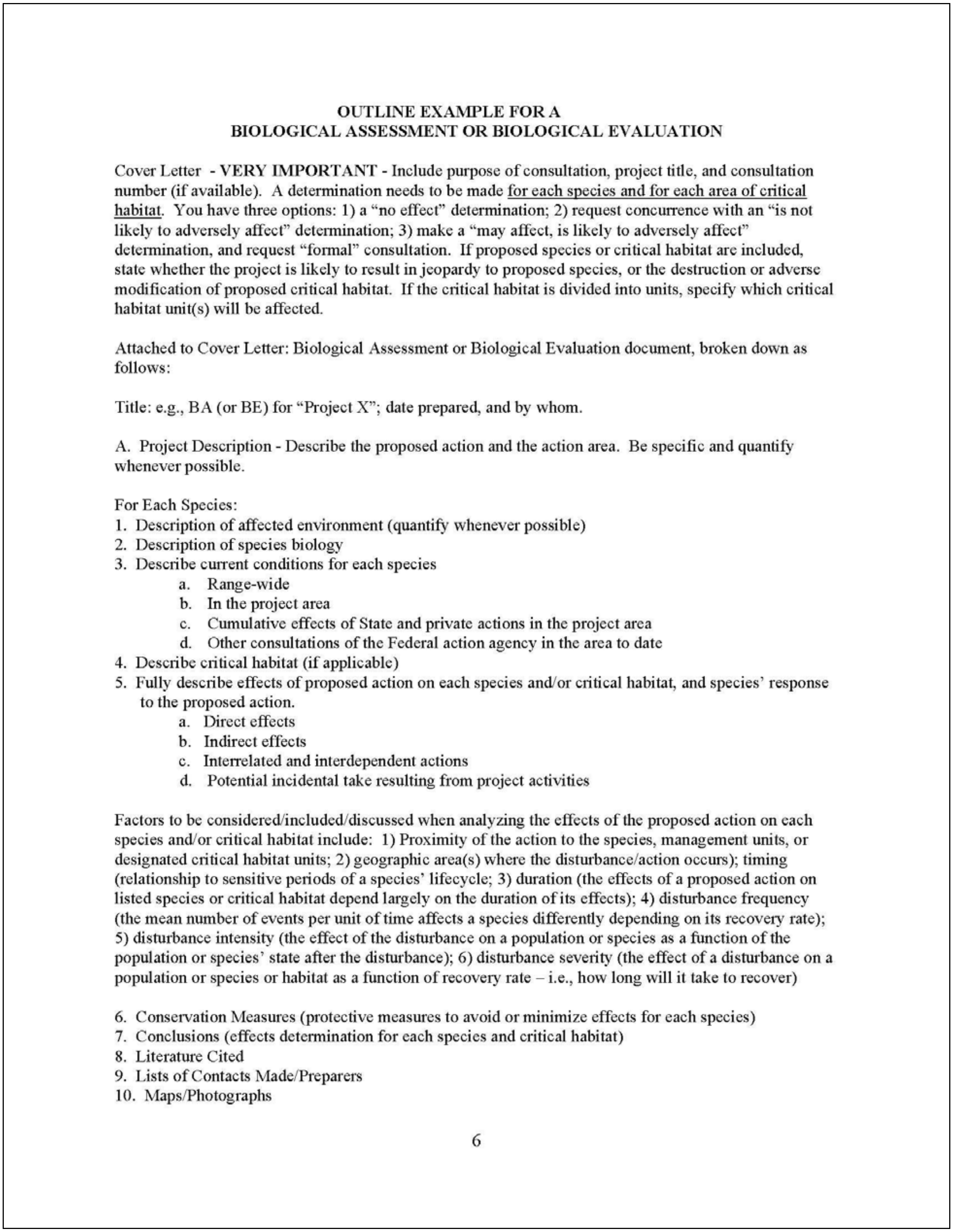


OUTLINE EXAMPLE FOR A
BIOLOGICAL ASSESSMENT OR BIOLOGICAL EVALUATION

Cover Letter - **VERY IMPORTANT** - Include purpose of consultation, project title, and consultation number (if available). A determination needs to be made for each species and for each area of critical habitat. You have three options: 1) a "no effect" determination; 2) request concurrence with an "is not likely to adversely affect" determination; 3) make a "may affect, is likely to adversely affect" determination, and request "formal" consultation. If proposed species or critical habitat are included, state whether the project is likely to result in jeopardy to proposed species, or the destruction or adverse modification of proposed critical habitat. If the critical habitat is divided into units, specify which critical habitat unit(s) will be affected.

Attached to Cover Letter: Biological Assessment or Biological Evaluation document, broken down as follows:

Title: e.g., BA (or BE) for "Project X"; date prepared, and by whom.

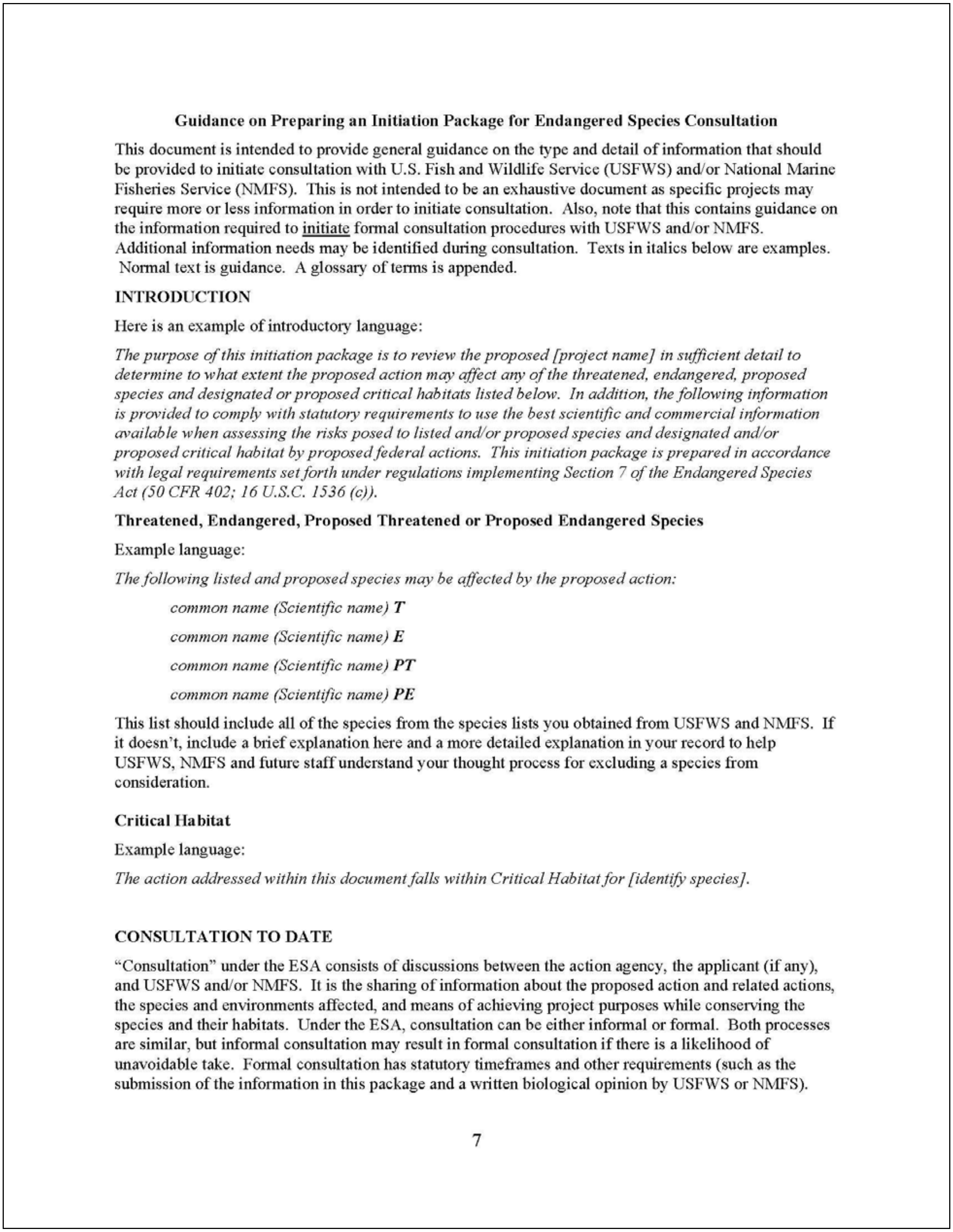
A. Project Description - Describe the proposed action and the action area. Be specific and quantify whenever possible.

For Each Species:
1. Description of affected environment (quantify whenever possible)
2. Description of species biology
3. Describe current conditions for each species
    a. Range-wide
    b. In the project area
    c. Cumulative effects of State and private actions in the project area
    d. Other consultations of the Federal action agency in the area to date
4. Describe critical habitat (if applicable)
5. Fully describe effects of proposed action on each species and/or critical habitat, and species' response to the proposed action.
    a. Direct effects
    b. Indirect effects
    c. Interrelated and interdependent actions
    d. Potential incidental take resulting from project activities

Factors to be considered/included/discussed when analyzing the effects of the proposed action on each species and/or critical habitat include: 1) Proximity of the action to the species, management units, or designated critical habitat units; 2) geographic area(s) where the disturbance/action occurs); timing (relationship to sensitive periods of a species' lifecycle; 3) duration (the effects of a proposed action on listed species or critical habitat depend largely on the duration of its effects); 4) disturbance frequency (the mean number of events per unit of time affects a species differently depending on its recovery rate); 5) disturbance intensity (the effect of the disturbance on a population or species as a function of the population or species' state after the disturbance); 6) disturbance severity (the effect of a disturbance on a population or species or habitat as a function of recovery rate – i.e., how long will it take to recover)

6. Conservation Measures (protective measures to avoid or minimize effects for each species)
7. Conclusions (effects determination for each species and critical habitat)
8. Literature Cited
9. Lists of Contacts Made/Preparers
10. Maps/Photographs

6



Guidance on Preparing an Initiation Package for Endangered Species Consultation

This document is intended to provide general guidance on the type and detail of information that should be provided to initiate consultation with U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS). This is not intended to be an exhaustive document as specific projects may require more or less information in order to initiate consultation. Also, note that this contains guidance on the information required to initiate formal consultation procedures with USFWS and/or NMFS. Additional information needs may be identified during consultation. Texts in italics below are examples. Normal text is guidance. A glossary of terms is appended.

INTRODUCTION

Here is an example of introductory language:

The purpose of this initiation package is to review the proposed [project name] in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, proposed species and designated or proposed critical habitats listed below. In addition, the following information is provided to comply with statutory requirements to use the best scientific and commercial information available when assessing the risks posed to listed and/or proposed species and designated and/or proposed critical habitat by proposed federal actions. This initiation package is prepared in accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (50 CFR 402; 16 U.S.C. 1536 (c)).

Threatened, Endangered, Proposed Threatened or Proposed Endangered Species

Example language:

The following listed and proposed species may be affected by the proposed action:

common name (Scientific name) ***T***

common name (Scientific name) ***E***

common name (Scientific name) ***PT***

common name (Scientific name) ***PE***

This list should include all of the species from the species lists you obtained from USFWS and NMFS. If it doesn't, include a brief explanation here and a more detailed explanation in your record to help USFWS, NMFS and future staff understand your thought process for excluding a species from consideration.

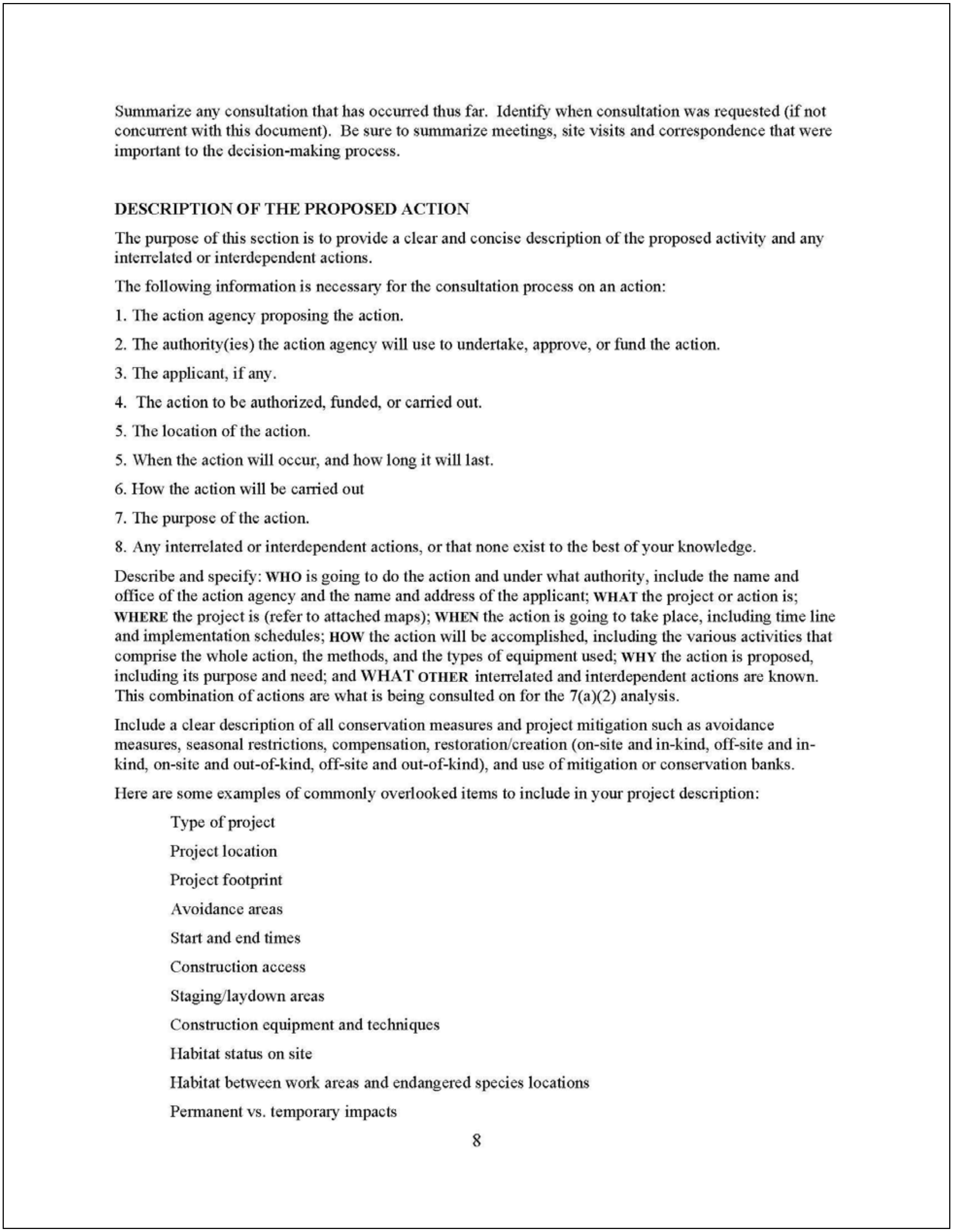
Critical Habitat

Example language:

The action addressed within this document falls within Critical Habitat for [identify species].

CONSULTATION TO DATE

"Consultation" under the ESA consists of discussions between the action agency, the applicant (if any), and USFWS and/or NMFS. It is the sharing of information about the proposed action and related actions, the species and environments affected, and means of achieving project purposes while conserving the species and their habitats. Under the ESA, consultation can be either informal or formal. Both processes are similar, but informal consultation may result in formal consultation if there is a likelihood of unavoidable take. Formal consultation has statutory timeframes and other requirements (such as the submission of the information in this package and a written biological opinion by USFWS or NMFS).



Summarize any consultation that has occurred thus far. Identify when consultation was requested (if not concurrent with this document). Be sure to summarize meetings, site visits and correspondence that were important to the decision-making process.

DESCRIPTION OF THE PROPOSED ACTION

The purpose of this section is to provide a clear and concise description of the proposed activity and any interrelated or interdependent actions.

The following information is necessary for the consultation process on an action:

1. The action agency proposing the action.
2. The authority(ies) the action agency will use to undertake, approve, or fund the action.
3. The applicant, if any.
4. The action to be authorized, funded, or carried out.
5. The location of the action.
5. When the action will occur, and how long it will last.
6. How the action will be carried out
7. The purpose of the action.
8. Any interrelated or interdependent actions, or that none exist to the best of your knowledge.

Describe and specify: **WHO** is going to do the action and under what authority, include the name and office of the action agency and the name and address of the applicant; **WHAT** the project or action is; **WHERE** the project is (refer to attached maps); **WHEN** the action is going to take place, including time line and implementation schedules; **HOW** the action will be accomplished, including the various activities that comprise the whole action, the methods, and the types of equipment used; **WHY** the action is proposed, including its purpose and need; and **WHAT OTHER** interrelated and interdependent actions are known. This combination of actions are what is being consulted on for the 7(a)(2) analysis.

Include a clear description of all conservation measures and project mitigation such as avoidance measures, seasonal restrictions, compensation, restoration/creation (on-site and in-kind, off-site and in-kind, on-site and out-of-kind, off-site and out-of-kind), and use of mitigation or conservation banks.

Here are some examples of commonly overlooked items to include in your project description:

Type of project

Project location

Project footprint

Avoidance areas

Start and end times

Construction access

Staging/laydown areas

Construction equipment and techniques

Habitat status on site

Habitat between work areas and endangered species locations

Permanent vs. temporary impacts

Surrounding land-use

Hydrology and drainage patterns

Duration of "temporary" impacts

Prevailing winds and expected seasonal shifts

Restoration areas

Conservation measures

Compensation and set-asides

Bank ratios and amounts

Mitigation: what kind and who is responsible?

Dust, erosion, and sedimentation controls

Whether the project is growth-inducing or facilitates growth

Whether the project is part of a larger project or plan

What permits will need to be obtained

Action Area

Describe all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. This includes any interrelated and interdependent actions. Remember that the action area is not based simply on the Federal action and should not be limited to the location of the Federal action. The same applies to the applicant's action. The action area is defined by measurable or detectable changes in land, air and water, or to other measurable factors that may elicit a response in the species or critical habitat.

To determine the action area, we recommend that you first break the action down into its components (*e.g.*, vegetation clearing, construction of cofferdams, storage areas, borrow areas, operations, maintenance, etc.,) to assess the potential impacts resulting from each component.

Determine the impacts that are expected to result from each component. For example, instream actions may mobilize sediments that travel downstream as increased turbidity and then settle out as sediments on the stream substrate. Sound levels from machinery may be detectable hundreds of feet, thousands of feet, or even miles away. Use these distances when delineating the extent of your action area. Note: don't forget to subsequently reconstruct the action to assess the combined stressors of the components. You may find that some stressors are synergistically minimized or avoided, whereas other stressors may increase.

Finally, describe the action area, including features and habitat types. Include photographs and an area map as well as a vicinity map. The vicinity map for terrestrial projects should be at a 1:24,000 scale with the USGS quad name included.

SPECIES ACCOUNTS AND STATUS OF THE SPECIES IN THE ACTION AREA

Provide local information on affected individuals and populations, such as presence, numbers, life history, etc. Identify which threats to the species' persistence identified at the time of listing are likely to be present in the action area. Identify any additional threats that are likely to be present in the action area.

If the species has a distribution that is constrained by limiting factors, identify where in the action area factors are present that could support the species and where they are absent or limiting. For example, if a species is limited to a narrow thermal range and a narrow humidity range, show where in the action area the temperatures are sufficient to support the species, where the humidity is sufficient to support the species, and where those areas overlap.

Include aspects of the species' biology that relate to the impact of the action, such as sensitivity to or tolerance of: noise, light, heat, cold, inundation, smoke, sediments, dust, etc. For example, if the species is sensitive to loud sounds or vibration, and your project involves loud tools or equipment, reference that aspect of their biology. Include citations for all sources of information

Describe habitat use in terms of breeding, feeding, and sheltering. Describe habitat condition and habitat designations such as: critical habitat (provide unit name or number, if applicable), essential habitat, important habitat, recovery area, recovery unit (provide unit name or number, if applicable). Also discuss habitat use patterns, including seasonal use and migration (if relevant), and identify habitat needs.

Identify and quantify the listed-species habitat remaining in the action area. GIS layers are useful here, as are land ownership patterns--especially local land trusts and open space designations.

Identify any recovery plan implementation that is occurring in the action area, especially priority one action items from recovery plans.

Include survey information. For all monitoring and survey reports, please clearly identify how it was done, when, where, and by whom. If survey protocols were followed, reference the name and date of the protocol. If survey protocols were modified, provide an explanation of how the surveying occurred and the reasoning for modifying the protocol.

Keep it relevant. It is unnecessary to discuss biology that is totally unrelated to project impacts--*e.g.*, discussion of pelage color, teat number, and number of digits fore and aft when the project is a seasonal wetland establishment.

Utilize the best scientific and commercial information available. Use and cite recent publications/journal articles/agency data and technical reports. Include local information, relative to the action area, views of recognized experts, results from recent studies, and information on life history, population dynamics, trends and distribution. Reference field notes, unpublished data, research in progress, etc.

Things to consider:

Existing threats to species

Fragmentation

Urban growth area

Drainage patterns

Information on local sightings and populations

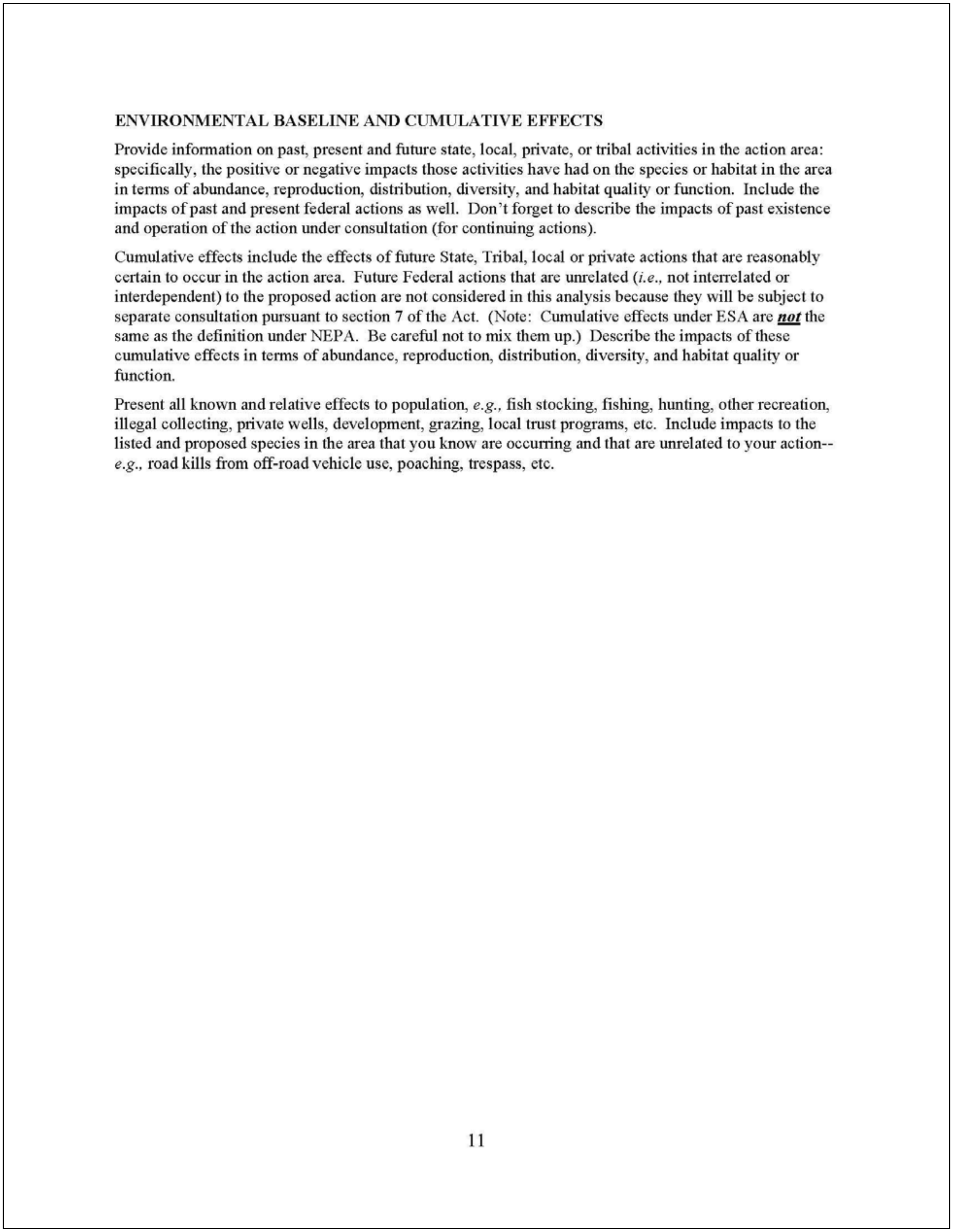
Population trends

Home range and dispersal

Sensitivity of endangered species to: dust, noise, head, desiccation, etc.

Trap stress/mortality

Predators



ENVIRONMENTAL BASELINE AND CUMULATIVE EFFECTS

Provide information on past, present and future state, local, private, or tribal activities in the action area: specifically, the positive or negative impacts those activities have had on the species or habitat in the area in terms of abundance, reproduction, distribution, diversity, and habitat quality or function. Include the impacts of past and present federal actions as well. Don't forget to describe the impacts of past existence and operation of the action under consultation (for continuing actions).

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated (*i.e.,* not interrelated or interdependent) to the proposed action are not considered in this analysis because they will be subject to separate consultation pursuant to section 7 of the Act. (Note: Cumulative effects under ESA are ***not*** the same as the definition under NEPA. Be careful not to mix them up.) Describe the impacts of these cumulative effects in terms of abundance, reproduction, distribution, diversity, and habitat quality or function.

Present all known and relative effects to population, *e.g.,* fish stocking, fishing, hunting, other recreation, illegal collecting, private wells, development, grazing, local trust programs, etc. Include impacts to the listed and proposed species in the area that you know are occurring and that are unrelated to your action-- *e.g.,* road kills from off-road vehicle use, poaching, trespass, etc.

EFFECTS OF THE ACTION

The purpose of this section is to document your analysis of the potential impacts the proposed action will have on species and/or critical habitats. This analysis has two possible conclusions for listed species and designated critical habitat:

(1) May Affect, Not Likely to Adversely Affect – the appropriate conclusion when effects on a listed species are expected to be *discountable*, *insignificant*, or completely *beneficial*.

Beneficial effects – contemporaneous positive effects without any adverse effects

Insignificant effects – relate to the size of the impact and should never reach the scale where take would occur.

Discountable effects – those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

(2) May Affect, Likely to Adversely Affect – the appropriate finding if *any* adverse effect may occur to listed species or critical habitat as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

A finding of "may affect" is the primary trigger for initiating section 7 consultation. Further analysis leads to one of the two conclusions above. In the case of a determination that an action is "not likely to adversely affect" a species or critical habitat, you can request USFWS and/or NMFS concurrence with this determination and consultation can be concluded upon receipt of our concurrence. Determinations of "likely to adversely affect" require further consultation between the action agency and USFWS and NMFS. These consultations typically lead to the preparation of a biological opinion, although they can also lead to incorporation of additional protective measures that render the project "not likely to adversely affect" listed species or designated critical habitat. Any actions that are likely to result in the incidental take of a listed species are automatically considered "likely to adversely affect."

In the case of proposed species or proposed critical habitat, the possible conclusions are:

Species

Likely to Jeopardize the Continued Existence

Not Likely to Jeopardize the Continued Existence

Critical Habitat

Likely to Destroy or Adversely Modify

Not Likely to Destroy or Adversely Modify

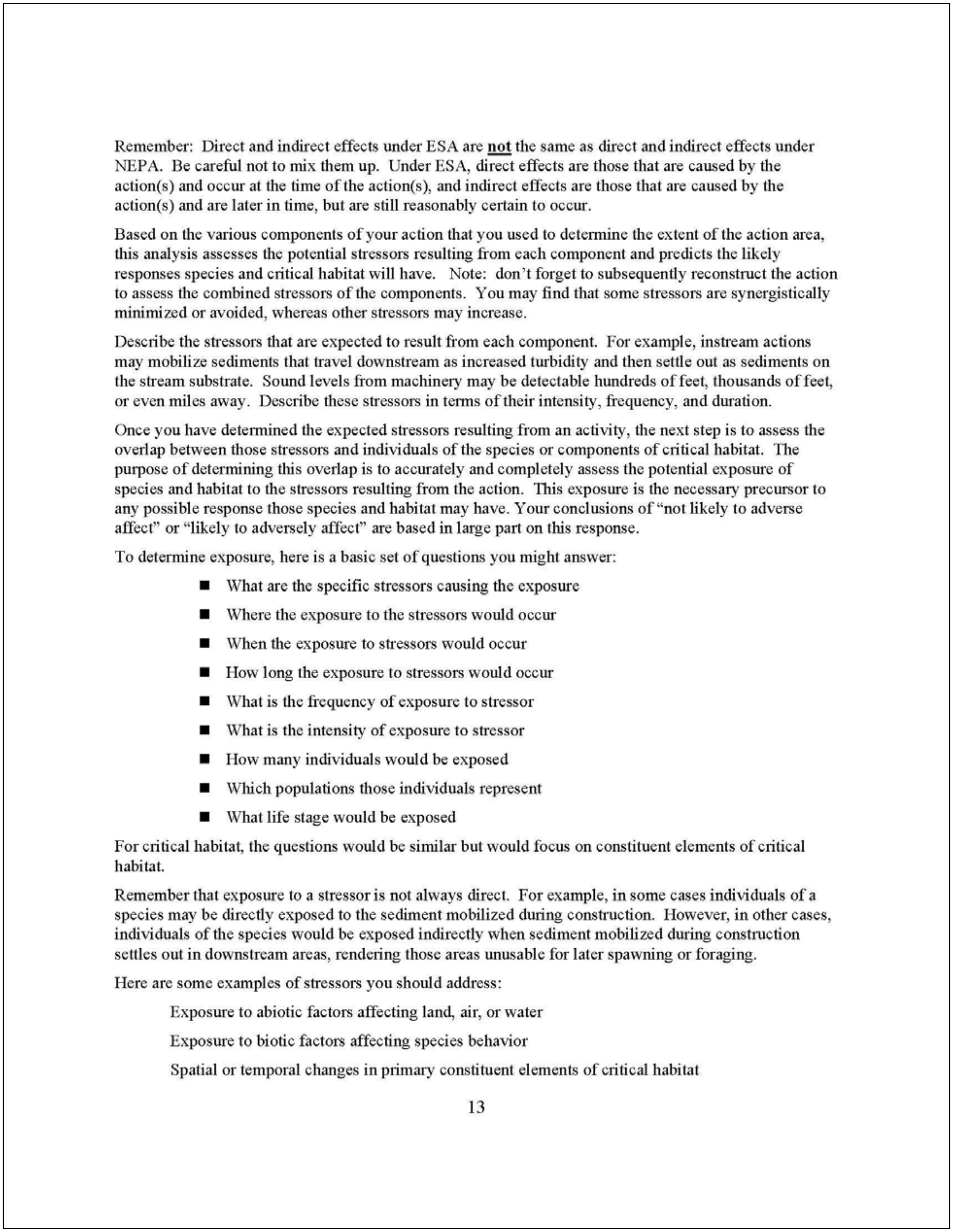
The effects analysis includes assessment of:

Direct and indirect effects (stressors) of Federal action

Direct and indirect effects (stressors) of applicant's action

Direct and indirect effects (stressors) of interrelated or interdependent actions

Direct and indirect effects (stressors) of conservation and minimization measures



Remember: Direct and indirect effects under ESA are **not** the same as direct and indirect effects under NEPA. Be careful not to mix them up. Under ESA, direct effects are those that are caused by the action(s) and occur at the time of the action(s), and indirect effects are those that are caused by the action(s) and are later in time, but are still reasonably certain to occur.

Based on the various components of your action that you used to determine the extent of the action area, this analysis assesses the potential stressors resulting from each component and predicts the likely responses species and critical habitat will have. Note: don't forget to subsequently reconstruct the action to assess the combined stressors of the components. You may find that some stressors are synergistically minimized or avoided, whereas other stressors may increase.

Describe the stressors that are expected to result from each component. For example, instream actions may mobilize sediments that travel downstream as increased turbidity and then settle out as sediments on the stream substrate. Sound levels from machinery may be detectable hundreds of feet, thousands of feet, or even miles away. Describe these stressors in terms of their intensity, frequency, and duration.

Once you have determined the expected stressors resulting from an activity, the next step is to assess the overlap between those stressors and individuals of the species or components of critical habitat. The purpose of determining this overlap is to accurately and completely assess the potential exposure of species and habitat to the stressors resulting from the action. This exposure is the necessary precursor to any possible response those species and habitat may have. Your conclusions of "not likely to adverse affect" or "likely to adversely affect" are based in large part on this response.

To determine exposure, here is a basic set of questions you might answer:

- What are the specific stressors causing the exposure
- Where the exposure to the stressors would occur
- When the exposure to stressors would occur
- How long the exposure to stressors would occur
- What is the frequency of exposure to stressor
- What is the intensity of exposure to stressor
- How many individuals would be exposed
- Which populations those individuals represent
- What life stage would be exposed

For critical habitat, the questions would be similar but would focus on constituent elements of critical habitat.

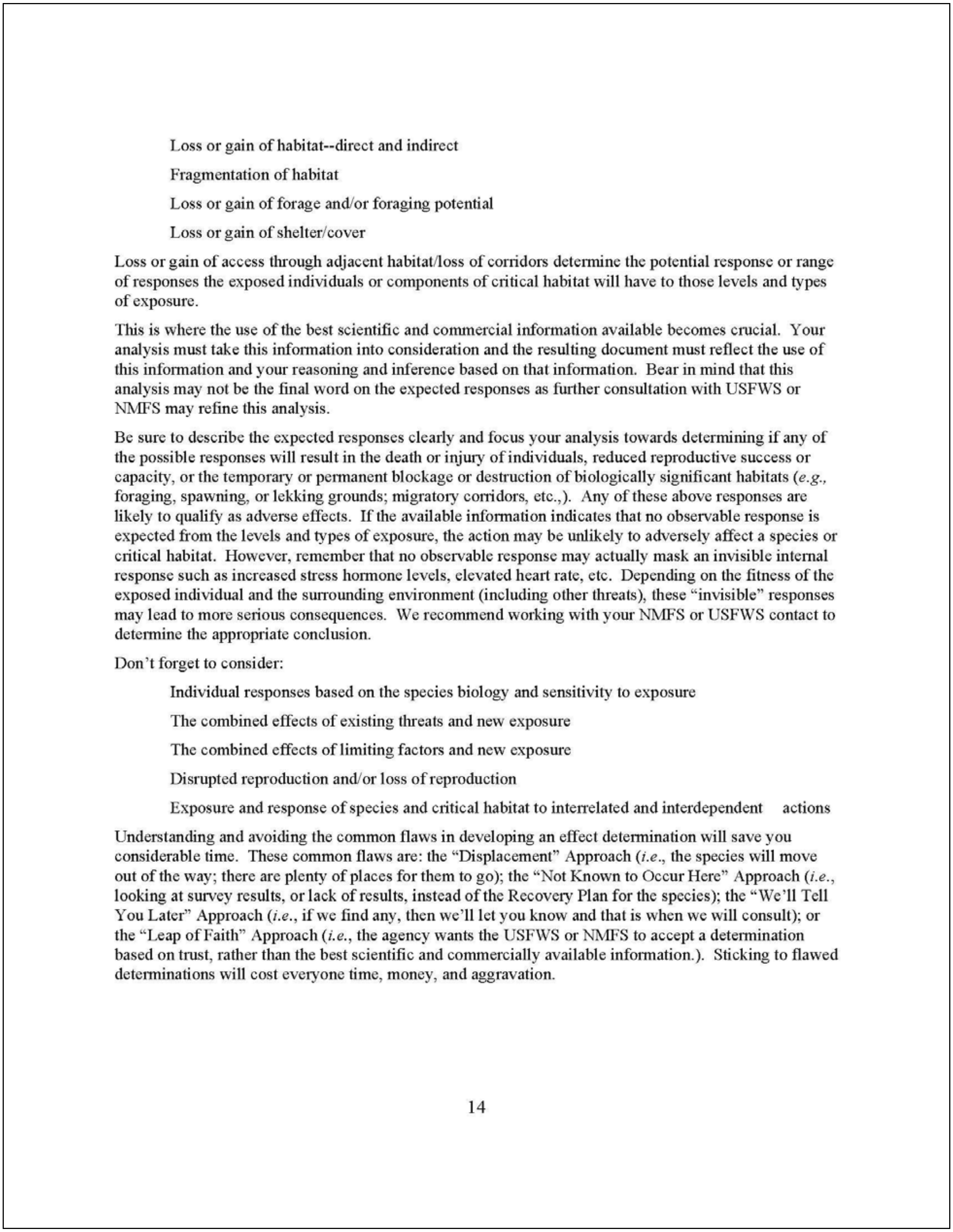
Remember that exposure to a stressor is not always direct. For example, in some cases individuals of a species may be directly exposed to the sediment mobilized during construction. However, in other cases, individuals of the species would be exposed indirectly when sediment mobilized during construction settles out in downstream areas, rendering those areas unusable for later spawning or foraging.

Here are some examples of stressors you should address:

Exposure to abiotic factors affecting land, air, or water

Exposure to biotic factors affecting species behavior

Spatial or temporal changes in primary constituent elements of critical habitat



Loss or gain of habitat--direct and indirect

Fragmentation of habitat

Loss or gain of forage and/or foraging potential

Loss or gain of shelter/cover

Loss or gain of access through adjacent habitat/loss of corridors determine the potential response or range of responses the exposed individuals or components of critical habitat will have to those levels and types of exposure.

This is where the use of the best scientific and commercial information available becomes crucial. Your analysis must take this information into consideration and the resulting document must reflect the use of this information and your reasoning and inference based on that information. Bear in mind that this analysis may not be the final word on the expected responses as further consultation with USFWS or NMFS may refine this analysis.

Be sure to describe the expected responses clearly and focus your analysis towards determining if any of the possible responses will result in the death or injury of individuals, reduced reproductive success or capacity, or the temporary or permanent blockage or destruction of biologically significant habitats (*e.g.,* foraging, spawning, or lekking grounds; migratory corridors, etc.,). Any of these above responses are likely to qualify as adverse effects. If the available information indicates that no observable response is expected from the levels and types of exposure, the action may be unlikely to adversely affect a species or critical habitat. However, remember that no observable response may actually mask an invisible internal response such as increased stress hormone levels, elevated heart rate, etc. Depending on the fitness of the exposed individual and the surrounding environment (including other threats), these "invisible" responses may lead to more serious consequences. We recommend working with your NMFS or USFWS contact to determine the appropriate conclusion.

Don't forget to consider:

Individual responses based on the species biology and sensitivity to exposure

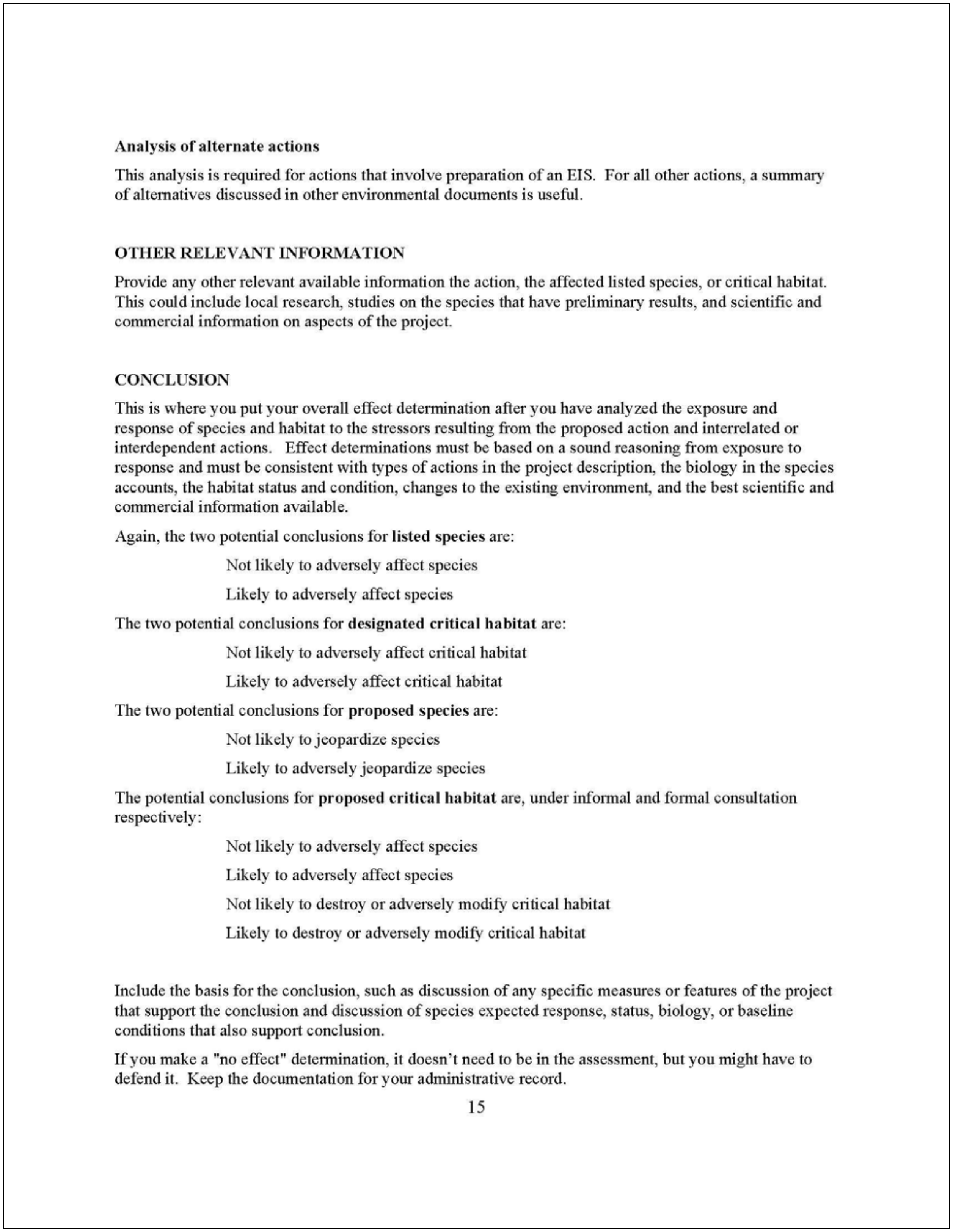
The combined effects of existing threats and new exposure

The combined effects of limiting factors and new exposure

Disrupted reproduction and/or loss of reproduction

Exposure and response of species and critical habitat to interrelated and interdependent actions

Understanding and avoiding the common flaws in developing an effect determination will save you considerable time. These common flaws are: the "Displacement" Approach (*i.e*., the species will move out of the way; there are plenty of places for them to go); the "Not Known to Occur Here" Approach (*i.e.*, looking at survey results, or lack of results, instead of the Recovery Plan for the species); the "We'll Tell You Later" Approach (*i.e.*, if we find any, then we'll let you know and that is when we will consult); or the "Leap of Faith" Approach (*i.e.*, the agency wants the USFWS or NMFS to accept a determination based on trust, rather than the best scientific and commercially available information.). Sticking to flawed determinations will cost everyone time, money, and aggravation.



Analysis of alternate actions

This analysis is required for actions that involve preparation of an EIS. For all other actions, a summary of alternatives discussed in other environmental documents is useful.

OTHER RELEVANT INFORMATION

Provide any other relevant available information the action, the affected listed species, or critical habitat. This could include local research, studies on the species that have preliminary results, and scientific and commercial information on aspects of the project.

CONCLUSION

This is where you put your overall effect determination after you have analyzed the exposure and response of species and habitat to the stressors resulting from the proposed action and interrelated or interdependent actions. Effect determinations must be based on a sound reasoning from exposure to response and must be consistent with types of actions in the project description, the biology in the species accounts, the habitat status and condition, changes to the existing environment, and the best scientific and commercial information available.

Again, the two potential conclusions for **listed species** are:

Not likely to adversely affect species

Likely to adversely affect species

The two potential conclusions for **designated critical habitat** are:

Not likely to adversely affect critical habitat

Likely to adversely affect critical habitat

The two potential conclusions for **proposed species** are:

Not likely to jeopardize species

Likely to adversely jeopardize species

The potential conclusions for **proposed critical habitat** are, under informal and formal consultation respectively:

Not likely to adversely affect species

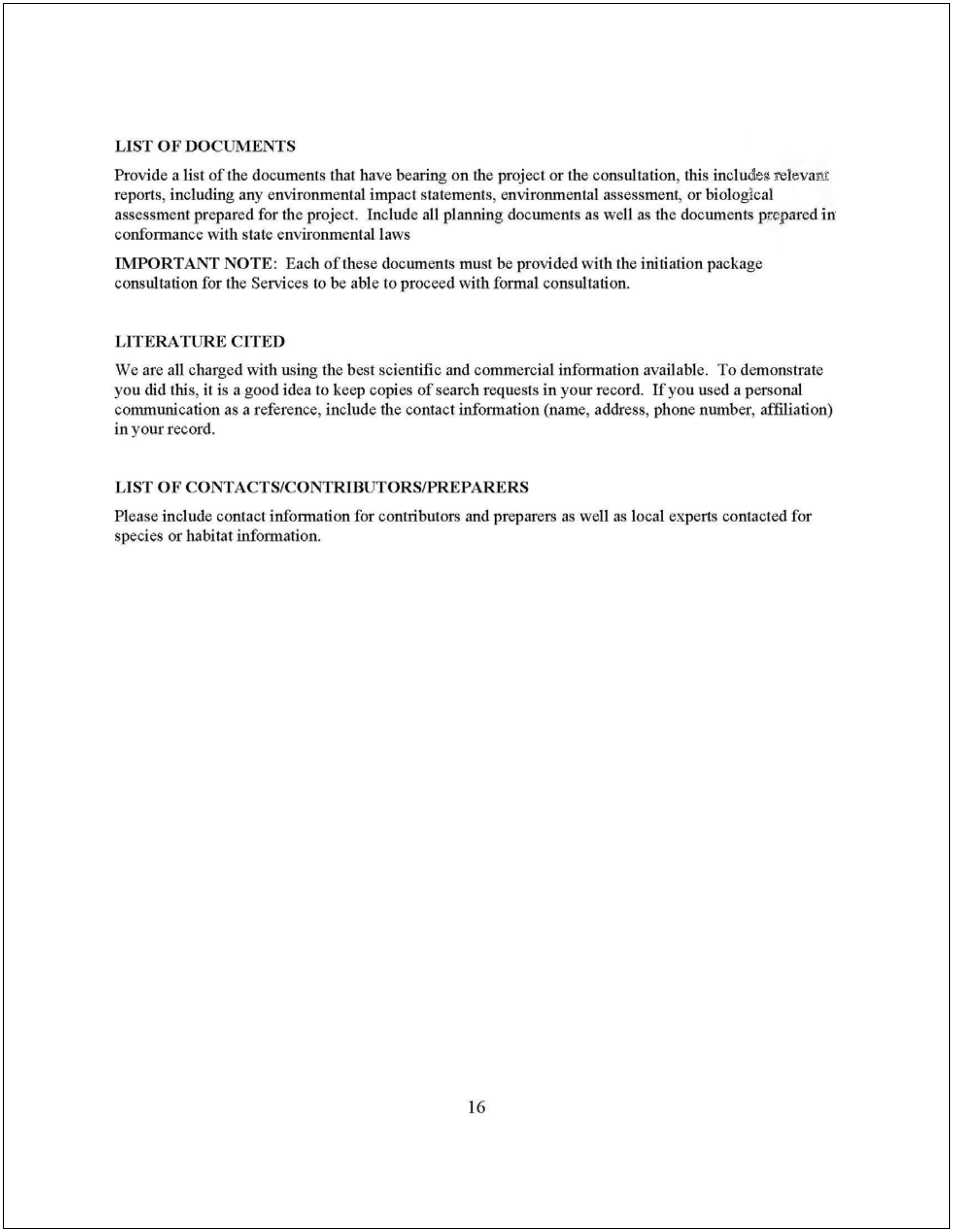
Likely to adversely affect species

Not likely to destroy or adversely modify critical habitat

Likely to destroy or adversely modify critical habitat

Include the basis for the conclusion, such as discussion of any specific measures or features of the project that support the conclusion and discussion of species expected response, status, biology, or baseline conditions that also support conclusion.

If you make a "no effect" determination, it doesn't need to be in the assessment, but you might have to defend it. Keep the documentation for your administrative record.



LIST OF DOCUMENTS

Provide a list of the documents that have bearing on the project or the consultation, this includes relevant reports, including any environmental impact statements, environmental assessment, or biological assessment prepared for the project. Include all planning documents as well as the documents prepared in conformance with state environmental laws

IMPORTANT NOTE: Each of these documents must be provided with the initiation package consultation for the Services to be able to proceed with formal consultation.

LITERATURE CITED

We are all charged with using the best scientific and commercial information available. To demonstrate you did this, it is a good idea to keep copies of search requests in your record. If you used a personal communication as a reference, include the contact information (name, address, phone number, affiliation) in your record.

LIST OF CONTACTS/CONTRIBUTORS/PREPARERS

Please include contact information for contributors and preparers as well as local experts contacted for species or habitat information.

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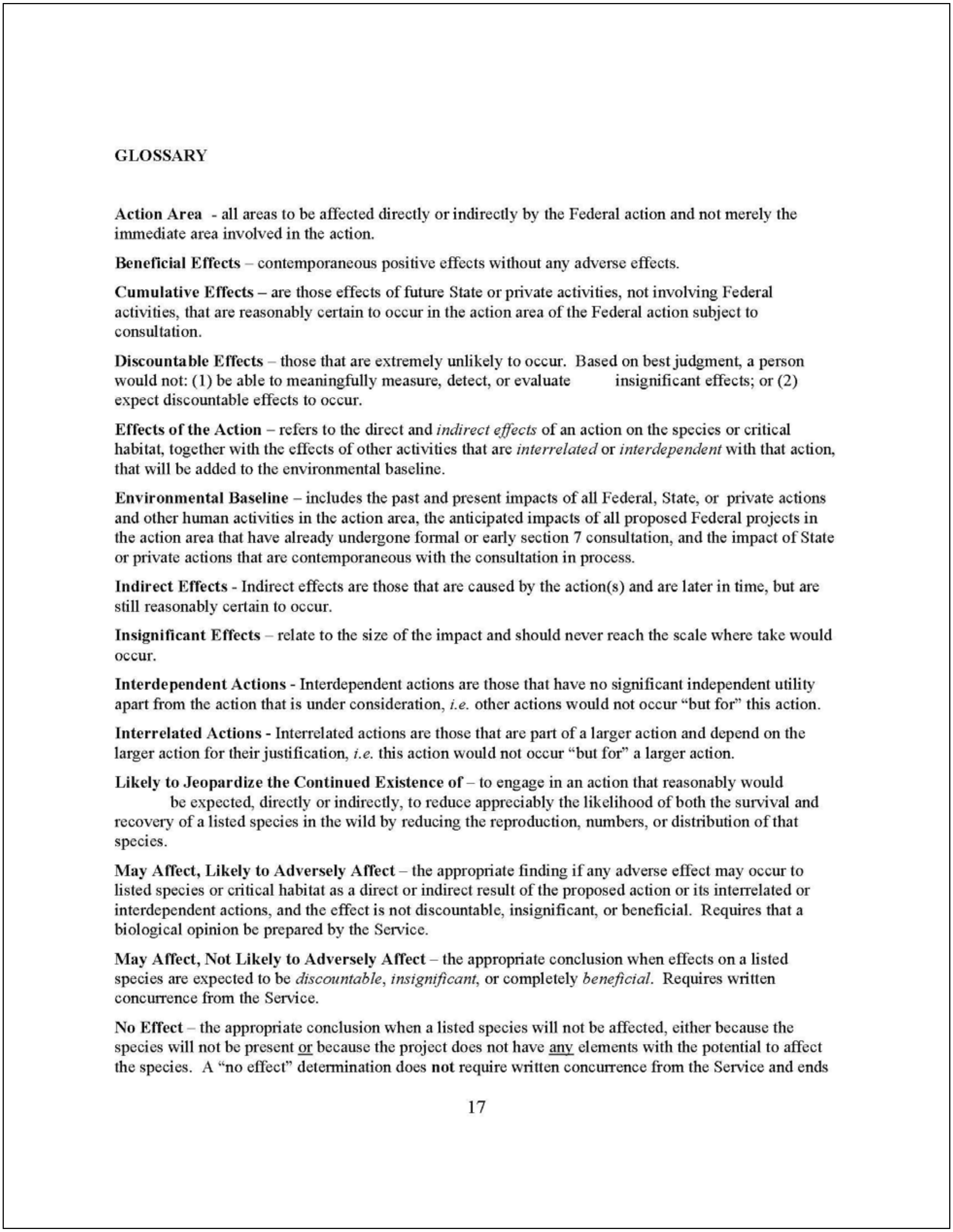


GLOSSARY

Action Area - all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

Beneficial Effects – contemporaneous positive effects without any adverse effects.

Cumulative Effects – are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur in the action area of the Federal action subject to consultation.

Discountable Effects – those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

Effects of the Action – refers to the direct and *indirect effects* of an action on the species or critical habitat, together with the effects of other activities that are *interrelated* or *interdependent* with that action, that will be added to the environmental baseline.

Environmental Baseline – includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process.

Indirect Effects - Indirect effects are those that are caused by the action(s) and are later in time, but are still reasonably certain to occur.

Insignificant Effects – relate to the size of the impact and should never reach the scale where take would occur.

Interdependent Actions - Interdependent actions are those that have no significant independent utility apart from the action that is under consideration, *i.e.* other actions would not occur "but for" this action.

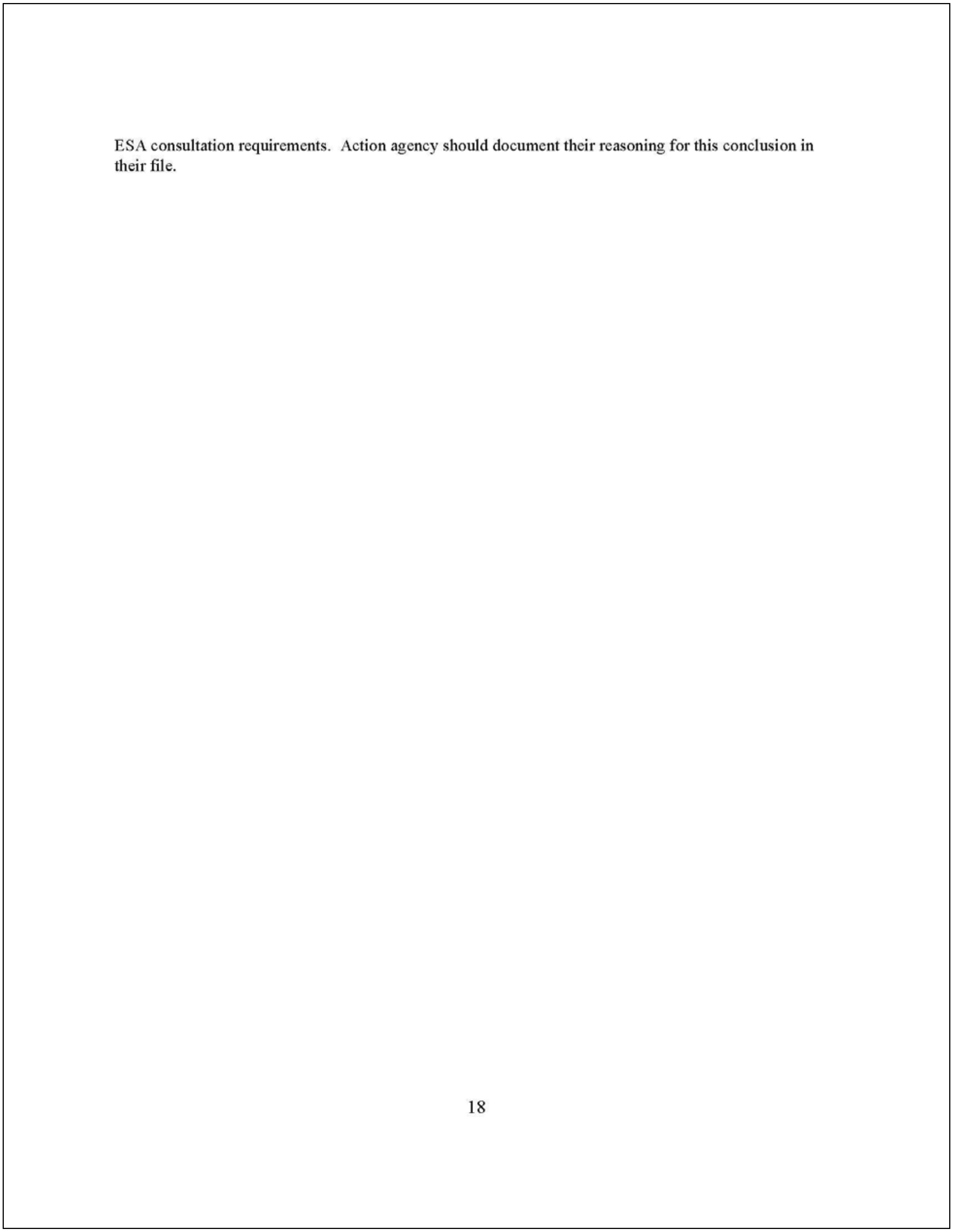
Interrelated Actions - Interrelated actions are those that are part of a larger action and depend on the larger action for their justification, *i.e.* this action would not occur "but for" a larger action.

Likely to Jeopardize the Continued Existence of – to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

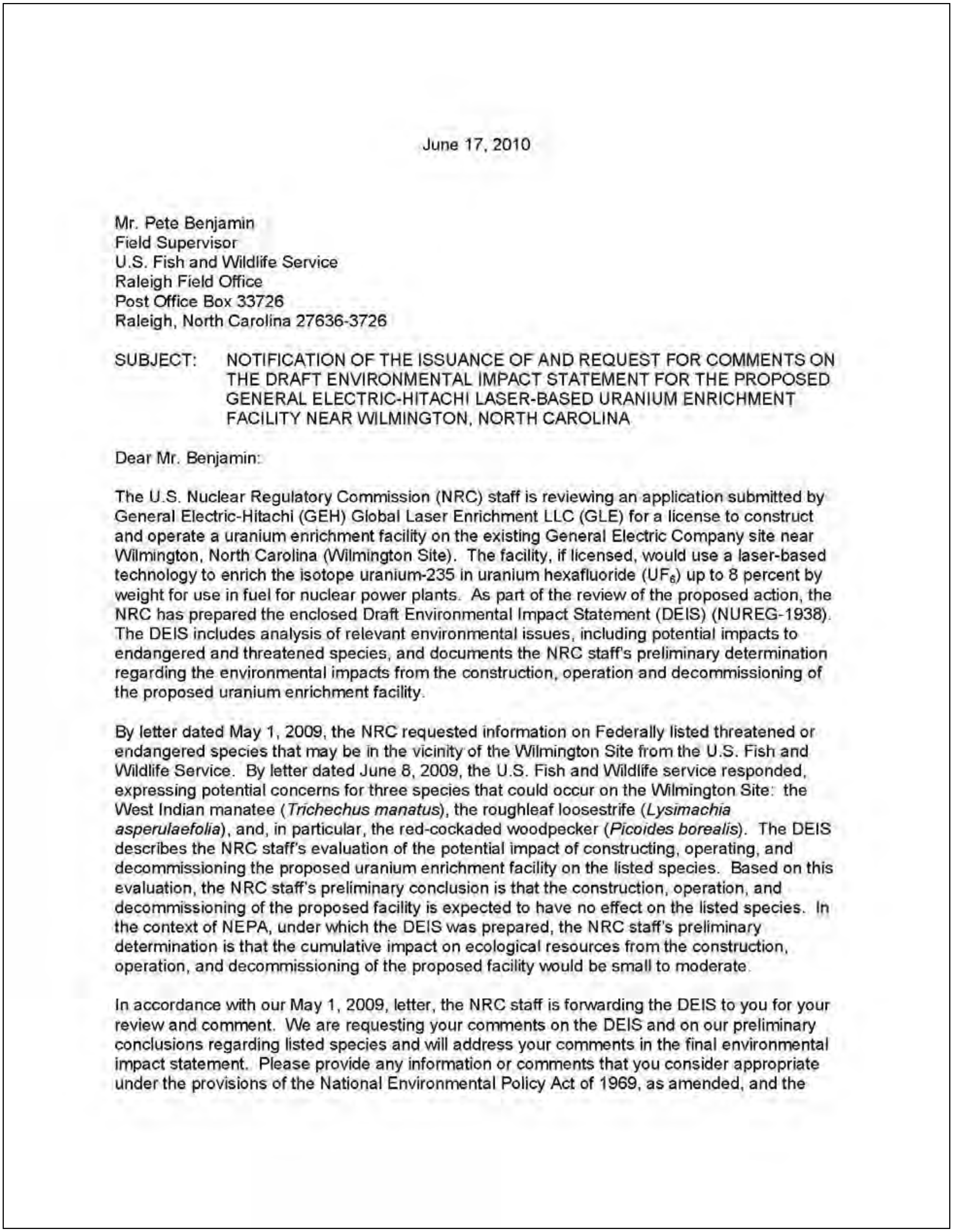
May Affect, Likely to Adversely Affect – the appropriate finding if any adverse effect may occur to listed species or critical habitat as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. Requires that a biological opinion be prepared by the Service.

May Affect, Not Likely to Adversely Affect – the appropriate conclusion when effects on a listed species are expected to be *discountable*, *insignificant*, or completely *beneficial*. Requires written concurrence from the Service.

No Effect – the appropriate conclusion when a listed species will not be affected, either because the species will not be present or because the project does not have any elements with the potential to affect the species. A "no effect" determination does **not** require written concurrence from the Service and ends



ESA consultation requirements. Action agency should document their reasoning for this conclusion in their file.



June 17, 2010

Mr. Pete Benjamin
Field Supervisor
U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

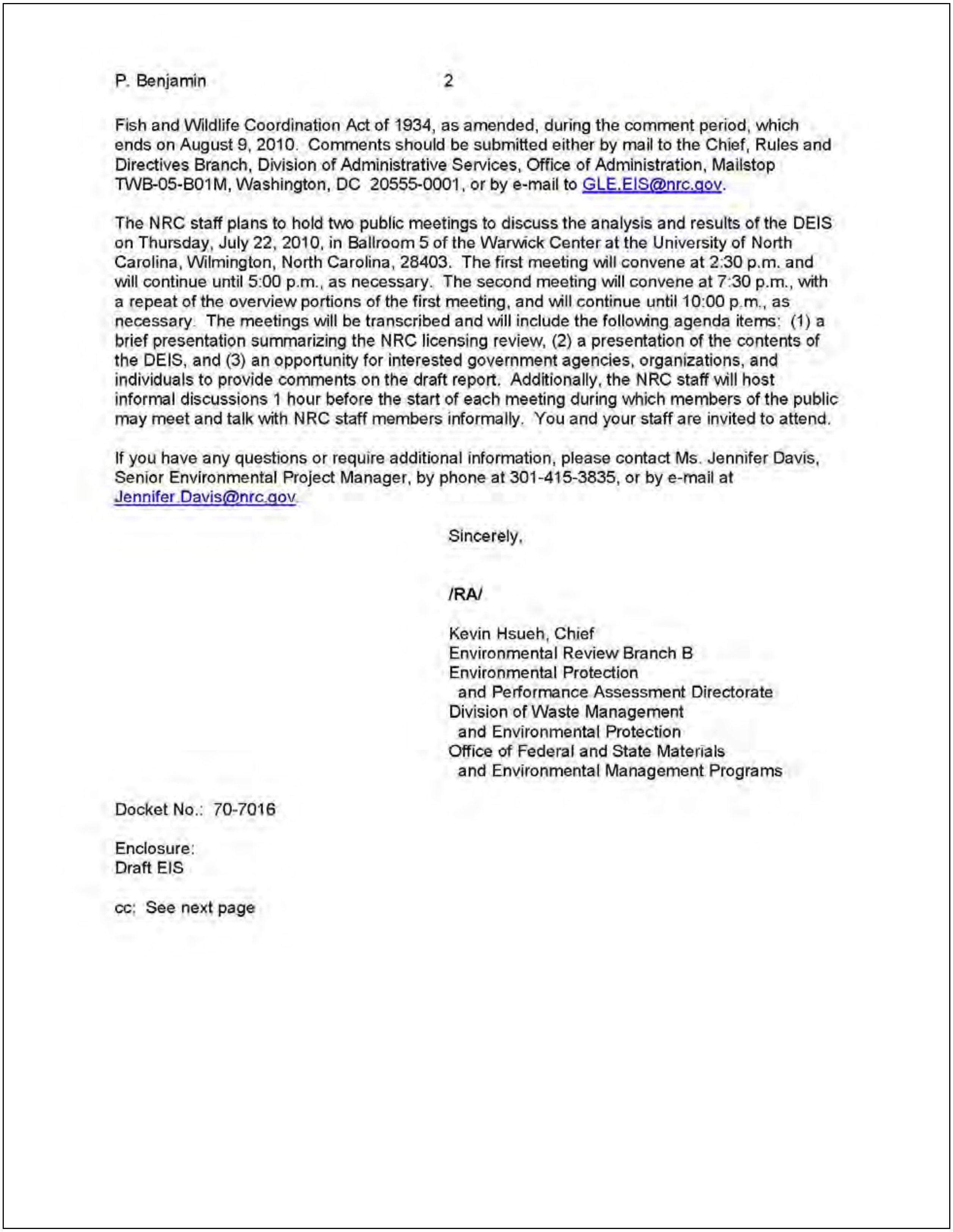
SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Mr. Benjamin:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to endangered and threatened species, and documents the NRC staff's preliminary determination regarding the environmental impacts from the construction, operation and decommissioning of the proposed uranium enrichment facility.

By letter dated May 1, 2009, the NRC requested information on Federally listed threatened or endangered species that may be in the vicinity of the Wilmington Site from the U.S. Fish and Wildlife Service. By letter dated June 8, 2009, the U.S. Fish and Wildlife service responded, expressing potential concerns for three species that could occur on the Wilmington Site: the West Indian manatee (*Trichechus manatus*), the roughleaf loosestrife (*Lysimachia asperulaefolia*), and, in particular, the red-cockaded woodpecker (*Picoides borealis*). The DEIS describes the NRC staff's evaluation of the potential impact of constructing, operating, and decommissioning the proposed uranium enrichment facility on the listed species. Based on this evaluation, the NRC staff's preliminary conclusion is that the construction, operation, and decommissioning of the proposed facility is expected to have no effect on the listed species. In the context of NEPA, under which the DEIS was prepared, the NRC staff's preliminary determination is that the cumulative impact on ecological resources from the construction, operation, and decommissioning of the proposed facility would be small to moderate.

In accordance with our May 1, 2009, letter, the NRC staff is forwarding the DEIS to you for your review and comment. We are requesting your comments on the DEIS and on our preliminary conclusions regarding listed species and will address your comments in the final environmental impact statement. Please provide any information or comments that you consider appropriate under the provisions of the National Environmental Policy Act of 1969, as amended, and the



Fish and Wildlife Coordination Act of 1934, as amended, during the comment period, which ends on August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.

The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

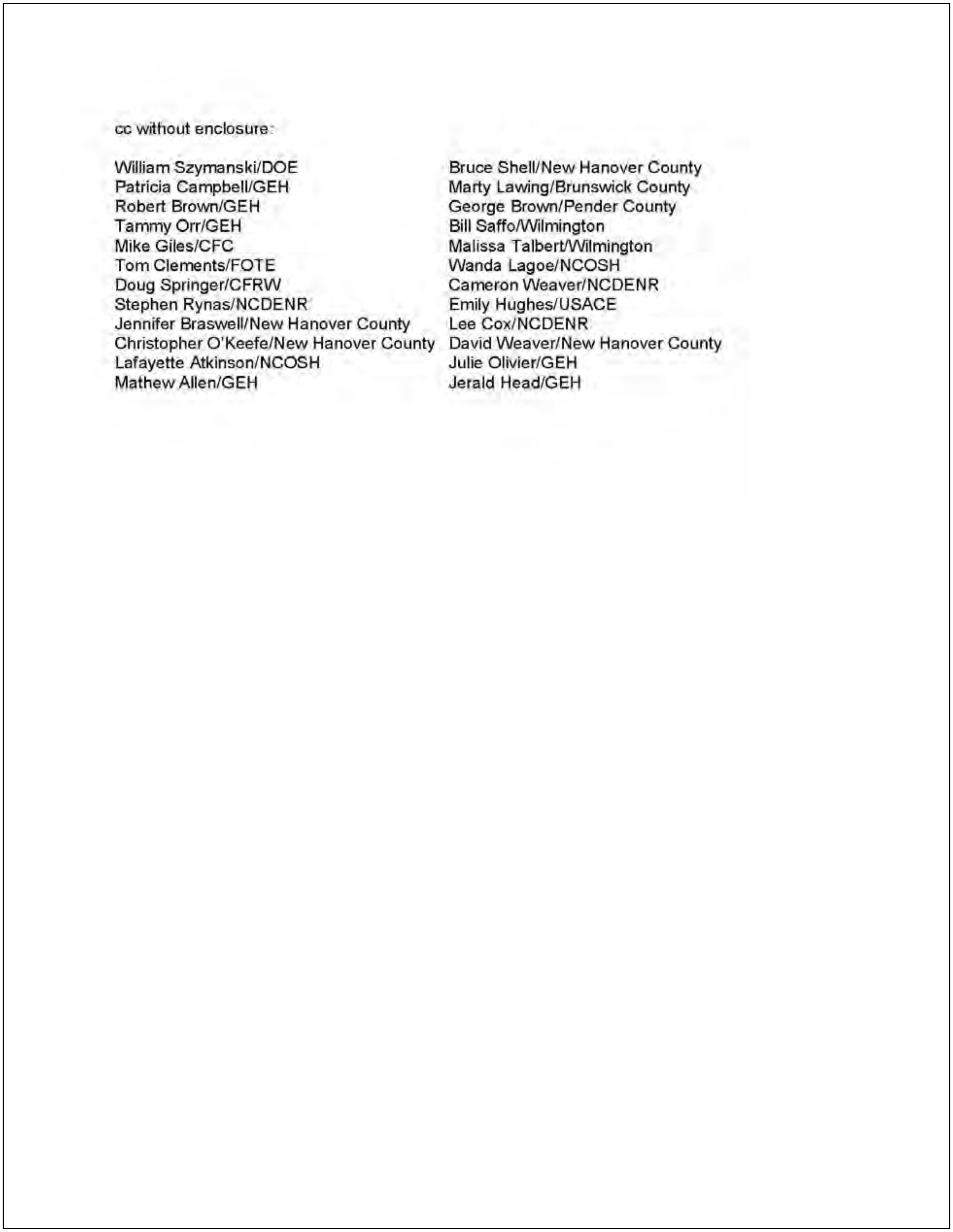
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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

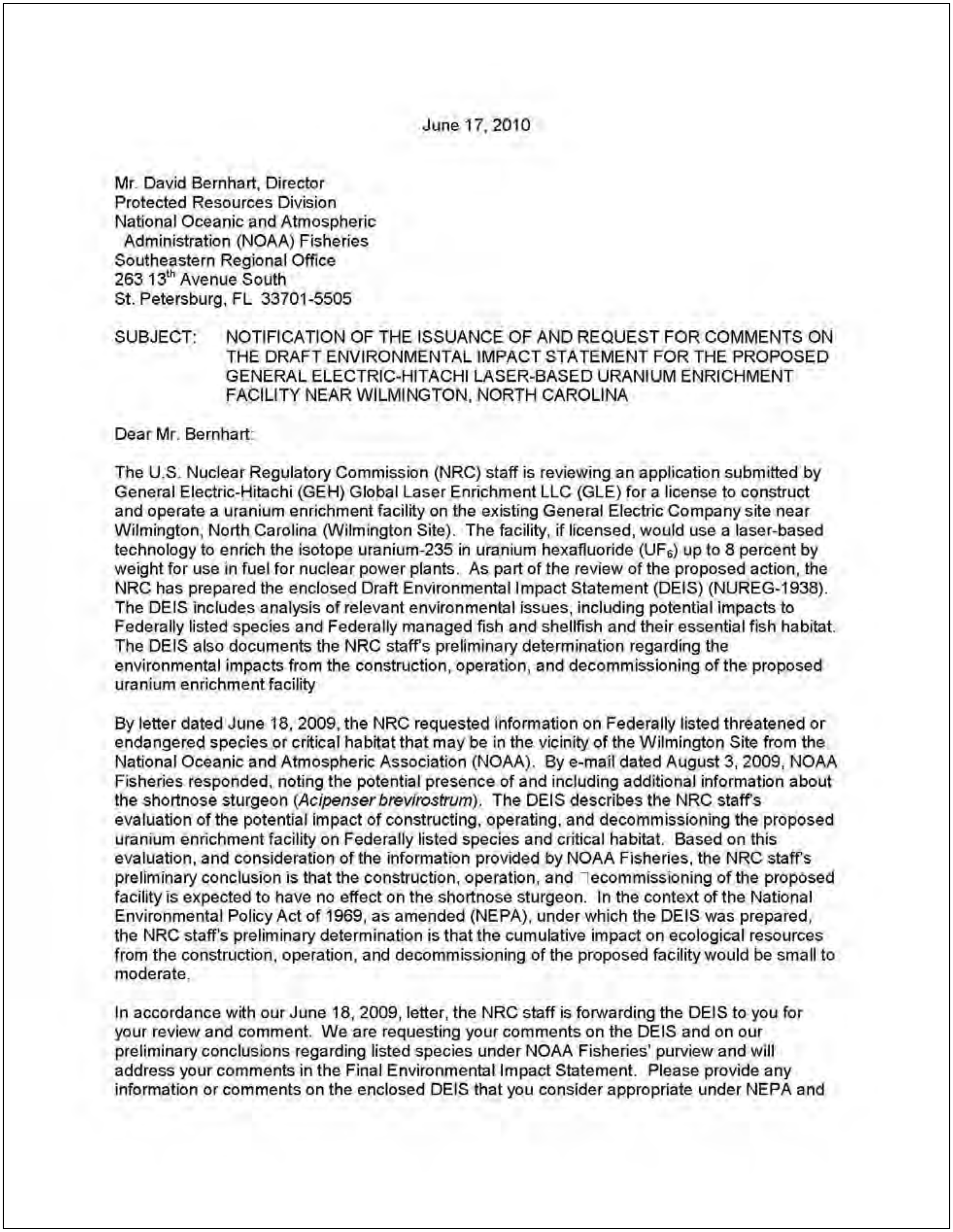
Enclosure:
Draft EIS

cc: See next page



cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Lafayette Atkinson/NCOSH
Mathew Allen/GEH
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lee Cox/NCDENR
David Weaver/New Hanover County
Julie Olivier/GEH
Jerald Head/GEH



June 17, 2010

Mr. David Bernhart, Director
Protected Resources Division
National Oceanic and Atmospheric
Administration (NOAA) Fisheries
Southeastern Regional Office
263 13th Avenue South
St. Petersburg, FL 33701-5505

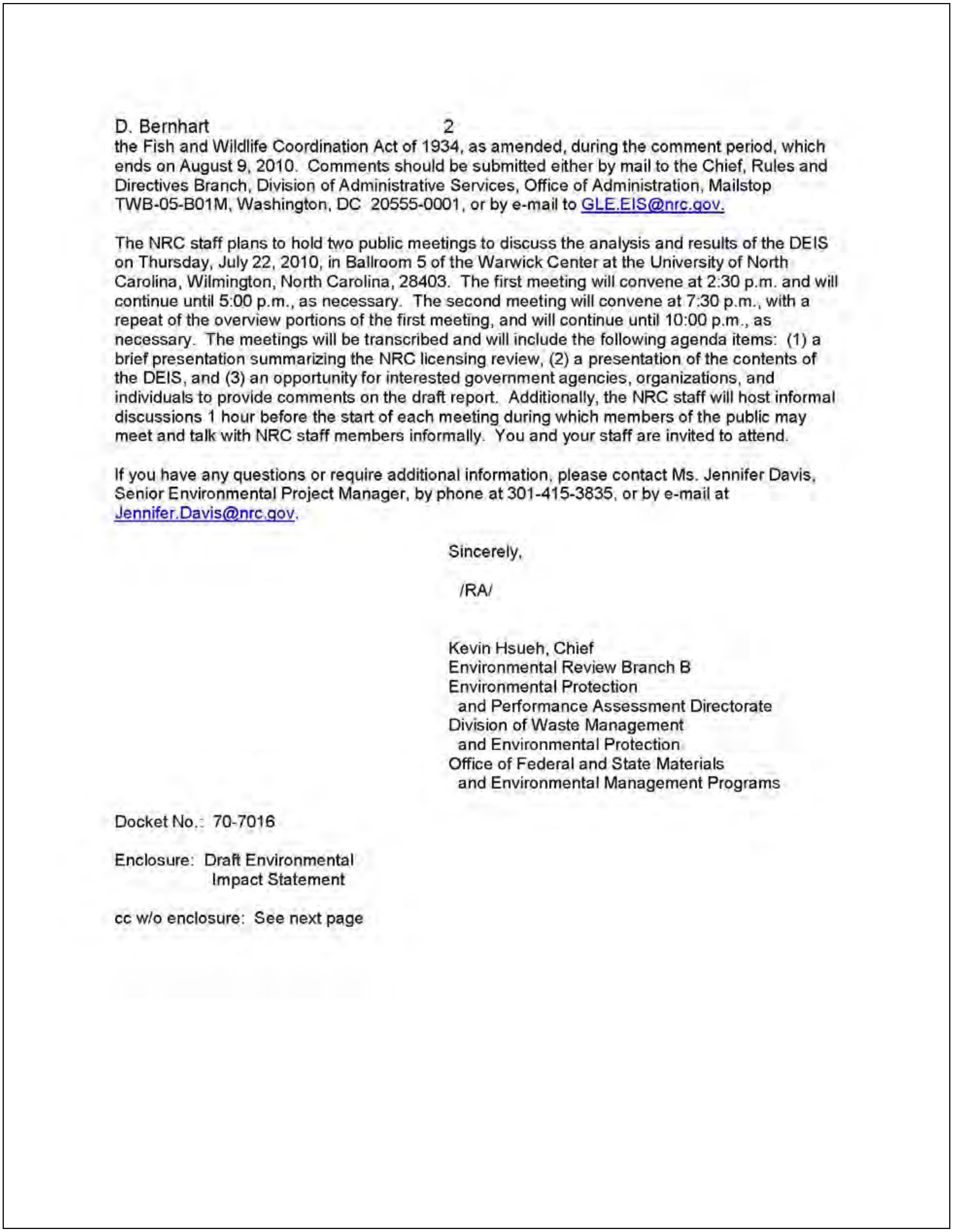
SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Mr. Bernhart:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to Federally listed species and Federally managed fish and shellfish and their essential fish habitat. The DEIS also documents the NRC staff's preliminary determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed uranium enrichment facility

By letter dated June 18, 2009, the NRC requested information on Federally listed threatened or endangered species or critical habitat that may be in the vicinity of the Wilmington Site from the National Oceanic and Atmospheric Association (NOAA). By e-mail dated August 3, 2009, NOAA Fisheries responded, noting the potential presence of and including additional information about the shortnose sturgeon (*Acipenser brevirostrum*). The DEIS describes the NRC staff's evaluation of the potential impact of constructing, operating, and decommissioning the proposed uranium enrichment facility on Federally listed species and critical habitat. Based on this evaluation, and consideration of the information provided by NOAA Fisheries, the NRC staff's preliminary conclusion is that the construction, operation, and decommissioning of the proposed facility is expected to have no effect on the shortnose sturgeon. In the context of the National Environmental Policy Act of 1969, as amended (NEPA), under which the DEIS was prepared, the NRC staff's preliminary determination is that the cumulative impact on ecological resources from the construction, operation, and decommissioning of the proposed facility would be small to moderate.

In accordance with our June 18, 2009, letter, the NRC staff is forwarding the DEIS to you for your review and comment. We are requesting your comments on the DEIS and on our preliminary conclusions regarding listed species under NOAA Fisheries' purview and will address your comments in the Final Environmental Impact Statement. Please provide any information or comments on the enclosed DEIS that you consider appropriate under NEPA and



the Fish and Wildlife Coordination Act of 1934, as amended, during the comment period, which ends on August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.

The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
Environmental Protection
and Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

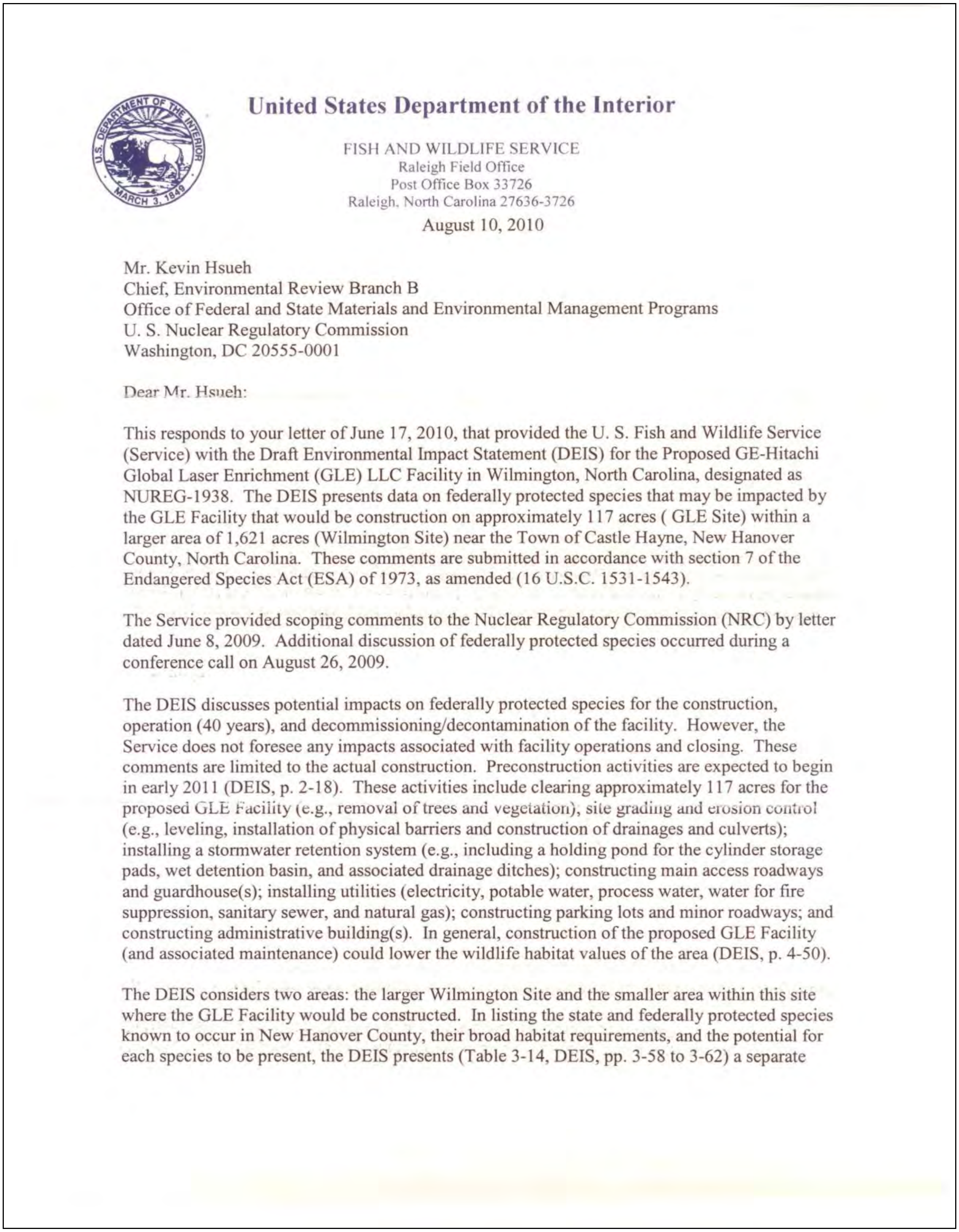
Docket No.: 70-7016

Enclosure: Draft Environmental
Impact Statement

cc w/o enclosure: See next page

cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Lafayette Atkinson/NCOSH
Mathew Allen/GEH
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lee Cox/NCDENR
David Weaver/New Hanover County
Julie Olivier/GEH
Jerald Head/GEH



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

August 10, 2010

Mr. Kevin Hsueh
Chief, Environmental Review Branch B
Office of Federal and State Materials and Environmental Management Programs
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Hsueh:

This responds to your letter of June 17, 2010, that provided the U. S. Fish and Wildlife Service (Service) with the Draft Environmental Impact Statement (DEIS) for the Proposed GE-Hitachi Global Laser Enrichment (GLE) LLC Facility in Wilmington, North Carolina, designated as NUREG-1938. The DEIS presents data on federally protected species that may be impacted by the GLE Facility that would be construction on approximately 117 acres (GLE Site) within a larger area of 1,621 acres (Wilmington Site) near the Town of Castle Hayne, New Hanover County, North Carolina. These comments are submitted in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

The Service provided scoping comments to the Nuclear Regulatory Commission (NRC) by letter dated June 8, 2009. Additional discussion of federally protected species occurred during a conference call on August 26, 2009.

The DEIS discusses potential impacts on federally protected species for the construction, operation (40 years), and decommissioning/decontamination of the facility. However, the Service does not foresee any impacts associated with facility operations and closing. These comments are limited to the actual construction. Preconstruction activities are expected to begin in early 2011 (DEIS, p. 2-18). These activities include clearing approximately 117 acres for the proposed GLE Facility (e.g., removal of trees and vegetation), site grading and erosion control (e.g., leveling, installation of physical barriers and construction of drainages and culverts); installing a stormwater retention system (e.g., including a holding pond for the cylinder storage pads, wet detention basin, and associated drainage ditches); constructing main access roadways and guardhouse(s); installing utilities (electricity, potable water, process water, water for fire suppression, sanitary sewer, and natural gas); constructing parking lots and minor roadways; and constructing administrative building(s). In general, construction of the proposed GLE Facility (and associated maintenance) could lower the wildlife habitat values of the area (DEIS, p. 4-50).

The DEIS considers two areas: the larger Wilmington Site and the smaller area within this site where the GLE Facility would be constructed. In listing the state and federally protected species known to occur in New Hanover County, their broad habitat requirements, and the potential for each species to be present, the DEIS presents (Table 3-14, DEIS, pp. 3-58 to 3-62) a separate assessment for each area. More listed species are potentially present on the Wilmington Site, a larger area with greater habitat diversity. For example, the federally endangered West Indian manatee (*Trichechus manatus*) may occur on the Wilmington Site, but not on the inland GLE Site. The Service concurs that construction of the GLE facility would not affect the manatee.

These comments are limited to the section 7 requirement for construction on the GLE Site. Future work on other portions of the Wilmington Site should be submitted to the Service for review.

The Service's letter of June 2009 stated that we were unable to determine the status of the endangered rough-leaved loosestrife (RLL) (*Lysimachia asperulaefolia*) from the information provided. The earlier Environment Report (ER), dated December 2008, stated that RLL habitat was present on the "site," but added that that naturally occurring habitat for the RLL "may have occurred naturally on the Wilmington Site in the past, but the pocosin habitat that could have supported this plant has been drained." Furthermore, the fire regime necessary for the species is not currently present on the site.

The DEIS states that RLL is potential present on or near the larger Wilmington Site, but not on the smaller GLE Site. The DEIS correctly states (p. 3-65) that the species occurs in grass-shrub ecotones (transition areas between two habitats that can contain characteristic species from both) adjacent to longleaf pine/scrub oak, pine savanna, flatwoods, and pond pine pocosins (evergreen shrub bogs). It prefers full sunlight and is shade intolerant. It grows on moist, seasonally saturated sands or shallow organic soils overlying sands. Plants have been found in roadside depressions, firebreaks, seeps, and power rights-of-way.

Much of the GLE Site consists of pine forest/plantation (DEIS, p. 3-46) with soils that may be saturated under natural conditions, but may now be partially ditched and drained (DEIS, p. 3-51). Water levels generally fluctuate over a range of several feet in response to seasonal changes or precipitation events (DEIS, p. 3-39). In considering the wetland pine forest on the GLE Site, the DEIS notes (p. 3-52) that "limited wetland hydrology remains in the area." Construction of the proposed facility would not directly affect wetlands (DEIS, p. xxxi).

The DEIS concludes that habitat for the rough-leaf loosestrife is not present within the proposed GLE Facility area (DEIS, p. 4-42). Therefore, preconstruction and construction activities are expected to have no effect on the species. The Service believe that such habitat is not likely to be present and would concur with a finding that the proposed work may affect, but is not likely to adversely affect the species. Our concurrence is based on information in the DEIS indicating that: (1) no wetlands would be impacted due, perhaps, to drainage ditches associated with commercial pine production; (2) forest cover that limits sunlight on the ground surface; and, (3) the absence of documented occurrences near the site.

The Service's letter of June 2009 stated that impact must be determined for both nesting and foraging habitat of the federally endangered red-cockaded woodpecker (RCW) (*Picoides borealis*). The DEIS correctly notes (p. 4-47) that while nesting and roosting occur in cavities created in large, mature, live trees; foraging may occur in stands of smaller pines or mixed pines and hardwoods that are over 30 years old. In southeastern North Carolina, RCWs may forage in pines as smaller as six inches diameter breast height (dbh).

Based on field surveys conducted for the 2008 ER, the DEIS reiterates (p. 4-47) that no RCW cavity trees were observed on the Wilmington Site. More specifically, no cavity trees or trees more than 30 years old were observed in the proposed GLE Site. The Service would concur that current forest conditions on the GLE Site are not suitable for RCW nesting.

While the GLE Site does not have cavity trees, a separate analysis is necessary to determine whether the area serves as foraging habitat for active RCW clusters outside the Wilmington Site. The RCW exists in northern New Hanover County (DEIS, p. 4-47). An active RCW cluster occurs approximately five miles northeast of the Wilmington Site (DEIS, p. 4-47). It is located just north of the Northeast Cape Fear River along NC 117 in Pender County (GLE, 2008). There are several occurrence records for the RCW within two miles of the western border of the Wilmington Site. The Sledge Forest, a property containing over 4,000 acres of high-quality forests directly adjacent to, and north of, the Wilmington Site, does contain loblolly (*Pinus taeda*) and longleaf (*P. palustris*) pine trees that are over 300 years old. This area would be suitable as nesting and roosting habitat for the RCW.

Some forested habitats on the Wilmington Site meet the minimum area requirements needed for foraging habitat (DEIS, p. 4-47). However, the lack of mature forests would limit the value of the Wilmington Site as foraging habitat. The DEIS states (p. 4-47) that RCWs nesting and foraging in the Sledge Forest could occasionally forage within the western forested portion of the Wilmington Site, outside the GLE Facility Site, where Figure 3-12 (p. 3-49) shows a small area has trees that are greater than 40 years old.

Within the GLE Facility Site the Service recognizes that the younger pines are just approaching a size where RCW foraging would be possible and have probably not been foraging habitat in the recent past. Most of the area within the proposed GLE Facility Site has been logged within the last 20 years or less (GLE, 2008). Figure 3-12 (p. 3-49) indicates that most trees within the GLE Site are less than 20 years old and the rest are 20-29 years old. Trees within the GLE Facility Site were thinned in 2009. The DEIS concludes (p. 4-47) that "it is not expected that habitat suitable for the red-cockaded woodpecker would be impacted by preconstruction and construction activities for the proposed GLE Facility; therefore, these activities would have no effect on the species."

In evaluating the project impact on the RCW, the Service has considered the current ecological monitoring program for the Wilmington Site (DEIS, p. 6-10) that consists of a forestry management plan to improve natural habitats on the Wilmington Site. This program would also provide appropriate monitoring and habitat management for the proposed GLE Facility. Monitoring would include ecological surveys to identify potential issues and habitat areas that need improvement.

Part of the program includes mitigation for the loss of mature trees (DEIS, p. 6-10) as determined by GLE surveys for trees greater than 24 inches in diameter in areas that would be affected by preconstruction activities and construction of the proposed GLE Facility. These surveys would determine compensatory requirements for tree plantings that would be performed elsewhere on the Wilmington Site. The DEIS proposes (p. 4-56) to mitigate the loss of each large tree by planting of one 24-inch diameter tree, two 12-inch diameter trees, or three 8-inch diameter trees elsewhere on the Wilmington Site.

For the benefit of RCWs that may inhabit adjacent areas, the Service recommends an alternative tree mitigation program. Planting, or transplanting, large trees would be difficult, expensive, and long-term survival is likely to be low. A mature tree should not be defined as one with a dbh of 24 inches or greater. In an area composed primarily of trees less than 30 years old, such trees may not be present. The Service proposes that compensation should be provided for pines with a dbh of ten inches or more. Mitigation for the loss of these pines would consist of planting longleaf pine seedlings in appropriate habitat. We recommend that one longleaf pine seedling be planted for every two inches of dbh lost. For example, five seedlings would be planted for the loss of a 10-inch dbh pine. The dhb of pines lost would be rounded up to the nearest two inches. For example, a pine with a dbh of 10.5 inches would be rounded up to 12 inches and require the planting of six longleaf seedlings. Professional foresters could designate the appropriate spacing of the seedling and suitable habitat. This mitigation would be limited to the amount of suitable habitat. Trees planted as mitigation should have long-term protection. Longleaf pines seedlings could be planted as landscaping around buildings and parking lots. Once all suitable habitats that could be protected have been planted, additional mitigation would not be required. Such mitigation areas should be areas identified in the forest management plan as excluded from all future development.

Your letter states that the NRC staff has made a "preliminary conclusion" that the construction, operation and decommissioning of the proposed GLE facility is expected to have no effect on federally protected species. It is the opinion of the Service, based on the information provided, the proposed tree mitigation program (which should focus on longleaf pine restoration), and other information available, that the work may affect, but is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for your project. Please remember that obligations of the NRC under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

The Service appreciates the opportunity to provide these comments on the DEIS. If you have questions regarding these comments, please contact Howard Hall at 919-856-4520, ext. 27 or by e-mail at < howard_hall@fws.gov >.

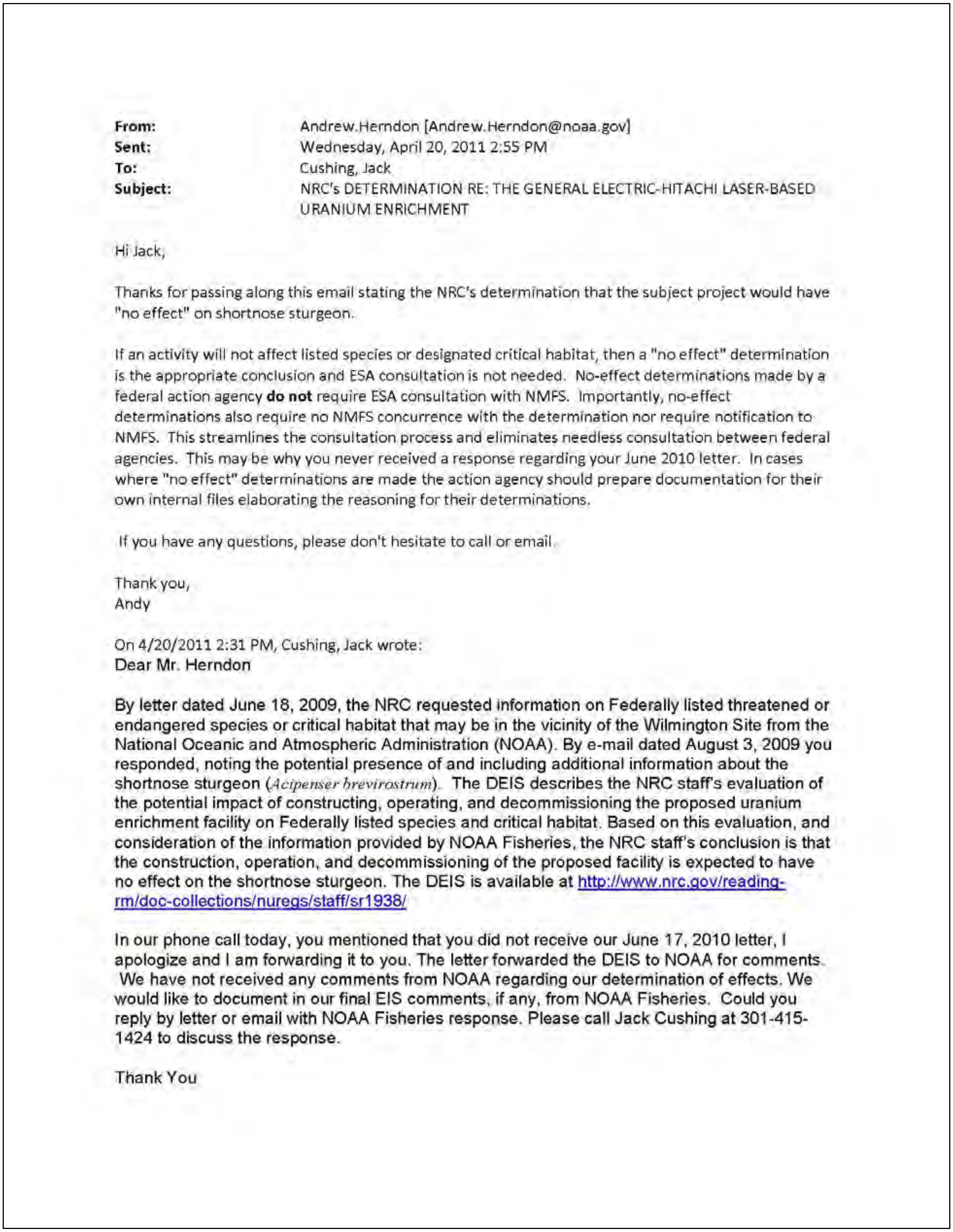
Sincerely,

Howard F. Hall

for Pete Benjamin
Field Supervisor

cc:

Molly Ellwood, NC Wildlife Resources Commission, Wilmington, NC



From: Andrew.Herndon [Andrew.Herndon@noaa.gov]
Sent: Wednesday, April 20, 2011 2:55 PM
To: Cushing, Jack
Subject: NRC's DETERMINATION RE: THE GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT

Hi Jack,

Thanks for passing along this email stating the NRC's determination that the subject project would have "no effect" on shortnose sturgeon.

If an activity will not affect listed species or designated critical habitat, then a "no effect" determination is the appropriate conclusion and ESA consultation is not needed. No-effect determinations made by a federal action agency **do not** require ESA consultation with NMFS. Importantly, no-effect determinations also require no NMFS concurrence with the determination nor require notification to NMFS. This streamlines the consultation process and eliminates needless consultation between federal agencies. This may be why you never received a response regarding your June 2010 letter. In cases where "no effect" determinations are made the action agency should prepare documentation for their own internal files elaborating the reasoning for their determinations.

If you have any questions, please don't hesitate to call or email.

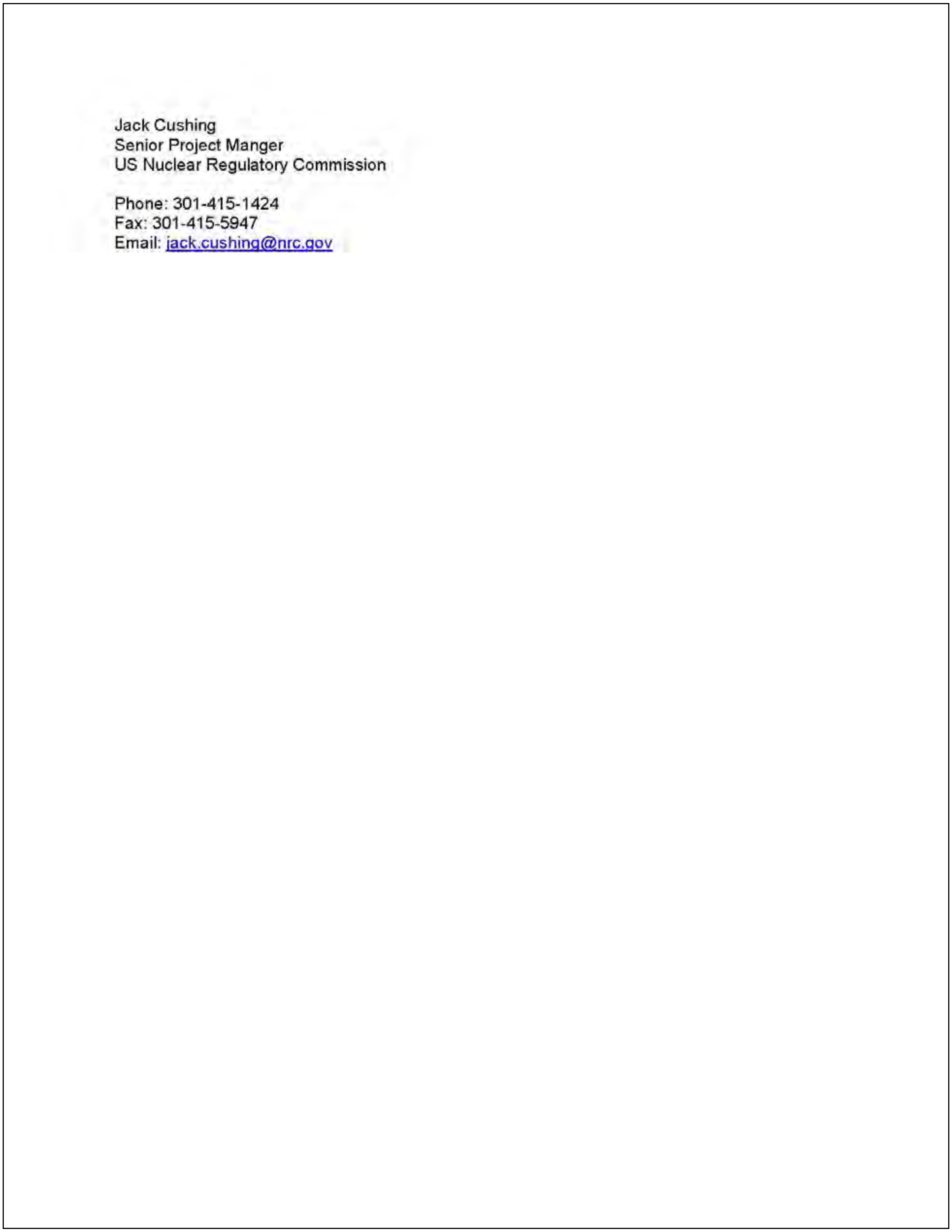
Thank you,
Andy

On 4/20/2011 2:31 PM, Cushing, Jack wrote:
Dear Mr. Herndon

By letter dated June 18, 2009, the NRC requested information on Federally listed threatened or endangered species or critical habitat that may be in the vicinity of the Wilmington Site from the National Oceanic and Atmospheric Administration (NOAA). By e-mail dated August 3, 2009 you responded, noting the potential presence of and including additional information about the shortnose sturgeon (*Acipenser brevirostrum*). The DEIS describes the NRC staff's evaluation of the potential impact of constructing, operating, and decommissioning the proposed uranium enrichment facility on Federally listed species and critical habitat. Based on this evaluation, and consideration of the information provided by NOAA Fisheries, the NRC staff's conclusion is that the construction, operation, and decommissioning of the proposed facility is expected to have no effect on the shortnose sturgeon. The DEIS is available at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1938/

In our phone call today, you mentioned that you did not receive our June 17, 2010 letter, I apologize and I am forwarding it to you. The letter forwarded the DEIS to NOAA for comments. We have not received any comments from NOAA regarding our determination of effects. We would like to document in our final EIS comments, if any, from NOAA Fisheries. Could you reply by letter or email with NOAA Fisheries response. Please call Jack Cushing at 301-415-1424 to discuss the response.

Thank You



Jack Cushing
Senior Project Manger
US Nuclear Regulatory Commission

Phone: 301-415-1424
Fax: 301-415-5947
Email: jack.cushing@nrc.gov

B.2 Section 106 Consultation Letters

On August 27, 2009, and September 2, 2009, the U.S. Nuclear Regulatory Commission (NRC) sent consultation letters to 16 American Indian tribes and organizations. The list of tribes and organizations (see Section 9.2) was provided by the North Carolina State Historic Preservation Office (SHPO). This section contains one sample of the outgoing NRC letter; the remaining NRC letters can be accessed via NRC's online document retrieval system (ADAMS) using the accession numbers in Table B-2. The two responses received by the NRC are also shown in the table, and copies of the response letters are included in this section.

Also included in this section are copies of Section 106 correspondence involving the North Carolina SHPO and the Advisory Council on Historic Preservation. Dates and accession numbers are provided in Table B-3.

Table B-2 NRC Correspondence with American Indian Tribes and Organizations

Tribe	ADAMS Accession Number(s)
Catawba Indian Nation	ML092120329
Cherokee Nation of Oklahoma	ML092120524
Coharie Indian Tribe	ML092150041
Cumberland County Association for Indian People	ML092150248
Eastern Band of Cherokee Indians	ML092150452
Guilford Native American Association	ML092160204
Haliwa-Saponi Indian Tribe	ML092160271, ML092160427
Lumbee Indian Tribe	ML092160427
Meherrin Indian Tribe	ML092160461
Metrolina Native American Association	ML092160756
Occaneechi Band of the Saponi Nation	ML092230748
Sappony Nation	ML092160873
Triangle Native American Society	ML092160934
Tuscarora Nation	ML092170004
United Keetoowah Band of Cherokee Indians	ML092170014
Waccamaw Siouan Indian Tribe (August 27, 2009)	ML092170017
Response from Coharie Indian Tribe (undated letter)	ML092600484
Response from United Keetoowah Band of Cherokee Indians (November 24, 2009)	ML093570295
NRC letter to United Keetoowah Band of Cherokee Indians (June 17, 2010)	ML101660041

Table B-3 Section 106 Correspondence with the North Carolina SHPO and the Advisory Council on Historic Preservation

Correspondence	ADAMS Accession Number
NRC letter to North Carolina Department of Cultural Resources, State Historic Preservation Office (SHPO) (April 29, 2009)	ML091100104
Response from SHPO (June 2, 2009)	ML091630258
NRC letter to Advisory Council on Historic Preservation (ACHP) (September 1, 2009)	ML092380591
Environmental Services, Inc. to SHPO (December 9, 2009)	--
NRC letter to SHPO (February 25, 2010)	ML100470007
NRC letter to SHPO (June 17, 2010)	ML101241259
NRC letter to ACHP (June 17, 2010)	ML101241127
Response from SHPO (July 15, 2010 – part of North Carolina Department of Administration submittal)	ML102180383
NRC letter to SHPO (March 28, 2011)	ML110840685
Response from SHPO (April 5, 2011)	ML110950680

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 2, 2009

The Honorable Gene Faircloth, Chief
Coharie Indian Tribe
7531 N. U.S. Hwy 421
Clinton, NC 28328

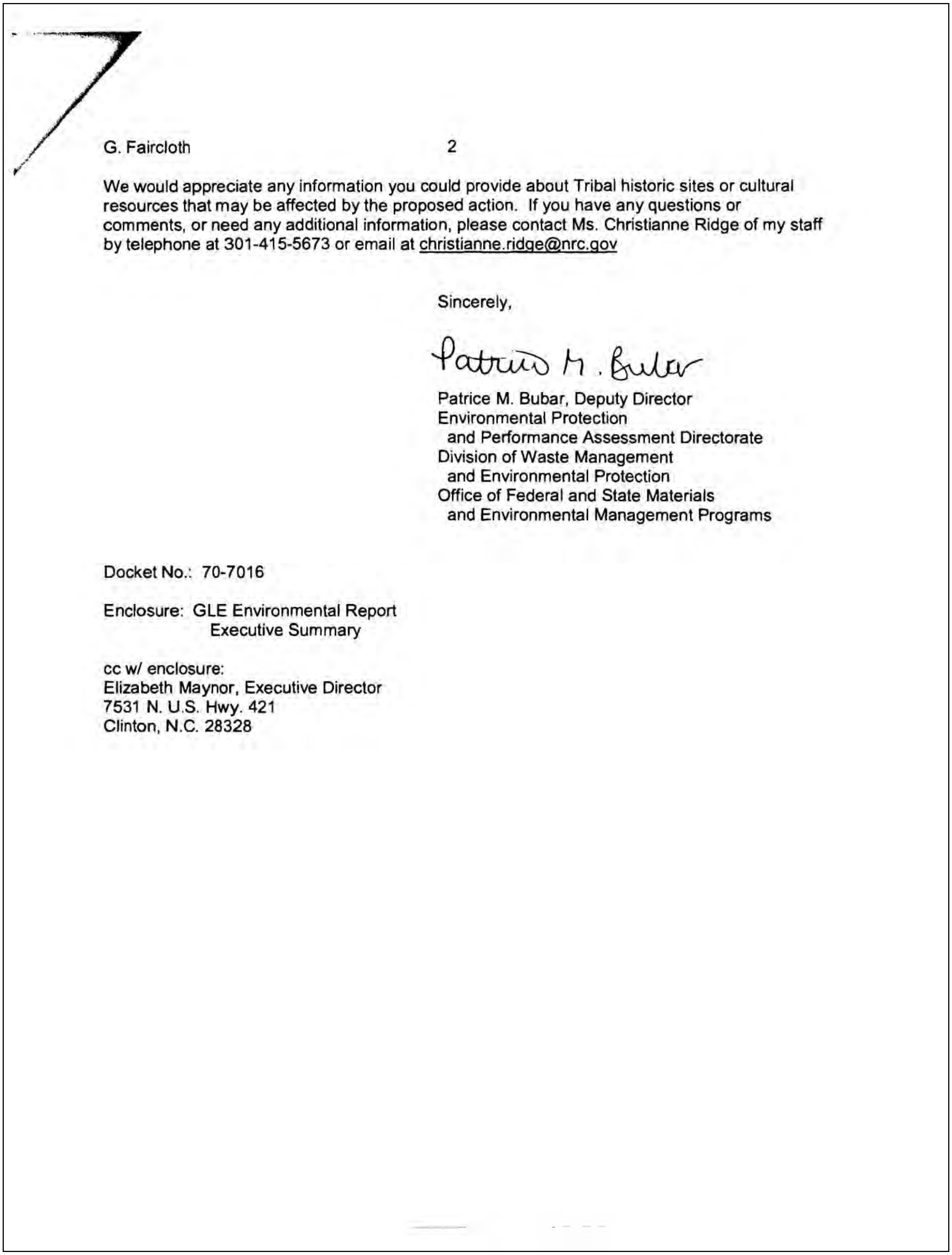
SUBJECT: REQUEST FOR INFORMATION REGARDING TRIBAL HISTORIC AND CULTURAL RESOURCES POTENTIALLY AFFECTED BY THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Chief Faircloth:

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 of the 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 Coharie Indian Tribe 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.



G. Faircloth 2

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,

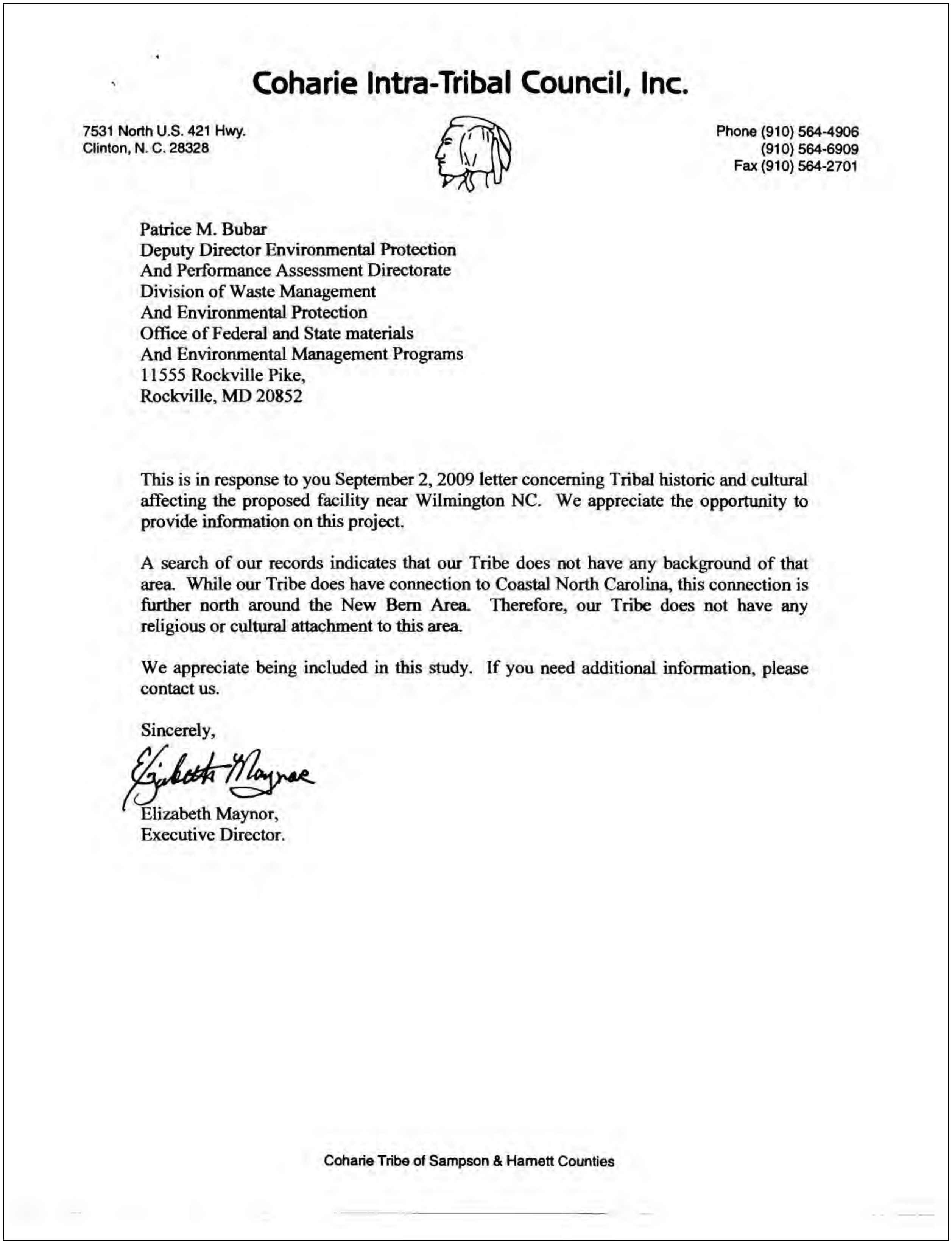
Patrice M. Bubar

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 w/ enclosure:
Elizabeth Maynor, Executive Director
7531 N. U.S. Hwy. 421
Clinton, N.C. 28328



Coharie Intra-Tribal Council, Inc.

7531 North U.S. 421 Hwy.
Clinton, N. C. 28328

Phone (910) 564-4906
(910) 564-6909
Fax (910) 564-2701

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
11555 Rockville Pike,
Rockville, MD 20852

This is in response to you September 2, 2009 letter concerning Tribal historic and cultural affecting the proposed facility near Wilmington NC. We appreciate the opportunity to provide information on this project.

A search of our records indicates that our Tribe does not have any background of that area. While our Tribe does have connection to Coastal North Carolina, this connection is further north around the New Bern Area. Therefore, our Tribe does not have any religious or cultural attachment to this area.

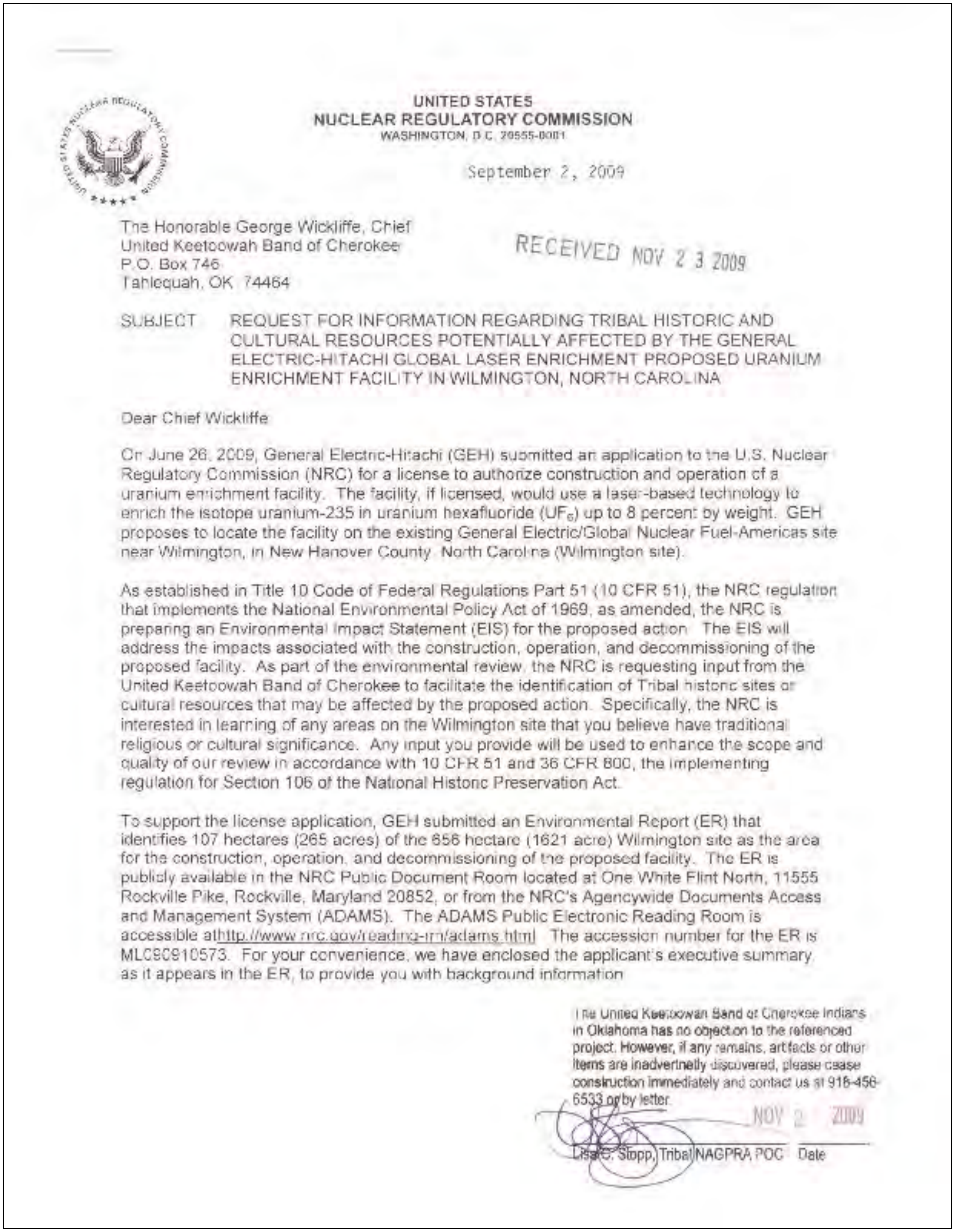
We appreciate being included in this study. If you need additional information, please contact us.

Sincerely,

Elizabeth Maynor

Elizabeth Maynor,
Executive Director.

Coharie Tribe of Sampson & Hamett Counties



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 2, 2009

The Honorable George Wickliffe, Chief
United Keetoowah Band of Cherokee
P.O. Box 746
Tahlequah, OK 74464

RECEIVED NOV 2 3 2009

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

Dear Chief Wickliffe

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).

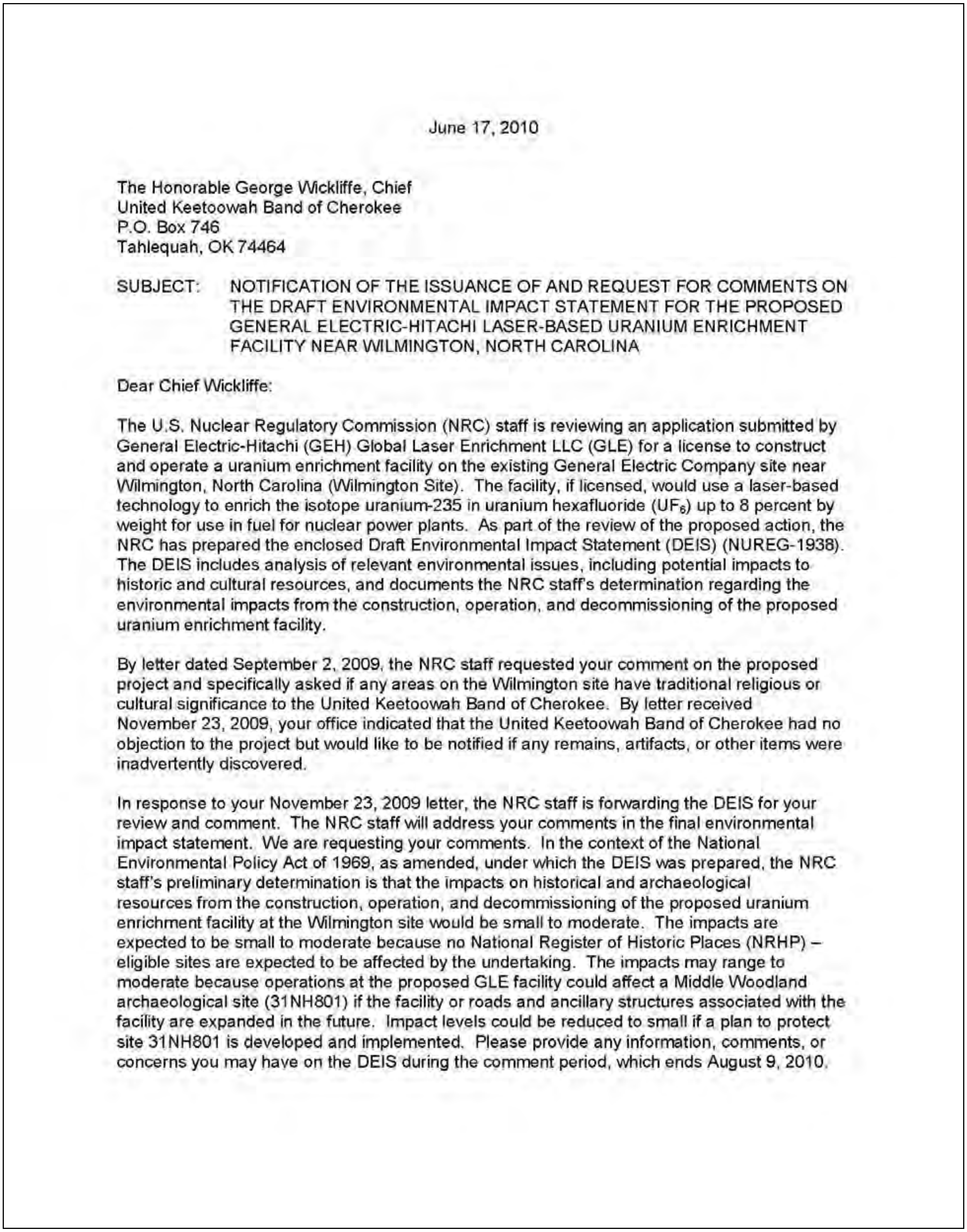
As established in Title 10 Code of Federal Regulations Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, the NRC is preparing an Environmental Impact Statement (EIS) for the proposed action. The EIS will address the impacts associated with the construction, operation, and decommissioning of the proposed facility. As part of the environmental review, the NRC is requesting input from the United Keetoowah Band of Cherokee 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 athttp://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.

The United Keetoowah Band of Cherokee Indians in Oklahoma has no objection to the referenced project. However, if any remains, artifacts or other items are inadvertnelly discovered, please cease construction immediately and contact us at 918-456-6533 or by letter.

NOV 2 2009

Lisa C. Stopp, Tribal NAGPRA POC   Date



June 17, 2010

The Honorable George Wickliffe, Chief
United Keetoowah Band of Cherokee
P.O. Box 746
Tahlequah, OK 74464

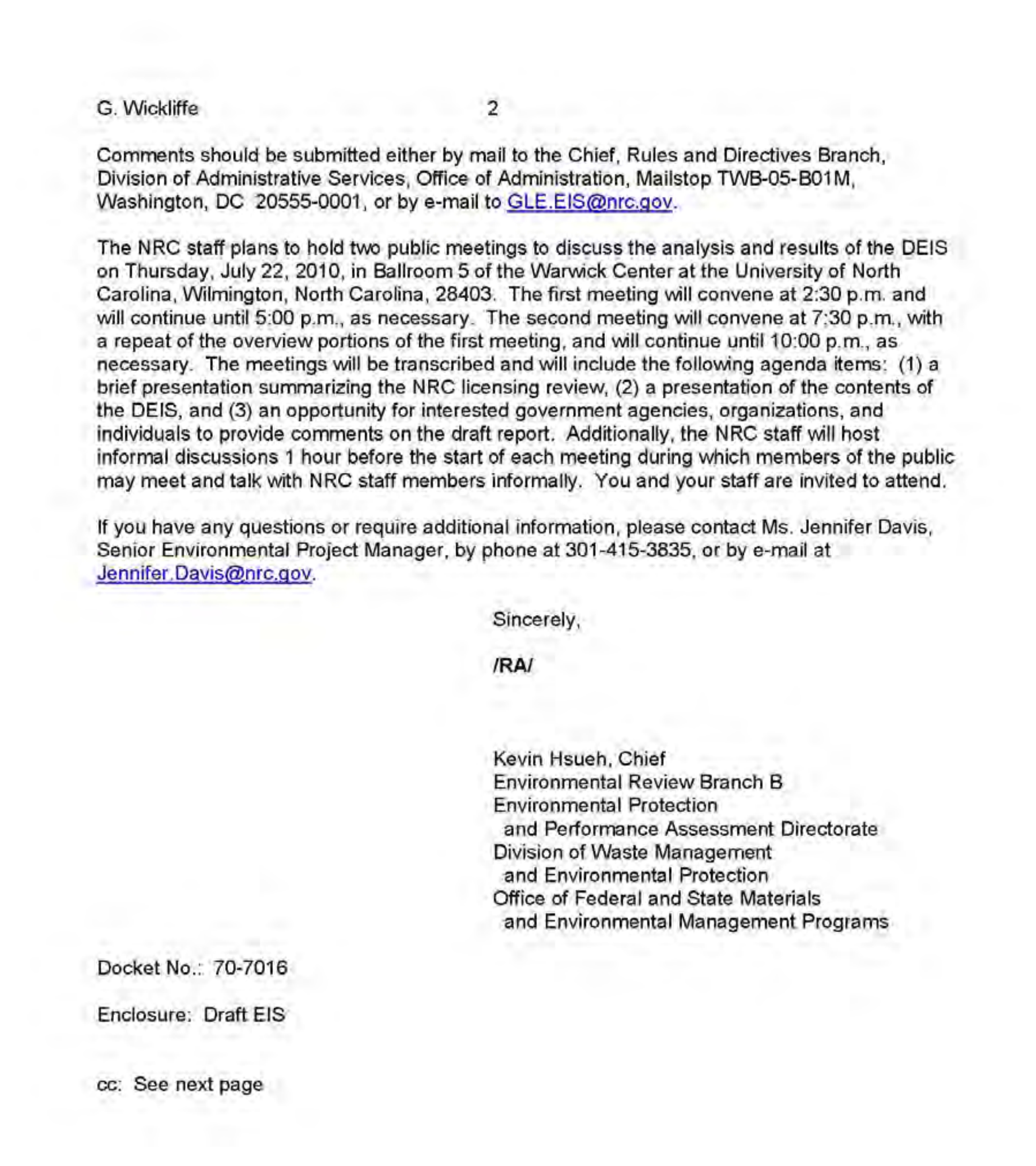
SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Chief Wickliffe:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to historic and cultural resources, and documents the NRC staff's determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed uranium enrichment facility.

By letter dated September 2, 2009, the NRC staff requested your comment on the proposed project and specifically asked if any areas on the Wilmington site have traditional religious or cultural significance to the United Keetoowah Band of Cherokee. By letter received November 23, 2009, your office indicated that the United Keetoowah Band of Cherokee had no objection to the project but would like to be notified if any remains, artifacts, or other items were inadvertently discovered.

In response to your November 23, 2009 letter, the NRC staff is forwarding the DEIS for your review and comment. The NRC staff will address your comments in the final environmental impact statement. We are requesting your comments. In the context of the National Environmental Policy Act of 1969, as amended, under which the DEIS was prepared, the NRC staff's preliminary determination is that the impacts on historical and archaeological resources from the construction, operation, and decommissioning of the proposed uranium enrichment facility at the Wilmington site would be small to moderate. The impacts are expected to be small to moderate because no National Register of Historic Places (NRHP) – eligible sites are expected to be affected by the undertaking. The impacts may range to moderate because operations at the proposed GLE facility could affect a Middle Woodland archaeological site (31NH801) if the facility or roads and ancillary structures associated with the facility are expanded in the future. Impact levels could be reduced to small if a plan to protect site 31NH801 is developed and implemented. Please provide any information, comments, or concerns you may have on the DEIS during the comment period, which ends August 9, 2010.



G. Wickliffe 2

Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.

The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

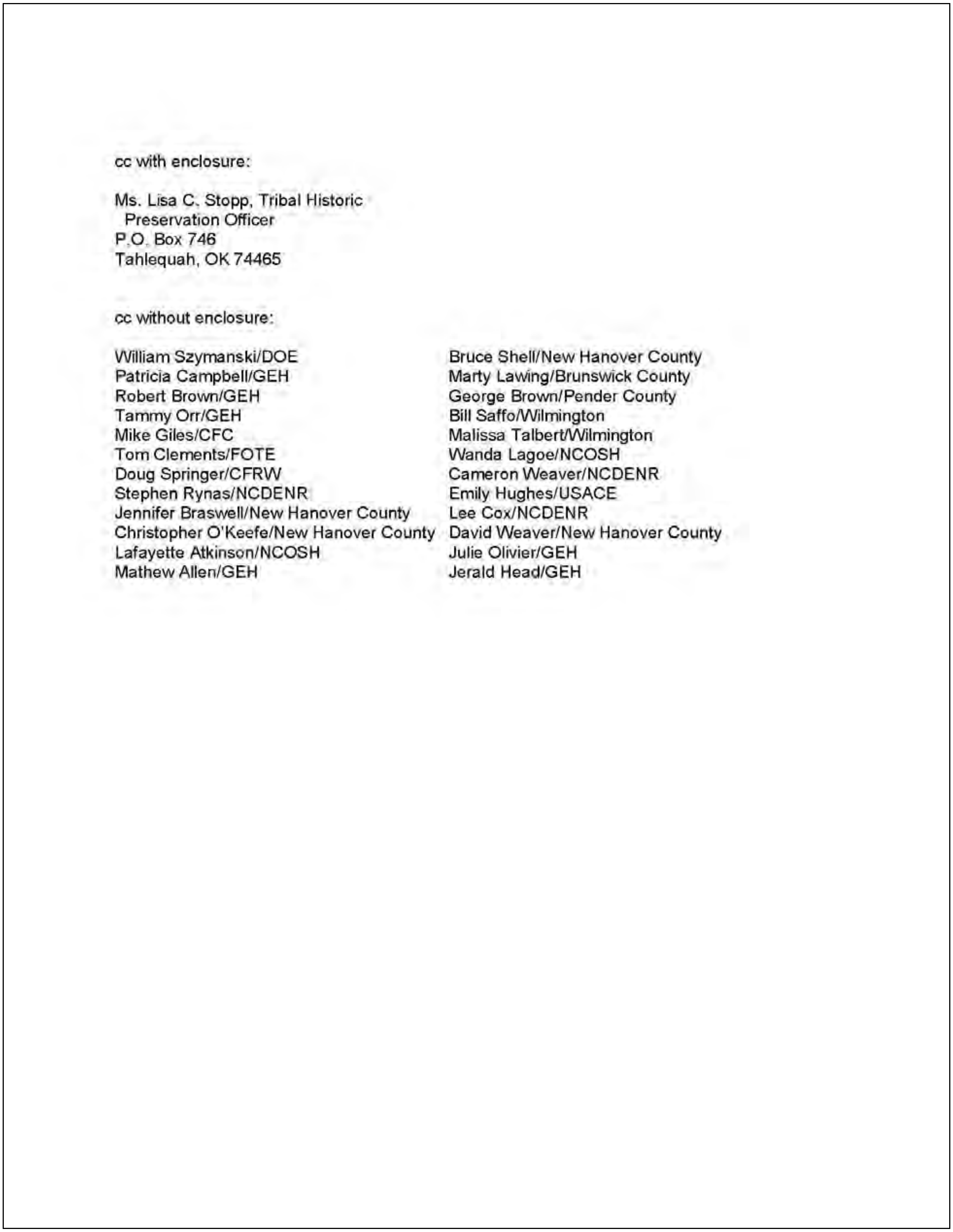
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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: Draft EIS

cc: See next page

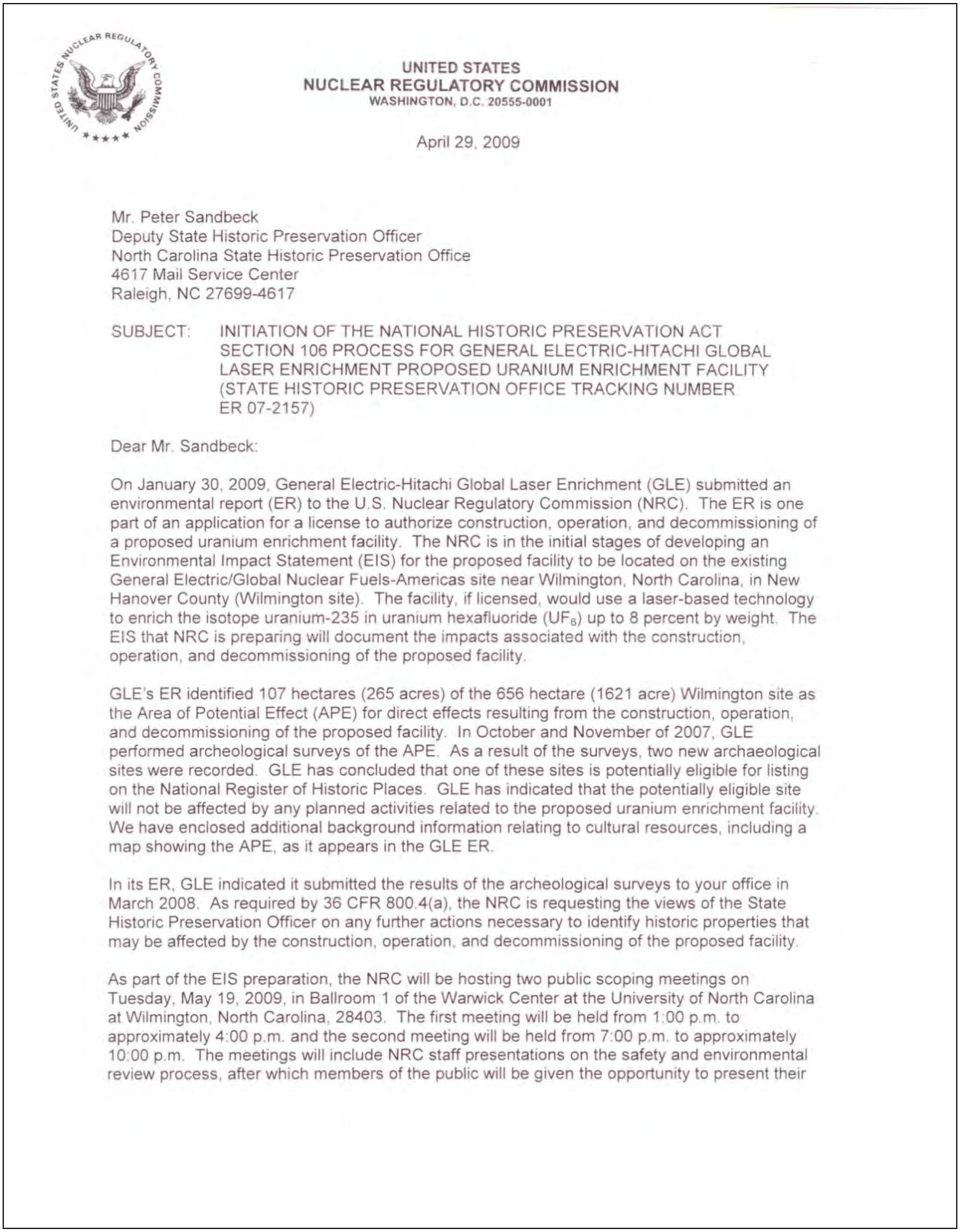


cc with enclosure:

Ms. Lisa C. Stopp, Tribal Historic
Preservation Officer
P.O. Box 746
Tahlequah, OK 74465

cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Lafayette Atkinson/NCOSH
Mathew Allen/GEH
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lee Cox/NCDENR
David Weaver/New Hanover County
Julie Olivier/GEH
Jerald Head/GEH



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 29, 2009

Mr. Peter Sandbeck
Deputy State Historic Preservation Officer
North Carolina State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

SUBJECT: INITIATION OF THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 PROCESS FOR GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT PROPOSED URANIUM ENRICHMENT FACILITY (STATE HISTORIC PRESERVATION OFFICE TRACKING NUMBER ER 07-2157)

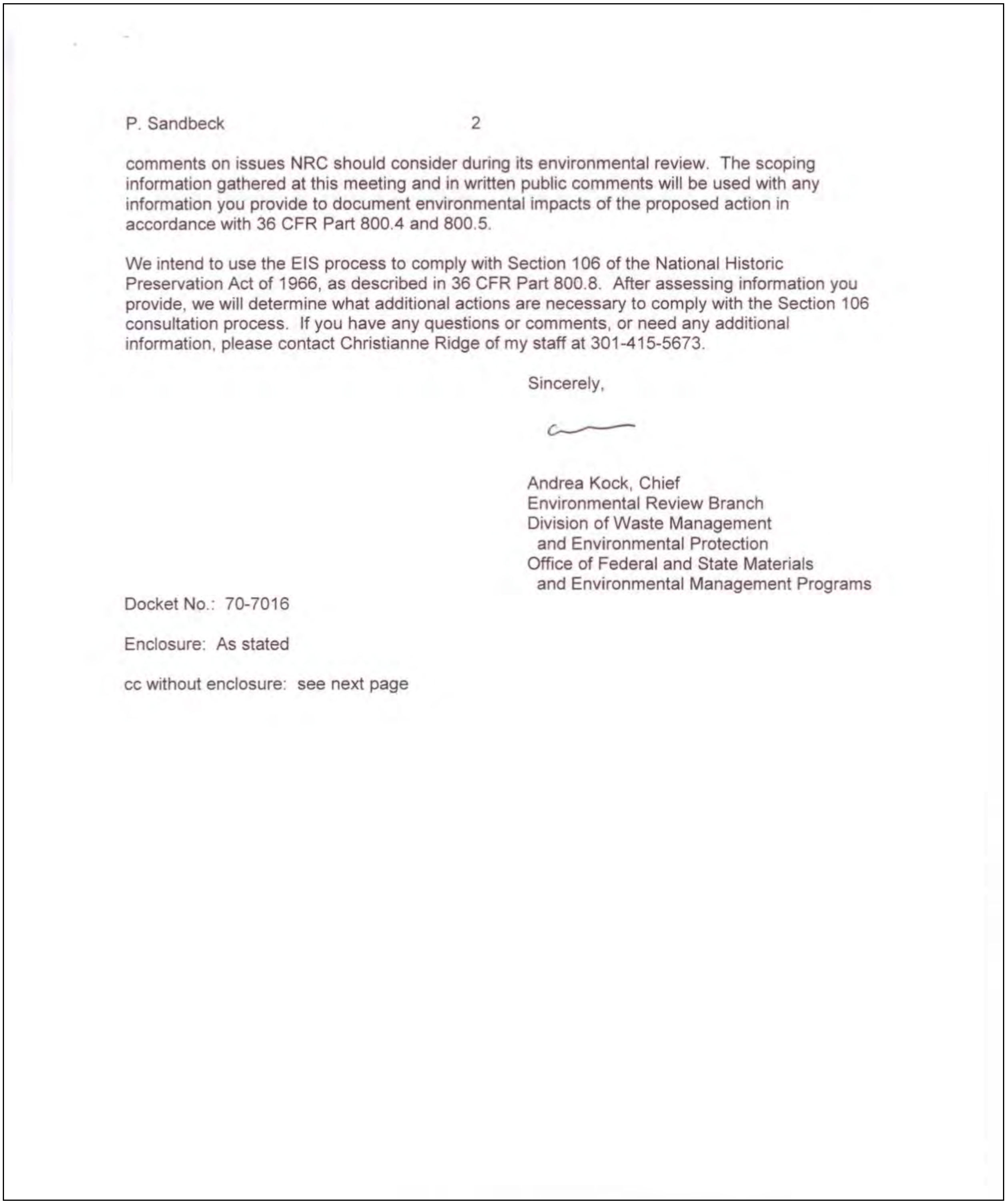
Dear Mr. Sandbeck:

On January 30, 2009, General Electric-Hitachi Global Laser Enrichment (GLE) submitted an environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). The ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located on the existing General Electric/Global Nuclear Fuels-Americas site near Wilmington, North Carolina, in New Hanover County (Wilmington site). 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. The EIS that NRC is preparing will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

GLE's ER identified 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site as the Area of Potential Effect (APE) for direct effects resulting from the construction, operation, and decommissioning of the proposed facility. In October and November of 2007, GLE performed archeological surveys of the APE. As a result of the surveys, two new archaeological sites were recorded. GLE has concluded that one of these sites is potentially eligible for listing on the National Register of Historic Places. GLE has indicated that the potentially eligible site will not be affected by any planned activities related to the proposed uranium enrichment facility. We have enclosed additional background information relating to cultural resources, including a map showing the APE, as it appears in the GLE ER.

In its ER, GLE indicated it submitted the results of the archeological surveys to your office in March 2008. As required by 36 CFR 800.4(a), the NRC is requesting the views of the State Historic Preservation Officer on any further actions necessary to identify historic properties that may be affected by the construction, operation, and decommissioning of the proposed facility.

As part of the EIS preparation, the NRC will be hosting two public scoping meetings on Tuesday, May 19, 2009, in Ballroom 1 of the Warwick Center at the University of North Carolina at Wilmington, North Carolina, 28403. The first meeting will be held from 1:00 p.m. to approximately 4:00 p.m. and the second meeting will be held from 7:00 p.m. to approximately 10:00 p.m. The meetings will include NRC staff presentations on the safety and environmental review process, after which members of the public will be given the opportunity to present their



P. Sandbeck 2

comments on issues NRC should consider during its environmental review. The scoping information gathered at this meeting and in written public comments will be used with any information you provide to document environmental impacts of the proposed action in accordance with 36 CFR Part 800.4 and 800.5.

We intend to use the EIS process to comply with Section 106 of the National Historic Preservation Act of 1966, as described in 36 CFR Part 800.8. After assessing information you provide, we will determine what additional actions are necessary to comply with the Section 106 consultation process. If you have any questions or comments, or need any additional information, please contact Christianne Ridge of my staff at 301-415-5673.

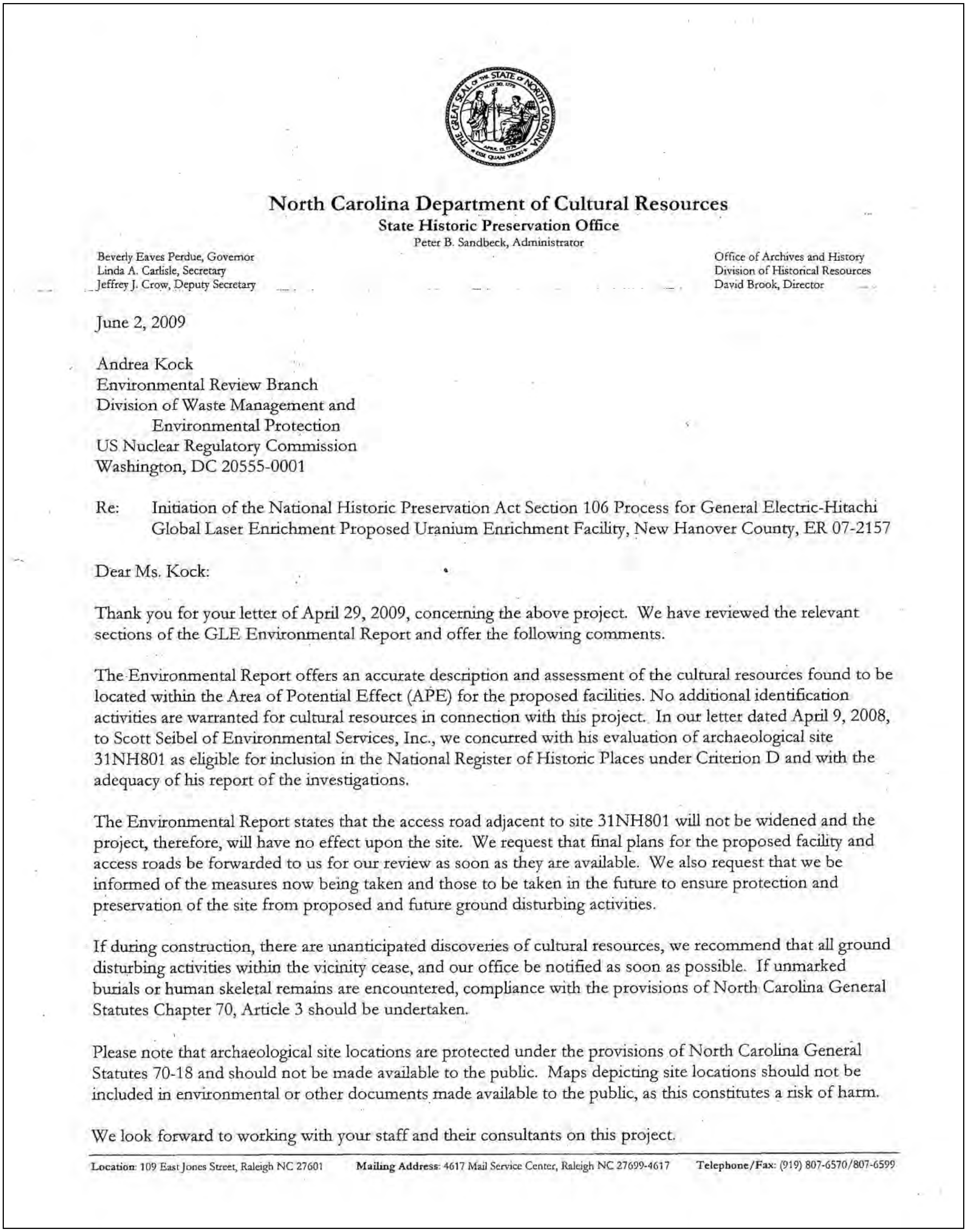
Sincerely,

Andrea Kock, Chief
Environmental Review Branch
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 70-7016

Enclosure: As stated

cc without enclosure: see next page



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

June 2, 2009

Andrea Kock
Environmental Review Branch
Division of Waste Management and
Environmental Protection
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Initiation of the National Historic Preservation Act Section 106 Process for General Electric-Hitachi Global Laser Enrichment Proposed Uranium Enrichment Facility, New Hanover County, ER 07-2157

Dear Ms. Kock:

Thank you for your letter of April 29, 2009, concerning the above project. We have reviewed the relevant sections of the GLE Environmental Report and offer the following comments.

The Environmental Report offers an accurate description and assessment of the cultural resources found to be located within the Area of Potential Effect (APE) for the proposed facilities. No additional identification activities are warranted for cultural resources in connection with this project. In our letter dated April 9, 2008, to Scott Seibel of Environmental Services, Inc., we concurred with his evaluation of archaeological site 31NH801 as eligible for inclusion in the National Register of Historic Places under Criterion D and with the adequacy of his report of the investigations.

The Environmental Report states that the access road adjacent to site 31NH801 will not be widened and the project, therefore, will have no effect upon the site. We request that final plans for the proposed facility and access roads be forwarded to us for our review as soon as they are available. We also request that we be informed of the measures now being taken and those to be taken in the future to ensure protection and preservation of the site from proposed and future ground disturbing activities.

If during construction, there are unanticipated discoveries of cultural resources, we recommend that all ground disturbing activities within the vicinity cease, and our office be notified as soon as possible. If unmarked burials or human skeletal remains are encountered, compliance with the provisions of North Carolina General Statutes Chapter 70, Article 3 should be undertaken.

Please note that archaeological site locations are protected under the provisions of North Carolina General Statutes 70-18 and should not be made available to the public. Maps depicting site locations should not be included in environmental or other documents made available to the public, as this constitutes a risk of harm.

We look forward to working with your staff and their consultants on this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

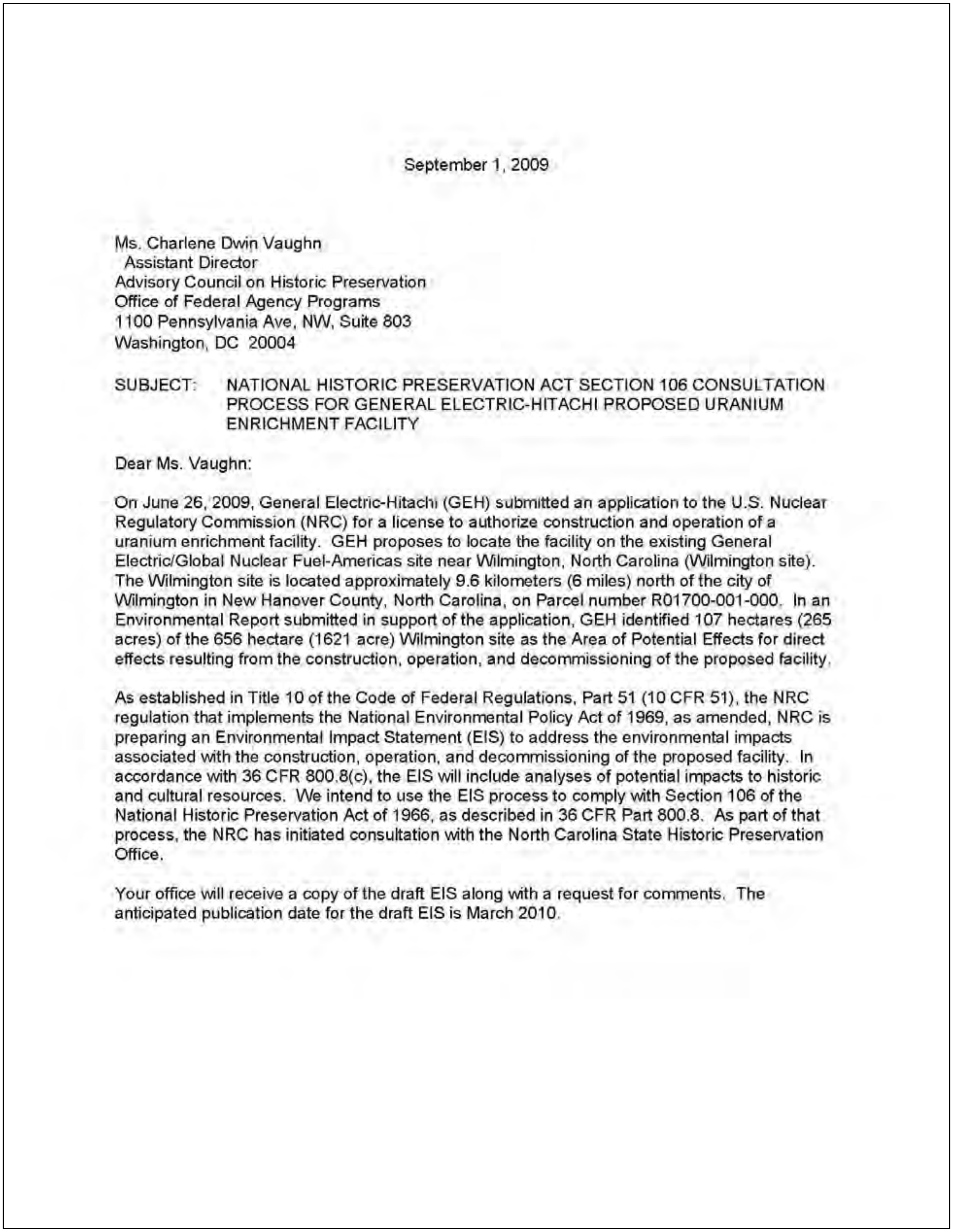
Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter Sandbeck

cc: Christianne Ridge, Division of Waste Management and Environmnetal Protection
Clearinghouse



September 1, 2009

Ms. Charlene Dwin Vaughn
Assistant Director
Advisory Council on Historic Preservation
Office of Federal Agency Programs
1100 Pennsylvania Ave, NW, Suite 803
Washington, DC 20004

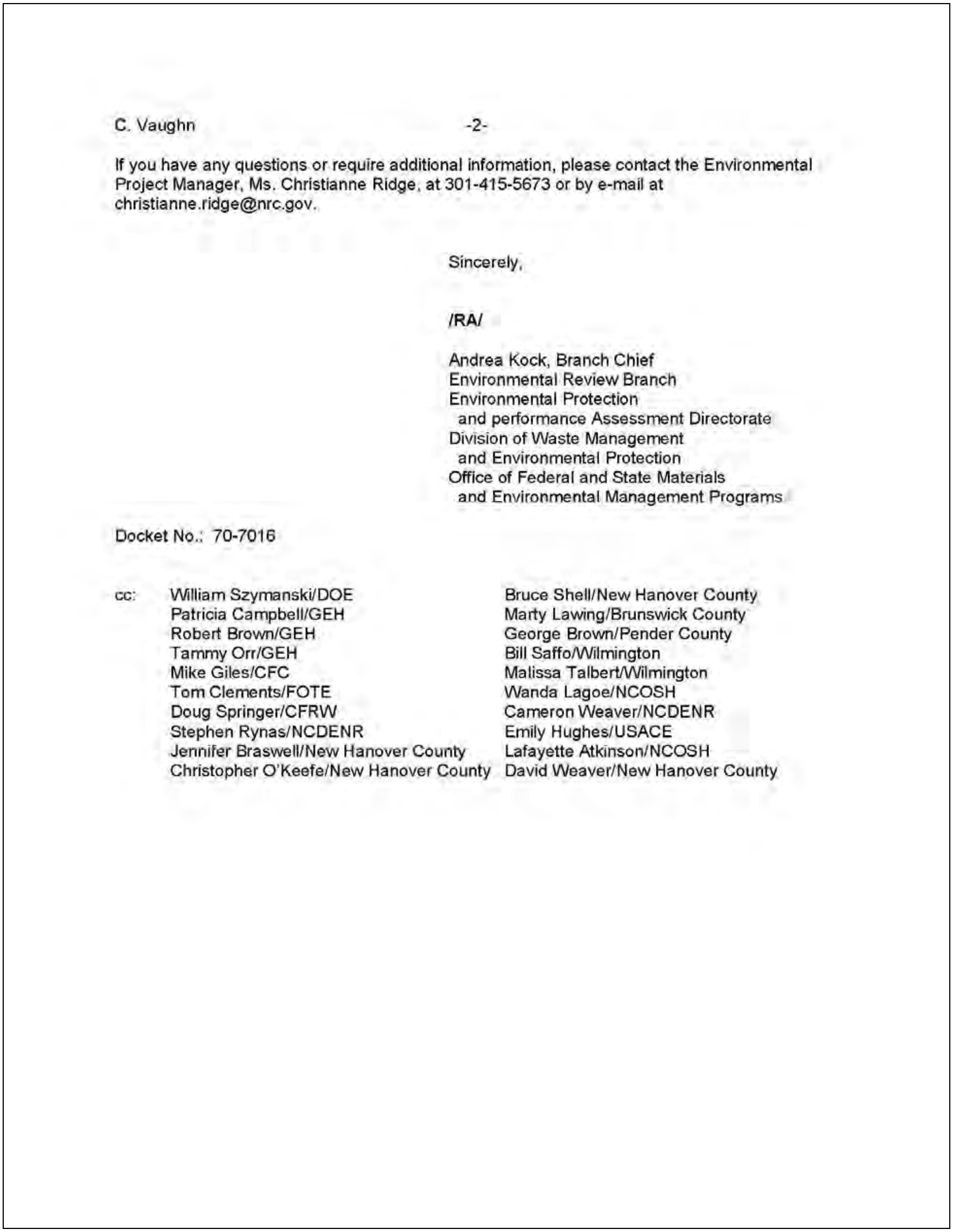
SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION PROCESS FOR GENERAL ELECTRIC-HITACHI PROPOSED URANIUM ENRICHMENT FACILITY

Dear Ms. Vaughn:

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. GEH proposes to locate the facility on the existing General Electric/Global Nuclear Fuel-Americas site near Wilmington, North Carolina (Wilmington site). The Wilmington site is located approximately 9.6 kilometers (6 miles) north of the city of Wilmington in New Hanover County, North Carolina, on Parcel number R01700-001-000. In an Environmental Report submitted in support of the application, GEH identified 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site as the Area of Potential Effects for direct effects resulting from the construction, operation, and decommissioning of the proposed facility.

As established in Title 10 of the Code of Federal Regulations, Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, NRC is preparing an Environmental Impact Statement (EIS) to address the environmental impacts associated with the construction, operation, and decommissioning of the proposed facility. In accordance with 36 CFR 800.8(c), the EIS will include analyses of potential impacts to historic and cultural resources. We intend to use the EIS process to comply with Section 106 of the National Historic Preservation Act of 1966, as described in 36 CFR Part 800.8. As part of that process, the NRC has initiated consultation with the North Carolina State Historic Preservation Office.

Your office will receive a copy of the draft EIS along with a request for comments. The anticipated publication date for the draft EIS is March 2010.



C. Vaughn -2-

If you have any questions or require additional information, please contact the Environmental Project Manager, Ms. Christianne Ridge, at 301-415-5673 or by e-mail at christianne.ridge@nrc.gov.

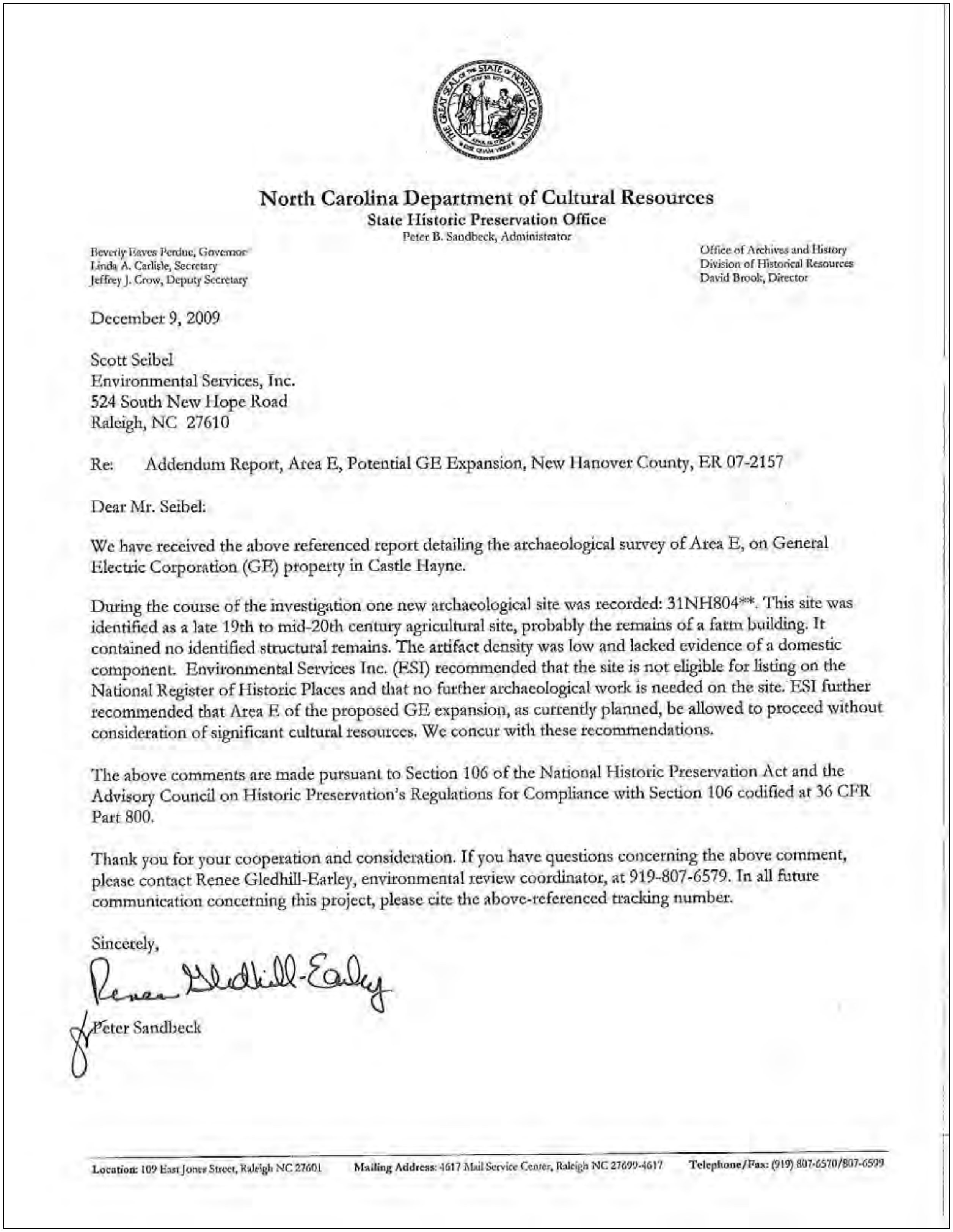
Sincerely,

/RA/

Andrea Kock, Branch Chief
Environmental Review Branch
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

cc:
William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lafayette Atkinson/NCOSH
David Weaver/New Hanover County



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

December 9, 2009

Scott Seibel
Environmental Services, Inc.
524 South New Hope Road
Raleigh, NC 27610

Re: Addendum Report, Area E, Potential GE Expansion, New Hanover County, ER 07-2157

Dear Mr. Seibel:

We have received the above referenced report detailing the archaeological survey of Area E, on General Electric Corporation (GE) property in Castle Hayne.

During the course of the investigation one new archaeological site was recorded: 31NH804**. This site was identified as a late 19th to mid-20th century agricultural site, probably the remains of a farm building. It contained no identified structural remains. The artifact density was low and lacked evidence of a domestic component. Environmental Services Inc. (ESI) recommended that the site is not eligible for listing on the National Register of Historic Places and that no further archaeological work is needed on the site. ESI further recommended that Area E of the proposed GE expansion, as currently planned, be allowed to proceed without consideration of significant cultural resources. We concur with these recommendations.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

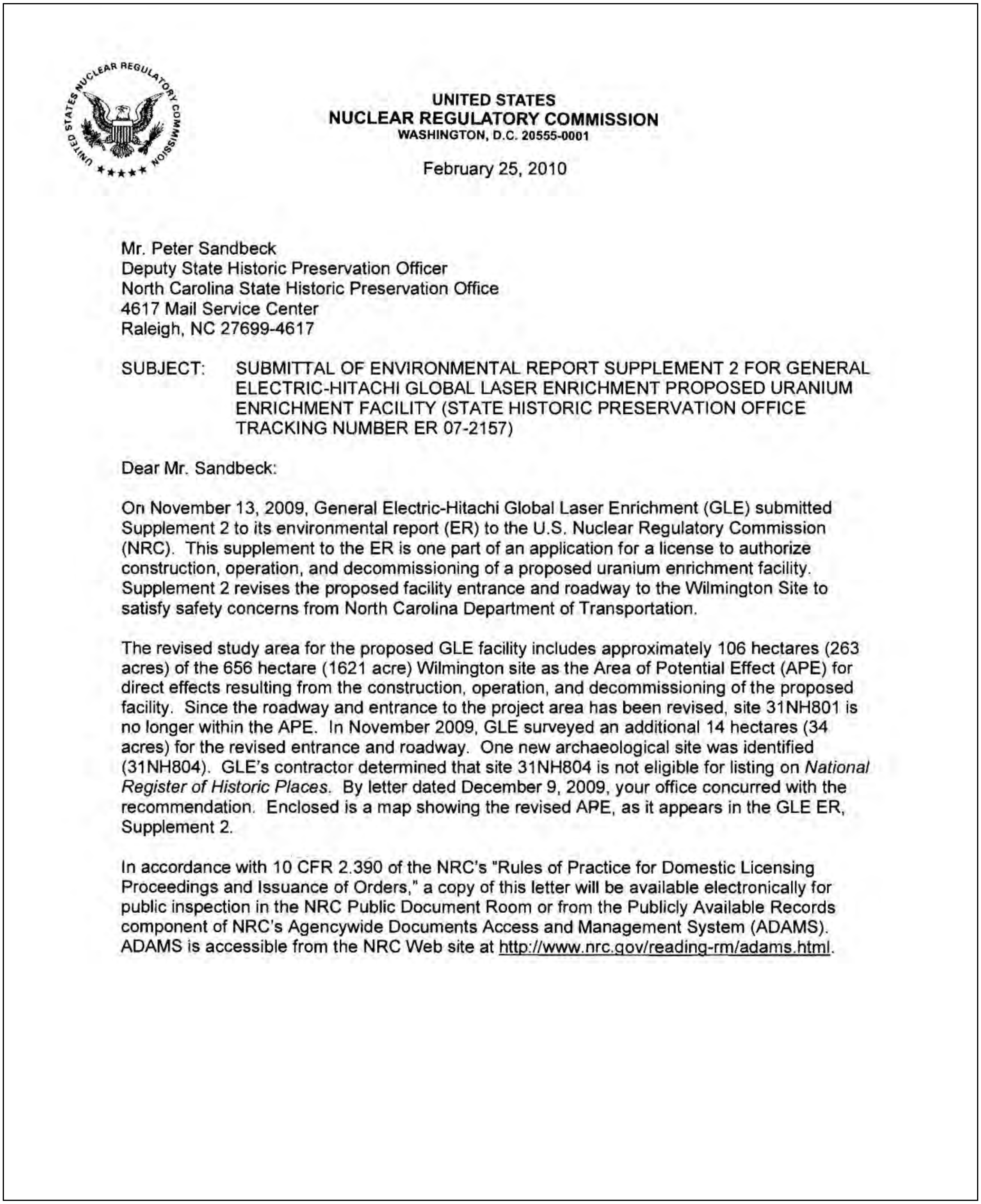
Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Peter Sandbeck

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address:** 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax:** (919) 807-6570/807-6599



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 25, 2010

Mr. Peter Sandbeck
Deputy State Historic Preservation Officer
North Carolina State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

SUBJECT: SUBMITTAL OF ENVIRONMENTAL REPORT SUPPLEMENT 2 FOR GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT PROPOSED URANIUM ENRICHMENT FACILITY (STATE HISTORIC PRESERVATION OFFICE TRACKING NUMBER ER 07-2157)

Dear Mr. Sandbeck:

On November 13, 2009, General Electric-Hitachi Global Laser Enrichment (GLE) submitted Supplement 2 to its environmental report (ER) to the U.S. Nuclear Regulatory Commission (NRC). This supplement to the ER is one part of an application for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. Supplement 2 revises the proposed facility entrance and roadway to the Wilmington Site to satisfy safety concerns from North Carolina Department of Transportation.

The revised study area for the proposed GLE facility includes approximately 106 hectares (263 acres) of the 656 hectare (1621 acre) Wilmington site as the Area of Potential Effect (APE) for direct effects resulting from the construction, operation, and decommissioning of the proposed facility. Since the roadway and entrance to the project area has been revised, site 31NH801 is no longer within the APE. In November 2009, GLE surveyed an additional 14 hectares (34 acres) for the revised entrance and roadway. One new archaeological site was identified (31NH804). GLE's contractor determined that site 31NH804 is not eligible for listing on *National Register of Historic Places*. By letter dated December 9, 2009, your office concurred with the recommendation. Enclosed is a map showing the revised APE, as it appears in the GLE ER, Supplement 2.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions or comments, or need any additional information, please contact Jennifer Davis of my staff at 301-415-3835.

Sincerely,

Andrea Kock, Chief
Environmental Review Branch
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: Map

cc w/out enclosure: see next page

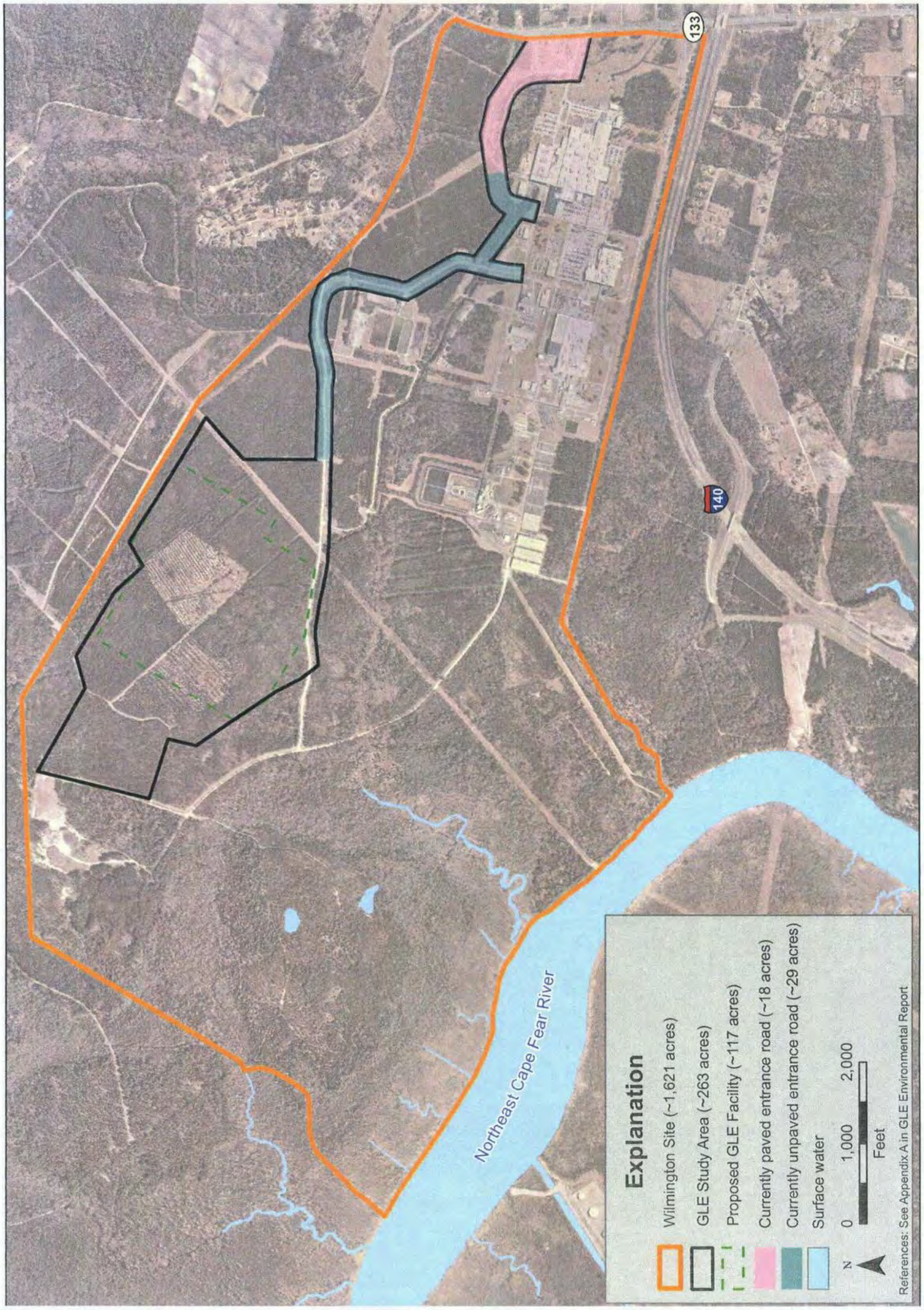
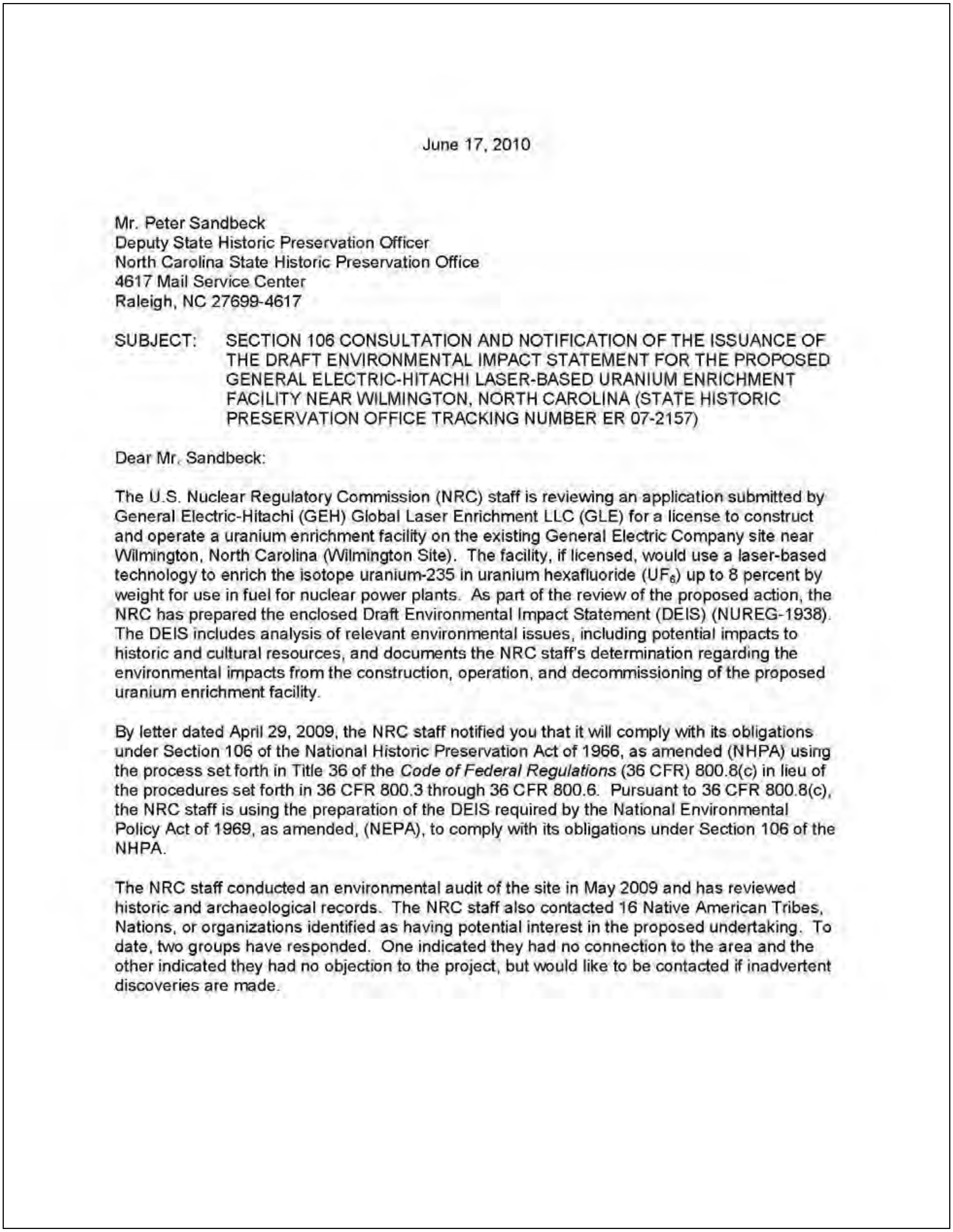


Figure 1-1. Location of revised entrance and roadway to the Proposed GLE Facility.



June 17, 2010

Mr. Peter Sandbeck
Deputy State Historic Preservation Officer
North Carolina State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

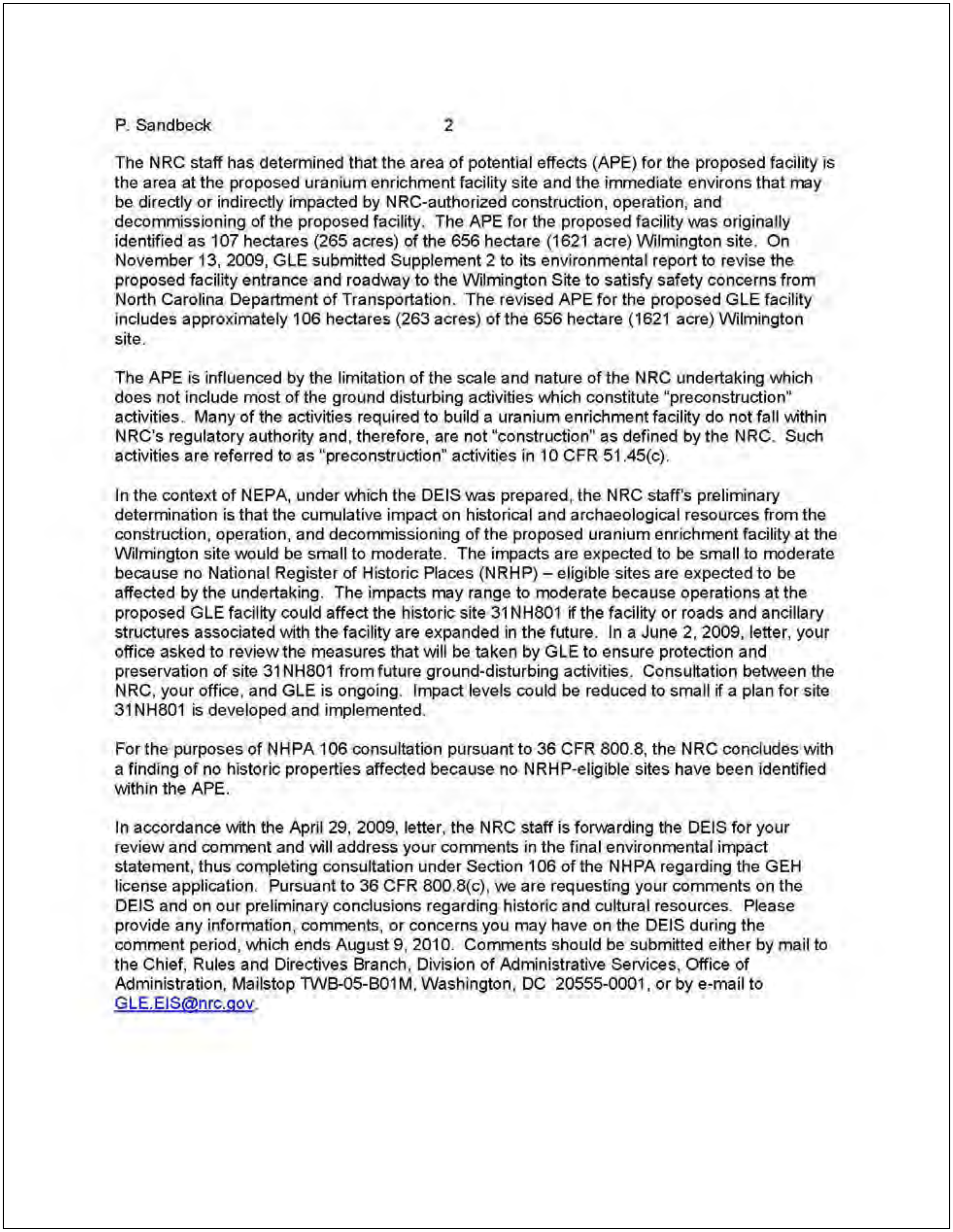
SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA (STATE HISTORIC PRESERVATION OFFICE TRACKING NUMBER ER 07-2157)

Dear Mr. Sandbeck:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to historic and cultural resources, and documents the NRC staff's determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed uranium enrichment facility.

By letter dated April 29, 2009, the NRC staff notified you that it will comply with its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) using the process set forth in Title 36 of the *Code of Federal Regulations* (36 CFR) 800.8(c) in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6. Pursuant to 36 CFR 800.8(c), the NRC staff is using the preparation of the DEIS required by the National Environmental Policy Act of 1969, as amended, (NEPA), to comply with its obligations under Section 106 of the NHPA.

The NRC staff conducted an environmental audit of the site in May 2009 and has reviewed historic and archaeological records. The NRC staff also contacted 16 Native American Tribes, Nations, or organizations identified as having potential interest in the proposed undertaking. To date, two groups have responded. One indicated they had no connection to the area and the other indicated they had no objection to the project, but would like to be contacted if inadvertent discoveries are made.



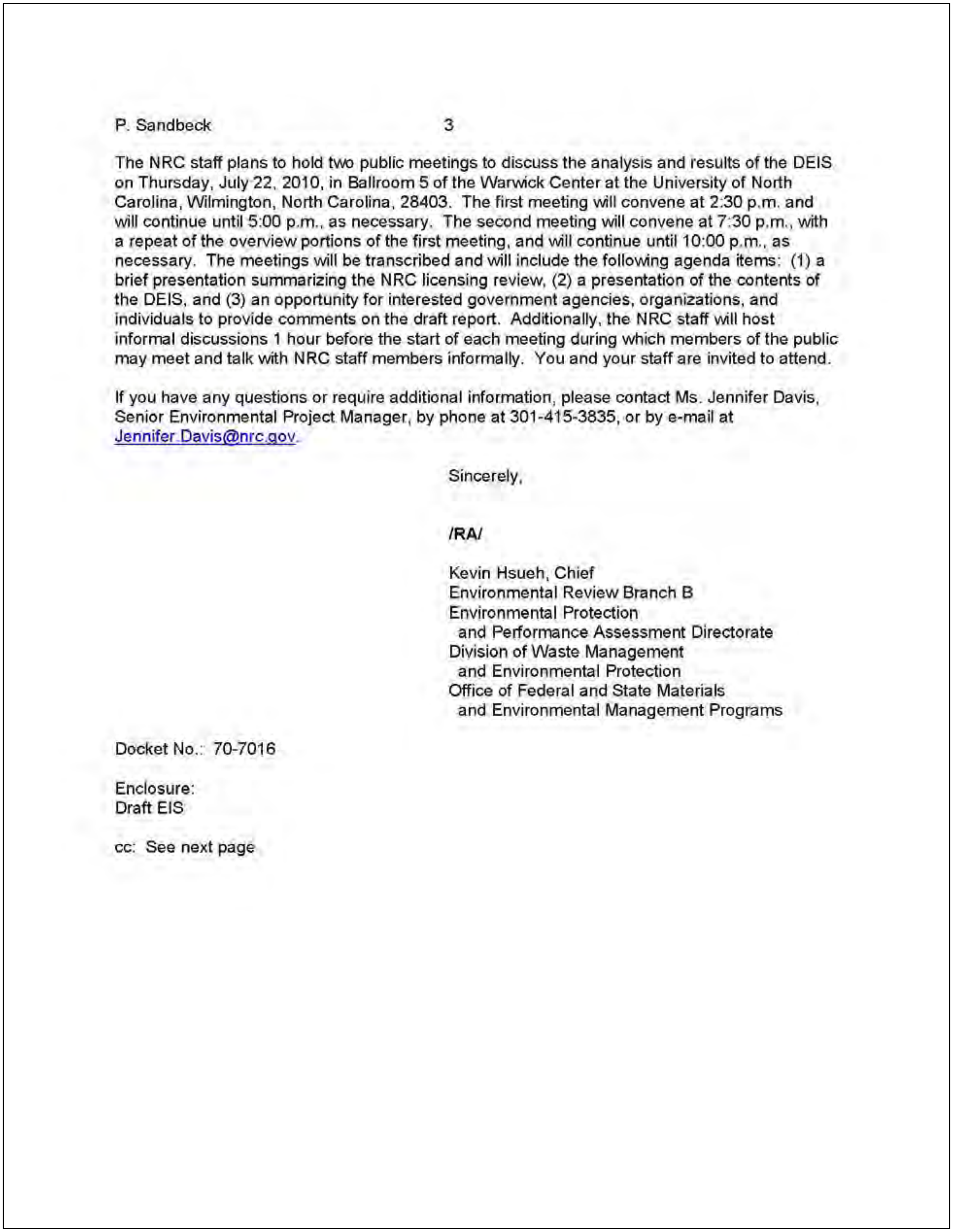
The NRC staff has determined that the area of potential effects (APE) for the proposed facility is the area at the proposed uranium enrichment facility site and the immediate environs that may be directly or indirectly impacted by NRC-authorized construction, operation, and decommissioning of the proposed facility. The APE for the proposed facility was originally identified as 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site. On November 13, 2009, GLE submitted Supplement 2 to its environmental report to revise the proposed facility entrance and roadway to the Wilmington Site to satisfy safety concerns from North Carolina Department of Transportation. The revised APE for the proposed GLE facility includes approximately 106 hectares (263 acres) of the 656 hectare (1621 acre) Wilmington site.

The APE is influenced by the limitation of the scale and nature of the NRC undertaking which does not include most of the ground disturbing activities which constitute "preconstruction" activities. Many of the activities required to build a uranium enrichment facility do not fall within NRC's regulatory authority and, therefore, are not "construction" as defined by the NRC. Such activities are referred to as "preconstruction" activities in 10 CFR 51.45(c).

In the context of NEPA, under which the DEIS was prepared, the NRC staff's preliminary determination is that the cumulative impact on historical and archaeological resources from the construction, operation, and decommissioning of the proposed uranium enrichment facility at the Wilmington site would be small to moderate. The impacts are expected to be small to moderate because no National Register of Historic Places (NRHP) – eligible sites are expected to be affected by the undertaking. The impacts may range to moderate because operations at the proposed GLE facility could affect the historic site 31NH801 if the facility or roads and ancillary structures associated with the facility are expanded in the future. In a June 2, 2009, letter, your office asked to review the measures that will be taken by GLE to ensure protection and preservation of site 31NH801 from future ground-disturbing activities. Consultation between the NRC, your office, and GLE is ongoing. Impact levels could be reduced to small if a plan for site 31NH801 is developed and implemented.

For the purposes of NHPA 106 consultation pursuant to 36 CFR 800.8, the NRC concludes with a finding of no historic properties affected because no NRHP-eligible sites have been identified within the APE.

In accordance with the April 29, 2009, letter, the NRC staff is forwarding the DEIS for your review and comment and will address your comments in the final environmental impact statement, thus completing consultation under Section 106 of the NHPA regarding the GEH license application. Pursuant to 36 CFR 800.8(c), we are requesting your comments on the DEIS and on our preliminary conclusions regarding historic and cultural resources. Please provide any information, comments, or concerns you may have on the DEIS during the comment period, which ends August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.



The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

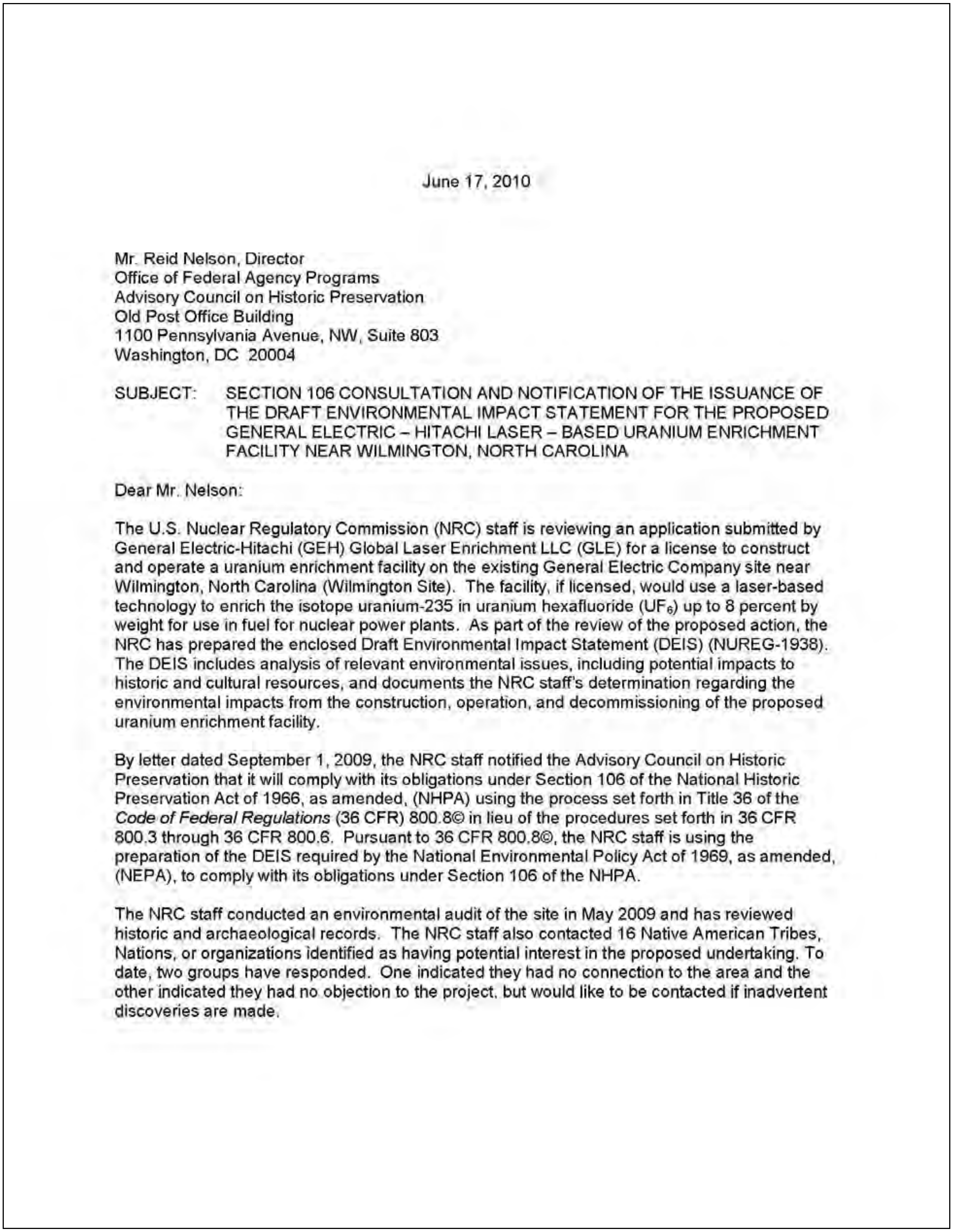
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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:
Draft EIS

cc: See next page



June 17, 2010

Mr. Reid Nelson, Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

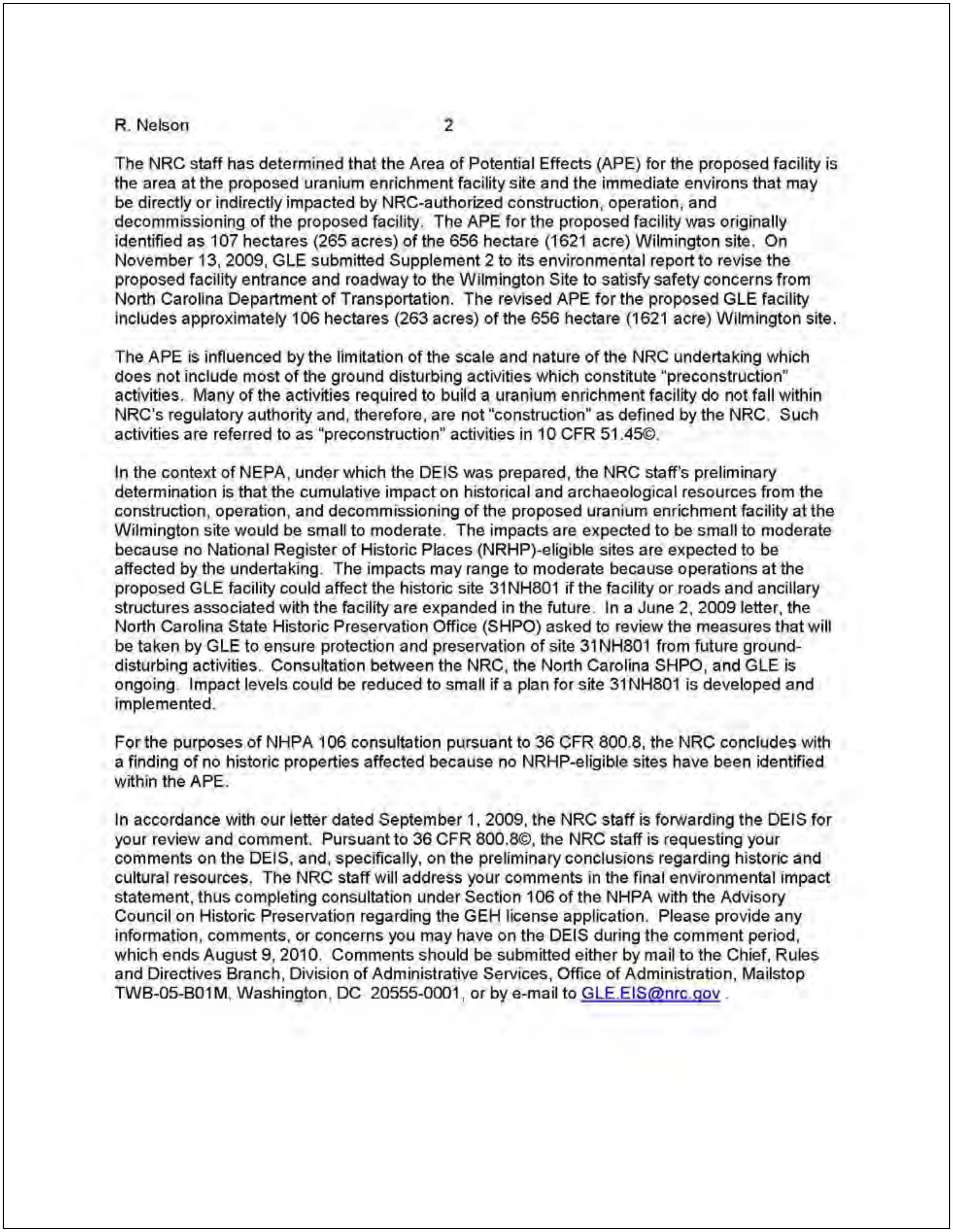
SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC – HITACHI LASER – BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Mr. Nelson:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to historic and cultural resources, and documents the NRC staff's determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed uranium enrichment facility.

By letter dated September 1, 2009, the NRC staff notified the Advisory Council on Historic Preservation that it will comply with its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended, (NHPA) using the process set forth in Title 36 of the *Code of Federal Regulations* (36 CFR) 800.8© in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6. Pursuant to 36 CFR 800.8©, the NRC staff is using the preparation of the DEIS required by the National Environmental Policy Act of 1969, as amended, (NEPA), to comply with its obligations under Section 106 of the NHPA.

The NRC staff conducted an environmental audit of the site in May 2009 and has reviewed historic and archaeological records. The NRC staff also contacted 16 Native American Tribes, Nations, or organizations identified as having potential interest in the proposed undertaking. To date, two groups have responded. One indicated they had no connection to the area and the other indicated they had no objection to the project, but would like to be contacted if inadvertent discoveries are made.



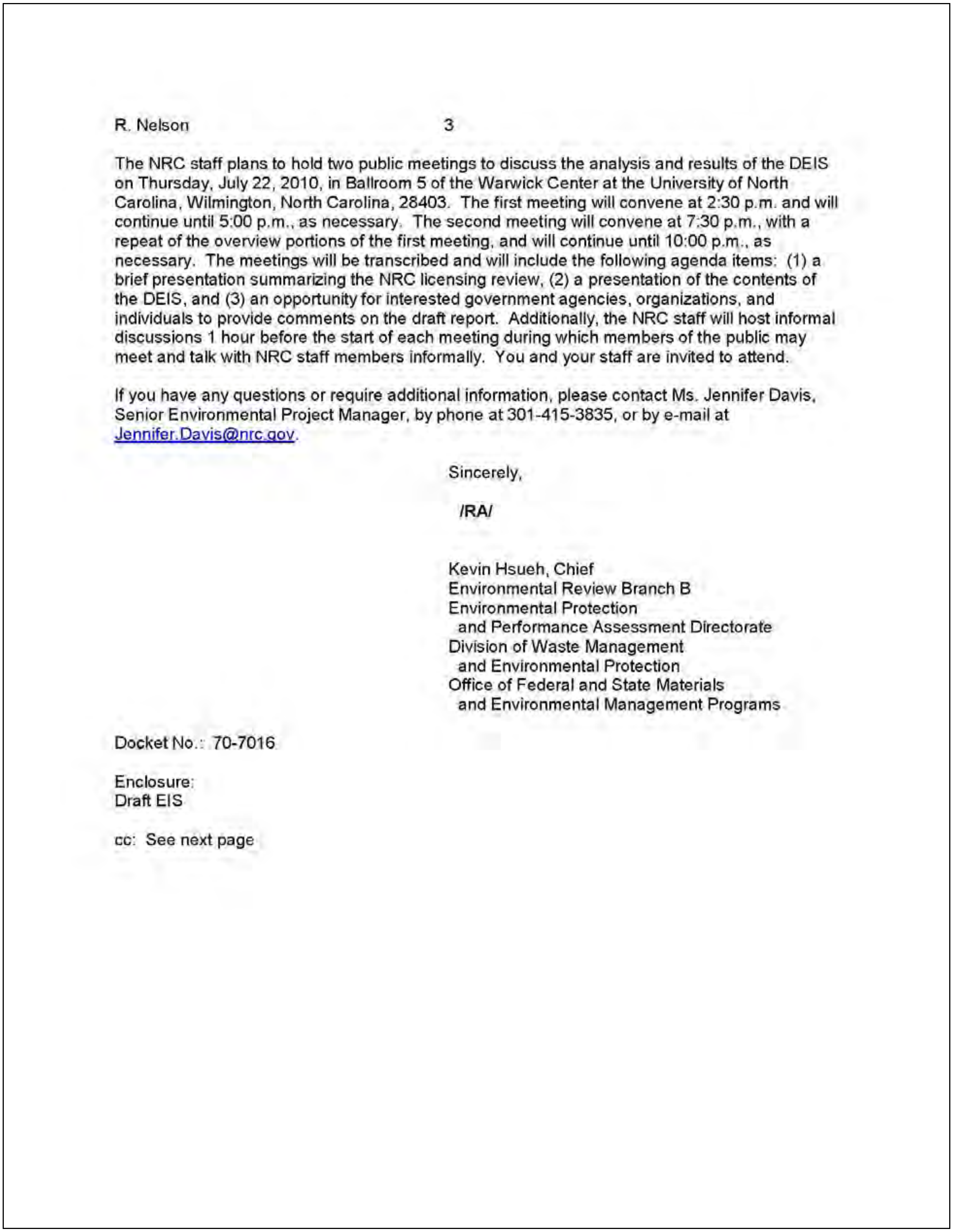
The NRC staff has determined that the Area of Potential Effects (APE) for the proposed facility is the area at the proposed uranium enrichment facility site and the immediate environs that may be directly or indirectly impacted by NRC-authorized construction, operation, and decommissioning of the proposed facility. The APE for the proposed facility was originally identified as 107 hectares (265 acres) of the 656 hectare (1621 acre) Wilmington site. On November 13, 2009, GLE submitted Supplement 2 to its environmental report to revise the proposed facility entrance and roadway to the Wilmington Site to satisfy safety concerns from North Carolina Department of Transportation. The revised APE for the proposed GLE facility includes approximately 106 hectares (263 acres) of the 656 hectare (1621 acre) Wilmington site.

The APE is influenced by the limitation of the scale and nature of the NRC undertaking which does not include most of the ground disturbing activities which constitute "preconstruction" activities. Many of the activities required to build a uranium enrichment facility do not fall within NRC's regulatory authority and, therefore, are not "construction" as defined by the NRC. Such activities are referred to as "preconstruction" activities in 10 CFR 51.45©.

In the context of NEPA, under which the DEIS was prepared, the NRC staff's preliminary determination is that the cumulative impact on historical and archaeological resources from the construction, operation, and decommissioning of the proposed uranium enrichment facility at the Wilmington site would be small to moderate. The impacts are expected to be small to moderate because no National Register of Historic Places (NRHP)-eligible sites are expected to be affected by the undertaking. The impacts may range to moderate because operations at the proposed GLE facility could affect the historic site 31NH801 if the facility or roads and ancillary structures associated with the facility are expanded in the future. In a June 2, 2009 letter, the North Carolina State Historic Preservation Office (SHPO) asked to review the measures that will be taken by GLE to ensure protection and preservation of site 31NH801 from future ground-disturbing activities. Consultation between the NRC, the North Carolina SHPO, and GLE is ongoing. Impact levels could be reduced to small if a plan for site 31NH801 is developed and implemented.

For the purposes of NHPA 106 consultation pursuant to 36 CFR 800.8, the NRC concludes with a finding of no historic properties affected because no NRHP-eligible sites have been identified within the APE.

In accordance with our letter dated September 1, 2009, the NRC staff is forwarding the DEIS for your review and comment. Pursuant to 36 CFR 800.8©, the NRC staff is requesting your comments on the DEIS, and, specifically, on the preliminary conclusions regarding historic and cultural resources. The NRC staff will address your comments in the final environmental impact statement, thus completing consultation under Section 106 of the NHPA with the Advisory Council on Historic Preservation regarding the GEH license application. Please provide any information, comments, or concerns you may have on the DEIS during the comment period, which ends August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov .



The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

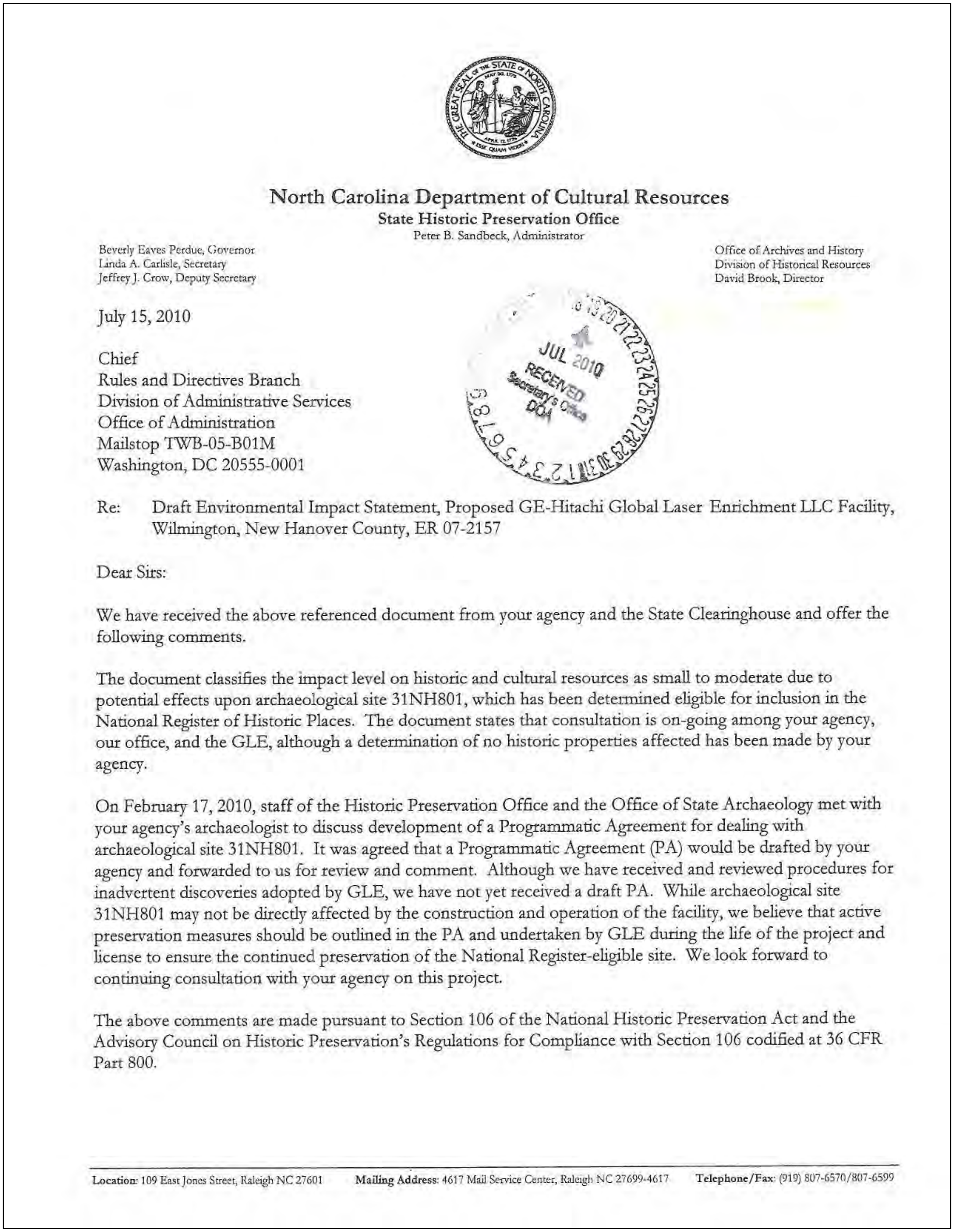
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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:
Draft EIS

cc: See next page



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

JUL 2010
RECEIVED
Secretary's Office
DOA

July 15, 2010

Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop TWB-05-B01M
Washington, DC 20555-0001

Re: Draft Environmental Impact Statement, Proposed GE-Hitachi Global Laser Enrichment LLC Facility, Wilmington, New Hanover County, ER 07-2157

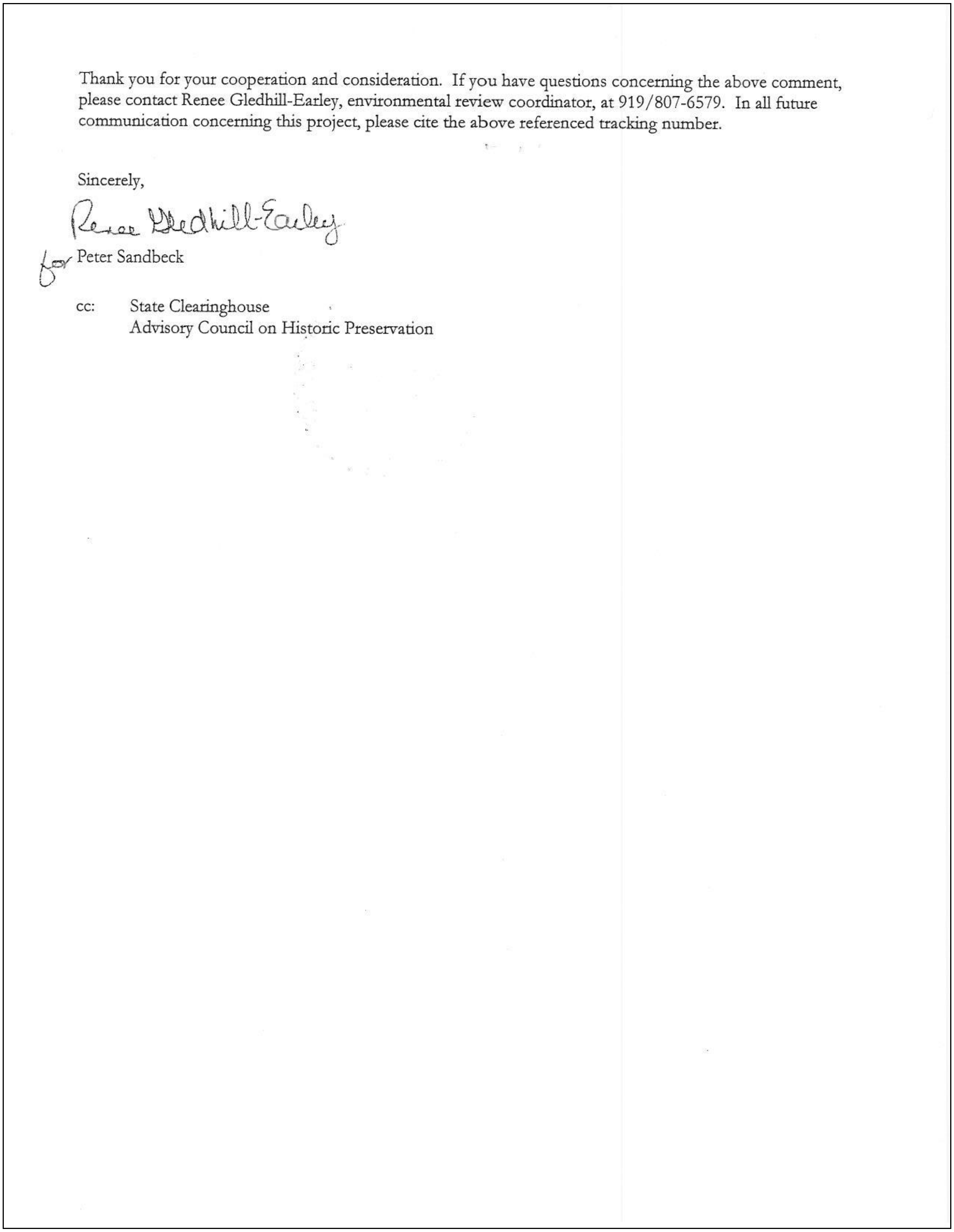
Dear Sirs:

We have received the above referenced document from your agency and the State Clearinghouse and offer the following comments.

The document classifies the impact level on historic and cultural resources as small to moderate due to potential effects upon archaeological site 31NH801, which has been determined eligible for inclusion in the National Register of Historic Places. The document states that consultation is on-going among your agency, our office, and the GLE, although a determination of no historic properties affected has been made by your agency.

On February 17, 2010, staff of the Historic Preservation Office and the Office of State Archaeology met with your agency's archaeologist to discuss development of a Programmatic Agreement for dealing with archaeological site 31NH801. It was agreed that a Programmatic Agreement (PA) would be drafted by your agency and forwarded to us for review and comment. Although we have received and reviewed procedures for inadvertent discoveries adopted by GLE, we have not yet received a draft PA. While archaeological site 31NH801 may not be directly affected by the construction and operation of the facility, we believe that active preservation measures should be outlined in the PA and undertaken by GLE during the life of the project and license to ensure the continued preservation of the National Register-eligible site. We look forward to continuing consultation with your agency on this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.



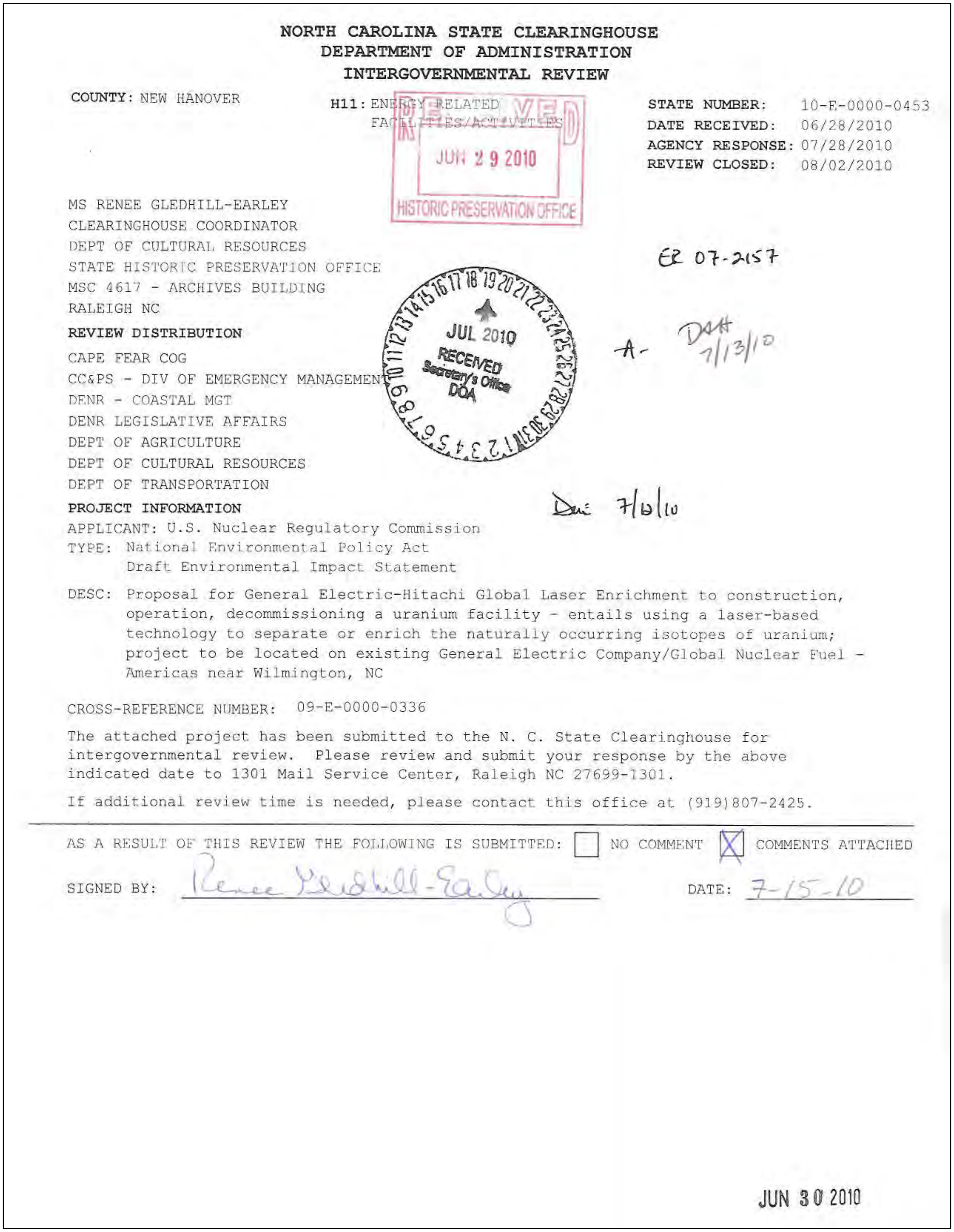
Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Peter Sandbeck

cc: State Clearinghouse
Advisory Council on Historic Preservation



NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: NEW HANOVER

H11: ENERGY RELATED
FACILITIES/ACTIVITIES

RECEIVED
JUN 29 2010
HISTORIC PRESERVATION OFFICE

STATE NUMBER: 10-E-0000-0453
DATE RECEIVED: 06/28/2010
AGENCY RESPONSE: 07/28/2010
REVIEW CLOSED: 08/02/2010

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF CULTURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

ER 07-2157

JUL 2010
RECEIVED
Secretary's Office
DOA

A- DAH 7/13/10

REVIEW DISTRIBUTION

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DENR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CULTURAL RESOURCES
DEPT OF TRANSPORTATION

Due: 7/6/10

PROJECT INFORMATION

APPLICANT: U.S. Nuclear Regulatory Commission
TYPE: National Environmental Policy Act
Draft Environmental Impact Statement

DESC: Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility - entails using a laser-based technology to separate or enrich the naturally occurring isotopes of uranium; project to be located on existing General Electric Company/Global Nuclear Fuel - Americas near Wilmington, NC

CROSS-REFERENCE NUMBER: 09-E-0000-0336

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

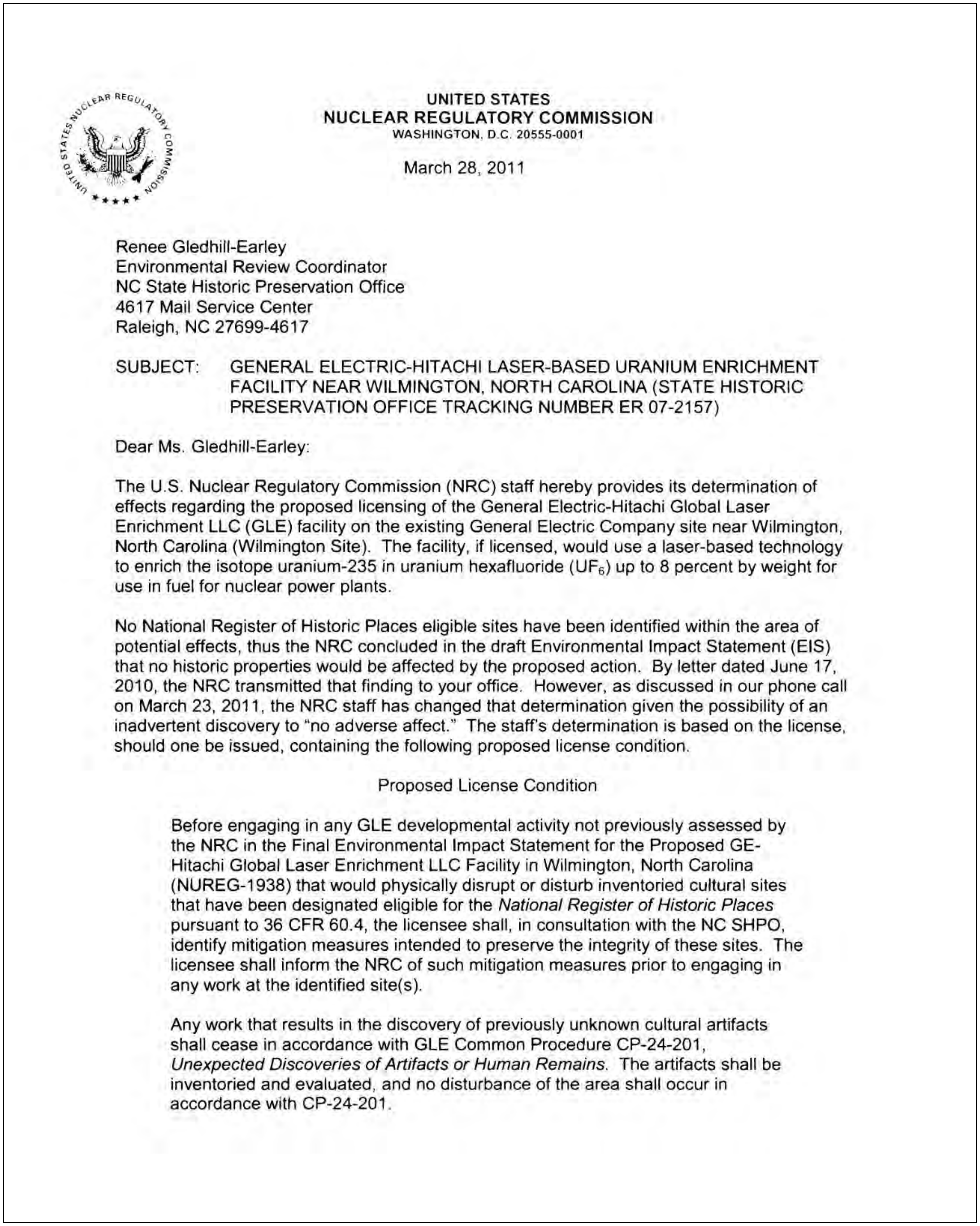
If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley

DATE: 7-15-10

JUN 30 2010



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 28, 2011

Renee Gledhill-Earley
Environmental Review Coordinator
NC State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

SUBJECT: GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA (STATE HISTORIC PRESERVATION OFFICE TRACKING NUMBER ER 07-2157)

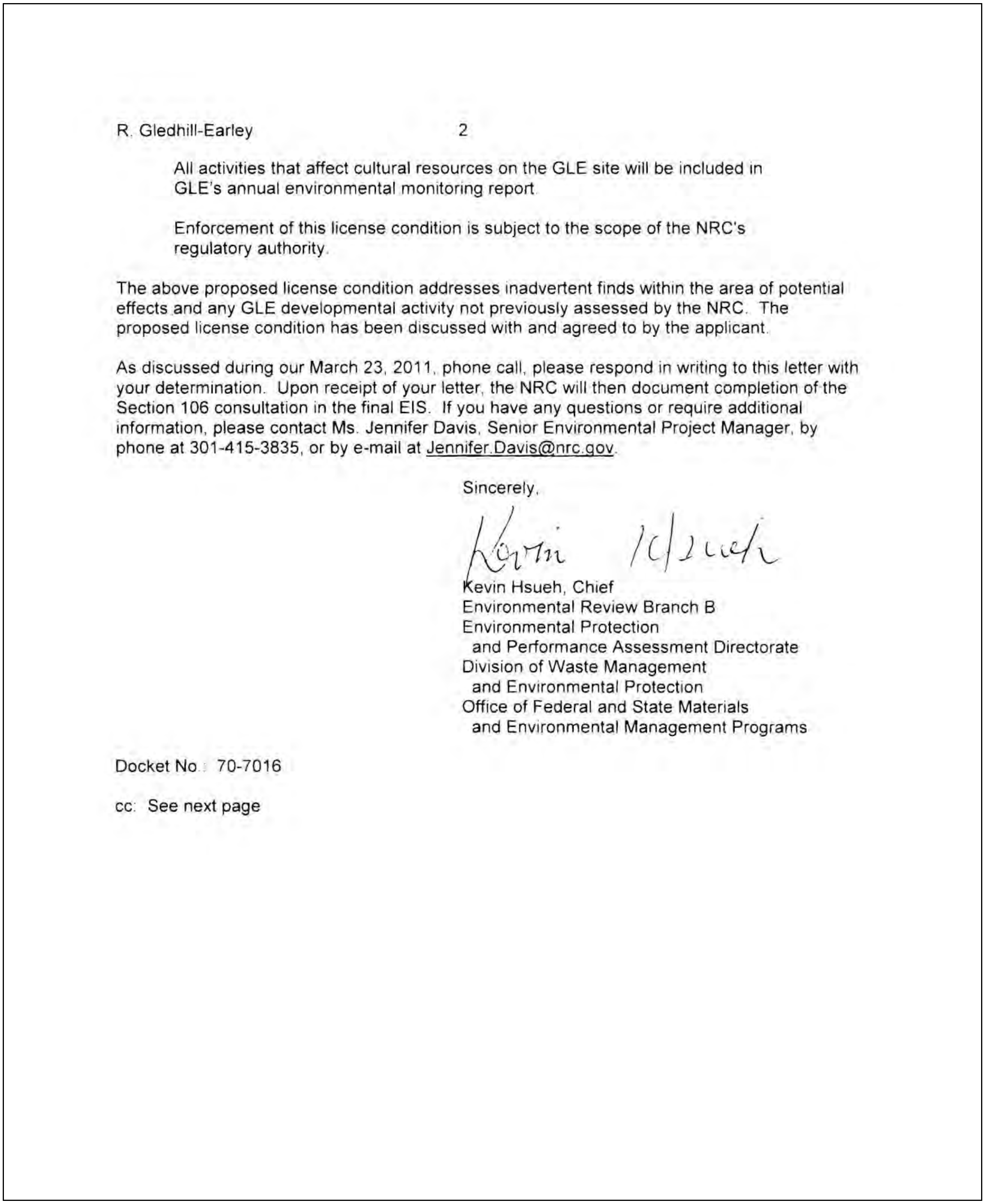
Dear Ms. Gledhill-Earley:

The U.S. Nuclear Regulatory Commission (NRC) staff hereby provides its determination of effects regarding the proposed licensing of the General Electric-Hitachi Global Laser Enrichment LLC (GLE) facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants.

No National Register of Historic Places eligible sites have been identified within the area of potential effects, thus the NRC concluded in the draft Environmental Impact Statement (EIS) that no historic properties would be affected by the proposed action. By letter dated June 17, 2010, the NRC transmitted that finding to your office. However, as discussed in our phone call on March 23, 2011, the NRC staff has changed that determination given the possibility of an inadvertent discovery to "no adverse affect." The staff's determination is based on the license, should one be issued, containing the following proposed license condition.

Proposed License Condition

> Before engaging in any GLE developmental activity not previously assessed by the NRC in the Final Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina (NUREG-1938) that would physically disrupt or disturb inventoried cultural sites that have been designated eligible for the *National Register of Historic Places* pursuant to 36 CFR 60.4, the licensee shall, in consultation with the NC SHPO, identify mitigation measures intended to preserve the integrity of these sites. The licensee shall inform the NRC of such mitigation measures prior to engaging in any work at the identified site(s).
>
> Any work that results in the discovery of previously unknown cultural artifacts shall cease in accordance with GLE Common Procedure CP-24-201, *Unexpected Discoveries of Artifacts or Human Remains*. The artifacts shall be inventoried and evaluated, and no disturbance of the area shall occur in accordance with CP-24-201.



R. Gledhill-Earley 2

All activities that affect cultural resources on the GLE site will be included in GLE's annual environmental monitoring report.

Enforcement of this license condition is subject to the scope of the NRC's regulatory authority.

The above proposed license condition addresses inadvertent finds within the area of potential effects and any GLE developmental activity not previously assessed by the NRC. The proposed license condition has been discussed with and agreed to by the applicant.

As discussed during our March 23, 2011, phone call, please respond in writing to this letter with your determination. Upon receipt of your letter, the NRC will then document completion of the Section 106 consultation in the final EIS. If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

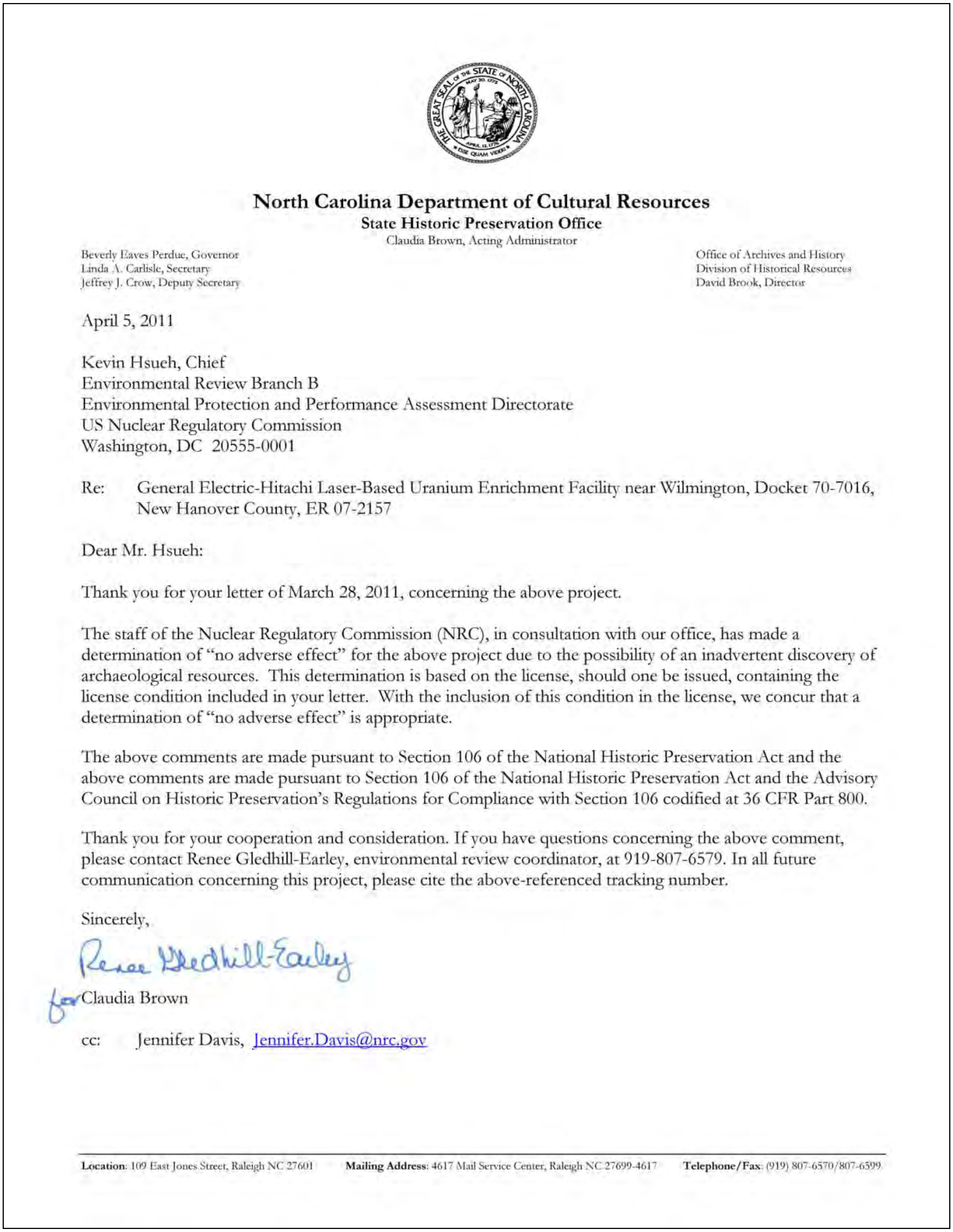
Sincerely,

Kevin Hsueh

Kevin Hsueh, Chief
Environmental Review Branch B
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

cc: See next page



North Carolina Department of Cultural Resources
State Historic Preservation Office
Claudia Brown, Acting Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

April 5, 2011

Kevin Hsueh, Chief
Environmental Review Branch B
Environmental Protection and Performance Assessment Directorate
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: General Electric-Hitachi Laser-Based Uranium Enrichment Facility near Wilmington, Docket 70-7016, New Hanover County, ER 07-2157

Dear Mr. Hsueh:

Thank you for your letter of March 28, 2011, concerning the above project.

The staff of the Nuclear Regulatory Commission (NRC), in consultation with our office, has made a determination of "no adverse effect" for the above project due to the possibility of an inadvertent discovery of archaeological resources. This determination is based on the license, should one be issued, containing the license condition included in your letter. With the inclusion of this condition in the license, we concur that a determination of "no adverse effect" is appropriate.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Claudia Brown

cc: Jennifer Davis, Jennifer.Davis@nrc.gov

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address**: 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax**: (919) 807-6570/807-6599

If you have any questions or require additional information, please contact the Environmental Project Manager, Ms. Christianne Ridge, at 301-415-5673 or by e-mail at christianne.ridge@nrc.gov.

Sincerely,

Andrea Kock, Branch Chief
Environmental Review Branch
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

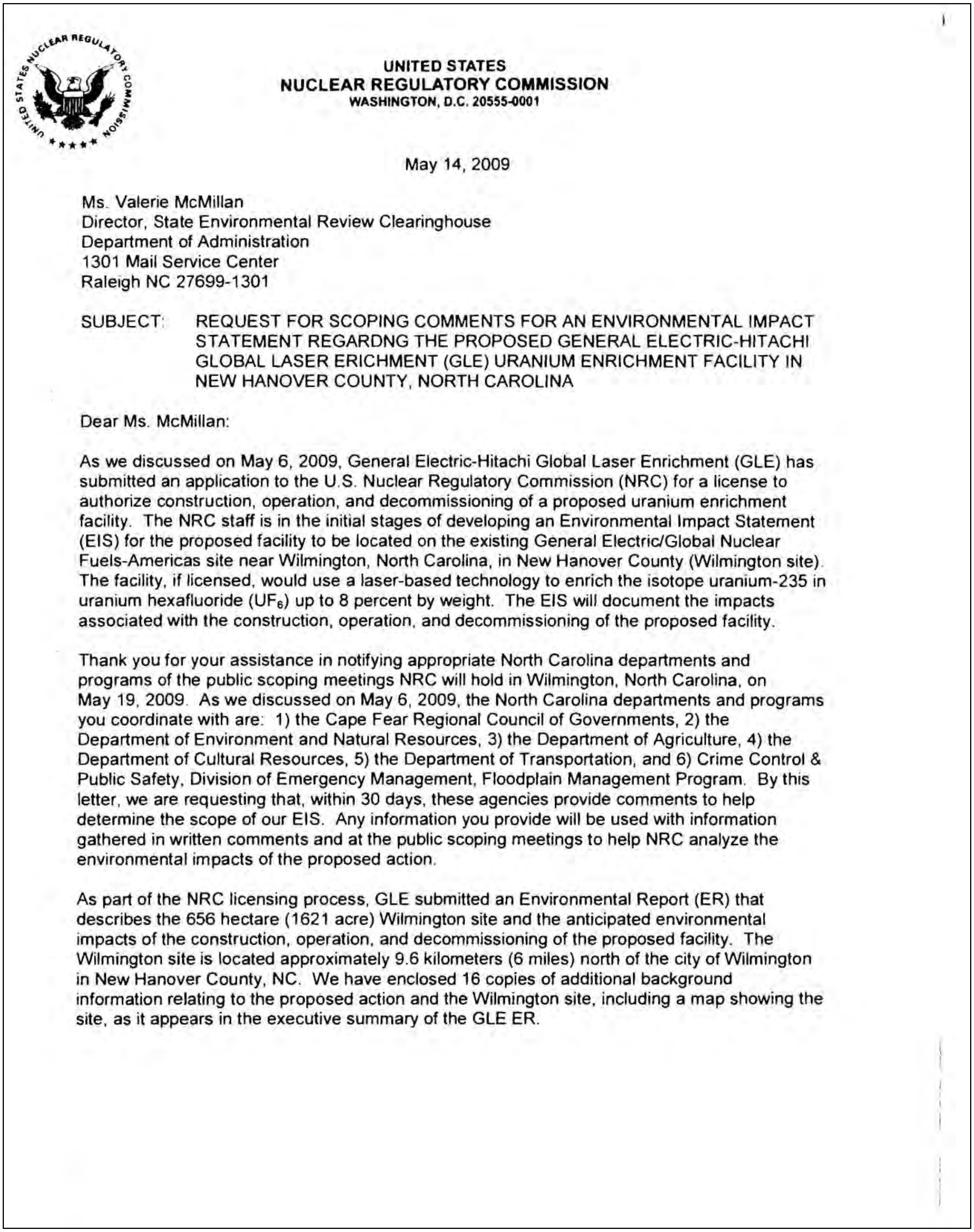
cc:
William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lafayette Atkinson/NCOSH
David Weaver/New Hanover County

B.3 Other Consultation Letters

The U.S. Nuclear Regulatory Commission (NRC) sent consultation letters to several Federal, State, and local government agencies. This section contains copies of several of these letters. The North Carolina Department of Labor responded in a teleconference on July 14, 2009. The North Carolina Department of Environmental and Natural Resources (Radiation Protection Section) sent requested data on September 1, 2009; this data is not provided in this appendix but can be accessed via NRC's online document retrieval system (ADAMS). All of the NRC letters and agency responses can be accessed via ADAMS using the accession numbers in Table B-4.

Table B-4 Additional Consultations with Government Agencies

Agency (Date)	ADAMS Accession Number(s)
NRC letter to North Carolina Department of Administration (NCDAH), State Environmental Review Clearinghouse (May 4, 2009)	ML091330018
NRC letter to North Carolina Department of Labor (June 15, 2009)	ML091620188
NRC letter to New Hanover County Planning Department (June 22, 2009)	ML091630272
Response 1 from NCDAH, State Environmental Review Clearinghouse (June 22, 2009)	ML091730327
Response 2 from NCDAH, State Environmental Review Clearinghouse (June 24, 2009)	ML091760350
Response 3 from NCDAH, State Environmental Review Clearinghouse (July 15, 2009)	ML091960418
NRC letter to North Carolina Department of Environment and Natural Resources, Radiation Protection Section (July 28, 2009)	ML091960499
NRC letter to United States Army Corps of Engineers (USACE) (August 13, 2009)	ML092160036
Response from New Hanover County Planning Department (received August 20, 2009)	ML092360197
Responses from North Carolina Department of Environment and Natural Resources, Radiation Protection Section (September 1, 2009)	ML100630876 ML100630877 ML100630880 ML100630887 ML100630890 ML100630893 ML100630907
Response from USACE (November 23, 2009)	ML093570306
NRC letter to NCDAH, State Environmental Review Clearinghouse (June 17, 2010)	ML101310322
NRC letter to USACE (June 17, 2010)	ML101330192
Response from NCDAH, State Environmental Review Clearinghouse (August 6, 2010)	ML102180383



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 14, 2009

Ms. Valerie McMillan
Director, State Environmental Review Clearinghouse
Department of Administration
1301 Mail Service Center
Raleigh NC 27699-1301

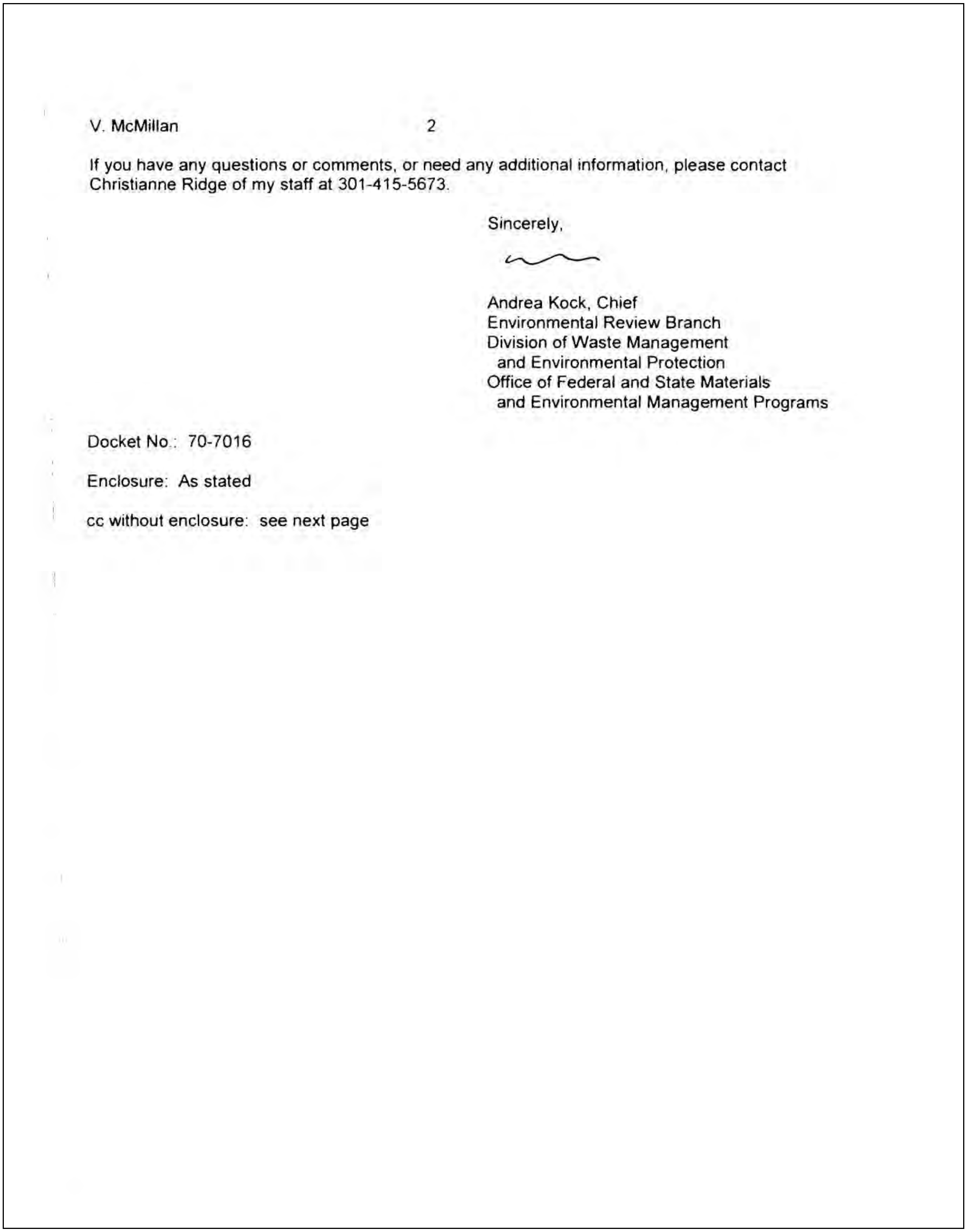
SUBJECT: REQUEST FOR SCOPING COMMENTS FOR AN ENVIRONMENTAL IMPACT STATEMENT REGARDNG THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ERICHMENT (GLE) URANIUM ENRICHMENT FACILITY IN NEW HANOVER COUNTY, NORTH CAROLINA

Dear Ms. McMillan:

As we discussed on May 6, 2009, General Electric-Hitachi Global Laser Enrichment (GLE) has submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a license to authorize construction, operation, and decommissioning of a proposed uranium enrichment facility. The NRC staff is in the initial stages of developing an Environmental Impact Statement (EIS) for the proposed facility to be located on the existing General Electric/Global Nuclear Fuels-Americas site near Wilmington, North Carolina, in New Hanover County (Wilmington site). 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. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility.

Thank you for your assistance in notifying appropriate North Carolina departments and programs of the public scoping meetings NRC will hold in Wilmington, North Carolina, on May 19, 2009. As we discussed on May 6, 2009, the North Carolina departments and programs you coordinate with are: 1) the Cape Fear Regional Council of Governments, 2) the Department of Environment and Natural Resources, 3) the Department of Agriculture, 4) the Department of Cultural Resources, 5) the Department of Transportation, and 6) Crime Control & Public Safety, Division of Emergency Management, Floodplain Management Program. By this letter, we are requesting that, within 30 days, these agencies provide comments to help determine the scope of our EIS. Any information you provide will be used with information gathered in written comments and at the public scoping meetings to help NRC analyze the environmental impacts of the proposed action.

As part of the NRC licensing process, GLE submitted an Environmental Report (ER) that describes the 656 hectare (1621 acre) Wilmington site and the anticipated environmental impacts of the construction, operation, and decommissioning of the proposed facility. The Wilmington site is located approximately 9.6 kilometers (6 miles) north of the city of Wilmington in New Hanover County, NC. We have enclosed 16 copies of additional background information relating to the proposed action and the Wilmington site, including a map showing the site, as it appears in the executive summary of the GLE ER.



If you have any questions or comments, or need any additional information, please contact Christianne Ridge of my staff at 301-415-5673.

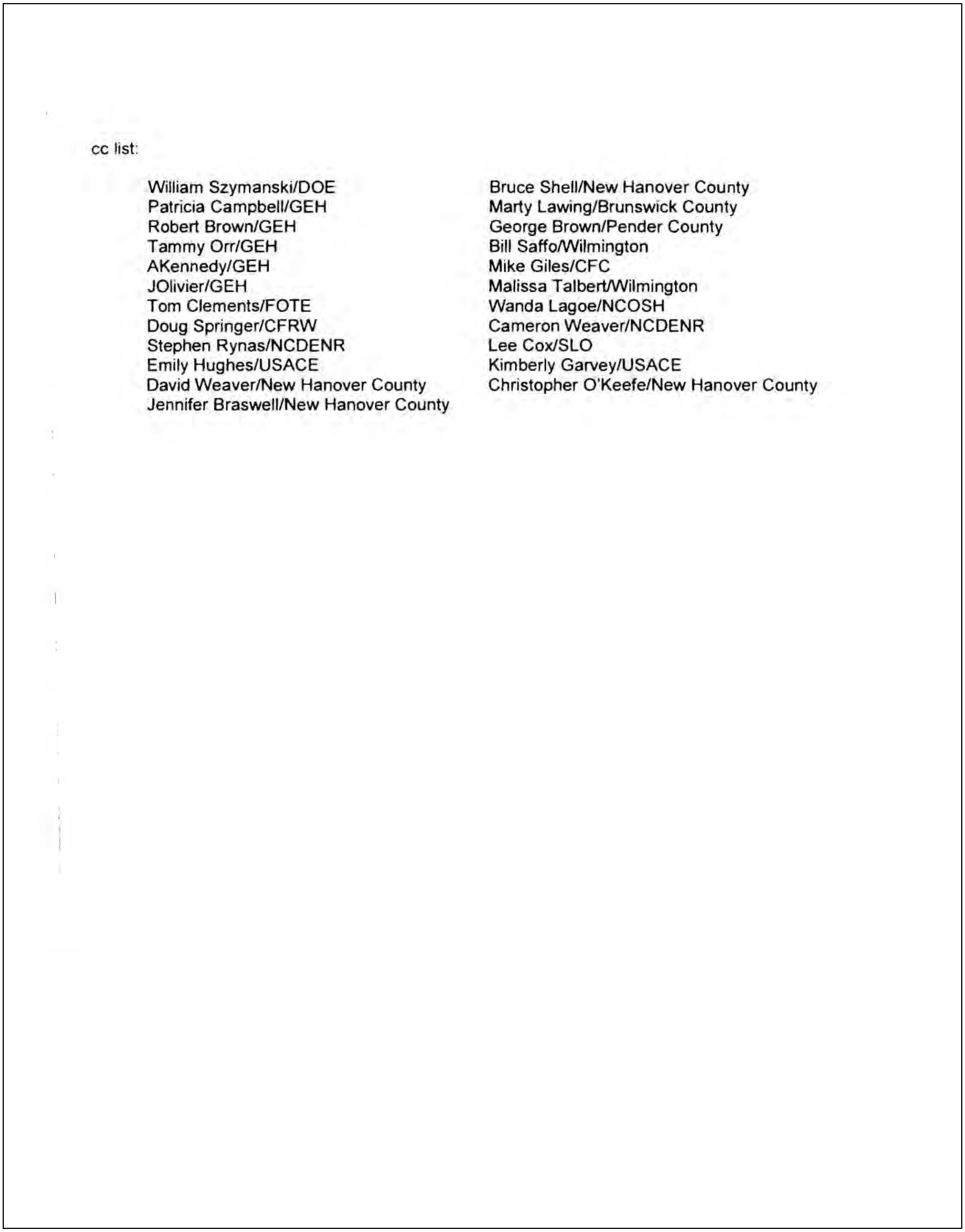
Sincerely,

Andrea Kock, Chief
Environmental Review Branch
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 70-7016

Enclosure: As stated

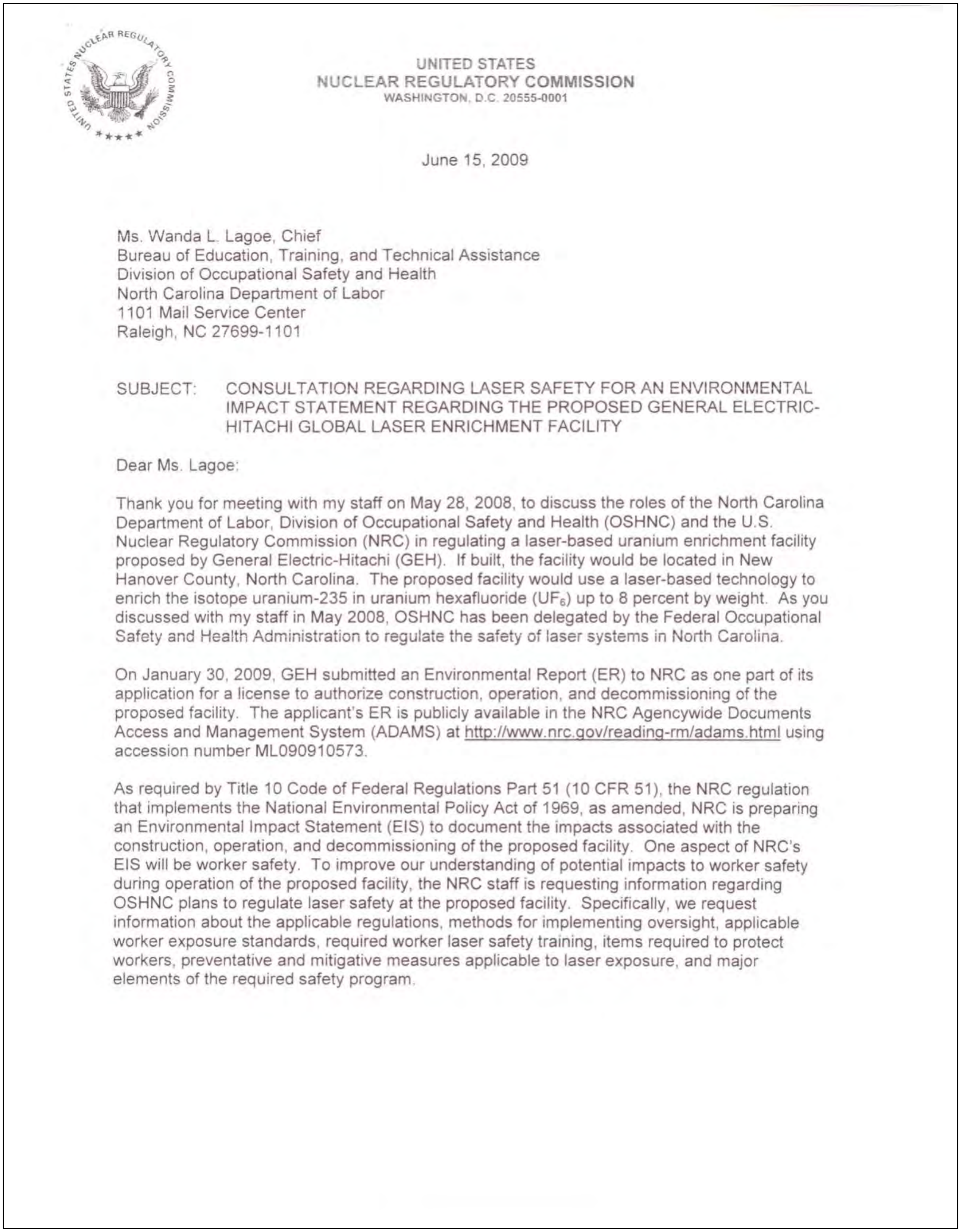
cc without enclosure: see next page



cc list:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
AKennedy/GEH
JOlivier/GEH
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Emily Hughes/USACE
David Weaver/New Hanover County
Jennifer Braswell/New Hanover County

Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Mike Giles/CFC
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Lee Cox/SLO
Kimberly Garvey/USACE
Christopher O'Keefe/New Hanover County



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 15, 2009

Ms. Wanda L. Lagoe, Chief
Bureau of Education, Training, and Technical Assistance
Division of Occupational Safety and Health
North Carolina Department of Labor
1101 Mail Service Center
Raleigh, NC 27699-1101

SUBJECT: CONSULTATION REGARDING LASER SAFETY FOR AN ENVIRONMENTAL IMPACT STATEMENT REGARDING THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY

Dear Ms. Lagoe:

Thank you for meeting with my staff on May 28, 2008, to discuss the roles of the North Carolina Department of Labor, Division of Occupational Safety and Health (OSHNC) and the U.S. Nuclear Regulatory Commission (NRC) in regulating a laser-based uranium enrichment facility proposed by General Electric-Hitachi (GEH). If built, the facility would be located in New Hanover County, North Carolina. The proposed facility would use a laser-based technology to enrich the isotope uranium-235 in uranium hexafluoride (UF_6) up to 8 percent by weight. As you discussed with my staff in May 2008, OSHNC has been delegated by the Federal Occupational Safety and Health Administration to regulate the safety of laser systems in North Carolina.

On January 30, 2009, GEH submitted an Environmental Report (ER) to NRC as one part of its application for a license to authorize construction, operation, and decommissioning of the proposed facility. The applicant's ER is publicly available in the NRC Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html using accession number ML090910573.

As required by 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, NRC is preparing an Environmental Impact Statement (EIS) to document the impacts associated with the construction, operation, and decommissioning of the proposed facility. One aspect of NRC's EIS will be worker safety. To improve our understanding of potential impacts to worker safety during operation of the proposed facility, the NRC staff is requesting information regarding OSHNC plans to regulate laser safety at the proposed facility. Specifically, we request information about the applicable regulations, methods for implementing oversight, applicable worker exposure standards, required worker laser safety training, items required to protect workers, preventative and mitigative measures applicable to laser exposure, and major elements of the required safety program.

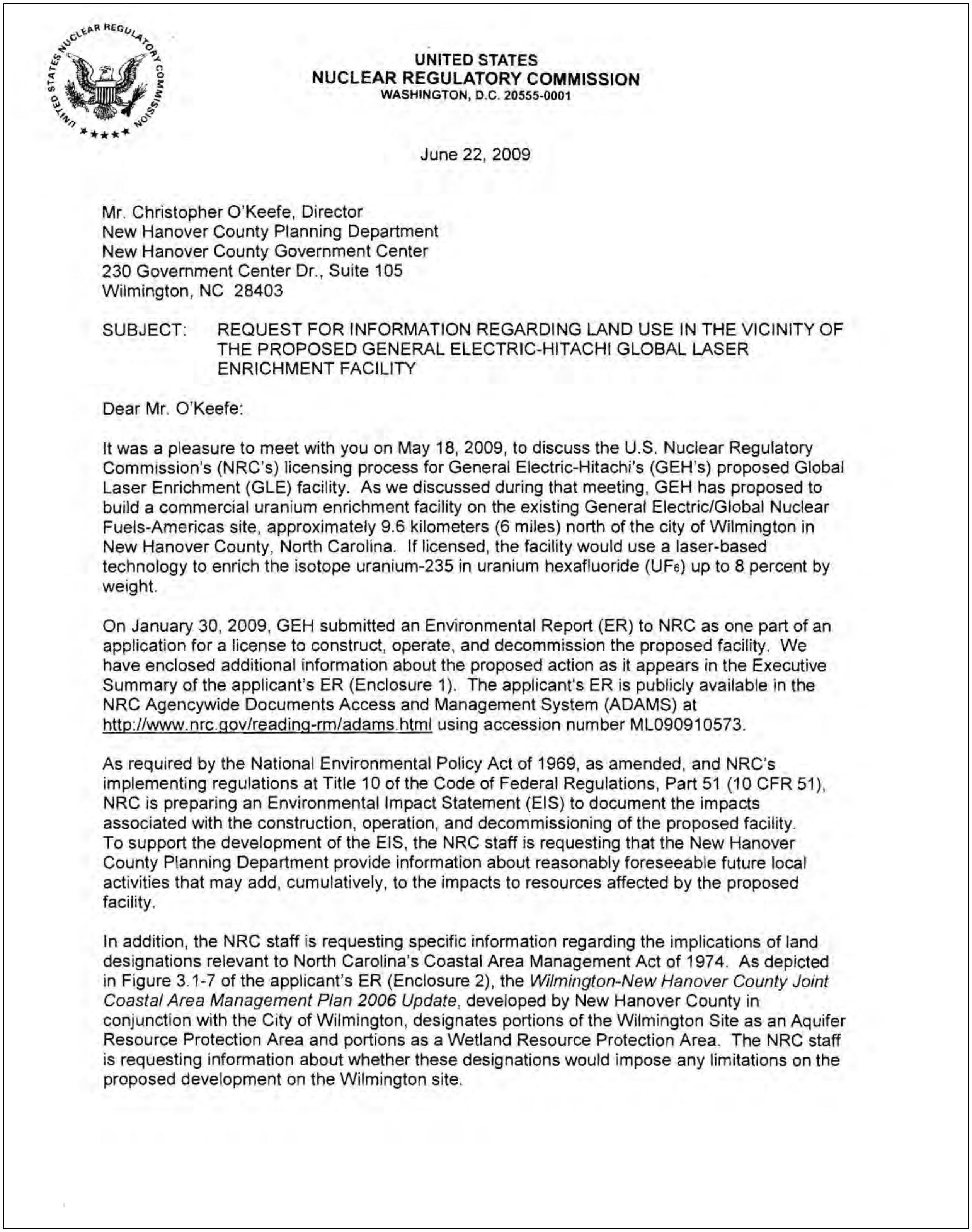
We would appreciate any information you could provide on these topics. If you would prefer to discuss these issues, we can arrange a teleconference. Ms. Christianne Ridge of my staff will contact you to discuss your preference. If you have any questions or comments, or need any additional information, please contact Ms. Ridge at 301-415-5673.

Sincerely,

Andrea Kock, Chief
Environmental Review Branch
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

cc: See next page



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 22, 2009

Mr. Christopher O'Keefe, Director
New Hanover County Planning Department
New Hanover County Government Center
230 Government Center Dr., Suite 105
Wilmington, NC 28403

SUBJECT: REQUEST FOR INFORMATION REGARDING LAND USE IN THE VICINITY OF THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY

Dear Mr. O'Keefe:

It was a pleasure to meet with you on May 18, 2009, to discuss the U.S. Nuclear Regulatory Commission's (NRC's) licensing process for General Electric-Hitachi's (GEH's) proposed Global Laser Enrichment (GLE) facility. As we discussed during that meeting, GEH has proposed to build a commercial uranium enrichment facility on the existing General Electric/Global Nuclear Fuels-Americas site, approximately 9.6 kilometers (6 miles) north of the city of Wilmington in New Hanover County, North Carolina. If licensed, the facility would use a laser-based technology to enrich the isotope uranium-235 in uranium hexafluoride (UF_6) up to 8 percent by weight.

On January 30, 2009, GEH submitted an Environmental Report (ER) to NRC as one part of an application for a license to construct, operate, and decommission the proposed facility. We have enclosed additional information about the proposed action as it appears in the Executive Summary of the applicant's ER (Enclosure 1). The applicant's ER is publicly available in the NRC Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html using accession number ML090910573.

As required by the National Environmental Policy Act of 1969, as amended, and NRC's implementing regulations at Title 10 of the Code of Federal Regulations, Part 51 (10 CFR 51), NRC is preparing an Environmental Impact Statement (EIS) to document the impacts associated with the construction, operation, and decommissioning of the proposed facility. To support the development of the EIS, the NRC staff is requesting that the New Hanover County Planning Department provide information about reasonably foreseeable future local activities that may add, cumulatively, to the impacts to resources affected by the proposed facility.

In addition, the NRC staff is requesting specific information regarding the implications of land designations relevant to North Carolina's Coastal Area Management Act of 1974. As depicted in Figure 3.1-7 of the applicant's ER (Enclosure 2), the *Wilmington-New Hanover County Joint Coastal Area Management Plan 2006 Update*, developed by New Hanover County in conjunction with the City of Wilmington, designates portions of the Wilmington Site as an Aquifer Resource Protection Area and portions as a Wetland Resource Protection Area. The NRC staff is requesting information about whether these designations would impose any limitations on the proposed development on the Wilmington site.

We appreciate any information you can provide on these topics. After analyzing the information you provide, with information provided by other agencies and public comments, NRC will prepare a draft EIS and publish it for public comment.

If you have any questions or comments, or need any additional information, please contact Christianne Ridge of my staff at 301-415-5673.

Sincerely,

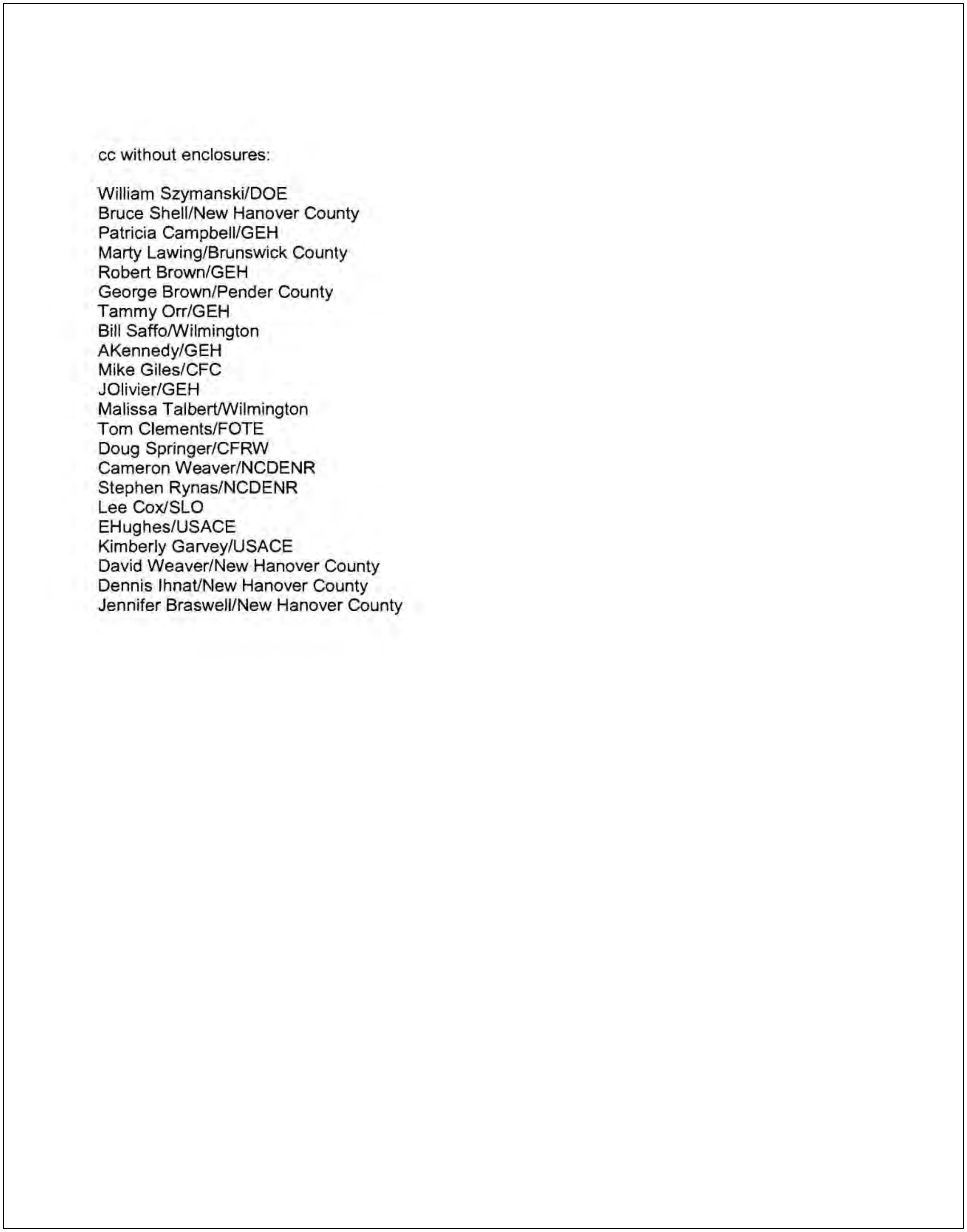
Andrea Kock, Chief
Environmental Review Branch
Environmental Protection and
Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 70-7016

Enclosures:

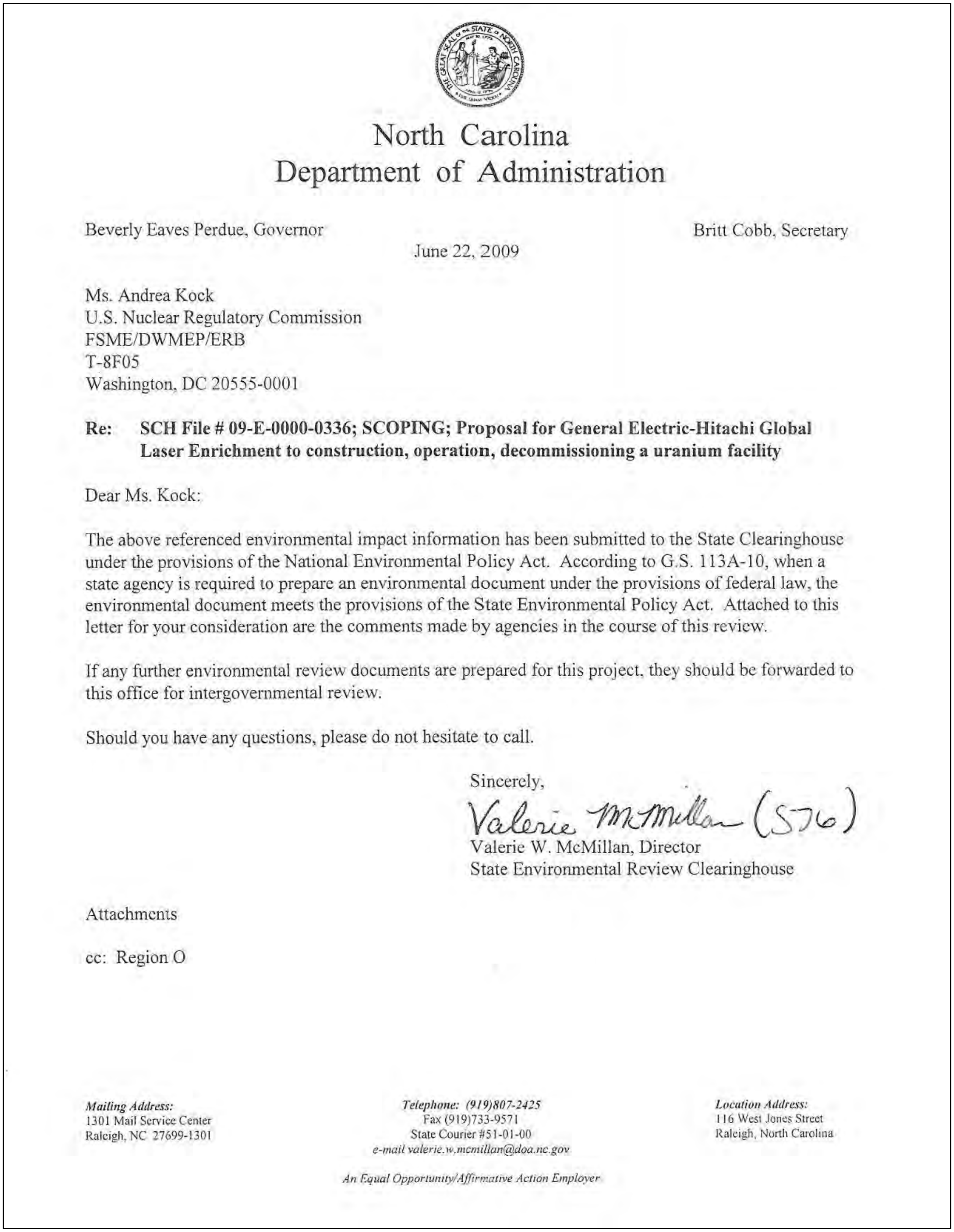
1. Executive Summary of the Environmental Report for the GLE Commercial Facility (GE-Hitachi Global Laser Enrichment LLC, 2008)
2. Figure 3.1-7 of the Environmental Report for the GLE Commercial Facility (GE-Hitachi Global Laser Enrichment LLC, 2008)

cc w/o enclosures:
See next page



cc without enclosures:

William Szymanski/DOE
Bruce Shell/New Hanover County
Patricia Campbell/GEH
Marty Lawing/Brunswick County
Robert Brown/GEH
George Brown/Pender County
Tammy Orr/GEH
Bill Saffo/Wilmington
AKennedy/GEH
Mike Giles/CFC
JOlivier/GEH
Malissa Talbert/Wilmington
Tom Clements/FOTE
Doug Springer/CFRW
Cameron Weaver/NCDENR
Stephen Rynas/NCDENR
Lee Cox/SLO
EHughes/USACE
Kimberly Garvey/USACE
David Weaver/New Hanover County
Dennis Ihnat/New Hanover County
Jennifer Braswell/New Hanover County



North Carolina
Department of Administration

Beverly Eaves Perdue, Governor
Britt Cobb, Secretary

June 22, 2009

Ms. Andrea Kock
U.S. Nuclear Regulatory Commission
FSME/DWMEP/ERB
T-8F05
Washington, DC 20555-0001

Re: SCH File # 09-E-0000-0336; SCOPING; Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility

Dear Ms. Kock:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Valerie McMillan (SJG)

Valerie W. McMillan, Director
State Environmental Review Clearinghouse

Attachments

cc: Region O

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail valerie.w.mcmillan@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

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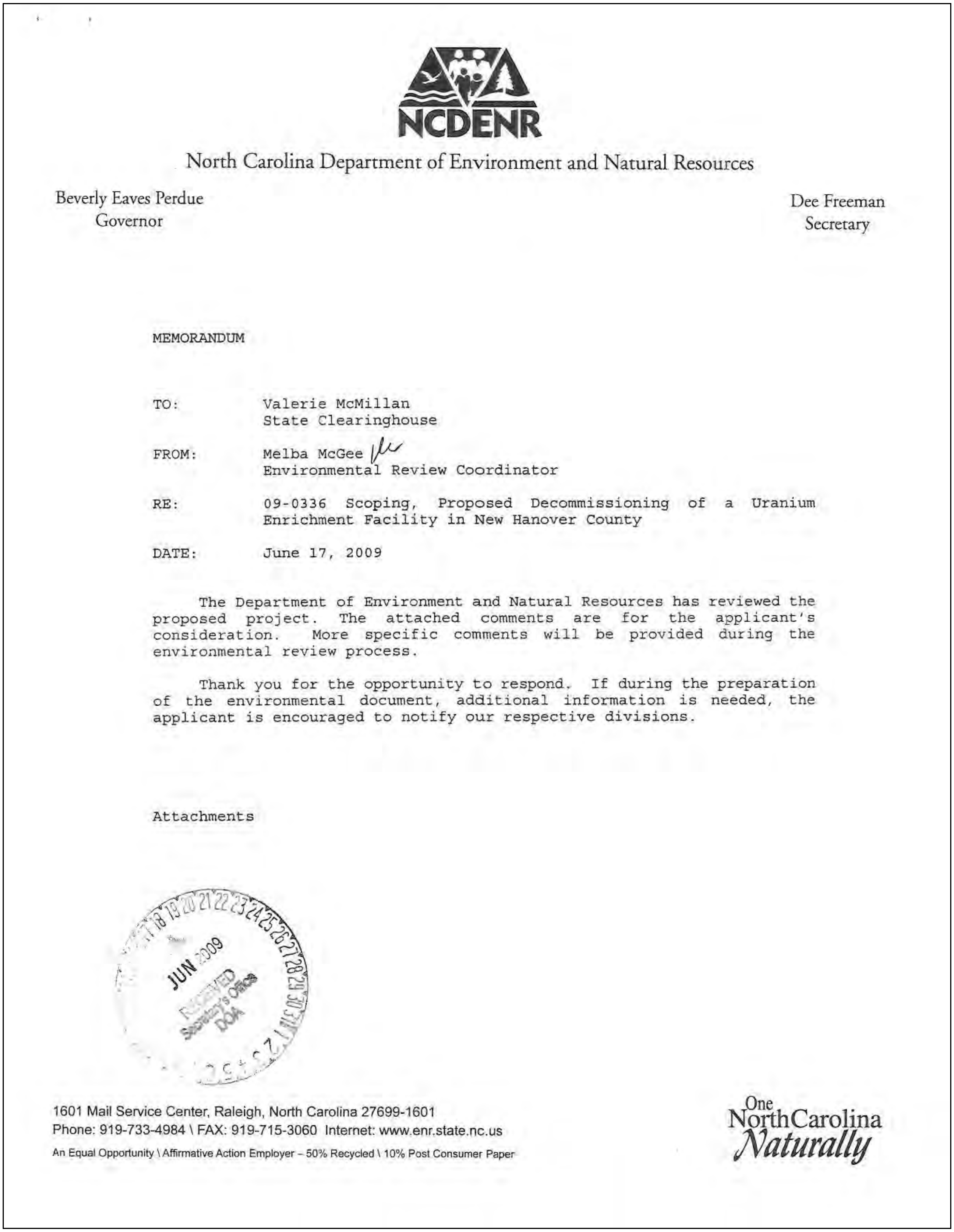

NCDENR

North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

MEMORANDUM

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Environmental Review Coordinator

RE: 09-0336 Scoping, Proposed Decommissioning of a Uranium Enrichment Facility in New Hanover County

DATE: June 17, 2009

The Department of Environment and Natural Resources has reviewed the proposed project. The attached comments are for the applicant's consideration. More specific comments will be provided during the environmental review process.

Thank you for the opportunity to respond. If during the preparation of the environmental document, additional information is needed, the applicant is encouraged to notify our respective divisions.

Attachments

JUN 2009
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Secretary's Office
DOA

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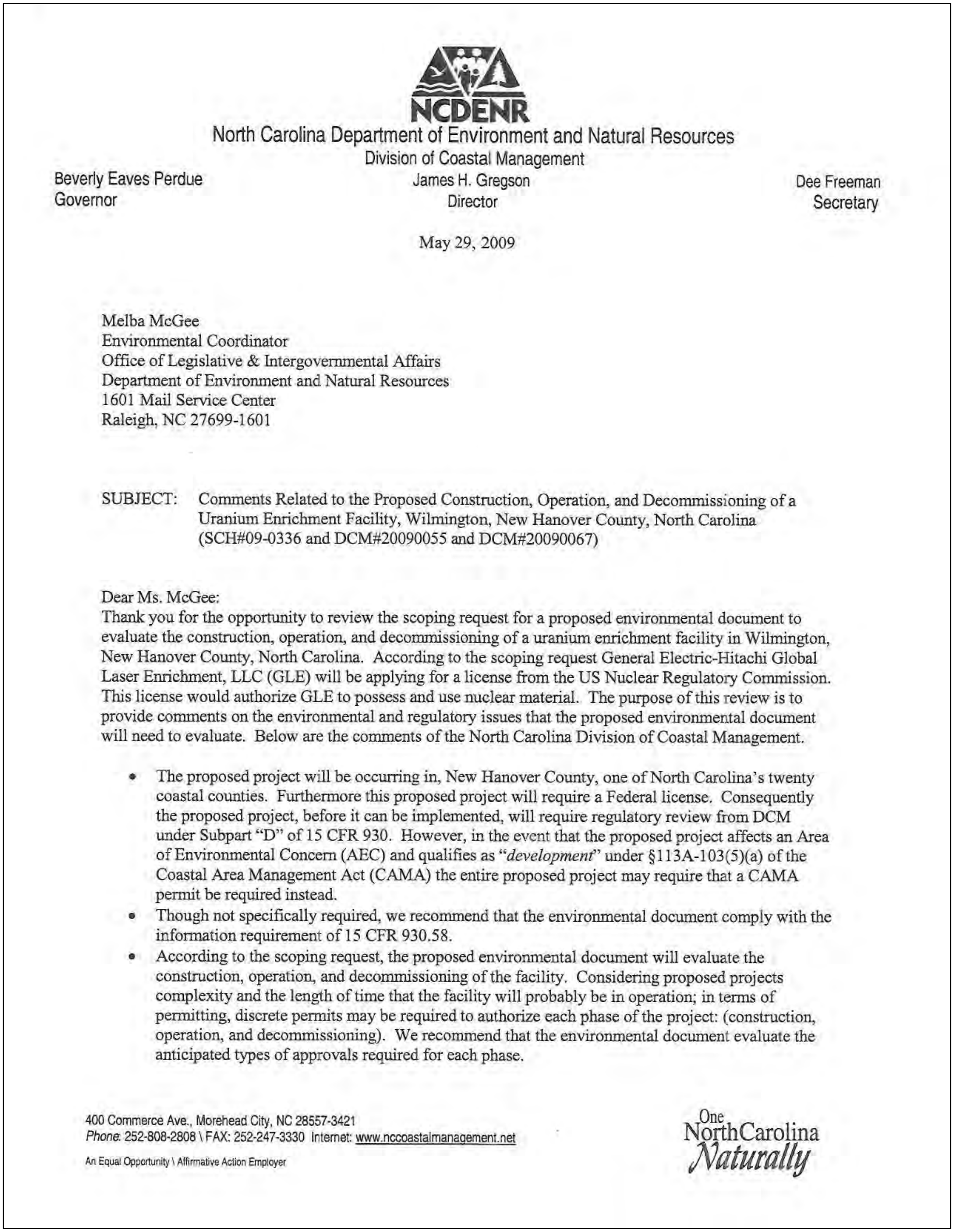

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

May 29, 2009

Melba McGee
Environmental Coordinator
Office of Legislative & Intergovernmental Affairs
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

SUBJECT: Comments Related to the Proposed Construction, Operation, and Decommissioning of a Uranium Enrichment Facility, Wilmington, New Hanover County, North Carolina (SCH#09-0336 and DCM#20090055 and DCM#20090067)

Dear Ms. McGee:
Thank you for the opportunity to review the scoping request for a proposed environmental document to evaluate the construction, operation, and decommissioning of a uranium enrichment facility in Wilmington, New Hanover County, North Carolina. According to the scoping request General Electric-Hitachi Global Laser Enrichment, LLC (GLE) will be applying for a license from the US Nuclear Regulatory Commission. This license would authorize GLE to possess and use nuclear material. The purpose of this review is to provide comments on the environmental and regulatory issues that the proposed environmental document will need to evaluate. Below are the comments of the North Carolina Division of Coastal Management.

- The proposed project will be occurring in, New Hanover County, one of North Carolina's twenty coastal counties. Furthermore this proposed project will require a Federal license. Consequently the proposed project, before it can be implemented, will require regulatory review from DCM under Subpart "D" of 15 CFR 930. However, in the event that the proposed project affects an Area of Environmental Concern (AEC) and qualifies as "*development*" under §113A-103(5)(a) of the Coastal Area Management Act (CAMA) the entire proposed project may require that a CAMA permit be required instead.
- Though not specifically required, we recommend that the environmental document comply with the information requirement of 15 CFR 930.58.
- According to the scoping request, the proposed environmental document will evaluate the construction, operation, and decommissioning of the facility. Considering proposed projects complexity and the length of time that the facility will probably be in operation; in terms of permitting, discrete permits may be required to authorize each phase of the project: (construction, operation, and decommissioning). We recommend that the environmental document evaluate the anticipated types of approvals required for each phase.

400 Commerce Ave., Morehead City, NC 28557-3421
Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net

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- We suggest that the environmental document graphically delineate any AEC that may exist in the study area.
- We suggest that any wetland delineations (if required) separate coastal wetlands from Section 404 wetlands and specifically identify each wetland type.
- We suggest that the environmental document clearly define the construction activities and methods to build the proposed facility. Resource concerns related to this issue would be conformance with any moratorium periods, endangered species, conversion of habitat to urban uses, water quality, stormwater management, waste management, storage of nuclear material, and/or the potential to impact coastal resources (especially those within an AEC). Please see 15 CFR 930.11.
- We suggest that the environmental document assess operational issues such as groundwater uptake, discharges into public trust waters, potential closure of public access and/or public use of coastal waters, etc. Please see 15 CFR 930.11.

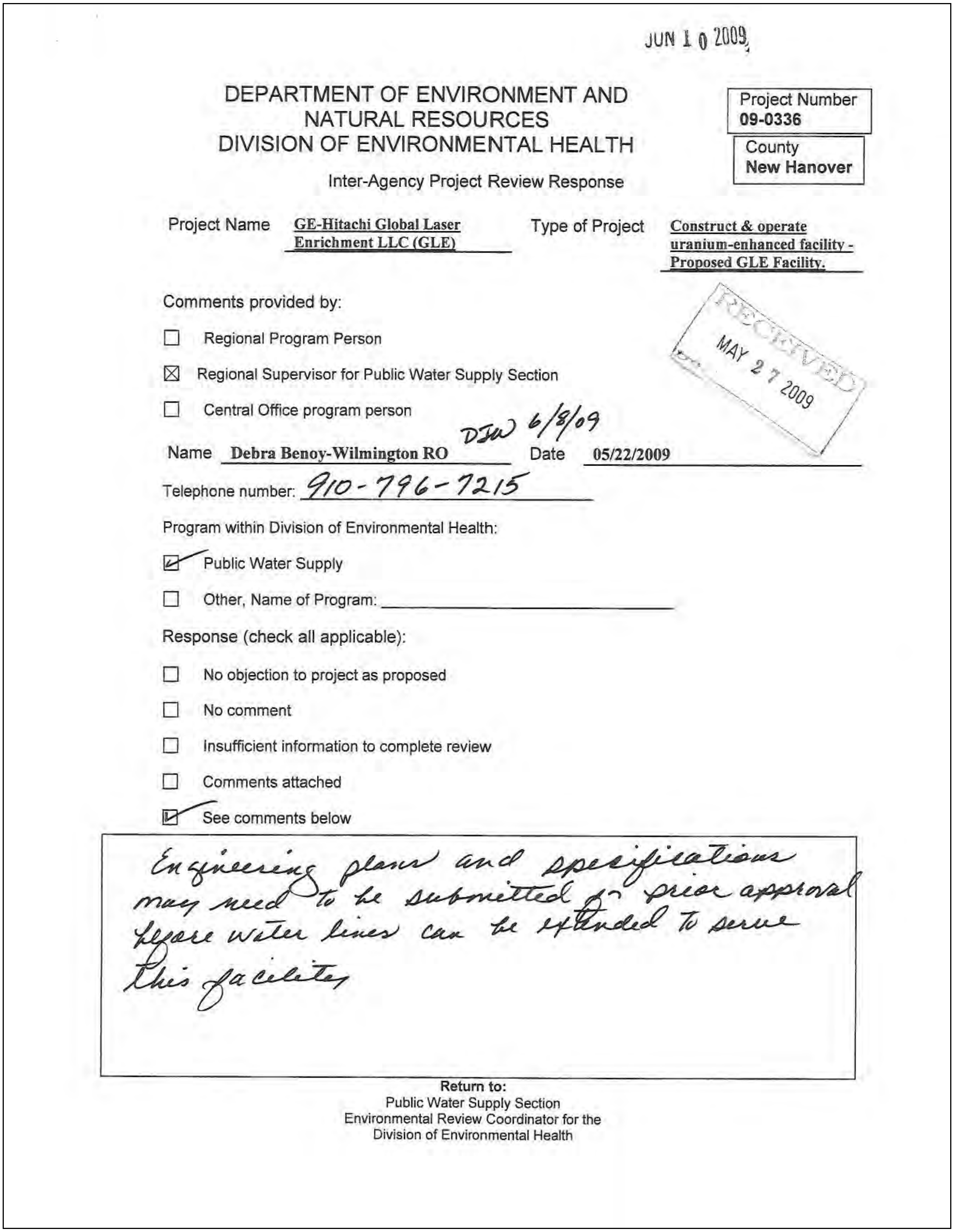
Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Ste Rynas

Stephen Rynas, AICP
Federal Consistency Coordinator

cc: Doug Huggett, Division of Coastal Management
Steve Everhart, Division of Coastal Management
Christine Ridge, US Nuclear Regulatory Commission



JUN 10 2009

DEPARTMENT OF ENVIRONMENT AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

Inter-Agency Project Review Response

Project Number
09-0336

County
New Hanover

Project Name **GE-Hitachi Global Laser Enrichment LLC (GLE)**

Type of Project **Construct & operate uranium-enhanced facility - Proposed GLE Facility.**

RECEIVED
MAY 27 2009

Comments provided by:

☐ Regional Program Person

☒ Regional Supervisor for Public Water Supply Section

☐ Central Office program person

DJW 6/8/09

Name **Debra Benoy-Wilmington RO** Date **05/22/2009**

Telephone number: 910-796-7215

Program within Division of Environmental Health:

☑ Public Water Supply

☐ Other, Name of Program: ________

Response (check all applicable):

☐ No objection to project as proposed

☐ No comment

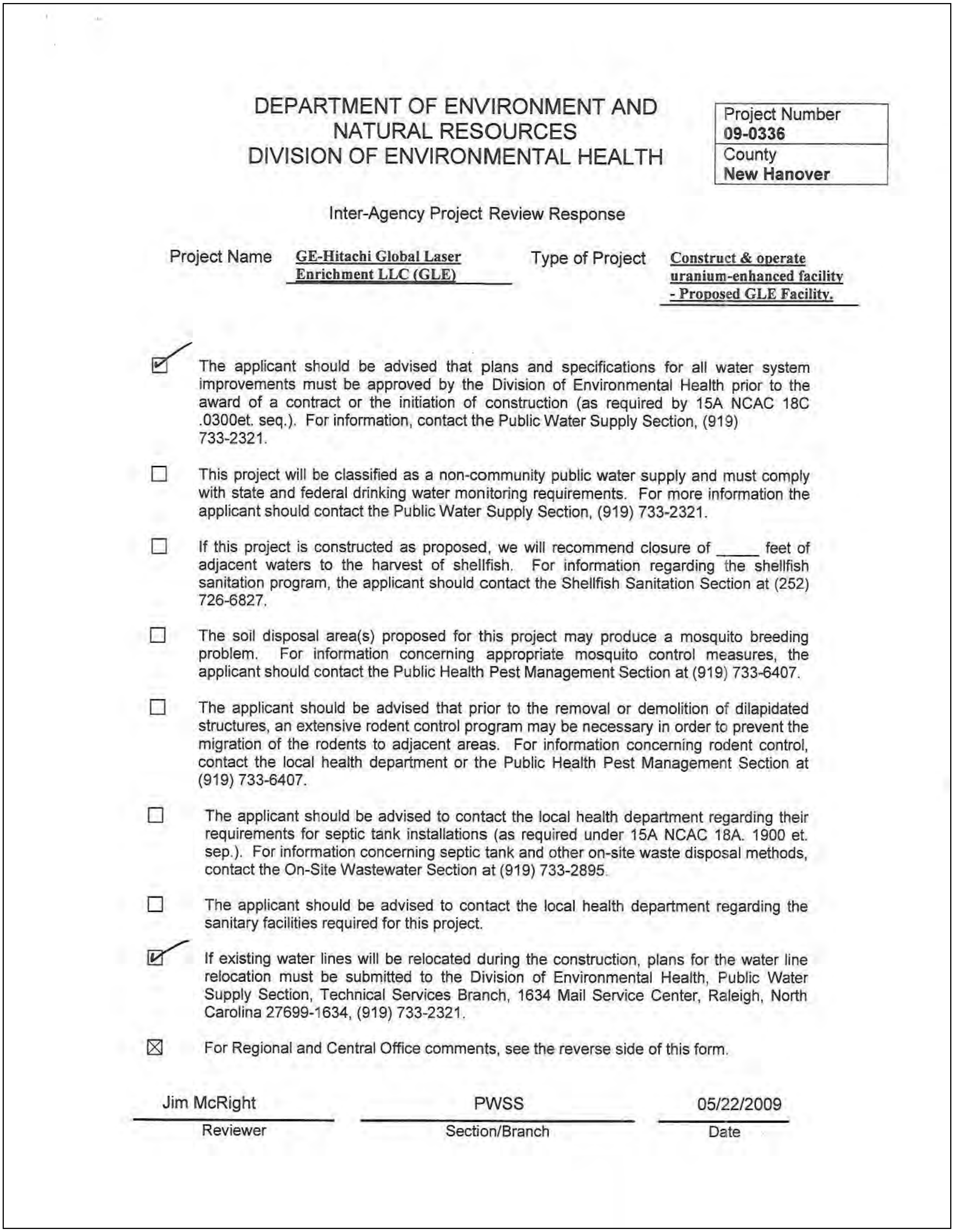
☐ Insufficient information to complete review

☐ Comments attached

☑ See comments below

Engineering plans and specifications may need to be submitted for prior approval before water lines can be extended to serve this facility

Return to:
Public Water Supply Section
Environmental Review Coordinator for the
Division of Environmental Health



DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

Project Number **09-0336**	
County **New Hanover**	

Inter-Agency Project Review Response

Project Name **GE-Hitachi Global Laser Enrichment LLC (GLE)**

Type of Project **Construct & operate uranium-enhanced facility - Proposed GLE Facility.**

☑ The applicant should be advised that plans and specifications for all water system improvements must be approved by the Division of Environmental Health prior to the award of a contract or the initiation of construction (as required by 15A NCAC 18C .0300et. seq.). For information, contact the Public Water Supply Section, (919) 733-2321.

☐ This project will be classified as a non-community public water supply and must comply with state and federal drinking water monitoring requirements. For more information the applicant should contact the Public Water Supply Section, (919) 733-2321.

☐ If this project is constructed as proposed, we will recommend closure of _____ feet of adjacent waters to the harvest of shellfish. For information regarding the shellfish sanitation program, the applicant should contact the Shellfish Sanitation Section at (252) 726-6827.

☐ The soil disposal area(s) proposed for this project may produce a mosquito breeding problem. For information concerning appropriate mosquito control measures, the applicant should contact the Public Health Pest Management Section at (919) 733-6407.

☐ The applicant should be advised that prior to the removal or demolition of dilapidated structures, an extensive rodent control program may be necessary in order to prevent the migration of the rodents to adjacent areas. For information concerning rodent control, contact the local health department or the Public Health Pest Management Section at (919) 733-6407.

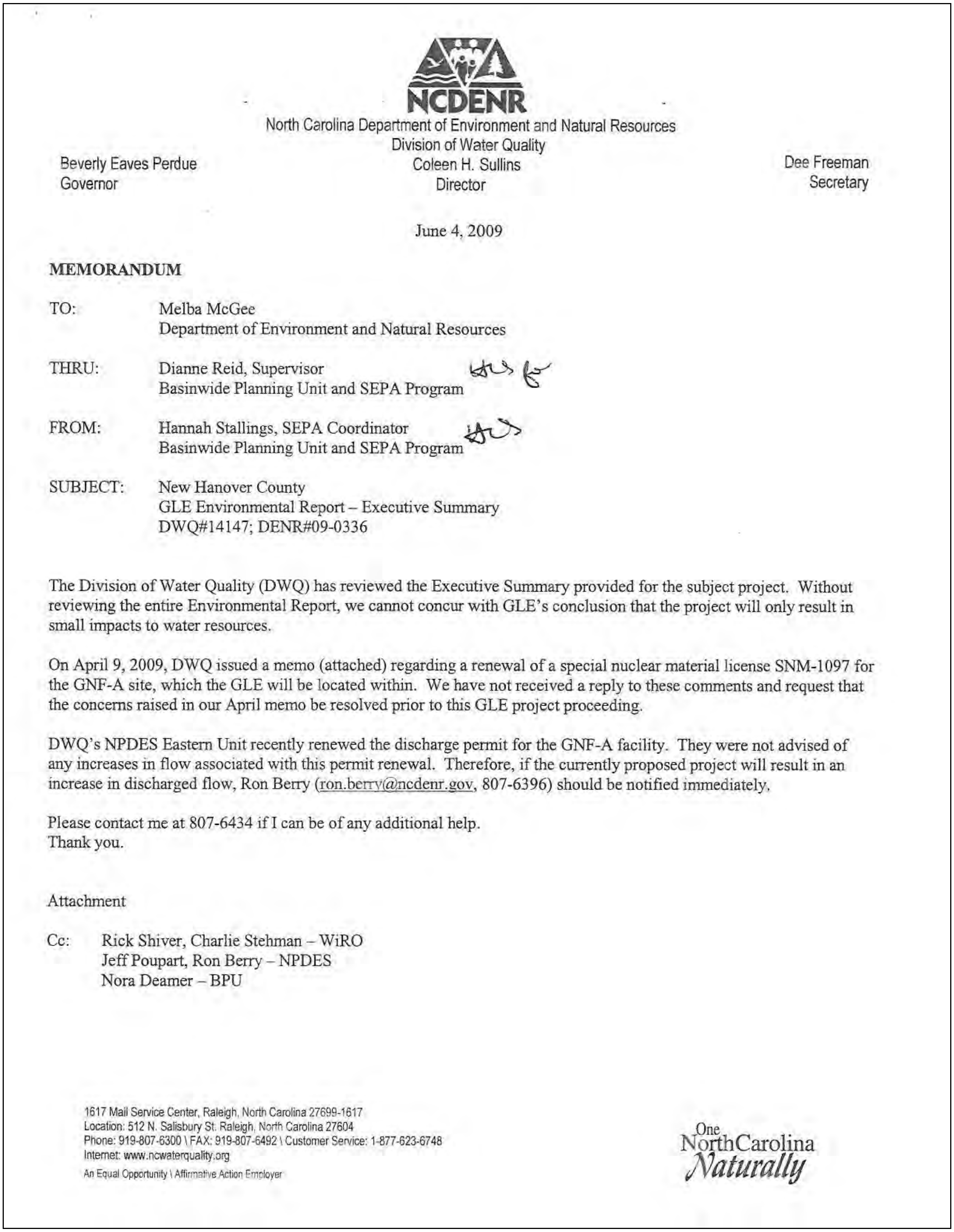
☐ The applicant should be advised to contact the local health department regarding their requirements for septic tank installations (as required under 15A NCAC 18A. 1900 et. sep.). For information concerning septic tank and other on-site waste disposal methods, contact the On-Site Wastewater Section at (919) 733-2895.

☐ The applicant should be advised to contact the local health department regarding the sanitary facilities required for this project.

☑ If existing water lines will be relocated during the construction, plans for the water line relocation must be submitted to the Division of Environmental Health, Public Water Supply Section, Technical Services Branch, 1634 Mail Service Center, Raleigh, North Carolina 27699-1634, (919) 733-2321.

☒ For Regional and Central Office comments, see the reverse side of this form.

Jim McRight	PWSS	05/22/2009
Reviewer	Section/Branch	Date



NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

June 4, 2009

MEMORANDUM

TO: Melba McGee
Department of Environment and Natural Resources

THRU: Dianne Reid, Supervisor
Basinwide Planning Unit and SEPA Program

FROM: Hannah Stallings, SEPA Coordinator
Basinwide Planning Unit and SEPA Program

SUBJECT: New Hanover County
GLE Environmental Report – Executive Summary
DWQ#14147; DENR#09-0336

The Division of Water Quality (DWQ) has reviewed the Executive Summary provided for the subject project. Without reviewing the entire Environmental Report, we cannot concur with GLE's conclusion that the project will only result in small impacts to water resources.

On April 9, 2009, DWQ issued a memo (attached) regarding a renewal of a special nuclear material license SNM-1097 for the GNF-A site, which the GLE will be located within. We have not received a reply to these comments and request that the concerns raised in our April memo be resolved prior to this GLE project proceeding.

DWQ's NPDES Eastern Unit recently renewed the discharge permit for the GNF-A facility. They were not advised of any increases in flow associated with this permit renewal. Therefore, if the currently proposed project will result in an increase in discharged flow, Ron Berry (ron.berry@ncdenr.gov, 807-6396) should be notified immediately.

Please contact me at 807-6434 if I can be of any additional help.
Thank you.

Attachment

Cc: Rick Shiver, Charlie Stehman – WiRO
Jeff Poupart, Ron Berry – NPDES
Nora Deamer – BPU

1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
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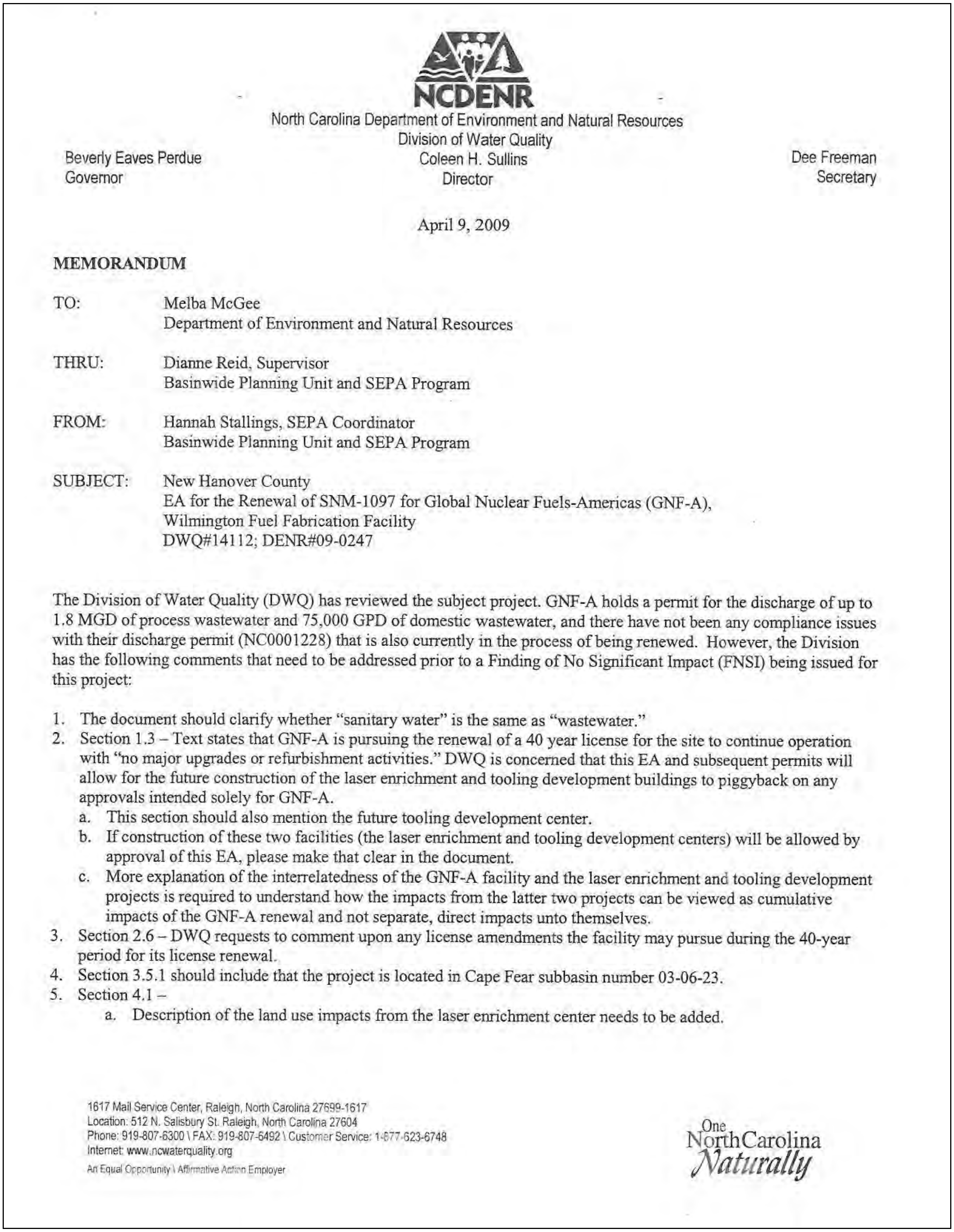

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

April 9, 2009

MEMORANDUM

TO: Melba McGee
Department of Environment and Natural Resources

THRU: Dianne Reid, Supervisor
Basinwide Planning Unit and SEPA Program

FROM: Hannah Stallings, SEPA Coordinator
Basinwide Planning Unit and SEPA Program

SUBJECT: New Hanover County
EA for the Renewal of SNM-1097 for Global Nuclear Fuels-Americas (GNF-A),
Wilmington Fuel Fabrication Facility
DWQ#14112; DENR#09-0247

The Division of Water Quality (DWQ) has reviewed the subject project. GNF-A holds a permit for the discharge of up to 1.8 MGD of process wastewater and 75,000 GPD of domestic wastewater, and there have not been any compliance issues with their discharge permit (NC0001228) that is also currently in the process of being renewed. However, the Division has the following comments that need to be addressed prior to a Finding of No Significant Impact (FNSI) being issued for this project:

1. The document should clarify whether "sanitary water" is the same as "wastewater."
2. Section 1.3 – Text states that GNF-A is pursuing the renewal of a 40 year license for the site to continue operation with "no major upgrades or refurbishment activities." DWQ is concerned that this EA and subsequent permits will allow for the future construction of the laser enrichment and tooling development buildings to piggyback on any approvals intended solely for GNF-A.
    a. This section should also mention the future tooling development center.
    b. If construction of these two facilities (the laser enrichment and tooling development centers) will be allowed by approval of this EA, please make that clear in the document.
    c. More explanation of the interrelatedness of the GNF-A facility and the laser enrichment and tooling development projects is required to understand how the impacts from the latter two projects can be viewed as cumulative impacts of the GNF-A renewal and not separate, direct impacts unto themselves.
3. Section 2.6 – DWQ requests to comment upon any license amendments the facility may pursue during the 40-year period for its license renewal.
4. Section 3.5.1 should include that the project is located in Cape Fear subbasin number 03-06-23.
5. Section 4.1 –
    a. Description of the land use impacts from the laser enrichment center needs to be added.

1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492 \ Customer Service: 1-877-623-6748
Internet: www.ncwaterquality.org
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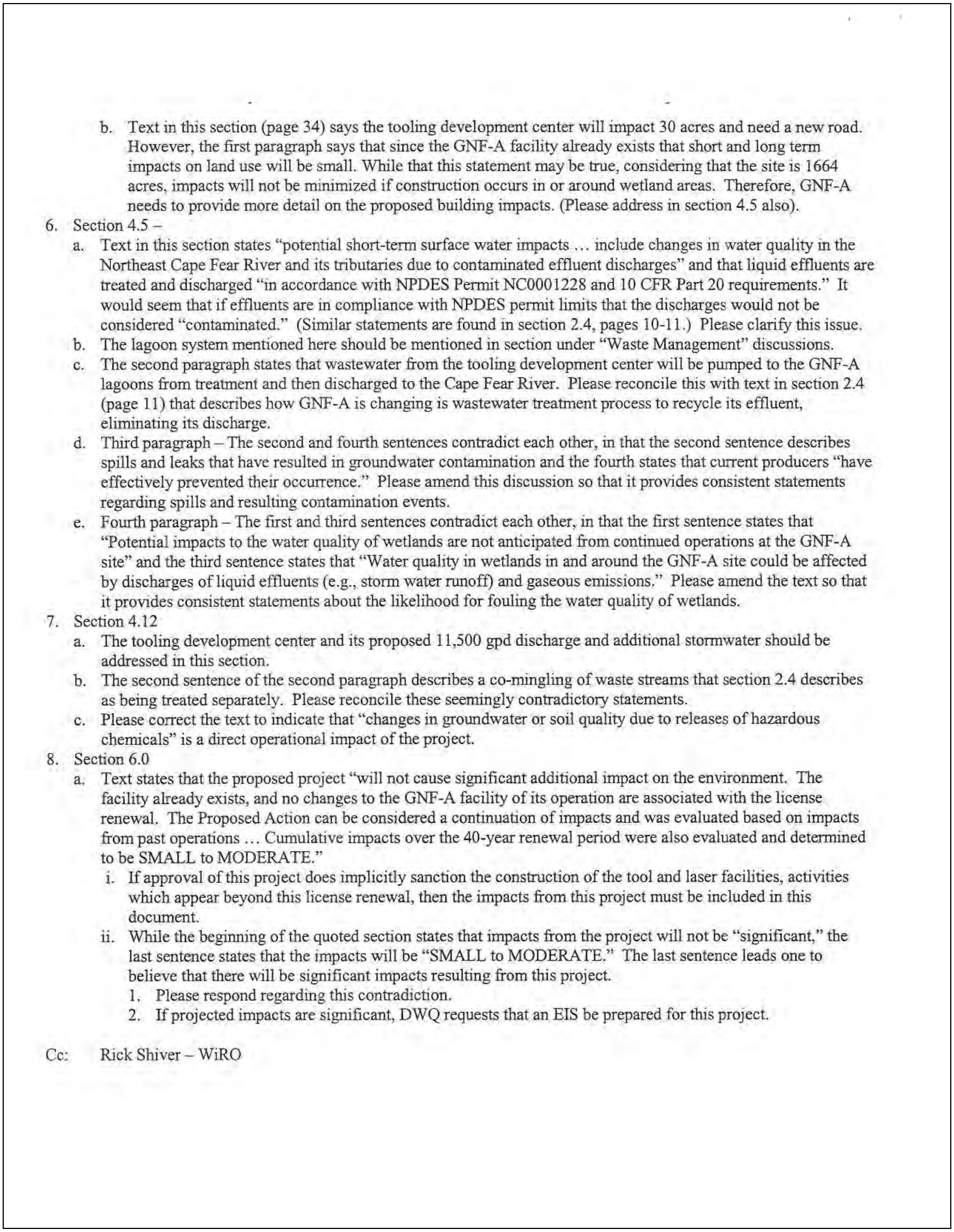
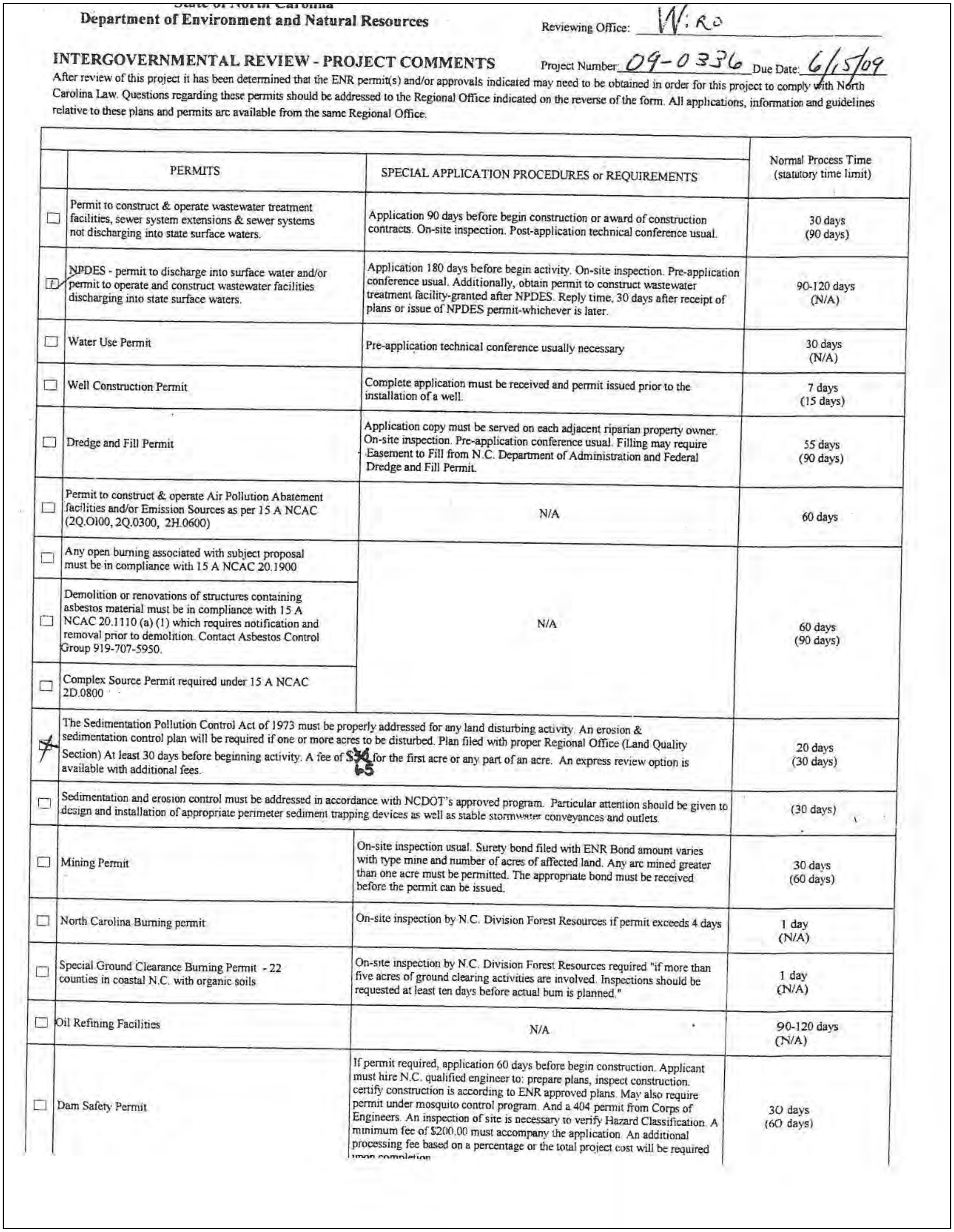
Naturally



   b. Text in this section (page 34) says the tooling development center will impact 30 acres and need a new road. However, the first paragraph says that since the GNF-A facility already exists that short and long term impacts on land use will be small. While that this statement may be true, considering that the site is 1664 acres, impacts will not be minimized if construction occurs in or around wetland areas. Therefore, GNF-A needs to provide more detail on the proposed building impacts. (Please address in section 4.5 also).

6. Section 4.5 –
   a. Text in this section states "potential short-term surface water impacts … include changes in water quality in the Northeast Cape Fear River and its tributaries due to contaminated effluent discharges" and that liquid effluents are treated and discharged "in accordance with NPDES Permit NC0001228 and 10 CFR Part 20 requirements." It would seem that if effluents are in compliance with NPDES permit limits that the discharges would not be considered "contaminated." (Similar statements are found in section 2.4, pages 10-11.) Please clarify this issue.
   b. The lagoon system mentioned here should be mentioned in section under "Waste Management" discussions.
   c. The second paragraph states that wastewater from the tooling development center will be pumped to the GNF-A lagoons from treatment and then discharged to the Cape Fear River. Please reconcile this with text in section 2.4 (page 11) that describes how GNF-A is changing is wastewater treatment process to recycle its effluent, eliminating its discharge.
   d. Third paragraph – The second and fourth sentences contradict each other, in that the second sentence describes spills and leaks that have resulted in groundwater contamination and the fourth states that current producers "have effectively prevented their occurrence." Please amend this discussion so that it provides consistent statements regarding spills and resulting contamination events.
   e. Fourth paragraph – The first and third sentences contradict each other, in that the first sentence states that "Potential impacts to the water quality of wetlands are not anticipated from continued operations at the GNF-A site" and the third sentence states that "Water quality in wetlands in and around the GNF-A site could be affected by discharges of liquid effluents (e.g., storm water runoff) and gaseous emissions." Please amend the text so that it provides consistent statements about the likelihood for fouling the water quality of wetlands.
7. Section 4.12
   a. The tooling development center and its proposed 11,500 gpd discharge and additional stormwater should be addressed in this section.
   b. The second sentence of the second paragraph describes a co-mingling of waste streams that section 2.4 describes as being treated separately. Please reconcile these seemingly contradictory statements.
   c. Please correct the text to indicate that "changes in groundwater or soil quality due to releases of hazardous chemicals" is a direct operational impact of the project.
8. Section 6.0
   a. Text states that the proposed project "will not cause significant additional impact on the environment. The facility already exists, and no changes to the GNF-A facility of its operation are associated with the license renewal. The Proposed Action can be considered a continuation of impacts and was evaluated based on impacts from past operations … Cumulative impacts over the 40-year renewal period were also evaluated and determined to be SMALL to MODERATE."
      i. If approval of this project does implicitly sanction the construction of the tool and laser facilities, activities which appear beyond this license renewal, then the impacts from this project must be included in this document.
      ii. While the beginning of the quoted section states that impacts from the project will not be "significant," the last sentence states that the impacts will be "SMALL to MODERATE." The last sentence leads one to believe that there will be significant impacts resulting from this project.
         1. Please respond regarding this contradiction.
         2. If projected impacts are significant, DWQ requests that an EIS be prepared for this project.

Cc: Rick Shiver – WiRO



State of North Carolina

Department of Environment and Natural Resources

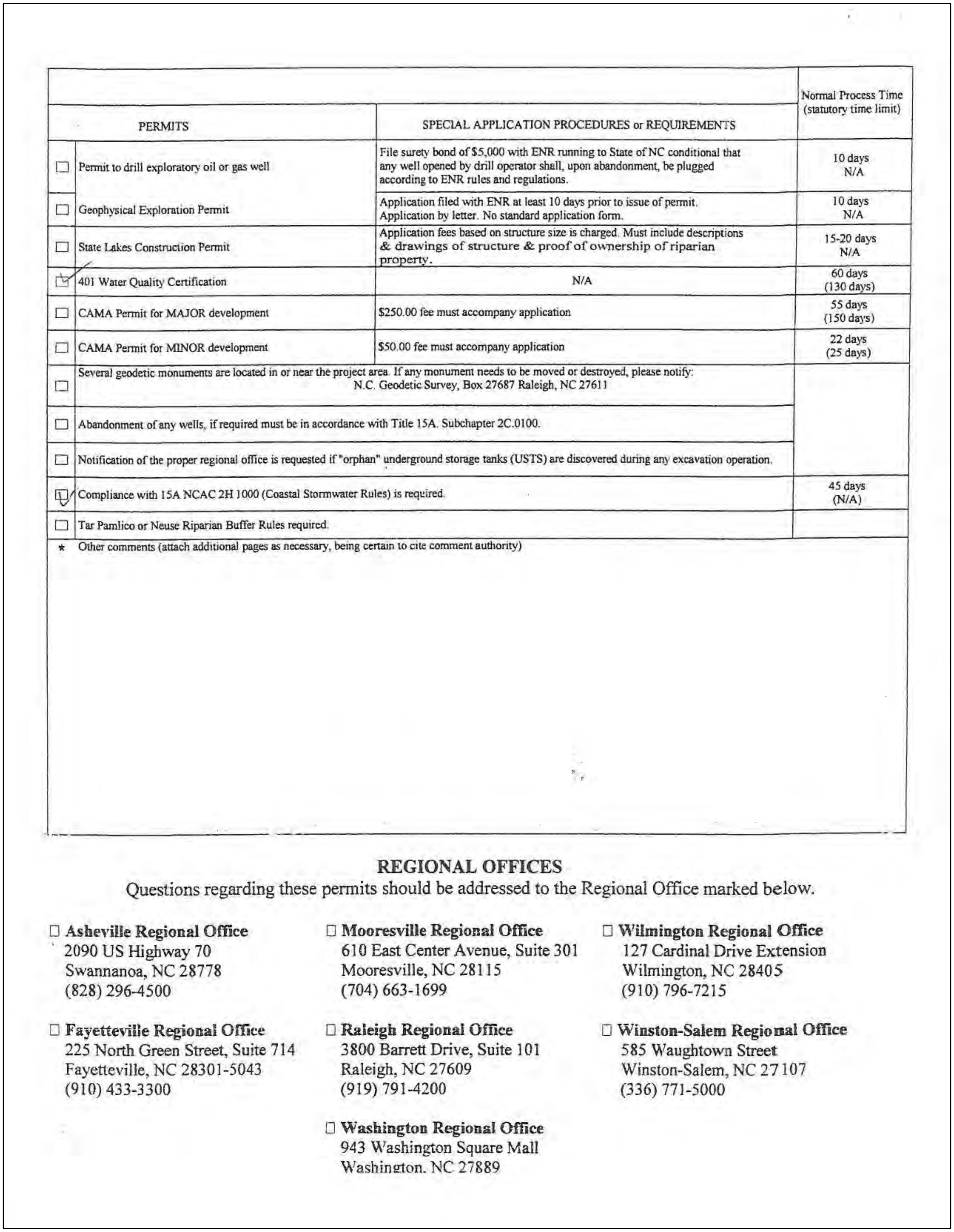
Reviewing Office: W; RO

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

Project Number: 09-0336 Due Date: 6/15/09

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☑	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100, 2Q.0300, 2H.0600)	N/A	60 days
☐	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 20.1900	N/A	60 days (90 days)
☐	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
☒	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) At least 30 days before beginning activity. A fee of $~~50~~ 65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
☐	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.		(30 days)
☐	Mining Permit	On-site inspection usual. Surety bond filed with ENR Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion	30 days (60 days)



	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days N/A
☑	401 Water Quality Certification	N/A	60 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	55 days (150 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☐	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, NC 27611		
☐	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☐	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☑	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
☐	Tar Pamlico or Neuse Riparian Buffer Rules required.		
*	Other comments (attach additional pages as necessary, being certain to cite comment authority)		

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 US Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ **Fayetteville Regional Office**
225 North Green Street, Suite 714
Fayetteville, NC 28301-5043
(910) 433-3300

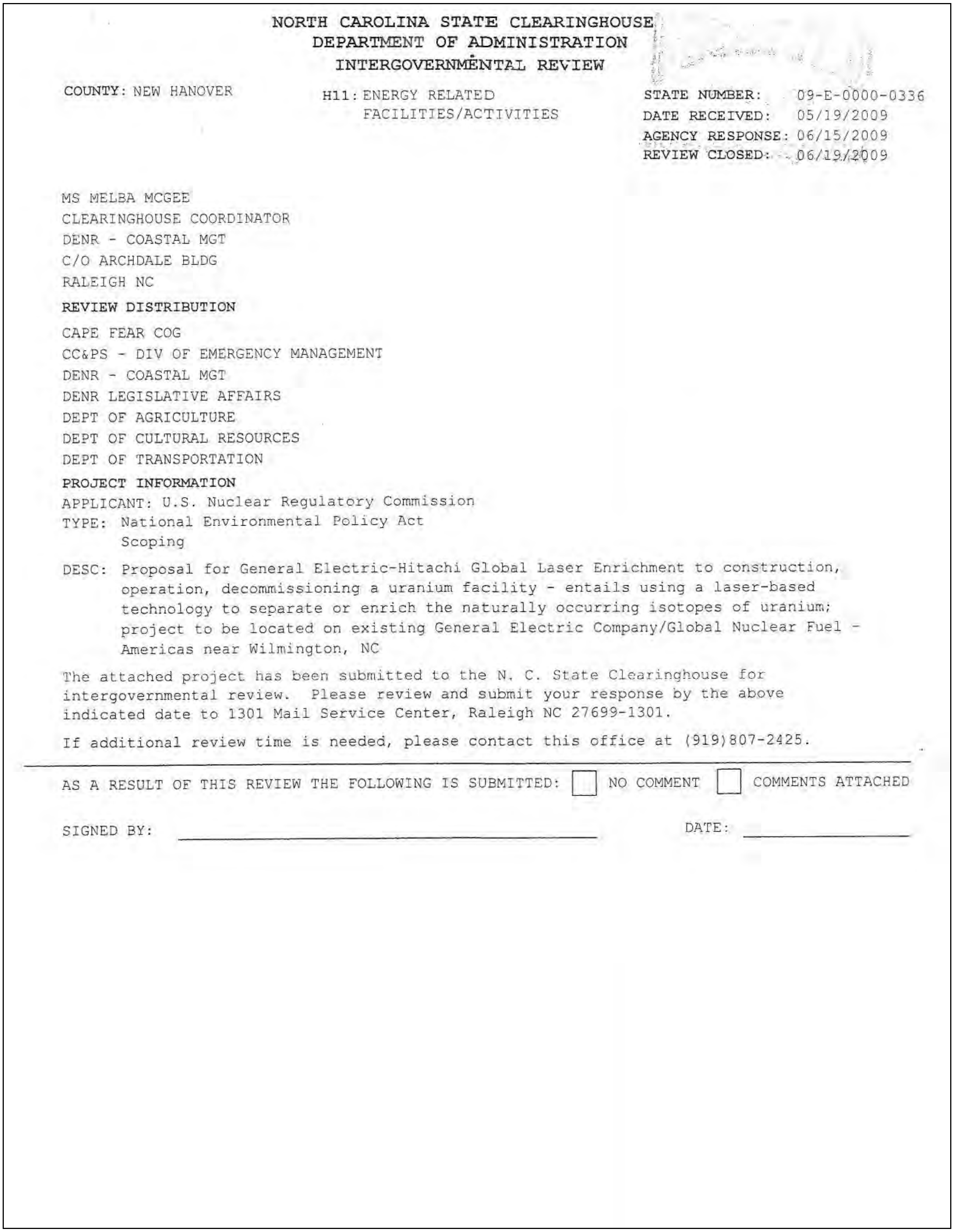
☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☐ **Raleigh Regional Office**
3800 Barrett Drive, Suite 101
Raleigh, NC 27609
(919) 791-4200

☐ **Washington Regional Office**
943 Washington Square Mall
Washington, NC 27889

☐ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000



NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: NEW HANOVER

H11: ENERGY RELATED
FACILITIES/ACTIVITIES

STATE NUMBER: 09-E-0000-0336
DATE RECEIVED: 05/19/2009
AGENCY RESPONSE: 06/15/2009
REVIEW CLOSED: 06/19/2009

MS MELBA MCGEE
CLEARINGHOUSE COORDINATOR
DENR - COASTAL MGT
C/O ARCHDALE BLDG
RALEIGH NC

REVIEW DISTRIBUTION

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DENR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CULTURAL RESOURCES
DEPT OF TRANSPORTATION

PROJECT INFORMATION

APPLICANT: U.S. Nuclear Regulatory Commission
TYPE: National Environmental Policy Act
Scoping

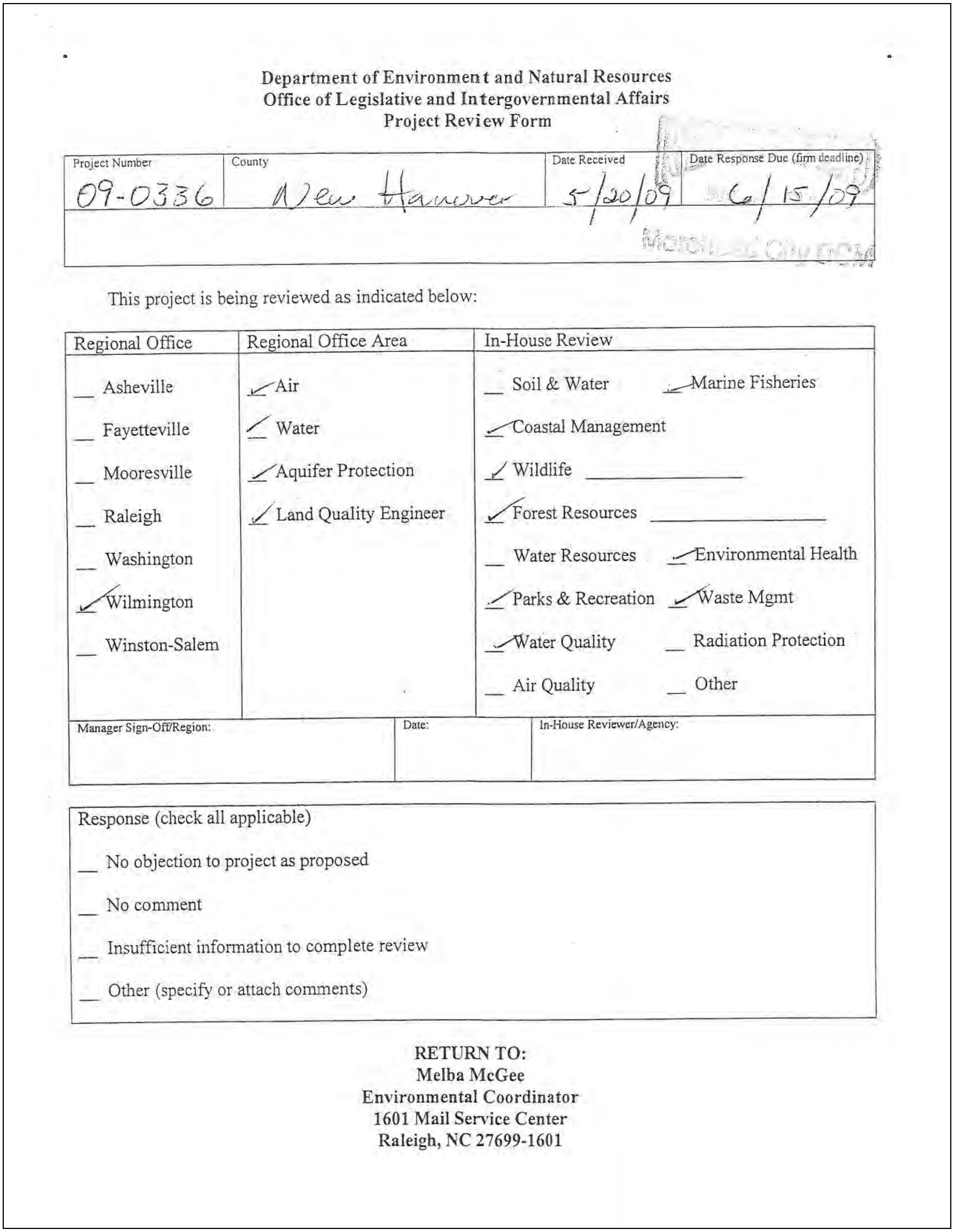
DESC: Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility - entails using a laser-based technology to separate or enrich the naturally occurring isotopes of uranium; project to be located on existing General Electric Company/Global Nuclear Fuel - Americas near Wilmington, NC

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☐ COMMENTS ATTACHED

SIGNED BY: ______________________ DATE: ____________



Department of Environment and Natural Resources
Office of Legislative and Intergovernmental Affairs
Project Review Form

Project Number	County	Date Received	Date Response Due (firm deadline)
09-0336	New Hanover	5/20/09	6/15/09

This project is being reviewed as indicated below:

Regional Office

- __ Asheville
- __ Fayetteville
- __ Mooresville
- __ Raleigh
- __ Washington
- ✓ Wilmington
- __ Winston-Salem

Regional Office Area

- ✓ Air
- ✓ Water
- ✓ Aquifer Protection
- ✓ Land Quality Engineer

In-House Review

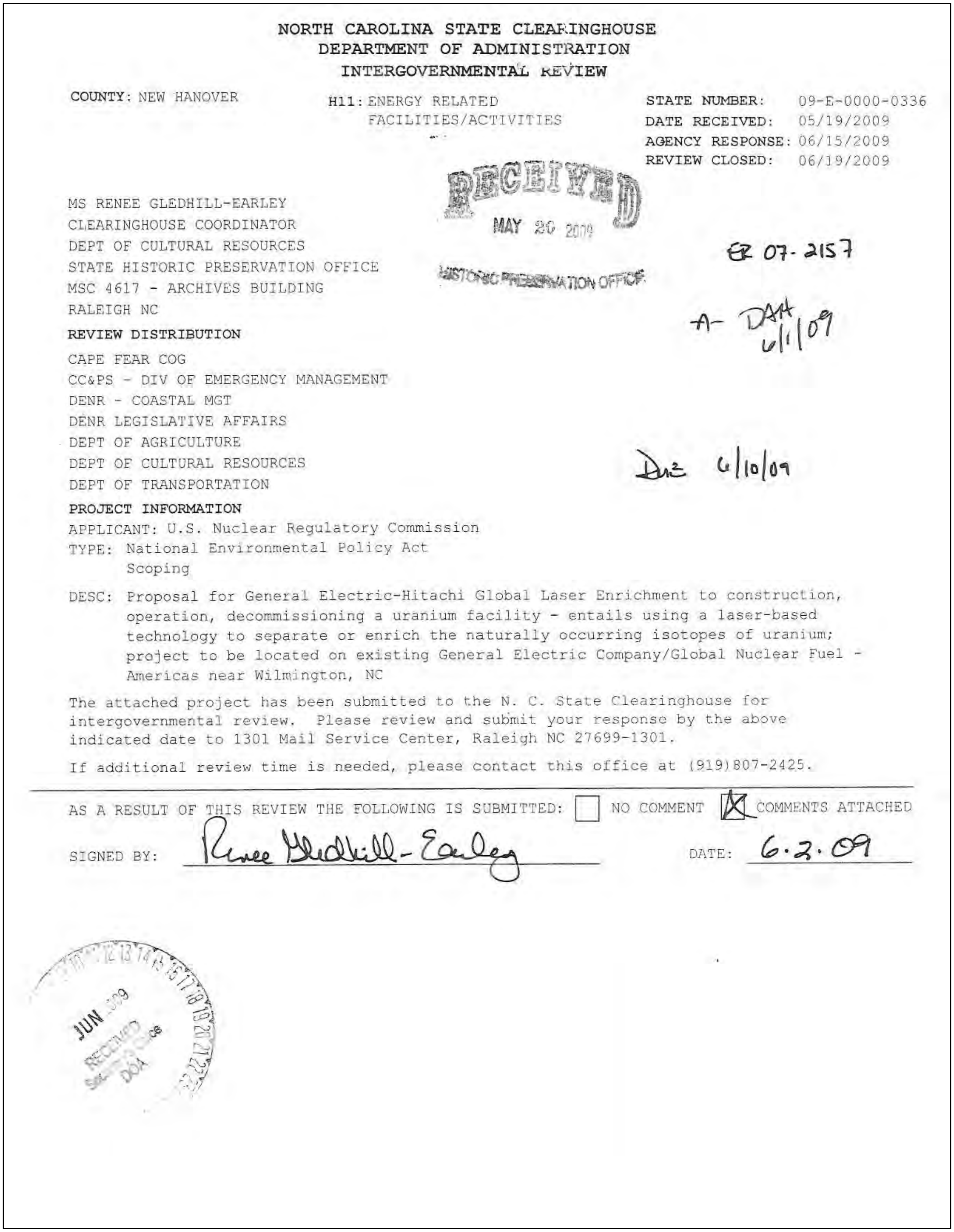
- __ Soil & Water
- ✓ Marine Fisheries
- ✓ Coastal Management
- ✓ Wildlife ________________
- ✓ Forest Resources ________________
- __ Water Resources
- ✓ Environmental Health
- ✓ Parks & Recreation
- ✓ Waste Mgmt
- ✓ Water Quality
- __ Radiation Protection
- __ Air Quality
- __ Other

Manager Sign-Off/Region:	Date:	In-House Reviewer/Agency:

Response (check all applicable)

- __ No objection to project as proposed
- __ No comment
- __ Insufficient information to complete review
- __ Other (specify or attach comments)

RETURN TO:
Melba McGee
Environmental Coordinator
1601 Mail Service Center
Raleigh, NC 27699-1601



NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: NEW HANOVER

H11: ENERGY RELATED
FACILITIES/ACTIVITIES

STATE NUMBER: 09-E-0000-0336
DATE RECEIVED: 05/19/2009
AGENCY RESPONSE: 06/15/2009
REVIEW CLOSED: 06/19/2009

RECEIVED
MAY 20 2009
HISTORIC PRESERVATION OFFICE

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF CULTURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

ER 07-2157

A- DAH 6/1/09

REVIEW DISTRIBUTION

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DENR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CULTURAL RESOURCES
DEPT OF TRANSPORTATION

Due 6/10/09

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APPLICANT: U.S. Nuclear Regulatory Commission
TYPE: National Environmental Policy Act
Scoping

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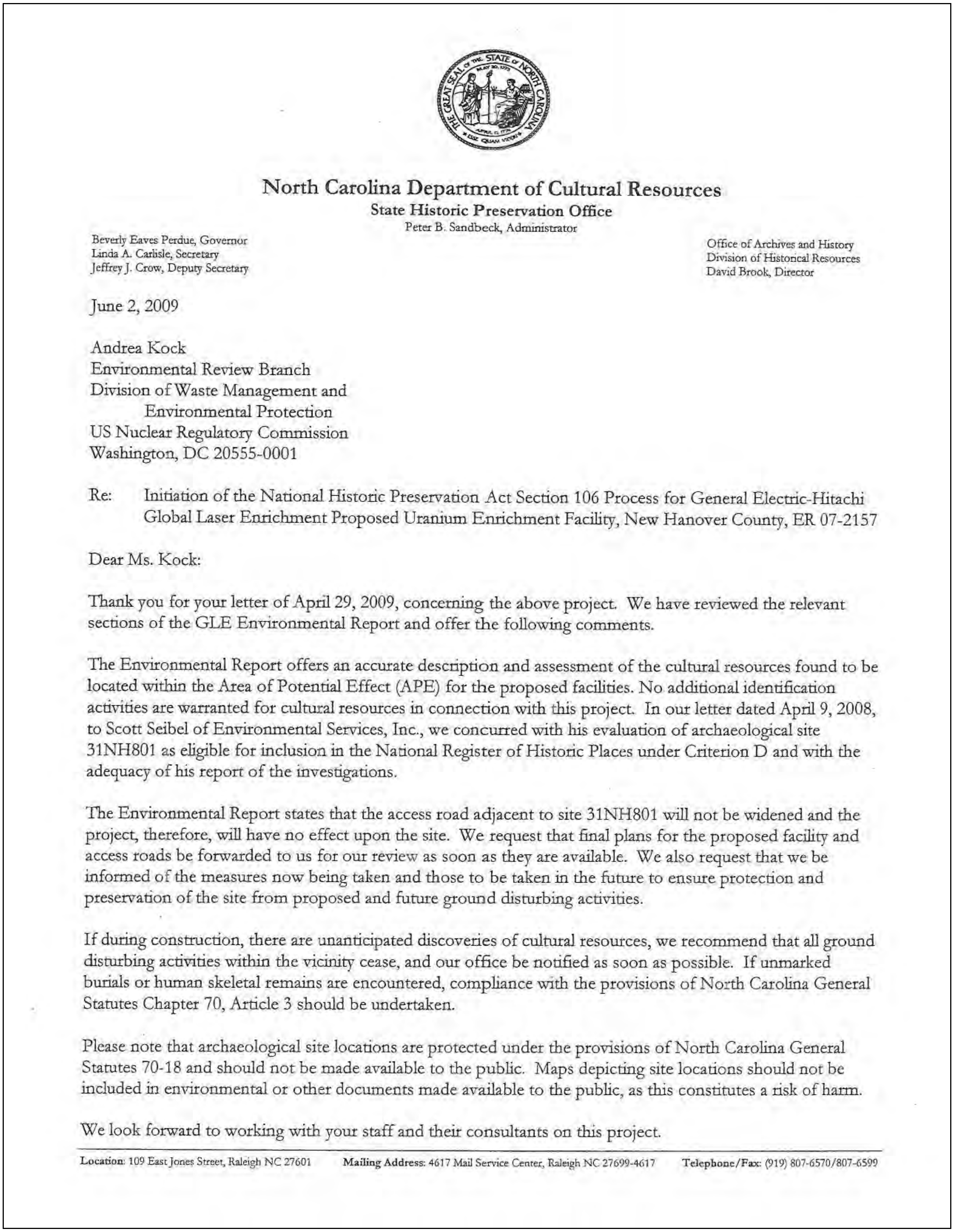
The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley DATE: 6.2.09

JUN 2009
RECEIVED
State Clearinghouse
DOA



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

June 2, 2009

Andrea Kock
Environmental Review Branch
Division of Waste Management and
Environmental Protection
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Initiation of the National Historic Preservation Act Section 106 Process for General Electric-Hitachi Global Laser Enrichment Proposed Uranium Enrichment Facility, New Hanover County, ER 07-2157

Dear Ms. Kock:

Thank you for your letter of April 29, 2009, concerning the above project. We have reviewed the relevant sections of the GLE Environmental Report and offer the following comments.

The Environmental Report offers an accurate description and assessment of the cultural resources found to be located within the Area of Potential Effect (APE) for the proposed facilities. No additional identification activities are warranted for cultural resources in connection with this project. In our letter dated April 9, 2008, to Scott Seibel of Environmental Services, Inc., we concurred with his evaluation of archaeological site 31NH801 as eligible for inclusion in the National Register of Historic Places under Criterion D and with the adequacy of his report of the investigations.

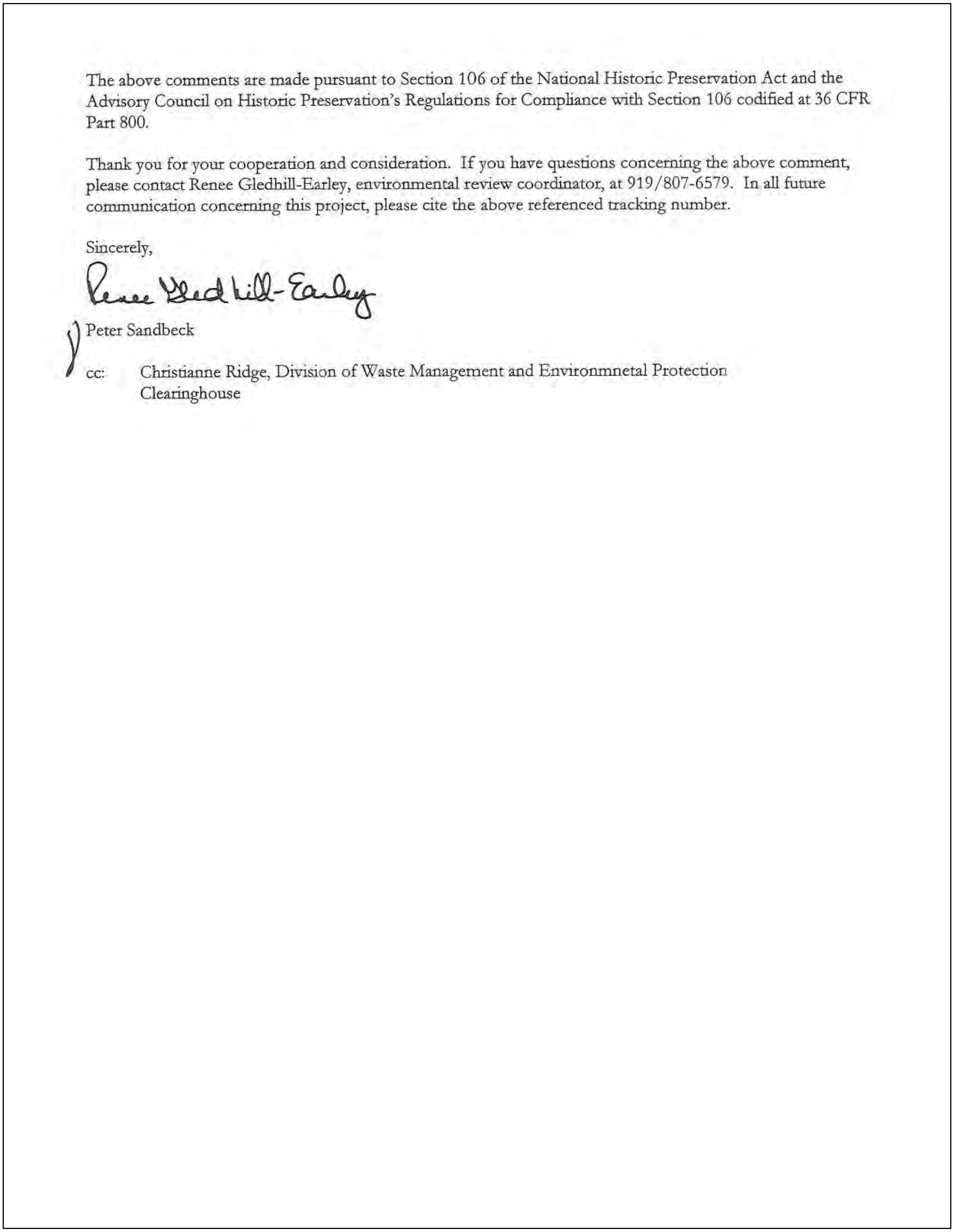
The Environmental Report states that the access road adjacent to site 31NH801 will not be widened and the project, therefore, will have no effect upon the site. We request that final plans for the proposed facility and access roads be forwarded to us for our review as soon as they are available. We also request that we be informed of the measures now being taken and those to be taken in the future to ensure protection and preservation of the site from proposed and future ground disturbing activities.

If during construction, there are unanticipated discoveries of cultural resources, we recommend that all ground disturbing activities within the vicinity cease, and our office be notified as soon as possible. If unmarked burials or human skeletal remains are encountered, compliance with the provisions of North Carolina General Statutes Chapter 70, Article 3 should be undertaken.

Please note that archaeological site locations are protected under the provisions of North Carolina General Statutes 70-18 and should not be made available to the public. Maps depicting site locations should not be included in environmental or other documents made available to the public, as this constitutes a risk of harm.

We look forward to working with your staff and their consultants on this project.

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address:** 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax:** (919) 807-6570/807-6599



The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

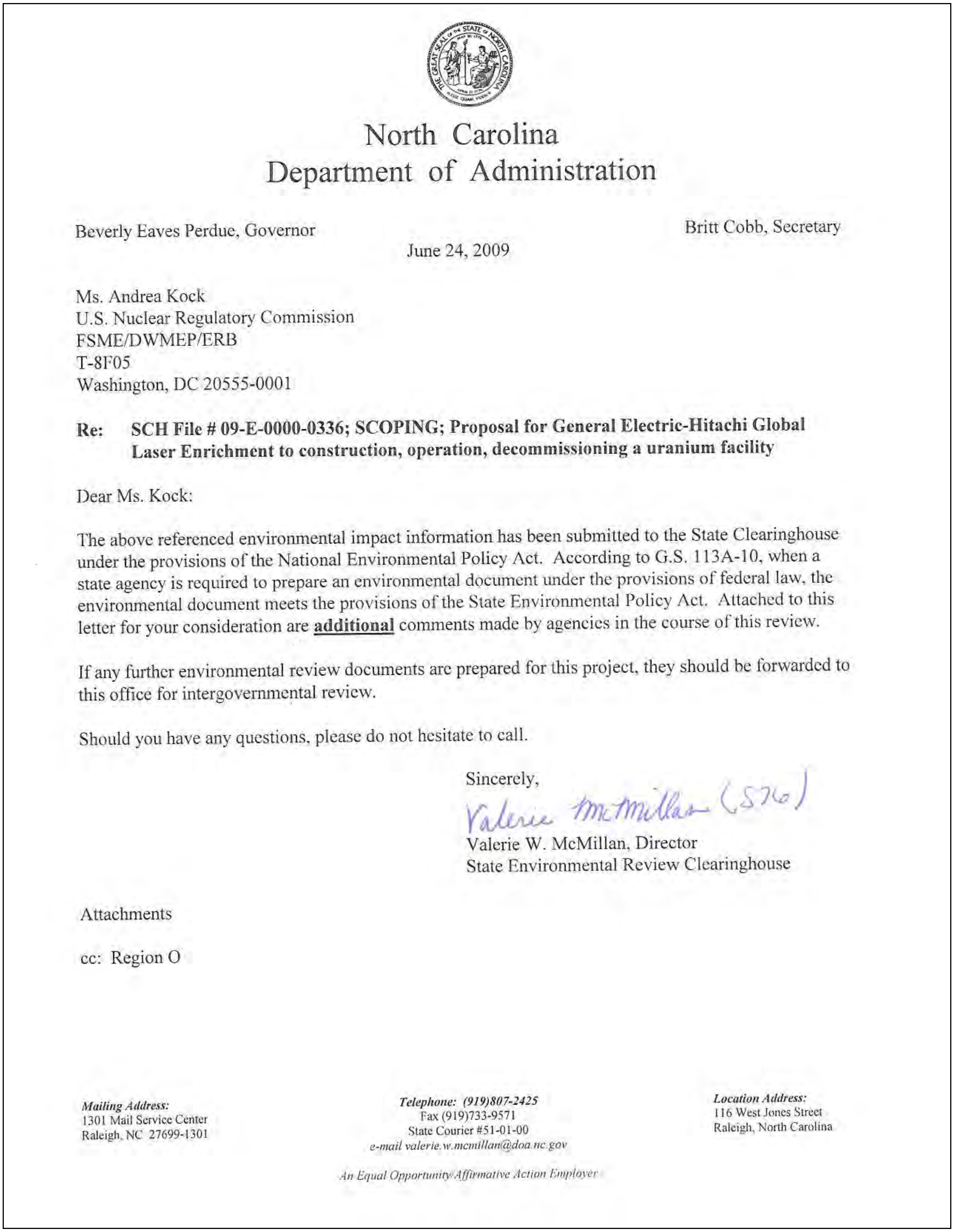
Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter Sandbeck

cc: Christianne Ridge, Division of Waste Management and Environmnetal Protection
Clearinghouse



North Carolina
Department of Administration

Beverly Eaves Perdue, Governor
Britt Cobb, Secretary

June 24, 2009

Ms. Andrea Kock
U.S. Nuclear Regulatory Commission
FSME/DWMEP/ERB
T-8F05
Washington, DC 20555-0001

Re: SCH File # 09-E-0000-0336; SCOPING; Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility

Dear Ms. Kock:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are **additional** comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Valerie McMillan (S76)

Valerie W. McMillan, Director
State Environmental Review Clearinghouse

Attachments

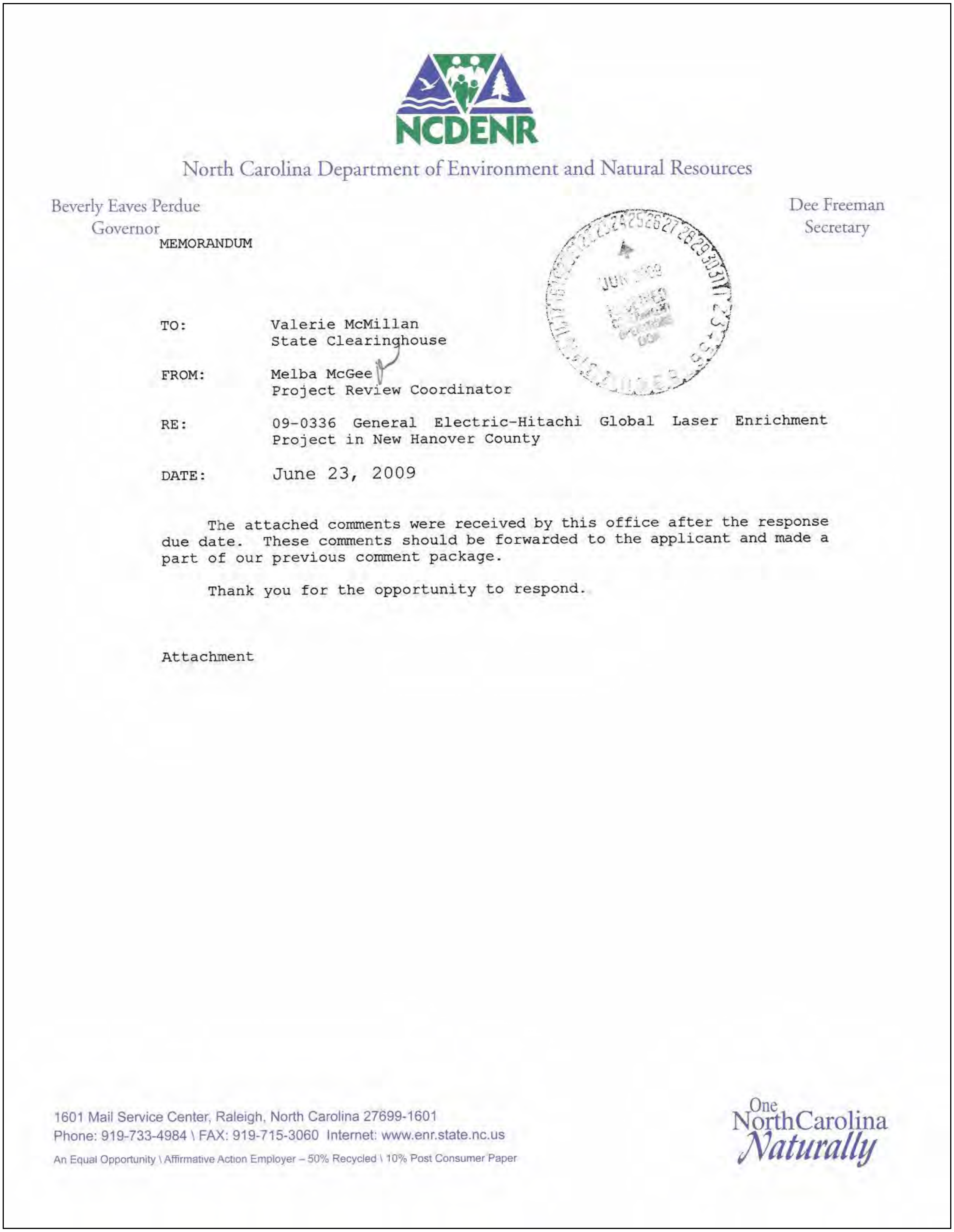
cc: Region O

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail valerie.w.mcmillan@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

An Equal Opportunity/Affirmative Action Employer



NCDENR

North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

MEMORANDUM

JUN 2009

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Project Review Coordinator

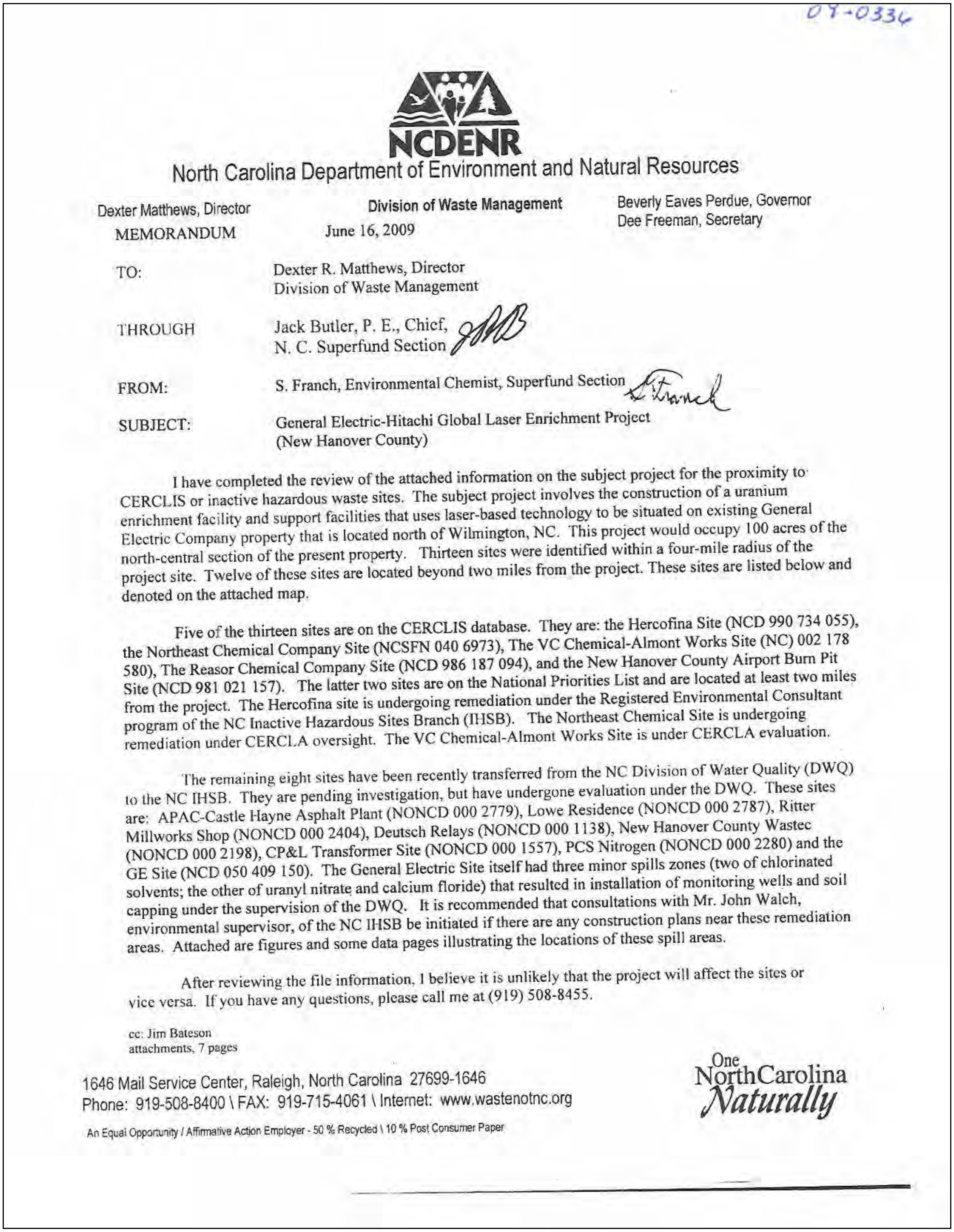
RE: 09-0336 General Electric-Hitachi Global Laser Enrichment Project in New Hanover County

DATE: June 23, 2009

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

Attachment



07-0336

NCDENR
North Carolina Department of Environment and Natural Resources

Dexter Matthews, Director
Division of Waste Management
Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

MEMORANDUM

June 16, 2009

TO: Dexter R. Matthews, Director
Division of Waste Management

THROUGH Jack Butler, P. E., Chief,
N. C. Superfund Section

FROM: S. Franch, Environmental Chemist, Superfund Section

SUBJECT: General Electric-Hitachi Global Laser Enrichment Project
(New Hanover County)

I have completed the review of the attached information on the subject project for the proximity to CERCLIS or inactive hazardous waste sites. The subject project involves the construction of a uranium enrichment facility and support facilities that uses laser-based technology to be situated on existing General Electric Company property that is located north of Wilmington, NC. This project would occupy 100 acres of the north-central section of the present property. Thirteen sites were identified within a four-mile radius of the project site. Twelve of these sites are located beyond two miles from the project. These sites are listed below and denoted on the attached map.

Five of the thirteen sites are on the CERCLIS database. They are: the Hercofina Site (NCD 990 734 055), the Northeast Chemical Company Site (NCSFN 040 6973), The VC Chemical-Almont Works Site (NC) 002 178 580), The Reasor Chemical Company Site (NCD 986 187 094), and the New Hanover County Airport Burn Pit Site (NCD 981 021 157). The latter two sites are on the National Priorities List and are located at least two miles from the project. The Hercofina site is undergoing remediation under the Registered Environmental Consultant program of the NC Inactive Hazardous Sites Branch (IHSB). The Northeast Chemical Site is undergoing remediation under CERCLA oversight. The VC Chemical-Almont Works Site is under CERCLA evaluation.

The remaining eight sites have been recently transferred from the NC Division of Water Quality (DWQ) to the NC IHSB. They are pending investigation, but have undergone evaluation under the DWQ. These sites are: APAC-Castle Hayne Asphalt Plant (NONCD 000 2779), Lowe Residence (NONCD 000 2787), Ritter Millworks Shop (NONCD 000 2404), Deutsch Relays (NONCD 000 1138), New Hanover County Wastec (NONCD 000 2198), CP&L Transformer Site (NONCD 000 1557), PCS Nitrogen (NONCD 000 2280) and the GE Site (NCD 050 409 150). The General Electric Site itself had three minor spills zones (two of chlorinated solvents; the other of uranyl nitrate and calcium floride) that resulted in installation of monitoring wells and soil capping under the supervision of the DWQ. It is recommended that consultations with Mr. John Walch, environmental supervisor, of the NC IHSB be initiated if there are any construction plans near these remediation areas. Attached are figures and some data pages illustrating the locations of these spill areas.

After reviewing the file information, I believe it is unlikely that the project will affect the sites or vice versa. If you have any questions, please call me at (919) 508-8455.

cc: Jim Bateson
attachments, 7 pages

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-715-4061 \ Internet: www.wastenotnc.org

One
NorthCarolina
Naturally

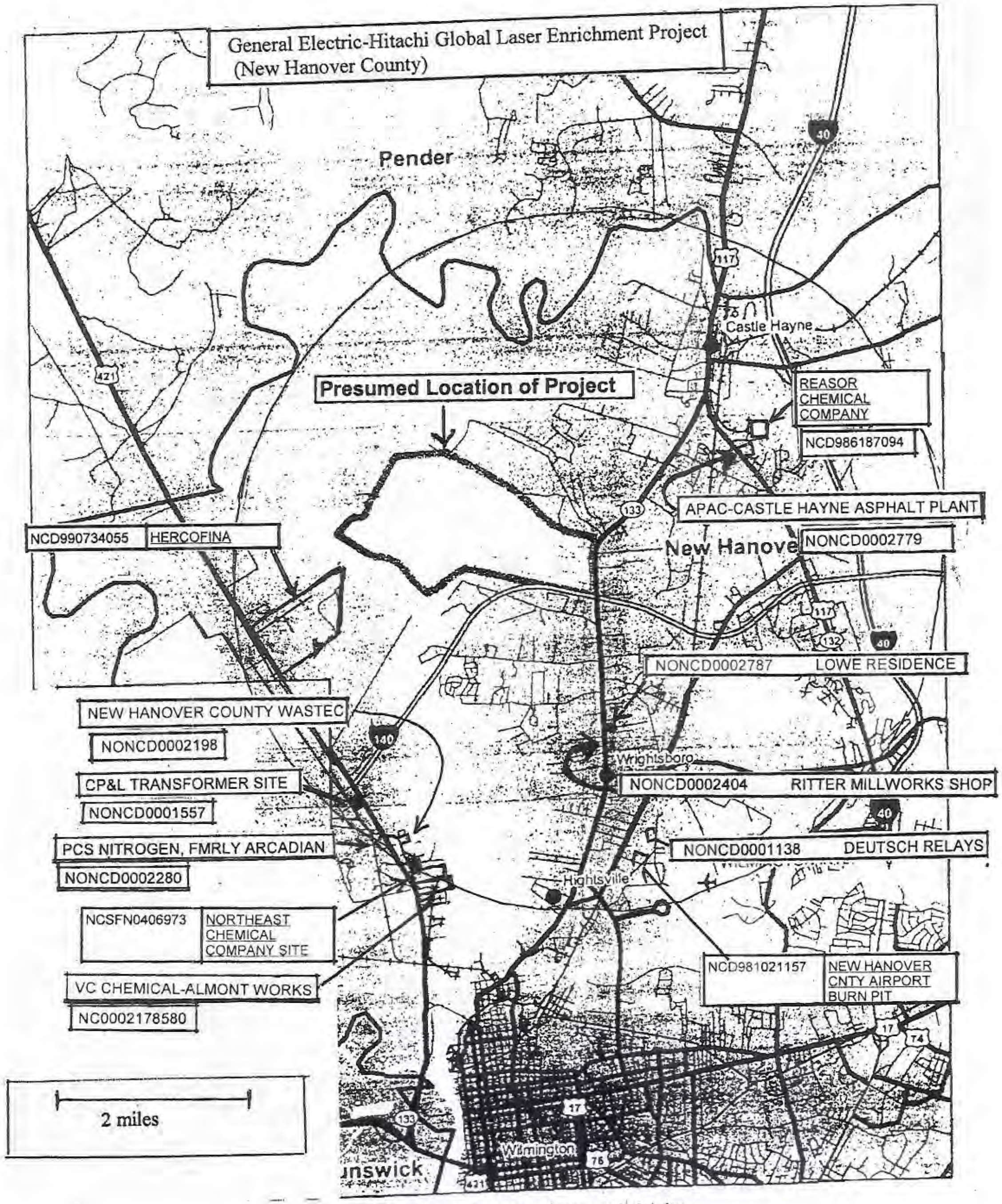


Figure ES-1. Wilmington Site location and vicinity.

JUN-17-2009 WED 09:26 AM NCDENR FAX NO. 910 350 2004 P. 04

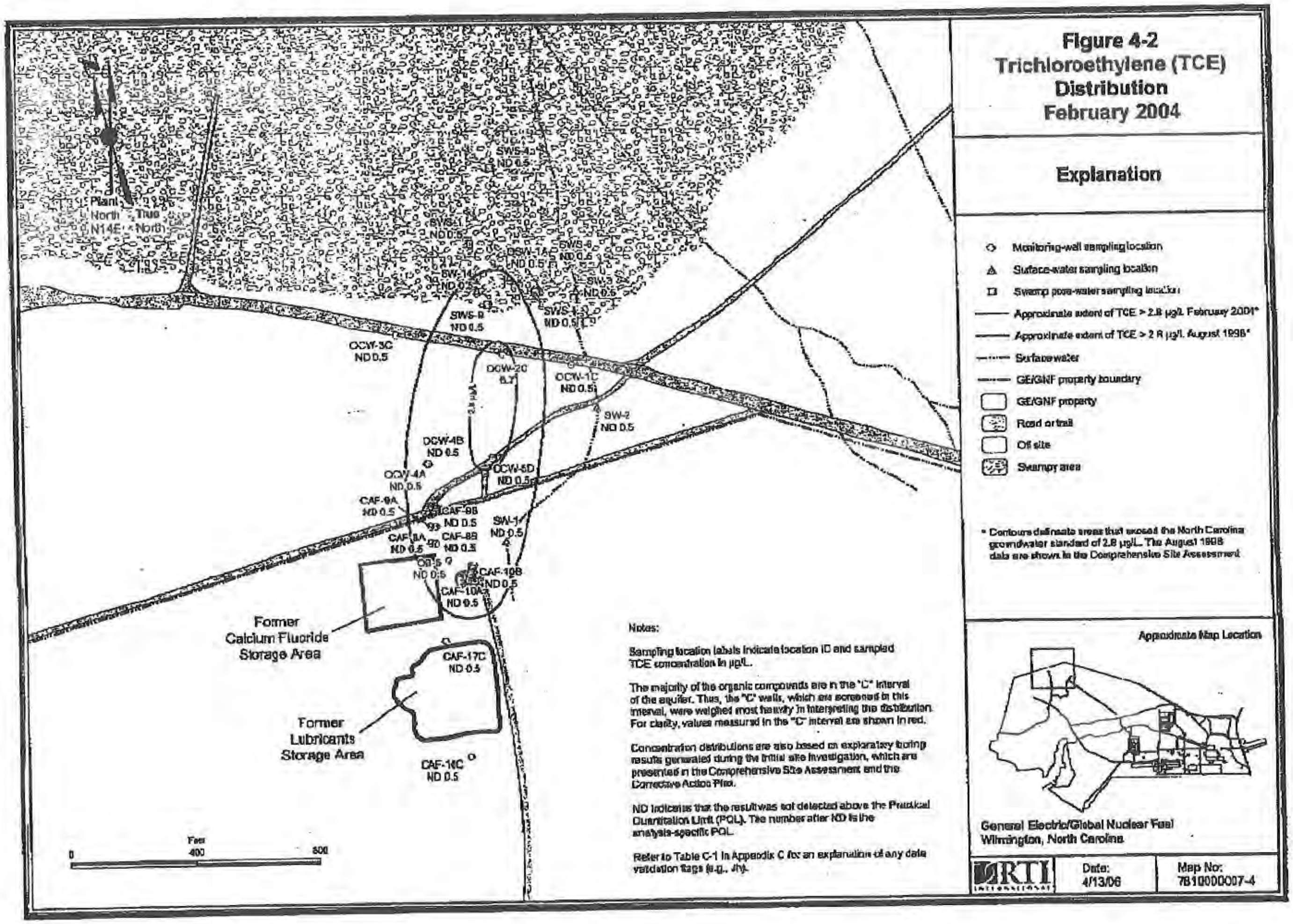


Figure 4-2 Trichloroethylene (TCE) Distribution February 2004

Explanation

- ○ Monitoring-well sampling location
- △ Surface-water sampling location
- □ Swamp pore-water sampling location
- —— Approximate extent of TCE > 2.8 µg/L February 2004*
- —— Approximate extent of TCE > 2.8 µg/L August 1998*
- —·—·— Surface water
- —·—·— GE/GNF property boundary
- ☐ GE/GNF property
- ▨ Road or trail
- ☐ Off site
- ▨ Swampy area

* Contours delineate areas that exceed the North Carolina groundwater standard of 2.8 µg/L. The August 1998 data are shown in the Comprehensive Site Assessment.

Notes:

Sampling location labels indicate location ID and sampled TCE concentration in µg/L.

The majority of the organic compounds are in the "C" interval of the aquifer. Thus, the "C" wells, which are screened in this interval, were weighed most heavily in interpreting the distribution. For clarity, values measured in the "C" interval are shown in red.

Concentration distributions are also based on exploratory boring results generated during the initial site investigation, which are presented in the Comprehensive Site Assessment and the Corrective Action Plan.

ND indicates that the result was not detected above the Practical Quantitation Limit (PQL). The number after ND is the analysis-specific PQL.

Refer to Table C-1 in Appendix C for an explanation of any data validation flags (e.g., J/h).

General Electric/Global Nuclear Fuel
Wilmington, North Carolina

RTI INTERNATIONAL

Date: 4/13/06

Map No: 7810000007-4

JUN-17-2009 WED 09:26 AM NCDENR

FAX NO. 910 350 2004

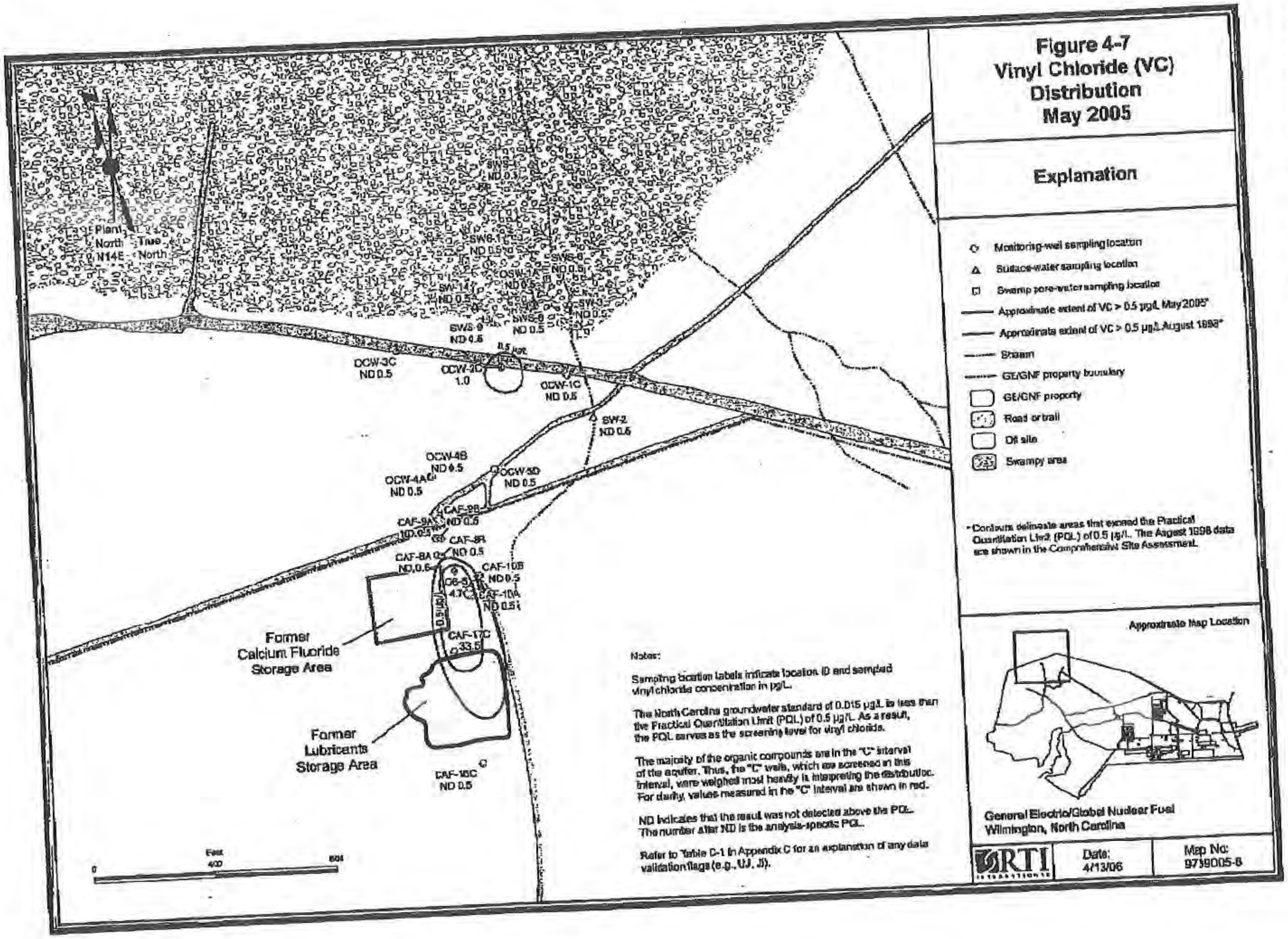


Figure 4-7
Vinyl Chloride (VC)
Distribution
May 2005

Explanation

- ○ Monitoring-well sampling location
- △ Surface-water sampling location
- □ Swamp pore-water sampling location
- —— Approximate extent of VC > 0.5 µg/L May 2005*
- —— Approximate extent of VC > 0.5 µg/L August 1998*
- ------ Stream
- ------ GE/GNF property boundary
- ☐ GE/GNF property
- ▨ Road or trail
- ☐ Off site
- ▨ Swampy area

* Contours delineate areas that exceed the Practical Quantitation Limit (PQL) of 0.5 µg/L. The August 1998 data are shown in the Comprehensive Site Assessment.

Notes:

Sampling location labels indicate location ID and sampled vinyl chloride concentration in µg/L.

The North Carolina groundwater standard of 0.015 µg/L is less than the Practical Quantitation Limit (PQL) of 0.5 µg/L. As a result, the PQL serves as the screening level for vinyl chloride.

The majority of the organic compounds are in the "C" interval of the aquifer. Thus, the "C" wells, which are screened in this interval, were weighed most heavily in interpreting the distribution. For clarity, values measured in the "C" interval are shown in red.

ND indicates that the result was not detected above the PQL. The number after ND is the analysis-specific PQL.

Refer to Table C-1 in Appendix C for an explanation of any data validation flags (e.g., UJ, J).

General Electric/Global Nuclear Fuel
Wilmington, North Carolina

RTI INTERNATIONAL

Date: 4/13/06

Map No: 9739005-8

JUN-17-2009 WED 09:27 AM NCDENR FAX NO. 910 350 2004 P. 06

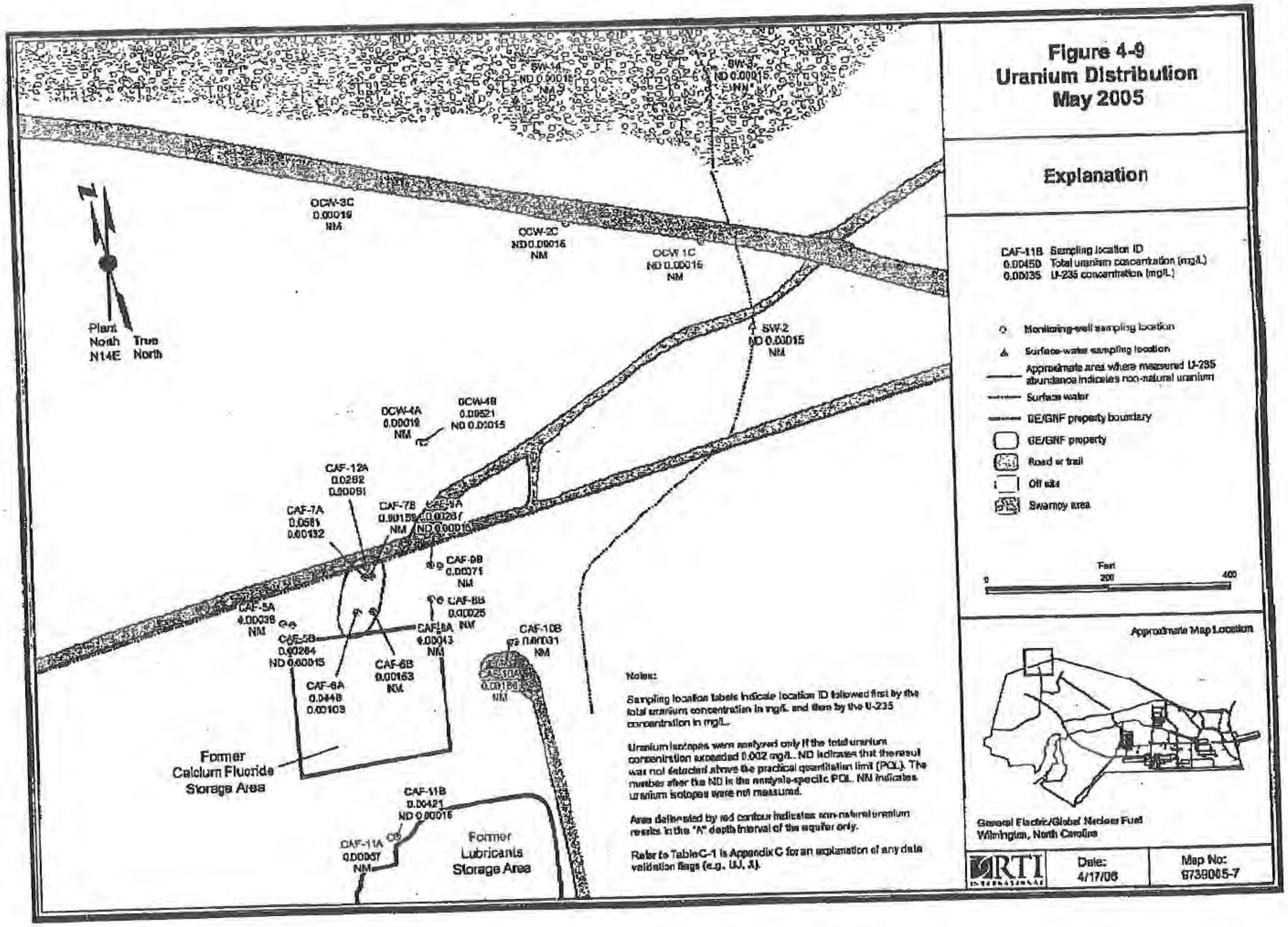


Figure 4-9
Uranium Distribution
May 2005

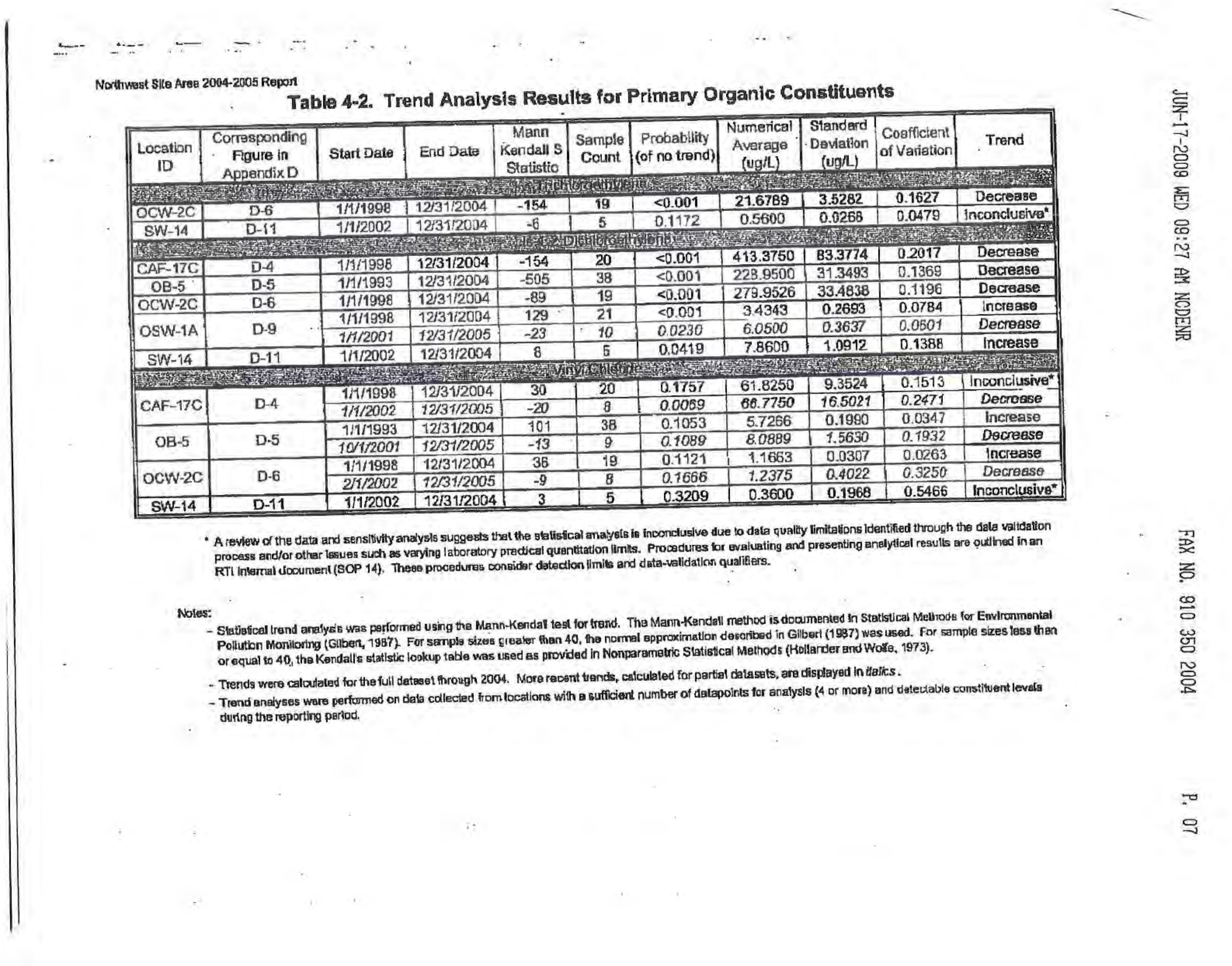
Notes:

Sampling location labels indicate location ID followed first by the total uranium concentration in mg/L and then by the U-235 concentration in mg/L.

Uranium isotopes were analyzed only if the total uranium concentration exceeded 0.002 mg/L. ND indicates that the result was not detected above the practical quantitation limit (PQL). The number after the ND is the analyte-specific PQL. NM indicates uranium isotopes were not measured.

Area delineated by red contour indicates non-natural uranium results in the "A" depth interval of the aquifer only.

Refer to Table C-1 in Appendix C for an explanation of any data validation flags (e.g., UJ, J).



JUN-17-2009 WED 09:27 AM NCDENR FAX NO. 910 350 2004 P. 07

Northwest Site Area 2004-2005 Report

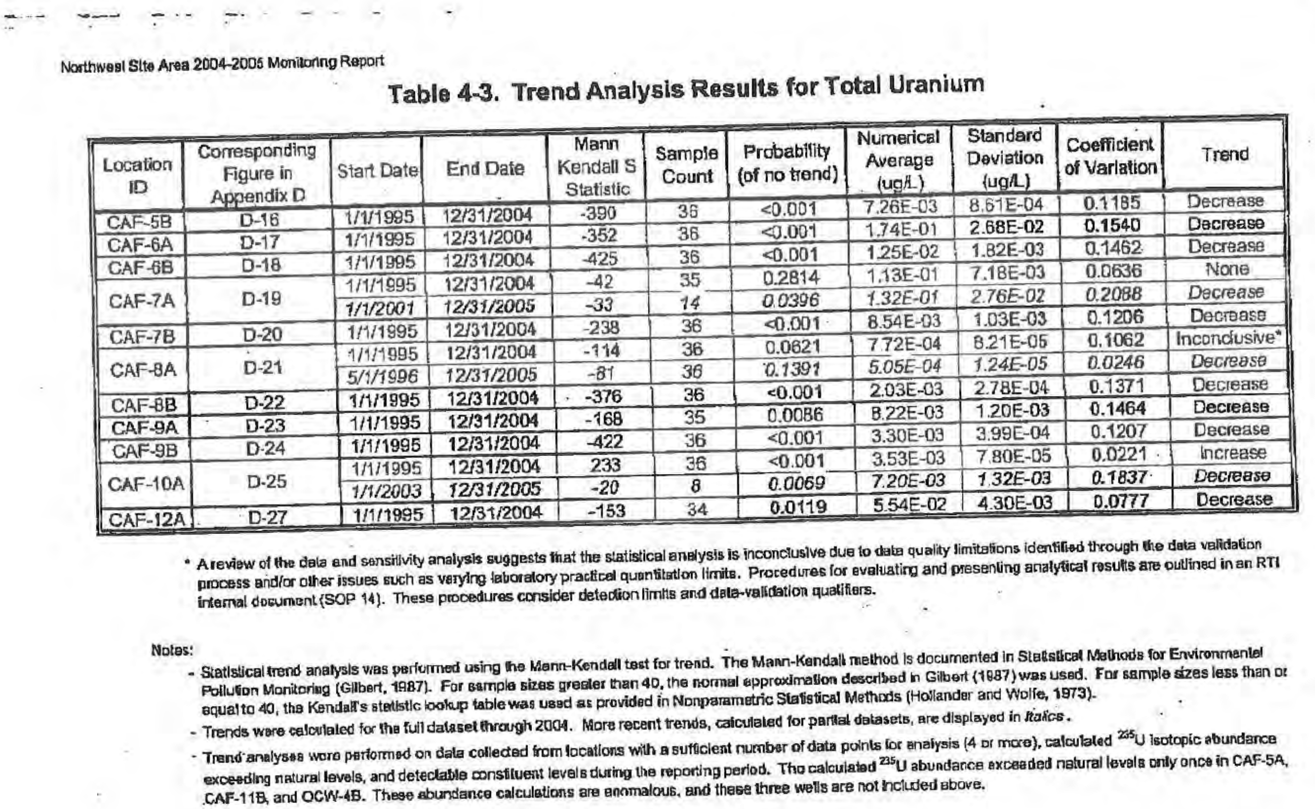
Table 4-2. Trend Analysis Results for Primary Organic Constituents

Location ID	Corresponding Figure in Appendix D	Start Date	End Date	Mann Kendall S Statistic	Sample Count	Probability (of no trend)	Numerical Average (ug/L)	Standard Deviation (ug/L)	Coefficient of Variation	Trend
Trichloroethylene										
OCW-2C	D-6	1/1/1998	12/31/2004	-154	19	<0.001	21.6789	3.5282	0.1627	Decrease
SW-14	D-11	1/1/2002	12/31/2004	-6	5	0.1172	0.5600	0.0268	0.0479	Inconclusive*
1,2-Dichloroethylene										
CAF-17C	D-4	1/1/1998	12/31/2004	-154	20	<0.001	413.3750	83.3774	0.2017	Decrease
OB-5	D-5	1/1/1993	12/31/2004	-505	38	<0.001	228.9500	31.3493	0.1369	Decrease
OCW-2C	D-6	1/1/1998	12/31/2004	-89	19	<0.001	279.9526	33.4838	0.1196	Decrease
OSW-1A	D-9	1/1/1998	12/31/2004	129	21	<0.001	3.4343	0.2693	0.0784	Increase
		1/1/2001	*12/31/2005*	*-23*	*10*	*0.0230*	*6.0500*	*0.3637*	*0.0601*	*Decrease*
SW-14	D-11	1/1/2002	12/31/2004	8	5	0.0419	7.8600	1.0912	0.1388	Increase
Vinyl Chloride										
CAF-17C	D-4	1/1/1998	12/31/2004	30	20	0.1757	61.8250	9.3524	0.1513	Inconclusive*
		1/1/2002	*12/31/2005*	*-20*	*8*	*0.0069*	*66.7750*	*16.5021*	*0.2471*	*Decrease*
OB-5	D-5	1/1/1993	12/31/2004	101	38	0.1053	5.7266	0.1990	0.0347	Increase
		10/1/2001	*12/31/2005*	*-13*	*9*	*0.1089*	*8.0889*	*1.5630*	*0.1932*	*Decrease*
OCW-2C	D-6	1/1/1998	12/31/2004	36	19	0.1121	1.1663	0.0307	0.0263	Increase
		2/1/2002	*12/31/2005*	*-9*	*8*	*0.1666*	*1.2375*	*0.4022*	*0.3250*	*Decrease*
SW-14	D-11	1/1/2002	12/31/2004	3	5	0.3209	0.3600	0.1968	0.5466	Inconclusive*

* A review of the data and sensitivity analysis suggests that the statistical analysis is inconclusive due to data quality limitations identified through the data validation process and/or other issues such as varying laboratory practical quantitation limits. Procedures for evaluating and presenting analytical results are outlined in an RTI internal document (SOP 14). These procedures consider detection limits and data-validation qualifiers.

Notes:

- Statistical trend analysis was performed using the Mann-Kendall test for trend. The Mann-Kendall method is documented in Statistical Methods for Environmental Pollution Monitoring (Gilbert, 1987). For sample sizes greater than 40, the normal approximation described in Gilbert (1987) was used. For sample sizes less than or equal to 40, the Kendall's statistic lookup table was used as provided in Nonparametric Statistical Methods (Hollander and Wolfe, 1973).
- Trends were calculated for the full dataset through 2004. More recent trends, calculated for partial datasets, are displayed in *italics*.
- Trend analyses were performed on data collected from locations with a sufficient number of datapoints for analysis (4 or more) and detectable constituent levels during the reporting period.



Northwest Site Area 2004-2005 Monitoring Report

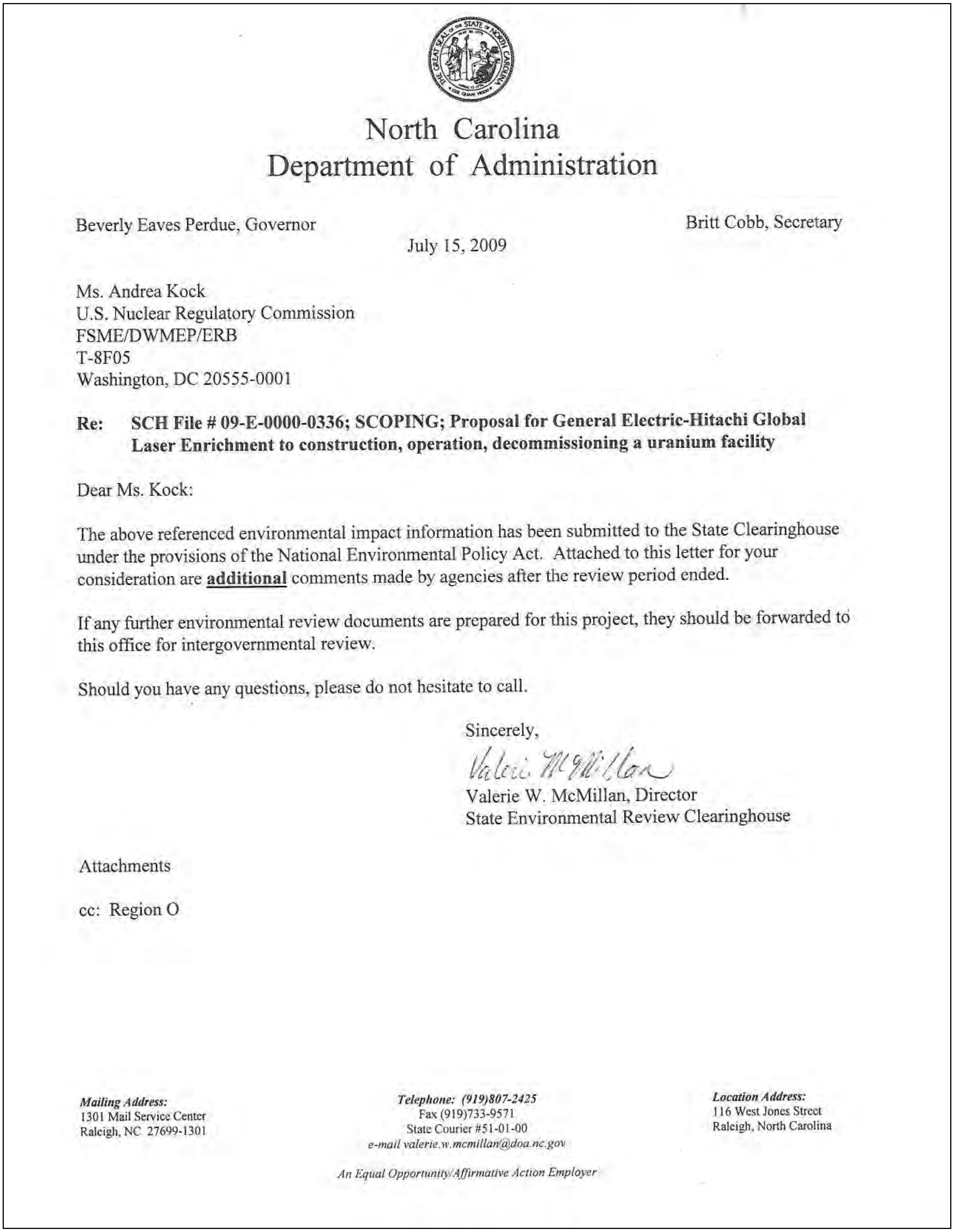
Table 4-3. Trend Analysis Results for Total Uranium

Location ID	Corresponding Figure in Appendix D	Start Date	End Date	Mann Kendall S Statistic	Sample Count	Probability (of no trend)	Numerical Average (ug/L)	Standard Deviation (ug/L)	Coefficient of Variation	Trend
CAF-5B	D-16	1/1/1995	12/31/2004	-390	36	<0.001	7.26E-03	8.61E-04	0.1185	Decrease
CAF-6A	D-17	1/1/1995	12/31/2004	-352	36	<0.001	1.74E-01	2.68E-02	0.1540	Decrease
CAF-6B	D-18	1/1/1995	12/31/2004	-425	36	<0.001	1.25E-02	1.82E-03	0.1462	Decrease
CAF-7A	D-19	1/1/1995	12/31/2004	-42	35	0.2814	1.13E-01	7.18E-03	0.0636	None
		1/1/2001	*12/31/2005*	*-33*	*14*	*0.0396*	*1.32E-01*	*2.76E-02*	*0.2088*	*Decrease*
CAF-7B	D-20	1/1/1995	12/31/2004	-238	36	<0.001	8.54E-03	1.03E-03	0.1206	Decrease
CAF-8A	D-21	1/1/1995	12/31/2004	-114	36	0.0621	7.72E-04	8.21E-05	0.1062	Inconclusive*
		5/1/1996	*12/31/2005*	*-81*	*36*	*0.1391*	*5.05E-04*	*1.24E-05*	*0.0246*	*Decrease*
CAF-8B	D-22	1/1/1995	12/31/2004	-376	36	<0.001	2.03E-03	2.78E-04	0.1371	Decrease
CAF-9A	D-23	1/1/1995	12/31/2004	-168	35	0.0086	8.22E-03	1.20E-03	0.1464	Decrease
CAF-9B	D-24	1/1/1995	12/31/2004	-422	36	<0.001	3.30E-03	3.99E-04	0.1207	Decrease
CAF-10A	D-25	1/1/1995	12/31/2004	233	36	<0.001	3.53E-03	7.80E-05	0.0221	Increase
		1/1/2003	*12/31/2005*	*-20*	*8*	*0.0069*	*7.20E-03*	*1.32E-03*	*0.1837*	*Decrease*
CAF-12A	D-27	1/1/1995	12/31/2004	-153	34	0.0119	5.54E-02	4.30E-03	0.0777	Decrease

* A review of the data and sensitivity analysis suggests that the statistical analysis is inconclusive due to data quality limitations identified through the data validation process and/or other issues such as varying laboratory practical quantitation limits. Procedures for evaluating and presenting analytical results are outlined in an RTI internal document (SOP 14). These procedures consider detection limits and data-validation qualifiers.

Notes:

- Statistical trend analysis was performed using the Mann-Kendall test for trend. The Mann-Kendall method is documented in Statistical Methods for Environmental Pollution Monitoring (Gilbert, 1987). For sample sizes greater than 40, the normal approximation described in Gilbert (1987) was used. For sample sizes less than or equal to 40, the Kendall's statistic lookup table was used as provided in Nonparametric Statistical Methods (Hollander and Wolfe, 1973).
- Trends were calculated for the full dataset through 2004. More recent trends, calculated for partial datasets, are displayed in *italics*.
- Trend analyses were performed on data collected from locations with a sufficient number of data points for analysis (4 or more), calculated ^{235}U isotopic abundance exceeding natural levels, and detectable constituent levels during the reporting period. The calculated ^{235}U abundance exceeded natural levels only once in CAF-5A, CAF-11B, and OCW-4B. These abundance calculations are anomalous, and these three wells are not included above.



North Carolina
Department of Administration

Beverly Eaves Perdue, Governor

Britt Cobb, Secretary

July 15, 2009

Ms. Andrea Kock
U.S. Nuclear Regulatory Commission
FSME/DWMEP/ERB
T-8F05
Washington, DC 20555-0001

Re: SCH File # 09-E-0000-0336; SCOPING; Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility

Dear Ms. Kock:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. Attached to this letter for your consideration are **additional** comments made by agencies after the review period ended.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Valerie McMillan

Valerie W. McMillan, Director
State Environmental Review Clearinghouse

Attachments

cc: Region O

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail valerie.w.mcmillan@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

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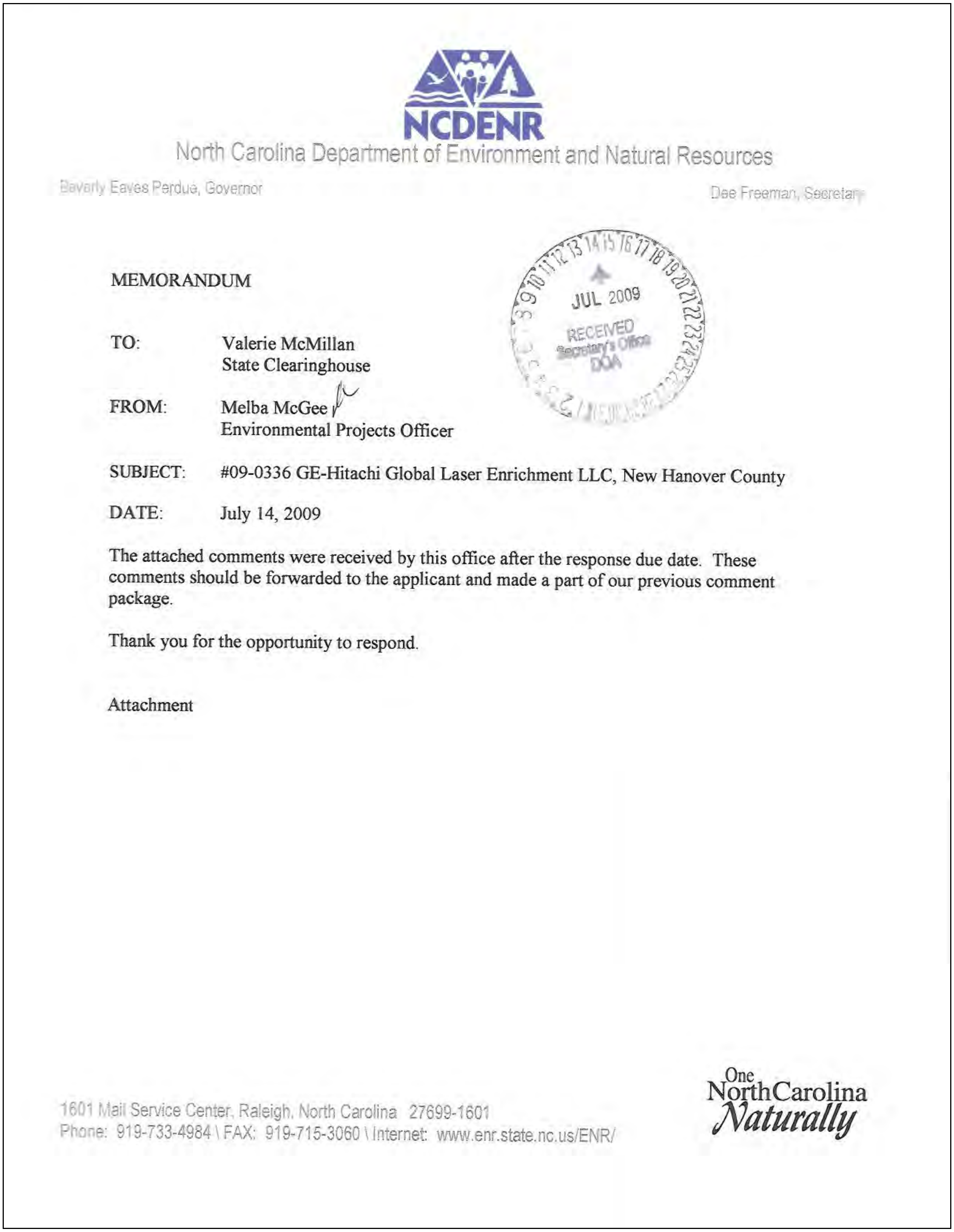

NCDENR
North Carolina Department of Environment and Natural Resources
Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

JUL 2009
RECEIVED
Secretary's Office
DOA

MEMORANDUM

TO: Valerie McMillan
State Clearinghouse

FROM: Melba McGee
Environmental Projects Officer

SUBJECT: #09-0336 GE-Hitachi Global Laser Enrichment LLC, New Hanover County

DATE: July 14, 2009

The attached comments were received by this office after the response due date. These comments should be forwarded to the applicant and made a part of our previous comment package.

Thank you for the opportunity to respond.

Attachment

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

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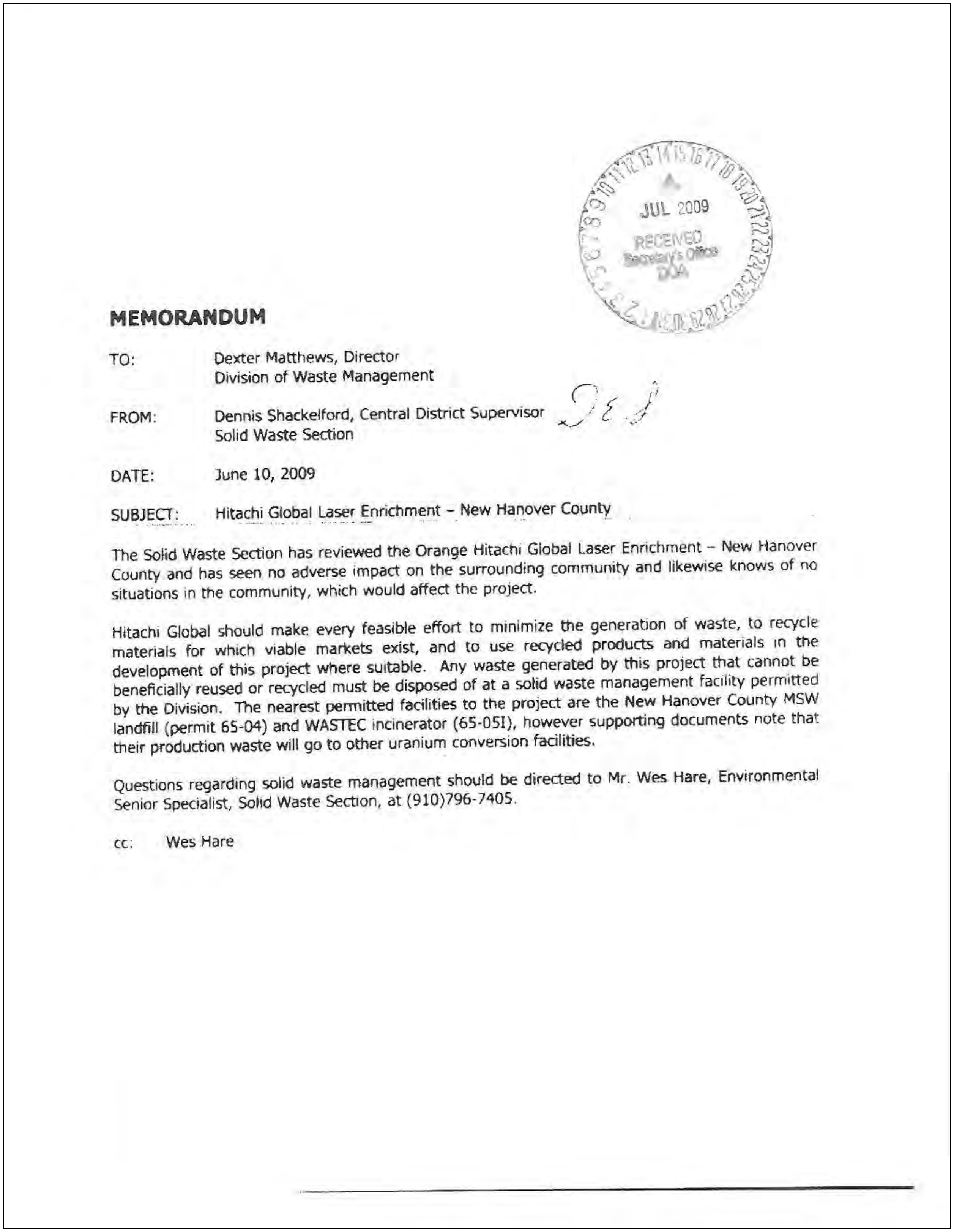


JUL 2009
RECEIVED
Secretary's Office
DOA

MEMORANDUM

TO: Dexter Matthews, Director
Division of Waste Management

FROM: Dennis Shackelford, Central District Supervisor
Solid Waste Section

DATE: June 10, 2009

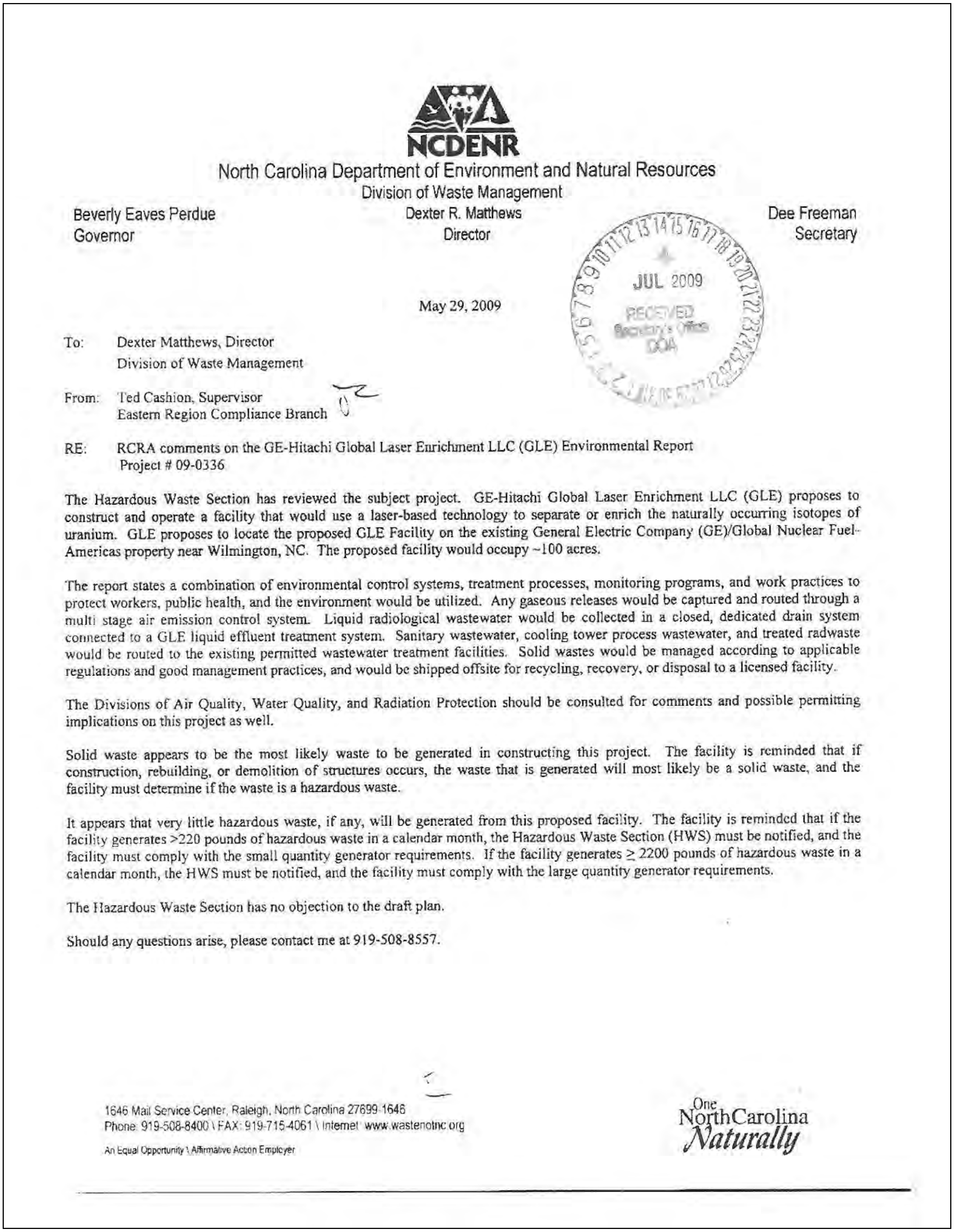
SUBJECT: Hitachi Global Laser Enrichment – New Hanover County

The Solid Waste Section has reviewed the Orange Hitachi Global Laser Enrichment – New Hanover County and has seen no adverse impact on the surrounding community and likewise knows of no situations in the community, which would affect the project.

Hitachi Global should make every feasible effort to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable. Any waste generated by this project that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility permitted by the Division. The nearest permitted facilities to the project are the New Hanover County MSW landfill (permit 65-04) and WASTEC incinerator (65-05I), however supporting documents note that their production waste will go to other uranium conversion facilities.

Questions regarding solid waste management should be directed to Mr. Wes Hare, Environmental Senior Specialist, Solid Waste Section, at (910)796-7405.

cc: Wes Hare



NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

JUL 2009
RECEIVED
Secretary's Office
DOA

May 29, 2009

To: Dexter Matthews, Director
Division of Waste Management

From: Ted Cashion, Supervisor
Eastern Region Compliance Branch

RE: RCRA comments on the GE-Hitachi Global Laser Enrichment LLC (GLE) Environmental Report
Project # 09-0336

The Hazardous Waste Section has reviewed the subject project. GE-Hitachi Global Laser Enrichment LLC (GLE) proposes 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 property near Wilmington, NC. The proposed facility would occupy ~100 acres.

The report states a combination of environmental control systems, treatment processes, monitoring programs, and work practices to protect workers, public health, and the environment would be utilized. Any gaseous releases would be captured and routed through a multi stage air emission control system. 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 to the existing permitted wastewater treatment facilities. Solid wastes would be managed according to applicable regulations and good management practices, and would be shipped offsite for recycling, recovery, or disposal to a licensed facility.

The Divisions of Air Quality, Water Quality, and Radiation Protection should be consulted for comments and possible permitting implications on this project as well.

Solid waste appears to be the most likely waste to be generated in constructing this project. The facility is reminded that if construction, rebuilding, or demolition of structures occurs, the waste that is generated will most likely be a solid waste, and the facility must determine if the waste is a hazardous waste.

It appears that very little hazardous waste, if any, will be generated from this proposed facility. The facility is reminded that if the facility generates >220 pounds of hazardous waste in a calendar month, the Hazardous Waste Section (HWS) must be notified, and the facility must comply with the small quantity generator requirements. If the facility generates ≥ 2200 pounds of hazardous waste in a calendar month, the HWS must be notified, and the facility must comply with the large quantity generator requirements.

The Hazardous Waste Section has no objection to the draft plan.

Should any questions arise, please contact me at 919-508-8557.

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-715-4061 \ Internet: www.wastenotnc.org
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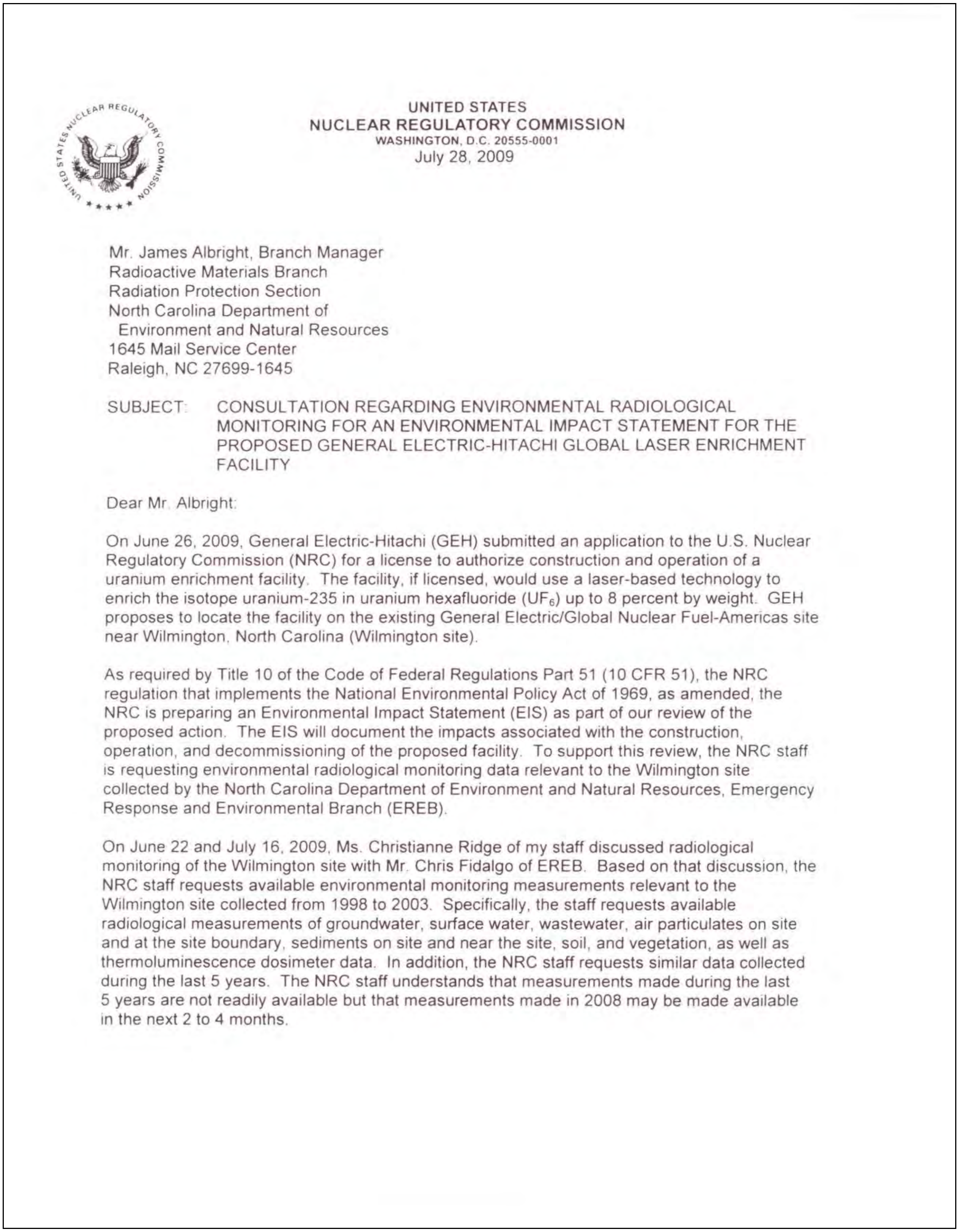


UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 28, 2009

Mr. James Albright, Branch Manager
Radioactive Materials Branch
Radiation Protection Section
North Carolina Department of
Environment and Natural Resources
1645 Mail Service Center
Raleigh, NC 27699-1645

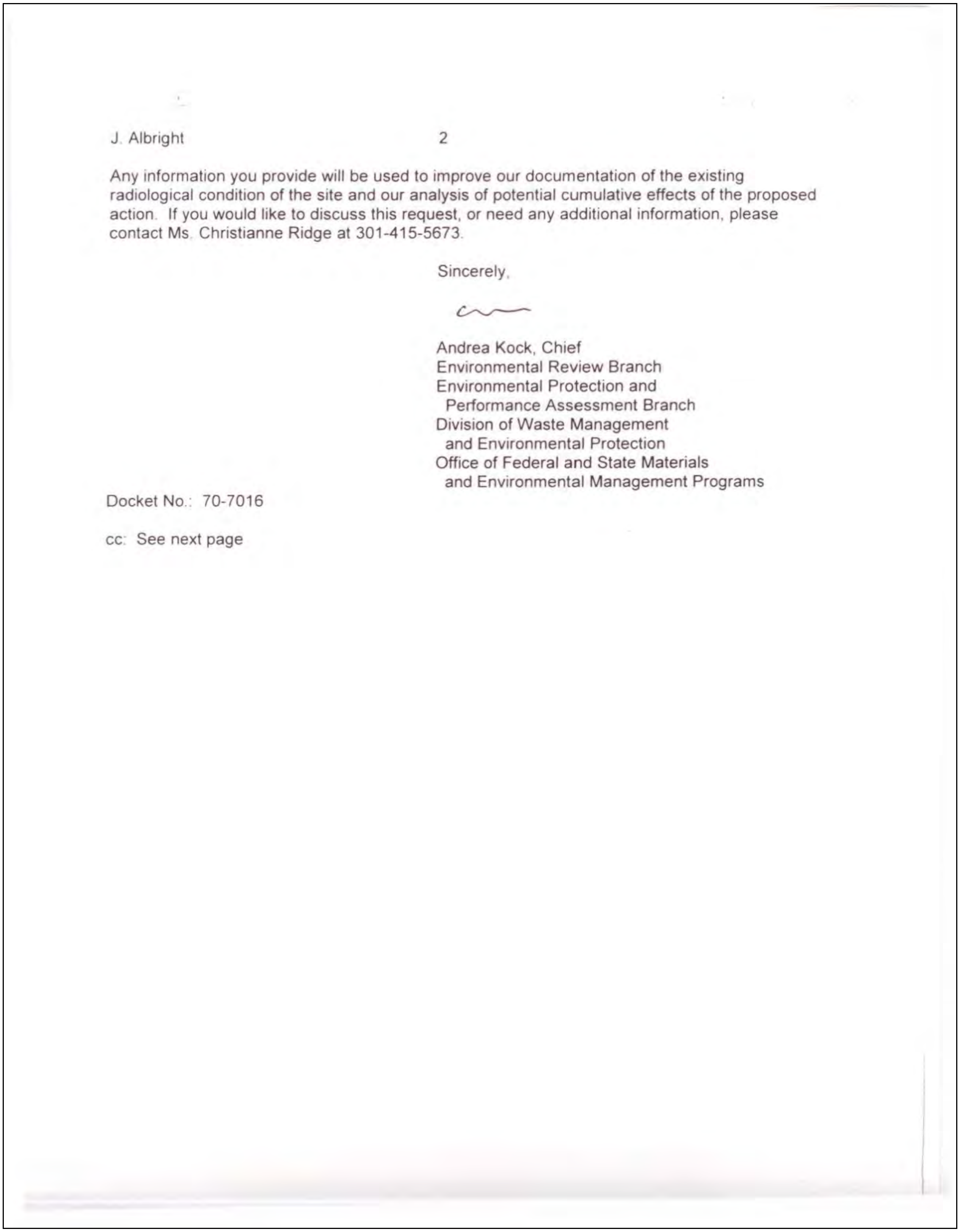
SUBJECT: CONSULTATION REGARDING ENVIRONMENTAL RADIOLOGICAL MONITORING FOR AN ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY

Dear Mr. Albright:

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, North Carolina (Wilmington site).

As required by Title 10 of the 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) as part of our review of the proposed action. The EIS will document the impacts associated with the construction, operation, and decommissioning of the proposed facility. To support this review, the NRC staff is requesting environmental radiological monitoring data relevant to the Wilmington site collected by the North Carolina Department of Environment and Natural Resources, Emergency Response and Environmental Branch (EREB).

On June 22 and July 16, 2009, Ms. Christianne Ridge of my staff discussed radiological monitoring of the Wilmington site with Mr. Chris Fidalgo of EREB. Based on that discussion, the NRC staff requests available environmental monitoring measurements relevant to the Wilmington site collected from 1998 to 2003. Specifically, the staff requests available radiological measurements of groundwater, surface water, wastewater, air particulates on site and at the site boundary, sediments on site and near the site, soil, and vegetation, as well as thermoluminescence dosimeter data. In addition, the NRC staff requests similar data collected during the last 5 years. The NRC staff understands that measurements made during the last 5 years are not readily available but that measurements made in 2008 may be made available in the next 2 to 4 months.



J. Albright 2

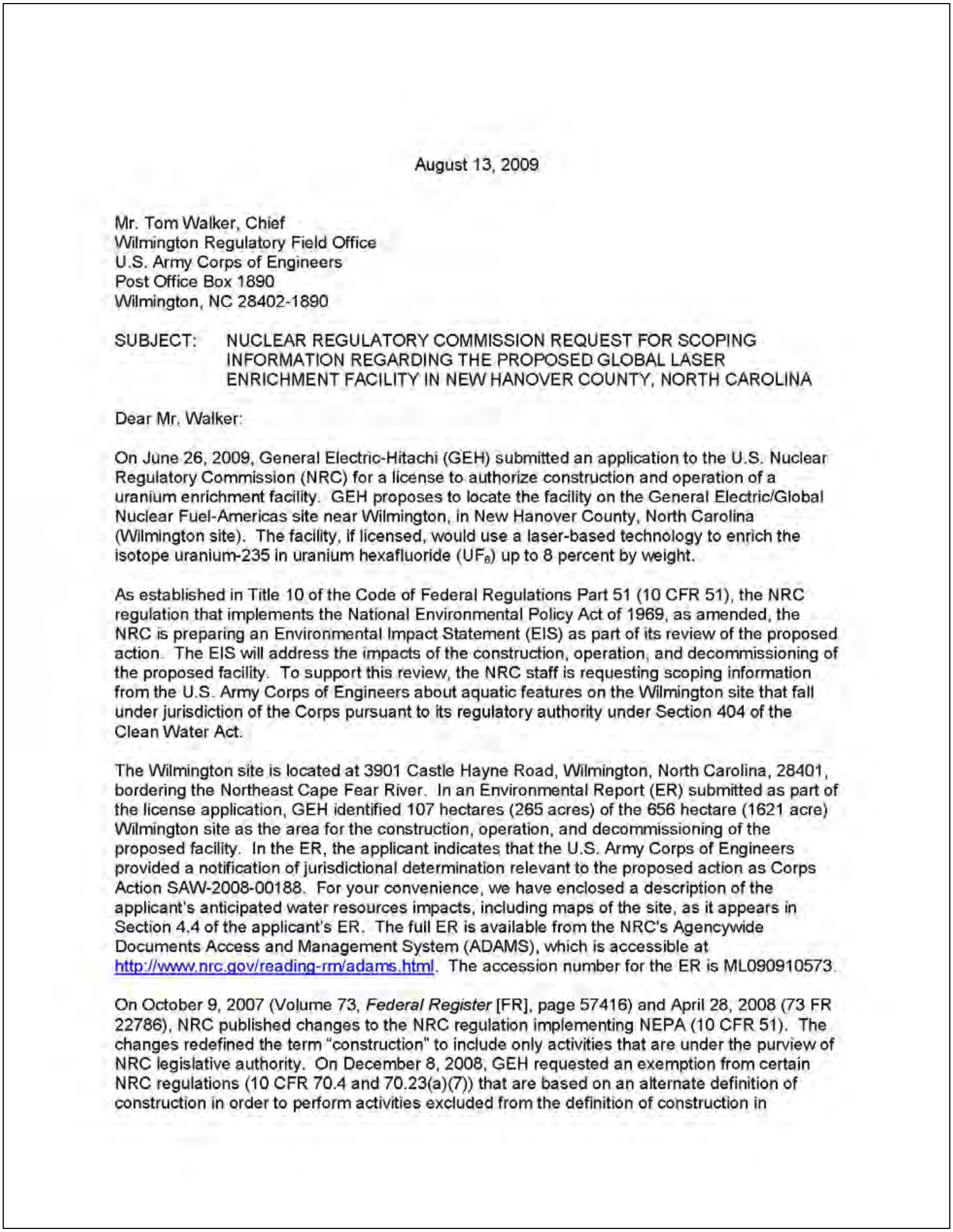
Any information you provide will be used to improve our documentation of the existing radiological condition of the site and our analysis of potential cumulative effects of the proposed action. If you would like to discuss this request, or need any additional information, please contact Ms. Christianne Ridge at 301-415-5673.

Sincerely,

Andrea Kock, Chief
Environmental Review Branch
Environmental Protection and
Performance Assessment Branch
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 70-7016

cc: See next page



August 13, 2009

Mr. Tom Walker, Chief
Wilmington Regulatory Field Office
U.S. Army Corps of Engineers
Post Office Box 1890
Wilmington, NC 28402-1890

SUBJECT: NUCLEAR REGULATORY COMMISSION REQUEST FOR SCOPING INFORMATION REGARDING THE PROPOSED GLOBAL LASER ENRICHMENT FACILITY IN NEW HANOVER COUNTY, NORTH CAROLINA

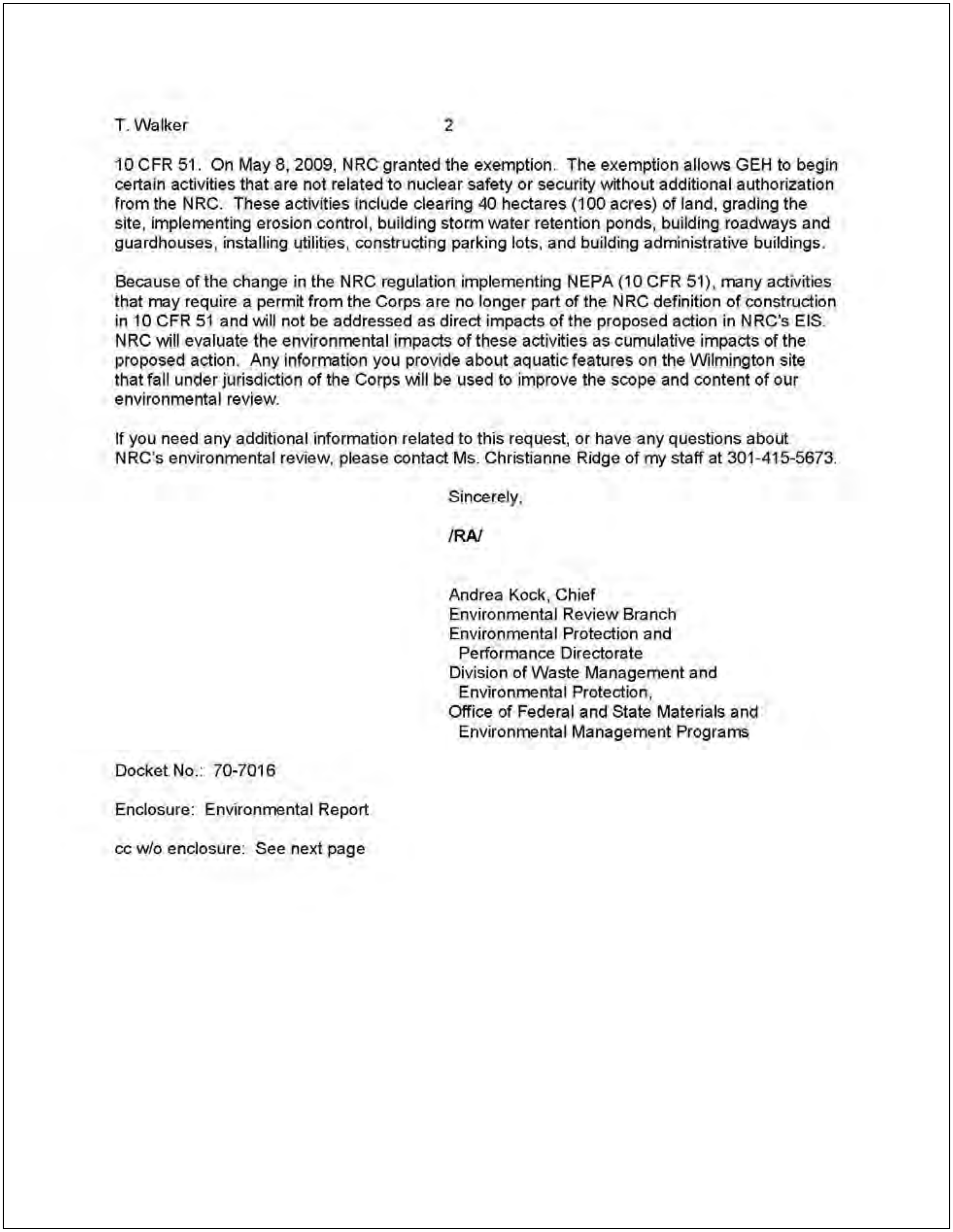
Dear Mr. Walker:

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. GEH proposes to locate the facility on the General Electric/Global Nuclear Fuel-Americas site near Wilmington, in New Hanover County, North Carolina (Wilmington site). 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.

As established in Title 10 of the 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) as part of its review of the proposed action. The EIS will address the impacts of the construction, operation, and decommissioning of the proposed facility. To support this review, the NRC staff is requesting scoping information from the U.S. Army Corps of Engineers about aquatic features on the Wilmington site that fall under jurisdiction of the Corps pursuant to its regulatory authority under Section 404 of the Clean Water Act.

The Wilmington site is located at 3901 Castle Hayne Road, Wilmington, North Carolina, 28401, bordering the Northeast Cape Fear River. In an Environmental Report (ER) submitted as part of the license application, GEH identified 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. In the ER, the applicant indicates that the U.S. Army Corps of Engineers provided a notification of jurisdictional determination relevant to the proposed action as Corps Action SAW-2008-00188. For your convenience, we have enclosed a description of the applicant's anticipated water resources impacts, including maps of the site, as it appears in Section 4.4 of the applicant's ER. The full ER is available from the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible at http://www.nrc.gov/reading-rm/adams.html. The accession number for the ER is ML090910573.

On October 9, 2007 (Volume 73, *Federal Register* [FR], page 57416) and April 28, 2008 (73 FR 22786), NRC published changes to the NRC regulation implementing NEPA (10 CFR 51). The changes redefined the term "construction" to include only activities that are under the purview of NRC legislative authority. On December 8, 2008, GEH requested an exemption from certain NRC regulations (10 CFR 70.4 and 70.23(a)(7)) that are based on an alternate definition of construction in order to perform activities excluded from the definition of construction in



10 CFR 51. On May 8, 2009, NRC granted the exemption. The exemption allows GEH to begin certain activities that are not related to nuclear safety or security without additional authorization from the NRC. These activities include clearing 40 hectares (100 acres) of land, grading the site, implementing erosion control, building storm water retention ponds, building roadways and guardhouses, installing utilities, constructing parking lots, and building administrative buildings.

Because of the change in the NRC regulation implementing NEPA (10 CFR 51), many activities that may require a permit from the Corps are no longer part of the NRC definition of construction in 10 CFR 51 and will not be addressed as direct impacts of the proposed action in NRC's EIS. NRC will evaluate the environmental impacts of these activities as cumulative impacts of the proposed action. Any information you provide about aquatic features on the Wilmington site that fall under jurisdiction of the Corps will be used to improve the scope and content of our environmental review.

If you need any additional information related to this request, or have any questions about NRC's environmental review, please contact Ms. Christianne Ridge of my staff at 301-415-5673.

Sincerely,

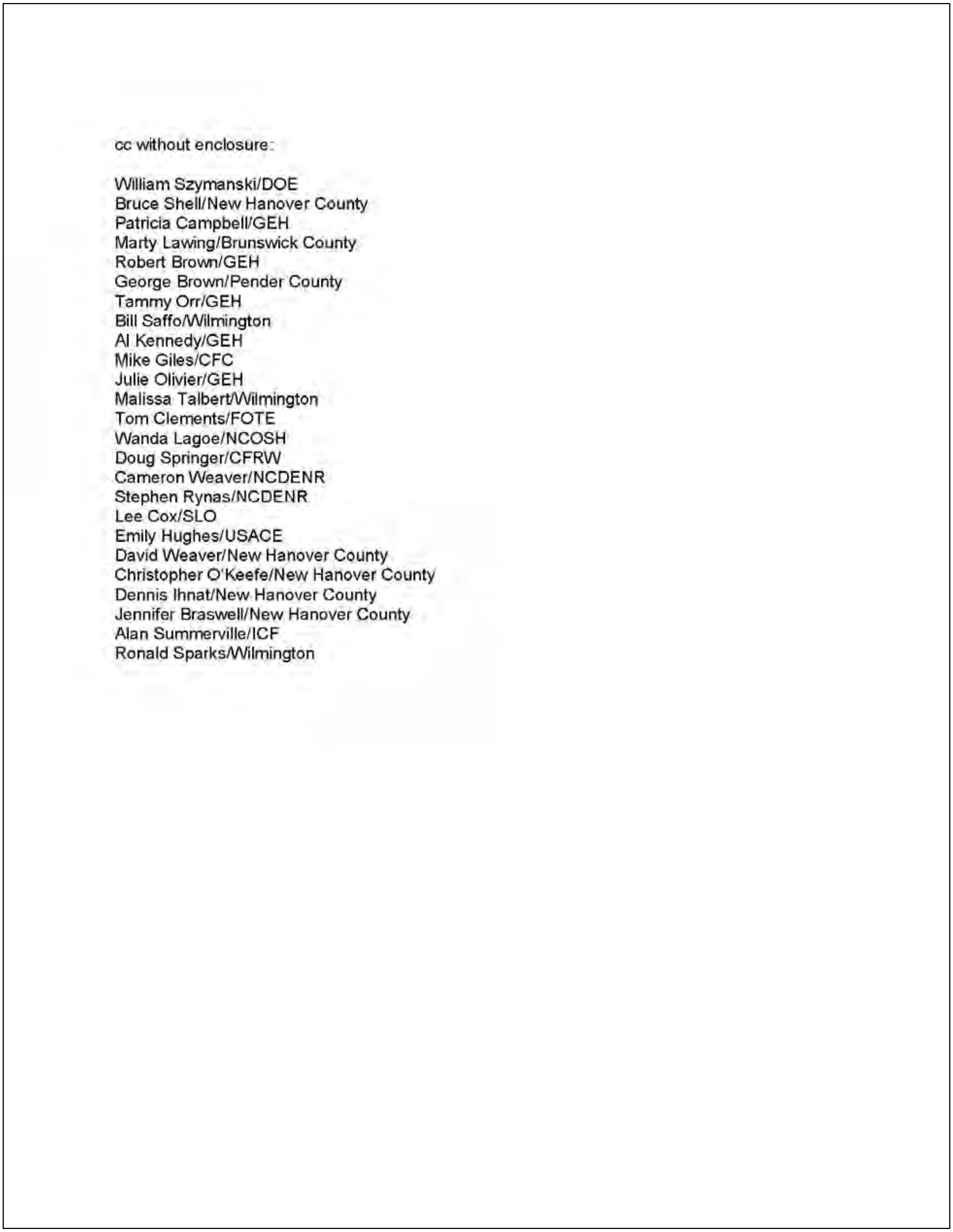
/RA/

Andrea Kock, Chief
Environmental Review Branch
Environmental Protection and
Performance Directorate
Division of Waste Management and
Environmental Protection,
Office of Federal and State Materials and
Environmental Management Programs

Docket No.: 70-7016

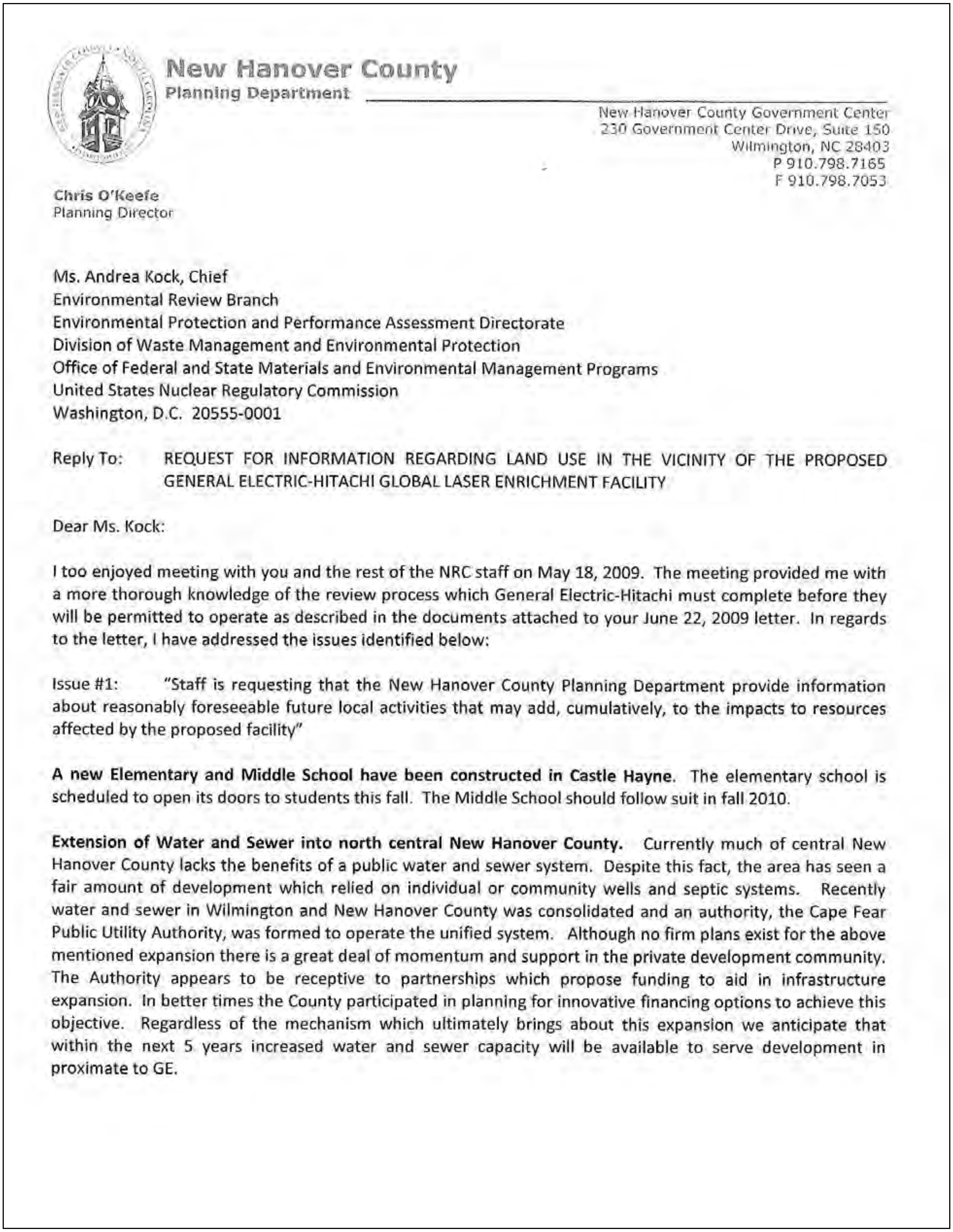
Enclosure: Environmental Report

cc w/o enclosure: See next page



cc without enclosure:

William Szymanski/DOE
Bruce Shell/New Hanover County
Patricia Campbell/GEH
Marty Lawing/Brunswick County
Robert Brown/GEH
George Brown/Pender County
Tammy Orr/GEH
Bill Saffo/Wilmington
Al Kennedy/GEH
Mike Giles/CFC
Julie Olivier/GEH
Malissa Talbert/Wilmington
Tom Clements/FOTE
Wanda Lagoe/NCOSH
Doug Springer/CFRW
Cameron Weaver/NCDENR
Stephen Rynas/NCDENR
Lee Cox/SLO
Emily Hughes/USACE
David Weaver/New Hanover County
Christopher O'Keefe/New Hanover County
Dennis Ihnat/New Hanover County
Jennifer Braswell/New Hanover County
Alan Summerville/ICF
Ronald Sparks/Wilmington



New Hanover County
Planning Department

New Hanover County Government Center
230 Government Center Drive, Suite 150
Wilmington, NC 28403
P 910.798.7165
F 910.798.7053

Chris O'Keefe
Planning Director

Ms. Andrea Kock, Chief
Environmental Review Branch
Environmental Protection and Performance Assessment Directorate
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Reply To: REQUEST FOR INFORMATION REGARDING LAND USE IN THE VICINITY OF THE PROPOSED GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT FACILITY

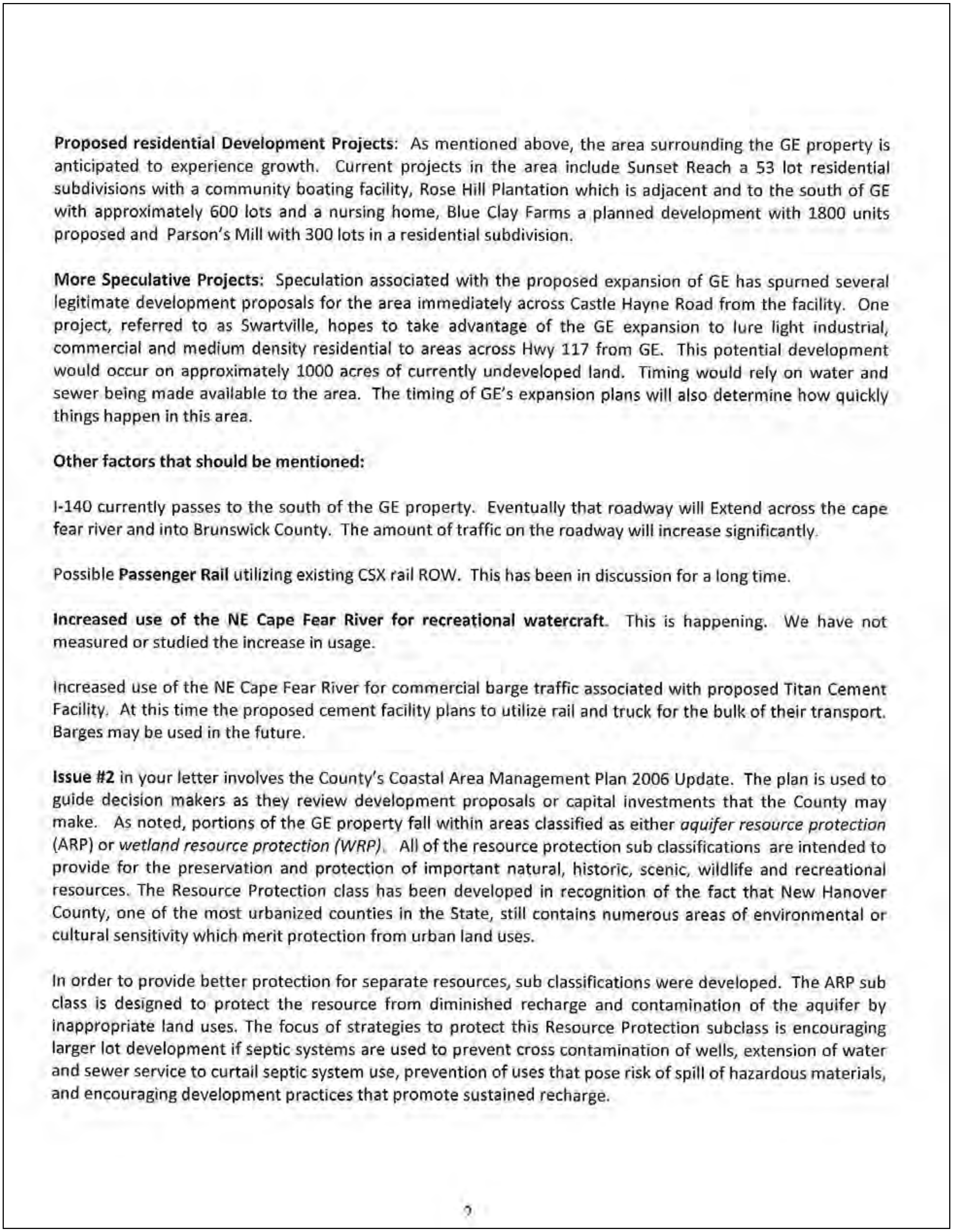
Dear Ms. Kock:

I too enjoyed meeting with you and the rest of the NRC staff on May 18, 2009. The meeting provided me with a more thorough knowledge of the review process which General Electric-Hitachi must complete before they will be permitted to operate as described in the documents attached to your June 22, 2009 letter. In regards to the letter, I have addressed the issues identified below:

Issue #1: "Staff is requesting that the New Hanover County Planning Department provide information about reasonably foreseeable future local activities that may add, cumulatively, to the impacts to resources affected by the proposed facility"

A new Elementary and Middle School have been constructed in Castle Hayne. The elementary school is scheduled to open its doors to students this fall. The Middle School should follow suit in fall 2010.

Extension of Water and Sewer into north central New Hanover County. Currently much of central New Hanover County lacks the benefits of a public water and sewer system. Despite this fact, the area has seen a fair amount of development which relied on individual or community wells and septic systems. Recently water and sewer in Wilmington and New Hanover County was consolidated and an authority, the Cape Fear Public Utility Authority, was formed to operate the unified system. Although no firm plans exist for the above mentioned expansion there is a great deal of momentum and support in the private development community. The Authority appears to be receptive to partnerships which propose funding to aid in infrastructure expansion. In better times the County participated in planning for innovative financing options to achieve this objective. Regardless of the mechanism which ultimately brings about this expansion we anticipate that within the next 5 years increased water and sewer capacity will be available to serve development in proximate to GE.



Proposed residential Development Projects: As mentioned above, the area surrounding the GE property is anticipated to experience growth. Current projects in the area include Sunset Reach a 53 lot residential subdivisions with a community boating facility, Rose Hill Plantation which is adjacent and to the south of GE with approximately 600 lots and a nursing home, Blue Clay Farms a planned development with 1800 units proposed and Parson's Mill with 300 lots in a residential subdivision.

More Speculative Projects: Speculation associated with the proposed expansion of GE has spurned several legitimate development proposals for the area immediately across Castle Hayne Road from the facility. One project, referred to as Swartville, hopes to take advantage of the GE expansion to lure light industrial, commercial and medium density residential to areas across Hwy 117 from GE. This potential development would occur on approximately 1000 acres of currently undeveloped land. Timing would rely on water and sewer being made available to the area. The timing of GE's expansion plans will also determine how quickly things happen in this area.

Other factors that should be mentioned:

I-140 currently passes to the south of the GE property. Eventually that roadway will Extend across the cape fear river and into Brunswick County. The amount of traffic on the roadway will increase significantly.

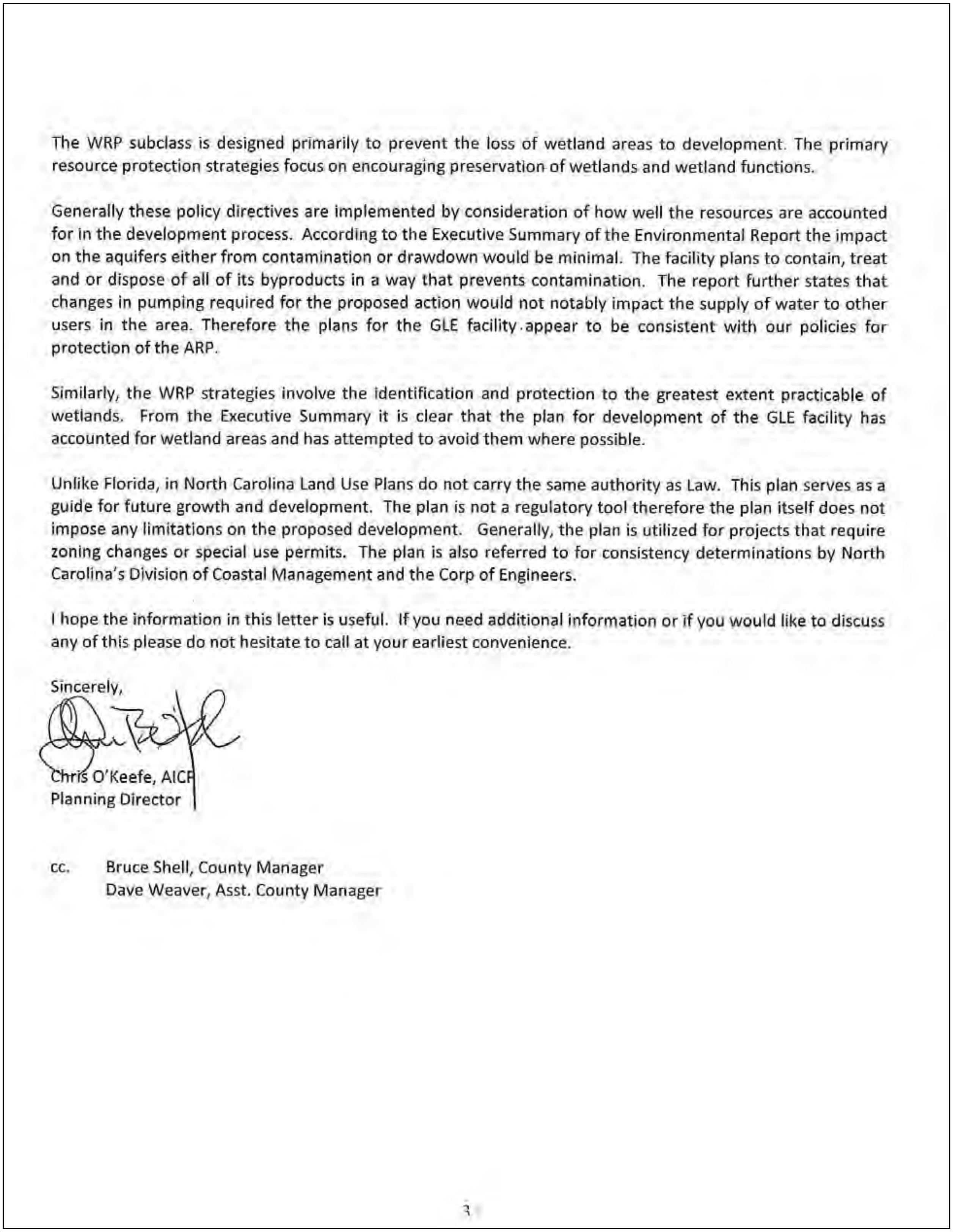
Possible **Passenger Rail** utilizing existing CSX rail ROW. This has been in discussion for a long time.

Increased use of the NE Cape Fear River for recreational watercraft. This is happening. We have not measured or studied the increase in usage.

Increased use of the NE Cape Fear River for commercial barge traffic associated with proposed Titan Cement Facility. At this time the proposed cement facility plans to utilize rail and truck for the bulk of their transport. Barges may be used in the future.

Issue #2 in your letter involves the County's Coastal Area Management Plan 2006 Update. The plan is used to guide decision makers as they review development proposals or capital investments that the County may make. As noted, portions of the GE property fall within areas classified as either *aquifer resource protection* (ARP) or *wetland resource protection (WRP)*. All of the resource protection sub classifications are intended to provide for the preservation and protection of important natural, historic, scenic, wildlife and recreational resources. The Resource Protection class has been developed in recognition of the fact that New Hanover County, one of the most urbanized counties in the State, still contains numerous areas of environmental or cultural sensitivity which merit protection from urban land uses.

In order to provide better protection for separate resources, sub classifications were developed. The ARP sub class is designed to protect the resource from diminished recharge and contamination of the aquifer by inappropriate land uses. The focus of strategies to protect this Resource Protection subclass is encouraging larger lot development if septic systems are used to prevent cross contamination of wells, extension of water and sewer service to curtail septic system use, prevention of uses that pose risk of spill of hazardous materials, and encouraging development practices that promote sustained recharge.



The WRP subclass is designed primarily to prevent the loss of wetland areas to development. The primary resource protection strategies focus on encouraging preservation of wetlands and wetland functions.

Generally these policy directives are implemented by consideration of how well the resources are accounted for in the development process. According to the Executive Summary of the Environmental Report the impact on the aquifers either from contamination or drawdown would be minimal. The facility plans to contain, treat and or dispose of all of its byproducts in a way that prevents contamination. The report further states that changes in pumping required for the proposed action would not notably impact the supply of water to other users in the area. Therefore the plans for the GLE facility appear to be consistent with our policies for protection of the ARP.

Similarly, the WRP strategies involve the identification and protection to the greatest extent practicable of wetlands. From the Executive Summary it is clear that the plan for development of the GLE facility has accounted for wetland areas and has attempted to avoid them where possible.

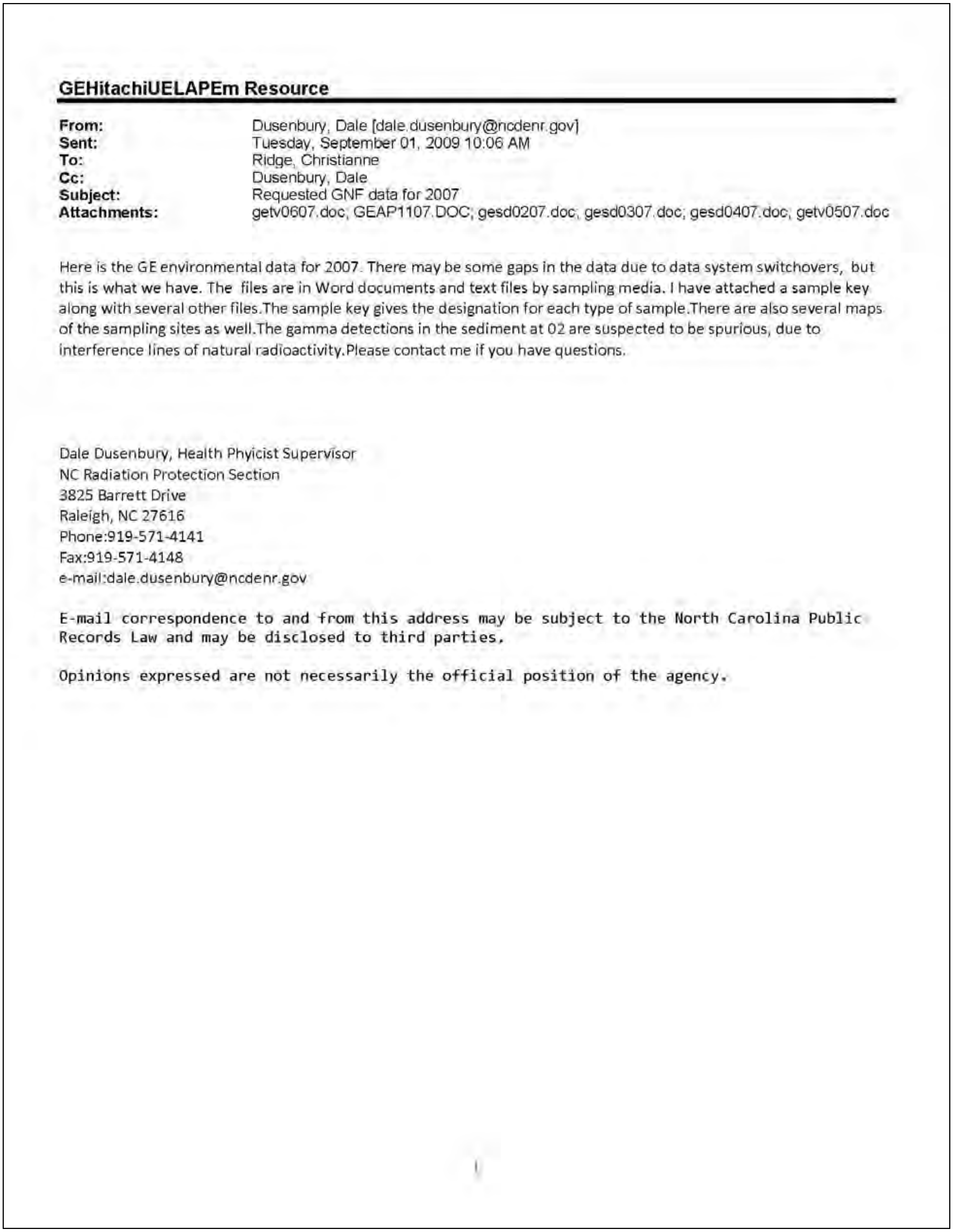
Unlike Florida, in North Carolina Land Use Plans do not carry the same authority as Law. This plan serves as a guide for future growth and development. The plan is not a regulatory tool therefore the plan itself does not impose any limitations on the proposed development. Generally, the plan is utilized for projects that require zoning changes or special use permits. The plan is also referred to for consistency determinations by North Carolina's Division of Coastal Management and the Corp of Engineers.

I hope the information in this letter is useful. If you need additional information or if you would like to discuss any of this please do not hesitate to call at your earliest convenience.

Sincerely,

Chris O'Keefe, AICP
Planning Director

cc. Bruce Shell, County Manager
Dave Weaver, Asst. County Manager

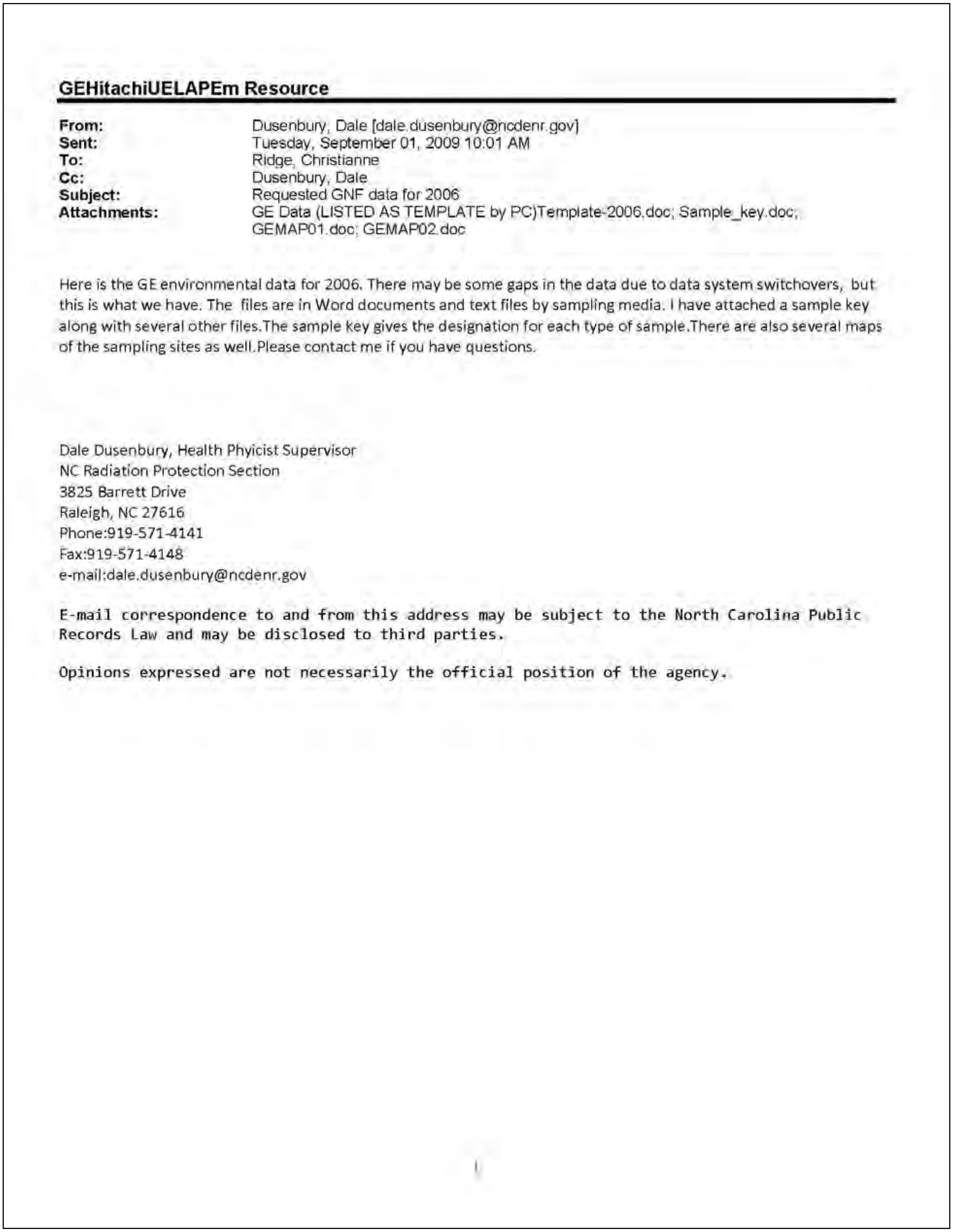


GEHitachiUELAPEm Resource

From:	Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent:	Tuesday, September 01, 2009 10:06 AM
To:	Ridge, Christianne
Cc:	Dusenbury, Dale
Subject:	Requested GNF data for 2007
Attachments:	getv0607.doc; GEAP1107.DOC; gesd0207.doc; gesd0307.doc; gesd0407.doc; getv0507.doc

Here is the GE environmental data for 2007. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.The gamma detections in the sediment at 02 are suspected to be spurious, due to interference lines of natural radioactivity.Please contact me if you have questions.

Dale Dusenbury, Health Phyicist Supervisor
NC Radiation Protection Section
3825 Barrett Drive
Raleigh, NC 27616
Phone:919-571-4141
Fax:919-571-4148
e-mail:dale.dusenbury@ncdenr.gov



GEHitachiUELAPEm Resource

From:	Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent:	Tuesday, September 01, 2009 10:01 AM
To:	Ridge, Christianne
Cc:	Dusenbury, Dale
Subject:	Requested GNF data for 2006
Attachments:	GE Data (LISTED AS TEMPLATE by PC)Template-2006.doc; Sample_key.doc; GEMAP01.doc; GEMAP02.doc

Here is the GE environmental data for 2006. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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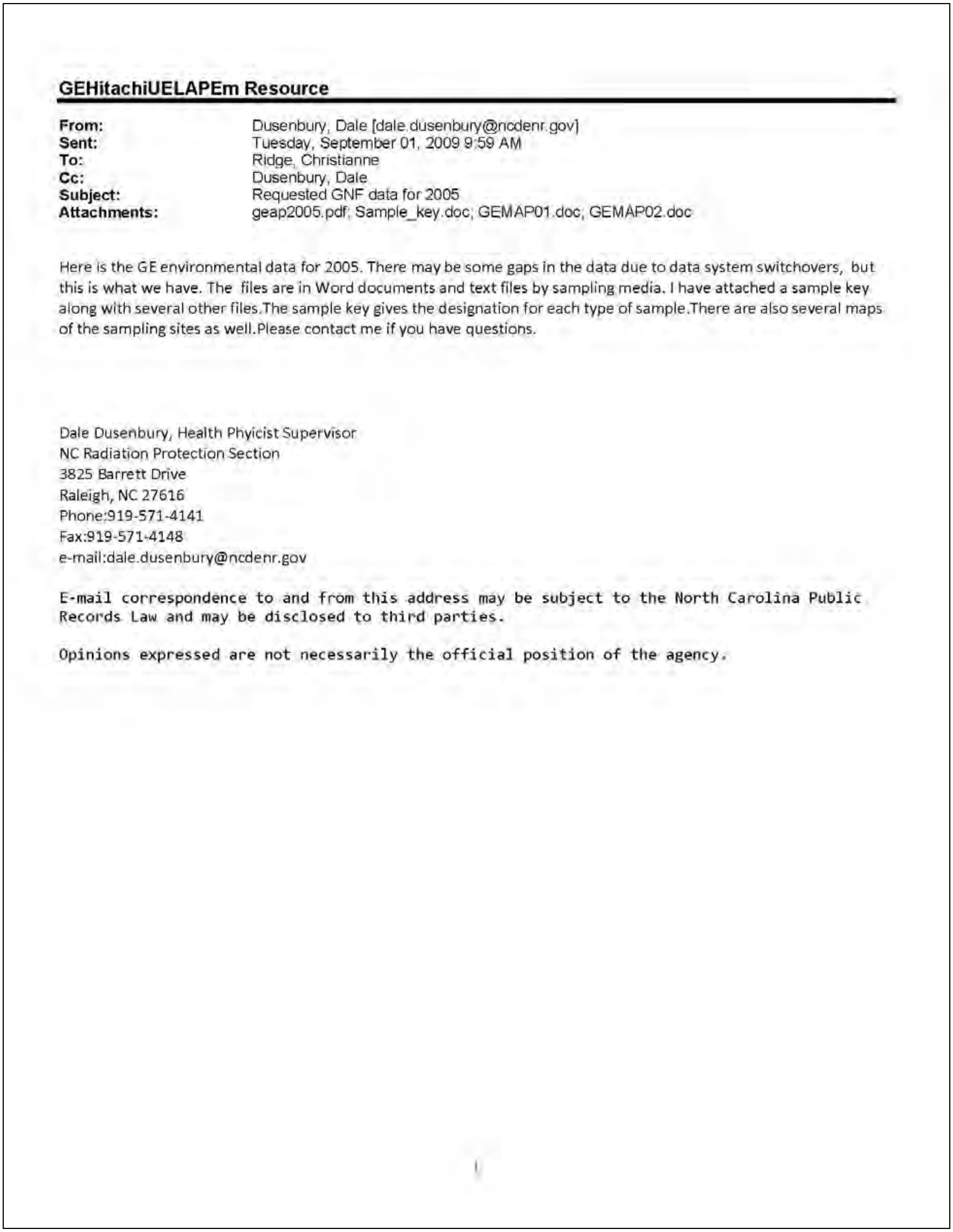

GEHitachiUELAPEm Resource

From: Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent: Tuesday, September 01, 2009 9:59 AM
To: Ridge, Christianne
Cc: Dusenbury, Dale
Subject: Requested GNF data for 2005
Attachments: geap2005.pdf; Sample_key.doc; GEMAP01.doc; GEMAP02.doc

Here is the GE environmental data for 2005. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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Fax:919-571-4148
e-mail:dale.dusenbury@ncdenr.gov

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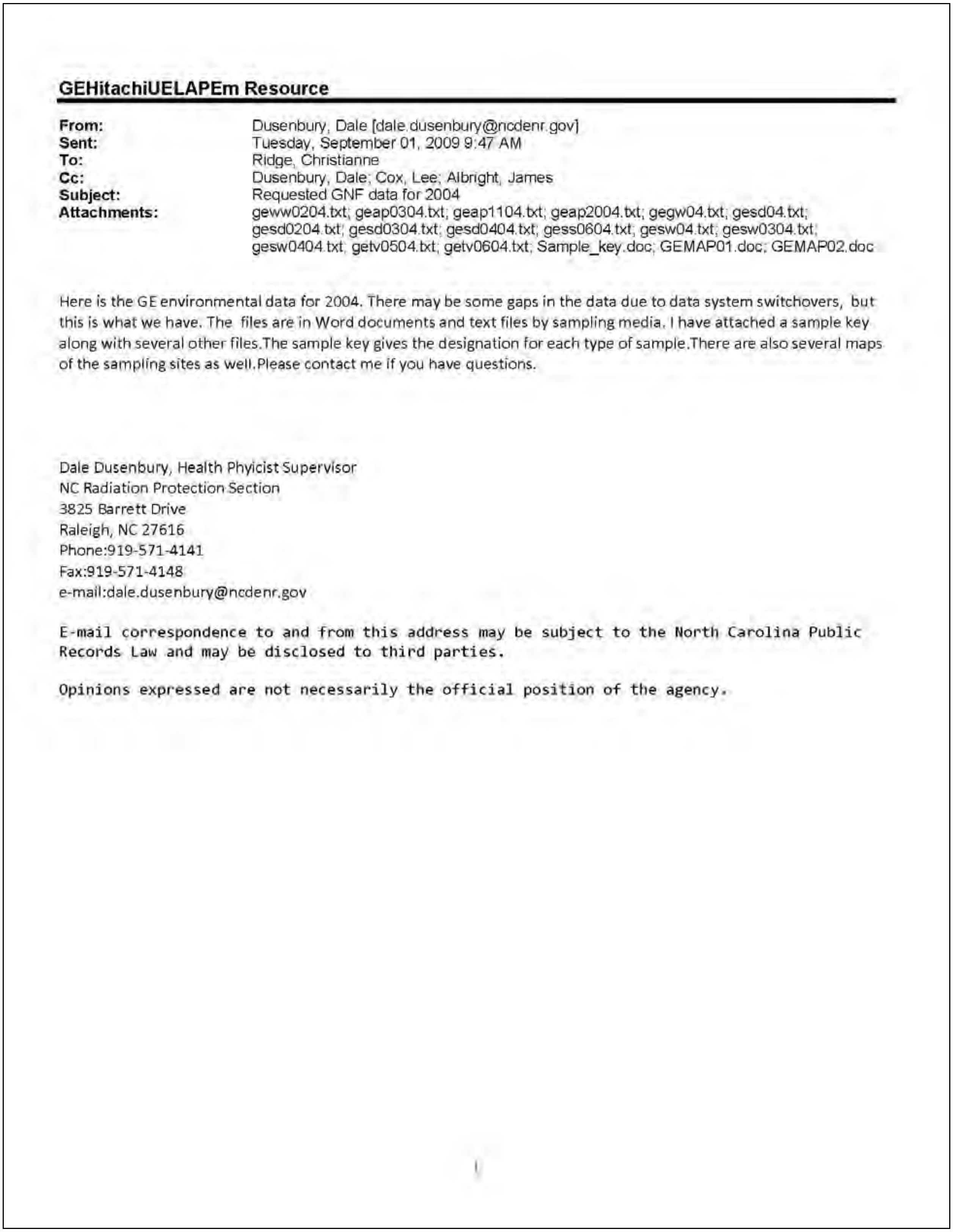

GEHitachiUELAPEm Resource

From: Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent: Tuesday, September 01, 2009 9:47 AM
To: Ridge, Christianne
Cc: Dusenbury, Dale; Cox, Lee; Albright, James
Subject: Requested GNF data for 2004
Attachments: geww0204.txt; geap0304.txt; geap1104.txt; geap2004.txt; gegw04.txt; gesd04.txt; gesd0204.txt; gesd0304.txt; gesd0404.txt; gess0604.txt; gesw04.txt; gesw0304.txt; gesw0404.txt; getv0504.txt; getv0604.txt; Sample_key.doc; GEMAP01.doc; GEMAP02.doc

Here is the GE environmental data for 2004. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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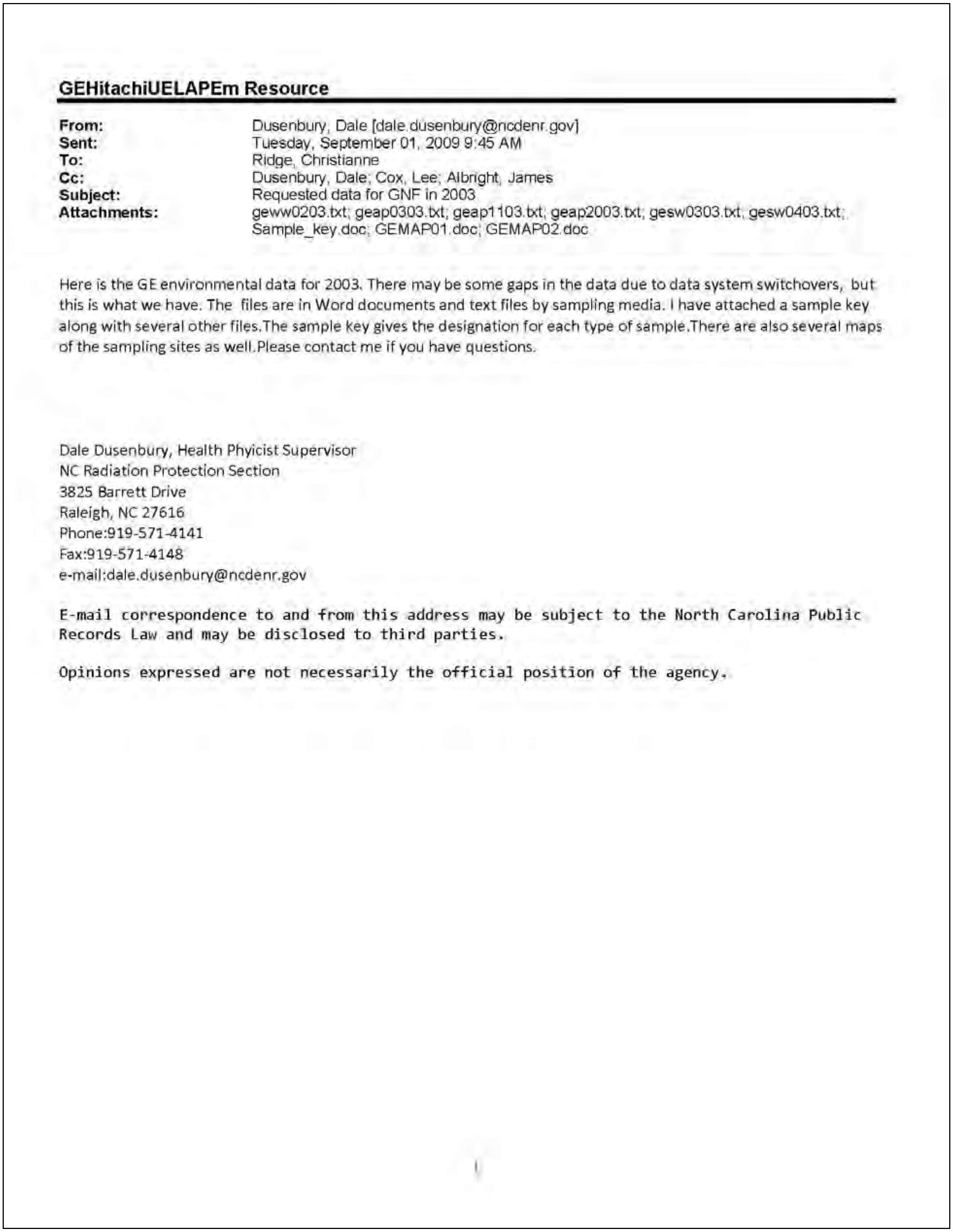

GEHitachiUELAPEm Resource

From: Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent: Tuesday, September 01, 2009 9:45 AM
To: Ridge, Christianne
Cc: Dusenbury, Dale; Cox, Lee; Albright, James
Subject: Requested data for GNF in 2003
Attachments: geww0203.txt; geap0303.txt; geap1103.txt; geap2003.txt; gesw0303.txt; gesw0403.txt; Sample_key.doc; GEMAP01.doc; GEMAP02.doc

Here is the GE environmental data for 2003. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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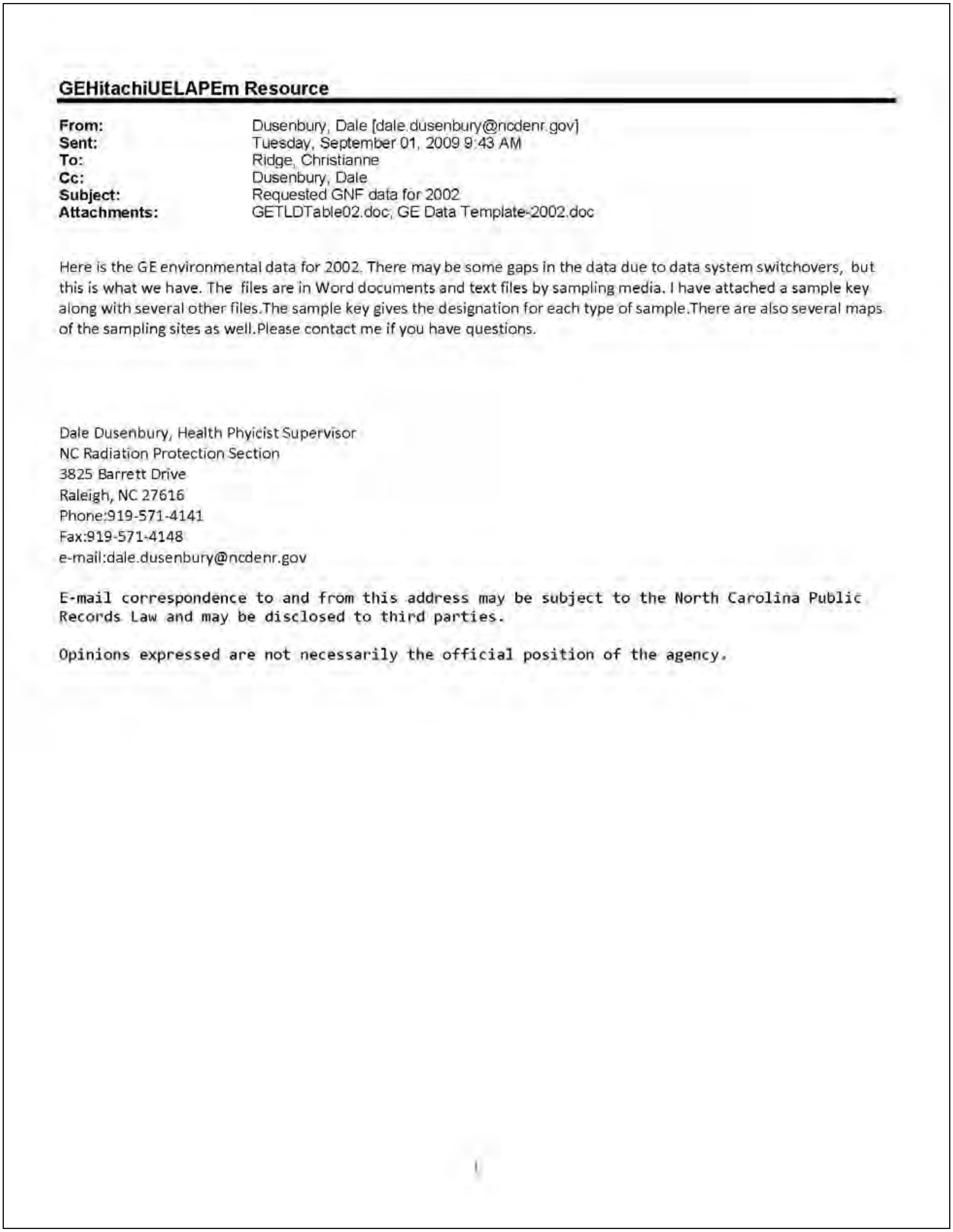

GEHitachiUELAPEm Resource

From:	Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent:	Tuesday, September 01, 2009 9:43 AM
To:	Ridge, Christianne
Cc:	Dusenbury, Dale
Subject:	Requested GNF data for 2002
Attachments:	GETLDTable02.doc; GE Data Template-2002.doc

Here is the GE environmental data for 2002. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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e-mail:dale.dusenbury@ncdenr.gov

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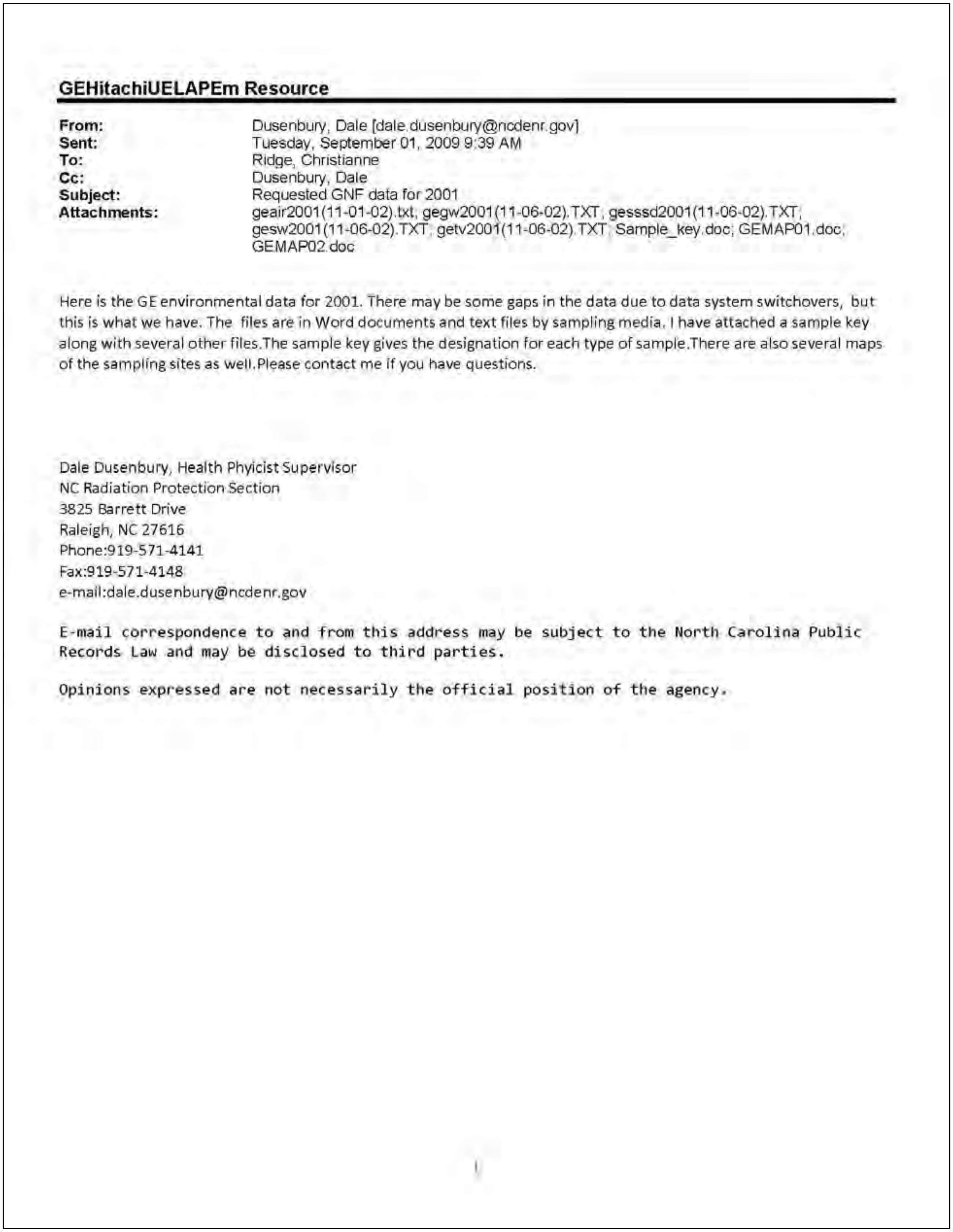

GEHitachiUELAPEm Resource

From: Dusenbury, Dale [dale.dusenbury@ncdenr.gov]
Sent: Tuesday, September 01, 2009 9:39 AM
To: Ridge, Christianne
Cc: Dusenbury, Dale
Subject: Requested GNF data for 2001
Attachments: geair2001(11-01-02).txt; gegw2001(11-06-02).TXT; gesssd2001(11-06-02).TXT; gesw2001(11-06-02).TXT; getv2001(11-06-02).TXT; Sample_key.doc; GEMAP01.doc; GEMAP02.doc

Here is the GE environmental data for 2001. There may be some gaps in the data due to data system switchovers, but this is what we have. The files are in Word documents and text files by sampling media. I have attached a sample key along with several other files.The sample key gives the designation for each type of sample.There are also several maps of the sampling sites as well.Please contact me if you have questions.

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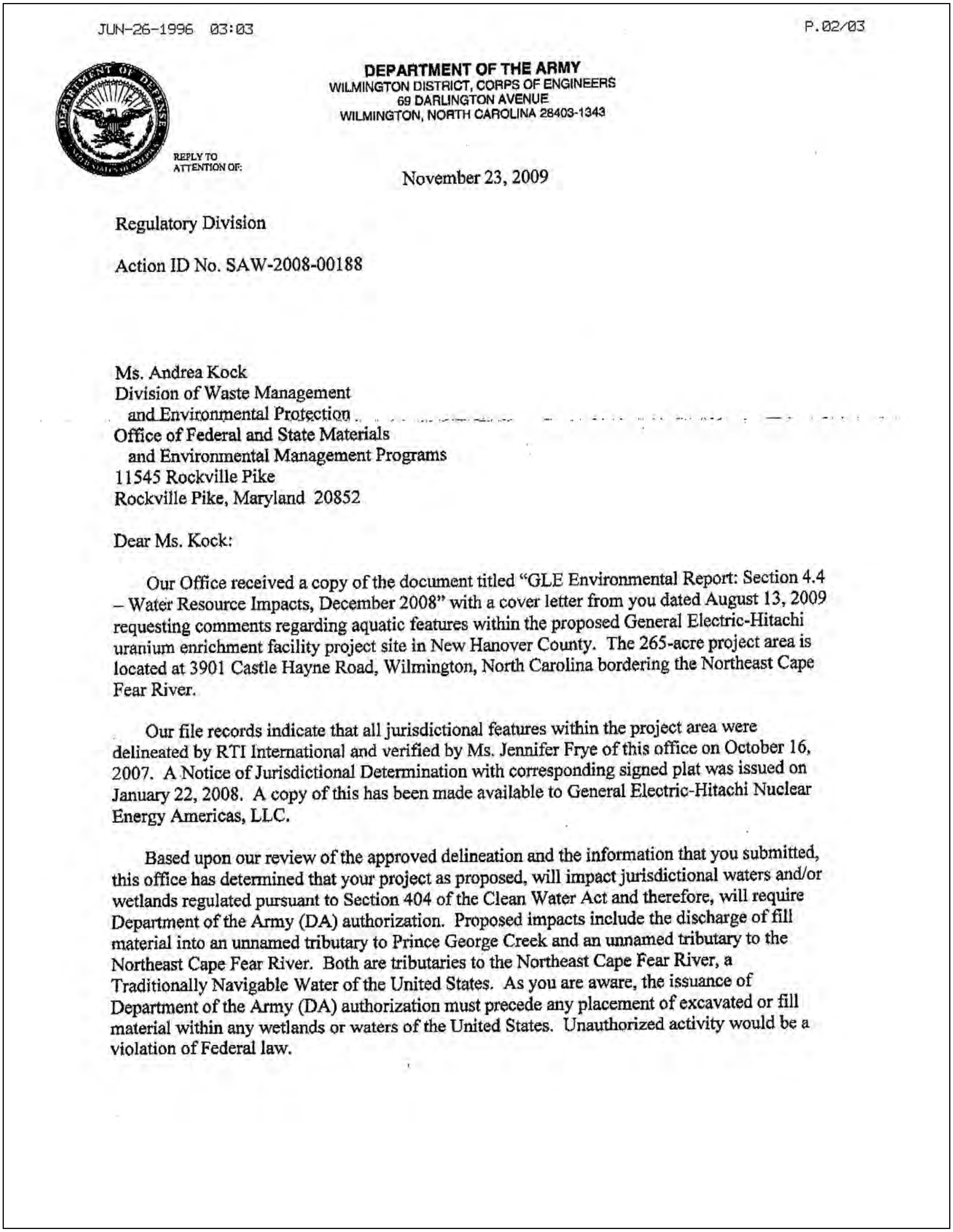
Fax:919-571-4148
e-mail:dale.dusenbury@ncdenr.gov

E-mail correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties.

Opinions expressed are not necessarily the official position of the agency.



JUN-26-1996 03:03 P.02/03

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

November 23, 2009

Regulatory Division

Action ID No. SAW-2008-00188

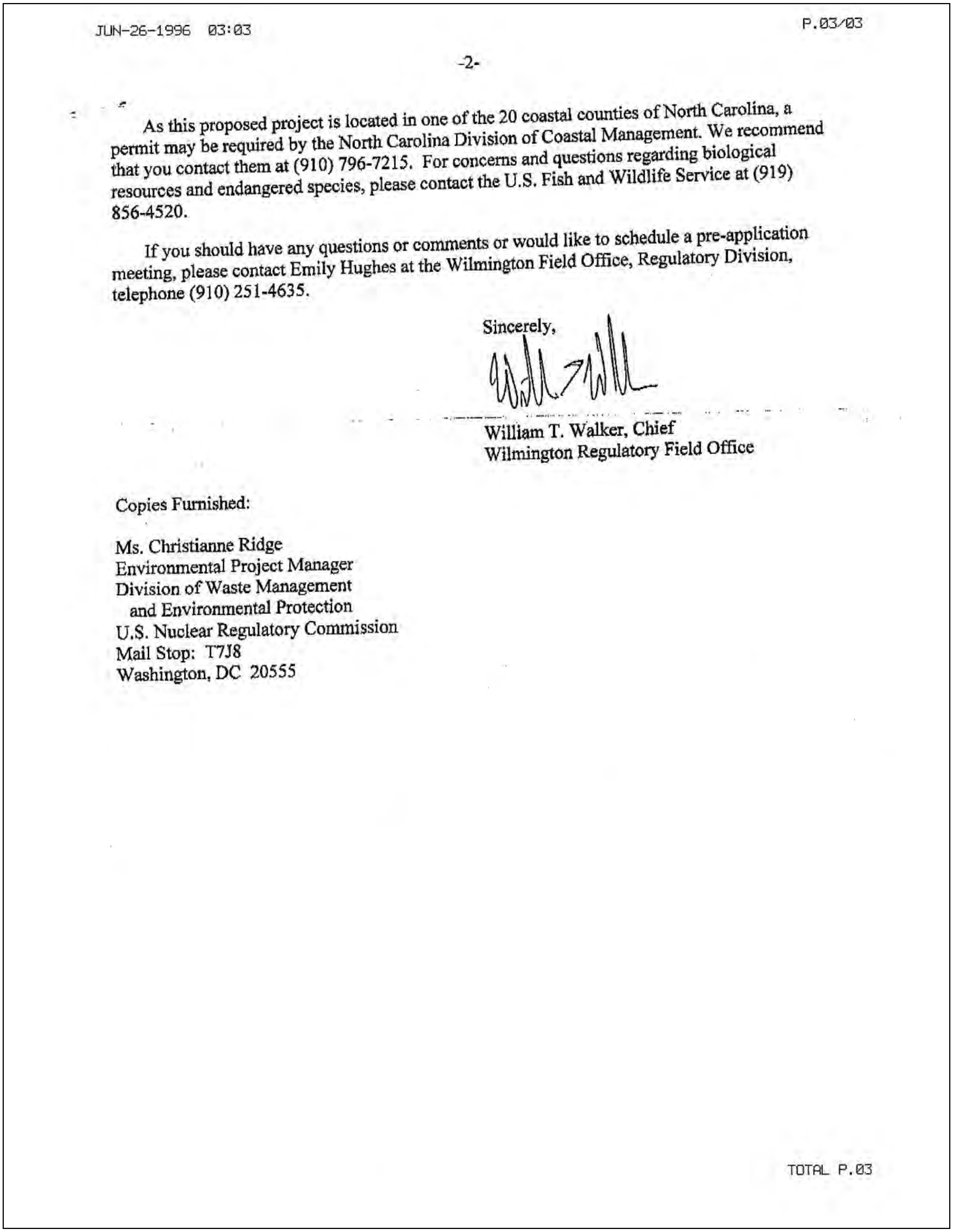
Ms. Andrea Kock
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs
11545 Rockville Pike
Rockville Pike, Maryland 20852

Dear Ms. Kock:

Our Office received a copy of the document titled "GLE Environmental Report: Section 4.4 – Water Resource Impacts, December 2008" with a cover letter from you dated August 13, 2009 requesting comments regarding aquatic features within the proposed General Electric-Hitachi uranium enrichment facility project site in New Hanover County. The 265-acre project area is located at 3901 Castle Hayne Road, Wilmington, North Carolina bordering the Northeast Cape Fear River.

Our file records indicate that all jurisdictional features within the project area were delineated by RTI International and verified by Ms. Jennifer Frye of this office on October 16, 2007. A Notice of Jurisdictional Determination with corresponding signed plat was issued on January 22, 2008. A copy of this has been made available to General Electric-Hitachi Nuclear Energy Americas, LLC.

Based upon our review of the approved delineation and the information that you submitted, this office has determined that your project as proposed, will impact jurisdictional waters and/or wetlands regulated pursuant to Section 404 of the Clean Water Act and therefore, will require Department of the Army (DA) authorization. Proposed impacts include the discharge of fill material into an unnamed tributary to Prince George Creek and an unnamed tributary to the Northeast Cape Fear River. Both are tributaries to the Northeast Cape Fear River, a Traditionally Navigable Water of the United States. As you are aware, the issuance of Department of the Army (DA) authorization must precede any placement of excavated or fill material within any wetlands or waters of the United States. Unauthorized activity would be a violation of Federal law.



JUN-26-1996 03:03 P.03/03

-2-

As this proposed project is located in one of the 20 coastal counties of North Carolina, a permit may be required by the North Carolina Division of Coastal Management. We recommend that you contact them at (910) 796-7215. For concerns and questions regarding biological resources and endangered species, please contact the U.S. Fish and Wildlife Service at (919) 856-4520.

If you should have any questions or comments or would like to schedule a pre-application meeting, please contact Emily Hughes at the Wilmington Field Office, Regulatory Division, telephone (910) 251-4635.

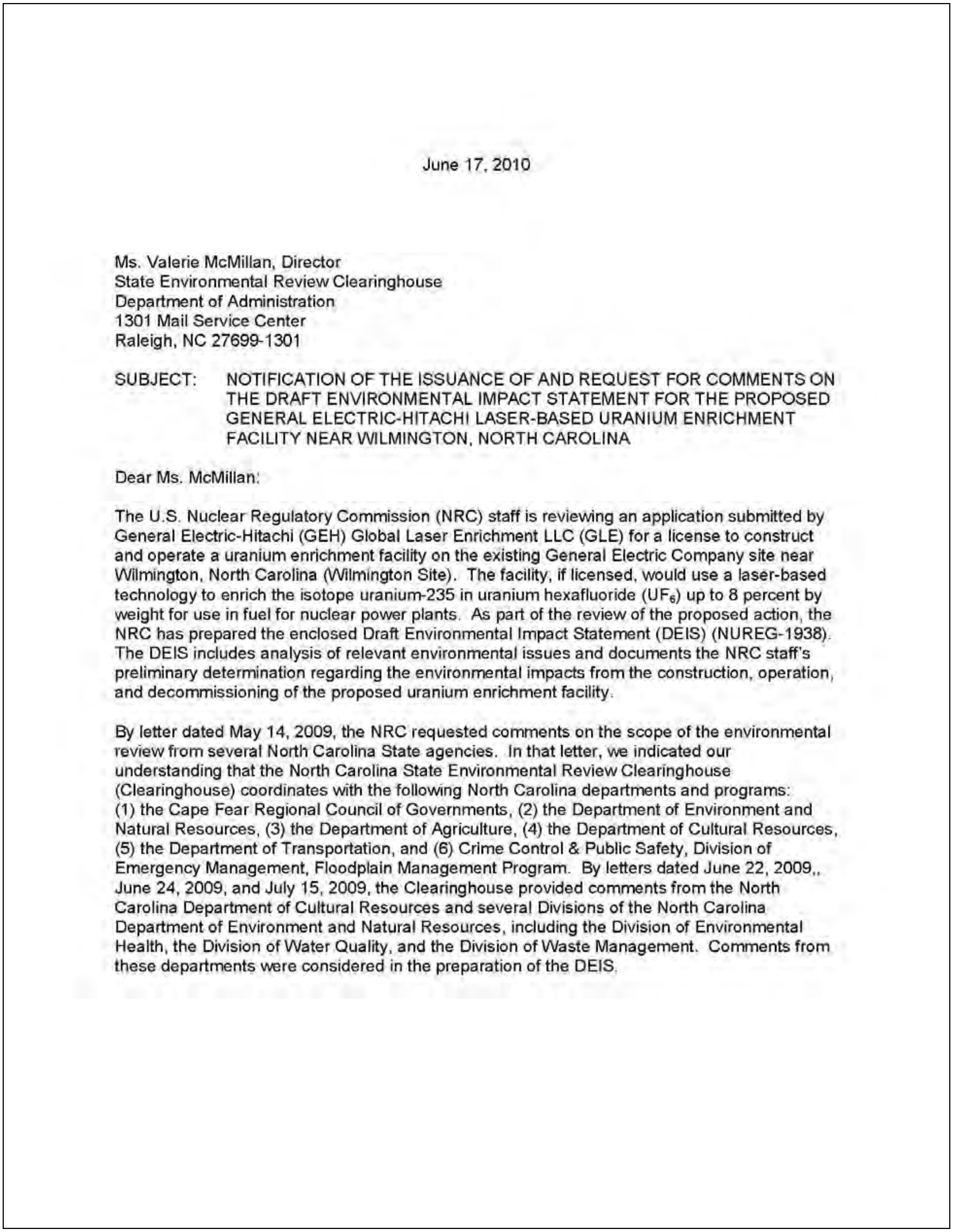
Sincerely,

William T. Walker, Chief
Wilmington Regulatory Field Office

Copies Furnished:

Ms. Christianne Ridge
Environmental Project Manager
Division of Waste Management
and Environmental Protection
U.S. Nuclear Regulatory Commission
Mail Stop: T7J8
Washington, DC 20555

TOTAL P.03



June 17, 2010

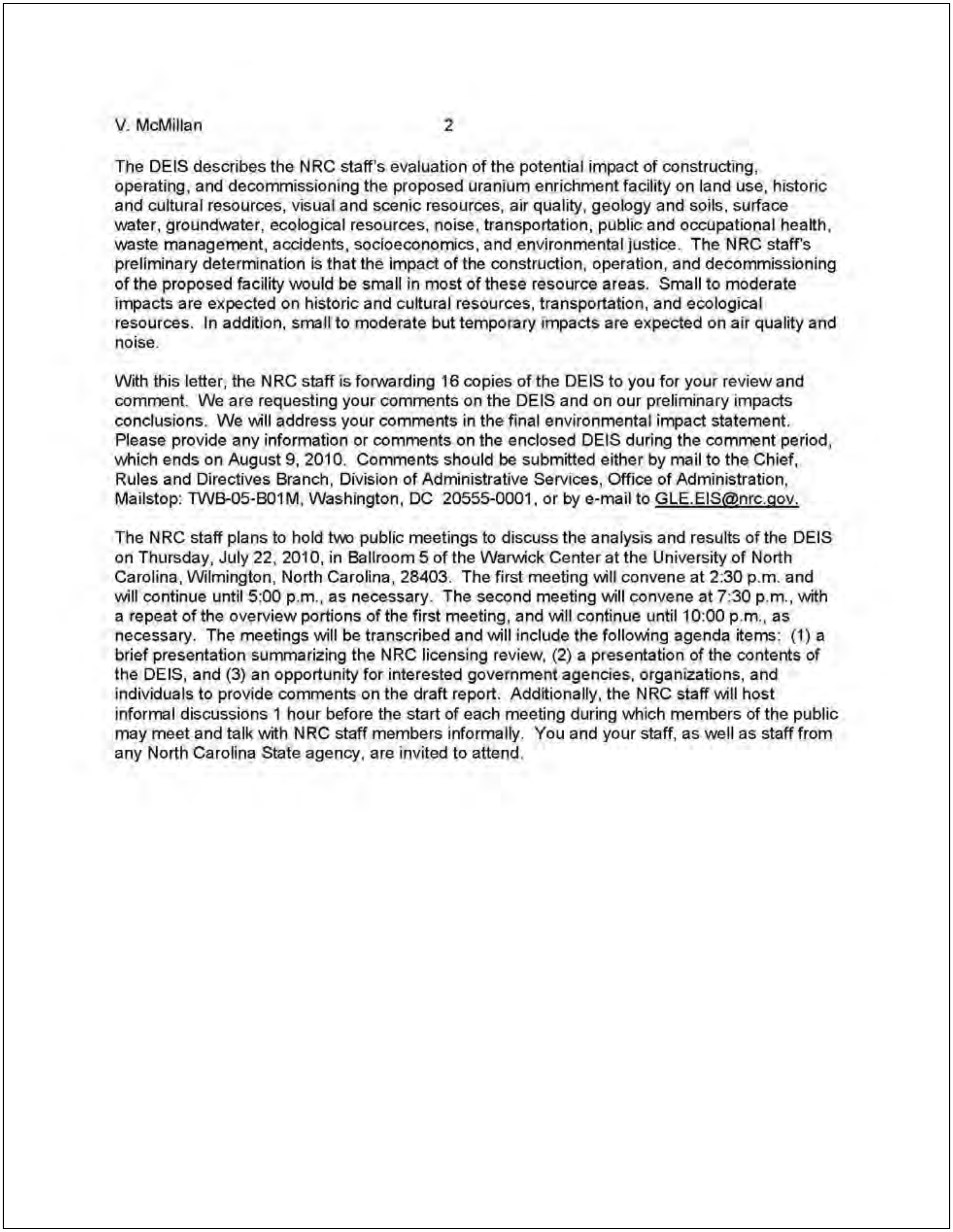
Ms. Valerie McMillan, Director
State Environmental Review Clearinghouse
Department of Administration
1301 Mail Service Center
Raleigh, NC 27699-1301

SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

Dear Ms. McMillan:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues and documents the NRC staff's preliminary determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed uranium enrichment facility.

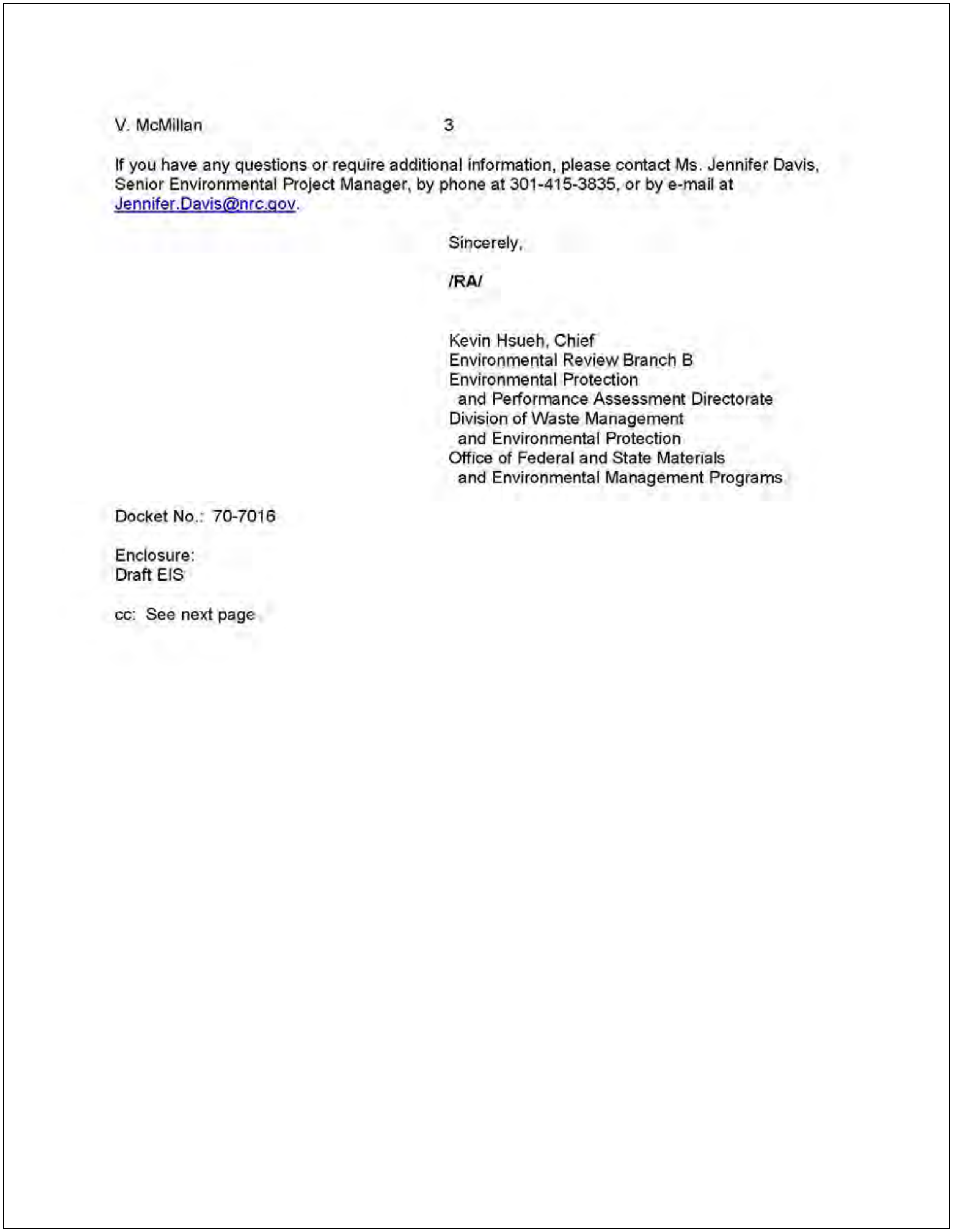
By letter dated May 14, 2009, the NRC requested comments on the scope of the environmental review from several North Carolina State agencies. In that letter, we indicated our understanding that the North Carolina State Environmental Review Clearinghouse (Clearinghouse) coordinates with the following North Carolina departments and programs: (1) the Cape Fear Regional Council of Governments, (2) the Department of Environment and Natural Resources, (3) the Department of Agriculture, (4) the Department of Cultural Resources, (5) the Department of Transportation, and (6) Crime Control & Public Safety, Division of Emergency Management, Floodplain Management Program. By letters dated June 22, 2009,, June 24, 2009, and July 15, 2009, the Clearinghouse provided comments from the North Carolina Department of Cultural Resources and several Divisions of the North Carolina Department of Environment and Natural Resources, including the Division of Environmental Health, the Division of Water Quality, and the Division of Waste Management. Comments from these departments were considered in the preparation of the DEIS.



The DEIS describes the NRC staff's evaluation of the potential impact of constructing, operating, and decommissioning the proposed uranium enrichment facility on land use, historic and cultural resources, visual and scenic resources, air quality, geology and soils, surface water, groundwater, ecological resources, noise, transportation, public and occupational health, waste management, accidents, socioeconomics, and environmental justice. The NRC staff's preliminary determination is that the impact of the construction, operation, and decommissioning of the proposed facility would be small in most of these resource areas. Small to moderate impacts are expected on historic and cultural resources, transportation, and ecological resources. In addition, small to moderate but temporary impacts are expected on air quality and noise.

With this letter, the NRC staff is forwarding 16 copies of the DEIS to you for your review and comment. We are requesting your comments on the DEIS and on our preliminary impacts conclusions. We will address your comments in the final environmental impact statement. Please provide any information or comments on the enclosed DEIS during the comment period, which ends on August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop: TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.

The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff, as well as staff from any North Carolina State agency, are invited to attend.



If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

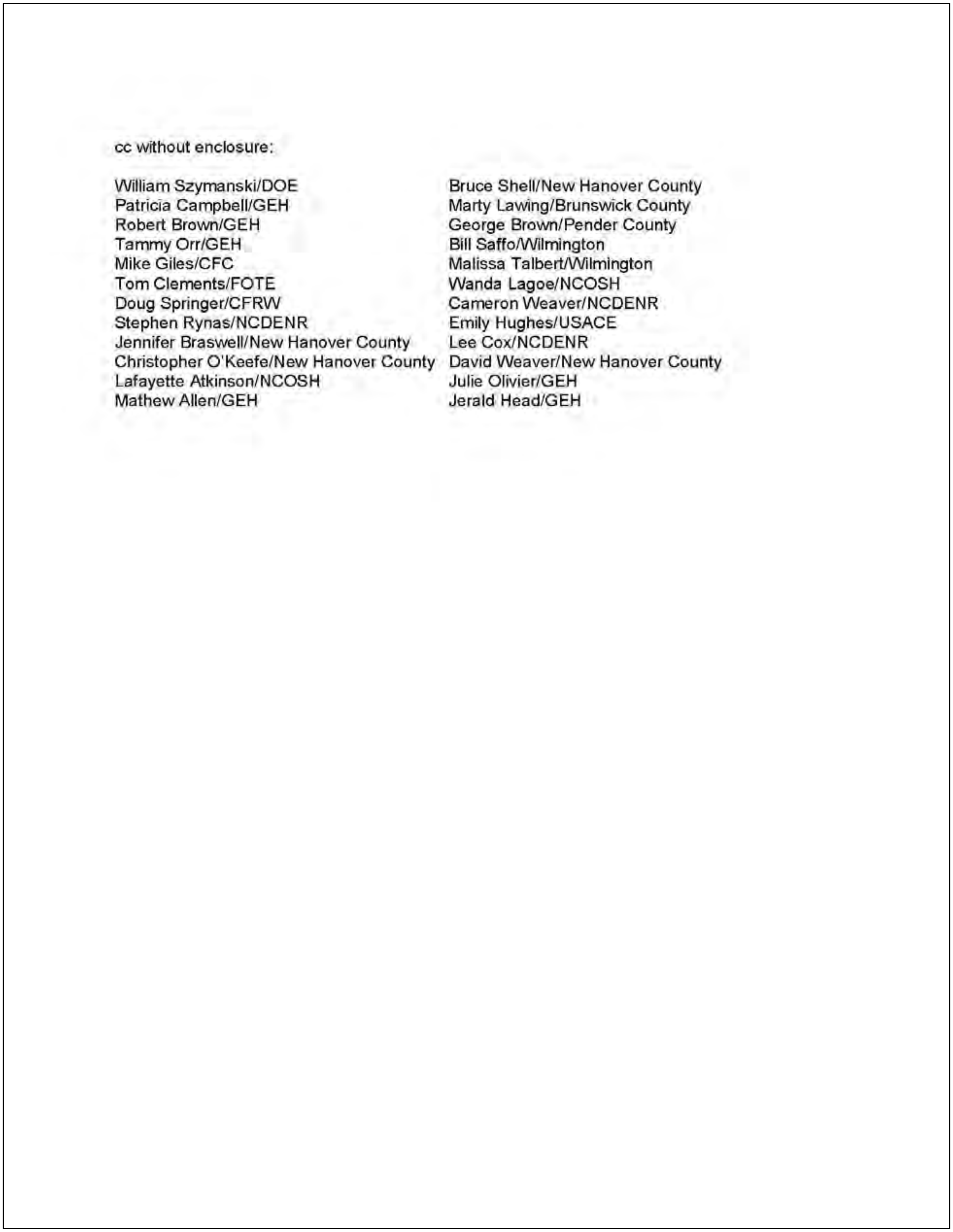
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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:
Draft EIS

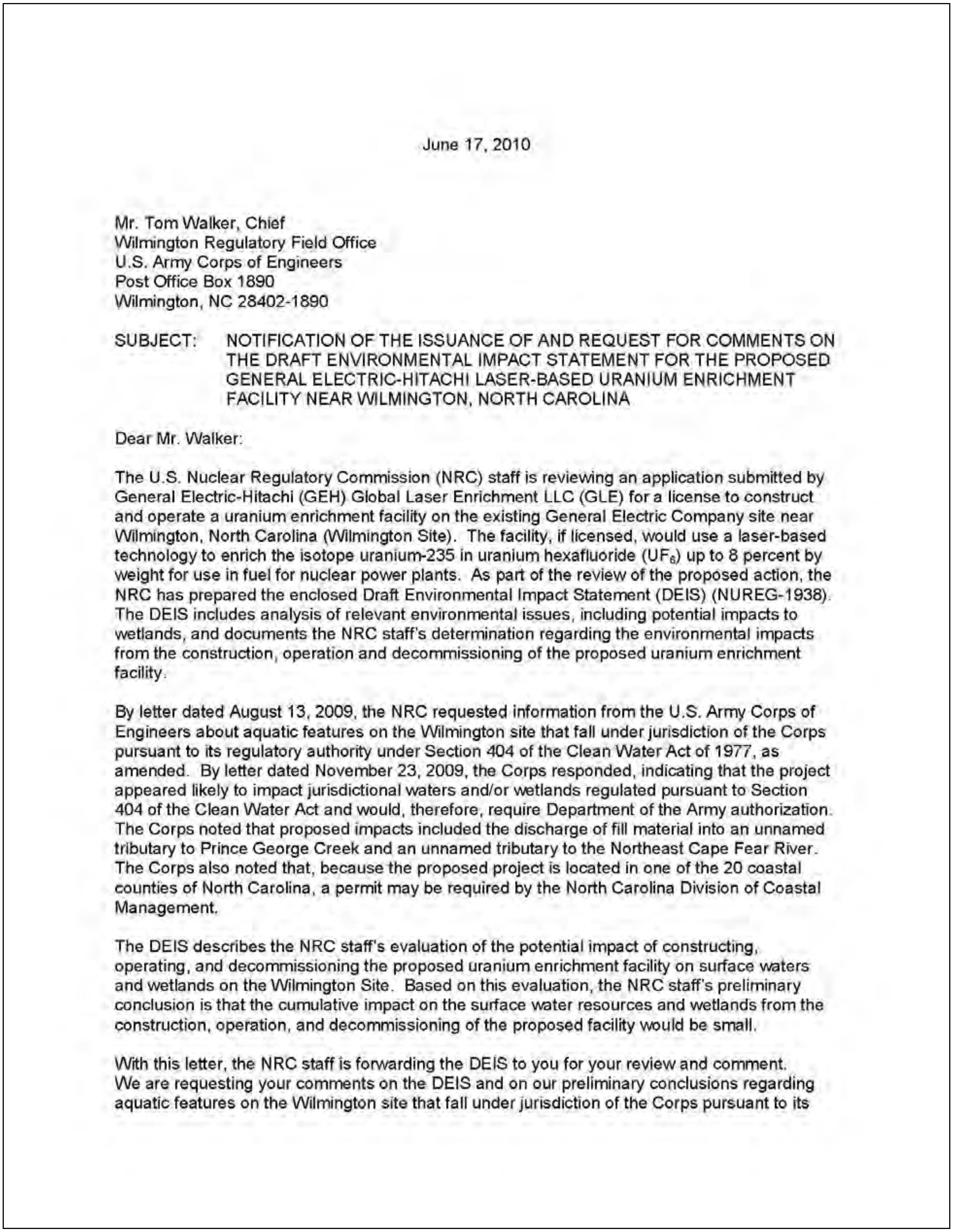
cc: See next page



cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Lafayette Atkinson/NCOSH
Mathew Allen/GEH

Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lee Cox/NCDENR
David Weaver/New Hanover County
Julie Olivier/GEH
Jerald Head/GEH



June 17, 2010

Mr. Tom Walker, Chief
Wilmington Regulatory Field Office
U.S. Army Corps of Engineers
Post Office Box 1890
Wilmington, NC 28402-1890

SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED GENERAL ELECTRIC-HITACHI LASER-BASED URANIUM ENRICHMENT FACILITY NEAR WILMINGTON, NORTH CAROLINA

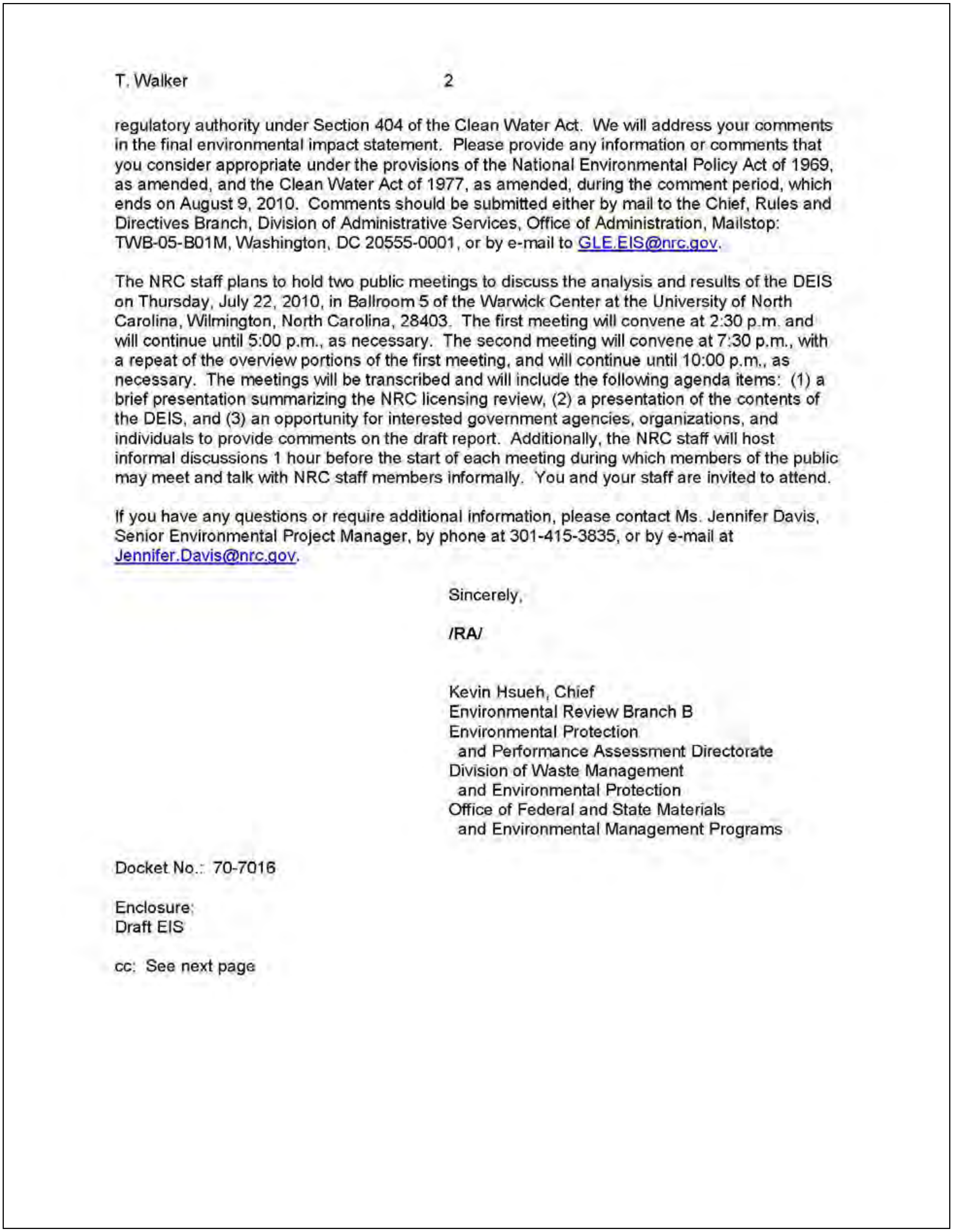
Dear Mr. Walker:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by General Electric-Hitachi (GEH) Global Laser Enrichment LLC (GLE) for a license to construct and operate a uranium enrichment facility on the existing General Electric Company site near Wilmington, North Carolina (Wilmington Site). 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 for use in fuel for nuclear power plants. As part of the review of the proposed action, the NRC has prepared the enclosed Draft Environmental Impact Statement (DEIS) (NUREG-1938). The DEIS includes analysis of relevant environmental issues, including potential impacts to wetlands, and documents the NRC staff's determination regarding the environmental impacts from the construction, operation and decommissioning of the proposed uranium enrichment facility.

By letter dated August 13, 2009, the NRC requested information from the U.S. Army Corps of Engineers about aquatic features on the Wilmington site that fall under jurisdiction of the Corps pursuant to its regulatory authority under Section 404 of the Clean Water Act of 1977, as amended. By letter dated November 23, 2009, the Corps responded, indicating that the project appeared likely to impact jurisdictional waters and/or wetlands regulated pursuant to Section 404 of the Clean Water Act and would, therefore, require Department of the Army authorization. The Corps noted that proposed impacts included the discharge of fill material into an unnamed tributary to Prince George Creek and an unnamed tributary to the Northeast Cape Fear River. The Corps also noted that, because the proposed project is located in one of the 20 coastal counties of North Carolina, a permit may be required by the North Carolina Division of Coastal Management.

The DEIS describes the NRC staff's evaluation of the potential impact of constructing, operating, and decommissioning the proposed uranium enrichment facility on surface waters and wetlands on the Wilmington Site. Based on this evaluation, the NRC staff's preliminary conclusion is that the cumulative impact on the surface water resources and wetlands from the construction, operation, and decommissioning of the proposed facility would be small.

With this letter, the NRC staff is forwarding the DEIS to you for your review and comment. We are requesting your comments on the DEIS and on our preliminary conclusions regarding aquatic features on the Wilmington site that fall under jurisdiction of the Corps pursuant to its



T. Walker 2

regulatory authority under Section 404 of the Clean Water Act. We will address your comments in the final environmental impact statement. Please provide any information or comments that you consider appropriate under the provisions of the National Environmental Policy Act of 1969, as amended, and the Clean Water Act of 1977, as amended, during the comment period, which ends on August 9, 2010. Comments should be submitted either by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop: TWB-05-B01M, Washington, DC 20555-0001, or by e-mail to GLE.EIS@nrc.gov.

The NRC staff plans to hold two public meetings to discuss the analysis and results of the DEIS on Thursday, July 22, 2010, in Ballroom 5 of the Warwick Center at the University of North Carolina, Wilmington, North Carolina, 28403. The first meeting will convene at 2:30 p.m. and will continue until 5:00 p.m., as necessary. The second meeting will convene at 7:30 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. The meetings will be transcribed and will include the following agenda items: (1) a brief presentation summarizing the NRC licensing review, (2) a presentation of the contents of the DEIS, and (3) an opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the NRC staff will host informal discussions 1 hour before the start of each meeting during which members of the public may meet and talk with NRC staff members informally. You and your staff are invited to attend.

If you have any questions or require additional information, please contact Ms. Jennifer Davis, Senior Environmental Project Manager, by phone at 301-415-3835, or by e-mail at Jennifer.Davis@nrc.gov.

Sincerely,

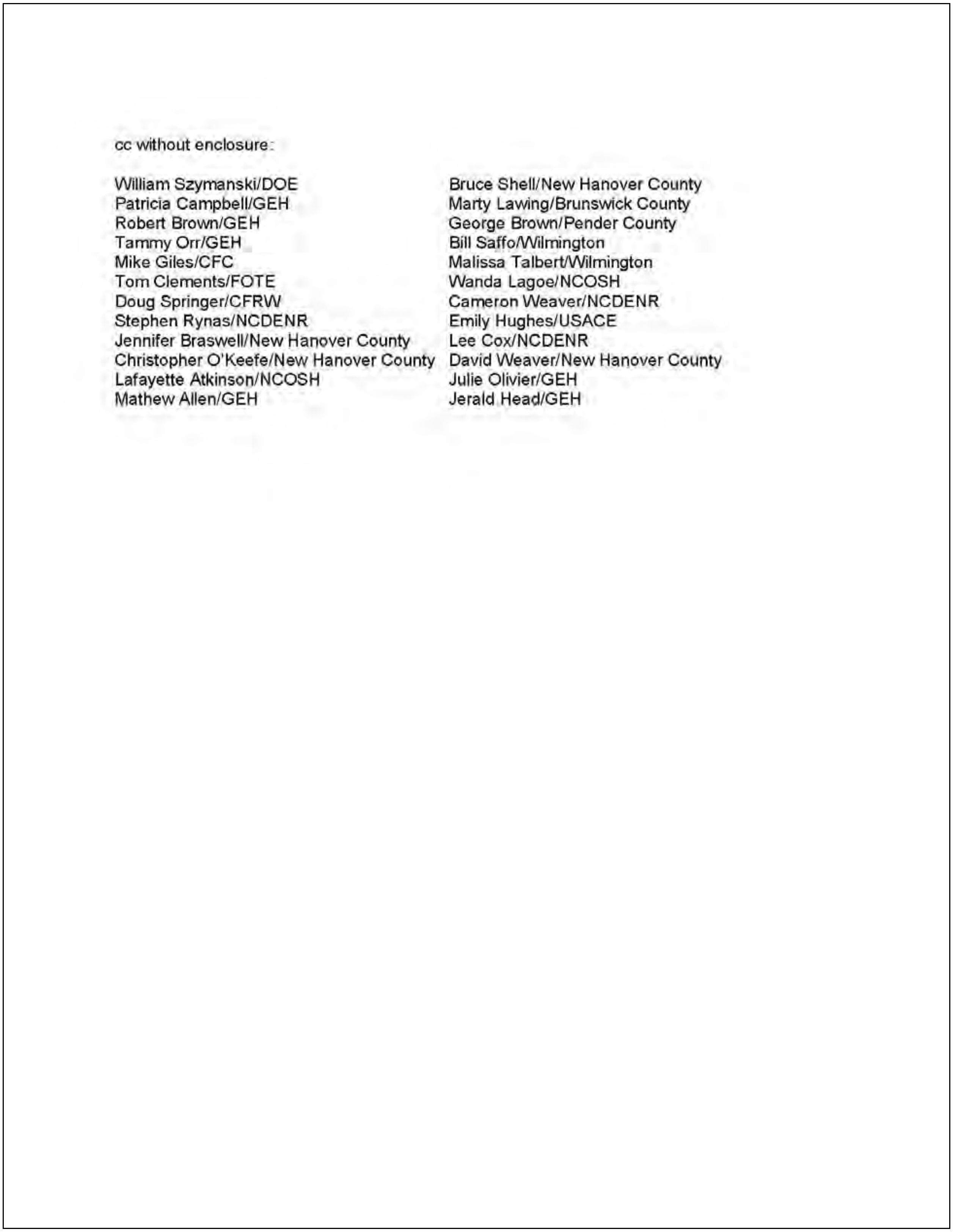
/RA/

Kevin Hsueh, Chief
Environmental Review Branch B
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

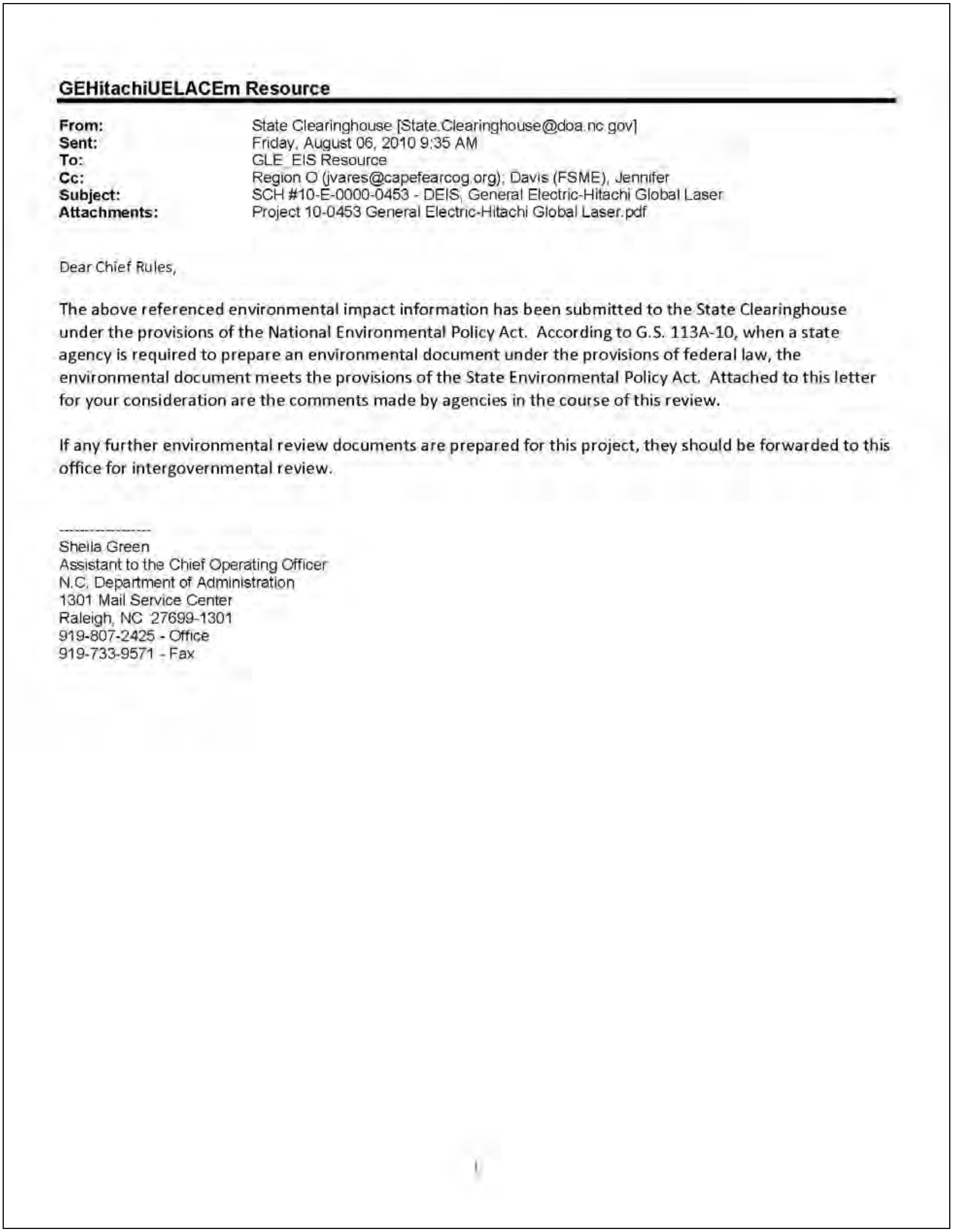
Enclosure:
Draft EIS

cc: See next page



cc without enclosure:

William Szymanski/DOE
Patricia Campbell/GEH
Robert Brown/GEH
Tammy Orr/GEH
Mike Giles/CFC
Tom Clements/FOTE
Doug Springer/CFRW
Stephen Rynas/NCDENR
Jennifer Braswell/New Hanover County
Christopher O'Keefe/New Hanover County
Lafayette Atkinson/NCOSH
Mathew Allen/GEH
Bruce Shell/New Hanover County
Marty Lawing/Brunswick County
George Brown/Pender County
Bill Saffo/Wilmington
Malissa Talbert/Wilmington
Wanda Lagoe/NCOSH
Cameron Weaver/NCDENR
Emily Hughes/USACE
Lee Cox/NCDENR
David Weaver/New Hanover County
Julie Olivier/GEH
Jerald Head/GEH



GEHitachiUELACEm Resource

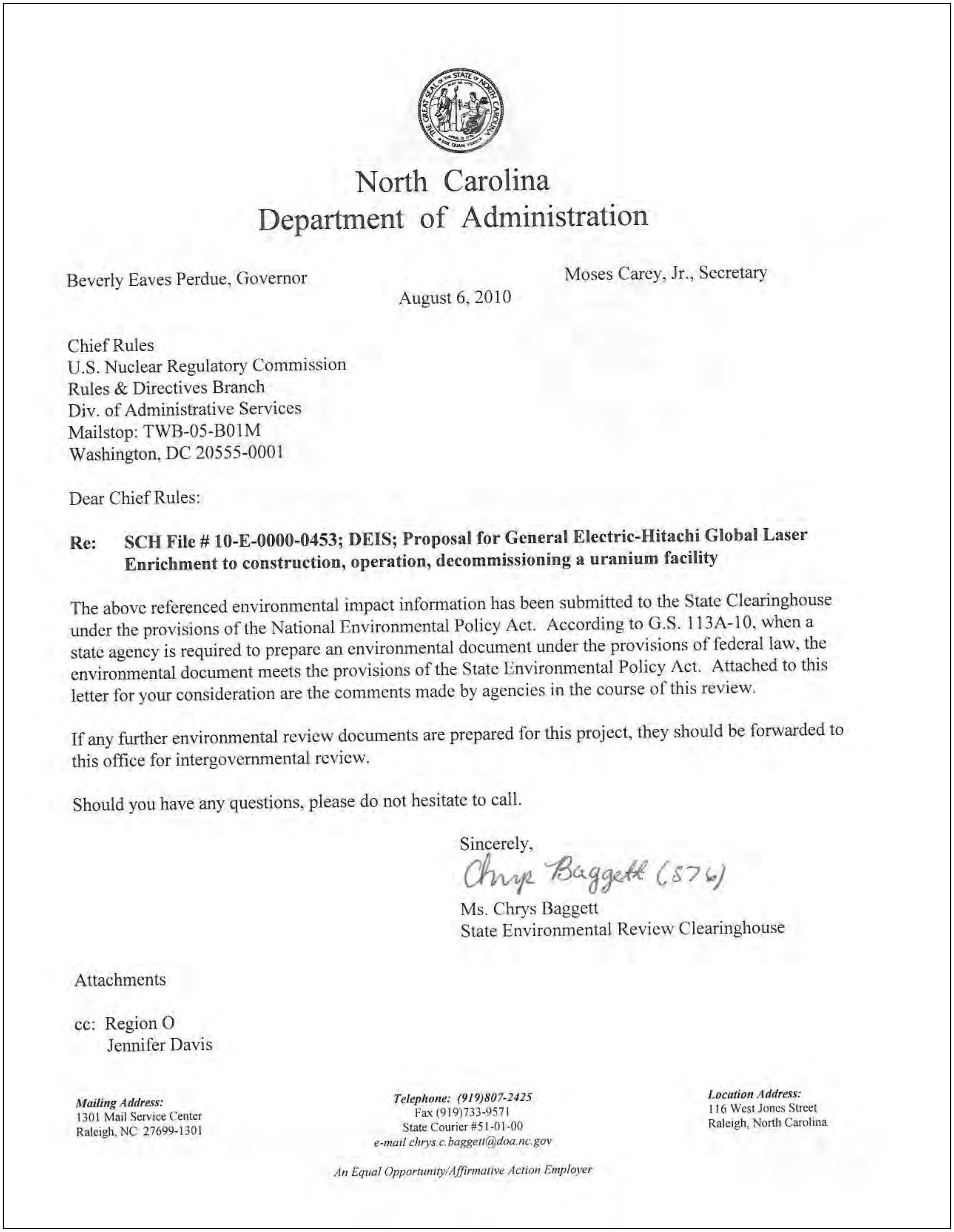
From: State Clearinghouse [State.Clearinghouse@doa.nc.gov]
Sent: Friday, August 06, 2010 9:35 AM
To: GLE_EIS Resource
Cc: Region O (jvares@capefearcog.org); Davis (FSME), Jennifer
Subject: SCH #10-E-0000-0453 - DEIS, General Electric-Hitachi Global Laser
Attachments: Project 10-0453 General Electric-Hitachi Global Laser.pdf

Dear Chief Rules,

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Sheila Green
Assistant to the Chief Operating Officer
N.C. Department of Administration
1301 Mail Service Center
Raleigh, NC 27699-1301
919-807-2425 - Office
919-733-9571 - Fax



North Carolina
Department of Administration

Beverly Eaves Perdue, Governor
Moses Carey, Jr., Secretary

August 6, 2010

Chief Rules
U.S. Nuclear Regulatory Commission
Rules & Directives Branch
Div. of Administrative Services
Mailstop: TWB-05-B01M
Washington, DC 20555-0001

Dear Chief Rules:

Re: SCH File # 10-E-0000-0453; DEIS; Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Chrys Baggett (876)

Ms. Chrys Baggett
State Environmental Review Clearinghouse

Attachments

cc: Region O
Jennifer Davis

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail chrys.c.baggett@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

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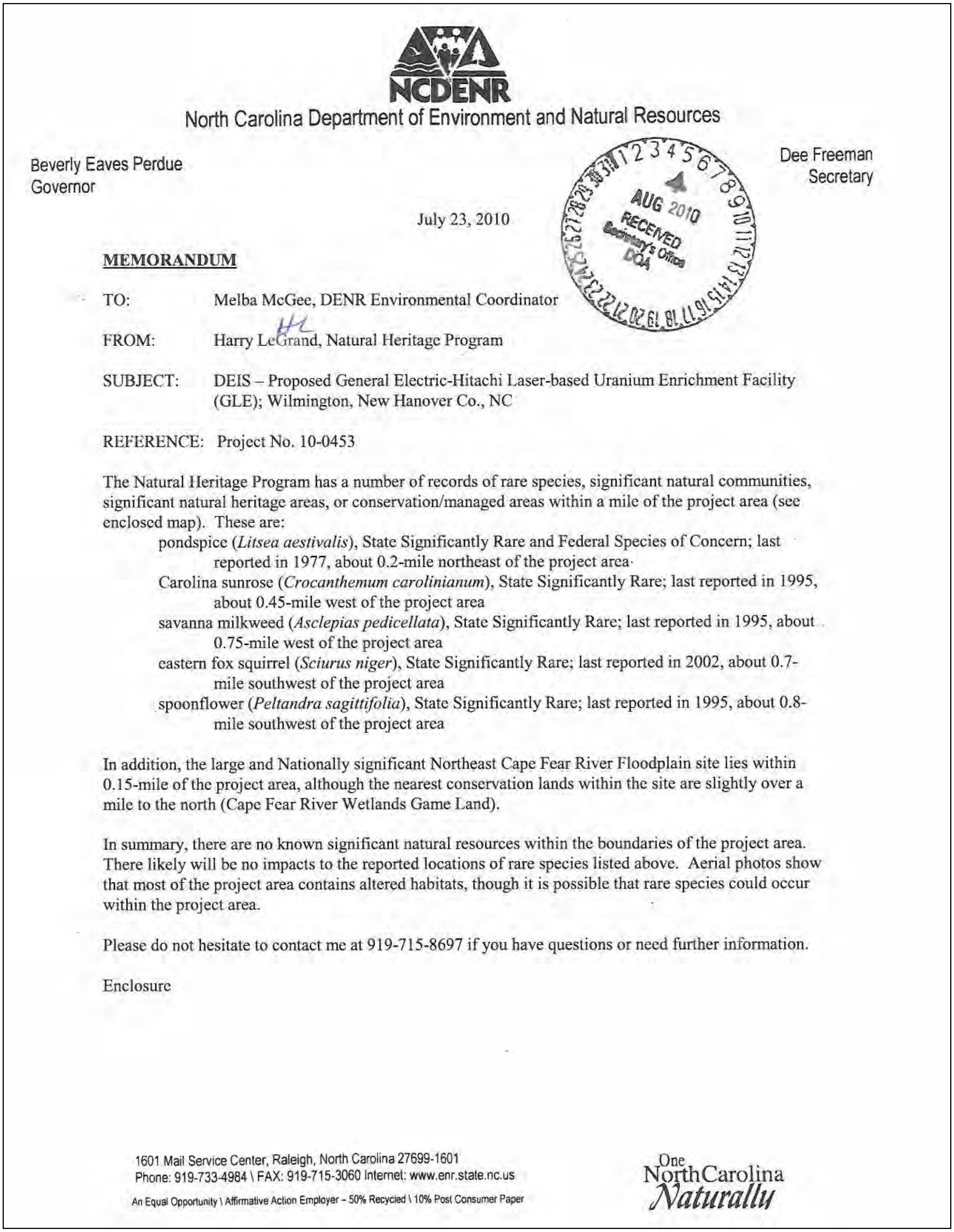

NCDENR
North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

AUG 2010
RECEIVED
Secretary's Office
DOA

July 23, 2010

MEMORANDUM

TO: Melba McGee, DENR Environmental Coordinator

FROM: Harry LeGrand, Natural Heritage Program

HL

SUBJECT: DEIS – Proposed General Electric-Hitachi Laser-based Uranium Enrichment Facility (GLE); Wilmington, New Hanover Co., NC

REFERENCE: Project No. 10-0453

The Natural Heritage Program has a number of records of rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas within a mile of the project area (see enclosed map). These are:

pondspice (*Litsea aestivalis*), State Significantly Rare and Federal Species of Concern; last reported in 1977, about 0.2-mile northeast of the project area·

Carolina sunrose (*Crocanthemum carolinianum*), State Significantly Rare; last reported in 1995, about 0.45-mile west of the project area

savanna milkweed (*Asclepias pedicellata*), State Significantly Rare; last reported in 1995, about 0.75-mile west of the project area

eastern fox squirrel (*Sciurus niger*), State Significantly Rare; last reported in 2002, about 0.7-mile southwest of the project area

spoonflower (*Peltandra sagittifolia*), State Significantly Rare; last reported in 1995, about 0.8-mile southwest of the project area

In addition, the large and Nationally significant Northeast Cape Fear River Floodplain site lies within 0.15-mile of the project area, although the nearest conservation lands within the site are slightly over a mile to the north (Cape Fear River Wetlands Game Land).

In summary, there are no known significant natural resources within the boundaries of the project area. There likely will be no impacts to the reported locations of rare species listed above. Aerial photos show that most of the project area contains altered habitats, though it is possible that rare species could occur within the project area.

Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

Enclosure

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Phone: 919-733-4984 \ FAX: 919-715-3060 Internet: www.enr.state.nc.us

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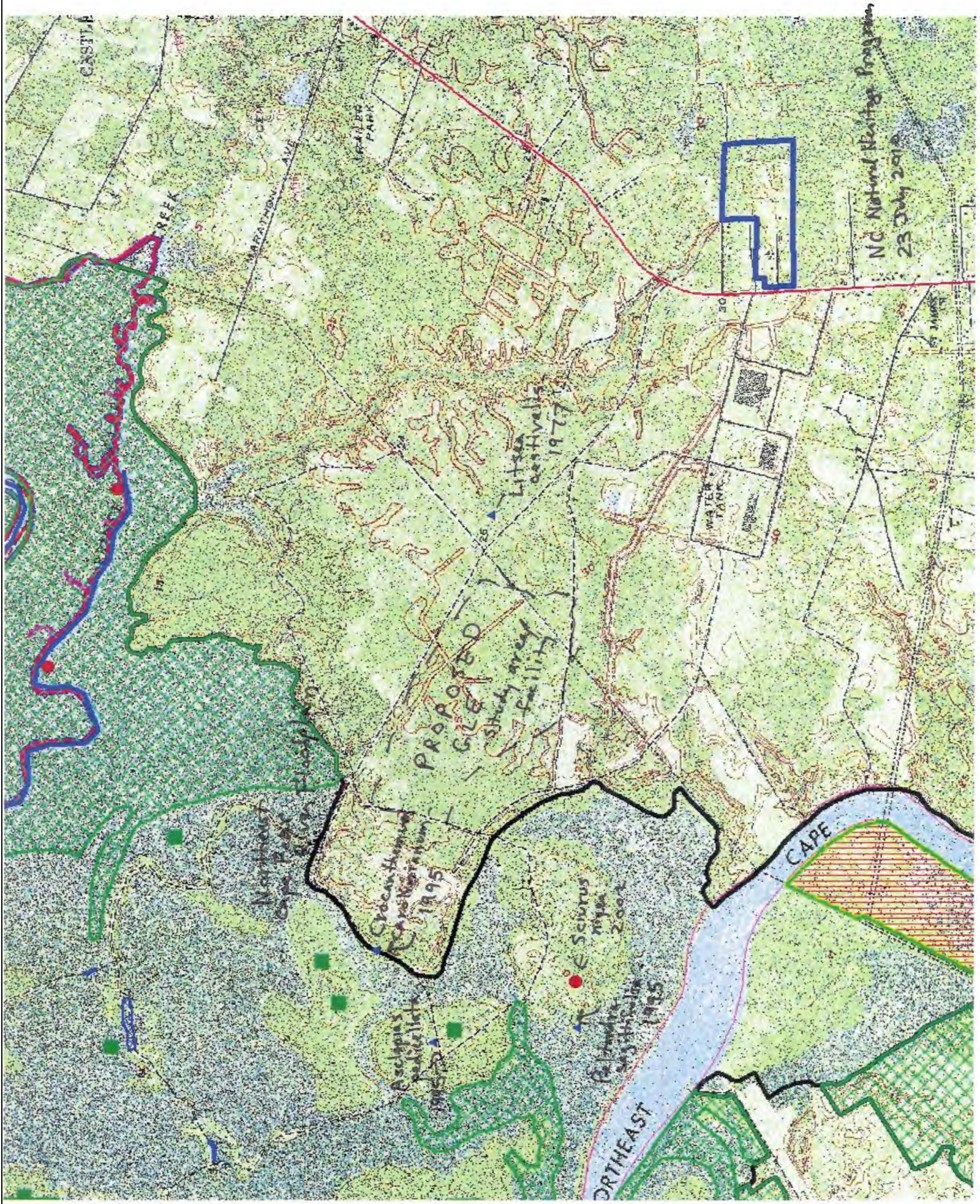
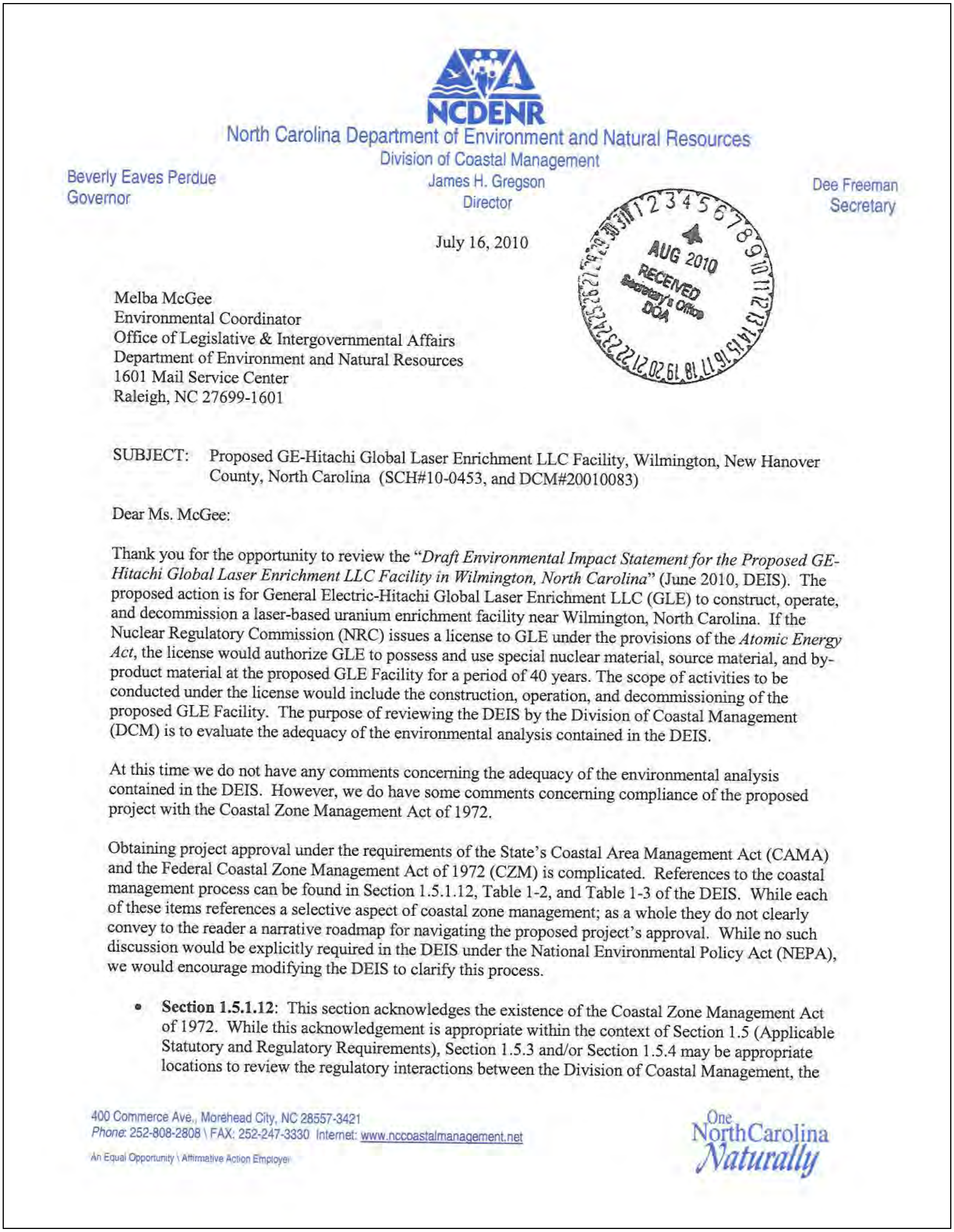

NC Natural Heritage Program, 23 July 2010
Litsea aestivalis 1977
PROPOSED GLE study area / facility
Northeast Cape Fear River Floodplain
Crocanthemum carolinianum 1995
Sciurus niger 2004
Asclepias pedicellata 1995
1995
CAPE
NORTHEAST
CREEK
WATER TANK



NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

July 16, 2010

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Melba McGee
Environmental Coordinator
Office of Legislative & Intergovernmental Affairs
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

SUBJECT: Proposed GE-Hitachi Global Laser Enrichment LLC Facility, Wilmington, New Hanover County, North Carolina (SCH#10-0453, and DCM#20010083)

Dear Ms. McGee:

Thank you for the opportunity to review the "*Draft Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina*" (June 2010, DEIS). The proposed action is for General Electric-Hitachi Global Laser Enrichment LLC (GLE) to construct, operate, and decommission a laser-based uranium enrichment facility near Wilmington, North Carolina. If the Nuclear Regulatory Commission (NRC) issues a license to GLE under the provisions of the *Atomic Energy Act*, the license would authorize GLE to possess and use special nuclear material, source material, and by-product material at the proposed GLE Facility for a period of 40 years. The scope of activities to be conducted under the license would include the construction, operation, and decommissioning of the proposed GLE Facility. The purpose of reviewing the DEIS by the Division of Coastal Management (DCM) is to evaluate the adequacy of the environmental analysis contained in the DEIS.

At this time we do not have any comments concerning the adequacy of the environmental analysis contained in the DEIS. However, we do have some comments concerning compliance of the proposed project with the Coastal Zone Management Act of 1972.

Obtaining project approval under the requirements of the State's Coastal Area Management Act (CAMA) and the Federal Coastal Zone Management Act of 1972 (CZM) is complicated. References to the coastal management process can be found in Section 1.5.1.12, Table 1-2, and Table 1-3 of the DEIS. While each of these items references a selective aspect of coastal zone management; as a whole they do not clearly convey to the reader a narrative roadmap for navigating the proposed project's approval. While no such discussion would be explicitly required in the DEIS under the National Environmental Policy Act (NEPA), we would encourage modifying the DEIS to clarify this process.

- **Section 1.5.1.12**: This section acknowledges the existence of the Coastal Zone Management Act of 1972. While this acknowledgement is appropriate within the context of Section 1.5 (Applicable Statutory and Regulatory Requirements), Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the

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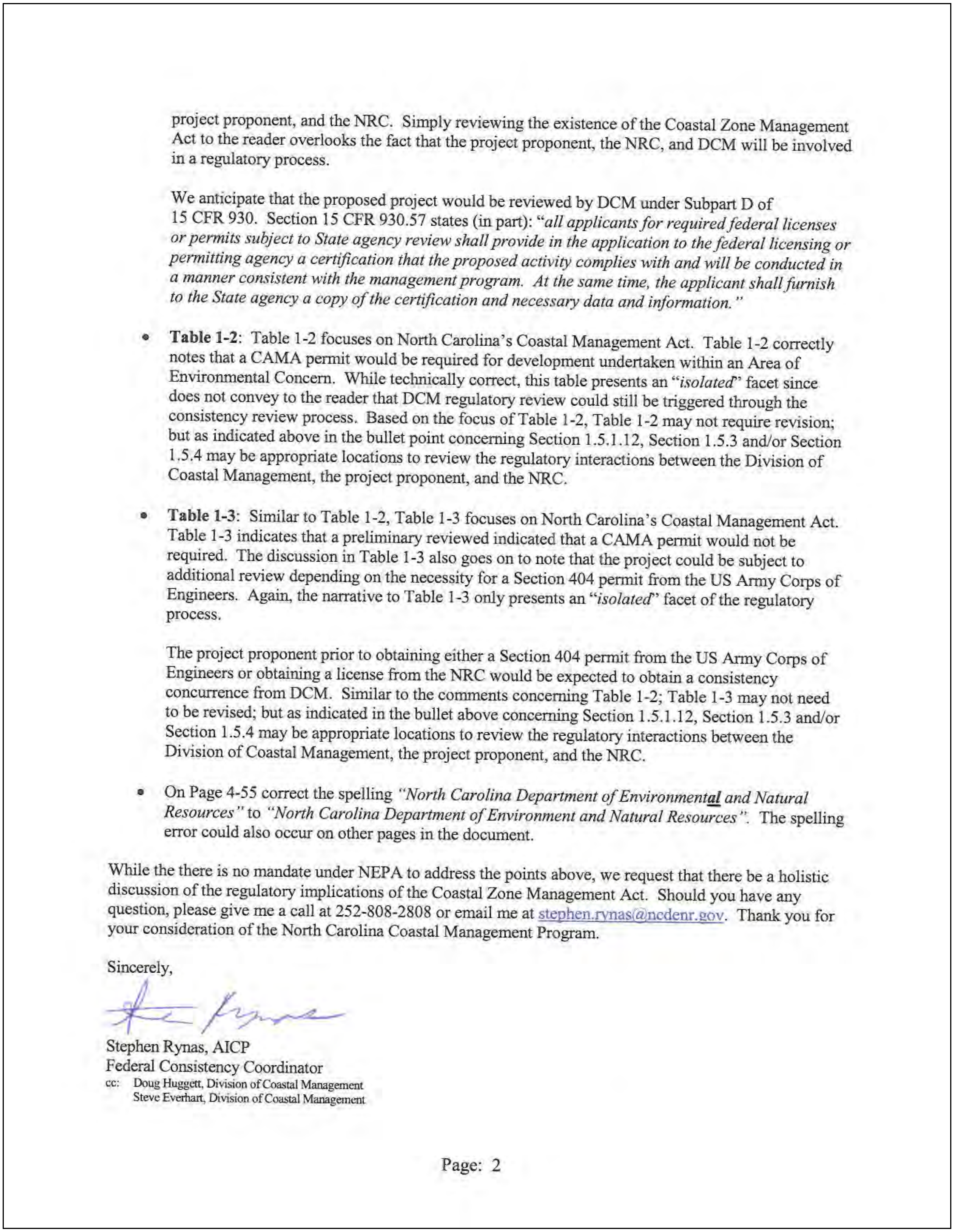


project proponent, and the NRC. Simply reviewing the existence of the Coastal Zone Management Act to the reader overlooks the fact that the project proponent, the NRC, and DCM will be involved in a regulatory process.

We anticipate that the proposed project would be reviewed by DCM under Subpart D of 15 CFR 930. Section 15 CFR 930.57 states (in part): "*all applicants for required federal licenses or permits subject to State agency review shall provide in the application to the federal licensing or permitting agency a certification that the proposed activity complies with and will be conducted in a manner consistent with the management program. At the same time, the applicant shall furnish to the State agency a copy of the certification and necessary data and information.*"

- **Table 1-2**: Table 1-2 focuses on North Carolina's Coastal Management Act. Table 1-2 correctly notes that a CAMA permit would be required for development undertaken within an Area of Environmental Concern. While technically correct, this table presents an "*isolated*" facet since does not convey to the reader that DCM regulatory review could still be triggered through the consistency review process. Based on the focus of Table 1-2, Table 1-2 may not require revision; but as indicated above in the bullet point concerning Section 1.5.1.12, Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the project proponent, and the NRC.

- **Table 1-3**: Similar to Table 1-2, Table 1-3 focuses on North Carolina's Coastal Management Act. Table 1-3 indicates that a preliminary reviewed indicated that a CAMA permit would not be required. The discussion in Table 1-3 also goes on to note that the project could be subject to additional review depending on the necessity for a Section 404 permit from the US Army Corps of Engineers. Again, the narrative to Table 1-3 only presents an "*isolated*" facet of the regulatory process.

  The project proponent prior to obtaining either a Section 404 permit from the US Army Corps of Engineers or obtaining a license from the NRC would be expected to obtain a consistency concurrence from DCM. Similar to the comments concerning Table 1-2; Table 1-3 may not need to be revised; but as indicated in the bullet above concerning Section 1.5.1.12, Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the project proponent, and the NRC.

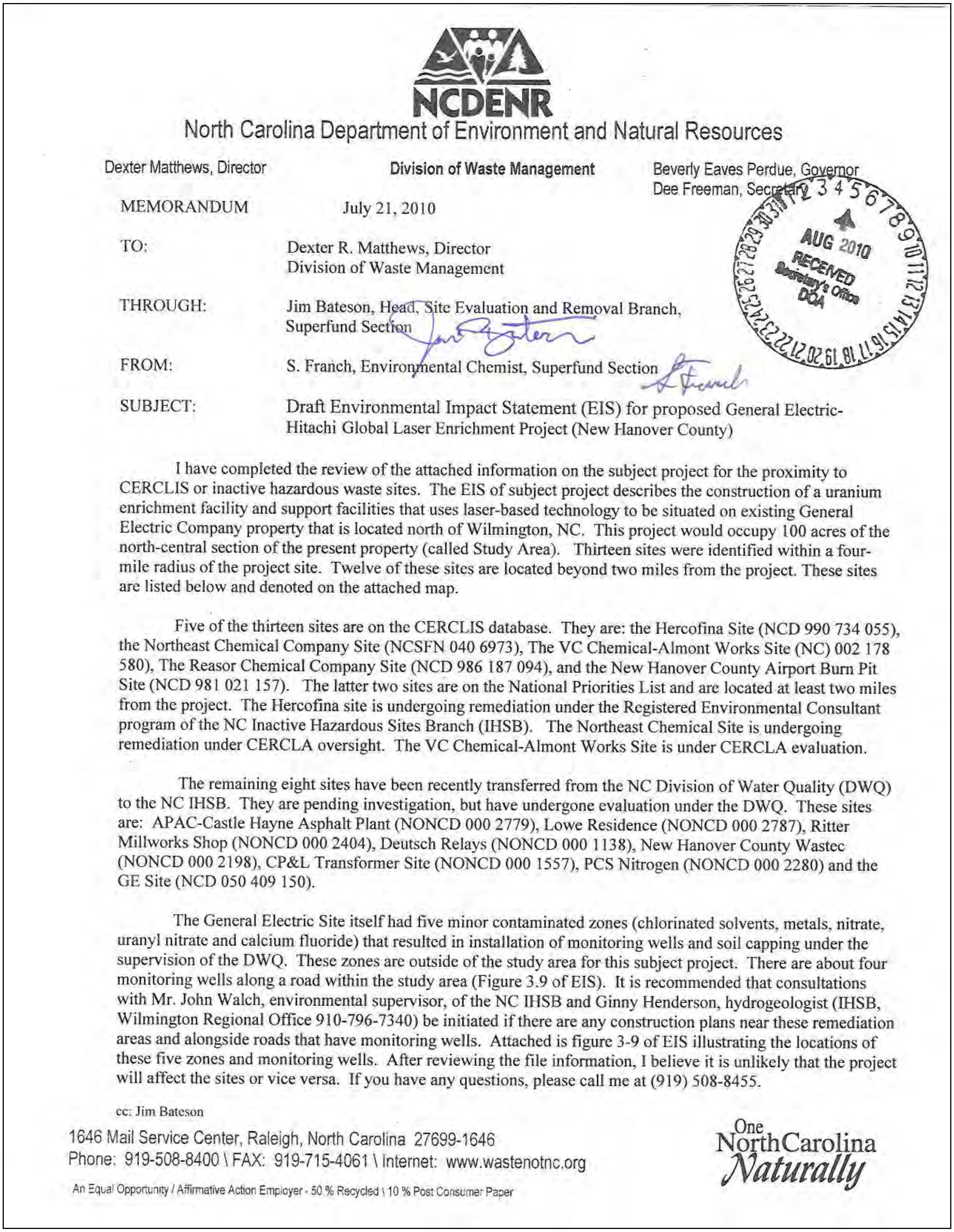
- On Page 4-55 correct the spelling *"North Carolina Department of Environmen**tal** and Natural Resources"* to *"North Carolina Department of Environment and Natural Resources"*. The spelling error could also occur on other pages in the document.

While the there is no mandate under NEPA to address the points above, we request that there be a holistic discussion of the regulatory implications of the Coastal Zone Management Act. Should you have any question, please give me a call at 252-808-2808 or email me at stephen.rynas@ncdenr.gov. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Stephen Rynas, AICP
Federal Consistency Coordinator
cc: Doug Huggett, Division of Coastal Management
Steve Everhart, Division of Coastal Management

Page: 2



NCDENR
North Carolina Department of Environment and Natural Resources

Dexter Matthews, Director
Division of Waste Management
Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

AUG 2010
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MEMORANDUM July 21, 2010

TO: Dexter R. Matthews, Director
Division of Waste Management

THROUGH: Jim Bateson, Head, Site Evaluation and Removal Branch,
Superfund Section

FROM: S. Franch, Environmental Chemist, Superfund Section

SUBJECT: Draft Environmental Impact Statement (EIS) for proposed General Electric-Hitachi Global Laser Enrichment Project (New Hanover County)

I have completed the review of the attached information on the subject project for the proximity to CERCLIS or inactive hazardous waste sites. The EIS of subject project describes the construction of a uranium enrichment facility and support facilities that uses laser-based technology to be situated on existing General Electric Company property that is located north of Wilmington, NC. This project would occupy 100 acres of the north-central section of the present property (called Study Area). Thirteen sites were identified within a four-mile radius of the project site. Twelve of these sites are located beyond two miles from the project. These sites are listed below and denoted on the attached map.

Five of the thirteen sites are on the CERCLIS database. They are: the Hercofina Site (NCD 990 734 055), the Northeast Chemical Company Site (NCSFN 040 6973), The VC Chemical-Almont Works Site (NC) 002 178 580), The Reasor Chemical Company Site (NCD 986 187 094), and the New Hanover County Airport Burn Pit Site (NCD 981 021 157). The latter two sites are on the National Priorities List and are located at least two miles from the project. The Hercofina site is undergoing remediation under the Registered Environmental Consultant program of the NC Inactive Hazardous Sites Branch (IHSB). The Northeast Chemical Site is undergoing remediation under CERCLA oversight. The VC Chemical-Almont Works Site is under CERCLA evaluation.

The remaining eight sites have been recently transferred from the NC Division of Water Quality (DWQ) to the NC IHSB. They are pending investigation, but have undergone evaluation under the DWQ. These sites are: APAC-Castle Hayne Asphalt Plant (NONCD 000 2779), Lowe Residence (NONCD 000 2787), Ritter Millworks Shop (NONCD 000 2404), Deutsch Relays (NONCD 000 1138), New Hanover County Wastec (NONCD 000 2198), CP&L Transformer Site (NONCD 000 1557), PCS Nitrogen (NONCD 000 2280) and the GE Site (NCD 050 409 150).

The General Electric Site itself had five minor contaminated zones (chlorinated solvents, metals, nitrate, uranyl nitrate and calcium fluoride) that resulted in installation of monitoring wells and soil capping under the supervision of the DWQ. These zones are outside of the study area for this subject project. There are about four monitoring wells along a road within the study area (Figure 3.9 of EIS). It is recommended that consultations with Mr. John Walch, environmental supervisor, of the NC IHSB and Ginny Henderson, hydrogeologist (IHSB, Wilmington Regional Office 910-796-7340) be initiated if there are any construction plans near these remediation areas and alongside roads that have monitoring wells. Attached is figure 3-9 of EIS illustrating the locations of these five zones and monitoring wells. After reviewing the file information, I believe it is unlikely that the project will affect the sites or vice versa. If you have any questions, please call me at (919) 508-8455.

cc: Jim Bateson

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-715-4061 \ Internet: www.wastenotnc.org

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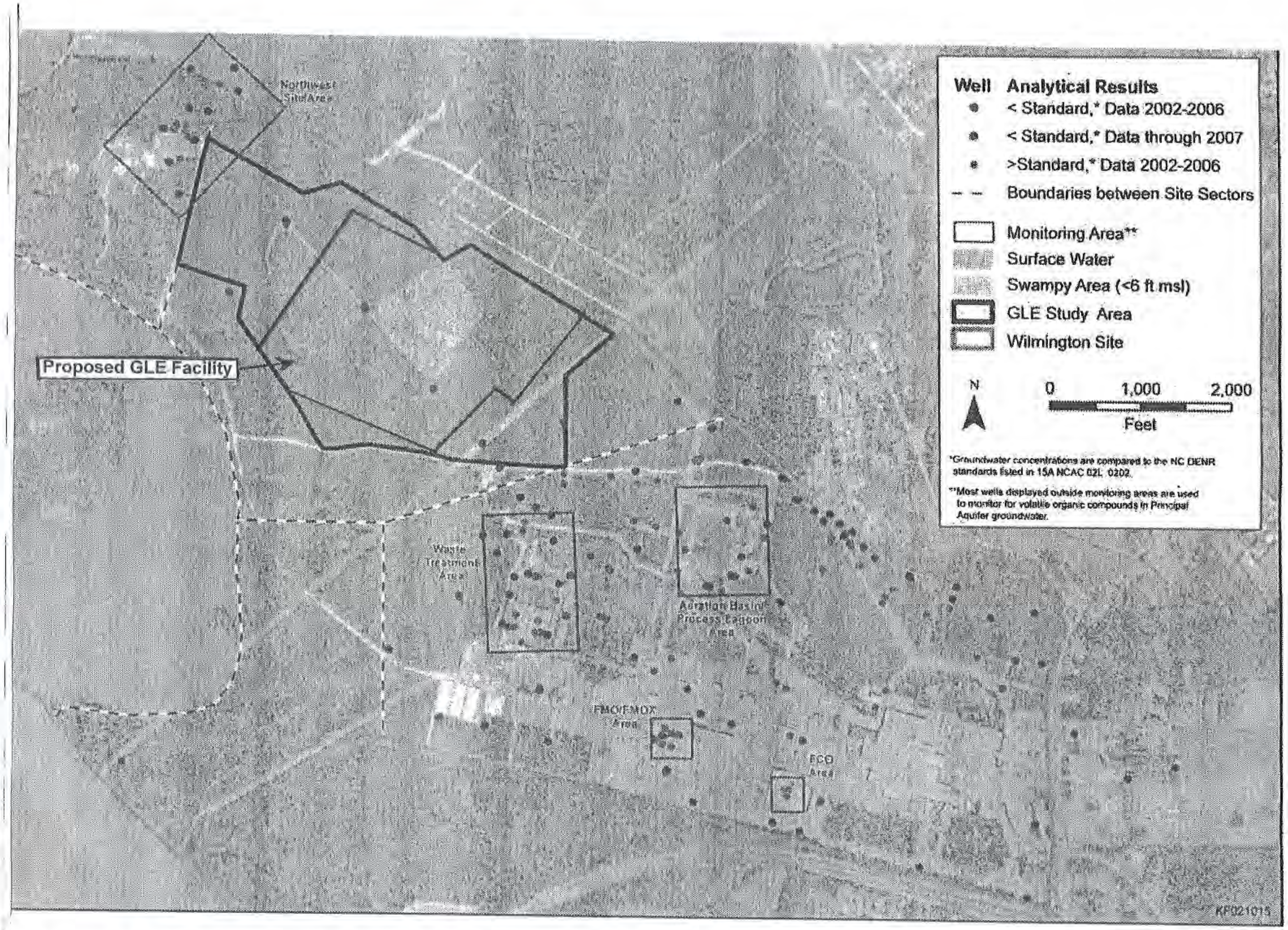


Figure 3-9 Groundwater Monitoring at the Wilmington Site (Modified from GLE, 2008)

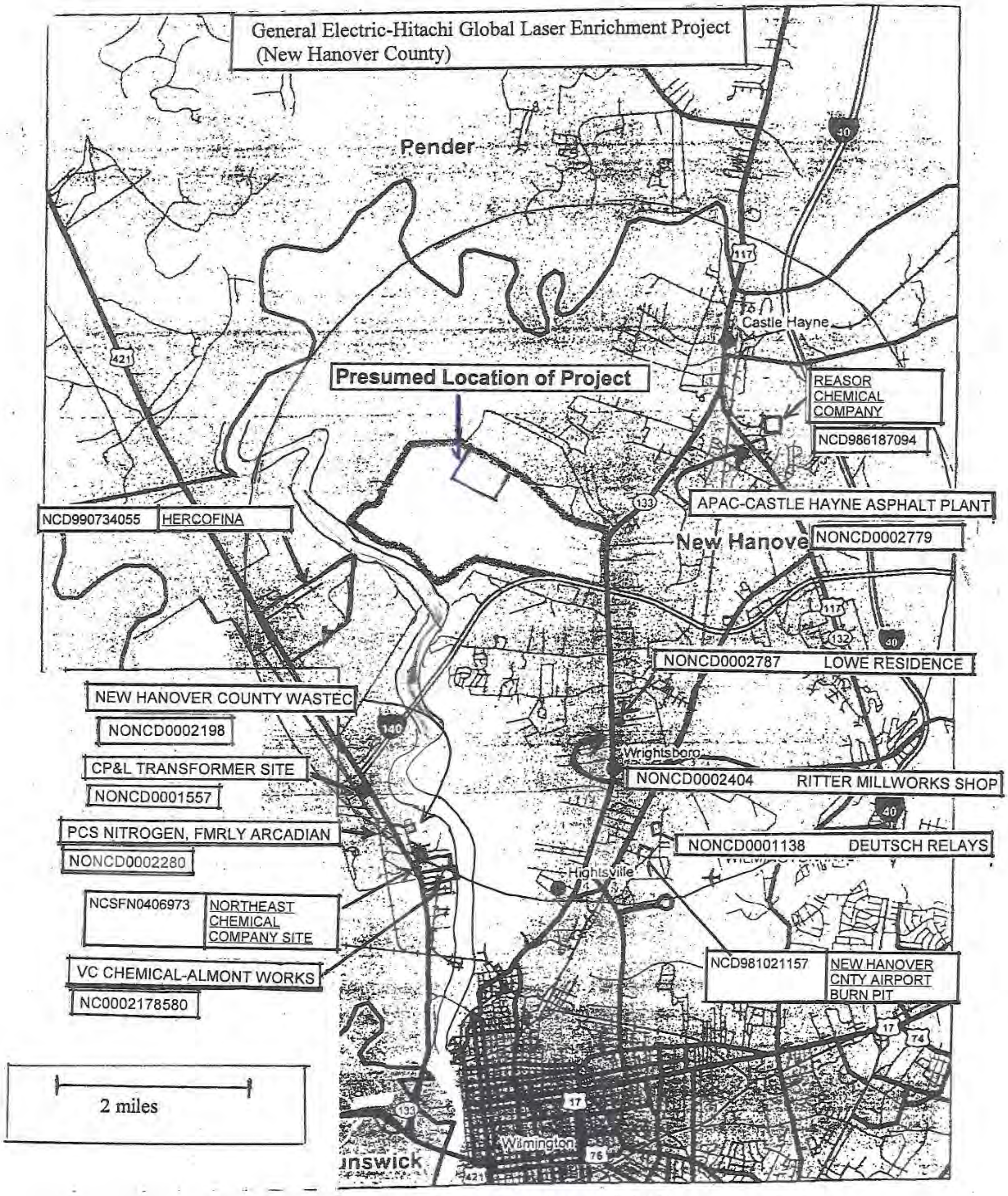
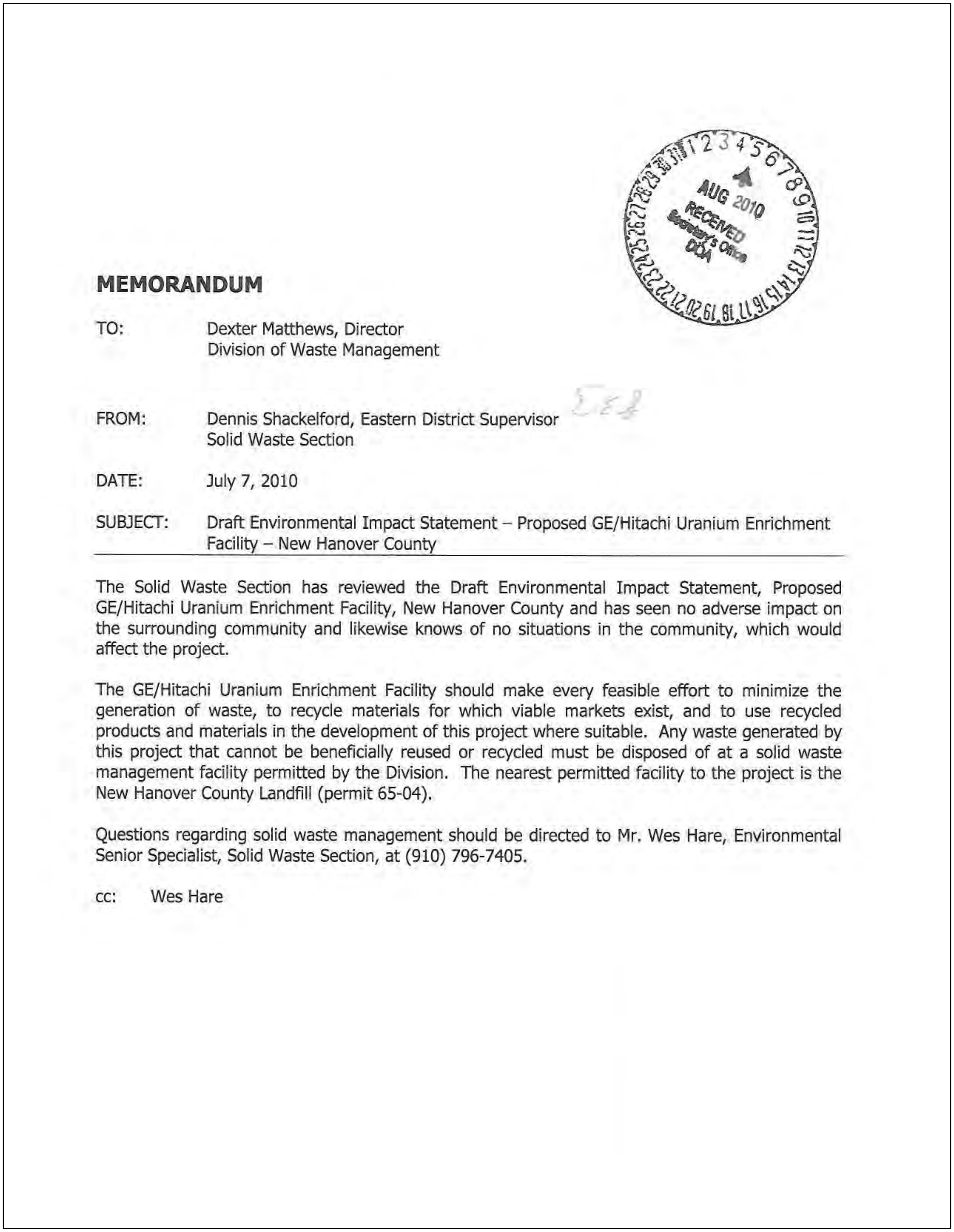


Figure ES-1. Wilmington Site location and vicinity.



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MEMORANDUM

TO: Dexter Matthews, Director
Division of Waste Management

FROM: Dennis Shackelford, Eastern District Supervisor
Solid Waste Section

DATE: July 7, 2010

SUBJECT: Draft Environmental Impact Statement – Proposed GE/Hitachi Uranium Enrichment Facility – New Hanover County

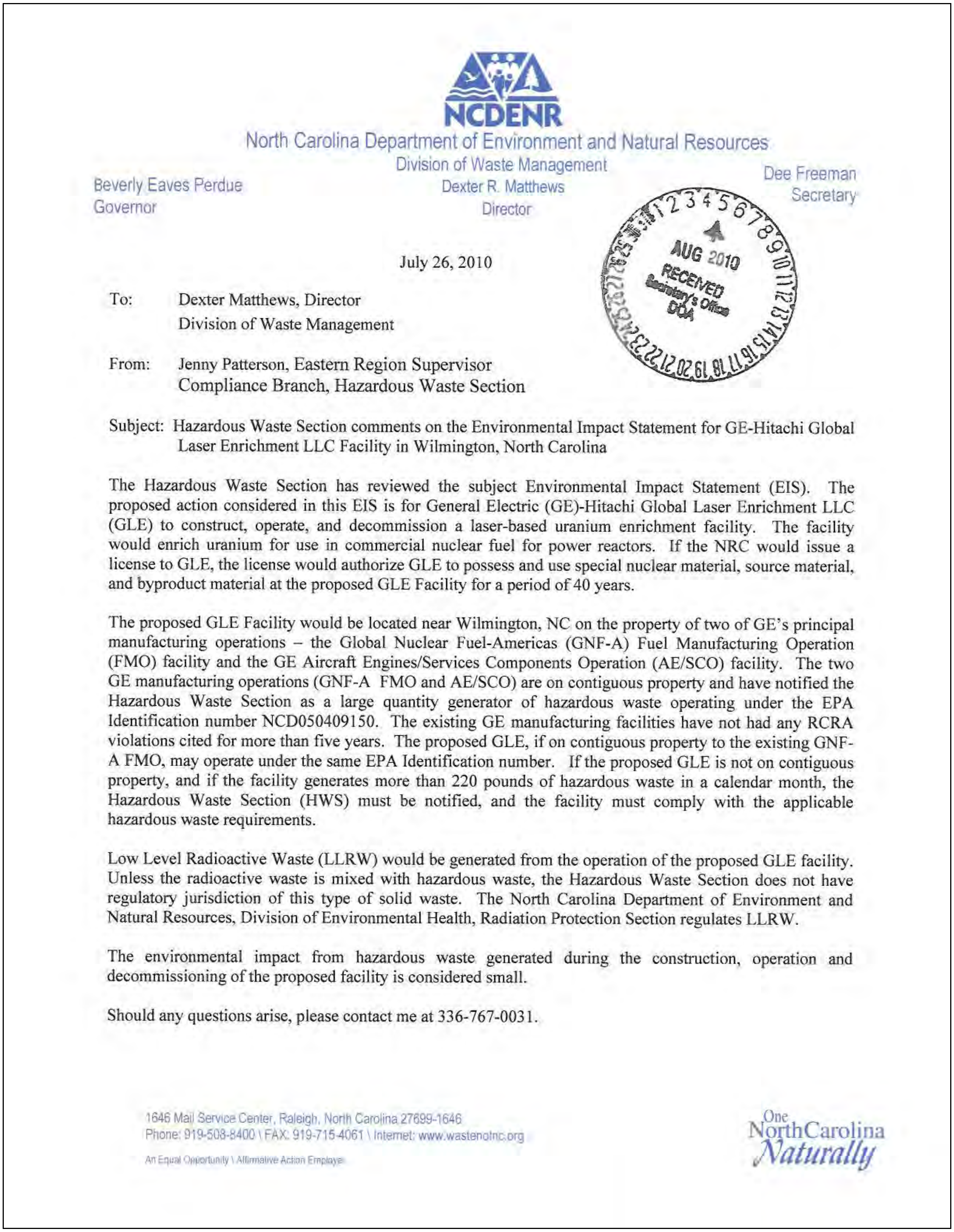
---

The Solid Waste Section has reviewed the Draft Environmental Impact Statement, Proposed GE/Hitachi Uranium Enrichment Facility, New Hanover County and has seen no adverse impact on the surrounding community and likewise knows of no situations in the community, which would affect the project.

The GE/Hitachi Uranium Enrichment Facility should make every feasible effort to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable. Any waste generated by this project that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility permitted by the Division. The nearest permitted facility to the project is the New Hanover County Landfill (permit 65-04).

Questions regarding solid waste management should be directed to Mr. Wes Hare, Environmental Senior Specialist, Solid Waste Section, at (910) 796-7405.

cc: Wes Hare



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North Carolina Department of Environment and Natural Resources
Division of Waste Management
Dexter R. Matthews
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

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July 26, 2010

To: Dexter Matthews, Director
Division of Waste Management

From: Jenny Patterson, Eastern Region Supervisor
Compliance Branch, Hazardous Waste Section

Subject: Hazardous Waste Section comments on the Environmental Impact Statement for GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina

The Hazardous Waste Section has reviewed the subject Environmental Impact Statement (EIS). The proposed action considered in this EIS is for General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) to construct, operate, and decommission a laser-based uranium enrichment facility. The facility would enrich uranium for use in commercial nuclear fuel for power reactors. If the NRC would issue a license to GLE, the license would authorize GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility for a period of 40 years.

The proposed GLE Facility would be located near Wilmington, NC on the property of two of GE's principal manufacturing operations – the Global Nuclear Fuel-Americas (GNF-A) Fuel Manufacturing Operation (FMO) facility and the GE Aircraft Engines/Services Components Operation (AE/SCO) facility. The two GE manufacturing operations (GNF-A FMO and AE/SCO) are on contiguous property and have notified the Hazardous Waste Section as a large quantity generator of hazardous waste operating under the EPA Identification number NCD050409150. The existing GE manufacturing facilities have not had any RCRA violations cited for more than five years. The proposed GLE, if on contiguous property to the existing GNF-A FMO, may operate under the same EPA Identification number. If the proposed GLE is not on contiguous property, and if the facility generates more than 220 pounds of hazardous waste in a calendar month, the Hazardous Waste Section (HWS) must be notified, and the facility must comply with the applicable hazardous waste requirements.

Low Level Radioactive Waste (LLRW) would be generated from the operation of the proposed GLE facility. Unless the radioactive waste is mixed with hazardous waste, the Hazardous Waste Section does not have regulatory jurisdiction of this type of solid waste. The North Carolina Department of Environment and Natural Resources, Division of Environmental Health, Radiation Protection Section regulates LLRW.

The environmental impact from hazardous waste generated during the construction, operation and decommissioning of the proposed facility is considered small.

Should any questions arise, please contact me at 336-767-0031.

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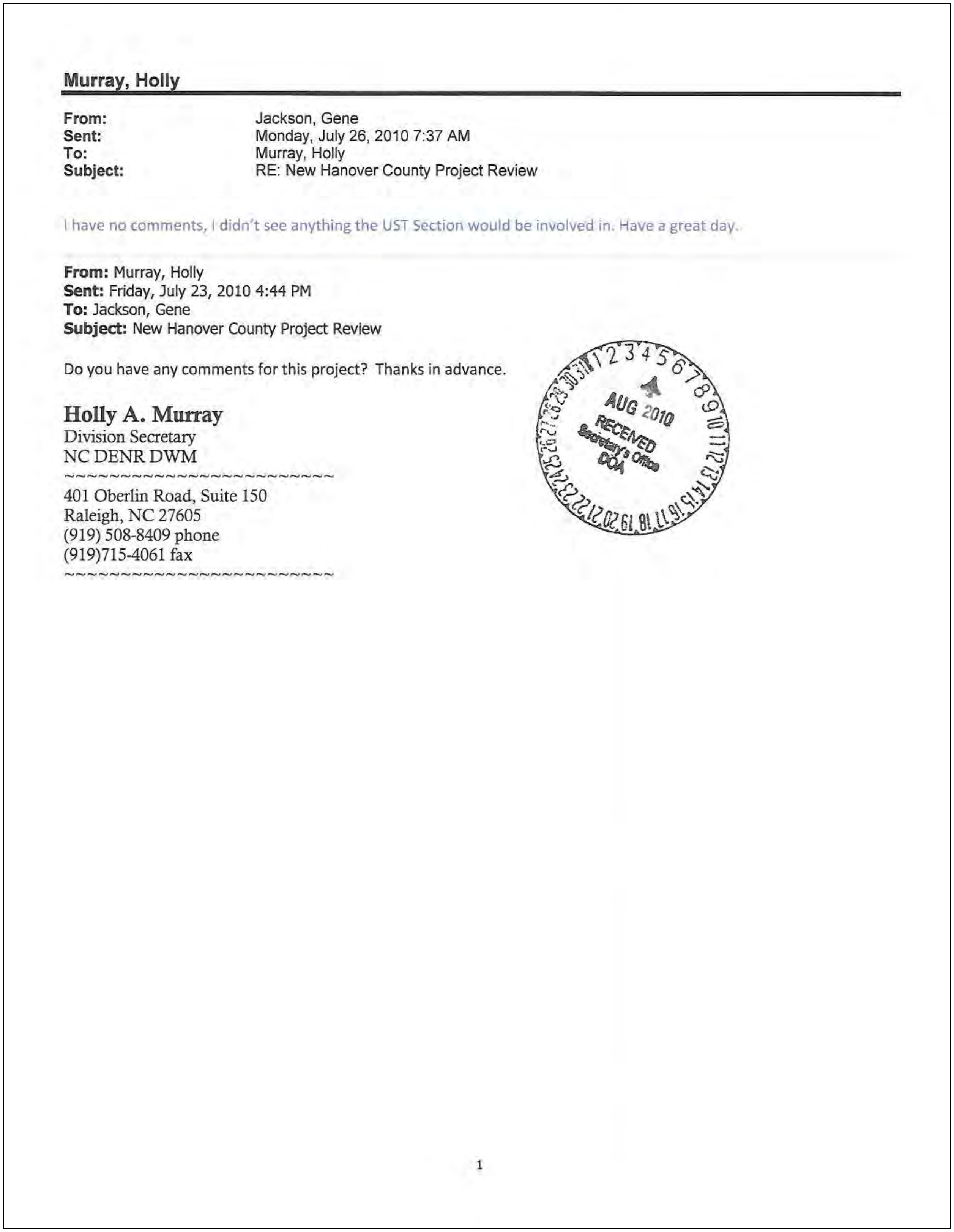


Murray, Holly

From: Jackson, Gene
Sent: Monday, July 26, 2010 7:37 AM
To: Murray, Holly
Subject: RE: New Hanover County Project Review

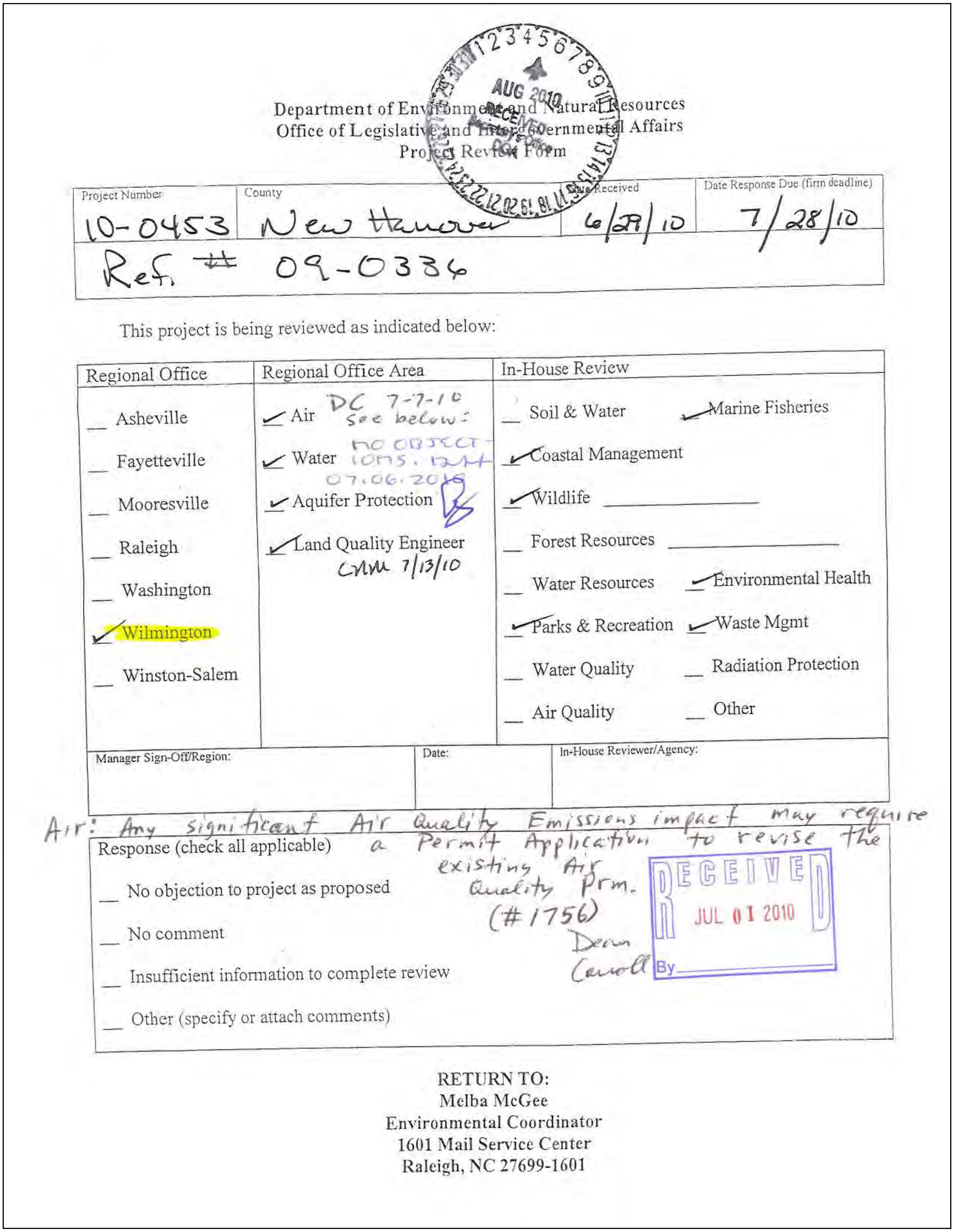
I have no comments, I didn't see anything the UST Section would be involved in. Have a great day.

From: Murray, Holly
Sent: Friday, July 23, 2010 4:44 PM
To: Jackson, Gene
Subject: New Hanover County Project Review

Do you have any comments for this project? Thanks in advance.

Holly A. Murray
Division Secretary
NC DENR DWM
~~~~~~~~~~~~~~~~~~~~~~~~~~
401 Oberlin Road, Suite 150
Raleigh, NC 27605
(919) 508-8409 phone
(919)715-4061 fax
~~~~~~~~~~~~~~~~~~~~~~~~~~

1



AUG 2010 RECEIVED

Department of Environment and Natural Resources
Office of Legislative and Intergovernmental Affairs
Project Review Form

Project Number	County	Date Received	Date Response Due (firm deadline)
10-0453	New Hanover	6/29/10	7/28/10

Ref. # 09-0336

This project is being reviewed as indicated below:

Regional Office

- __ Asheville
- __ Fayetteville
- __ Mooresville
- __ Raleigh
- __ Washington
- ✓ Wilmington
- __ Winston-Salem

Regional Office Area

- ✓ Air DC 7-7-10 see below:
- ✓ Water NO OBJECTIONS. BH 07.06.2010
- ✓ Aquifer Protection
- ✓ Land Quality Engineer CMM 7/13/10

In-House Review

- __ Soil & Water
- ✓ Marine Fisheries
- ✓ Coastal Management
- ✓ Wildlife ____________
- __ Forest Resources ____________
- __ Water Resources
- ✓ Environmental Health
- ✓ Parks & Recreation
- ✓ Waste Mgmt
- __ Water Quality
- __ Radiation Protection
- __ Air Quality
- __ Other

Manager Sign-Off/Region:

Date:

In-House Reviewer/Agency:

Air: Any significant Air Quality Emissions impact may require a Permit Application to revise the existing Air Quality Prm. (#1756) Dean Carroll

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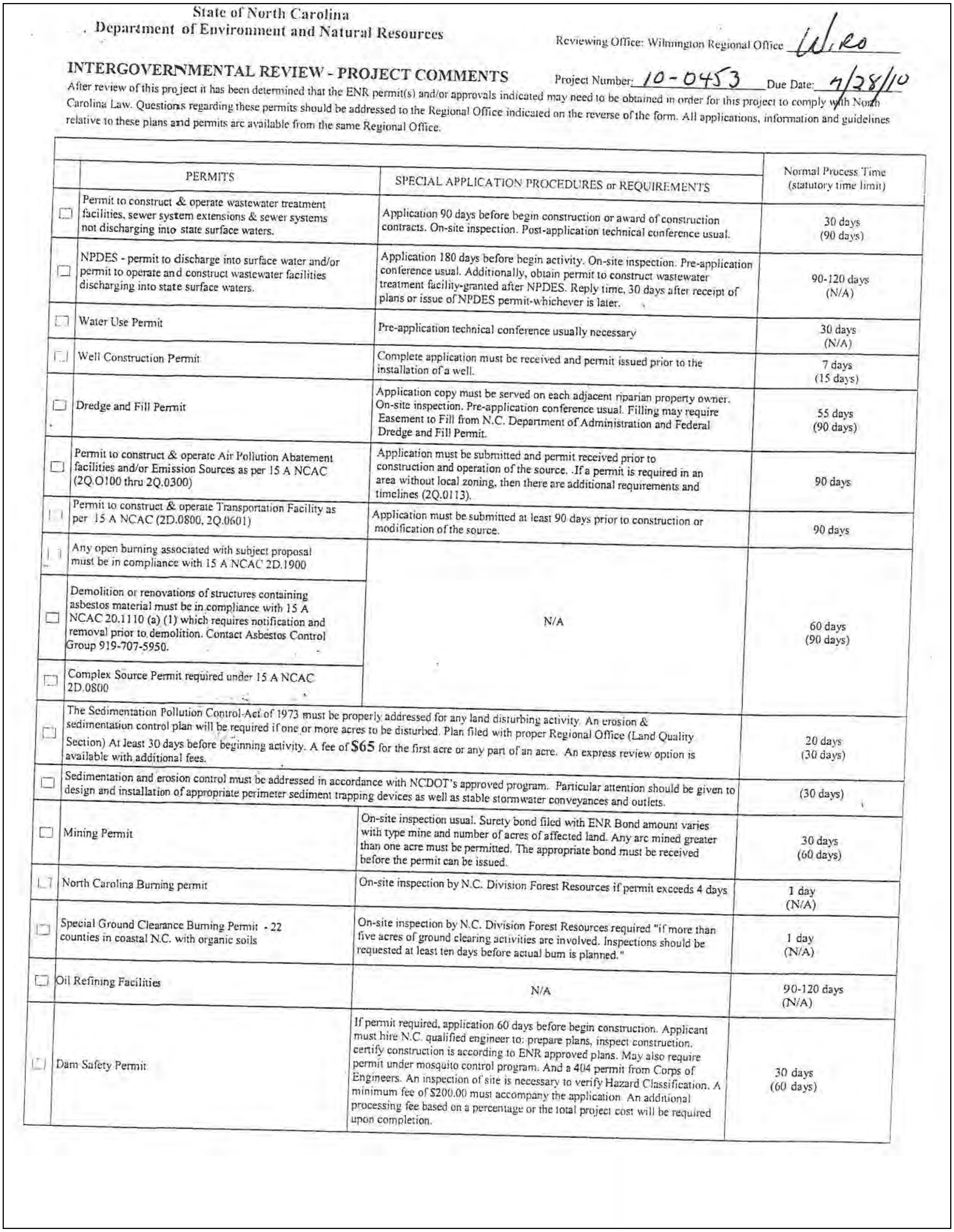
Response (check all applicable)

- __ No objection to project as proposed
- __ No comment
- __ Insufficient information to complete review
- __ Other (specify or attach comments)

RETURN TO:
Melba McGee
Environmental Coordinator
1601 Mail Service Center
Raleigh, NC 27699-1601



State of North Carolina
Department of Environment and Natural Resources

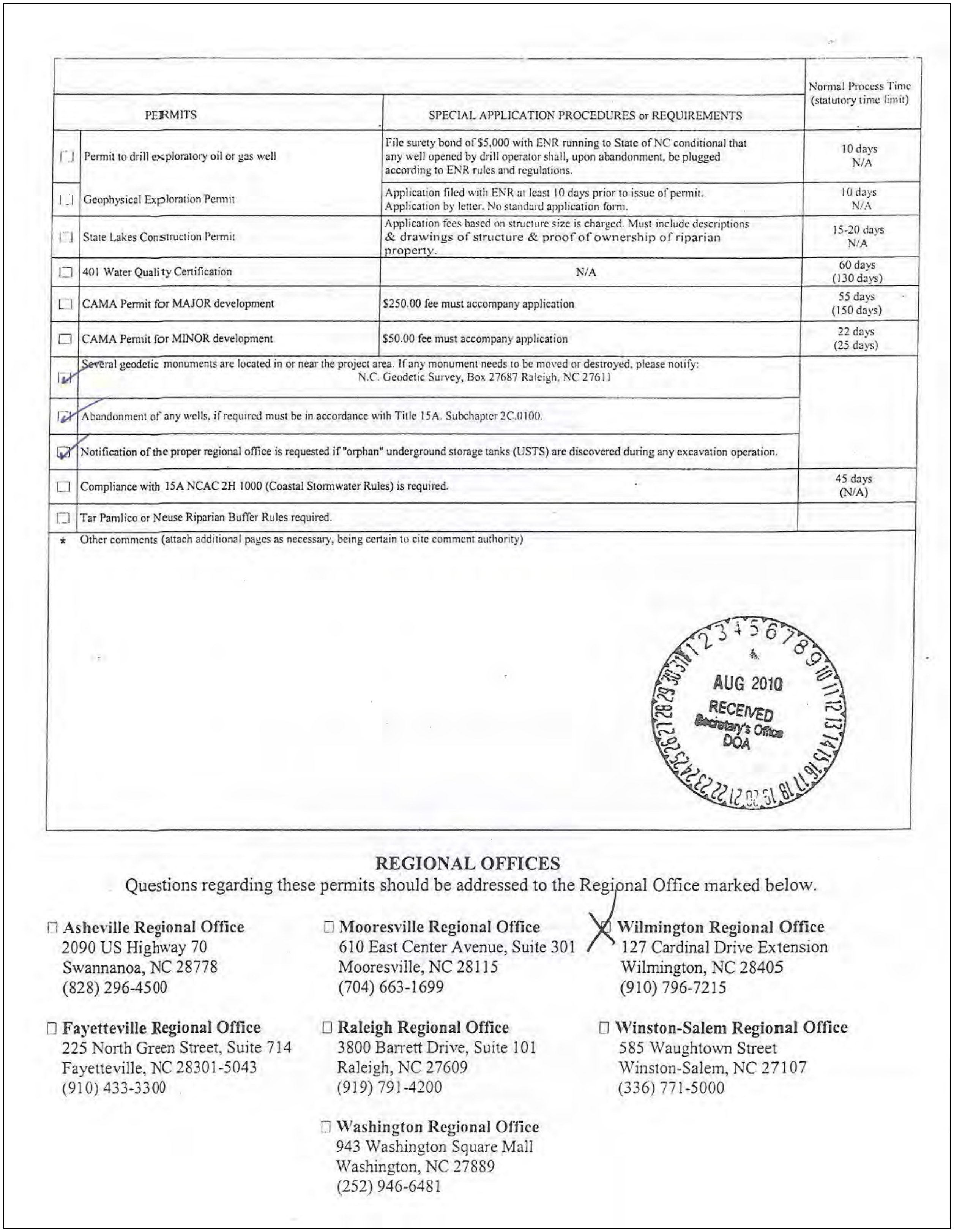
Reviewing Office: Wilmington Regional Office WiRO

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

Project Number: 10-0453 Due Date: 4/28/10

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☐	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.O100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
☐	Permit to construct & operate Transportation Facility as per 15 A NCAC (2D.0800, 2Q.0601)	Application must be submitted at least 90 days prior to construction or modification of the source.	90 days
☐	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
☐	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
☐	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) At least 30 days before beginning activity. A fee of $65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
☐	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.		(30 days)
☐	Mining Permit	On-site inspection usual. Surety bond filed with ENR Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion.	30 days (60 days)



	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days N/A
☐	401 Water Quality Certification	N/A	60 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	55 days (150 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☑	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, NC 27611		
☑	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☑	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☐	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
☐	Tar Pamlico or Neuse Riparian Buffer Rules required.		

* Other comments (attach additional pages as necessary, being certain to cite comment authority)

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 US Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☒ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☐ **Fayetteville Regional Office**
225 North Green Street, Suite 714
Fayetteville, NC 28301-5043
(910) 433-3300

☐ **Raleigh Regional Office**
3800 Barrett Drive, Suite 101
Raleigh, NC 27609
(919) 791-4200

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000

☐ **Washington Regional Office**
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: NEW HANOVER

H11: ENERGY RELATED
FACILITIES/ACTIVITIES

STATE NUMBER: 10-E-0000-0453
DATE RECEIVED: 06/28/2010
AGENCY RESPONSE: 07/28/2010
REVIEW CLOSED: 08/02/2010

RECEIVED
JUN 29 2010
HISTORIC PRESERVATION OFFICE

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF CULTURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

ER 07-2157

JUL 2010
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Secretary's Office
DOA

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REVIEW DISTRIBUTION

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DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CULTURAL RESOURCES
DEPT OF TRANSPORTATION

Due: 7/6/10

PROJECT INFORMATION

APPLICANT: U.S. Nuclear Regulatory Commission
TYPE: National Environmental Policy Act
Draft Environmental Impact Statement

DESC: Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility - entails using a laser-based technology to separate or enrich the naturally occurring isotopes of uranium; project to be located on existing General Electric Company/Global Nuclear Fuel - Americas near Wilmington, NC

CROSS-REFERENCE NUMBER: 09-E-0000-0336

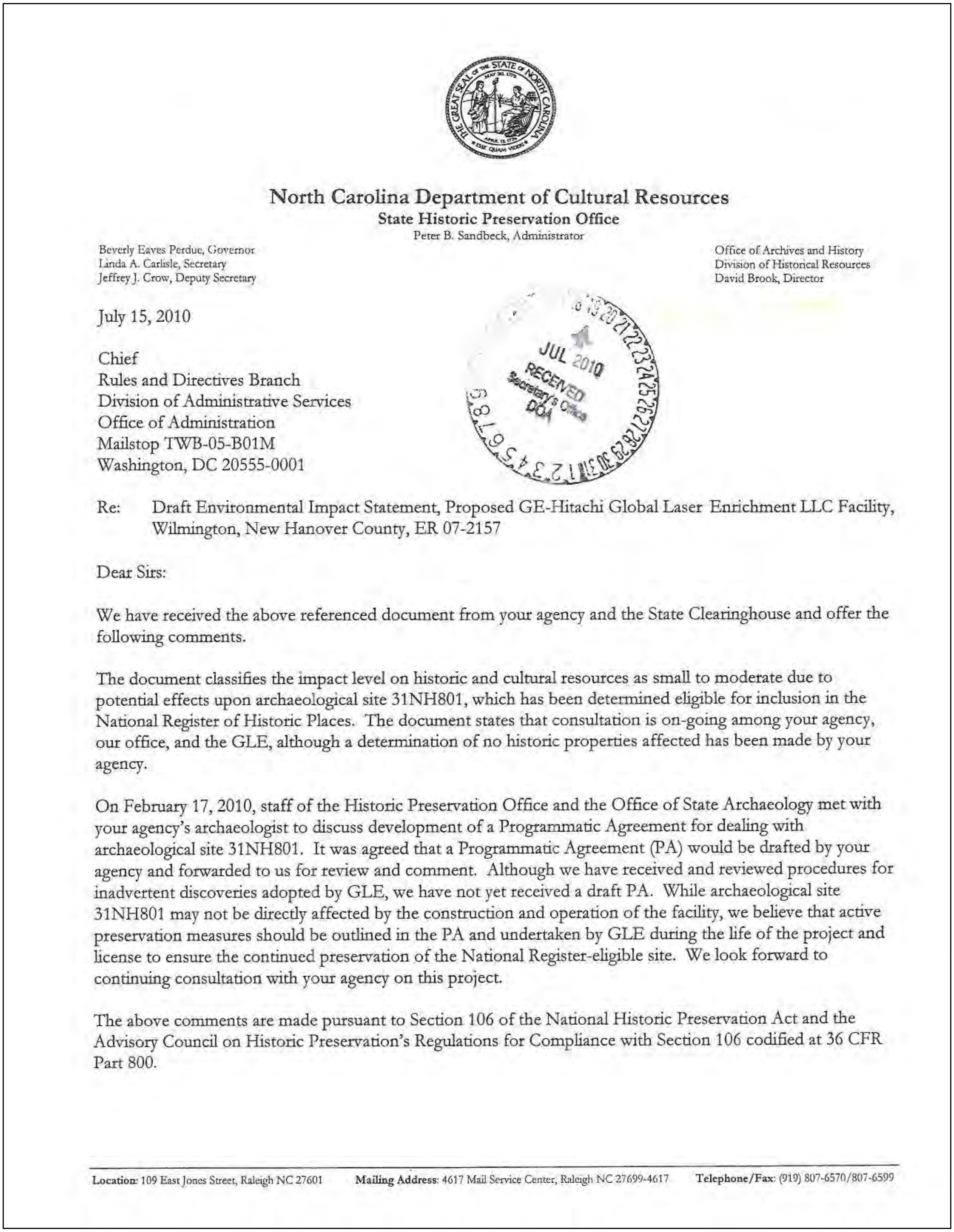
The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley DATE: 7-15-10

JUN 30 2010



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 15, 2010

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Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop TWB-05-B01M
Washington, DC 20555-0001

Re: Draft Environmental Impact Statement, Proposed GE-Hitachi Global Laser Enrichment LLC Facility, Wilmington, New Hanover County, ER 07-2157

Dear Sirs:

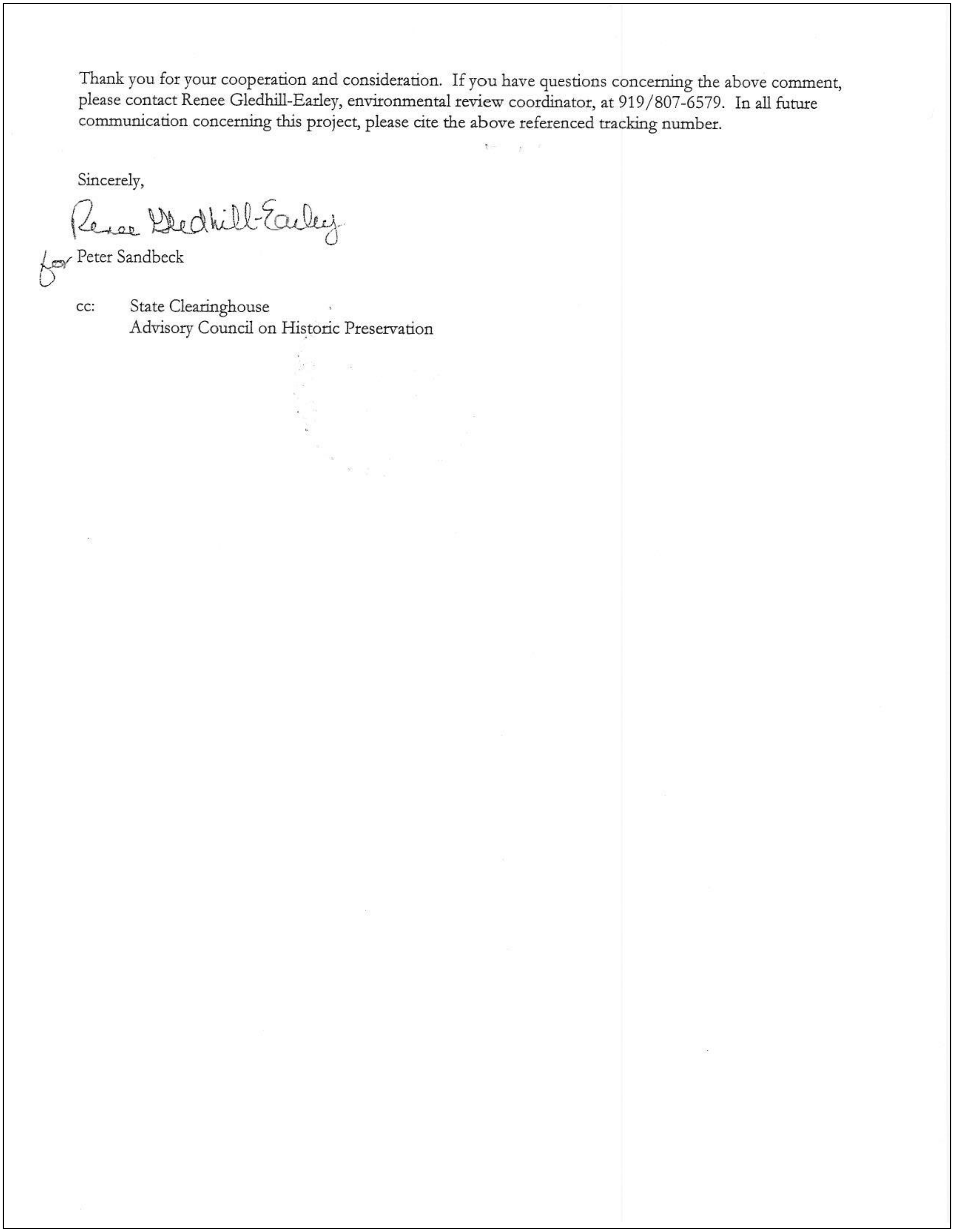
We have received the above referenced document from your agency and the State Clearinghouse and offer the following comments.

The document classifies the impact level on historic and cultural resources as small to moderate due to potential effects upon archaeological site 31NH801, which has been determined eligible for inclusion in the National Register of Historic Places. The document states that consultation is on-going among your agency, our office, and the GLE, although a determination of no historic properties affected has been made by your agency.

On February 17, 2010, staff of the Historic Preservation Office and the Office of State Archaeology met with your agency's archaeologist to discuss development of a Programmatic Agreement for dealing with archaeological site 31NH801. It was agreed that a Programmatic Agreement (PA) would be drafted by your agency and forwarded to us for review and comment. Although we have received and reviewed procedures for inadvertent discoveries adopted by GLE, we have not yet received a draft PA. While archaeological site 31NH801 may not be directly affected by the construction and operation of the facility, we believe that active preservation measures should be outlined in the PA and undertaken by GLE during the life of the project and license to ensure the continued preservation of the National Register-eligible site. We look forward to continuing consultation with your agency on this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address:** 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax:** (919) 807-6570/807-6599



Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Peter Sandbeck

cc: State Clearinghouse
Advisory Council on Historic Preservation

APPENDIX C
RADIOLOGICAL AND CHEMICAL IMPACT ASSESSMENT METHODOLOGY AND IMPACTS

APPENDIX C
RADIOLOGICAL AND CHEMICAL IMPACT ASSESSMENT METHODOLOGY AND IMPACTS

C.1 Introduction

This appendix discusses the methodology, data, and results for the potential impacts to workers as well as members of the general public resulting from preconstruction and construction activities, and normal operations of the proposed General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) Facility. The impacts during decommissioning are discussed in Section 4.2.17.10.

Radiological impacts during preconstruction and construction activities would be accrued primarily to the workers. Exposures to the offsite public would not be expected due to the distance from construction emission sources. However, the public would be exposed to emissions from the proposed GLE Facility during the overlap period of construction and early operations.

Preconstruction and construction activities would not generate any radiological contamination, but they could disturb areas previously contaminated due to deposition of contaminated particulates on soil from air effluent releases of past operation of the Fuel Manufacturing Operation (FMO) Facility as well as to the current air emissions from FMO facility operations. Preconstruction and construction workers could also be exposed to external gamma radiation from stored depleted uranium (DU) cylinders, low-enriched uranium (LEU) product cylinders, natural feed cylinders and empty cylinders relating to the existing FMO operations. Construction workers would also be exposed to air effluent releases from the proposed GLE Facility and external radiation from cylinder storage (DU, LEU, etc.) during the period when construction and early operation overlap.

Radiation impacts to members of the general public would result from the atmospheric release of uranium from normal operations as well as external gamma radiation associated with stored cylinders. Potential long-term, low-level, hydrogen fluoride (HF) and uranium exposures to members of the public would be the primary offsite chemical exposures of concern.

Potential radiation impacts to GLE operational workers include internal exposures associated with uranium enrichment operations, external exposures to DU and LEU product cylinders, as well as external exposures associated with process operations. Radiation dosimetry associated with similar operational facilities will be used to assess operational worker doses at the proposed GLE Facility.

C.2 Pathway Assessment Methodology

For calculating the doses to workers from existing soil contamination, the RESRAD code Version 6.5 (Yu et al., 2001) was used in conjunction with contamination data from site environmental reports (GNF-A, 2007) and the environmental assessment for the license renewal for the Global Nuclear Fuel-Americas (GNF-A) FMO Facility (NRC, 2009). The CAP88-PC computer code was used to estimate the dose from existing FMO operations and air effluent releases from the proposed GLE Facility. The CAP88-PC code also calculates airborne concentrations in picocuries per cubic meter for each radionuclide at user-defined locations. These concentrations can be converted to micrograms per cubic meters for the purpose of evaluating the chemical toxicity of uranium. Similarly, the chemical toxicity from HF emissions can be evaluated. For estimating the external dose from the cylinder storage yard, the RESRAD-BUILD code Version 3.5 (Yu et al., 2003) was used. The GENII Version 2 computer code was used to estimate the doses for the public from liquid effluent releases (Napier, 2007; Napier et al., 2007).

C.2.1 Construction Workers

The primary exposure pathways for construction workers from existing soil contamination are:

- inhalation of contaminated dust resuspended by construction activities in contaminated soils
- external exposure from previously contaminated soils

The primary exposure pathways for construction workers from existing FMO operations are:

- external radiation from stored DU tails, LEU product, and natural feed and empty cylinders from FMO operations
- external gamma radiation due to plume submersion from FMO operations
- external gamma radiation due to deposition from FMO operations
- inhalation of uranium compounds due to plume passage from FMO operations
- inhalation of uranium compounds due to resuspension from FMO operations

The additional exposure pathways for construction workers associated with continued construction activities after startup of the proposed GLE Facility include:

- external radiation from stored DU tails, LEU product, and natural feed and empty cylinders from operation of the proposed GLE Facility
- external gamma radiation due to plume submersion from GLE Facility operations
- external gamma radiation due to deposition from GLE Facility operations
- inhalation of uranium compounds due to plume passage from GLE Facility operations
- inhalation of uranium compounds due to resupension from GLE Facility operations

C.2.2 Members of the General Public

Radiological impacts to members of the general public from air effluent releases were estimated for the following receptors:

- nearest resident
- hypothetical persons residing outside the Wilmington Site boundary

The following exposure pathways were included in the dose assessment:

- external gamma radiation due to plume submersion
- external gamma radiation due to deposition
- inhalation of uranium compounds due to plume passage
- inhalation of uranium compounds due to resuspension
- ingestion of plant foods grown onsite and/or within the region of the proposed GLE Facility
- ingestion of meat products raised onsite and/or within the region of the proposed GLE Facility
- ingestion of milk produced onsite and/or within the region of the proposed GLE Facility

Radiological impacts to the public were also estimated from liquid effluent releases. It was assumed that a member of the public was exposed to contaminated surface water from recreational activities and from ingestion of fish grown in the contaminated surface water. The recreational activities considered were swimming, boating, and use of shoreline. The following exposure pathways were included in the dose assessment:

- external exposure from swimming
- external exposure from boating
- external exposure from contaminated shoreline sediment
- inadvertent ingestion of contaminated surface water during swimming
- ingestion of fish grown in contaminated surface water

C.2.3 GLE Operational Workers

Radiological impacts to GLE operational workers were estimated on the basis of dosimetry records from historical operations from similar facilities. The GLE operational workers will be monitored under a radiation dosimetry program that measures both external and internal radiation doses.

C.2.4 Dose Assessment Methodology for Existing Soil Contamination

For calculating the doses to workers from the existing soil contamination, the RESRAD code Version 6.5 (Yu et al., 2001) was used. RESRAD incorporates pathway analysis models to evaluate the dose from direct exposure, inhalation of particulates and radon, and ingestion of plant foods, meat, milk, aquatic foods, water, and soil. Preconstruction and construction workers were assumed to not ingest any foods grown onsite; therefore, only doses from direct external exposure and inhalation pathways were considered. The contamination in RESRAD changes are due to soil erosion, leaching, and in-growth and decay of radionuclides in the decay chain.

The external pathway dose for an outside receptor in the RESRAD code is calculated as:

$$D(t) = \sum_n F_i \times C_n(t) \times DCF_{ext,n} \times FCD_n \times FA_n \times FS_n \qquad \text{(Eq. 1)}$$

where

F_i = fraction of time spent outside near the source
$C_n(t)$ = yearly average concentration of radionuclide n present at time t (pCi/g)
$DCF_{ext,n}$ = external dose conversion factor for infinite volume source for radionuclide n (mrem/yr/pCi/g)
FCD_n = depth-and-cover factor that corrects for the depth of contamination and any cover on top of contamination of radionuclide n
FA_n = area factor corrects for the area of contamination for radionuclide n
FS_n = shape factor corrects for the irregular shape of the contaminated area for radionuclide n

In the RESRAD code for external pathway dose estimation, the depth-and-cover factor is calculated from the thickness of contamination and the thickness of cover material. The area factor is calculated from the contaminated area, and the shape factor is calculated if the contamination is not circular. All three factors are radionuclide-dependent.

The inhalation pathway dose for an outside receptor in the RESRAD code is calculated as:

$$D(t) = \sum_n F_i \times C_n(t) \times DCF_{inh,n} \times FCD \times FA \times ASR \times FI \qquad \text{(Eq. 2)}$$

where

F_i = fraction of time spent outdoors
$C_n(t)$ = yearly average concentration of radionuclide n present at time t (pCi/g)
$DCF_{inh,n}$ = inhalation dose conversion factor for radionuclide n (mrem/pCi)
FCD = depth-and-cover factor that corrects for the depth of contamination and any cover on top of contamination
FA = area factor corrects for the area of contamination
ASR = average mass loading of airborne contaminated soil particles (g/m^3)
FI = annual intake of air (m^3/yr)

In the RESRAD code for inhalation pathway dose estimation, the depth-and-cover factor is calculated from the thickness of contamination and the thickness of cover material. The area factor is calculated from the size of the contaminated area. Both parameters are radionuclide-independent. The detailed discussion on yearly average concentration calculations and these pathways can be found in the RESRAD manual (Yu et al., 2001).

C.2.5 Dose Assessment Methodology for Air Effluent Releases

The CAP88-PC code (Version 3) was used to estimate the radiological impacts associated with the atmospheric transport of uranium isotope air emission during normal operations (Rosnick, 2007). CAP88-PC estimates the total effective dose associated with the external, inhalation, and ingestion pathways. Version 3 of the code has incorporated dose conversion and risk factors from Federal Guidance Report Number 13 (FGR-13) (EPA, 1999), which utilized dose conversion factors from the International Commission on Radiological Protection (ICRP) 72 (ICRP-72) (ICRP, 1996).

The CAP88-PC code incorporates a modified version of the AIRDOS-EPA program to calculate the environmental transport of radionuclides. Relevant sections of the CAP88-PC Version 3 user guide are reproduced in this section as referenced.

At the center of the atmospheric transport model is the Gaussian plume model of Pasquill as modified by Gifford:

$$\chi = \frac{Q}{2\pi \times \sigma_y \times \sigma_z \times \mu} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]\left(\exp\left[-\frac{1}{2}\left(\frac{z-H}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z+H}{\sigma_z}\right)^2\right]\right) \quad \text{(Eq. 3)}$$

where

χ = concentration in air (chi) at *x* meters downwind, *y* meters crosswind and *z* meters above ground (Ci/m^3)
Q = Release rate from stack (Ci/s)
μ = wind speed (m/s)
σ_y = horizontal dispersion coefficient (m)
σ_z = vertical dispersion coefficient (m)
H = effective stack height (m)
y = crosswind distance (m)
z = vertical distance (m)

The effective release height used in Equation 3 considers the buoyant plume rise due to compounds being released above ambient temperatures. For the proposed GLE Facility, any released uranium compounds are assumed to be at ambient temperatures and the effective stack height is assumed to be the height of the release point.

Annual average meteorological data sets usually include frequencies for several wind-speed categories for each wind direction and Pasquill atmospheric stability category. The CAP88-PC code uses reciprocal averaged wind speeds in the atmospheric dispersion equations that permit a single calculation for each wind speed category. Equation 3 is applied to ground-level concentrations in the air at the plume centerline by setting *y* and *z* to zero, which results in:

$$\chi = \frac{Q}{\pi \times \sigma_y \times \sigma_z \times \mu} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \quad \text{(Eq. 4)}$$

The average ground-level concentration in air over a sector of 22.5° can be approximated by:

$$\chi_{avg} = \frac{\int_0^\infty \exp\left[-\left(\frac{0.5}{\sigma_y{}^2}\right)y^2\right]dy}{x\tan(11.25^\circ)} \times \frac{Q}{\pi \times \sigma_y \times \sigma_z \times \mu}\exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \quad \text{(Eq. 5)}$$

which can be reduced further to:

$$\chi_{avg} = \frac{Q}{0.15871 \times \pi \times x \times \sigma_z \times \mu}\exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \quad \text{(Eq. 6)}$$

The CAP88-PC code considers both dry and wet deposition as well as radioactive decay. Plume depletion is accounted for by substituting a reduced release rate *Q*' for the original release rate for each downwind distance *x* (Slade, 1968). The ratio of the reduced release rate to the original is the depletion fraction. The overall depletion fraction used in CAP88-PC is the product of the depletion fractions for precipitation, dry deposition, and radioactive decay.

Ground surface soil concentrations are calculated on an annual basis, with in-growth and decay of progeny radionuclides calculated using modified Bateman's equations (Rosnick, 2007) for the entire decay chain. Radionuclide concentrations in meat, milk, and vegetables are calculated using elemental transfer factors from Report 123 of the National Council on Radiation Protection and Measurements (NCRP, 1996). The concentration in soil for each isotope is multiplied by the appropriate elemental transfer factor to generate a concentration in each of the ingestion pathway media for that isotope in that sector.

C.2.6 Dose Assessment Methodology for External Dose from Cylinder Storage Yard

For estimating the external dose from the cylinder storage yard, the RESRAD-BUILD code Version 3.5 (Yu et al., 2003) was used. RESRAD-BUILD is a pathway analysis model developed to evaluate the potential radiation dose incurred by an individual who works or lives in a building contaminated with radioactive material. The code includes seven exposure pathways:

- external exposure directly from the source
- external exposure to the material deposited on the floor
- external exposure due to air submersion
- inhalation of airborne radioactive particulates
- inhalation of aerosol indoor radon progeny
- inadvertent ingestion of radioactive material directly from the sources
- inadvertent ingestion of materials deposited on the surfaces

For estimating the dose from the cylinder storage yard, a preconstruction and construction worker working outside is assumed to have been exposed directly to a large uniformly contaminated line source. Since the receptor is outside, only the dose from the direct external pathway was calculated.

The yearly average external dose at any time *t* from a contaminated line source is calculated as:

$$D_n(t) = 24 \times ED \times F_i \times \overline{C_n(t)} \times \sum_j Y_{nj} \times E_{nj} \times B(\mu_a t_a^{'}) \times d \times \left[\frac{\mu_{en}(E_{nj})}{\rho}\right]_{air} \times A_L \qquad \text{(Eq. 7)}$$

A_L is given as:

$$A_L = e^{-\mu_c t_c} \int_{line} \frac{e^{-\mu_a \sqrt{x^2+t_a^2}}}{4\pi(x^2+t_a^2)} dx \qquad \text{(Eq. 8)}$$

where

24 = time conversion factor (hours/day)
ED = exposure duration (day)
μ_a = attenuation coefficient in air (cm^{-1})
B = buildup factor
F_i = fraction of time spent near the source
$\overline{C_n(t)}$ = average line source concentration of radionuclide *n* at time *t* (pCi/m)
y_{nj} = yield for gamma *j* from radionuclide *n*
E_{nj} = energy for gamma *j* from radionuclide *n* (MeV)
d = unit dose rate per energy absorption
μ_c = attenuation coefficient in shielding material (cm^{-1})
$\left[\frac{\mu_{en}(E_{nj})}{\rho}\right]_{air}$ = mass energy absorption coefficient in air (cm^2/g)
t_a = perpendicular distance to receptor
$t_{a'}$ = distance from the receptor to the midpoint of the line source

A detailed discussion on calculating the external dose from line sources is provided in the RESRAD-BUILD user's manual (Yu et al., 2003).

C.2.7 Liquid Effluent Dose Assessment Methodology

For calculating doses to the public from liquid effluent releases, the GENII code Version 2.06 (Napier, 2007; Napier et al., 2007) was used. The code has been developed by Pacific Northwest National Laboratory for the U.S. Environmental Protection Agency (EPA) for calculating dose and risk from radionuclide releases in the environment. GENII Version 2 incorporates internal dosimetry models recommended by the ICRP, and the related risk factors published in FGR-13 (EPA, 1999). The GENII code includes a set of programs for calculating radiation dose and risk from radionuclides released to the environment. GENII implements the U.S. Nuclear Regulatory Commission (NRC) models in the LADTAP computer code for surface water doses. The Northeast Cape Fear River would receive the liquid effluent discharges from the proposed GLE Facility. There are no public water intakes on the river downstream of the discharge point, so only the fish ingestion and recreational water use-related exposure pathways were analyzed (GLE, 2009b).

The GENII code calculates the average media concentration at the exposure location, the pathway-specific intake parameter, and the pathway dose. The following equations for dose estimations from different applicable pathways used in this analysis are taken directly from the GENII code (Napier, 2007; Napier et al., 2007).

C.2.7.1 Swimming Exposure

The evaluation of the recreational swimming immersion intake parameter is performed as follows:

$$I_{wrig}(T) = C_{wri}(T) \times FE_{wrg} \times TE_{wrg} \times TC_s \tag{Eq. 9}$$

where

$I_{wrig}(T)$ = average exposure factor over time period T for radionuclide i from swimming at recreational swimming location r for individuals in age group g (Bq/L)

$C_{wri}(T)$ = average water concentration over time period T for radionuclide i in surface water at the recreational swimming location r (Bq/L)

FE_{wrg} = frequency of swimming events at recreational swimming location r for individuals in age group g (events/day)

TE_{wrg} = duration of an average swimming event at recreational swimming location r for individuals in age group g (hours/event)

T_{wrg} = annual exposure factor for swimming at recreational swimming location r for individuals in age group g (days)

TC_s = time correction set equal to T_{wrg}/8760 hours/year

For this pathway, the daily exposure factor may be represented as the product of the event frequency, FE_{wrg}, and the event duration, TE_{wrg}.

The effective dose from external exposure to swimming in contaminated water is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$IE_{wrig}(T) = I_{wrig}(T) \times E_{iaw} \times TE_w \times 3.15 \times 10^7 \tag{Eq. 10}$$

where

$IE_{wrig}(T)$ = effective dose from external exposure to radionuclide i in contaminated water at recreational water usage location r for an individual in age group g (Sv)

E_{iaw} = effective dose equivalent factor for external exposure from water immersion (w) for radionuclide i for an adult (Sv-L per Bq-s)

TE_w = time of exposure (year)

3.15×10^7 = units correction (seconds/year)

C.2.7.2 Boating Exposure

The evaluation of the recreational boating exposure intake parameter is performed as follows:

$$I_{brig}(T) = C_{bri}(T) \times SB \times FE_{brg} \times TE_{brg} \times TC_b \qquad \text{(Eq. 11)}$$

where

$I_{brig}(T)$ = average exposure factor over the period *T* for radionuclide *i* from boating at recreational boating location *r* for individuals in age group *g* (Bq/L)
$C_{bri}(\mathrm{T})$ = average water concentration of radionuclide *i* at recreational boating location *r* (Bq/L)
SB = shielding factor for boating exposures (dimensionless)
FE_{brg} = average frequency of daily boating events at recreational boating location *r* for individuals in age group *g* (events/day)
TE_{brg} = duration of an average boating event at recreational boating location *r* for individuals in age group *g* (hours/event)
TC_b = time correction set equal to T_{brg}/8760 hours/year
T_{brg} = annual exposure factor for boating at recreational boating location *r* for individuals in age group *g* (days)

For this pathway the daily exposure factor may be represented as the product of the event frequency, FE_{brg}, and the event duration, TE_{brg}.

The effective dose from external exposure to boating in contaminated water is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$IE_{brig}(T) = I_{brig}(T) \times E_{iaw} \times TE_b \times 3.15 \times 10^7 / 2 \qquad \text{(Eq. 12)}$$

where

$IE_{brig}(T)$ = effective dose from external exposure to radionuclide *i* from boating in contaminated water at recreational water usage location *r* for an individual in age group *g* (Sv)
E_{iaw} = effective dose equivalent factor for external exposure from water immersion (*w*) for radionuclide *i* for an adult (Sv-L per Bq-s)
TE_b = time of exposure (year)
2 = factor to account for being at the water surface rather than immersed (dimensionless)
3.15×10^7 = units correction (s/yr)

C.2.7.3 External Exposure to Shoreline Sediment

The sediment concentration at the end of a year is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$C_{sri}(T_{yr}) = \frac{TC \times C_{ri}(T_{yr}) \times (1 - e^{-\lambda_i T_{yr}})}{\lambda_i} \tag{Eq. 13}$$

where

$C_{sri}(T_{yr})$ = concentration of radionuclide i in sediment after one year of accumulation, from deposition on the shoreline at recreational water usage location r (Bq/m^2)
TC = transfer rate constant from water to sediment (L/m^2/yr)
$C_{ri}(T_{yr})$ = average (constant) annual water concentration for radionuclide i at recreational water usage location r (Bq/L)
T_{yr} = one year integrating period for deposition to sediments (year)
λ_i = radiological decay constant for radionuclide i (year^{-1})

The external exposure parameter is evaluated by determination of the average sediment concentration during a year, as follows:

$$C_{sri}(T_{yr}) = \int_0^{T_{yr}} \frac{C_{sri}(t)dt}{T_{yr} \times d_{sed} \times \rho_{sed}} \tag{Eq. 14}$$

where

$C_{sri}(T_{yr})$ = shoreline sediment time integral of exposure for radionuclide i evaluated at the recreational usage location r (Bq/kg)
$C_{sri}(t)$ = sediment concentration for radionuclide i at recreational water usage location r (Bq/m^2) at any time t
d_{sed} = thickness of shoreline sediments (m)
ρ_{sed} = density of shoreline sediments (kg/m^3)
T_{yr} = one year exposure period (year)

The evaluation of the recreational shoreline exposure intake parameter is performed as follows:

$$I_{srig}(T) = C_{sri}(T) \times SW_r \times FE_{srg} \times TE_{srg} \times T_{srg} / 8760 \tag{Eq. 15}$$

where

$I_{srig}(T)$ = average exposure factor over the period T for radionuclide i from shoreline exposure at recreational shoreline location r for individuals in age group g (Bq/kg)
$C_{sri}(T)$ = average shoreline sediment concentration of radionuclide i at recreational shoreline location r (Bq/kg)
SW_r = shoreline width factor for the recreational shoreline location r (dimensionless)
FE_{srg} = shoreline use event frequency at recreational shoreline location r for individuals in age group g (events/day)
TE_{srg} = duration of each shoreline exposure event at recreational shoreline location r for individuals in age group g (hours/event)
T_{srg} = annual exposure factor for shoreline exposure at recreational shoreline location r for individuals in age group g (days)
8760 = unit correction (hours/year)

For this pathway, the daily exposure factor may be represented as the product of the event frequency, FE_{srg}, and the event duration, TE_{srg}.

The effective dose from external exposure to shoreline sediment is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$IE_{srig}(T) = I_{srig}(T) \times EC_{iag} \times TE_s \times 3.15 \times 10^7 \times \rho_s \times d_s \qquad \text{(Eq. 16)}$$

where

$IE_{srig}(T)$ = effective dose from external exposure to radionuclide *i* in shoreline sediment at recreational water usage location *r* for an individual in age group *g* (Sv)
EC_{iag} = effective dose equivalent factor for external exposure from contaminated soil (g) for radionuclide *i* for an adult (Sv-m^2 per Bq-s)
TE_s = time of exposure, T_{yr} (years)
ρ_s = surface soil bulk density (kg/m^3)
d_s = thickness of surface soil layer (m)
3.15×10^7 = units correction (seconds/year)

C.2.7.4 Water Ingestion Pathway

The water concentration at the point of consumption is evaluated as follows:

$$C_{dwi}(T_{yr}) = C_{wi}(T_{yr}) \times TF_i \times e^{-\lambda_i \times Th_w \times 2.74 \times 10^{-3}} \qquad \text{(Eq. 17)}$$

where

$C_{dwi}(T_{yr})$ = concentration of radionuclide *i* in water at water usage location *w* at the time of consumption (Bq/L)
$C_{wi}(T_{yr})$ = average concentration of radionuclide *i* in water for usage location *w* at the time it reaches the water intake plant (Bq/L)
TF_i = water treatment purification factor giving the fraction of radionuclide *i* remaining in the water after treatment (dimensionless)
λ_i = radiological decay constant for radionuclide *i* (year^{-1})
Th_w = holdup time between the water intake plant and the water point of water use (days)
2.74×10^{-3} = units conversion factor (years/day)

Evaluation of the drinking water intake parameter is performed as follows:

$$I_{dwig}(T) = C_{dwi}(T) \times U_{dw} \times T_{dwg} \times TC_w \times ED_{dwg} \qquad \text{(Eq. 18)}$$

where

$I_{dwig}(T)$ = total intake of radionuclide *i* from drinking water ingestion over the period *T* at water usage location *w* for individuals in age group *g* (Bq)

$C_{dwi}(T)$ = average concentration of radionuclide *i* in drinking water at water usage location *w* (Bq/L)
U_{dw} = drinking water ingestion rate (L/day)
T_{dwg} = annual intake factor giving days per year that water is consumed (days/year)
TC_w = time correction equal to ED_{dwg}
ED_{dwg} = exposure duration for the drinking water pathway at usage location *w* for individuals in age group *g* (years)

The effective dose from ingestion of drinking water is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$IE_{dwig}(T) = I_{dwig}(T) \times EC_{igoc} \tag{Eq. 19}$$

where

$IE_{dwig}(T)$ = effective dose from ingestion intake of radionuclide *i* in drinking water at water usage location *w* for an individual in age group *g* for exposure over time period *T* (Sv)
EC_{igoc} = effective dose coefficient for ingestion intake of radionuclide *i* of class *c* for an individual in age group *g* (Sv/Bq)

C.2.7.5 Fish Ingestion Pathway

Aquatic food products may become contaminated when grown in contaminated surface waters. The concentration in an aquatic food is based on the average surface water concentration for the current year, as follows:

$$C_{hqi}(T_{yr}) = C_{wi}(T_{yr}) \times B_{qi} \tag{Eq. 20}$$

where

$C_{hqi}(T_{yr})$ = concentration of radionuclide *i* in aquatic food type *q* at time of harvest (Bq/kg)
$C_{wi}(T_{yr})$ = average concentration of radionuclide *i* at water location *w* (Bq/L)
B_{qi} = bioaccumulation factor for radionuclide *i* in the edible portions of aquatic food type *q* (Bq/kg wet fish per Bq/L water)

The concentration at the start of the consumption period is evaluated accounting for decay during holdup as follows:

$$C_{fwi}(T_{yr}) = C_{hqi}(T_{yr}) \times e^{-\lambda_i \times Th_q \times 2.74 \times 10^{-3}} \tag{Eq. 21}$$

where

$C_{fwi}(T_{yr})$ = concentration of radionuclide *i* in aquatic food type *q* at water location *w* at the time of consumption (Bq/kg wet weight)
Th_q = holdup delay time between harvest and consumption for aquatic food type *q* (days)

λ_i = radiological decay constant for radionuclide i (year^{-1})
2.74×10^{-3} = units conversion factor (years/day)

The evaluation of the aquatic food intake parameter is performed as follows:

$$I_{fwig}(T) = C_{fwi}(T) \times U_{fwg} \times T_{fwg} \times ED_{fwg} \qquad \text{(Eq. 22)}$$

where

$I_{fwig}(T)$ = total intake of radionuclide i from ingestion of aquatic food f over the period T at aquatic food location w for individuals in age group g (Bq)
$C_{fwi}(T)$ = average concentration in aquatic food f at aquatic food location w for radionuclide i (Bq/kg)
U_{fwg} = ingestion rate of aquatic food f at aquatic food location w by an individual in age group g (kg/day)
T_{fwg} = annual intake factor giving the days per year that aquatic food f is eaten at aquatic food location w by individuals in age group g (days/year)
ED_{fwg} = exposure duration for consumption of aquatic food f at aquatic food location w for individuals in age group g (years)

The effective dose from ingestion of aquatic foods is calculated in the GENII code as follows (Napier, 2007; Napier et al., 2007):

$$IE_{fwig}(T) = I_{wfig}(T) \times EC_{igoc} \qquad \text{(Eq. 23)}$$

where

$IE_{fwig}(T)$ = effective dose from ingestion intake of radionuclide i in aquatic food f at water usage location w for an individual in age group g for exposure over time period T (Sv)
EC_{igoc} = effective dose coefficient for ingestion intake of radionuclide i of class c for an individual in age group g (Sv/Bq)

In this analysis, effective dose for the adult member of the public is calculated.

C.3 Impact Assessment Input

The data and results of the radiological impacts are provided below for the following groups:

- preconstruction and construction workers
- nearest resident
- persons residing adjacent to the site boundary
- persons that use the Northeast Cape Fear River near the Wilmington Site for fishing or other recreational activities

Inputs required are for the RESRAD code to evaluate the dose from existing soil contamination, for the CAP88-PC code to model the air effluent releases from operations of the existing FMO Facility and the proposed GLE Facility, for the RESRAD-BUILD code to model the dose from the uranium hexafluoride (UF_6) cylinder storage pads, and for the GENII code to model doses from the liquid effluent releases.

C.3.1 RESRAD Inputs

To estimate the external and inhalation pathway doses using the RESRAD code, it was assumed that a 1-hectare (2.5-acre) area of soil was contaminated to a depth of 15 centimeters (6 inches) and that preconstruction and construction workers would spend 2000 hours in 1 year onsite. The inhalation rate of the construction worker was assumed to be 1.4 cubic meters per hour (1.8 cubic yards per hour), which is characteristic for a worker (EPA, 1997). The mass loading for respirable particulates due to construction activity was assumed to be 1×10^{-4} grams per cubic meter (1.7×10^{-7} pounds per cubic yard), and the most restrictive lung clearance class was used for inhalation dose conversion factors. Table C-1 lists the radionuclide-specific parameters used in the radiological impact assessment. The rest of the parameters were RESRAD default values.

C.3.2 CAP-88 Code Inputs

This section provides the parameters used in dose estimations for preconstruction and construction workers and for the hypothetical receptor at the site boundary and the nearest resident. Parameters provided include Wilmington Site characteristics, emission characteristics of the existing FMO facility and proposed GLE Facility, receptor time fractions and locations, agricultural input parameters, and radionuclide-specific inputs. For chemical toxicity calculations from HF emissions, it was assumed that the concentration at the GLE stack is 7.8 micrograms per cubic meter (1.3×10^{-8} pounds per cubic yard) (see Section 4.2.11.2). The dimension of the stack diameter and exit velocity were used to calculate the HF release rate.

C.3.2.1 FMO and GLE Stack Characteristics and Releases

Table C-2 includes the stack and vent characteristics, site-specific parameters, and annual release rates assumed in dose modeling (GLE, 2008). For FMO operations, actual air effluent releases for 2007 were used (GLE, 2009a). There are multiple release points for FMO operations, the heights of the release points are all different, and the CAP88-PC code does not account for building wake effects. Therefore, releases were assumed to occur at ground level, resulting in larger air concentrations of radionuclides for receptors near the source than for elevated releases. The GLE stack could be higher (21–27 meters [69–89 feet]) (GLE, 2009a), but the lower value (GLE, 2008) was used because it is conservative. For conservatism, the same quantity of uranium release from the GLE stack was assumed to be released during the combined construction and operational phase in order to estimate the maximum dose potential construction workers would incur.

Table C-1 Radionuclide-Specific Parameters Used in the RESRAD Code for Radiological Impact Assessment

	Radionuclide			
Parameter Name	Uranium-234	Uranium-235	Uranium-236	Uranium-238
Lung clearance class	S	S	S	S
Inhalation dose conversion factor (mrem/pCi)[a,b]	3.48×10^{-2}	3.15×10^{-2}	3.22×10^{-2}	2.96×10^{-2}
External dose conversion factor (mrem/yr per pCi/g)[a,b]	3.44×10^{-4}	6.60×10^{-1}	1.78×10^{-4}	7.96×10^{-5}
Soil concentration (pCi/g)[b,c]	3.21	1.25×10^{-1}	1.40×10^{-3}	4.57×10^{-1}

[a] The latest dose factors based on ICRP 60 methodology (ICRP, 1991) and ICRP 72 (ICRP, 1996) were used.

[b] To convert mrem to mSv, divide by 100. To convert pCi to Bq, multiply by 0.037.

[c] Soil concentration is calculated from the site environmental reports (GNF-A, 2007) and environmental assessment for the license renewal for the GNF-A (NRC, 2009).

Table C-2 FMO and GLE Emissions and Site Characteristics Used in Modeling

Input Parameter	FMO	GLE
Stack diameter (m)[a]	NR	1.2
Stack release height (m)[b]	NR	15.24
Velocity (m/s)	NR	12.3
Source area (m^2)[a]	2500	
Temperature	Ambient	Ambient
Uranium-234 emission rate	1.86×10^{-5} (Ci/yr)[a]	1.25×10^{-13} (Ci/s)[c]
Uranium-235 emission rate	7.27×10^{-7} (Ci/yr)	4.88×10^{-15} (Ci/s)[c]
Uranium-236 emission rate	8.20×10^{-9} (Ci/yr)	5.49×10^{-17} (Ci/s)[c]
Uranium-238 emission rate	2.65×10^{-6} (Ci/yr)	1.77×10^{-14} (Ci/s)[c]
Ambient temperature (°C)	17.7	17.7
Annual precipitation (cm)[d]	144.96	144.96

[a] To convert m to ft, multiply by 3.28. To convert m^2 to ft^2, multiply by 10.76. To convert Ci to Bq, multiply by 3.7×10^{10}.

[b] Stack could be higher (21–27 m) (GLE, 2009a), but the lower value (GLE, 2008) was used because it is conservative.

[c] Emission rates are converted to Ci/yr by multiplying 3.15×10^{7} seconds per year conversion factor for input in the CAP88-PC code.

[d] 100 cm = 1 m.

Sources: GLE, 2008, 2009a.

C.3.2.2 Exposure Time Fractions and Receptor Locations

The CAP88-PC code assumes that the individual spends an entire year at the locations provided. The assumption that the individual spends 8760 hours at the job site is overly conservative when it comes to evaluating the construction worker dose, since on average, a worker is assumed to spend approximately 2000 hours per year at a job site. In order to account for this limitation, construction worker doses were scaled down by a factor of 4.38 (24 × 365.25/2000). The preconstruction and construction workers would be located, on average, a distance no less than 250 meters (820 feet) from the stack release points. The construction workers would be closest to the FMO stack releases during the construction of the access road (average distance greater than 250 meters [820 feet]) (Figure 2-2), for a period of about one month. For GLE stack releases, construction workers would be beyond the controlled area fence (average distance greater than 250 meters [820 feet] from the GLE stack release) (Figure 6-1). For the purposes of analyses, these workers were conservatively assumed to be at 250 meters (820 feet) from the release point.

The hypothetical site boundary receptor was chosen so that a person would receive the maximum dose and this individual could be considered a maximally exposed individual. The dose was modeled in 16 compass directions at the site boundary. The dose was also calculated for the nearest resident from the proposed GLE Facility stack. A hypothetical receptor and a resident are assumed to be at that location for an entire year. Table C-3 provides a listing of the locations used to estimate the radiological impacts to the nearest resident and the hypothetical receptor at the site boundary from operation of the proposed GLE Facility.

C.3.2.3 Agricultural Productivity

The ingestion of vegetables, meat and milk was considered in the radiological impact assessment for the hypothetical receptor and for the nearest resident. The EPA rural food source scenario option within CAP88-PC was selected in the assessment for the hypothetical receptor and the nearest resident. For preconstruction and construction workers the EPA regional food source option within CAP88-PC was used. Preconstruction and construction workers are not expected to consume any food grown onsite. On the basis of regional food production, estimates were derived for the beef cattle density, milk cattle density, and land fraction cultivated by vegetables. Table C-4 provides a listing of the agricultural parameters used in CAP88-PC for the radiological impact assessment.

C.3.2.4 Radionuclide-Specific Input

The radiological impacts were estimated using the CAP88-PC Version 3.0 computer code. This code uses newer dose conversion factors based on the ICRP 60 methodology (ICRP, 1991). The most restrictive “slow” lung clearance classes were assigned to each uranium isotope.

Radionuclide transfer factors were used to model the uptake of radionuclides by plants and animals. The transfer factors are element-dependent rather than radionuclide-dependent. The default values for uranium found in CAP88-PC were used for the radiological impact assessment. A listing of the elemental and radionuclide-specific factors used for all radiological impact modeling is provided in Table C-5.

Table C-3 Receptor Location for Radiation Dose and Chemical Toxicity Estimation from GLE Stack Releases

Location	Direction	Distance (meters)
Site boundary	North	3.99×10^2
Site boundary	North-northwest	5.73×10^2
Site boundary	Northwest	9.24×10^2
Site boundary	West-northwest	1.49×10^3
Site boundary	West	1.72×10^3
Site boundary	West-southwest	2.30×10^3
Site boundary	Southwest	1.81×10^3
Site boundary	South-southwest	1.89×10^3
Site boundary	South	1.42×10^3
Site boundary	South-southeast	1.71×10^3
Site boundary	Southeast	2.66×10^3
Site boundary	East-southeast	1.27×10^3
Site boundary	East	6.71×10^2
Site boundary	East-northeast	4.27×10^2
Site boundary	Northeast	3.53×10^2
Site boundary	North-northeast	3.46×10^2
Nearest resident	East-southeast	1.35×10^3

Table C-4 Agricultural Input Parameters Used in the Radiological Impact Assessment

Parameter	Vegetable	Meat	Milk	Scenario
Fraction from assessed area	1.0	1.0	1.0	Preconstruction and construction worker
Fraction home produced	0.0	0.0	0.0	Preconstruction and construction worker
Fraction from assessed area	0.7	0.44	0.4	Hypothetical receptor and nearest resident
Fraction home produced	0.3	0.56	0.6	Hypothetical receptor and nearest resident
Cattle density (number/km^2)	NA[a]	0.102	0.0126	All scenarios
Land fraction cultivated for vegetables	0.00632	NA	NA	All scenarios

[a] NA = not applicable.

Source: Rosnick, 2007.

Table C-5 Radionuclide-Specific Inputs Used in the Radiological Impact Assessment

Parameter Name	Radionuclide				Element Uranium
	Uranium-234	Uranium-235	Uranium-236	Uranium-238	
Lung clearance class	S	S	S	S	NA[a]
Inhalation dose conversion factor (mrem/pCi)[b]	3.48×10^{-2}	3.14×10^{-2}	3.23×10^{-2}	2.97×10^{-2}	NA
Ingestion dose conversion factor (mrem/pCi)	1.83×10^{-4}	1.73×10^{-4}	1.73×10^{-4}	1.65×10^{-4}	NA
Immersion dose conversion factor (mrem cm^3/µCi-yr)[b,c]	7.14×10^{5}	7.55×10^{8}	4.51×10^{5}	2.92×10^{5}	NA
Ground surface dose conversion factor (mrem cm^2/µCi-yr)	6.83×10^{2}	1.63×10^{5}	5.86×10^{2}	4.94×10^{2}	NA
Deposition velocity (m/s)[b]	1.8×10^{-3}	1.8×10^{-3}	1.8×10^{-3}	1.8×10^{-3}	NA
Particle size (µm)[d]	1	1	1	1	
Milk transfer factor	NA	NA	NA	NA	4×10^{-4}
Meat transfer factor	NA	NA	NA	NA	8×10^{-4}
Forage uptake factor (pCi/kg dry forage/pCi/kg dry soil)[b]	NA	NA	NA	NA	0.1
Edible update factor (pCi/kg wet weight per pCi/kg dry soil)	NA	NA	NA	NA	0.002

[a] NA = not applicable.
[b] To convert mrem to mSv, divide by 100. To convert pCi to Bq, multiply by 0.037. To convert µCi to Bq, multiply by 3.7×10^4. To convert m to ft, multiply by 3.28. To convert kg to lb, multiply by 2.2.
[c] 100 cm = 1 m.
[d] 10^6 µm = 1 m.
Source: Rosnick, 2007.

C.3.3 RESRAD-BUILD Code Inputs

For estimating the external dose from the cylinder storage yard, RESRAD-BUILD code Version 3.5 (Yu et al., 2003) was used. Preconstruction and construction workers initially would only be exposed to the dose from the stored cylinders from the existing FMO facility and during the overlap period would be additionally exposed to the dose from the cylinders stored at the proposed GLE Facility. Natural uranium cylinders, natural uranium heel cylinders, tails cylinders, tails heel cylinders, and product cylinders are typically stored at a uranium enrichment site. The external dose depends on the number and type of cylinders stored, shielding, and the distance to the receptor. The dose does not depend on the facility that generated the cylinders. Typically, more tails cylinders are present compared to other types of cylinders.

Following are the inputs used in the code:

- source location, $x = 0$, $y = 0$, $z = 0$
- source direction, x
- source length, 300 m (984 ft) (estimated from the tails pad length)

- receptor location, *x* = 0, *z* = 1, *y* = 100 m (328 ft) (this parameter was varied depending on the distance of the receptor from the source)
- source shielding thickness = 1.59 c, shielding density = 7.8 g/cm^3, material = iron, and time onsite = 2000 hours
- The shielding thickness was estimated from actual Type 48Y cylinders. The line source concentration was estimated from actual uranium concentration in the cylinders.

C.3.4 GENII Code Inputs

The radionuclide concentration in the surface water was calculated at three potential exposure locations from the uranium concentrations in the liquid effluent releases from the proposed GLE Facility and the dilution factor in the receiving water body (GLE, 2009b). Table C-6 shows the estimated radionuclide concentrations in the surface water at three exposure locations. Table C-7 lists the estimated number of people involved in recreational activities, which was estimated based on regional recreational activity data (GLE, 2009b). It is expected that the same number of people would be involved at all three exposure locations. Table C-8 lists the radionuclide-specific parameters used in the GENII code for radiological impact assessment.

Dose conversion factors (DCFs) based on ICRP 60 methodology (ICRP, 1991) were used to estimate effective dose. Table C-9 lists other exposure parameters used in estimating the doses from different exposure pathways. Since the surface water concentrations were known, the surface water dissolved module in GENII code (WCF) was used in estimating the public dose.

C.4 Results of the Radiological and Chemical Impact Analyses

This section provides the results of the radiological impact analyses. Radiological impacts were estimated for the following:

- GLE Facility preconstruction and construction workers
- nearest resident
- hypothetical receptor at the site boundary
- member of the public and population that uses northeast Cape Fear River for recreational activities
- GLE Facility operational workers

Table C-10 provides the estimated annual effective dose from the air emissions due to the proposed GLE Facility at different receptor locations. The estimated annual effective dose for a preconstruction and construction worker from the air emissions associated with the existing FMO operation was 2.8×10^{-5} millisievert per year (2.8×10^{-3} millirem per year). For calculating this dose, it was assumed that the worker was onsite for 2000 hours in one year.

Table C-6 Estimated Radionuclide Concentrations in Surface Water at Exposure Locations

Exposure Location	Radionuclide concentration (pCi/L)[a]						
	Uranium-238	Uranium-235	Uranium-234	Thorium-234	Protactinium-234	Protactinium-234m	Thorium-231
Confluence with Unnamed Tributary #1 to Northeast Cape Fear River	1.08×10^{-3}	9.38×10^{-5}	1.01×10^{-6}	1.08×10^{-3}	3.55×10^{-6}	1.07×10^{-3}	9.38×10^{-5}
Just South of GE Wilmington Site Boundary	1.08×10^{-3}	9.38×10^{-5}	1.01×10^{-6}	1.08×10^{-3}	3.55×10^{-6}	1.07×10^{-3}	9.38×10^{-5}
NC 133 Bridge	1.04×10^{-3}	9.06×10^{-5}	9.76×10^{-7}	1.04×10^{-3}	3.43×10^{-6}	1.04×10^{-3}	9.06×10^{-5}

[a] To convert pCi to Bq, multiply by 0.037.

Note: Isotopic weight fractions used were: uranium-234: 8.64×10^{-4}; uranium-235: 8.02×10^{-2}; and uranium-238: 9.19×10^{-1}. Short-lived progeny of uranium-238 (thorium-234, protactinium-234, and protactinium-234m) and uranium-235 (thorium-231) are assumed to be in equilibrium with the parent radionuclide.

Source: GLE, 2009b.

Table C-7 Estimated Number of People Involved in Different Recreational Activities[a]

Recreational Activity	Number of People Involved
Fish ingestion	1414
Swimming	1906
Boating	1244
Shoreline	1231

[a] Recreational survey data representative of the southeast United States were used to estimate the number of people involved in different recreational activities at each exposure location (GLE, 2009c). People involved in swimming that would spend a significant amount of time in shoreline activities are assumed to be counted in shoreline activities. Recreational activities such as sunbathing and fishing result in external exposure from sediment contamination while onshore. The pathways considered during swimming were external exposure from water immersion and water ingestion. The pathway considered during boating was water exposure at the surface.

Source: GLE, 2009c.

Table C-11 shows modeled uranium and HF concentrations at various onsite and offsite locations after dispersion. For calculating the total uranium concentrations, individual isotope concentrations were multiplied by the specific activities and added together.

Table C-12 shows the estimated external doses at various distances from the cylinder storage pads, assuming that the receptor was at the location for 2000 hours in 1 year. In actuality, construction workers would be at many different locations and distances from the cylinder storage pads. Based on the locations of the FMO facility and the proposed GLE Facility, it is highly unlikely that the same construction workers would be close to the storage pads from both facilities when onsite. Table C-12 demonstrates that the external dose decreases rapidly with distance, and it is expected that the dose would be even smaller at longer distances. The construction workers would be closest to the existing FMO facility storage pads during construction of the access road (average distance greater than 250 meters [820 feet]) (Figure 2-2) for a period of about one month. The entire perimeter of the storage pads constructed for the proposed GLE Facility would be fenced (GLE, 2008) and construction workers are assumed to be located beyond the controlled area boundary and would not spend significant time near them. The construction workers would be at distances greater than 250 meters from both FMO facility and GLE storage pads and the time spent near the storage pads would be much less than 2000 hours. However, for conservatism, construction workers are assumed to be located at 250 meters (820 feet) from the cylinder storage pads for all 2000 hours in 1 year in estimating the external dose from the existing site sources for GLE preconstruction and construction workers.

The maximum dose that a member of a public would receive from liquid effluent releases from the proposed GLE Facility would occur just south of the Wilmington Site boundary. Table C-13 provides the estimated annual effective dose for an exposed member of the public from different surface water exposure pathways, along with the estimated annual effective population doses.

Table C-8 Radionuclide-Specific Parameters Used in the GENII Code for Radiological Impact Assessment

Parameter	Uranium-238	Uranium-235	Uranium-234	Thorium-234	Protactinium-234	Protactinium-234m	Thorium-231
Ingestion dose conversion factor (rem/pCi)	1.65×10^{-7}	1.73×10^{-7}	1.83×10^{-7}	1.26×10^{-8}	1.94×10^{-9}	0.00×10^{0}	1.24×10^{-9}
External exposure from contaminated soil dose conversion factor (Sv/s per Bq/m^2)	4.24×10^{-19}	1.40×10^{-16}	5.86×10^{-19}	7.50×10^{-18}	1.80×10^{-15}	1.08×10^{-16}	1.56×10^{-17}
External exposure from water immersion dose conversion factor (Sv/s per Bq/m^3)	7.79×10^{-14}	1.90×10^{-10}	1.85×10^{-13}	8.75×10^{-12}	2.52×10^{-9}	2.64×10^{-11}	1.35×10^{-11}
Fish bioaccumulation factor (Bq/kg wet fish per Bq/L water)	1.00×10^{1}	1.00×10^{1}	1.00×10^{1}	1.00×10^{2}	1.00×10^{2}	1.00×10^{1}	1.00×10^{2}

Source: Napier, 2007; Napier et al., 2007.

Table C-9 Exposure Parameters for Different Activities

Parameter	Shoreline Use	Boating	Swimming	Fish Ingestion
Frequency, events/day	1	1	1	NA
Duration of event, hours	2	2	2	NA
Event days, days	50	50	50	NA
Shielding factor	NA	1	NA	NA
Ingestion of water while swimming, L/hour	NA	NA	0.021	NA
Shoreline width factor	0.2	NA	NA	NA
Shoreline sediment density, kg/m^2	15	NA	NA	NA
Transfer rate constant from water to sediment, L/m^2/yr	25,400	NA	NA	NA
Soil layer thickness, cm	35	NA	NA	NA
Fish ingestion rate, g/day	NA	NA	NA	44
Fish consumption period, days	NA	NA	NA	365
Fish holdup time, days	NA	NA	NA	1

C.4.1 GLE Preconstruction and Construction Workers

The maximum estimated dose for each of the exposure pathways was calculated for an annual exposure period. These estimated doses are:

- internal dose from inhalation of resuspended contaminated soil: $<6 \times 10^{-5}$ mSv/yr (6×10^{-3} mrem/yr)
- external dose from contaminated soil: $<3.2 \times 10^{-4}$ mSv/yr (3.2×10^{-2} mrem/yr)
- estimated dose from air emissions associated with FMO operations: $<2.8 \times 10^{-5}$ mSv/yr (2.8×10^{-3} mrem/yr)
- estimated dose from air emissions associated with proposed GLE operations: $<3.2 \times 10^{-7}$ mSv/yr (3.2×10^{-5} mrem/yr) (see Table C-10)
- external dose from the existing site sources: $<1.05 \times 10^{-1}$ mSv/yr (10.5 mrem/yr)

The total maximum estimated dose before and after the start of GLE operations is $<1.05 \times 10^{-1}$ millisievert per year (10.5 millirem per year). The maximum dose is dominated by the external dose received from existing sources.

The maximum dose to construction workers of 1.05×10^{-1} millisievert (1.05 millirem) is a very small fraction of background radiation exposure in the United States, which averages approximately 3.11 millisievert per year (311 millirem per year) (see Section 3.11.1). The

Table C-10 Annual Effective Dose from Proposed GLE Facility Stack Releases at Different Receptor Locations

Location	Direction	Distance (meters)[b]	Dose (millirem per year)[c]
Site boundary	North	399	8.5×10^{-5}
Site boundary	North-northwest	573	6.2×10^{-5}
Site boundary	Northwest	924	2.1×10^{-5}
Site boundary	West-northwest	1493	4.7×10^{-6}
Site boundary	West	1717	1.7×10^{-5}
Site boundary	West-southwest	2302	1.4×10^{-5}
Site boundary	Southwest	1806	2.3×10^{-5}
Site boundary	South-southwest	1892	2.2×10^{-5}
Site boundary	South	1416	3.9×10^{-5}
Site boundary	South-southeast	1708	2.5×10^{-5}
Site boundary	Southeast	2664	1.8×10^{-5}
Site boundary	East-southeast	1270	1.5×10^{-5}
Site boundary	East	671	4.9×10^{-5}
Site boundary	East-northeast	427	8.3×10^{-5}
Site boundary	Northeast	353	1.1×10^{-4}
Site boundary	North-northeast	346	9.4×10^{-5}
Onsite construction worker[a]	South	250	3.2×10^{-5}
Nearest resident	East-southeast	1352	1.4×10^{-5}

[a] Onsite construction worker in the south direction got the maximum dose. For calculating the dose for the onsite construction worker, the worker was assumed to be onsite for 2000 hours in 1 year.

[b] To convert m to ft, multiply by 3.28.

[c] To convert mrem to mSv, divide by 100.

estimated maximum annual dose applies to workers in both the preconstruction and construction phases.

The total maximum possible dose to construction workers from all pathways is less than the 10 CFR 20.1301(a)(1) limit of 1 millisievert per year (100 millirem per year) for members of the general public, even for estimates combining the most conservative analytical assumptions. This is a negligible dose, representing a lifetime excess cancer risk of less than 5×10^{-6} (less than 5 chances in 1,000,000 of contracting a fatal cancer) when using a risk coefficient of 5×10^{-2} risk/sievert (5×10^{-4} risk/rem) (ICRP, 1991).

A maximum HF concentration of 3.7×10^{-4} micrograms per cubic meter (4.5×10^{-7} parts per million) is estimated at the location of the onsite member of the public (e.g., construction

Table C-11 Predicted Airborne Concentrations of Uranium and HF from the Proposed GLE Facility Stack Releases at Different Receptor Locations

Location	Direction	Distance Meters[a]	Uranium-234 (pCi/m^3)[b]	Uranium-235 (pCi/m^3)[b]	Uranium-236 (pCi/m^3)[b]	Uranium-238 (pCi/m^3)[b]	Total Uranium ($\mu g/m^3$)[c]	HF[d] ($\mu g/m^3$)
Site boundary	North	4.0×10^{2}	2.6×10^{-7}	1.0×10^{-8}	1.1×10^{-10}	3.6×10^{-8}	1.1×10^{-7}	2.2×10^{-4}
Site Boundary	North-northwest	5.7×10^{2}	1.2×10^{-7}	4.6×10^{-9}	5.1×10^{-11}	1.7×10^{-8}	5.2×10^{-8}	1.0×10^{-4}
Site boundary	Northwest	9.2×10^{2}	6.1×10^{-8}	2.4×10^{-9}	2.7×10^{-11}	8.6×10^{-9}	2.7×10^{-8}	5.3×10^{-5}
Site boundary	West-northwest	1.5×10^{3}	3.3×10^{-8}	1.3×10^{-9}	1.5×10^{-11}	4.7×10^{-9}	1.5×10^{-8}	2.9×10^{-5}
Site boundary	West	1.7×10^{3}	5.0×10^{-8}	2.0×10^{-9}	2.2×10^{-11}	7.1×10^{-9}	2.2×10^{-8}	4.4×10^{-5}
Site boundary	West-southwest	2.3×10^{3}	4.1×10^{-8}	1.6×10^{-9}	1.8×10^{-11}	5.7×10^{-9}	1.8×10^{-8}	3.5×10^{-5}
Site boundary	Southwest	1.8×10^{3}	6.7×10^{-8}	2.6×10^{-9}	2.9×10^{-11}	9.5×10^{-9}	3.0×10^{-8}	5.8×10^{-5}
Site boundary	South-southwest	1.9×10^{3}	6.6×10^{-8}	2.6×10^{-9}	2.9×10^{-11}	9.4×10^{-9}	2.9×10^{-8}	5.7×10^{-5}
Site boundary	South	1.4×10^{3}	1.2×10^{-7}	4.5×10^{-9}	5.1×10^{-11}	1.6×10^{-8}	5.1×10^{-8}	1.0×10^{-4}
Site boundary	South-southeast	1.7×10^{3}	4.2×10^{-8}	1.7×10^{-9}	1.9×10^{-11}	6.0×10^{-9}	1.9×10^{-8}	3.7×10^{-5}
Site boundary	Southeast	2.7×10^{3}	2.5×10^{-8}	9.6×10^{-10}	1.1×10^{-11}	3.5×10^{-9}	1.1×10^{-8}	2.1×10^{-5}
Site boundary	East-southeast	1.3×10^{3}	4.4×10^{-8}	1.7×10^{-9}	1.9×10^{-11}	6.2×10^{-9}	1.9×10^{-8}	3.8×10^{-5}
Site boundary	East	6.7×10^{2}	1.5×10^{-7}	5.8×10^{-9}	6.5×10^{-11}	2.1×10^{-8}	6.5×10^{-8}	1.3×10^{-4}
Site boundary	East-northeast	4.3×10^{2}	2.5×10^{-7}	9.7×10^{-9}	1.1×10^{-10}	3.5×10^{-8}	1.1×10^{-7}	2.1×10^{-4}
Site boundary	Northeast	3.5×10^{2}	3.4×10^{-7}	1.3×10^{-8}	1.5×10^{-10}	4.8×10^{-8}	1.5×10^{-7}	3.0×10^{-4}
Site boundary	North-northeast	3.5×10^{2}	2.8×10^{-7}	1.1×10^{-8}	1.2×10^{-10}	4.0×10^{-8}	1.2×10^{-7}	2.4×10^{-4}
Onsite member of the public	South	2.5×10^{2}	4.3×10^{-7}	1.7×10^{-8}	1.9×10^{-10}	6.1×10^{-8}	1.9×10^{-7}	3.7×10^{-4}
Nearest resident	East-southeast	1.4×10^{3}	4.2×10^{-8}	1.6×10^{-9}	1.8×10^{-11}	5.9×10^{-9}	1.8×10^{-8}	3.6×10^{-5}

[a] To convert m to ft, multiply by 3.28.

[b] To convert pCi to Bq, multiply by 0.037.

[c] 10^6 µg = 1 g.

[d] HF concentrations are based on dispersion of a release point concentration of 7.8 $\mu g/m^3$, or twice that estimated for the 3-million-separative work unit (SWU) proposed National Enrichment Facility (NRC, 2005).

Table C-12 Estimated Doses from Cylinder Storage Pad

Receptor Distance (m)	External Dose (mrem/yr)[a]
50	218
100	83.5
150	40.3
200	19.8
250	10.5
500	0.721
1000	7.67×10^{-3}

[a] To convert mrem to mSv, divide by 100.

worker). Uranium emissions would result in a maximum uranium concentration of 1.9×10^{-7} micrograms per cubic meter at the location of the onsite construction worker (Table C-11). Both the estimated HF and uranium concentrations at onsite exposure locations are orders of magnitude below safe levels established by the Occupational Safety and Health Administration (2.5 micrograms per cubic meter for HF [3.1 parts per million] and 50 micrograms per cubic meter for uranium, each averaged over 8 hours; see Section 3.11.2).

C.4.2 Hypothetical Receptor at the Site Boundary and Nearest Resident

Table C-11 shows the estimated dose to hypothetical receptors residing at the site boundary in each of the 16 directions modeled in CAP88-PC Version 3.0 computer code. It also includes the dose to the nearest resident. The maximum dose to a hypothetical receptor at the Wilmington Site boundary (0.35 kilometers [0.22 miles] in the northeast direction) due to operation of the proposed GLE Facility is estimated to be 1.1×10^{-6} millisievert per year (1.1×10^{-4} millirem per year). The dose to the nearest resident located at 1.35 kilometers (0.84 miles) east-southeast of the proposed GLE Facility is estimated to be 1.4×10^{-7} millisievert per year (1.4×10^{-5} millirem per year). These estimated doses are well below the 10 CFR 20.1301(a)(1) limit of 1 millisievert (100 millirem) per year for members of the public and the 40 CFR Part 61, Subpart H (NESHAPs) airborne dose limit of 0.1 millisievert (10 millirem) per year.

The estimated uranium and HF levels at the site boundary and at the location of the nearest resident given in Table C-11 are lower than onsite levels. HF concentrations at any exposure location, moreover, are far below the most stringent State or Federal ambient air quality standards for the general public (e.g., the State of Washington’s standard of 8.7 micrograms per cubic meter [0.011 parts per million]; see Section 3.11.2).

C.4.3 Estimated Doses from Liquid Effluent Releases

Table C-13 shows the estimated dose to a member of the public involved in recreational activities at three potential exposure locations, as calculated using the GENII Version 2.06

Table C-13 Estimated Doses for Liquid Effluent Releases from the Proposed GLE Facility

Exposure Location	Exposure Pathway	Dose (mrem/yr)[a] to a Member of Public	Number of People Exposed	Collective Dose (person-mrem/yr)[a]
Confluence with Unnamed Tributary #1 to Northeast Cape Fear River	Fish ingestion	5.26×10^{-5}	1414	7.44×10^{-2}
	Water ingestion during swimming	4.37×10^{-7}	1906	8.33×10^{-4}
	External exposure from swimming	1.03×10^{-8}	1906	1.96×10^{-5}
	External exposure from boating	5.15×10^{-9}	1244	6.41×10^{-6}
	External exposure from shoreline activities	2.01×10^{-5}	1231	2.47×10^{-2}
	Total for a member of public	7.32×10^{-5}	NA[b]	NA[b]
Just South of GE Wilmington Site Boundary	Fish ingestion	5.26×10^{-5}	1414	7.44×10^{-2}
	Water ingestion during swimming	4.37×10^{-7}	1906	8.33×10^{-4}
	External exposure from swimming	1.03×10^{-8}	1906	1.96×10^{-5}
	External exposure from boating	5.15×10^{-9}	1244	6.41×10^{-6}
	External exposure from shoreline activities	2.01×10^{-5}	1231	2.47×10^{-2}
	Total for a member of public	7.32×10^{-5}	NA	NA
NC 133 Bridge	Fish ingestion	5.06×10^{-5}	1414	7.15×10^{-2}
	Water ingestion during swimming	4.21×10^{-7}	1906	8.02×10^{-4}
	External exposure from swimming	9.95×10^{-9}	1906	1.90×10^{-5}
	External exposure from boating	4.98×10^{-9}	1244	6.20×10^{-6}
	External exposure from shoreline activities	1.93×10^{-5}	1231	2.38×10^{-2}
	Total for a member of public	7.03×10^{-5}	NA	NA
	Total population dose	NA	NA	2.72×10^{-1}

[a] To convert mrem to mSv, divide by 100.

[b] NA = not applicable.

computer code. The maximum dose to a member of the public due to operation of the proposed GLE Facility is estimated to be 7.3×10^{-7} millisievert per year (7.3×10^{-5} millirem per year).

The estimated doses for the liquid effluent releases from the proposed GLE Facility are well below the 10 CFR 20.1301(a)(1) limit of 1 millisievert (100 millirem) per year for members of the public. The population dose is estimated to be 2.7×10^{-3} person-millisievert per year (2.7×10^{-1} person-millirem per year).

C.4.4 Operational Worker Doses

The existing nuclear and industrial safety program at the Wilmington Site would be expanded to include operations of the proposed GLE Facility. The program would monitor the occupational workers at the proposed facility for internal exposure from intake of uranium as well as the dose from external exposure to radiation. GLE would also apply an annual administrative limit of 40 millisievert (4000 millirem), which is below the 10 CFR 20.1201(a)(1) total effective dose equivalent (TEDE) annual limit of 50 millisievert (5000 millirem) for occupational exposure.

GNF-A has implemented a comprehensive exposure control program at the Wilmington Site to manage occupational radiation exposure and dose. The program maintains exposures “As Low As Reasonably Achievable” (ALARA) through the use of radiation monitoring systems, personnel dosimetry, and mitigation systems to reduce environmental concentrations of uranium. The average TEDE to workers from existing GNF-A operations at the Wilmington Site for 2003–2007 varied from 0.5 to 0.75 millisievert (50 to 75 millirem), and the maximum TEDE during the same period varied from 4.7 to 5.6 millisievert (470 to 560 millirem) (NRC, 2009).

From operations of the proposed GLE Facility, the most significant contributor to occupational radiation exposure would be direct radiation from uranium hexafluoride (UF_6). It is expected that the average occupational doses at the proposed GLE Facility would be similar to occupational doses at existing fuel cycle facilities in the United States. For such facilities, the most substantial sources of direct radiation would likely include full Type 48Y cylinders containing feed material or depleted UF_6 and empty Type 48Y cylinders containing residual material (NRC, 2005). Table C-14 presents occupational doses at fuel cycle facilities within the United States for 2003–2007 (Burrows and Hagemeyer, 2005; Burrows and Hagemeyer; 2006; Lewis et al., 2008).

The occupational exposure analysis and the historical exposure data from the United States Enrichment Corporation facilities and the existing GNF-A operations at the Wilmington Site demonstrate that a properly administered radiation protection program at the proposed GLE Facility would maintain radiological occupational impacts below the regulatory limits of 10 CFR 20.1201.

Table C-14 Annual CEDE[a] and TEDE[b] for Fuel Cycle Facilities within the United States for 2003–2007

Year	Number of Monitored Individuals	Workers with Measured TEDE	Collective TEDE (person-rem)[c,d]	Average Measured TEDE (rem)	Workers with Measured DDE	Collective DDE (person-rem)	Average Measured DDE (rem)	Workers with Measured CEDE	Collective CEDE (person-rem)	Average Measured CEDE (rem)
2003	7738	3633	556	0.15	2815	258	0.09	2255	298	0.13
2004	7562	3814	514	0.13	2933	258	0.09	2327	256	0.11
2005	7699	3371	497	0.15	2385	238	0.10	2173	259	0.12
2006	7417	3413	522	0.15	2475	283	0.11	2131	238	0.11
2007	7536	3225	429	0.13	2254	230	0.10	1983	199	0.10

[a] Committed effective dose equivalent = total radiation dose received from ingestion or inhalation of radioactive material.

[b] Total effective dose equivalent = CEDE plus DDE (deep dose equivalent from external radiation).

[c] 1 rem = 1000 mrem.

[d] To convert rems to Sv, divide by 100.

Sources: Burrows and Hagemeyer, 2005; Burrows and Hagemeyer, 2006; Lewis, et al. 2008.

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APPENDIX D
TRANSPORTATION METHODOLOGY, ASSUMPTIONS, AND IMPACTS

APPENDIX D
TRANSPORTATION ANALYSIS METHODOLOGY, ASSUMPTIONS, AND IMPACTS

D.1 Introduction

This appendix provides the detailed methodology, input parameters and assumptions, and results for the transportation risk analysis performed in this Environmental Impact Statement (EIS) for the proposed General Electric (GE)-Hitachi Global Laser Enrichment (GLE) Facility near Wilmington, North Carolina. The analysis evaluates transportation of:

- natural uranium hexafluoride (UF_6) (i.e., not enriched) feed to the GLE Facility
- enriched UF_6 product from the GLE Facility to a fuel fabrication facility
- depleted UF_6 to a conversion facility
- return of empty feed cylinders with residual contamination
- low-level radioactive waste (LLRW) for disposal

All domestic shipments are anticipated to occur via heavy haul tractor-trailer combination trucks. A number of these shipments may have multiple origins or destinations. UF_6 feed may be obtained from a U.S. facility (Honeywell International, Metropolis, Illinois), a Canadian source (Cameco, Port Hope, Ontario, Canada) or overseas sources arriving at U.S. seaports (Portsmouth Marine Terminal [PMT], Portsmouth, Virginia; Dundalk Marine Terminal [DMT], Baltimore, Maryland). UF_6 product may be used at the Wilmington Site or sent to other fuel fabrication facilities in Columbia, South Carolina (Westinghouse Electric) and Richland, Washington (AREVA NP). The depleted UF_6 tails could be sent to facilities in either Paducah, Kentucky or Portsmouth, Ohio, both facilities currently under construction for conversion of depleted UF_6 to uranium oxide for disposal. In the case of the low-level radioactive waste (LLRW) generated at the proposed GLE Facility, only one destination would be planned, the Energy*Solutions* disposal facility in Clive, Utah. Single shipment and annual impacts are evaluated for all potential shipment routes. Annual impacts are assumed based on all shipments of one material type over the same route (e.g., all depleted UF_6 tails going to Paducah, Kentucky or all going to Portsmouth, Ohio).

D.2 Methodology

D.2.1 Overview

The transportation risk assessment considers human health risks from routine transport (normal, incident-free conditions) of hazardous materials and from potential accidents. In both cases, risks associated with the nature of the cargo itself, or “cargo-related” impacts, and those related to the transportation vehicle (regardless of type of cargo), or “vehicle-related” impacts, are considered.

D.2.1.1 Routine Transportation Risk

The radiological risk associated with routine transportation is cargo-related and results from the potential exposure to low levels of external radiation near a loaded shipment. It is assumed that there are no cargo-related risks posed by incident-free transport of hazardous chemicals. No direct chemical exposure to radioactive material will occur during routine transport because, as discussed in Section D.3.2, these materials will be in packages that are designed and maintained to ensure that they will contain and shield their contents during normal transport. Any leakage or unintended release would be considered under accident risks.

Vehicle-related risks during routine transportation are caused by potential exposure to increased vehicular emissions. These emissions include diesel exhaust, tire and brake particulate emissions, and fugitive dust raised from the roadbed by passing vehicles.

D.2.1.2 Accident Transportation Risk

The cargo-related radiological risk from transportation-related accidents lies in the potential release and dispersal of radioactive material into the environment during an accident and the subsequent exposure of the nearby population through multiple exposure pathways, such as exposure to contaminated soil, inhalation, or the ingestion of contaminated food. Cargo-related hazardous chemical accident impacts to human health during transportation come from immediate inhalation exposure resulting from container failure and chemical release during an accident.

Vehicle-related accident risks refer to the potential for transportation-related accidents that result in fatalities caused by physical trauma unrelated to the cargo.

D.2.2 Routine Risk Assessment Methodology

The RADTRAN 5 computer code (Neuhauser and Kanipe, 2003; Weiner et al., 2006) was used in the routine and accident cargo-related risk assessments to estimate the radiological impacts to collective populations. RADTRAN 5 was developed by Sandia National Laboratories to calculate population risks associated with the transportation of radioactive materials by truck, rail, air, ship, or barge. The code has been used extensively for transportation risk assessments since it was originally issued in the late 1970s as RADTRAN (RADTRAN 1) and has been reviewed and updated periodically. RADTRAN 1 was originally developed to facilitate the calculations presented in NUREG-0170 (NRC, 1977).

D.2.2.1 Collective Population Risk

The radiological risk associated with routine transportation results from the potential exposure to low-level external radiation in the vicinity of loaded shipments. Even under routine transportation, some radiological exposure could occur. Because the radiological consequences (dose) would occur as a direct result of normal operations, the probability of routine consequences is taken to be 1 in the RADTRAN 5 code. Therefore, the dose risk is equivalent to the estimated dose.

For routine transportation, the RADTRAN 5 computer code considers major groups of potentially exposed persons. The RADTRAN 5 calculations of risk for routine highway transportation include exposures of the following population groups:

- *Persons along the Route (Off-Link Population)*. Collective doses were calculated for all persons living or working within 0.8 kilometer (0.5 mile) of each side of a transportation route. The total number of persons within the 1.6-kilometer (1-mile) corridor was calculated separately for each route considered in the assessment.

- *Persons Sharing the Route (On-Link Population)*. Collective doses were calculated for persons in all vehicles sharing the transportation route. This group includes persons traveling in the same or opposite directions as the shipment, as well as persons in vehicles passing the shipment.

- *Persons at Stops*. Collective doses were calculated for people who might be exposed while a shipment was stopped en route. For truck transportation, these stops include those for refueling, food, and rest.

- *Crew Members*. Collective doses were calculated for truck transportation crew members involved in the actual shipment of material. Workers involved in loading or unloading were not considered in the transportation analysis because they are considered to be facility workers.

The doses calculated for the first three population groups were summed to yield the collective dose to the public; the dose calculated for the fourth group represents the collective dose to workers.

The RADTRAN 5 calculations for routine dose generically compute the dose rate as a function of distance from a point source (Neuhauser and Kanipe, 2003). Associated with the calculation of routine doses for each exposed population group are parameters such as the radiation field strength, the source-receptor distance, the duration of exposure, vehicular speed, stopping time, traffic density, and route characteristics (such as population density). The RADTRAN manual contains derivations of the equations used and descriptions of these parameters (Neuhauser and Kanipe, 2003).

D.2.2.2 Maximally Exposed Individual Risk

In addition to the assessment of the routine collective population risk, the risk to a maximally exposed individual (MEI) was estimated. In RADTRAN 5, the MEI is assumed to be located 30 meters (100 feet) from the transport route as the radioactive shipment passes at a speed of 24 kilometers per hour (15 miles per hour).

D.2.2.3 Vehicle-Related Risk

Vehicle-related health risks resulting from routine transportation are associated with the generation of air pollutants by transport vehicles during shipment and would be independent of the radioactive or chemical nature of the shipment. The health endpoint assessed under routine transportation conditions was the excess latent mortality from inhalation of vehicular emissions. These emissions consist of particulate matter in the form of diesel engine exhaust, tire and brake particulates, and fugitive dust raised from the roadway by the transport vehicle. Risk factors for pollutant inhalation in terms of latent mortality have been used in this analysis. Vehicle-related risks from routine transportation were calculated for each shipment by multiplying the total distance traveled by the appropriate risk factor.

D.2.3 Accident Assessment Methodology

The risk analysis for potential accidents differs fundamentally from the risk analysis for routine transportation because occurrences of accidents are statistical in nature. The accident risk assessment is treated probabilistically. Accident risk is defined as the product of the accident consequence (dose or exposure) and the probability of the accident occurring. In this respect, the analysis estimates the collective accident risk to populations by considering a spectrum of transportation-related accidents. The spectrum of accidents was designed to encompass a range of possible accidents, including low-probability accidents that have high consequences, and high-probability accidents that have low consequences (such as “fender benders”). For radiological risk, the results for collective accident risk can be directly compared with the results for routine collective risk because the latter results implicitly incorporate a probability of occurrence of 1 if the shipment takes place.

D.2.3.1 Radiological Accident Risk Assessment

The RADTRAN 5 calculation of collective accident risk uses models that quantify the range of potential accident severities and the responses of transported packages to accidents. The spectrum of accident severity is divided into several categories, each of which is assigned a conditional probability of occurrence – that is, the probability that if an accident does occur, it will be of a particular severity. Release fractions, defined as the fraction of the material in a package that could be released in an accident, are assigned to each accident severity category on the basis of the physical and chemical form of the material. The model takes into account the mode of transportation and the type of packaging through selection of the appropriate accident probabilities and release fractions, respectively. The accident rates, the definition of accident severity categories, and the release fractions used in this analysis are discussed further in Sections D.3 and D.4.

For accidents involving the release of radioactive material, RADTRAN 5 assumes that the material is dispersed in the environment according to standard Gaussian diffusion models. For the risk assessment, default data for atmospheric dispersion were used, representing an instantaneous ground-level release and a small-diameter source cloud (Neuhauser and Kanipe, 2003). The calculation of the collective population dose following the release and dispersal of radioactive material includes the following exposure pathways:

- external exposure to the passing radioactive cloud
- external exposure to contaminated ground
- internal exposure from inhalation of airborne contaminants
- internal exposure from the ingestion of contaminated food

For the ingestion pathway, the fraction of farmland in each state traversed was used as input to the RADTRAN code. Doses of radiation from external exposure and the ingestion or inhalation of radionuclides were calculated by applying standard dose conversion factors (Eckerman and Ryman, 1993; ICRP, 1996).

D.2.3.2 Chemical Accident Risk Assessment

The risks from exposure to hazardous chemicals during transportation-related accidents, which for this assessment includes consideration of the formation of hydrogen fluoride (HF) from the reaction of UF_6 with moisture in the air, can be either acute (result in immediate injury or fatality) or latent (result in cancer that would present itself after a latency period of several years). However, none of the chemicals that might be released in any of the transportation accidents involving UF_6 are carcinogenic. As a result, no excess chemically induced latent cancers would be expected from accidental chemical releases.

The acute effects considered were assumed to exhibit a threshold nonlinear relationship with exposure; that is, some low level of exposure can be tolerated without inducing a health effect. To estimate risks, chemical-specific concentrations were developed for potential irreversible adverse effects. All individuals exposed at these levels or higher following an accident were included in the transportation risk estimates.

The primary exposure route of concern with respect to accidental release of hazardous chemicals would be inhalation. Although direct exposure to hazardous chemicals via other pathways such as ingestion or absorption through the skin (dermal absorption) would also be possible, these routes would be expected to result in much lower exposure than the inhalation pathway doses for the uranium compounds. The likelihood of acute effects would be much less for the ingestion and dermal pathways than for inhalation.

The acute health endpoint – potential irreversible adverse effects – was considered for the assessment of cargo-related population impacts from transportation accidents. However, chemical impacts would be negligible; past analyses of depleted UF_6 shipments have shown that the estimates of irreversible adverse effects to be approximately 1 to 3 orders of magnitude lower than the estimates of public latent cancer fatalities from radiological accident exposure (DOE, 2004a; DOE, 2004b; NRC, 2005a). In addition, no more than one percent of cases involving irreversible adverse effects due to exposure to HF or uranium compounds result in fatalities (Policastro, 1997). Thus, no further analysis of chemical hazards posed by transport was conducted for this EIS as radiological accident impacts are shown to be SMALL and the relative chemical hazards would be less.

D.2.3.3 Vehicle-Related Accident Risk Assessment

The vehicle-related accident risk refers to the potential for transportation accidents that could result directly in fatalities not related to the nature of the cargo in the shipment. This risk represents fatalities from physical trauma. State-average rates for transportation fatalities are used in the assessment. Vehicle-related accident risks are calculated by multiplying the total distance traveled by the rates for transportation fatalities. In all cases, the vehicle-related accident risks are calculated on the basis of distances for round-trip shipment since the presence or absence of cargo would not be a factor in accident frequency.

D.3 Input Parameters and Assumptions

The principal input parameters and assumptions used in the transportation risk assessment are discussed in this section. Where appropriate, applicable government regulations are referenced. Transportation of hazardous chemical and radioactive materials is governed by U.S. Department of Transportation (DOT), U.S. Nuclear Regulatory Commission (NRC), and U.S. Environmental Protection Agency (EPA) regulations, and by the *Hazardous Materials Transportation Act* (HMTA) (49 U.S.C. 5101 et seq.). These regulations may be found in the U.S. *Code of Federal Regulations* (CFR) at 49 CFR Parts 171−178 and 383−397, 10 CFR Part 71, and 40 CFR Parts 262 and 265, respectively. State agencies are also involved in regulating such transport within their borders. All transportation-related activities must be in accordance with applicable regulations of these agencies. However, the DOT and NRC have primary regulatory responsibility for shipment of radioactive materials. Those regulations most pertinent to this risk assessment can be found in 49 CFR Part 173, 49 CFR Part 397, and 10 CFR Part 71.

D.3.1 Route Characteristics

The transportation route selected for a shipment determines the total potentially exposed population and the expected frequency of transportation-related accidents. For truck transportation, the route characteristics most important to the risk assessment include the total shipping distance between each origin and destination and the population density along the route.

D.3.1.1 Route Selection

The DOT routing regulations concerning radioactive materials on public highways are prescribed in 49 CFR 397.101. The objectives of the regulations are to reduce the impacts of transporting radioactive materials, to establish consistent and uniform requirements for route selection, and to identify the role of state and local governments in routing radioactive materials. The regulations attempt to reduce potential hazards by prescribing that populous areas be avoided and that travel times be minimized. In addition, the regulations require that the carrier of radioactive materials ensure that the vehicle is operated on routes that minimize radiological risks, and that accident rates, transit times, population density and activity, time of day, and day of week are considered in determining risk. However, the final determination of the route is left to the discretion of the carrier, such as for shipments of UF_6 (depleted or enriched to five percent uranium-235).

For this analysis, representative shipment routes were identified using the WebTRAGIS (Version 1.5.4) routing model (Johnson and Michelhaugh, 2003) for the truck shipments. The routes were selected to be reasonable and consistent with routing regulations and general practice, but they are considered only representative because the actual routes used would be chosen in the future and are often determined by the shipper. At the time of shipment, route selection would reflect current road conditions, including road repairs and traffic congestion.

The HIGHWAY data network in WebTRAGIS is a computerized road atlas that includes a complete description of the interstate highway system and of all U.S. highways. In addition, most principal state highways and many local and community highways are identified. The code is periodically updated to reflect current road conditions and has been compared with reported mileages and observations of commercial trucking firms.

Routes are calculated within the model by minimizing the total impedance between origin and destination. The impedance is a function of distance and driving time along a particular segment of highway. The population densities along a route are derived from 2000 Census data from the U.S. Census Bureau.

The WebTRAGIS database version used was Highway Data Network 4.0. Summary route information on the truck routes used in the analysis is provided in Table D-1.

D.3.1.2 Population Density

Three population density zones – rural, suburban, and urban – were used for the population risk assessment. The fractions of travel and average population density in each zone were determined with the WebTRAGIS routing model. Rural, suburban, and urban areas are characterized according to the following breakdown: rural population densities range from 0 to 54 persons per square kilometer (0 to 139 persons per square mile); suburban densities range from 55 to 1284 persons per square kilometer (140 to 3326 persons per square mile); and urban covers all population densities greater than 1284 persons per square kilometer (3326 persons per square mile). Use of these three population density zones is based on an aggregation of the 12 population density zones provided in the WebTRAGIS model output. For calculation purposes, information about population density was generated at the state level and used as RADTRAN input for all routes. Route average population densities and other route characteristics are given in Table D-1.

D.3.1.3 Accident and Fatality Rates

For calculating accident risks, vehicle accident involvement and fatality rates are taken from data provided in Saricks and Tompkins (1999). For each transport mode, accident rates are defined generically as the number of accident involvements (or fatalities) in a given year per unit of travel by that mode in the same year. Therefore, the rate is a fractional value – the accident-involvement count is the numerator, and vehicular activity (total traveled distance) is the denominator. Accident rates are derived from multiple-year averages that automatically account for such factors as heavy traffic and adverse weather conditions. For assessment purposes, the total number of expected accidents or fatalities is calculated by multiplying the total shipping distance for a specific route by the appropriate accident or fatality rate.

For truck transportation, the rates presented by Saricks and Tompkins are specifically for heavy combination trucks involved in interstate commerce. Heavy combination trucks are rigs composed of a separable tractor unit containing the engine and one to three freight trailers connected to each other and the tractor. Heavy combination trucks are typically used for shipping radioactive wastes. Truck accident rates are computed for each state on the basis of statistics compiled by the DOT Office of Motor Carriers for 1994 to 1996. Saricks and Tompkins present accident involvement and fatality counts, estimated kilometers of travel by state, and the corresponding average accident involvement and fatality rates for the 3 years investigated. Fatalities (including of crew members) are deaths that are attributable to the accident and that occurred within 30 days of the accident.

Table D-1 Summary Route Data

	Total Distance		Fraction of Travel			Average Population Density (persons/km^2 [persons/mi^2])					
Route	km	(mi)	Rural	Suburban	Urban	Rural		Suburban		Urban	
UF$_6$ feed coming from:											
Portsmouth Marine Terminal	463	(288)	70.0	28.2	1.8	16.3	(42.2)	296.4	(767.7)	2157	(5588)
Dundalk Marine Terminal	754	(467)	50.1	42.0	8.0	18.2	(47.2)	369.7	(957.5)	2447	(6338)
Honeywell International	1313	(816)	55.2	42.3	2.5	19.1	(49.4)	332.2	(860.5)	2075	(5373)
Cameco	1397	(868)	52.6	41.7	5.8	18.9	(49.1)	351.1	(909.3)	2383	(6171)
UF$_6$ product going to:											
Westinghouse Electric	479	(298)	65.0	33.6	1.3	16.6	(43.0)	276.0	(714.8)	2495	(6463)
AREVA NP	4785	(2973)	75.0	23.0	2.0	11.2	(28.9)	325.0	(841.8)	2163	(5603)
Depleted UF$_6$ tails going to:											
Paducah conversion facility	1316	(818)	55.4	42.2	2.4	19.1	(49.6)	331.9	(859.5)	2087	(5404)
Portsmouth conversion facility	989	(615)	55.3	41.3	3.4	18.3	(47.5)	359.6	(931.4)	2150	(5569)
Empty 48Y cylinder return to:											
Honeywell International	1313	(816)	55.2	42.3	2.5	19.1	(49.4)	332.2	(860.5)	2075	(5373)
LLRW going to:											
EnergySolutions	3947	(2452)	73.0	24.6	2.5	11.4	(29.6)	335.0	(867.7)	2199	(5695)

The truck accident assessment presented in this EIS uses accident (fatality) rates for travel on interstate highways. The total accident risk for a case depends on the total distance traveled in various states and does not rely on national average accident statistics. However, for comparative purposes, the national average truck accident rate on interstate highways presented in Saricks and Tompkins is 3.15×10^{-7} accidents per truck-kilometer (5.07×10^{-7} accidents per mile). Note that the accident rates used in this assessment were computed using all interstate shipments, regardless of the cargo.

D.3.2 Packaging

Shipment packaging for radioactive materials must be designed, constructed, and maintained to ensure that it will contain and shield the contents during normal transportation. For more highly radioactive material, the packaging must contain and shield the contents in severe accidents. The type of packaging used is determined by the radioactive hazard associated with the packaged material. The basic types of packaging required by the applicable regulations are designated as Type A, Type B, or industrial packaging (generally for low-specific activity [LSA] material). Table D-2 summarizes the shipment packaging for the shipments considered.

The LLRW and the feed and tails UF_6 shipments would use Type A packaging. This type of packaging must withstand the conditions of normal transportation without the loss or dispersal of the radioactive contents. “Normal” transportation refers to all transportation conditions except those resulting from accidents or sabotage. Approval of Type A packaging is obtained by demonstrating that the packaging can withstand specified testing conditions intended to simulate normal transportation. Type A packaging usually does not require special handling, packaging, or transportation equipment. The UF_6 feed and depleted tails would be shipped in Model 48Y cylinders (USEC, 1999). LLRW would be shipped in 4 × 4 × 4-foot waste boxes. The dimensions of the Model 48Y cylinder are shown in Figure D-1.

The enriched product would be shipped in Model 30B cylinders (USEC, 1999) in Type B overpacks. Figure D-2 displays the dimensions of the 30B cylinder. In addition to meeting all the Type A standards, Type B packaging must also provide a high degree of assurance that the package integrity will be maintained even during severe accidents, with essentially no loss of the radioactive contents or serious impairment of the shielding capability. Type B packaging must satisfy stringent testing criteria (as specified in 10 CFR Part 71) that were developed to simulate conditions of severe hypothetical accidents, including impact, puncture, fire, and immersion in water. The most widely recognized Type B packagings are the massive casks used to transport highly radioactive spent nuclear fuel from nuclear power stations. For shipping the Model 30B cylinders, a UX-30 overpack would be used. The UX-30 has a diameter of 1.10 meters (43.5 inches) and a 2.44 meters (96 inches) length (NRC, 2009).

D.3.3 Shipment Configurations and Number of Shipments

The anticipated shipment information for the proposed action is summarized in Table D-2. Table D-3 lists the radionuclide inventory for each shipment type. Uranium feed and depleted tails shipments would consist of one Type 48Y cylinder per truck. Each cylinder would contain about 12.4 metric tons (13.7 tons) of natural or depleted UF_6. Enriched UF_6 product would be shipped in Type 30B cylinders in UX-30 overpacks, five cylinders to a truck. Each 30B cylinder would contain approximately 2.3 metric tons (2.5 tons) of product. LLRW would be shipped in

Table D-2 Radioactive Material Shipment Information

Material	Shipment Configuration	Annual Average Number of Shipments
UF_6 feed	1-48Y cylinder	900
UF_6 product	5-30B cylinders	50
Depleted UF_6 tails	1-48Y cylinder	800
Empty cylinders	2-48Y cylinders with residual heels	50
LLRW	36-4 × 4 × 4-ft waste boxes	36

Sources: GLE, 2008; GLE, 2009.

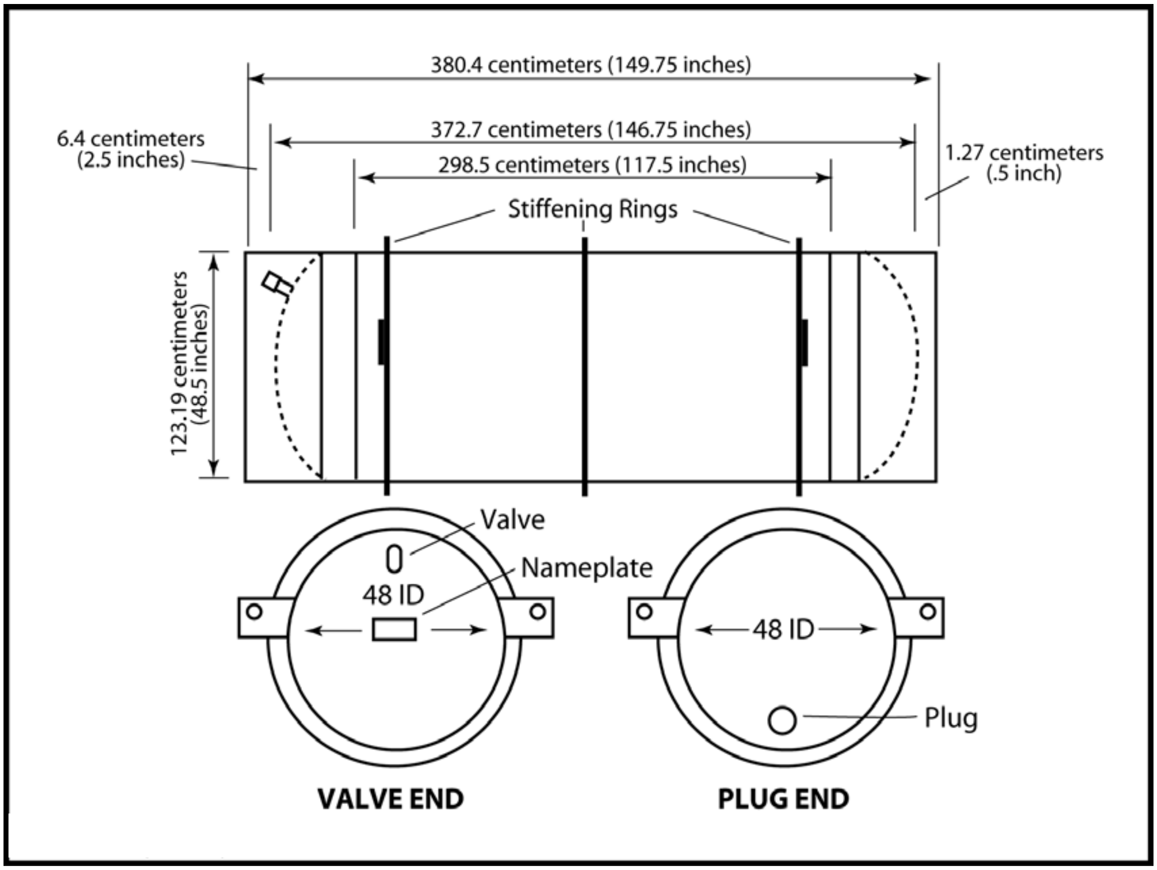

Figure D-1 Schematic of a Type 48Y Cylinder (USEC, 1995)

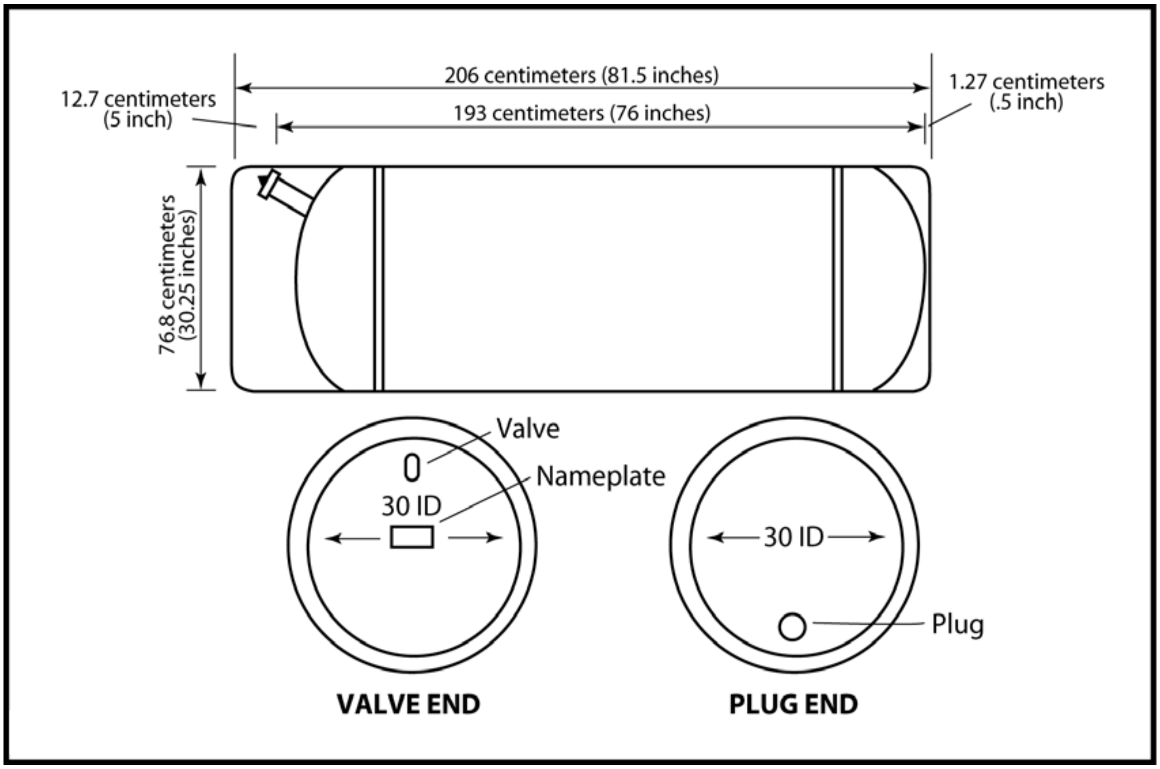

Figure D-2 Schematic of a Type 30B Cylinder (USEC, 1995)

Table D-3 Single-Shipment Radionuclide Inventories (Curies)[a]

Isotopes	UF_6 Feed	Enriched UF_6	Depleted UF_6 (tails)	Empty Cylinders	LLRW
Uranium-234	2.8	22.6	0.509	9.0×10^{-4}	0.027
Uranium-235	0.13	0.830	0.037	1.0×10^{-4}	0.0012
Uranium-238	2.8	2.46	2.835	0.0051	0.027

[a] Source: GLE, 2009.

4 × 4 × 4-foot waste boxes, 36 to a truck. The types and amounts of LLRW to be shipped are discussed in Section 4.2.12.2.

D.3.4 Accident Characteristics

Assessment of transportation accident risk takes into account the fraction of material in a package that would be released or spilled to the environment during an accident, commonly referred to as the release fraction. The release fraction is a function of the severity of the accident and the material packaging. For instance, a low-impact accident, such as a “fender-bender,” would not be expected to cause any release of material. Conversely, a very severe accident would be expected to release nearly all of the material in a shipment into the environment. The method used to characterize accident severities and the corresponding release fractions for estimating both radioactive and chemical risks are described below.

D.3.4.1 Accident Severity Categories

A method to characterize the potential severity of transportation-related accidents has been described in NUREG-0170, *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* (NRC, 1977). The NRC method divides the spectrum of transportation accident severities into eight categories. Other studies have divided the same accident spectrum into six categories (Wilmot, 1981), 20 categories (Fischer et al., 1987), or more (Sprung et al., 2000); however, these latter studies focused primarily on accidents involving shipments of spent nuclear fuel (SNF). In this analysis, the NUREG-0170 scheme was used for all shipments.

The NUREG-0170 scheme for truck transportation accident classification is shown in Figure D-3. Severity is described as a function of the magnitudes of the mechanical forces (impact) and thermal forces (fire) to which a package may be subjected during an accident. Because all accidents can be described in these terms, severity is independent of the specific accident sequence. In other words, any sequence of events that results in an accident in which a package is subjected to forces within a certain range of values is assigned to the accident severity category associated with that range. The scheme for accident severity is designed to take into account all credible transportation-related accidents, including those accidents with low probability but high consequences and those with high probability but low consequences.

Each severity category represents a set of accident scenarios defined by a combination of mechanical and thermal forces. A conditional probability of occurrence — that is, the probability that if an accident occurs, it is of a particular severity — is assigned to each category. The fractional occurrences for accidents by accident severity category and population density zone are shown in Table D-4 and are used for estimating the radioactive risks.

Category I accidents are the least severe but the most frequent; Category VIII accidents are very severe but very infrequent. To determine the expected frequency of an accident of a given severity, the conditional probability in the category is multiplied by the baseline accident rate. Each population density zone has a distinct distribution of accident severities related to differences in average vehicular velocity, traffic density, location (rural, suburban, or urban), and other factors.

D.3.4.2 Package Release Fractions

In NUREG-0170, radiological and chemical consequences are calculated by assigning package release fractions to each accident severity category. The release fraction is defined as the fraction of the material in a package that could be released from the package as the result of an accident of a given severity. Release fractions take into account all mechanisms necessary to create release of material from a damaged package to the environment. Release fractions vary according to the type of package and the physical form of the material.

Representative release fractions for accidents involving all shipments were taken from NUREG-0170 (NRC, 1977). The recommendations in NUREG-0170 are based on best engineering judgments and have been shown to provide conservative estimates of material releases following accidents (Sprung et al., 2000). The release fractions used are those reported in NUREG-0170 for both Type A and Type B packages. Release fractions for

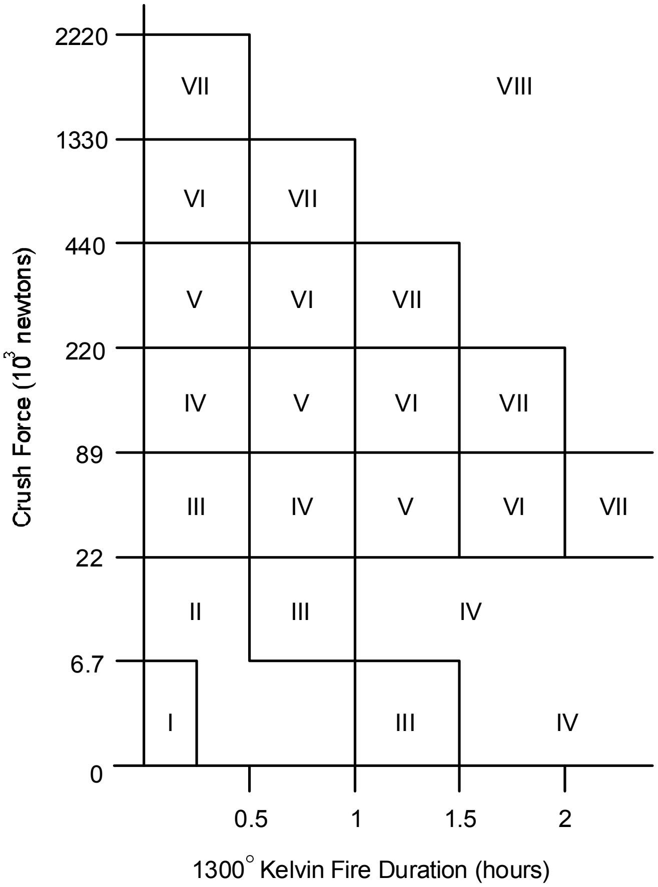

Figure D-3 Scheme for NUREG-0170 Classification by Accident Severity Category for Truck Accidents (NRC, 1977)

Table D-4 Fractional Occurrences for Truck Accidents by Severity Category and Population Density Zone

		Fractional Occurrence by Population Density Zone		
Severity Category	**Fractional Occurrence**	**Rural**	**Suburban**	**Urban**
I	0.55	0.1	0.1	0.8
II	0.36	0.1	0.1	0.8
III	0.07	0.3	0.4	0.3
IV	0.016	0.3	0.4	0.3
V	0.0028	0.5	0.3	0.2
VI	0.0011	0.7	0.2	0.1
VII	8.5×10^{-5}	0.8	0.1	0.1
VIII	1.5×10^{-5}	0.9	0.05	0.05

Source: NRC, 1977.

accidents of each severity category are given in Table D-5. As shown in that table, the amount of material released from the package ranges from zero for minor accidents to 100% for the most severe accidents.

Also important for the purposes of risk assessment are the fraction of the released material that can be entrained in an aerosol (part of an airborne contaminant plume) and the fraction of the aerosolized material that is also respirable (of a size that can be inhaled into the lungs). These fractions depend on the physical form of the material. Most solid materials are difficult to release in particulate form and are, therefore, relatively nondispersible. Conversely, liquid or gaseous materials are relatively easy to release if the container is breached in an accident.

The aerosolized fraction for the UF_6 shipments was taken to be 0.01, except in the case of higher severity accidents (Categories VI through VIII) involving fire, for which it was taken to be 0.33 (NRC, 2005a). The respirable fraction was taken to be 1 for all accidents. For LLRW, which was assumed to behave as a loose powder, the aerosolized fraction was set to 0.1, with a respirable fraction of 0.05 (Neuhauser and Kanipe, 2003).

Table D-5 Estimated Release Fractions for Type A and Type B packages under Various Accident Severity Categories

Severity Category	Release Fraction[a]	
	Type A	Type B
I	0	0
II	0.01	0
III	0.1	0.01
IV	1	0.1
V	1	1
VI	1	1
VII	1	1
VIII	1	1

[a] Values are for total material release fraction (the fraction of material in a package released to the environment during an accident).

Source: NRC, 1977.

D.3.4.3 Atmospheric Conditions During Accidents

Hazardous material released to the atmosphere is transported by the wind. The amount of dispersion, or dilution, of the contaminant material in the air depends on the meteorologic conditions at the time of the accident. Because predicting the specific location of an offsite transportation-related accident and the exact meteorologic conditions at the time of the accident is impossible, generic atmospheric conditions were selected for the accident risk assessment. Neutral weather conditions were assumed. These conditions were represented by Pasquill atmospheric stability Class D with a wind speed of 4 meters per second (9 miles per hour). Because neutral meteorological conditions are the most frequently occurring atmospheric stability condition in the United States, these conditions are most likely to be present in the event of an accident involving a hazardous material shipment. Observations at National Weather Service surface meteorological stations at more than 300 U.S. locations indicate that on a yearly average, neutral conditions (represented by Pasquill Classes C and D) occur about half (50 percent) the time; stable conditions (Pasquill Classes E and F) occur about one-third (33 percent) of the time; and unstable conditions (Pasquill Classes A and B) occur about one-sixth (17 percent) of the time (Doty and Wallace, 1976). The neutral category predominates in all seasons, but it is most prevalent (nearly 60 percent of the observations) during winter.

D.3.5 Radiological Risk Assessment Input Parameters and Assumptions

The dose (and, correspondingly, the risk) to populations during routine transportation of radioactive materials is directly proportional to the assumed external dose rate from the shipment. The actual dose rate from the shipment is a complex function of the composition and configuration of shielding and containment materials used in the packaging, the geometry of the loaded shipment, and the characteristics of the radioactive material itself.

Table D-6 lists the external dose rates used for this analysis that were adapted from Table D-7 of NUREG-1790, *Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico* (NRC, 2005b) and used in this transportation analysis. The dose rates are presented in terms of the transport index (TI), which is the dose rate at 1 meter (3 feet) from the side of any package surface. The regulatory limit established in 49 CFR 173.441 and 10 CFR 71.47 to protect the public is 0.1 millisievert per hour (10 millirem per hour) at 2 meters (6 feet) from the outer lateral sides of the transport vehicle.

Note that in Table D-6, the external radiation levels for an empty cylinder are approximately double those for a full cylinder. This occurs for two reasons. First, after UF_6 is vaporized and removed from a cylinder, the radioactive uranium daughter products that build up due to the radioactive decay of uranium collect at the bottom and form what is known as a “heel.” The nature of the radiation emitted from the uranium daughter products results in a greater release of gamma radiation than occurs from just uranium. Second, uranium is also a good shield material for gamma radiation. When the cylinder is full of UF_6, the uranium daughters are distributed throughout the cylinder and emitted radiation must pass through a significant amount of uranium (and thus, can be stopped or absorbed by the uranium). It is only gamma radiation from the uranium daughters near to the inner surface of the cylinder that can penetrate the cylinder and contribute to a nearby person’s radiation exposure. Because the empty cylinder no longer has the high shielding capability of the UF_6 versus the remaining vapor, and the heel concentrates the more highly radioactive uranium daughters right next to the inner cylinder surface, the radiation levels of the empty UF_6 cylinder are higher than those for a full UF_6 cylinder.

In addition to the specific parameters discussed previously, values for a number of general parameters must be specified within the RADTRAN code to calculate radiological risks. These general parameters define basic characteristics of the shipment and traffic and are specific to the mode of transportation. The RADTRAN user manual (Neuhauser and Kanipe, 2003)

Table D-6 External Dose Rates and Package Sizes Used in RADTRAN

Material	Vehicle Size (m)	Crew View (m)	Shipment External Dose Rate at 1 m (mrem/hour)[a]
UF_6 feed	3.73	1.23	0.29
UF_6 product	12	0.76	0.95
Depleted UF_6 tails	3.73	1.23	0.28
Empty cylinders[b]	8	1.23	2.0
LLRW	14	2.44	0.15

[a] Sources: GLE, 2008; GLE, 2009; NRC, 2005b.

[b] Contains residual material. See text for discussion.

Table D-7 General RADTRAN Input Parameters[a]

Parameter	Truck
Number of crew members	2
Distance from source to crew (m)	3.1
Average vehicular speed (km/hour)[b]	
Rural	88.49
Suburban	88.49
Urban	88.49
Number of people per vehicle sharing route	2
Population density along routes (persons/km^2)[c]	Route-specific
One-way traffic count (vehicles/hour)[d]	
Rural	530
Suburban	760
Urban	2400
Stop time (hour/km)[e]	0.0014
Population density at stops (persons/km^2)[f]	
1 to 10 m from vehicle	30,000
10 to 800 m from vehicle	340

[a] Accident conditional probabilities are listed by severity category in Table D-4; accident release fractions are given in Table D-5.

[b] Fraction of rural and suburban travel on freeways was set to 1 in RADTRAN. Thus, the rural speed was used for both urban and suburban zones.

[c] Route-specific population densities are listed in Table D-1.

[d] DOE, 2002.

[e] Hostick et al., 1992. Equivalent to 30 minutes for every 4 hours of driving at 88.49 km/hour (55 mph).

contains derivations and descriptions of these parameters. The general RADTRAN input parameters used in the radiological transportation risk assessment are summarized in Table D-7.

D.3.6 Routine Nonradiological Vehicle Emission Risks

Vehicle-related risks during incident-free transportation include incremental risks caused by potential exposure to airborne particulate matter from fugitive dust and vehicular exhaust emissions. The health endpoint assessed under routine transport conditions is the excess (additional) latent mortality caused by inhalation of vehicular emissions. These emissions occur primarily in the form of diesel exhaust and fugitive dust (resuspended particulates from the roadway). Strong epidemiological evidence exists suggesting that increases in ambient air concentrations of PM_{10} (particulate matter with a mean aerodynamic diameter less than or equal to 10 microns) lead to increases in mortality (EPA, 1996a; EPA, 1996b). Currently, it is assumed that no threshold exists and that the dose-response functions for most health effects associated with PM_{10} exposure, including premature mortality, are linear over the concentration ranges investigated (EPA, 1996a). Over both the short and long terms, fatalities (mortality) may result from life-shortening respiratory or cardiovascular diseases (EPA, 1996a; Ostro and Chestnut, 1998). The long-term fatalities also are assumed to include those from cancer.

The increased ambient air particulate concentrations caused by the transport vehicle, due to fugitive dust and diesel exhaust emissions, were related to premature latent fatalities in the form of risk factors for transportation risk assessments (Biwer and Butler, 1999). Thus, a value of 8.36×10^{-10} latent fatalities per kilometer for truck transport was used in this assessment. This value is for heavy combination trucks (truck class VIIIB) and for areas with an assumed population density of one person per square kilometer (2.6 persons per square mile). One-way shipment risks are obtained by multiplying the appropriate risk factor by the average population density along the route and the route distance. The risks reported for routine vehicle risks in this analysis are for round-trip travel of the transport vehicle.

The vehicle risks reported here are estimates based on the best available data. However, as is true for the radiological risks, there is a large and not readily quantifiable degree of uncertainty in the vehicle emission risk factors. For example, large uncertainties exist as to the extent of increased mortality with an incremental rise in particulate air concentrations and as to whether there are threshold air concentrations that are applicable. Also, estimates of the particulate air concentrations caused by transport vehicles are dependent on location, road conditions, vehicle conditions, and weather.

As discussed by Biwer and Butler (1999), there are large uncertainties in the human health risk factors used to develop the emission risks. In addition, because of the conservatism of the assumptions made to reconcile results with those presented by EPA (EPA, 1993), latent fatality risks estimated with the above risk factor may be considered to be near an upper bound. Use of this risk factor for truck class VIIIB will give estimated fatalities comparable to those from accident fatalities in some cases. In addition, the question as to what exactly constitutes a fatality as a direct consequence of increased PM_{10} levels from vehicle emissions has not been answered definitively, but long-term fatalities have been associated with increased levels of PM_{10} (Biwer and Butler, 1999).

D.4 Transportation Impacts

Single shipment transportation impacts are presented in Table 4-13 of Section 4.2.10.2. Total collective population transportation impacts are presented in Table 4-14.

D.5 References

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APPENDIX E
AIR QUALITY ANALYSIS

APPENDIX E
AIR QUALITY ANALYSIS

This appendix discusses detailed information on assumptions, emission factors, and emission calculations for criteria air pollutants. Detailed information on assumptions, parameter selection, and air dispersion modeling is also presented. For the air quality analysis, the lifespan of the proposed General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) Facility is considered in four phases:

- Access road construction and land clearing (does not include other elements of preconstruction, such as ancillary building construction)
- Building construction (including ancillary building construction that occurs as part of preconstruction)[1]
- Start-up and final construction (includes concurrent indoor construction with staged testing and start-up of process units as completed)
- Facility operation

The analyses in this appendix are based on the assumption that a licensing decision will be made in 2012, NRC-licensed construction (if authorized) would begin shortly after the licensing decision, and termination of the 40-year license would occur in 2052. Construction activities, which include ancillary building construction, may begin before NRC-licensed construction starts (as discussed in Section 1.4.1). Start-up and final construction would occur from 2014 to 2020, at which time the facility would be fully operational (GLE, 2011). The NRC expects that any additional changes in the licensing and construction schedule would cause slight changes to the air quality analysis but would not affect the resulting impact conclusions.

E.1 Emissions Estimation Associated with Construction and Operation of the Proposed GLE Facility

For convenience in emission inventories and air quality modeling, road construction is conservatively assumed to take place during the two consecutive months of the year that result in the highest air quality impacts, followed by 1 year or more of land clearing. Building construction, including ancillary building construction (which is part of preconstruction), would begin in 2012. Table E-1 presents general assumptions for estimating air emissions associated with construction and operation of the proposed GLE Facility. Tables E-2 through E-5 discuss input parameters and activity-specific assumptions used for estimating air emissions at the proposed GLE Facility. Tables E-6 through E-14 present average daily and annual emissions based on emission factors and activity levels (e.g., area disturbed, total vehicle miles traveled).

During access road construction and land clearing, as well as building construction, air emissions would include fugitive dust from soil disturbances caused by heavy equipment and by truck traffic on unpaved roads, and engine exhaust emissions from off-road construction

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[1] For the purposes of estimating emission inventories and air quality modeling, the construction of ancillary structures, which is part of preconstruction, is grouped into building construction.

equipment and motor vehicles, such as commuting, visiting, support, and delivery traffic in and around the proposed GLE Facility. These activities would generate air emissions of criteria pollutants (sulfur dioxide [SO_2], nitrogen oxides [NO_x], carbon monoxide [CO], particulate matter equal to or smaller than 10 micrometers [PM_{10}] and particulate matter equal to or smaller than 2.5 micrometers [$PM_{2.5}$]), volatile organic compounds (VOCs), greenhouse gases (GHGs) (e.g., carbon dioxide [CO_2]), and a small amount of hazardous air pollutants (HAPs) (e.g., benzene). VOCs are organic compounds that easily volatize or evaporate and can break down through photochemical reactions, contributing to air pollution, especially the generation of tropospheric ozone (O_3). GHGs are gases that absorb outgoing infrared radiation emitted by the earth's surface and trap heat in the atmosphere. HAPS are a group of 188 chemicals identified in the *1990 Clean Air Act Amendments* (42 U.S.C. 7412), exposure to which can cause or contribute to cancer, birth defects, genetic damage, and other adverse health effects. Small quantities of additional VOC and HAP emissions would be released from the refueling and onsite maintenance of the off-road construction equipment, and from painting and other construction-finishing activities.

Fugitive Dust: No detailed information on the time schedule, heavy equipment usage, and activity levels is available at this time. General area-wide emission factors based on the area and duration of disturbances were used. As shown in Tables E-2 and E-3, it is assumed that an uncontrolled PM_{10} emission factor of 0.94 metric tons per hectare-month (0.42 tons per acre-month) was applied to large-scale earthmoving activities, such as road construction and site preparation, while an uncontrolled PM_{10} emission factor of 0.25 metric tons per hectare-month (0.11 tons per acre-month) was applied to construction activities, such as erection of building structures and equipment installation (MRI, 1996). It is also assumed that 10 percent of PM_{10} emissions of fugitive dust is $PM_{2.5}$ (Countess Environmental, 2006). For this analysis, an emission control efficiency of 74 percent is assumed during the early construction phase.

Off-Road Construction Equipment: A composite emission factor for off-road construction equipment was estimated based on assumed mix of heavy equipment types and pieces of heavy equipment, load factor, and equipment-specific emission factors (EPA, 2004a,b).

Onroad Motor Vehicles: Commuting, visitor, support, and delivery traffic, ranging from small passenger cars to heavy-duty tractor trailers, would travel within and to and from the Wilmington Site. Emission factors by vehicle classification are estimated using the EPA's MOBILE6.2 mobile source emission factor model (EPA, 2003).

Operation of the proposed GLE Facility would generate a small amount of criteria pollutants and HAP emissions because of no combustion being involved. During facility operation, primary emission sources would include minimal PM emissions from the GLE Facility building stack, PM emissions as drift from mechanical-draft cooling towers, auxiliary diesel generator units operating on an intermittent basis, onsite transfer vehicles (OSTVs) for moving cylinders to and from the cylinder pads, and heavy-duty trucks transferring product cylinders to the onsite Fuel Manufacturing Operations (FMO) facility. During the facility operation phase, commuting, visiting, support, and local delivery traffic in and around the proposed GLE Facility would also be emission sources. To support facility operation, regional deliveries would be anticipated: UF_6 feedstock coming to the GLE Facility and UF_6 product, depleted UF_6 tails, empty 48Y cylinders, and low-level radioactive waste (LLRW) going out from the proposed GLE Facility. But these emissions would have minimal impacts on the surrounding area of the proposed GLE Facility because they are released along the long roadways. Although criteria pollutants and VOCs from regional deliveries are not included, greenhouse gas emissions (such as CO_2) are included in the analysis. Overall, non-particulate matter (PM) emissions are comparable to, but PM emissions are far lower than, those for access road construction and land clearing as well as building construction.

E.2 Air Quality Modeling Analysis

Air dispersion modeling was performed to estimate ambient air concentration increments at the site boundary and offsite receptors as a result of air emissions during access road construction and land clearing as well as building construction at the proposed GLE Facility. Air quality modeling was performed for criteria air pollutants including SO_2, NO_2, CO, and PM (PM_{10} and $PM_{2.5}$). Air quality modeling for ozone and lead was not performed. Ozone is a regional concern and is formed by highly complex and nonlinear reactions that involve VOC and nitrogen oxide (NO_x) precursors. Air dispersion modeling for ozone requires intensive meteorological and emissions data processing and computing resources. However, emissions from construction and operation at the proposed GLE Facility would not be high enough to influence regional ozone levels, and thus, no ozone modeling is warranted. Air quality modeling for lead (Pb) was not performed because its emissions and associated ambient impacts would be minimal due to the phasing out of leaded gasoline in the 1970s. The following sections include brief descriptions of the air dispersion model, meteorological data processing, receptor data, and modeling assumptions.

E.2.1 Selection of Air Dispersion Model

For this modeling analysis, the latest version of the AMS/EPA Regulatory MODel (AERMOD) modeling system (version 09292) (EPA, 2009) was used. AERMOD is the U.S. Environmental Protection Agency's (EPA's) preferred or recommended model for a wide range of regulatory applications. AERMOD is a refined, steady-state plume model that incorporates air dispersion based on state-of-the-art planetary boundary layer turbulence structure and scaling concepts, and building wake effects and plume downwash for point sources. It includes treatment of both surface and elevated sources (including multiple point, area, and volume sources), and both simple and complex terrain, and can be applied to rural and urban areas. The model uses hourly sequential preprocessed meteorological data to estimate not only airborne concentrations, but also dry and wet deposition fluxes for both particulate and gaseous emissions of nonreactive pollutants for averaging times, ranging from 1 hour to the period (1 year or multiple years).

AERMOD is a modeling system that contains three major separate components:

- AERMET – meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts;

- AERMAP – terrain data preprocessor that incorporates complex terrain using digital elevation data; and

- AERMOD – air dispersion model that estimates airborne concentrations and dry/wet deposition fluxes.

In addition, supporting programs for the AERMOD modeling system include:

- AERSURFACE – surface characteristics preprocessor that estimates surface characteristics including surface roughness length, albedo, and Bowen ratio for input to the AERMET;
- BPIPPRIME – a tool that calculates building parameters to account for building downwash effects of point source(s) for input to the AERMOD; and
- AERSCREEN – a screening model for AERMOD that produces estimates of regulatory design concentrations without the need for meteorological data and is designed to produce more conservative results than AERMOD. EPA is currently working on a beta version of the code.

E.2.2 Determination of Surface Characteristics

For use in the computation of the fluxes and stability of the atmosphere, meteorological data preprocessor AERMET needs surface characteristics parameters, including surface roughness length, albedo, and the Bowen ratio. The surface roughness length is a measure of irregularities at the surface, including vegetation, topography, and structures, which influence the near-surface wind stress. Surface roughness length plays the most crucial role in determining the magnitude of mechanical turbulence and the stability of the boundary layer. The typical values range from 0.001 meter (0.003 feet) over calm water surfaces and 1 meter (3.3 feet) or more over a forest or urban area. Albedo is the fraction of the amount of radiation reflected from the surface to the amount of radiation incident on the surface. Typical values range from 0.1 for thick deciduous forests to 0.9 for fresh snow. The Bowen ratio, indicator of surface moisture, is the ratio of sensible heat flux to the latent heat flux. The Bowen ratio is used to determine the planetary boundary layer parameters for convective conditions. The typical values range from 0.1 over water to 10 over desert at midday.

Surface characteristics should represent the meteorological data at the application site. However, such data may not be available and data from a nearby *representative* measurement site must be used. In particular, the Wilmington/Hanover County Airport is exposed to open areas, while the proposed GLE Facility is surrounded by wooded area. Although the Wilmington Airport is only about 8 kilometers (5 miles) from the proposed GLE Facility, its meteorological parameters and surface characteristics are not representative of those for the proposed GLE Facility. In this case, the AERMOD Implementation Guide (EPA, 2009) recommends finding another nearby measurement site representative of both meteorological parameters and surface characteristics of the site of interest. Failing that, it is likely that site-specific meteorological data will be required. For this analysis, the nearby Horticultural Crops Research Station (CAST) was chosen as being representative of the proposed GLE Facility.

The AERSURFACE tool has been developed to aid users in obtaining realistic and reproducible surface characteristic values, which is, in turn, input to the meteorological data preprocessor AERMET. AERSURFACE requires land cover data from the U.S. Geological Survey (USGS) National Land Cover Data 1992 archives (NLCD92) (USGS, 2009). These data are used to determine the land cover types around the user-defined location.
The CAST in Castle Hayne operated by the State Climate Office of North Carolina (SCONC), which is located less than 3 kilometers (2 miles) directly east of the proposed GLE Facility, was selected for the AERSURFACE analysis. The elevation and terrain features (mostly flat)

surrounding the CAST station are comparable to those of the proposed GLE Facility. Surface characteristics for the CAST station are representative of those for the proposed GLE Facility, once trees are removed for construction. Accordingly, the CAST station is considered adequately representative of the proposed GLE Facility and was used as the source of onsite meteorological data for this assessment.

Seasonal surface characteristics were determined for each of twelve 30-degree sectors. A default domain defined by 10 kilometers by 10 kilometers (6 miles by 6 miles) centered on the measurement site is used for determination of albedo and Bowen ratio. A radius of 1 kilometer (0.6 mile) from the measurement site was used to determine the surface roughness values per recommendation in EPA's AERMOD Implementation Guide (EPA, 2009). To determine the Bowen ratio, surface moisture conditions around the site are needed to characterize the area relative to climate normals. Surface moisture conditions for Bowen ratio were determined by year, based on the 30-year (1971–2000) annual precipitation record at the Wilmington Airport[2] (NCDC, 2000; NCDC 2009a). If annual precipitation for the year of interest is within the lower-30th percentile or the upper-30th percentile of the 30-year record, dry or wet conditions, respectively, are assigned. Otherwise, average conditions were assigned. For this analysis, wet conditions were selected for 2005 and 2006, dry conditions for 2007, and average conditions for 2008. Additional user inputs to affect surface characteristic values include whether the site is an airport or an arid region, and the amount of continuous snow cover through most of the winter.

E.2.3 Meteorological Data Processing

The meteorological data preprocessor (AERMET) requires three types of data: National Weather Service (NWS) hourly surface observations; NWS twice-daily upper air soundings; and data collected from an onsite measurement tool such as an instrumented tower, if available. No onsite meteorological data are available, so hourly surface and twice-daily upper sounding data from the nearest CAST station and NWS stations were used for the analysis. As discussed, the CAST station represents onsite data for this assessment. Meteorological data at the CAST station have been collected at 10-meter (33-foot) height, which include wind speed and direction, ambient temperature, standard deviation of horizontal wind direction (missing from the second half of 2006 to 2008), and solar radiation. Site-specific surface characteristics influence plume dispersion in the boundary layer, associated parameters for which are typically derived using the surface measurement data from a nearby airport. Hourly surface meteorological data at the Wilmington Airport, which is located about 8 kilometers (5 miles) southeast of the proposed GLE Facility, are used to supplement the missing data at the CAST site and to estimate boundary layer parameters (NCDC, 2009b). Twice-daily upper sounding data from Charleston, South Carolina,[3] which is located about 249 kilometers (155 miles) southwest of the

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[2] The CAST has also collected precipitation data since 1983, which is less than the 30-year climatological record required to determine surface moisture conditions. Typically, there is little spatial variance over such a short distance.

[3] An upper air station at Morehead City, North Carolina is about 113 km (70 mi) northeast of the proposed GLE Facility, closer than Charleston, South Carolina. However, the former is located in the barrier island and thus, is more affected by the marine boundary layer of Atlantic Ocean than Charleston and the proposed GLE Facility, which are more than 16 km (10 mi) from the Atlantic Ocean. Accordingly, the Charleston was chosen for the analysis, considering the similarity of distance and orientation to the Atlantic Ocean.

GLE Facility, are used for estimating the heights of convective boundary layer (NOAA, 2009). Using the AERMET preprocessor, the most recent 4 years of meteorological data (2005 to 2008)[4] were processed for input to the AERMOD model. Table E-15 presents detailed information on surface, upper air, and onsite meteorological stations, data file formats, anemometer heights, and distance and direction from the proposed GLE Facility.

Figure E-1 presents a wind rose at 10-meter (33-foot) level of CAST station on 2005–2008 wind data (Frazier, 2009). The average annual wind speed is about 2.1 meters per second (4.7 miles per hour) and relatively higher calm winds are recorded about one-fourth of the time. The prevailing wind directions are from the southwest and northeast (about 8.7 percent of the time each), and secondarily from west–southwest (8.2 percent). Wind speed tends to be highest in spring and lowest in summer. Occurrences of calm winds are lowest (about 12 percent frequency) in spring and high (about 20 percent frequency) in all other seasons. In general, southwesterly winds prevail in winter through summer, while northerly winds prevail in fall. The southwesterly winds are strongly influenced by general synoptic-scale[5] wind patterns of the Bermuda High. In contrast, northerly winds reflect the influences of penetrating polar air masses and changes in global circulation (Robinson, 2005). Compared to wind directions at the Wilmington Airport (see Figure 3-5), prevailing wind directions at the CAST station are a little different, but general wind patterns are similar. Average wind speed at the CAST station is about two-thirds of that at the Wilmington Airport, even though the two stations are only 6 kilometers (4 miles) apart. This can be explained by differences in surface roughness, because the CAST site is surrounded by tall trees, but the airport is surrounded by open areas.

E.2.4 Terrain Data Processing

Areas are relatively flat within a 50-kilometer (31-mile) radius from the proposed GLE Facility, with approximately 20-meter (66-foot) variances in elevation, and no significant topographic features. For the modeling analysis, it is assumed that the terrain is flat, and thus, no AERMAP processing has been performed.

E.2.5 Receptor Location Data

For the analysis, a modeling domain of 50-kilometer (31-mile) radius centered on the proposed GLE Facility was developed. In doing so, two sets of receptor networks were developed: (1) fenceline receptors and (2) regularly spaced polar receptor grids. For the analysis, discrete receptors at Wilmington Site boundaries are set densely (few tens meters) at northern boundaries, where maximum concentration are anticipated, and sparsely (few hundred meters) at other site boundaries. Regularly spaced polar receptor grids were placed at 31 rings outward ranging from 50 meters (164 feet) to 50 kilometers (31 miles) along sixteen 22.5-degree radials.

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[4] Per EPA's modeling guidance (40 CFR Part 51, Appendix W – Guideline on Air Quality Models), most-recent consecutive five years of meteorological data representative of the site of interest should be used when estimating concentrations with an air quality model. However, four years of data (2005–2008) were used for this analysis. A problem in wind direction measurements was found at the CAST in 2004 and the wind sensor was replaced in January 2005. Wind roses for 2001–2004 at the station indicated that wind patterns are totally off from the general patterns in the area and thus, wind data during this period are not useable.

[5] The scale of high- or low-pressure systems in the lower atmosphere seen on weather maps, in which the typical horizontal dimension is on the order of 1000 km (621 mi) or more.

A total of 557 receptors consists of 61 fenceline receptors and 496 regularly spaced polar receptor grids. Although air quality impact analysis was performed at site boundaries and beyond, irrespective of human residence, modeling calculations for onsite receptors were made to provide maximum onsite concentrations for worker health hazards and to analyze concentration contour patterns.

E.2.6 Modeling Assumptions

The following assumptions are for air quality modeling and modeling result interpretations:

- Construction activities would occur seven days per week (359 days per year) for 9 hours per day, from 7 a.m. to 4 p.m, while operation activities would occur seven days per week (365 days per year) for 24 hours per day.

- Dry and wet deposition mechanisms are uncertain and are not included in EPA's regulatory option, and thus, it is not recommended to use them for typical applications except in special cases (e.g., deposition impacts on vegetation). Accordingly, no dry and wet depositions for construction-related PM modeling were assumed (i.e., all PMs are airborne as a conservatism).

- During the road construction, land clearing, and construction phases, fugitive dust emissions resulting from soil disturbances by heavy construction equipment or vehicles are typically released at the top of the wheel/tire, with initial dispersion corresponding to the volume size of the equipment or truck. Engine exhaust emissions from heavy construction equipment or vehicles are released at some height along with plume rise induced by momentum and buoyancy. However, for this analysis, it is conservatively assumed that emissions are released at the ground level without vertical dimension.

- For purposes of modeling demonstrations of compliance with the National Ambient Air Quality Standards (NAAQS), the following modeled concentrations were used for comparison with the NAAQS as recommended by EPA. The highest of the second-highest modeled concentrations over 4 years were presented for 3-hour and 24-hour SO_2, and 1-hour and 8-hour CO. The highest of the annual averages over 4 years were presented for annual average for SO_2 and NO_2. For PM_{10}, high-5th-high over 4 years (2005–2008) was presented. For $PM_{2.5}$, the highest of the 4-year average of the high-8th-high concentration at each receptor was presented. The highest of 4-year averaged annual means across the receptors for $PM_{2.5}$ were presented.

E.2.7 Modeling Results

Air dispersion modeling estimates concentration increments over the background. To obtain total concentrations for comparison with applicable air quality standards (NAAQS), these modeled concentration increments were added to measured background concentrations representative of the Wilmington Site (Buckler, 2009).

For road construction and land clearing activities and building construction activities, detailed discussion of modeling results, contributing factors to maximum concentrations, and mitigation measures can be found in Section 4.2.4. The following is a brief summary of the modeling results. Air dispersion modeling was not performed for the start-up and final construction and facility operations phases because estimated emissions were relatively small during these periods.

Throughout the entire life of the proposed GLE Facility, combustion-related emissions such as SO_2, NO_2, and CO would not have any potential impacts on ambient air quality. However, modeling results indicate that short-term (24-hour) PM_{10} and $PM_{2.5}$ concentrations resulting from fugitive dust emissions at ground level could exceed NAAQS near northern site boundaries during the earlier project phases.

During land clearing (preconstruction), high PM concentrations would occur at the proximate northern boundaries of the proposed GLE Facility due to heavy land clearing activities and near the Wooden Shoe residential subdivision due to vehicle traffic on the unpaved North Access Road. High PM concentrations are predicted only at proximate northern boundary of the proposed GLE Facility as the North Access Road is paved during the construction phase. Most of these exceedances are associated with a couple of hours of high concentrations in the early morning in winter, typical of low wind speeds, stable conditions, and relatively low mixing heights. It is assumed that access road construction would take place during the two consecutive months of the year that result in the highest air quality impacts, followed by 1 year or more of land clearing. These exceedances could be avoided by application of appropriate mitigation measures, such as implementation of aggressive dust control measures or minimization of soil-disturbing activities during unfavorable meteorological conditions (to the extent practicable).

E.3 References

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Table E-1 General Assumptions for Estimating Air Emissions Associated with Construction and Operation of the Proposed GLE Facility

Phase	Activity	Schedule[a]	Workdays per year	Work Schedule	Area Disturbed (acres)	Average Daily Workers Onsite[a]	Average Daily Trips[a,b,c]
Early Construction							
Road Construction	Onsite access road construction	2012[d]	60	7 days/week 7 a.m.– 4 p.m.	8.65[f]	95	200
Land Clearing	Preparation of site for erection of buildings and structures	2012[d]	365[e]		148.7		
Building Construction	Erection of main GLE Facility building and ancillary buildings and structures	2012 through 2014	365[g]	7 days/week 7 a.m.– 4 p.m.	117.4	858	1801
Start-up and Final Construction	Concurrent indoor construction activities with staged testing and start-up of process units as completed	2014 through 2020	365[h]	7 days/week 24 hours/day	NA[i]	590	1239
Operation	Full capacity fuel enrichment operations	2020 through 2051	365[h]	7 days/week 24 hours/day	NA	350	735

[a] Source: GLE, 2011. Additional changes to the project schedule would be expected to cause slight changes in the air quality analysis, but are not expected to affect the impacts conclusions.

[b] Each trip is a one-way trip, including onsite road from the proposed GLE Facility to the entrance on Castle Hayne Road (2.64 km [1.64 mi]) and offsite roads (16.1 km [10 mi] for automobiles and 161 km [100 mi] for heavy-duty trucks).

[c] Average daily traffic consists of gasoline engine automobiles of 90 percent and heavy-duty diesel trucks of 10 percent.

[d] As discussed in Section 2.1.5, the schedule for preconstruction activities, including road construction and land clearing, is uncertain.

[e] No work schedule on five holidays (Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day).

[f] Total length of the onsite access road to the proposed GLE Facility (2.64 km [1.64 mi]) consists of existing paved road (0.72 km [0.45 mi]) and unpaved road (1.91 km [1.19 mi]). Road construction would occur on unpaved road segment only with an assumed 18.3-meter (60-foot) width.

[g] No work schedule on six holidays (New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day).

[h] 366 for leap years.

[i] NA = not applicable.

Table E-2 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Road Construction Followed by Land Clearing

Air Emission Source	Parameter	Parameter Value	Reference and/or Note
Fugitive dust emissions from soil disturbances at construction sites	PM_{10} uncontrolled emission factor	0.42 ton/acre/month	MRI, 1996
	$PM_{2.5}$ to PM_{10} ratio	0.1	Countess Environmental, 2006 (Section 3.3.1)
	Dust control efficiency	74%	Countess Environmental, 2006 (Section 3.6); 2.1-hour watering interval
Fugitive dust emissions from vehicular travel on unpaved onsite access road	Unpaved road segment	1.19 mi	See note d in Table E-1
	Surface silt content	18.9%	Weighted-average site-specific data for soils on onsite road segment; 0.77 mile of road for Murville fine sand soil (0.6% silt) and 0.42 mile of road for Pantego loam soil (44% silt)
	Average vehicle weight	9700 lb (4.85 ton)	Weighted average based on assumed 90% daily trips for automobiles with 3000 lb and 10% daily traffic for heavy-duty diesel trucks with 70,000 lb
	Average vehicle speed	15 mph	Assumed as part of onsite fugitive dust control mitigation measures
	PM_{10} uncontrolled emission factor	2.81 lb/VMT	EPA, 1995 (Section 13.2.2, 11/06)
	$PM_{2.5}$ uncontrolled emission factor	0.28 lb/VMT	EPA, 1995 (Section 13.2.2, 11/06)
	Dust control efficiency	55%	Countess Environmental, 2006 (Section 6.5); watering twice per day

Table E-2 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Road Construction Followed by Land Clearing (Cont.)

Air Emission Source	Parameter	Parameter Value			Reference and/or Note
Engine exhaust emissions from offroad diesel-powered heavy construction equipment	Average equipment mix	**Equipment**			Assumed mix of heavy construction equipment Load factor from EPA, 2004a
		Type (Number)	**Engine Horsepower (hp)**	**Load Factor**	
		Bulldozer (4)	175	0.59	
		Loader (4)	175	0.59	
		Grader (2)	175	0.59	
		Compactor/Roller (2)	120	0.59	
		Excavator (1)	175	0.59	
		Water truck (1)	175	0.59	
		Paver (1)	120	0.59	
	Site-specific composite emission factors	**Pollutant**	**lb/hr**		EPA, 2004b
		PM_{10}	1.48		Weighted averages based on emission factor for each equipment, number of each equipment, and load factor
		$PM_{2.5}$	1.44		
		NO_x	8.16		
		SO_2	0.02		
		VOC	0.62		
		CO	4.75		

Table E-2 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Road Construction Followed by Land Clearing (Cont.)

Air Emission Source	Parameter	Parameter Value		Reference and/or Note
Engine exhaust emissions from automobile and truck traffic	$PM_{2.5}$ to PM_{10} ratio	0.97		EPA, 2004b
	Automobile emission factors	**Pollutant**	**g/mi**	EPA, 2003
		PM_{10}	0.025	Estimated using MOBILE6.2 with: Calendar year: 2011[a] Minimum/maximum temperature: 2.1°C/13.5°C (35.8°F/56.3°F) (January) Fuel RVP: 9.0 (maximum RVP allowed in attainment areas in North Carolina) Used default values for other input parameters and assumptions
		$PM_{2.5}$	0.024	
		NO_x	0.549	
		SO_2	0.007	
		VOC	0.656	
		CO	13.080	
	Truck emission factors	**Pollutant**	**g/mi**	
		PM_{10}	0.136	Use light-duty gasoline vehicle (LDGV) emission factor for automobiles and heavy-duty diesel vehicle (HDDV) for trucks
		$PM_{2.5}$	0.132	
		NO_x	6.360	
		SO_2	0.013	
		VOC	0.381	
		CO	1.627	

[a] The calendar years for the emissions inventory in the MOBILE6.2 model were chosen based on the original project schedule. Emission factors for onroad vehicles decrease with time due to the introduction of more stringent emission controls. Thus, these emission estimates are conservative.

Table E-3 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Building Construction

<table>
<tr><th>Air Emission Source</th><th>Parameter</th><th colspan="3">Parameter Value</th><th>Reference and/or Note</th></tr>
<tr><td rowspan="2">Fugitive dust emissions from soil disturbances at construction sites</td><td>PM_{10} uncontrolled emission factor</td><td colspan="3">0.11 ton/acre/month</td><td>MRI, 1996</td></tr>
<tr><td>$PM_{2.5}$ to PM_{10} ratio</td><td colspan="3">0.1</td><td>Countess Environmental, 2006 (Section 3.3.1)</td></tr>
<tr><td rowspan="7">Engine exhaust emissions from offroad diesel-powered heavy construction equipment</td><td rowspan="7">Average equipment mix</td><td colspan="3">Equipment</td><td rowspan="7">Assumed mix of heavy construction equipment
Load factor from EPA, 2004a</td></tr>
<tr><td>Type (Number)</td><td>Engine Horsepower (hp)</td><td>Load Factor</td></tr>
<tr><td>Crane (2)</td><td>175</td><td>0.43</td></tr>
<tr><td>Tractor/backhoe (4)</td><td>100</td><td>0.21</td></tr>
<tr><td>Forklift (4)</td><td>75</td><td>0.59</td></tr>
<tr><td>Aerial lift (4)</td><td>75</td><td>0.21</td></tr>
<tr><td>Air compressor (4)</td><td>75</td><td>0.43</td></tr>
<tr><td rowspan="7"></td><td rowspan="7">Site-specific composite emission factors</td><td>Pollutant</td><td colspan="2">lb/hr</td><td rowspan="7">EPA, 2004b
Weighted averages based on emission factor for each equipment, number of each equipment, and load factor</td></tr>
<tr><td>PM_{10}</td><td colspan="2">0.75</td></tr>
<tr><td>$PM_{2.5}$</td><td colspan="2">0.73</td></tr>
<tr><td>NO_x</td><td colspan="2">4.01</td></tr>
<tr><td>SO_2</td><td colspan="2">0.01</td></tr>
<tr><td>VOC</td><td colspan="2">0.29</td></tr>
<tr><td>CO</td><td colspan="2">4.47</td></tr>
</table>

Table E-3 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Building Construction (Cont.)

Air Emission Source	Parameter	Parameter Value		Reference and/or Note
Engine exhaust emissions from automobile and truck traffic	$PM_{2.5}$ to PM_{10} ratio	0.97		EPA, 2004b
	Automobile emission factors	**Pollutant**	**g/mi**	EPA, 2003
		PM_{10}	0.025	Estimated using MOBILE6.2 with: Calendar year: 2012 Minimum/maximum temperature: 2.1°C/13.5°C (35.8°F/56.3°F) (January) Fuel RVP: 9.0 (maximum RVP allowed In attainment areas in North Carolina) Used default values for other input parameters and assumptions
		$PM_{2.5}$	0.024	
		NO_x	0.498	
		SO_2	0.007	
		VOC	0.597	
		CO	12.590	
	Truck emission factors	**Pollutant**	**g/mi**	
		PM_{10}	0.136	Use light-duty gasoline vehicle (LDGV) emission factor for automobiles and heavy-duty diesel vehicle (HDDV) for trucks
		$PM_{2.5}$	0.132	
		NO_x	5.481	
		SO_2	0.013	
		VOC	0.352	
		CO	1.418	

Table E-4 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Start-up and Final Construction

Air Emission Source	Parameter	Parameter Value	Reference and/or Note
Fugitive dust emissions from soil disturbances	Assumed no emissions because activities would occur mostly inside buildings		GLE Preliminary design information as of November 2009
Drift PM emissions from mechanical-draft cooling towers	See parameter and parameter data for the operation phase in the below		Production will be incrementally ramped up to full production over the 5-year period of the start-up (final construction) phase. Conservatively, assumed the same parameter values for the operation phase.
Engine exhaust emissions from auxiliary diesel generator units			
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for moving UF_6 cylinders to and from cylinder pads			
Engine exhaust emissions from heavy-duty truck used for transfer of product cylinders to onsite Fuel Manufacturing Operations (FMO) facility			

Table E-4 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Start-up and Final Construction (Cont.)

Air Emission Source	Parameter	Parameter Value		Reference and/or Note
Engine exhaust emissions from automobile and truck traffic	$PM_{2.5}$ to PM_{10} ratio	0.97		EPA, 2004b
	Automobile emission factors	**Pollutant**	**g/mi**	EPA, 2003
		PM_{10}	0.025	Estimated using MOBILE6.2 with: Calendar year: 2015 Minimum/maximum temperature: 2.1°C/13.5°C (35.8°F/56.3°F) (January) Fuel RVP: 9.0 (maximum RVP allowed in attainment areas in North Carolina) Used default values for other input parameters and assumptions
		$PM_{2.5}$	0.024	
		NO_x	0.379	
		SO_2	0.007	
		VOC	0.475	
		CO	11.640	
	Truck emission factors	**Pollutant**	**g/mi**	Use light-duty gasoline vehicle (LDGV) emission factor for automobiles and heavy-duty diesel vehicle (HDDV) for trucks.
		PM_{10}	0.136	
		$PM_{2.5}$	0.132	
		NO_x	3.507	
		SO_2	0.013	
		VOC	0.304	
		CO	0.840	

Table E-5 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Operations

Air Emission Source	Parameter	Parameter Value	Reference and/or Note
Drift PM emissions from mechanical-draft cooling towers	Number of cooling towers	2	GLE Preliminary design information as of November 2009
	Number of cells per cooling tower	8	
	Water flow rate per cell	22,500 gal/hr	
	Total dissolved solids (TDS) concentration	858 ppm	Based on cooling towers operating at the existing manufacturing facilities at the Wilmington Site
	Total liquid drift factor	1.7 lb/1000 gal	EPA, 1995 (induced draft cooling tower, Section 13.4, 1/95)
	PM_{10} emission factor per cell	0.0015 lb/1000 gal	Calculated
	$PM_{2.5}$ to PM_{10} ratio	1	Assumed based on typical drift particle size distribution for cooling towers
Engine exhaust emissions from auxiliary diesel generator units	Number of units	2	GLE Preliminary design information as of November 2009
	Engine rating	382 hp	
	Diesel fuel sulfur content	0.2%	Based on NCDAQ air permit conditions for the existing emergency diesel generators at the Wilmington Site
	Annual operation	240 hours per year per unit	
	Emission factors	**Pollutant** **lb/hr**	NCDENR, 2000
		PM_{10} 0.27	Assume VOC is the non-methane total organic compound (NMTOC) rate provided in the NCDAQ spreadsheet
		$PM_{2.5}$ 0.27	
		NO_x 5.0	
		SO_2 0.62	
		VOC 0.25	
		CO 2.1	

Table E-5 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Operations (Cont.)

Air Emission Source	Parameter	Parameter Value		Reference and/or Note
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for moving UF_6 cylinders to and from cylinder pads	Number of OSTVs	2		GLE Preliminary design information as of November 2009
	Engine rating	75 hp		Assume based on engineering judgment.
	Operating hours per day	3		GLE Preliminary design information as of November 2009
	Emission factors	**Pollutant**	**g/hp-hr**	EPA, 2004b
		PM_{10}	0.6496	
		$PM_{2.5}$	0.6301	
		NO_x	3.1450	
		SO_2	0.0049	
		VOC	0.1980	
		CO	4.1657	
Engine exhaust emissions from heavy-duty diesel truck used for transfer of product cylinders to onsite Fuel Manufacturing Operations (FMO) facility	Number of vehicles	1		GLE Preliminary design information as of November 2009
	Operating interval	1 round trip per week		
	Distance traveled	2 mi		One-way distance between the proposed GLE Facility and FMO facility
	Emission Factors	See below		

Table E-5 Input Parameters Used for Estimating Air Emissions at the Proposed GLE Facility: Operations (Cont.)

Air Emission Source	Parameter	Parameter Value		Reference and/or Note
Engine exhaust emissions from automobile and truck traffic	$PM_{2.5}$ to PM_{10} ratio	0.97		EPA, 2004b
	Automobile emission factors	**Pollutant**	**g/mi**	EPA, 2003
		PM_{10}	0.025	Estimated using MOBILE6.2 with: Calendar year: 2018 Minimum/maximum temperature: 2.1°C/13.5°C (35.8°F/56.3°F) (January) Fuel RVP: 9.0 (maximum RVP allowed in attainment areas in North Carolina) Used default values for other input parameters and assumptions
		$PM_{2.5}$	0.024	
		NO_x	0.300	
		SO_2	0.007	
		VOC	0.403	
		CO	11.060	
	Truck emission factors	**Pollutant**	**g/mi**	Use light-duty gasoline vehicle (LDGV) emission factor for automobiles and heavy-duty diesel vehicle (HDDV) for trucks.
		PM_{10}	0.136	
		$PM_{2.5}$	0.132	
		NO_x	2.272	
		SO_2	0.013	
		VOC	0.279	
		CO	0.585	

Table E-6 Estimated Average Daily Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Road Construction and Land Clearing

Average Daily Onsite Air Emissions Associated with Access Road Construction Activities

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Fugitive dust emissions from onsite access road construction	63.0	6.30	NA[a]	NA	NA	NA
Engine exhaust emissions from offroad diesel-powered heavy construction equipment	13.4	13.0	73.5	0.14	5.55	42.8
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.02	0.02	0.36	0.004	0.43	8.48
Engine exhaust emissions from onsite diesel engine truck traffic	0.01	0.01	0.46	0.001	0.03	0.12
TOTAL	76.4	19.3	74.3	0.14	6.00	51.4

Average Daily Onsite Air Emissions Associated with Land Clearing

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Fugitive dust emissions from site preparation	1082.5	108.3	NA	NA	NA	NA
Fugitive dust emissions from construction vehicle traffic on unpaved onsite access road	300.0	30.0	NA	NA	NA	NA
Engine exhaust emissions from offroad diesel-powered heavy construction equipment	13.4	13.0	73.5	0.14	5.55	42.8
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.02	0.02	0.36	0.004	0.43	8.48
Engine exhaust emissions from onsite diesel engine truck traffic	0.01	0.01	0.46	0.001	0.03	0.12
TOTAL	1395.9	151.2	74.3	0.14	6.00	51.4

Table E-6 Estimated Average Daily Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Road Construction and Land Clearing (Cont.)

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Access Road Construction and Land Clearing

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.10	0.10	2.17	0.03	2.59	51.7
Diesel engine truck traffic	0.60	0.58	27.9	0.06	1.67	7.15
TOTAL	0.70	0.68	30.1	0.08	4.27	58.9

[a] NA = not applicable.

Table E-7 Estimated Average Annual Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Road Construction

Average Annual Onsite Air Emissions Associated with Access Road Construction

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Fugitive dust emissions from onsite access road construction	1.89	0.19	NA[a]	NA	NA	NA
Engine exhaust emissions from offroad diesel-powered heavy construction equipment for access road construction	0.40	0.39	2.20	0.004	0.17	1.28
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.00	0.00	0.011	0.00	0.01	0.25
Engine exhaust emissions from onsite diesel engine truck traffic	0.00	0.00	0.01	0.00	0.001	0.00
TOTAL	2.29	0.58	2.23	0.004	0.18	1.54

Average Annual Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Road Construction

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.00	0.00	0.07	0.001	0.08	1.55
Diesel engine truck traffic	0.02	0.02	0.84	0.002	0.05	0.21
TOTAL	0.02	0.02	0.90	0.003	0.13	1.77

[a] NA = not applicable.

Table E-8 Estimated Average Annual Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Land Clearing

Average Annual Onsite Air Emissions Associated with Land Clearing

Air Emission Source	Average Annual Emissions (ton/yr)					
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	VOC	CO
Fugitive dust emissions from site preparation	197.6	19.8	NA[a]	NA	NA	NA
Fugitive dust emissions from construction vehicle traffic on unpaved access roads	54.7	5.47	NA	NA	NA	NA
Engine exhaust emissions from offroad diesel-powered heavy construction equipment for site preparation	2.44	2.36	13.41	0.025	1.01	7.81
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.003	0.003	0.065	0.001	0.08	1.55
Engine exhaust emissions from onsite diesel engine truck traffic	0.002	0.002	0.08	0.0002	0.005	0.02
TOTAL	254.75	27.60	13.56	0.03	1.10	9.38

Average Annual Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Land Clearing

Air Emission Source	Average Annual Emissions (ton/yr)					
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	VOC	CO
Gasoline engine automobile traffic	0.02	0.02	0.40	0.005	0.47	9.44
Diesel engine truck traffic	0.11	0.11	5.10	0.01	0.31	1.30
TOTAL	0.13	0.12	5.50	0.02	0.78	10.75

[a] NA = not applicable.

Table E-9 Estimated Average Daily Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Building Construction

Average Daily Onsite Air Emissions Associated with Building Construction Activities

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Fugitive dust emissions from proposed GLE Facility building construction activities	860.9	86.1	NA[a]	NA	NA	NA
Engine exhaust emissions from offroad construction equipment used for building construction	6.77	6.56	36.1	0.06	2.61	40.2
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.15	0.14	2.92	0.04	3.50	73.7
Engine exhaust emissions from onsite diesel engine truck traffic	0.09	0.09	3.57	0.01	0.23	0.92
TOTAL	867.9	92.9	42.6	0.11	6.33	114.9

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Building Construction Activities

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.89	0.87	17.8	0.24	21.3	449.4
Diesel engine truck traffic	5.40	5.24	217.4	0.52	14.0	56.2
TOTAL	6.29	6.10	235.2	0.76	35.3	505.7

[a] NA = not applicable.

Table E-10 Estimated Average Annual Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Building Construction

Average Daily Onsite Air Emissions Associated with Building Construction Activities

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Fugitive dust emissions from proposed GLE Facility building construction activities	154.5	15.5	NA[a]	NA	NA	NA
Engine exhaust emissions from offroad construction equipment used for building construction	1.21	1.18	6.48	0.01	0.47	7.22
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.03	0.03	0.52	0.01	0.63	13.2
Engine exhaust emissions from onsite diesel engine truck traffic	0.02	0.02	0.64	0.002	0.04	0.17
TOTAL	155.8	16.7	7.64	0.02	1.14	20.6

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Building Construction Activities

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.16	0.16	3.19	0.04	3.83	80.7
Diesel engine truck traffic	0.97	0.94	39.0	0.09	2.51	10.1
TOTAL	1.13	1.10	42.2	0.14	6.33	90.8

[a] NA = not applicable.

Table E-11 Estimated Average Daily Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Start-up and Final Construction

Average Daily Onsite Air Emissions Associated with Start-up and Final Construction Activities

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Stationary source emissions from main GLE Facility operations building stack vent	~0	~0	0	0	0	0
Stationary source emissions from mechanical-draft cooling towers	12.6	12.6	NA[a]	NA	NA	NA
Stationary source emissions from auxiliary diesel generator unit exhaust stacks	0.54	0.54	10.0	1.24	0.50	4.20
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for transfer of cylinders to and from the outdoor cylinder storage pads	0.64	0.62	3.12	0.00	0.20	4.13
Engine exhaust emissions from diesel engine truck used to transfer product cylinders to onsite Fuel Manufacturing Operations (FMO) facility	0.001	0.001	0.03	0.0001	0.003	0.007
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.10	0.10	1.53	0.03	1.91	46.9
Engine exhaust emissions from onsite diesel engine truck traffic	0.06	0.06	1.57	0.01	0.14	0.38
TOTAL	13.9	13.9	16.2	1.28	2.75	55.6

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Start-up and Final Construction Activities

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.61	0.60	9.3	0.16	11.7	285.9
Diesel engine truck traffic	3.71	3.60	95.7	0.36	8.3	22.9
TOTAL	4.33	4.20	105.0	0.52	20.0	308.8

[a] NA = not applicable.

Table E-12 Estimated Average Annual Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Start-up and Final Construction

Average Annual Onsite Air Emissions Associated with Start-up and Final Construction Activities

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Stationary source emissions from main GLE Facility operations building stack vent	~0	~0	0	0	0	0
Stationary source emissions from mechanical-draft cooling towers	2.3	2.3	NA[a]	NA	NA	NA
Stationary source emissions from auxiliary diesel generator unit exhaust stacks	0.06	0.06	1.20	0.15	0.06	0.50
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for transfer of cylinders to and from the outdoor cylinder storage pads	0.12	0.11	0.57	0.001	0.04	0.75
Engine exhaust emissions from diesel engine truck used to transfer product cylinders to onsite Fuel Manufacturing Operations (FMO) facility	~0	~0	~0	~0	~0	~0
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.02	0.02	0.28	0.005	0.35	8.6
Engine exhaust emissions from onsite diesel engine truck traffic	0.01	0.01	0.29	0.001	0.02	0.07
TOTAL	2.51	2.51	2.33	0.16	0.47	9.9

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Start-up and Final Construction Activities

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**VOC**	**CO**
Gasoline engine automobile traffic	0.11	0.11	1.70	0.03	2.13	52.2
Diesel engine truck traffic	0.68	0.66	17.5	0.07	1.51	4.18
TOTAL	0.79	0.77	19.2	0.10	3.64	56.4

[a] NA = not applicable.

Table E-13 Estimated Average Daily Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Operations

Average Daily Onsite Air Emissions Associated with Operations

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Stationary source emissions from main GLE Facility operations building stack vent	~0	~0	0	0	0	0
Stationary source emissions from mechanical-draft cooling towers	12.6	12.6	NA[a]	NA	NA	NA
Stationary source emissions from auxiliary diesel generator unit exhaust stacks	0.54	0.54	10.0	1.24	0.50	4.20
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for transfer of cylinders to and from the outdoor cylinder storage pads	0.64	0.62	3.12	0.00	0.20	4.13
Engine exhaust emissions from diesel engine truck used to transfer product cylinders to onsite Fuel Manufacturing Operations (FMO) facility	0.001	0.001	0.03	0.0001	0.003	0.007
Engine exhaust emissions from onsite gasoline engine automobile traffic	0.06	0.06	0.72	0.02	0.96	26.4
Engine exhaust emissions from onsite diesel engine truck traffic	0.04	0.04	0.60	0.003	0.07	0.16
TOTAL	13.9	13.9	14.5	1.26	1.74	34.9

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Operations

	Average Daily Emissions (lb/day)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Gasoline engine automobile traffic	0.36	0.35	4.37	0.10	5.87	161.1
Diesel engine truck traffic	2.20	2.14	36.8	0.21	4.52	9.47
TOTAL	2.57	2.49	41.2	0.31	10.4	170.6

[a] NA = not applicable.

Table E-14 Estimated Average Annual Criteria Air Pollutant and VOC Emissions at the Proposed GLE Facility During Operations

Average Daily Onsite Air Emissions Associated with Operations

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Stationary source emissions from main GLE Facility operations building stack vent	~0	~0	0	0	0	0
Stationary source emissions from mechanical-draft cooling towers	2.30	2.30	NA[a]	NA	NA	NA
Stationary source emissions from auxiliary diesel generator unit exhaust stacks	0.06	0.06	1.20	0.15	0.06	0.50
Engine exhaust emissions from onsite transfer vehicles (OSTVs) used for transfer of cylinders to and from the outdoor cylinder storage pads	0.12	0.11	0.57	0.001	0.04	0.75
Engine exhaust emissions from diesel engine truck used to transfer product cylinders to onsite Fuel Manufacturing Operations (FMO) facility	~0	~0	~0	~0	~0	~0
Engine exhaust emissions from onsite gasoline engine automobile	0.01	0.01	0.13	0.00	0.18	4.82
Engine exhaust emissions from onsite diesel engine truck traffic	0.01	0.01	0.11	0.001	0.01	0.03
TOTAL	2.50	2.50	2.01	0.15	0.29	6.11

Average Daily Offsite Air Emissions from Vehicle Traffic Traveling on Roadways to and from the Proposed GLE Facility Associated with Operations

	Average Annual Emissions (ton/yr)					
Air Emission Source	**PM$_{10}$**	**PM$_{2.5}$**	**NO$_x$**	**SO$_2$**	**VOC**	**CO**
Gasoline engine automobile traffic	0.07	0.06	0.80	0.02	1.07	29.4
Diesel engine truck traffic	0.40	0.39	6.71	0.04	0.82	1.73
TOTAL	0.47	0.45	7.51	0.06	1.90	31.1

[a] NA = not applicable.

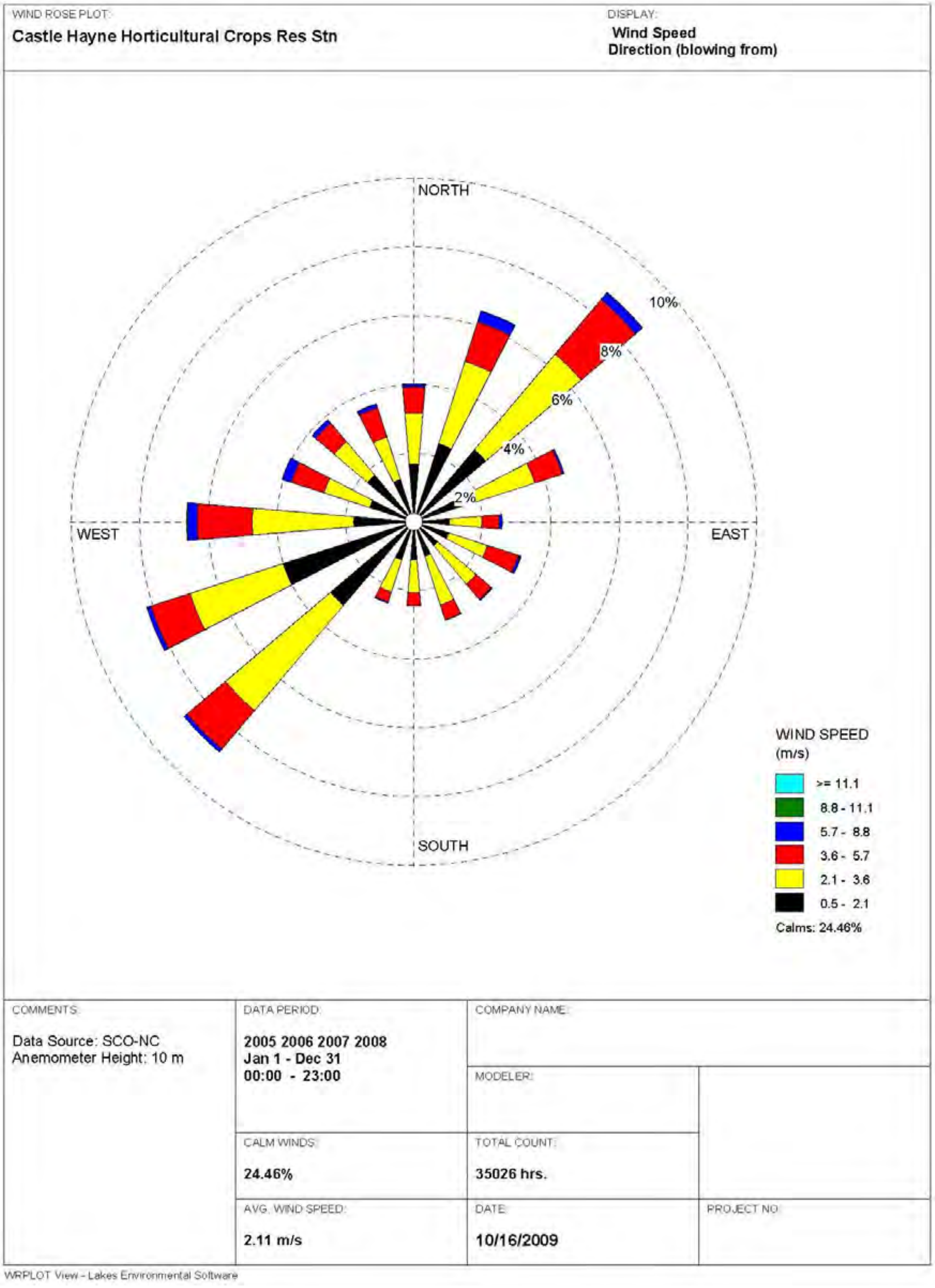
Table E-15 Meteorological Data Information Used for AERMET

Station Name	Station ID	Location (lat/long)	Elevation (m)	File Format	Anemometer Height (m)	Distance & Direction from the Proposed GLE Facility[a]	Notes
Surface Wilmington/ Hanover County Airport	ILM USAF: 723013 WBAN: 13748	34.267N 77.900W	9	ISD (DS3505)	10	5 mi southeast	NA[b]
Upper Air Charleston, SC	CHS WBAN: 13880 WMO: 72208	32.90N 80.03W	15	FSL	NA	155 mi southwest	NA
Onsite Horticultural Crops Research Station	CAST	34.321N 77.916W	13	NA	10	2 mi east	Wind sensor threshold = 1.0 m/s

[a] Longitude, latitude, and elevation for the center of the proposed GLE Facility are: 34.335N, 77.947W, and 7 m.

[b] NA = not applicable.

Sources: Frazier, 2009; NCDC, 2009b; NOAA, 2009.



WIND ROSE PLOT:
Castle Hayne Horticultural Crops Res Stn

DISPLAY:
Wind Speed
Direction (blowing from)

COMMENTS:
Data Source: SCO-NC
Anemometer Height: 10 m

DATA PERIOD:
2005 2006 2007 2008
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

MODELER:

CALM WINDS:
24.46%

TOTAL COUNT:
35026 hrs.

AVG. WIND SPEED:
2.11 m/s

DATE:
10/16/2009

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure E-1 Wind Rose (10-m [33-ft] Level) for the Horticultural Crops Research Station (CAST) in Castle Hayne, North Carolina, 2005–2008 (Frazier, 2009)

APPENDIX F
SOCIOECONOMIC ANALYSIS METHODS

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SOCIOECONOMIC ANALYSIS METHODS

This appendix describes the methods used to estimate the socioeconomic impacts of preconstruction and construction, operations, and decommissioning of the proposed General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) Facility. Impacts are evaluated for the area in which the majority of the proposed GLE Facility permanent employees are expected to live and spend their wages and salaries. This area, referred to as the region of influence (ROI) in this appendix, includes New Hanover County, Brunswick County, and Pender County. The ROI corresponds to the Wilmington Metropolitan Statistical Area (MSA), which is expected to be the primary source of labor for each phase of the proposed GLE Facility (GLE, 2008).

The socioeconomic analysis was divided into four main areas of impact: (1) site employment data during preconstruction and construction, start-up, operations, and decommissioning were used to estimate direct and indirect economic impacts; (2) the impact on direct State and local tax revenues was considered; (3) the number of in-migrating workers required to fill onsite job positions during each project phase, and associated family members, was estimated based on information gathered from local economic development agencies; and (4) the resulting housing and local community service employment impacts were estimated.

F.1 Economic and Fiscal Impacts

Employment and income impacts include both direct and indirect employment and income associated with the various phases of GLE Facility development. Direct employment and income are created by employing workers at the proposed GLE facility, while indirect employment and income are created in the ROI by GLE Facility workers spending their wages and salaries. New jobs and income (indirect) are also created in the ROI from the purchase of materials, equipment, and services by the proposed GLE Facility, as well as other expenditures. Direct employment and income are estimated based on anticipated labor and salaries for the various activities associated with each phase of the proposed action. The indirect impact of the proposed GLE Facility on regional employment and income is based on the use of regional economic multipliers. Multipliers capture the indirect (offsite) effects of onsite activities associated with construction and operation of an activity or event.

Multipliers were taken from the Impact Analysis for Planning (IMPLAN) input-output model. These multipliers take into account the flow of commodities to industries from producers and institutional consumers in the various sectors in the economy of the ROI. The IMPLAN model contains 528 sectors representing various industries including agriculture, mining, construction, manufacturing, wholesale and retail trade, utilities, finance, insurance and real estate, and consumer and business services.

Estimates of the indirect impacts used Social Accounting Matrix (SAM) IMPLAN multipliers, which measure the total (direct plus indirect) impact of facility employment on ROI output, income, and employment. Multipliers associated with each major expenditure category (for example, separator equipment, process building and offices, laser equipment, utilities, spare parts, construction payroll) are multiplied by the relevant direct employment number, with the resulting total impacts in each category to produce the overall impact of each phase of the proposed facility.

State income tax revenue impacts are estimated by applying State income tax rates to construction and operations earnings. State and local sales tax revenues are estimated by applying appropriate tax rates to after-tax income generated by construction and operations employees.

F.2 Impacts on Population

With preconstruction, construction, operation, and decommissioning of the proposed GLE Facility, a number of workers along with their families could migrate into the ROI, either temporarily or permanently. The capacity of regional labor markets to produce sufficient numbers of workers in the appropriate occupations required for facility construction and operation is closely related to the occupational profile of the ROI and occupational unemployment rates. Although the ROI corresponds to the Wilmington MSA, which is expected to be the primary source of labor for the proposed GLE Facility, some in-migration of workers into the ROI, either temporarily or permanently, is expected during each phase of the proposed GLE Facility. The number of in-migrating workers was based on interviews with local economic development officials, and was based on estimates of available labor in each labor category. The analysis used a range for in-migration during each phase of the proposed project. Sixty-five percent of in-migrating workers were assumed to be accompanied by families consisting of an additional adult and at least one school-age child (GLE, 2008). The national average household size was used to calculate the number of additional family members that would accompany direct and indirect in-migrating workers.

F.3 Impacts on Local Housing Markets

The analysis considered the impacts on local housing markets by estimating the increase in demand for rental housing units in the peak year of construction and for owner-occupied units in the first year of operation. Housing demand was determined by estimating the number of rental units required in the peak year of construction, and the number of owner-occupied units required in the first year of operation. The relative impact on local housing markets in the ROI was determined by comparing GLE-related housing demand to the forecasted number of vacant rental housing units in the peak year of construction, and the forecasted number of vacant owner-occupied units in the first year of operations. Forecasts are based on data provided by the U.S. Census Bureau.

F.4 Impacts on Community Services

The impacts of the proposed GLE Facility on community service employment are estimated for the ROI counties in which the majority of new workers would locate. Using the estimates of the number of in-migrating workers and families, the analysis calculates the number of new police officers, firefighters, and general government employees required to maintain the existing levels of service for each community service. Calculations were based on the existing number of community service employees per 1000 population for each service. The analysis of the impact on educational employment estimated the number of teachers in each school district required to maintain existing teacher-student ratios across all student age groups. Information on existing employment and levels of service was collected from the individual jurisdictions.

F.5 Reference

(GLE, 2008) GE-Hitachi Global Laser Enrichment LLC. “Environmental Report for the GLE Commercial Facility, Revision 0.” December. ADAMS Accession No. ML090910573.

APPENDIX G
ENVIRONMENTAL JUSTICE DATA

APPENDIX G
ENVIRONMENTAL JUSTICE DATA

Under Executive Order (EO) 12898 (59 FR 7629), Federal agencies are responsible for identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental impacts on minority and low-income populations. In 2004, the Commission issued a Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (69 FR 52040), which states, "The Commission is committed to the general goals set forth in EO 12898, and strives to meet those goals as part of its NEPA review process."

This appendix contains a brief description of methods and definitions, and provides the data used to assess the potential for disproportionately high and adverse human health or environmental effects on minority and/or low-income populations resulting from the preconstruction and construction, operation, and decommissioning of the proposed General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) Facility.

The assessment method consists of three parts: (1) the geographic distribution of low-income and minority populations in the affected area is described using data from the 2000 U.S. Census; (2) based on data provided on the health and environmental impacts of the proposed facility presented in Sections 4.2.1 through 4.2.18, an assessment is made as to whether the impacts of facility construction and operation would produce impacts that are high and adverse; and (3) if impacts are high and adverse, a determination is made as to whether these impacts disproportionately affect minority and low-income populations.

The Council of Environmental Quality (CEQ) provides the following information in Environmental Justice: Guidance Under the National Environmental Policy Act (CEQ, 1997). The criteria used for data analysis were based on guidance provided in Appendix C of NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs* (NRC, 2003).

G.1 Disproportionately High and Adverse Human Health Effects

Adverse health effects are measured in risks and rates that could result in latent cancer fatalities, as well as other fatal or nonfatal adverse impacts on human health. Adverse health effects may include bodily impairment, infirmity, illness, or death. Disproportionately high and adverse human health effects occur when the risk or rate of exposure to an environmental hazard for a minority or low-income population is significant (as employed by the National Environmental Policy Act [NEPA]) and appreciably exceeds the risk or exposure rate for the general population or for another appropriate comparison group (CEQ, 1997).

G.2 Disproportionately High and Adverse Environmental Effects

A disproportionately high and adverse environmental effect refers to an impact or risk of an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a low-income or minority community or Indian Tribe, and that appreciably exceeds the environmental impact on the general population or another appropriate comparison group. Such effects may include ecological, cultural, human health, economic, or social impacts (CEQ, 1997).

The criteria used for data analysis were based on guidance provided in Appendix C of NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs* (NRC, 2003). In assessing the impacts, the following definitions of minority individuals and populations and low-income population were used (CEQ, 1997).

G.3 Minority Individuals

These are individuals who identify themselves as members of the following population groups: Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races, meaning individuals who identified themselves on a Census form as being a member of two or more races, for example, Hispanic and Asian.

G.4 Minority Populations

Minority populations are identified when (1) the minority population of an affected area exceeds 50 percent or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

G.5 Low-income Population

Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the Census Bureau's Current Population Reports, Series P60, on Income and Poverty.

Tables G-1 through G-4 present detailed Census data for the environmental justice analysis at the State, county, and Census block group level for 2000 (USCB, 2009). The criteria for defining minority and low-income populations are described in Sections 3.14.1 and 3.14.2. ArcView® geographic information system software was used to determine minority and low-income characteristics by block group. Minority and low-income data are shown for all block groups that lay partially or completely within 6.4 kilometers (4 miles) of the proposed GLE Facility site. Census block groups exceeding minority or low-income criteria are shown in bold.

Table G-1 State and County Minority Population Totals

Location	Total Population	Minority Population	Percent Minority
North Carolina	8,049,313	2,623,620	32.6
Brunswick County	73,143	14,903	20.4
New Hanover County	160,307	35,485	22.1
Pender County	41,082	12,696	30.9

Source: USCB, 2009.

Table G-2 Census Block Group Minority Population Totals

Location	County	Total Population	Minority Population	Percent Minority
Census Tract 020100, Census Block Group 1	**Brunswick**	**2030**	**926**	**45.6**
Census Tract 011500, Census Block Group 1	New Hanover	2172	404	18.6
Census Tract 011500, Census Block Group 2	New Hanover	1699	182	10.7
Census Tract 011500, Census Block Group 3	New Hanover	495	47	9.5
Census Tract 011500, Census Block Group 4	New Hanover	974	98	10.1
Census Tract 011500, Census Block Group 5	**New Hanover**	**1985**	**1219**	**61.4**
Census Tract 011603, Census Block Group 1	New Hanover	1076	389	36.2
Census Tract 011603, Census Block Group 2	New Hanover	3286	616	18.7
Census Tract 011603, Census Block Group 3	New Hanover	1429	547	38.3
Census Tract 011604, Census Block Group 1	New Hanover	134	39	29.1
Census Tract 011604, Census Block Group 2	New Hanover	2475	340	13.7
Census Tract 980500, Census Block Group 4	Pender	1949	683	35.0
Census Tract 980600, Census Block Group 1	**Pender**	**800**	**404**	**50.5**
Census Tract 980600, Census Block Group 2	Pender	4981	1235	24.8
Census Tract 980600, Census Block Group 3	Pender	1271	431	33.9

Source: USCB, 2009.

Table G-3 State and County Low-Income Population Totals

Location	Total Population	Low-Income Population	Percent Low-Income
North Carolina	8,049,313	958,667	12.3
Brunswick County	73,143	9095	12.6
New Hanover County	160,307	20,445	13.1
Pender County	41,082	5429	13.6

Source: USCB, 2009.

Table G-4 Census Block Group Low-Income Population Totals

Location	County	Total Population	Low-Income Population	Percent Low-Income
Census Tract 020100, Census Block Group 1	Brunswick	1952	283	14.5
Census Tract 011500, Census Block Group 1	New Hanover	2168	146	6.7
Census Tract 011500, Census Block Group 2	New Hanover	1665	139	8.3
Census Tract 011500, Census Block Group 3	New Hanover	494	8	1.6
Census Tract 011500, Census Block Group 4	New Hanover	957	79	8.3
Census Tract 011500, Census Block Group 5	New Hanover	2016	324	16.1
Census Tract 011603, Census Block Group 1	New Hanover	1054	76	7.2
Census Tract 011603, Census Block Group 2	New Hanover	3285	258	7.9
Census Tract 011603, Census Block Group 3	New Hanover	1012	171	16.9
Census Tract 011604, Census Block Group 1	New Hanover	155	29	18.7
Census Tract 011604, Census Block Group 2	New Hanover	2411	258	10.7
Census Tract 980500, Census Block Group 4	Pender	1932	231	12.0
Census Tract 980600, Census Block Group 1	**Pender**	**826**	**302**	**36.6**
Census Tract 980600, Census Block Group 2	Pender	4958	789	15.9
Census Tract 980600, Census Block Group 3	Pender	1232	108	8.8

Source: USCB, 2009.

G.6 References

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APPENDIX H
PROPRIETARY AND SECURITY-RELATED INFORMATION

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The text in this appendix is being withheld under 10 CFR 2.390.

APPENDIX I
GLOSSARY

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Air pollutant: Any substance in the air which could, if in high enough concentration, harm humans, other animals, vegetation, or material. Pollutants may include almost any natural or artificial composition of matter capable of being airborne.

Air quality: A measure of the quantity of pollutants, measured individually, in the air. These levels are often compared to regulatory standards.

ALARA: Acronym for “As Low As (is) Reasonably Achievable.” An approach to keep radiation exposures (both to the workforce and the public) and releases of radioactive material to the environment at levels that are as low as social, technical, economic, practical, and public policy considerations allow. ALARA is not a dose limit; it is a practice whose objective is the attainment of dose levels as far below applicable limits as possible.

Alluvium: Loose gravel, sand, silt, or clay deposited by streams or running water.

Alpha particle: A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air).

Ambient Air Quality Standards: Standards established on a State or Federal level, that define the limits for airborne concentrations of designated “criteria” pollutants (sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, particulate matter [PM_{10} and $PM_{2.5}$], and lead), to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).

Aquifer: A permeable body of rock capable of yielding quantities of groundwater to wells and springs.

Archaeology: The science devoted to the study of historic or prehistoric peoples and their cultures by analysis of their artifacts, inscriptions, monuments, and other such remains.

Area of potential effects: The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (see 36 CFR 800.16).

Assay: The qualitative or quantitative analysis of a substance, often used to determine the proportion of isotopes in radioactive materials.

Attainment area: A region that meets the U.S. Environmental Protection Agency National Ambient Air Quality Standards (NAAQS) for a criteria pollutant under the *Clean Air Act*.

Background radiation: Radiation from cosmic sources, naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material), and global fallout as it exists in the environment from the testing of nuclear explosive devices. It does not include radiation from source, byproduct, or special nuclear materials regulated by the Nuclear Regulatory Commission. The typically quoted average individual exposure from background radiation is 3.6 millisieverts per year (360 millirems per year).

Becquerel (Bq): A unit used to measure radioactivity. One Becquerel is that quantity of a radioactive material that will have one transformation in one second. There are 3.7×10^{10} Bq in one curie (Ci).

Best Management Practices (BMPs): Structural, nonstructural, and managerial techniques recognized to be the most effective and practical means to reduce surface water and groundwater contamination while still allowing the productive use of resources.

Beta particle: A charged particle emitted from a nucleus during radioactive decay, with a mass equal to 1/1837 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Beta particles may be stopped by thin sheets of metal or plastic.

Bound: To estimate or describe a lower or upper limit on a potential environmental or health consequence when uncertainty exists.

Buffer area: A designated area of land that is designed to permanently remain vegetated in an undisturbed and natural condition in order to protect an adjacent aquatic or wetland site from upland impacts and to provide habitat for wildlife.

Byproduct material: The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. See also, Source Material.

Carbon monoxide (CO): An odorless, colorless, poisonous gas produced by incomplete burning of carbon in fuels.

Census tract: An area usually containing between 2500 and 8000 persons that is used for organizing and monitoring census data. The geographic dimensions of Census tracts vary widely, depending on population density. Census tracts do not cross county borders.

Climatology: The science devoted to the study of the conditions of the natural environment (rainfall, daylight, temperature, humidity, air movement) prevailing in specific regions of the earth.

Contamination: Undesired radioactive material that is deposited on the surface of, or inside structures, areas, objects, or people.

Cooling water: Water circulated through a nuclear reactor or processing plant to remove heat.

Cost-benefit analysis: A formal quantitative procedure comparing costs and benefits of a proposed project or act under a set of preestablished rules.

Criteria pollutants: Common air pollutants for which National Ambient Air Quality Standards have been established by the U.S. Environmental Protection Agency under Title I of the *Clean Air Act* (42 U.S.C. 7401 et seq.). Criteria pollutants include sulfur dioxide, nitrogen oxides, carbon monoxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), and lead. Standards for these pollutants were developed on the basis of scientific knowledge about their health effects.

Critical habitat: Specific areas within the geographical range of an endangered species that is formally designated by the U.S. Fish and Wildlife Service under the *Endangered Species Act* (16 U.S.C. 1531 et seq.) as essential for conservation.

Cumulative impacts: Potential impacts when the proposed action is added to other past, present, and reasonable foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Curie (Ci): The basic unit used to describe the intensity of radioactivity in a sample of material. The curie is equal to 37 billion (3.7×10^{10}) disintegrations per second, which is approximately the activity of 1 gram (0.035 ounces) of radium. A curie is also a quantity of any radionuclide that decays at a rate of 37 billion disintegrations per second.

Day-Night Average Sound Level (DNL or L_{dn}): DNL is a noise metric combining the levels and durations of noise events and the number of events over an extended time period. It is a cumulative average computed over a set of 24-hour periods to represent total noise exposure. DNL also accounts for more intrusive night time noise, adding a 10 decibel penalty for sounds after 10:00 p.m. and before 7:00 a.m.

Decibel (dB): A standard unit for measuring sound-pressure levels based on a reference sound pressure of 0.0002 dyne per square centimeter. This is the smallest sound a human can hear. In general, a sound doubles in loudness with every increase of about 10 decibels.

Decibel, A-weighted (dBA): A number representing the sound level which is frequency-weighted according to a prescribed frequency response established by the American National Standards Institute and accounts for the response of the human ear.

Decommissioning: The process of closing down a facility followed by reducing residual radioactivity to a level that permits the release of the property for unrestricted use (see 10 CFR 20.1003).

Decontamination: The reduction or removal of contaminating radioactive material from a structure, area, object, or person. Decontamination may be accomplished by (1) treating the surface to remove or decrease the contamination, (2) letting the material stand so that the radioactivity is decreased as a result of natural radioactive decay, or (3) covering the contamination to shield or attenuate the radiation emitted (see 10 CFR 20.1003 and 20.1402).

Depleted uranium: Uranium having a percentage of uranium-235 smaller than the 0.7 percent found in natural uranium. It is obtained from spent (used) fuel elements or as byproduct tails, or residues, from uranium isotope separation.

Depleted uranium hexafluoride (depleted UF_6): Uranium hexafluoride from which most of the uranium-235 isotope has been removed.

Direct jobs: The number of workers required at a site to implement an alternative.

Dose: The absorbed dose, given in rads (or in the International Systems of Units [SI], grays), that represents the energy absorbed from the radiation in a gram of any material. Furthermore, the biological dose or dose equivalent, given in rem or sieverts, is a measure of the biological damage to living tissue from radiation exposure.

Dosimetry: The theory and application of the principles and techniques involved in the measurement and recording of radiation doses. Its practical aspect is concerned with the use of various types of radiation instruments with which measurements are made (i.e., film badge, thermoluminescent dosimeter, and Geiger counter).

Ecological resources: Terrestrial, wetland, and aquatic resources that could be affected, with particular attention to species protected by the Federal government and State-listed species and habitats of special concern.

Ecoregion: An area having a general similarity in ecosystems and characterized by the spatial patterning and composition of biotic and abiotic features, including vegetation, wildlife, geology, physiography (patterns of terrain or land forms), climate, soils, land use, and hydrology, such that within an ecoregion, there is a similarity in the type, quality, and quantity of environmental resources present.

Effluent: A gas or fluid discharged into the environment, treated or untreated. Most frequently, the term applies to wastes discharged to surface waters.

Emissions: Substances that are discharged into the air.

Endangered species: Any species (plant or animal) that is in danger of extinction throughout all or a significant part of its range. Requirements for determining whether a species is endangered are found in the *Endangered Species Act* (16 U.S.C. 1531 et seq.).

Erosion: The wearing away of the land surface by wind, water, ice, or other geologic agents. Erosion occurs naturally from weather or runoff but is often intensified by human land use practices.

Exposure: Being exposed to ionizing radiation or to radioactive material.

Exposure pathways: A route or sequence of processes by which a radioactive or hazardous material may move through the environment to humans or other organisms. Each exposure pathway includes a source or release from a source, an exposure point, and an exposure route.

Fissile: A radionuclide that is capable of undergoing fission after capturing low-energy thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

Floodplain: Low-lying areas adjacent to rivers and streams that are subject to natural inundations typically associated with precipitation.

Fuel cycle: The series of steps involved in supplying fuel for nuclear power reactors. It can include mining, milling, isotopic enrichment, fabrication of fuel elements, use in a reactor, chemical reprocessing to recover the fissionable material remaining in the spent fuel, reenrichment of the fuel material, refabrication into new fuel elements, and waste disposal.

Fugitive Dust: Any solid particulate matter (PM) that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man. Fugitive dust may include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is either removed or redistributed.

Geology and soils: Those earth resources that may be described in terms of landforms, geology, and soil conditions.

Gray (Gy): The international system (SI) unit of absorbed dose. One gray is equal to an absorbed dose of 1 Joule/kilogram (one gray equals 100 rads) (see 10 CFR 20.1004).

Greenhouse gases (GHGs): Gases that absorb outgoing infrared radiation emitted by the earth's surface and trap heat in the atmosphere.

Groundwater: Water, both fresh and saline, that is stored below the earth's surface in pores, cracks, and crevices below the water table.

Hazardous Air Pollutants (HAPs): A group of 188 chemicals identified in the *1990 Clean Air Act Amendments* (42 U.S.C. 7401 et seq.).

Hazardous waste: As defined in the *Resource Conservation and Recovery Act* (42 U.S.C. 6901 et seq.), is "a solid waste, or combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness, or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed."

Hectare (ha): Metric unit of surface or land, equivalent to 10,000 square meters or 2.471 acres.

Heels: In the uranium enrichment process, heels refers to the residual solid uranium hexafluoride left after the feed rate declines to a predetermined level.

Highly enriched uranium (HEU): Uranium enriched in the isotope uranium-235 to 20 percent or above.

Holding ponds: Engineered depressions in the land that contain storm-water runoff until it can slowly seep back into the ground or evaporate.

Hydrogen fluoride (HF): Chemical compound formed from the conversion of uranium hexafluoride (UF_6) to uranyl fluoride (UO_2F_2) upon contact of UF_6 emissions with water vapor in air.

Hydrology: The science devoted to the study of the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

Impacts: An assessment of the meaning of changes in all attributes being studied for a given resource, usually measured using a qualitative and nominally subjective technique.

Indirect jobs: Jobs generated or lost in related industries within a regional economic area as a result of a change in direct employment.

Ingestion: To take in by mouth. Material that is ingested enters the digestive system.

Inhalation: To take in by breathing. Material that is inhaled enters the lungs.

Isotope: Any two or more forms of an element having identical or very closely related chemical properties and the same atomic number but different atomic weights or mass numbers.

Land Use: The way land is developed and used in terms of the kinds of human-related activities that occur (e.g., agriculture, residential areas, industrial areas).

Lead (Pb): A naturally occurring heavy metal element formerly added to gasoline and paint for improved performance characteristics. Lead can be inhaled and ingested in food, water, soil, or dust.

Low-enriched uranium (LEU): Uranium enriched in the isotope uranium-235, greater than 0.7 percent but less than 20 percent of the total mass. Naturally occurring uranium contains about 0.7 percent uranium-235, almost all the rest is uranium-238.

Low-level mixed waste: Low-level radioactive waste that also contains hazardous chemical components regulated under the *Resource Conservation and Recovery Act* (42 U.S.C. 6901 et seq.).

Low-level radioactive waste (LLRW): As defined in the *Low-Level Radioactive Waste Policy Act, as amended* (42 U.S.C. 2021 et seq.), low-level radioactive waste means radioactive material that is “not high-level radioactive waste, spent nuclear fuel, or byproduct material” as byproduct material is defined in the *Atomic Energy Act* (42 U.S.C. 2011 et seq.)

Maximally exposed individual (MEI): A hypothetical person who – because of proximity, activities, or living habits – could receive the highest possible dose of radiation or of a hazardous chemical from a given event or process.

Mercury (Hg): A naturally-occurring heavy metal element found in air, water, and soil. Mercury is listed as a hazardous air pollutant (HAP).

Meteorology: The science dealing with the atmosphere and its phenomena, especially as they relate to weather.

Microcurie (μCi): One millionth of a curie. That amount of radioactive material that disintegrates (decays) at the rate of 37 thousand atoms per second.

Mitigation: A series of actions implemented to ensure that projected impacts will result in no net loss of habitat value or wildlife populations. The purpose of mitigative actions is to avoid, minimize, rectify, or compensate for any adverse environmental impact.

Millirem (mrem): One thousandth of a rem (0.001 rem).

Millisievert (mSv): One thousandth of a sievert (0.001 Sv); equivalent to 100 millirem.

Mixing height: The height above the earth's surface through which relatively strong vertical mixing of the atmosphere occurs.

Nitrogen dioxide (NO_2): A brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of nitrogen dioxide in the atmosphere is the oxidation of the primary air pollutant nitric oxide.

Nitrogen oxides (NO_x): Nitrogen oxides form when fuel is burned at high temperatures.

Nonattainment Areas: An area that has been designated by the Environmental Protection Agency, or the appropriate state air quality agency, as exceeding one or more national or State Ambient Air Quality Standards.

Normal operations: Conditions during which facilities and processes operate as expected or designed. In general, normal operations include the occurrence of some infrequent events that, although not considered routine, are not classified as accidents.

Ozone (O_3): A photochemical (formed in chemical reactions between volatile organic compounds and nitrogen oxides in the presence of sunlight) oxidant.

Outfall: The place where effluent is discharged into receiving waters.

Particulate matter (PM): Materials such as dust, dirt, soot, smoke, and liquid droplets that are emitted into the air by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust. Commonly expressed as PM_{10} or $PM_{2.5}$, signifying particles with aerodynamic diameter of less than 10 micrometers and 2.5 micrometers, respectively.

Personnel monitoring: The use of portable survey meters to determine the amount of radioactive contamination on individuals; or, the use of dosimetry to determine an individual's occupational radiation dose.

Point source: A source of effluents that is small enough in dimension that it can be treated as if it were a point. A point source can be either a continuous source or a source that emits effluents only in puffs for a short time.

Pollutant: Any material entering the environment that has undesired effects.

Pollution: The addition of an undesirable agent to the environment in excess of the rate at which natural processes can degrade, assimilate, or disperse it.

Pollution prevention: The use of any process, practice, or product that reduces or eliminates the generation and release of pollutants, hazardous substances, contaminants, and wastes, including those that protect natural resources through conservation or more efficient utilization.

Prime farmland: Land with the best combination of physical and chemical characteristics for economically producing high yields of food, feed, forage, fiber, and oilseed crops with minimum inputs of fuel, fertilizer, pesticides, and labor. Prime farmland includes cropland, pastureland, rangeland, and forestland.

Rad: The traditional (English) unit for radiation absorbed dose, which is the amount of energy from any type of ionizing radiation (e.g., alpha, beta, gamma, neutrons, etc.) deposited in any medium (e.g., water, tissue, air). A dose of one rad means the absorption of 100 ergs (a small but measurable amount of energy) per gram of absorbing tissue (100 rad = 1 gray).

Radiation (ionizing radiation): Alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in 10 CFR Part 20, does not include non-ionizing radiation, such as radio- or microwaves, or visible, infrared, or ultraviolet light (see 10 CFR 20.1003).

Radiation standards: Exposure standards, permissible concentrations, rules for safe handling, regulations for transportation, regulations for industrial control of radiation, and control of radioactive material by legislative means.

Radioactivity: The spontaneous decay or disintegration of unstable atomic nuclei, accompanied by the emission of radiation. Eventually the unstable nuclei reach a stable state.

Radionuclide: An atom that exhibits radioactive properties. Radionuclides can be man-made or naturally occurring, can have a long life, and can have potentially mutagenic or carcinogenic effects on the human body.

Region of influence (ROI): The geographic region based on the area in which workers are expected to live and spend most of their salaries, and in which a significant portion of site purchase and nonpayroll expenditures from the construction, manufacturing, operation, and decommissioning phases are expected to occur. In this EIS, this region corresponds to the Wilmington Metropolitan Statistical Area (MSA), a three-county area comprising Brunswick, New Hanover, and Pender Counties. These three counties cover an area that extends up to approximately 80 kilometers (50 miles) from the Wilmington Site.

Rem: The acronym for roentgen equivalent man, is the traditional (English) unit that measures the effects of ionizing radiation on humans. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor of the type of radiation (see 10 CFR 20.1004).

Remediation: Action taken to permanently remedy a release, or threatened release, of a hazardous or radioactive substance to the environment, instead of or in addition to removal.

Restricted area: Any area to which access is controlled for the protection of individuals from exposure to radiation and radioactive materials.

Roentgen: A traditional (English) unit of exposure to ionizing radiation. It is the amount of gamma or x-rays required to produce ions resulting in a charge of 0.000258 coulombs/kilogram of air under standard conditions.

Runoff: The portion of rainfall that is not absorbed by soil, evaporated, or transpired by plants, but finds its way into streams directly or as overland surface flows.

Sanitary/industrial waste: Nonhazardous, nonradioactive liquid and solid waste generated by normal housekeeping activities.

Sediment: Eroded soil particles that are deposited downhill or downstream by surface runoff.

Separative Work Unit (SWU): A separative work unit (SWU) is a unit of measurement used in the nuclear industry, pertaining to the process of enriching uranium for use as fuel for nuclear power plants. It describes the effort needed to separate uranium-235 and uranium-238 atoms in natural uranium to create a final product that is richer in uranium-235 atoms.

Shielding: Any material or obstruction that absorbs radiation and thus tends to protect personnel or materials from the effects of ionizing radiation.

Sievert (Sv): The metric unit of radiation dose used to express a quantity called equivalent dose. This relates the absorbed dose in human tissue to the effective biological damage of the radiation by taking into account the kind of radiation received, the total amount absorbed by the body, and the tissues involved. Not all radiation has the same biological effect, even for the same amount of absorbed dose. One sievert is equivalent to 100 rem.

Site characterization: An onsite investigation at a known or suspected contaminated waste or release site to determine the extent and type(s) of contamination.

Source material: Uranium or thorium ores containing 0.05 percent uranium or thorium regulated under the *Atomic Energy Act* (42 U.S.C. 2011 et seq.). In general, this includes all materials containing radioactive isotopes in concentrations greater than natural and the byproduct (tailings) from the formation of these concentrated materials.

Special nuclear material: Plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235.

Subsidence: The process of sinking or settling of a land surface due to natural or artificial causes.

Sulfur dioxide (SO_2): A gas emitted largely from stationary sources such as coal and oil combustion, steel and paper mills, and refineries.

Surface water: Water located on the surface of the Earth in water bodies such as lakes, rivers, streams, ponds, wetlands, and the ocean.

Tails: In the uranium enrichment process, tails refers to gas with a reduced concentration of the uranium-235 isotope.

Toxic air pollutants (TAPs): Toxic air pollutants from created sources. Many chemicals on a State TAPs list may overlap those on the Federal HAPs list, but the State list may include additional substances.

Threatened species: Plant and wildlife species that are likely to become endangered in the foreseeable future.

Total effective dose equivalent (TEDE): The sum of deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

Uranium: A radioactive element with the atomic number 92 and, as found in natural ores, an atomic weight of approximately 238. The two principal natural isotopes are uranium-235 (0.7 percent of natural uranium) and uranium-238 (99.3 percent of natural uranium). Naturally occurring uranium also includes a minute amount of uranium-234.

Uranium enrichment: The process of increasing the percentage of the naturally occurring and fissile uranium-235 isotope and decreasing the percentage of uranium-238.

Uranium Hexafluoride (UF_6): The chemical form of uranium used during the uranium enrichment process consisting of one atom of uranium and six atoms of fluorine.

Visual Resource Management (VRM): A process devised by the Bureau of Land Management to assess the aesthetic quality of a landscape and to design proposed activities in a way that would minimize their visual impact on that landscape. The process consists of a rating of site visual quality followed by a measurement of the degree of contrast between the proposed development activities and the existing landscape.

Visual and scenic resources: Natural or developed landscapes that provide information for an individual to develop their perceptions of the area. The size, type, gradient, scale, and continuity of landforms, structures, land use patterns, and vegetation are all contributing factors to an area’s visual character and how it is perceived.

Volatile Organic Compounds (VOCs): Organic compounds that easily evaporate and can break down through photochemical reactions.

Waste management: The planning, coordination, and direction of functions related to generation, handling, treatment, storage, transportation, and disposal of waste. It also includes associated pollution prevention and surveillance and maintenance activities.

Waste minimization: An action that economically avoids or reduces the generation of waste by source reduction and recycling; or reduces the toxicity of hazardous waste, improving energy usage.

Water resources: This term includes both freshwater and marine systems, wetlands, floodplains, and groundwater.

Well field: Area containing one or more wells that produce usable amounts of water.

Wetlands: Land or areas exhibiting the following characteristics: hydric soil conditions; saturated or inundated soil during some part of the year and plant species tolerant of such conditions; also, areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

APPENDIX J
PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

APPENDIX J
PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

J.1 Introduction

This appendix summarizes the public participation process conducted by the U.S. Nuclear Regulatory Commission (NRC) staff for the environmental review and preparation of the Environmental Impact Statement (EIS) for the proposed construction, operation, and decommissioning of the General Electric (GE)-Hitachi Global Laser Enrichment, LLC, (GLE) uranium enrichment facility. The proposed GLE Facility would be located in the North-Central Sector of the existing GE property near Wilmington, North Carolina. This appendix also presents all of the comments received by the NRC on the Draft EIS and the staff's response to those comments. The NRC has considered and addressed comments received from 20 commenters (comments from several state agencies were submitted under a single cover, and one commenter provided two submittals). In addition, oral comments were received from eight individuals at two public meetings conducted by the NRC on July 22, 2010.

J.2 Public Participation

Public participation is an essential part of the environmental review process under the *National Environmental Policy Act of 1969*, as amended (NEPA). This section discusses the public participation process during the NRC's development of the EIS for the proposed GLE Facility. The NRC conducted an open, public EIS development process consistent with NEPA and the NRC's regulations under Title 10 of the U.S. Code of Federal Regulations (10 CFR) Part 51.

J.2.1 Initial Notification and Notice of Formal Proceeding

On December 8, 2008, GLE transmitted a "Request for Exemption from Code of Federal Regulations (10 CFR), §§ 51.60(a) and 70.21(h) to Allow Early Submittal of an Environmental Report" to the NRC for review and approval. NRC approved this exemption request on January 13, 2009 (NRC, 2009). GLE submitted its environmental report on January 30, 2009, and its license application for the proposed GLE Facility on June 26, 2009 (GLE, 2008; GLE, 2009a). On April 9, 2009, the NRC published a Notice of Intent (NOI) in the *Federal Register* (74 FR 16237) to prepare an EIS for the construction, operation, and decommissioning of the proposed GLE Facility and to conduct the scoping process for the EIS. After completing the acceptance review of the license application, the NRC published a notice in the *Federal Register* on January 13, 2010 (75 FR 1819) of receipt of the application and notice of hearing. The NRC's environmental review began following acceptance and docketing of the environmental report. The NRC conducted its reviews pursuant to the requirements of 10 CFR 70.65 and 10 CFR 51.60, respectively.

J.2.2 Public Scoping

The NRC's public scoping process for the EIS began on April 9, 2009, with the publication in the *Federal Register* (74 FR 16237) of a Notice of Intent to prepare an EIS. As part of this process, the NRC conducted two public scoping meetings in Wilmington, North Carolina, on May 19, 2009. At these meetings, the NRC provided a description of NRC's role, responsibilities, and mission; gave a brief overview of its environmental and safety review processes; discussed how the public could participate effectively in the environmental review process; and solicited input from the public on environmental concerns related to the proposed GLE Facility. Due to a delay in submission of the license application, the NRC extended the public scoping comment period from June 8, 2009 to August 31, 2009, on July 24, 2009 (74 FR 36781), to allow members of the public to review publicly available portions of the license application.

Scoping comments received by the NRC were summarized by the staff in the *Scoping Summary Report*, issued on November 25, 2009. This report, which is included in this EIS in Appendix A, also contains additional information on the scoping process and identifies the issues that would be addressed in the EIS based on the public scoping comments.

J.2.3 Issuance and Availability of the Draft EIS

On June 25, 2010, in accordance with NRC regulations, the NRC published a Notice of Availability for the Draft EIS in the *Federal Register* (75 FR 36447). In the notice, the NRC provided information on how to submit comments and request a copy of the Draft EIS. The Environmental Protection Agency issued a Notice of Availability on the same day (75 FR 36386). The NRC provided a 45 day public comment period which ended on August 9, 2010. Copies of the Draft EIS were mailed to approximately 70 individuals including Federal, Tribal, State, and local government officials as well as members of the public. An electronic version of the Draft EIS and supporting information was made available through the NRC's project-specific web site (http://www.nrc.gov/materials/fuel-cycle-fac/laser.html) and through the NRC's Agencywide Documents Access and Management System (ADAMS) database (http://www.nrc.gov/reading-rm/adams.html).

J.2.4 Draft EIS Public Comment Meetings

The NRC conducted two public meetings to receive comments on the Draft EIS (July 22, 2010). The NRC selected the City of Wilmington as the location for the meetings because it is a few miles from the proposed GLE Facility site. The NRC advertised these meetings in local and regional newspapers including the *Wilmington Star-News*, *Wilmington Journal*, *State Port Pilot*, *Pender Chronicle*, *Brunswick Beacon*, *Pender Post*, and *Topsail Voice*. Eight individuals provided comments during the meetings. A court reporter recorded the oral comments and prepared written transcripts. The transcripts are provided in Appendix K of this EIS. The transcripts are part of the public record for the proposed project and were used in developing the comment summaries contained in Appendix J.

J.3 Comments Received on the Draft EIS

As discussed above, the NRC received both oral and written comments on the Draft EIS during the comment period. The NRC identified 78 specific comments in letters, facsimiles, and e-mails received from 20 governmental agencies or individuals and from the statements made at the public comment meetings.

J.3.1 Comment Review

The NRC reviewed each comment letter and both transcripts. Comments relating to similar issues and topics were grouped, as permitted by NRC regulations in 10 CFR 51.91 and the Council on Environmental Quality's NEPA regulations at 40 CFR 1503.4(b). Appendix J presents the comments, or summaries of comments, along with the NRC's corresponding responses. When comments have resulted in a modification to the Draft EIS, those changes are noted in the staff's response. In cases for which the comments do not warrant a detailed response, the NRC provides an explanation as to why no further response is necessary. In all cases, the NRC sought to respond to all comments received during the public comment period.

Appendix J provides summaries of all substantive comments received on the Draft EIS. The NRC prepared responses for each of the comments or for summaries of comments.

J.3.2 Major Issues and Topics of Concern

The majority of the comments received specifically addressed the scope of the environmental reviews, analysis, and issues contained in the Draft EIS, including existing conditions, potential impacts, proposed mitigation, and the NRC's environmental review process. However, other comments addressed topics and issues that were not part of the review process for the proposed action. Those comments included questions about the NRC's safety evaluation of the proposed uranium enrichment facility, security concerns, general statements of support or opposition to nuclear power, and observations regarding past GE activities.

J.3.3 Comments on Out-of-Scope Topics

The scope of the EIS analysis is defined in 10 CFR 51.71(a), 10 CFR 51.91, NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs" (NRC, 2003), and the *Scoping Summary Report* in Appendix A of this EIS. Some commenters raised issues that were not specifically related to the NRC's environmental review of GLE's application to construct, operate, and decommission the proposed GLE Facility. Because these issues did not directly relate to the environmental effects of the proposed action and were outside the scope of the NEPA review, the NRC did not prepare detailed responses to these comments. NRC addressed all comments received during the comment period.

J.4 Mandatory Hearing

By law, a license to construct and operate the proposed GLE Facility cannot be issued until completion of a hearing before the NRC's Atomic Safety and Licensing Board. Notice of the hearing, including guidance on certain aspects, was provided by the Commission in a notice published in the *Federal Register* on January 13, 2010 (75 FR 1819). Because no petitions for a contested hearing were received within the subsequent 45-day period, the Licensing Board will only conduct a mandatory hearing. The purpose of the mandatory hearing is to determine the adequacy of the NRC's technical (safety) and environmental reviews. On April 26, 2010, the Commission provided notice that a Licensing Board comprised of three administrative judges had been established to conduct the hearing (75 FR 21680). Following completion of the mandatory hearing, the Licensing Board will issue a final decision as to whether the requested license should be issued. The evidence submitted during the hearing and the decisions of the Licensing Board are publically available except to the extent that they contain proprietary or sensitive security information.

J.5 Public Participation in the NRC Environmental Review Process

The NRC's environmental review began with the receipt and docketing of GLE's environmental report (GLE, 2008). Pursuant to 10 CFR 51.60, an applicant for an NRC license to construct and operate a uranium enrichment facility must submit an environmental report to the NRC with the application. In support of its licensing decision for a uranium enrichment facility, the NRC is required under 10 CFR 51.20(b)(10) to prepare an EIS, and under 10 CFR 51.26 to issue a Notice of Intent to prepare the EIS, which is published in the Federal Register. In the Notice of Intent, the NRC described, among other things, the scoping process proposed for the requested action. Two public scoping meetings were held in Wilmington, North Carolina on May 19, 2009, to receive both oral and written comments from interested parties. Pursuant to 10 CFR 51.28, the NRC invited designated persons to participate in the scoping process, including any person who requested to participate.

Once the NRC completed the scoping process, defined the proposed action, and determined the scope of the EIS, the staff prepared a Draft EIS. During the development of the Draft EIS, NRC sought input from a number of sources, including Federal, State and local government agencies, Tribal governments, and individuals identified as consulting parties. Pursuant to 10 CFR 51.74, the NRC published notice of availability in the *Federal Register* announcing the issuance of the Draft EIS for public comment. As specified in 10 CFR 51.73, the minimum public comment period is 45 days. The NRC also distributed copies of the Draft EIS to the persons or organizations identified in 10 CFR 51.74, including the U.S. Environmental Protection Agency (EPA), certain Federal, State and local agencies, Indian Tribes, and, upon written request and to the extent copies are available, to any other person. After receipt and consideration of public comments on the Draft EIS, the NRC prepares a Final EIS pursuant to 10 CFR 51.90 and 51.91.

J.6 NRC Safety Review Process

The NRC evaluates a license application to determine whether an applicant has demonstrated compliance with the regulatory requirements which pertain to the type of license being sought. In the case of the present license application from GLE to construct, operate, and decommission a uranium enrichment facility, the NRC evaluated the application against the Commission's regulations found at 10 CFR Part 70. The NRC's evaluation of an applicant's demonstration of compliance with the regulations is documented in a Safety Evaluation Report. Requests by the NRC for additional information from the applicant are made publicly available unless the request contains proprietary or security-related information. However, there is no requirement for a formal public comment resolution process for Safety Evaluation Reports.

J.7 Commenter and Comment Identification

The NRC received seven comment documents (one document contained comments from seven agencies or individuals and one commenter provided two submittals). The NRC assigned an identification number to each commenter, which will aid the reader in locating comments submitted by an individual and the NRC’s corresponding responses. Comment numbers beginning with the letters PM refer to comments summarized from the transcripts of the two public comment meetings held in Wilmington, North Carolina, on July 22, 2010. All remaining comment numbers reflect written comments received during the public comment period on the Draft EIS (e.g., 001).

In addition to the commenters identified in Table J-1, five additional agency representatives indicated they had reviewed the document but had no comments. These individuals represented the U.S. Department of the Interior (ML102170176); the North Carolina Department of Environment and Natural Resources Division of Waste Management, Underground Storage Tank Section (ML102180383); and the Water Quality, Aquifer Protection, and Land Engineering Regional Office Areas of the North Carolina Department of Environment and Natural Resources, Wilmington Region (ML102180383). Written comments and public comment meeting transcripts are included in Appendix K, and members of the public can access these documents on the ADAMS database using the accession numbers provided in Table J-1.

J.8 General Opposition and Opposition to the NRC Environmental Review Process

Comment: 006-6

The commenters find the Draft EIS to be an attempt by the NRC to avoid the concerns of the environmental and nuclear security communities and thwart their meaningful participation in the licensing process.

Response: *Public participation is an essential part of the NRC's environmental review process under NEPA. As indicated in Section J.2 of this Appendix, the NRC conducted an open, public EIS development process consistent with NEPA and the NRC's NEPA implementing regulations under 10 CFR Part 51.*

The NRC's public scoping process began on April 9, 2009, with the publication in the Federal Register (74 FR 16237) of a Notice of Intent to prepare an EIS. As part of this process the NRC conducted two public scoping meetings in Wilmington, North Carolina on May 19, 2009 to solicit public comments. On July 24, 2009 (74 FR 36781), the NRC extended the public scoping comment period from June 8, 2009 to August 31, 2009 in response to GLE submitting additional information to support its application. This was done to provide members of the public to review the new portions of the application. In addition to scoping, a Notice of Hearing was published in the Federal Register on January 13, 2010 (75 FR 1819) which instructed members of the public how to access documents related to the review and how to petition to intervene in the licensing process.

On June 25, 2010, the NRC published a Notice of Availability for the Draft EIS in the Federal Register (75 FR 36447). In the notice, the NRC provided information on how to submit comments and request a copy of the Draft EIS. The NRC conducted two public meetings on the Draft EIS in Wilmington, North Carolina on July 22, 2010. The NRC provided a 45-day public comment period for agencies and the public to review the Draft EIS and provide comments. Public comments on the Draft EIS could be submitted in many forms, including via postal mail, emails, and uploads to the Federal Rulemaking website, as well as written or oral comments provided to the NRC at the two Draft EIS public meetings. As stated in Section J.5, the NRC has reviewed and considered all comments provided on the Draft EIS in preparing the Final EIS.

*Copies of the Draft EIS were mailed to Federal, Tribal, State, and local government officials as well as members of the public. An electronic version of the Draft EIS and supporting information was made available through the NRC's project-specific web site (http://www.nrc.gov/materials/fuel-cycle-fac/laser.html) and through the NRC's Agencywide Documents Access and Management System (ADAMS) database (*http://www.nrc.gov/reading-rm/adams.html*).*

Table J-1 Draft EIS Commenter Identification and Comment Response Locations

Commenter Name	Affiliation	Commenter Number	ADAMS Accession No.
Knapp, Paul	Space Coast Health Physics Services, LLC	001-1, 001-2	ML102210052, ML102170080
O'Barr, Kevin	N.C. Department of Labor	002	ML102080670
LeGrand, Harry	N.C. Department of Environment and Natural Resources, Natural Heritage Program	003-1	ML102180383
Rynas, Stephen	N.C. Department of Environment and Natural Resources, Division of Coastal Management	003-2	ML102180383
Franch, S.	N.C. Department of Environment and Natural Resources, Division of Waste Management, Superfund Section	003-3	ML102180383
Shackelford, Dennis	N.C. Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section	003-4	ML102180383
Patterson, Jenny	N.C. Department of Environment and Natural Resources, Division of Waste Management, Hazardous Waste Section	003-5	ML102180383
Carroll, Dean	N.C. Department of Environment and Natural Resources, Wilmington Regional Office	003-6	ML102180383
Gledhill-Earley, Renee	N.C. Department of Cultural Resources, State Historic Preservation Office	003-7	ML102180383
Mueller, Heinz	U.S. Environmental Protection Agency, Region 4, Office of Policy and Management, NEPA Program Office	004	ML102310025
Hall, Howard on behalf of Pete Benjamin	U.S. Fish and Wildlife Service	005	ML102420377
Cochran, Thomas Paine, Christopher Fettus, Geoffrey	Natural Resources Defense Council	006	ML102370761
Butler, Deborah	Member of the Public	PMT-1-001	ML102510820
Klein, Ellie	Member of the Public	PMT-1-002	ML102510820
Yates, Andy on behalf of Ilario Pantano	Candidate for U.S. Congress	PMT-1-003	ML102510820
Monroe, John	Member of the Public	PMT-1-004	ML102510820
Milmoe, Cornelius	Nuclear Infrastructure Council	PMT-1-005	ML102510820
Goolsby, Tom	Candidate for N.C. State Senate	PMT-1-006	ML102510820
Dawson, Beth	Member of the Public	PMT-2-001	ML102510822
Sparks, Ronald	Wilmington City Council	PMT-2-002	ML102510822

J.9 General Support

Comment: PMT-1-003-1; PMT-1-003-2; PMT-1-004-1; PMT-1-005-1; PMT-1-005-2; PMT-1-005-4; PMT-1-006-1; PMT-1-006-2; PMT-2-002-1

Several commenters expressed general support for the proposed action. Four commenters noted the employment opportunities and positive economic impacts that it will create. Four commenters praised the NRC for its thorough evaluation of environmental impacts, and four commended the applicant for its history of good corporate citizenship, environmental stewardship, and/or attention to safety. Three commenters noted the country's need for reliable sources of energy, and two commenters noted the country's need to develop nuclear energy infrastructure to meet energy needs.

***Response:** The staff acknowledges these comments. The comments are supportive of the proposed action and are general in nature. No changes to the EIS were made in response to these comments.*

J.10 NEPA Process

Comment: PMT-1-002-2, PMT-1-002-5

One commenter asked if the NRC has initiated any contact with the Federal Emergency Management Administration (FEMA) and if FEMA will have any role in reviewing emergency response plans that relate to the proposed action.

The commenter also suggested that regulations are minimum acceptable standards, as established by Congress, and subject to change due to political processes and turnover of public officials. The commenter doesn't necessarily believe that the regulations are protective.

***Response:** Although a FEMA review is required for the licensing of a nuclear power plant, NEPA does not require a FEMA review for the licensing of a uranium enrichment facility. Nevertheless, emergency response and evacuation plans are addressed in the NRC's Safety Evaluation Report.*

The NRC acknowledges the comment regarding the protectiveness of regulations, as they apply to the requirements for FEMA review of NRC licensing actions.

Comment: PMT-1-003-3

One commenter urged the NRC to act as expeditiously as possible to approve the license application, so that the region may begin to reap the economic and employment benefits.

***Response:** The NRC licensing review schedule was established shortly after receipt of the license application, including the date of the mandatory public hearing by the Atomic Safety and Licensing Board. The NRC acknowledges the comment but does not plan to expedite the licensing review schedule.*

Comment: PMT-1-002-3

One commenter noted the importance that information from the Draft EIS be presented and available to the public in a forum and via the media.

Response: *As noted in Section J.1, the NRC has encouraged public participation throughout the development of the EIS, including the public scoping process and the Draft EIS public review period. On June 25, 2010, the NRC published a Notice of Availability in the Federal Register (75 FR 36447) announcing the issuance of the Draft EIS for public comment, provided notice for public meetings. The NRC advertised both the scoping and Draft EIS meetings in local and regional newspapers including the Wilmington Star-News, Wilmington Journal, State Port Pilot, Pender Chronicle, Brunswick Beacon, Pender Post, and Topsail Voice.*

At the Draft EIS public meetings, the NRC provided a description of the NRC's role, responsibilities, and mission; gave a brief overview of its licensing and environmental review processes; summarized the content and preliminary findings and recommendations of the Draft EIS; provided information on how the Draft EIS could be accessed or obtained and how to provide comments on the document; and solicited comments from the public on the Draft EIS.

*Copies of the Draft EIS were mailed to Federal, Tribal, State, and local government officials as well as members of the public. Additionally, an electronic version of the Draft EIS and supporting information was made available through the NRC's project-specific web site (http://www.nrc.gov/materials/fuel-cycle-fac/laser.html) and through the NRC's Agencywide Documents Access and Management System (ADAMS) database (*http://www.nrc.gov/reading-rm/adams.html*).*

Comment: PMT-1-002-9

One commenter expressed concern about the exemption that allows the applicant to conduct preconstruction activities in advance of the licensing decision. The commenter is concerned that it will not be possible to stop the project once preparations have begun, even if other factors indicate that the project should be stopped. The commenter hopes that the project will not start until "all hurdles are met."

Response: *By requesting an exemption to conduct certain preconstruction activities, the applicant has acknowledged and assumes the risk that NRC may not grant a license for the proposed action. The applicant has stated that, if the NRC should deny the license, the land and supporting infrastructure could be used for another purpose.*

J.11 Purpose and Need

Comment: 006-3

The commenters contend that, with three new gas centrifuge enrichment facilities about to be built in the United States, the assertion that there is "a reliability risk in U.S. domestic enrichment capacity" requiring mitigation by the proposed action is not credible, while the use of lasers for clandestine enrichment research is already an accomplished fact in several countries.

Response: *The NRC understands that other potential future domestic sources of supply have emerged in recent years. The National Enrichment Facility (NEF) and American Centrifuge*

Plant (ACP) have already received construction and operating licenses from the NRC and the NEF plant has been operating since June 2010. In addition, AREVA received its materials license from the NRC in October 2011 (NRC, 2011a). As discussed in Section 1.3.1, if all of the proposed facilities were constructed and operated at their rated capacities, enrichment capacity in the United States would exceed the projected annual demand. However, given the uncertainties in future development and potential expansion of the proposed projects, the projected level of extra capacity provided by the proposed GLE Facility would provide needed assurance that domestically-produced enriched uranium would be reliably available when needed for domestic nuclear power production.

J.12 Scope of the Environmental Analysis

Comment: 004-1

The commenter notes that the construction and installation of supporting infrastructure (e.g., access roads, parking, laboratories, administrative buildings, and diesel generators) should be considered a part of the proposed action, and the impacts of these actions are direct project impacts.

Response: *NRC regulations, including 10 CFR 70.4, define construction[1] to explicitly exclude certain activities, such as land clearing and erection of administrative buildings, that do not have a reasonable nexus to radiological health and safety or the common defense and security. These activities, termed “preconstruction” activities, are regarded as “non-Federal actions” that do not require NRC approval or oversight. Thus, the impacts of these actions are not considered to be direct impacts of the Federal action (i.e., issuance of a license); however, the NRC does consider preconstruction activities with respect to cumulative impacts. In Section 4.3, the NRC considers the cumulative impacts on the environment that would result from the proposed action when added to other past, present, and reasonably foreseeable future actions, including preconstruction activities, regardless of what agency or person undertakes such action. Impacts from preconstruction activities are addressed within the various resource area discussions in Section 4.2 so that they can be presented alongside similar impacts from construction of the facility that are included in the proposed action. In Section 4.2.16, impacts resulting from preconstruction are identified as a percentage of total impacts estimated to occur prior to facility operations. In this sense, site preconstruction activities would be considered past activities for the purposes of cumulative impacts.*

J.13 Applicable Statutory and Regulatory Requirements

Comment: 002-1

The commenter noted that Section 1.5.1.14 references Federal Occupational Safety and Health Administration (OSHA) and suggests inserting “North Carolina is one of the states that manages its own OSH [occupational safety and health] program through the N.C. Department of Labor” (or similar) to provide clarification.

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[1] *On September 15, 2011, the NRC issued the final rule to make the definition of construction and commencement of construction for fuel cycle facilities, 10 CFR 70.4, consistent with the definition for nuclear power plants (76 FR 56951).*

Response: *Text has been added to Section 1.5.1.14 to reflect the commenter's suggestion.*

Comment: 003-2-1

One commenter noted that obtaining project approval under the requirements of the N.C. Coastal Area Management Act (CAMA) and the Federal Coastal Zone Management (CZM) Act is complicated, and while not incorrect, the descriptions provided in the Draft EIS do not clearly convey a narrative roadmap for obtaining approval of the proposed action. The commenter recommends the following clarifications:

- Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management (DCM), the project proponent, and the NRC. Simply reviewing the existence of the CZM overlooks the fact that these three parties will be involved in a regulatory process. The commenter anticipates that the proposed action would be reviewed by the DCM under Subpart D of 15 CFR 930 (specifically, 15 CFR 930.57).
- Table 1-2 focuses on the N.C. CAMA and correctly notes that a CAMA permit would be required for development undertaken within an Area of Environmental Concern. However, it presents an "isolated" facet by not conveying that DCM regulatory review could be triggered through the consistency review process. Table 1-2 may not require revision, but Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the DCM, the project proponent, and the NRC.
- Table 1-3 focuses on the N.C. CAMA, notes that a preliminary review indicates that a CAMA permit would not be required, and notes that the proposed action could be subject to additional review depending on the necessity for a Section 404 permit from the U.S. Army Corps of Engineers. Again, the table narrative only presents an "isolated" facet of the regulatory process. Prior to obtaining a Section 404 permit or a license from the NRC, the project proponent would be expected to obtain a consistency concurrence from DCM. Table 1-3 may not require revision, but Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the DCM, the project proponent, and the NRC.

Response: *NRC concurs that the consistency decision element of the CAMA should be addressed. Clarifying changes have been added to Section 1.5.1.12 to reflect the commenter's recommendations. Table 1-3 has been modified to focus on the consistency determination rather than the coastal area management permit. The intent and scope of Sections 1.5.3 and 1.5.4 and Table 1-2 are to indicate that State laws and regulations could apply as opposed to explaining their interaction with Federal laws and regulations; the change to the text at Section 1.5.1.12 addresses that interaction.*

J.14 Agencies and Persons Consulted

No comments received on this section.

J.15 Alternatives Considered but Eliminated

No comments received on this section.

J.16 Historic and Cultural Resources

Comment: 003-7

The commenter stated that the State Historic Preservation Office (SHPO) has not received the draft Programmatic Agreement (PA) that NRC agreed to draft during consultation on February 17, 2010. The commenter noted that, while archaeological site 31NH801 (which has been determined eligible for inclusion in the National Register of Historic Places) may not be directly affected by the construction and operation of the proposed GLE Facility, active preservation measures should be outlined in the PA and undertaken by GLE to ensure the continued preservation of the site during the project's lifetime.

Response: *Archaeological site 31NH801 was identified during the NRC's review and was determined to be eligible for listing on the NRHP. This site is located adjacent to one of the access roads that was identified in the original construction designs. GLE has reconfigured the access roads needs for the plant and will no longer develop the road adjacent to site 31NH801 (GLE, 2009b), therefore, no impacts are expected to site 31NH801 from preconstruction or construction activities.*

By letter dated March 28, 2011, the NRC provided its NHPA determination of effects regarding the licensing of the proposed GLE Facility to the NC SHPO. No sites eligible for listing on National Register of Historic Places have been identified within the area of potential effect, thus the NRC concluded in the Draft Environmental Impact Statement (DEIS) that no historic properties would be affected by the proposed action. However, due to the close proximity of numerous significant resources, there is the possibility for unanticipated discovery. The NRC has determined that there would be no adverse effect to historic and cultural resources from the proposed action. The staff's determination is based on the license, should one be issued, containing the following proposed license condition:

> *Before engaging in any GLE developmental activity not previously assessed by the NRC in the Final Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment LLC, Facility in Wilmington, North Carolina (NUREG-1938) that would physically disrupt or disturb inventoried cultural sites that have been designated eligible for the National Register of Historic Places pursuant to 36 CFR 60.4, the licensee shall, in consultation with the NC SHPO, identify mitigation measures intended to preserve the integrity of these sites. The licensee shall inform the NRC of such mitigation measures prior to engaging in any work at the identified site(s).*
>
> *Any work that results in the discovery of previously unknown cultural artifacts shall cease in accordance with GLE Common Procedure CP-24-201, Unexpected Discoveries of Artifacts or Human Remains. The artifacts shall be inventoried and evaluated, and no disturbance of the area shall occur in accordance with CP-24-201. All activities that affect cultural resources on the GLE site will be included in GLE's annual environmental monitoring report.*
>
> *Enforcement of this license condition is subject to the scope of the NRC's regulatory authority (NRC, 2011b).*

By letter dated April 5, 2011, the NC SHPO concurred with the NRC's determination of no adverse effect (NCDCR, 2011). Changes have been made to the appropriate sections of the EIS that discuss historic and cultural resources.

Comment: 004-18

The commenter recommends that the Final EIS include an update of ongoing coordination activities with the SHPO regarding plans to develop procedures to protect archaeological site 31NH801.

Response: *The text in Sections 1.5.6.2, 4.2.2.1, 4.2.2.2, and 4.2.2.3 were revised to reflect the coordination efforts between the consulting parties. In addition to the license condition discussed above, GLE has developed internal procedural guidance for unexpected archaeological discoveries and/or human remains (GLE, 2009c). In the event that historic and cultural resources are encountered in the area of potential effect, GLE would implement these procedures, which include notification of certain local and State agency representatives, including the State Archaeologist.*

J.17 Visual and Scenic Resources

No comments received on this section.

J.18 Air Quality

Comment: 003-6

The commenter noted that any significant air quality emissions impact may require a permit application to revise the existing Air Quality Permit (#1756).

Response: *Table 1-3 notes that GLE will apply for a construction and operating permit from the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality. The table entry has been revised to note that a Clean Air Act major source permit will not be necessary.*

Comment: 004-7

The commenter states that best management practices should be used to control dust and other particulates to the maximum extent feasible.

Response: *The NRC acknowledges the importance of using best management practices (BMPs). As noted in Section 4.2.4.3 of the Draft EIS, the NRC identified the use of BMPs as an additional mitigation measure for reducing or minimizing air quality impacts during road construction, land clearing, and building construction. GLE has also identified a number of mitigation measures in its application.*

The NRC's action with regard to the proposed GLE Facility is limited to granting a license, if all regulatory requirements are met, for the construction, operation, and decommissioning of the proposed facility. When NRC reviews a proposed action, its ability to impose additional requirements and environmental mitigation and monitoring measures beyond those proposed as *part of the license application is limited to those with a reasonable nexus to providing protection for radiological health and safety and common defense and security.*

J.19 Water Resources

Comment: 003-3-2

One commenter noted that the GE site has had five minor contaminated zones (chlorinated solvents, metals, nitrate, uranyl nitrate, and calcium fluoride) that resulted in the installation of monitoring wells and soil capping under North Carolina Department of Environment and Natural Resources, Division of Water Quality (NCDENR DWQ) supervision. These zones are outside of the study area for the proposed action, but approximately four of the monitoring wells are located along a road within the study area. The commenter recommends that consultation with the N.C. Inactive Hazardous Sites Branch (IHSB) be initiated if there are any construction plans near the remediation areas or alongside roads that have monitoring wells. However, the commenter does not foresee the remediation areas or monitoring wells being affected by the proposed action (or vice versa).

Response: *When a monitoring well location interferes with a construction area or road improvement, a nearby location would normally be selected for installation of a replacement well. Proper well abandonment procedures would be performed at the old well to remove its aboveground and shallow underground components, and to fill the deep portion with materials that will not allow any vertical hydraulic connections. The replacement well should be screened across the same depth interval as the original well, and should provide samples with similar chemistry. State approval would be sought if the original well is part of a formal monitoring network.*

Table 1-2 has been revised to include well abandonment regulations that are enforced by DWQ.

Comment: 004-14

The commenter recommends that the Final EIS provide further detail regarding the geographic extent of the groundwater drawdown area and when the groundwater monitoring plan will be available for review.

Response: *The text of Section 4.2.7.2 has been revised to reflect the commenter's request for further detail regarding the extent of the groundwater drawdown area. A formal groundwater monitoring plan for the proposed facility is not yet available, but GLE anticipates the commencement of groundwater monitoring activities prior to the commencement of facility operations.*

Comment: 004-15

The commenter recommends that the Final EIS include a discussion of drinking water standards and data regarding the monitoring and sampling of area wells.

Response: *Figure 3-10 of the EIS displays the collective groundwater monitoring data (generally from 2002 to 2006) relative to the standards for all monitored constituents. As described in Section 3.7.4.3, summaries of the individual constituents are tabulated in the Environmental Report, along with their respective standards. These data tables are not* *replicated in the EIS. The text in Section 3.7.4.3 has been clarified and the caption to Figure 3-10 has been revised.*

Comment: 004-16

The commenter recommends that the Final EIS clarify the estimated quantity of water required for operation of the closed-loop cooling tower.

Response: *The makeup water requirement for the cooling tower system (i.e., 30,000 gallons per day) was estimated by GLE in the Environmental Report; an appropriate reference citation has been added to Section 4.2.6.2. As described in the EIS (e.g., Sections 4.2.6.2 and 4.2.11.2), GLE proposes to use treated sanitary wastewater as the source of cooling tower makeup water.*

J.20 Ecological Resources

Comment: 003-1

One commenter noted the existence of records concerning rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas within a mile of the project area (including pondspice, Carolina sunrose, savanna milkweed, eastern fox squirrel, and spoonflower) and that the large and Nationally significant Northeast Cape Fear River Floodplain site lies within 0.15 mile of the project area (although the nearest conservation lands within the site are slightly over a mile to the north). The commenter summarized that there are no known significant natural resources within the boundaries of the project area, there likely will be no impacts to the reported locations of rare species, and aerial photos show that most of the project area contains altered habitats (although it is possible that rare species could occur within the project area).

Response: *The NRC acknowledges the commenter's concurrence with the findings in the Draft EIS.*

Comment: 003-2-2

The commenter noted that the proper organizational title on p. 4-55 (line 29) should "Environment and Natural Resources."

Response: *The text of Section 4.2.8.3 has been corrected.*

Comment: 004-11

The commenter noted that the presence of jurisdictional and isolated wetlands within the access road corridor may require a Section 404 permit or Isolated Wetland Permit for impacts. The commenter stated that a more precise determination of the potential type and extent of impacts to wetlands is needed, and that updated information on impacts analysis that occurs during the refinement of facility design plans should be included in the Final EIS.

Response: *As noted in Section 4.2.8.1, potential impacts to three jurisdictional wetlands and one isolated wetland could occur from construction of the revised entrance and roadway to the proposed facility. The entrance and roadway would be part of the preconstruction activities that* *are not associated with NRC licensing. GLE would obtain appropriate permits prior to constructing the entrance and roadway (see Table 1-3) and would conduct any wetland mitigation required by the U.S. Army Corps of Engineers (USACE) and the North Carolina Division of Water Quality (DWQ). GLE would provide updated information to those agencies after facility design plans are finalized, including a more precise determination of the potential type and extent of impacts to wetlands when applying for their Section 404 and Isolated Wetland permits.*

Comment: 004-12

The commenter recommends that the Final EIS identify the least environmentally damaging practicable alternative (LEDPA) and demonstrate how the alternative has avoided wetlands and other water impacts to the maximum extent possible.

Response: *The LEDPA determination is made under Section 404 of the Clean Water Act by the U.S. Army Corps of Engineers, not the NRC. The NRC uses the standard of whether there is an "obviously superior" alternative site. In Section 2.3.1 of the EIS, no alternative site was determined to be obviously superior to the proposed site. In Section 2.3.1.2, alternative locations at the Wilmington Site were evaluated to minimize the impacts on or avoid streams, wetlands, and rare ecological resources. For example, the proposed site is an upland area subjected to logging operations; is a non-wetland, non-floodplain area; and would not impact connectivity of wetlands to surface waters. No changes were made to the EIS in response to this comment.*

Comment: 004-13

The commenter recommends that, if wetlands will be impacted, the Final EIS include a conceptual compensatory mitigation plan that demonstrates that the losses in ecological functions will be replaced.

Response: *As noted in Section 4.2.8.1, a total of 0.05 acre of three jurisdictional wetlands and 0.06 acre of an isolated wetland could be impacted by construction of the entrance and roadway to the proposed facility. Construction of the entrance and roadway would be part of the preconstruction activities that are not associated with NRC licensing. GLE would obtain appropriate permits prior to this construction (see Table 1-3) and would conduct any wetland mitigation required by the USACE and the NCDWQ. However, wetland mitigation may not be required, as potential wetland loss would total less than 1.0 acre.*

Comment: 004-17

The commenter recommends that the Final EIS include updated information and data regarding consultations with the U.S. Fish and Wildlife Service (FWS).

Response: *The NRC forwarded a copy of the Draft EIS to FWS with a request for comments by letter dated June 17, 2010 (ML101241315). The FWS provided comments and updated information, as appropriate in its August 10, 2010 response (ML102420377). Most land-disturbing activities that could potentially impact Federally listed species would occur from preconstruction activities that are not associated with NRC licensing. Nevertheless, publication of the Final EIS would not preclude FWS involvement in the proposed project. For example, mitigation measures listed in Section 4.2.8.3 indicate GLE would consult with FWS if any*

Federally threatened or endangered species or if any red-cockaded woodpecker cavities are encountered and to determine an appropriate course of action to avoid or mitigate impacts.

Comment: 005-1

The FWS does not foresee any impacts associated with facility operation and decommissioning, but preconstruction and construction activities could lower the wildlife habitat values of the area. The FWS noted that future work on other portions of the Wilmington Site should be submitted for FWS review.

Response: *Future work or projects on the Wilmington Site may not fall under NRC jurisdiction. Nevertheless, the NRC expects that GLE would contact appropriate Federal and State agencies (including FWS) either to obtain required permits or to obtain recommendations to minimize or mitigate impacts.*

Comment: 005-2

The FWS concurs with the Draft EIS that construction of the proposed facility would not affect the West Indian Manatee.

Response: *The NRC acknowledges FWS's concurrence with the findings in the Draft EIS.*

Comment: 005-3

The FWS states that habitat for the rough-leaf loosestrife is not likely to be present within the proposed facility area and concurs that proposed preconstruction and construction activities may affect, but are not likely to adversely affect, the species. The FWS notes that this concurrence is based on information in the Draft EIS indicating that no wetlands would be impacted due, perhaps, to drainage ditches associated with commercial pine production; forest cover that limits sunlight on the ground surface; and the absence of documented occurrences near the site.

Response: *The NRC acknowledges FWS's concurrence with the findings in the Draft EIS.*

Comment: 005-4, 005-5

The FWS concurs that current forest conditions on the proposed facility site are not suitable for red-cockaded woodpecker (RCW) nesting, but notes that a separate analysis is necessary to determine whether the area serves as foraging habitat for active RCW clusters outside the Wilmington Site. The FWS recommends an alternative tree mitigation program for the benefit of RCWs that may inhabit adjacent areas; specifically, that compensation should be provided for pines with a diameter at breast height (dbh) of ten inches or more, and one longleaf pine seedling be planted for every two inches of dbh lost (rounded up to the nearest two inches). The FWS notes that professional foresters could designate the appropriate spacing of seedlings and suitable habitat, recommends that trees planted as mitigation have long-term protection, and recommends that longleaf pine seedlings could be planted as landscaping around buildings and parking lots. The FWS also recommends that mitigation areas should be identified in the forest management plan as excluded from all future development.

Response: *The NRC acknowledges the FWS's concurrence with the findings in the Draft EIS. Section 4.2.8.3 lists the compensatory tree-planting mitigation measure that would be* *conducted if potential nesting trees (i.e., trees greater than 24-inch dbh) would be cut down during preconstruction or construction activities. This mitigation measure was formulated, in part, through consultation with appropriate Federal and State agencies. Additional mitigation, such as that suggested by the FWS for forage trees, would be considered through future consultations between the applicant and FWS. Cavity and foraging trees for red-cockaded woodpeckers are generally at least 80 years old; therefore, planting pine seedlings around buildings and parking lots is not recommended as it is uncertain what future projects may occur in these areas. Also, large trees located in developed areas are not preferred red-cockaded woodpecker habitat. The applicant would consider recommendations from FWS when selecting areas for mitigation plantings. The western portion of the Wilmington Site that is adjacent to the Sledge Forest (an area identified as suitable for red-cockaded woodpeckers) would be the logical location for compensatory tree plantings.*

Comment: 005-6

The FWS concludes that preconstruction and construction activities may affect, but are not likely to adversely affect, any Federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. The FWS concludes that the requirements of section 7(a)(2) of the Endangered Species Act have been satisfied for the project. The FWS also notes that section 7 consultation must be reconsidered if new information reveals impacts of the project that may affect listed species or critical habitat in a manner not previously considered; the project is subsequently modified in a manner that was not considered in the FWS review; or a new species is listed or critical habitat determined that may be affected by the project.

Response: *The NRC acknowledges FWS's concurrence with the findings in the Draft EIS.*

J.21 Noise

No comments received on this section.

J.22 Transportation

Comment: 001-1-1, 001-2-1

The commenter noted that the reference to External Radiation Standards for All Packages on p. 4-68 (line 11) is incorrect; the reference should be 10 CFR 71.47, not 10 CFR 1.47.

Response: *The text in Section 4.2.10.2 has been corrected.*

Comment: 004-5

The commenter states that the Final EIS should consider transportation concerns for transferring depleted uranium hexafluoride (UF_6) to conversion facilities, and transporting U_3O_8 to a disposal site.

Response: *The potential impacts of transporting depleted* UF_6 *to a conversion facility are addressed in Section 4.2.10.2 and Appendix D.*

As noted in Section 4.2.10.2, the potential impacts of transporting converted depleted uranium oxide from the conversion facilities to potential disposal sites were previously evaluated by DOE. The impacts of transporting similar volumes of depleted uranium oxide originating from the proposed GLE Facility are expected to be SMALL.

Comment: PMT-1-002-1; PMT-1-002-7

The commenter expressed concern about truck travel and the possibility of a “whoosh effect” when trucks from the proposed action pass trucks from the proposed Titan Cement project. The commenter noted that trucks from the Titan Cement facility would carry limestone through Wilmington, and the commenter is concerned about what would happen when they encounter trucks (or railcars) that are carrying uranium as a result of the proposed action.

Response: *As discussed in Appendix D (Section D.3.2), all material in the uranium feed, tails, and waste shipments to and from the GLE Facility would be packaged in sturdy sealed containers that are designed to inhibit the release of any material during normal operations.*

J.23 Public and Occupational Health

Comment: 002-2

The commenter recommended changing “overseen” on p. 4-79 (line 30) to “regulated by” or “under the jurisdiction of.”

Response: *The text of Section 4.2.11.2 has been revised to reflect the commenter’s suggestion.*

Comment: 002-3

The commenter noted that the organizational unit on p. 4-79 (line 31) is technically “Occupational Safety and Health Division.”

Response: *The text of Section 4.2.11.2 has been revised to reflect the commenter’s clarification.*

Comment: 002-4

The commenter recommended changing “General Industrial Regulations for eye and face protection under 29 CFR 1910.132” on p. 4-79 (line 33) to “29 CFR 1910.133, eye and face protection.”

Response: *The text of Section 4.2.11.2 has been revised to reflect the commenter’s suggestion.*

Comment: 002-5

The commenter recommended changing “Department of Environmental Health” on p. 4-79 (line 35) to “Department of Labor.” Or, if the reference the Department of Environmental Health was intended, the NCAC reference needs to be changed (currently to the N.C. Department of Labor).

Response: *The text of Section 4.2.11.2 has been revised to reflect the commenter's suggestion.*

Comment: 002-6

The commenter noted that the sentence on p. 4-89 (line 46) is inaccurate. OSHA standards are minimum requirements, not best practices.

Response: *The text of Section 4.2.11.3 has been corrected to reflect the commenter's clarification.*

Comment: 001-1-2, 001-2-2

The commenter noted that the dose conversion factors in Federal Guidance Report 13 (FGR-13) are for morbidity and mortality, and are not expressed in terms of dose. Therefore, the references to FGR-13 on p. C-17 (Table C-1, note a) and on p. C-19 (line 5) appear to be incorrect.

Response: *The references to FGR-13 for dose conversion factors have been deleted from Table C-1 and Section C.3.2.4.*

J.24 Waste Management

Comment: 003-5-1, 003-5-2

The commenter noted that the existing GE manufacturing operations (GNF-A/FMO and AE/SCO) are on contiguous property, function as a large quantity generator of hazardous waste with an EPA Identification number, and have not had any cited Resource Conservation and Recovery Act (RCRA) violations for more than 5 years. The proposed GLE Facility, if located on contiguous property with the existing GNF-A (FMO), may operate under the same EPA Identification number.

If the proposed GLE is not on contiguous property, and if the facility generates more than 220 pounds of hazardous waste in a calendar month, the Hazardous Waste Section (HWS) must be notified, and the facility must comply with the applicable hazardous waste requirements.

Response: *As noted in Table 1-3, GLE would apply for a hazardous waste generator identification number. A determination would be made at that time as to whether GLE operations would be included under the same identification number. Clarifying text has been added to Table 1-3.*

Comment: 003-5-3

The commenter noted that non-hazardous low-level radioactive waste (LLRW) is regulated by the N.C. Department of Environment and Natural Resources, Division of Environmental Health, Radiation Protection Section.

Response: *Table 1-3 originally noted the requirement that GLE obtain a license for the use of radioactive materials from the State. However, the use of radioactive materials at the proposed GLE Facility would not require a license from the State, because NRC regulates all operations* *at uranium enrichment facilities under Section 193 of the AEA. The reference to 15A NCAC 11 has been removed from Table 1-3.*

Comment: 003-4

The commenter recommended that the applicant make every feasible effort to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of the project, where suitable. The commenter noted that any waste generated that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility permitted by the N.C. Department of Environment and Natural Resources, Division of Waste Management. The nearest permitted facility to the proposed action is the New Hanover County Landfill.

Response: *Section 4.2.12.3 presents mitigation measures that GLE has proposed to minimize the amount of waste generated by the proposed facility, including the implementation of a Waste Minimization Plan and consideration of reuse and recycling where possible. As discussed in Section 4.2.12.2, the estimated amount of municipal solid waste generated by the proposed facility would have a SMALL impact on the New Hanover County Landfill, contributing approximately an additional 0.3% to its current receipt rate.*

Table 1-2 has been revised to note that waste must be disposed of at a disposal facility licensed by the NCDENR Division of Waste Management.

Comment: 003-5-4

The commenter noted that the environmental impact from hazardous wastes generated during construction, operation, and decommissioning of the proposed GLE Facility is considered small.

Response: *The NRC acknowledges the commenter's concurrence with the findings of the Draft EIS.*

Comment: 004-3, 004-6

The commenter states that appropriate on-site storage of depleted UF_6 and other radioactive waste is necessary to prevent environmental impacts, and that the Final EIS should clarify whether a waste minimization plan has been developed to reduce the amount of waste generated from the enrichment process.

The commenter states that nonradioactive hazardous waste storage and disposal should be in accordance with the Resource Conservation and Recovery Act (RCRA), and that planning should take place to minimize the amount of hazardous waste generated from facility operations. The commenter also states that the Final EIS should clarify whether a waste minimization plan has been developed to reduce the amount of hazardous waste, and to what extent recycling and reuse are feasible.

Response: *The introductions to Section 4.2.12 and Section 4.2.12.3 discuss measures that GLE has committed to for the minimization of waste during operations, including the intent to develop a waste minimization plan that includes all facility processes. This plan would apply to all wastes, RCRA and non-RCRA, generated at the proposed facility and would include reuse and recycling where feasible. GLE has stated that it would "develop and implement a written* *waste minimization plan for the Facility operations" in preparation for the start-up of facility operations, as discussed in Section 4.13.3 of the Environmental Report.*

Comment: 004-4

The commenter states that the Final EIS should clarify the anticipated length of time between the storage of depleted UF_6 at the on-site storage pads and its conversion to U_3O_8.

Response: *The anticipated length of storage of depleted UF_6 will be limited by the capacity of the pads (10 years of peak operation, as described in Sections 2.1.2.1 and 4.2.12.2); this is also expected to be a condition of the license, if granted. However, there is no guarantee that a specific container of depleted UF_6 will not be stored for a period exceeding 10 years. In addition, cylinders could be stored for an additional 10–15 years at the site of a Department of Energy (DOE) or commercial conversion facility.*

The option exists for GLE to expand the cylinder storage pads if DOE should fail to accept the depleted UF_6 in accordance with the USEC Privatization Act. This would require a license amendment with the NRC. If such an amendment were denied by the NRC, GLE would likely be forced to cease operation until resolution of the storage issue.

Comment: PMT-1-002-4

The commenter inquired about what happens to waste that is produced by the proposed action.

Response: *As noted in Section 4.2.12 (Waste Management Impact), the majority of waste generated during facility construction would go to a local landfill, while minor amounts of hazardous wastes such as greases and excess paints would be packaged and shipped to appropriately licensed facilities for disposal.*

The predominant waste stream from operation of the proposed facility would be depleted UF_6. In accordance with Section 3113 of the USEC Privatization Act, DOE is obligated to accept depleted UF_6 waste for storage and conversion to a more stable chemical form (i.e., U_3O_8) for disposal. The waste would be shipped to one of two existing or planned DOE conversion facilities, where it would be stored and converted. As noted in Section 2.1.3.1, the NRC is also reviewing a license application for a commercial conversion facility.

As noted in Section 4.2.12.2, operation of the proposed facility will also generate low-level radioactive waste, including contaminated materials, sludge from the treatment of process wastewater, and waste from feed sampling and analysis. This waste would be packaged in accordance with Department of Transportation (DOT) requirements and shipped to a commercial disposal facility. Hazardous wastes such as cleaning solvents from maintenance activities would be packaged and shipped off-site for treatment and disposal at an appropriately licensed facility. Municipal solid waste, including administrative and maintenance activities not involving uranium compounds, would be sent for disposal at a local landfill.

J.25 Socioeconomics

No comments received on this section.

J.26 Environmental Justice

Comment: 004-19

The commenter noted that the DEIS states that impacts from the project to environmental justice communities would be small to moderate, and that the DEIS examined demographics using 2000 census data. The commenter states that nearby local residents are vulnerable to noise, aesthetics, odors, fugitive dust or localized air pollutants and light. Additionally, increased truck traffic and roadway congestion can affect residents and those living along nearby access roads. The commenter recommends consideration of potential mitigation measures to address traffic-related impacts on residents living along nearby access roads.

Response: *Potential impacts to minority and low-income populations would mostly consist of environmental and socioeconomic effects (e.g., noise, dust, light, and traffic impacts). Noise, dust, and light impacts would be short-term and limited to onsite activities. Vegetation and earthen barriers could be used to reduce any effects on offsite populations. Minority and low-income populations residing along site access and the primary commuter roads could experience increased commuter vehicle traffic during shift changes.*

The potential transportation impacts of constructing and operating the proposed GLE Facility are addressed in Section 4.2.10. The major impact identified in Sections 4.2.10.1 and 4.2.10.2 was related to traffic congestion near the Wilmington Site entrance, primarily as a result of commuting construction and operations workers for the proposed GLE Facility. The mitigation measures proposed by GLE are outlined in Section 4.2.10.3 in an effort to mitigate impacts to local roadways (GLE, 2008). These measures include: locating the proposed facility near an interstate highway interchange to facilitate employee commuter traffic and minimize truck traffic on local surface streets, increasing the number of entry gates to the Wilmington Site from NC 133, implementing roadway improvements (deceleration lanes, turn lanes, traffic control devices), working with the North Carolina Department of Transportation (NCDOT) to identify options to minimize impacts, stagger worker shift changes, routing truck shipments of radioactive materials around cities via the U.S. Interstate Highway Systems, scheduling truck deliveries and shipments for off-peak traffic hours, and encourage employees to carpool.

Comment: 004-20

The commenter believes that it is important to meaningfully engage affected communities in the vicinity of the proposed project site throughout the project regarding issues that have the potential to affect them, and that ongoing community engagement is especially important given that construction, operation, and decommissioning of the proposed facility may take place over a period of 40 years or more and could potentially result in adverse community impacts. The commenter recommends that the Final EIS clarify whether a community advisory group currently exists, whether complaints have been received from the community regarding the existing facility, and how those issues have been addressed.

Comment: 004-21

The commenter recommends that the NRC and applicant make every effort to ensure that residents nearby have an opportunity to receive training and compete for jobs at the facility, that efforts to work with and improve schools within the vicinity of the proposed project site should continue, to ensure that existing and future generations are being prepared to fill those jobs.

Response: *NRC asked the applicant if it has any community outreach programs, especially for low income or minority populations. GE does not have any outreach program, but GE does have a tutoring program with local elementary and middle schools. GE also has a cooperative agreement with Cape Fear Community College for training future GNF-A operators, and there are plans to expand this program to include the proposed GLE Facility (NRC, 2010).*

NRC also asked if GE has a community advisory group and requested information on how GE handles complaints from the local community. GE does not have a community advisory group, but has a presence on several local boards in the Wilmington area. GLE has no knowledge of any complaints, but noted that GE has established a process for addressing public complaints via their public outreach working group. GE also conducts public meetings and workshops. GE did sponsor one public meeting and one public workshop in 2009 to provide the public with information regarding the proposed GLE Facility (NRC, 2010).

J.27 Carbon Dioxide and Other Greenhouse Gas Emissions

Comment: 004-8, 004-9

The commenter recommends that the discussion of mitigation in the Final EIS consider opportunities to reduce greenhouse gases (GHGs) and other air emissions during construction and operation of the proposed facility; specifically, energy efficiency in construction and operation of buildings, equipment, and vehicles. The commenter also states that equipment and vehicles using conventional petroleum (i.e., diesel) should incorporate clean diesel technologies and fuels to reduce emissions of GHGs and other pollutants and should adhere to anti-idling policies to the extent possible. The commenter notes that alternative fuel vehicles are also possibilities.

Response: *Section 4.2.18.5 of the EIS has been revised to include a discussion of potential mitigation measures. These could include, but would not necessarily be limited to, energy-efficient design features and features to reduce space conditioning energy requirements, use of renewable energy sources, use of low-GHG-emitting vehicles, and other policies to reduce GHG emissions from vehicle use, such as anti-idling policies and van- or carpooling.*

NRC requested information regarding energy efficiency during construction and operation, to help mitigate greenhouse gas emissions. GLE stated that GE uses alternative fuel vehicles at the Wilmington Site whenever possible, and employees are encouraged to limit combustibles due to the nature of activities at the site (NRC, 2010).

The NRC's action with regard to the proposed GLE Facility is limited to granting a license, if found to be warranted, for the construction, operation, and decommissioning of the proposed facility. When NRC reviews a proposed action, its ability to impose additional requirements and environmental mitigation and monitoring measures beyond those proposed as part of the license application is limited to those with a reasonable nexus to providing protection for radiological health and safety and common defense and security.

Comment: 004-10

The commenter notes that the Council on Environmental Quality's Draft NEPA Guidance on Consideration of the Effects of Climate Change and GHGs is a helpful reference.

Response: *The NRC is aware of the EPA guidance and appreciates the comment.*

J.28 Cumulative Impacts

Comment: 003-3-1

The commenter noted the existence of 13 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or inactive hazardous waste sites within a 4-mile radius of the proposed project site; 12 of these sites are located beyond 2 miles from the proposed project site. Five of the 13 sites are on the CERCLIS database, 2 of which are on the National Priorities List and are located at least 2 miles from the proposed project site. Of the other three sites in the database, two are undergoing remediation and one is under CERCLA evaluation. The remaining eight sites have been transferred from the N.C. Division of Water Quality (DWQ) to the N.C. Inactive Hazardous Sites Branch (IHSB). The commenter, an Environmental Chemist in the NCDENR Superfund Section, concluded that it was unlikely that the proposed GLE project would affect the CERCLIS sites or vice versa.

Response: *NRC acknowledges the conclusion that the 13 inactive waste sites within 4 miles of the proposed project location would not likely affect the project or vice versa. NRC further concludes that there would be no cumulative impacts on public health from the waste sites and the proposed GLE Facility. None of the sites would likely produce exposures to uranium compounds or to hydrogen fluoride vapor (the emissions of concern from the proposed facility), nor would the public be exposed to other chemicals from the waste sites at levels that would cumulatively affect human health in combination with facility emissions. Exposures to hazardous chemicals from either source would be at levels far below health concern, while potential combined exposures would still remain far below health concerns. Given the distance between the sources, there would be minimal overlap of exposures, while no effects would be expected even if exposures were fully additive.*

Comment: 004-2

The commenter notes that the NRC considers preconstruction activities in the context of cumulative impacts and that, in accordance with NEPA, the EPA considers these activities as a part of the project (not a separate action).

Response: *NRC regulations, including, 10 CFR 70.4, define construction to explicitly exclude certain activities, such as land clearing and erection of administrative buildings, that do not have a reasonable nexus to radiological health and safety or the common defense and security. These activities, termed "preconstruction" activities, are regarded as "non-Federal actions" that do not require NRC approval or oversight. Thus, the impacts of these actions are not considered to be direct impacts of the Federal action (i.e., issuance of a license); however, the NRC does consider preconstruction activities with respect to cumulative impacts. In Section 4.3, the NRC considers the cumulative impacts on the environment that would result from the proposed action when added to other past, present, and reasonably foreseeable future actions, including preconstruction activities, regardless of what agency or person undertakes such action. Impacts from preconstruction activities are addressed within the various resource area discussions in Section 4.2 so that they can be presented alongside similar impacts from construction of the facility that are included in the proposed action. In Section 4.2.16, impacts resulting from preconstruction are identified as a percentage of total impacts estimated to occur prior to facility operations. In this sense, site preconstruction activities would be considered past activities for the purposes of cumulative impacts.*

Comment: PMT-1-001-1

The commenter asked about the proximity of the proposed action to the proposed Titan Cement plant, and whether the Draft EIS addresses the synergistic possibility between the two projects.

Response: *As discussed in Section 4.3, the Carolinas Cement Company has submitted an application for an air permit to construct a new cement manufacturing plant in northeastern Hanover County. This project is approximately 6 miles east-northeast of the proposed GLE Facility. Cumulative impacts of the proposed action and the proposed Titan Cement project are addressed in Section 4.3 (Cumulative Impacts) and the ensuing subsections.*

Comment: PMT-1-002-6; PMT-1-002-8

The commenter expressed concern about the impacts that the proposed Titan Cement project will have on the surrounding area. The commenter believes that activities at the proposed Titan Cement facility will be volatile in both a literal and figurative sense. The commenter is concerned about proceeding with the Titan project without knowing the true impacts (including the number of jobs that are proposed) and about the possibility of hurricane impacts on the project. The commenter noted that activities at the proposed Titan facility would be compounded by those of the proposed action, and the commenter expressed strong opposition to the Titan project as a result. The commenter believes that it is important for the public to understand the interface between the two projects.

Response: *Assessing the direct impacts of the proposed Titan Cement project does not fall within the scope of this EIS. However, the cumulative impacts of the proposed action and the proposed Titan Cement project are addressed in Section 4.3 (Cumulative Impacts).*

J.29 Environmental Measurement and Monitoring Programs

No comments received on this section.

J.30 Cost-Benefit Analysis

No comments received on this section.

J.31 Issues Outside the Scope of the Environmental Review

Nonproliferation/Security/Terrorism Issues

Comment: 006-1, 006-2, 006-4, 006-5

The commenters find the Draft EIS deficient, unlawful, and lacking common sense and judgment, noting that the NRC excluded 1) national defense and security issues related to nonproliferation and 2) the environmental, public health, and safety impacts arising from damage potentially inflicted by terrorists on this type of nuclear facility.

The commenters disagree with NRC's contention that nonproliferation issues are not within NRC jurisdiction and therefore beyond what the NRC can regulate, stating that the NRC may not grant a license application "if, in the opinion of the Commission, the issuance of a license to such person for such purpose would be inimical to the common defense and security or the health and safety of the public." The commenters believe that the NRC has a non-discretionary duty to consider whether the decision to grant this license could abet the proliferation of the laser-based technology to other nations (and therefore be inimical to the common defense and security of the United States).

The commenters contend that proliferation and security issues have been a part of NEPA decisions since the beginning of its application, dating back to the Atomic Energy Commission's programmatic environmental impact statement on the Liquid Metal Fast Breeder Reactor Program and the Generic Environmental Statement on Mixed Oxide Fuel, as well as the Department of Energy's Draft Global Nuclear Energy Partnership Programmatic Environmental Impact Statement.

The commenters contend that NRC is conveying a double standard by considering national security concerns to be within the scope of the EIS when energy security is the issue, but not when national security concerns derive from proliferation implications.

The commenters contend that the EIS must contain a thorough analysis and discussion of the proliferation implications of commercializing the laser-based technology, including the potential for wide-spread use, theft or replication of facility specifications, hiding a facility, and conversion of the process to produce highly enriched uranium.

The commenters disagree with the NRC's contention that the potential damage to public health and the environment from a potential terrorist attack are beyond the scope of a NEPA-required environmental review, and contend that omitting the potential effects of terrorism ignores statutory obligations. The commenters note that the NRC considers the environmental consequences of facility accidents, including those caused by human error, as within the scope of an EIS, but not the very same consequences if initiated by intent rather than error.

Response: *The NRC acknowledges the commenter's concern about the scope of the EIS. Independent of this review, the NRC has concluded that both nonproliferation issues and the effects of terrorism are beyond the scope of NRC's NEPA reviews.*

The term "Nuclear Proliferation Assessment Statement" is used in the Atomic Energy Act of 1954 (AEA) in the context of U.S. agreements for cooperation with a foreign nation under Section 123 and 131 of the AEA. Pursuant to those provisions, the NRC participated in the Nuclear Proliferation Assessment that allowed the SILEX technology to be transferred from Australia to the United States under the "Agreement for Cooperation between the United States of America and Australia Concerning Technology for the Separation of Isotopes of Uranium by Laser Excitation."

Separately, the AEA grants the NRC broad regulatory latitude to protect the public health and safety and common defense and security in its domestic licensing activities. NRC safety regulations regarding information, physical security, and material control adequately address non-proliferation concerns as part of a comprehensive regulatory infrastructure and an integrated set of activities. These regulations and activities are directed against activities that are inimical to the public health and safety and common defense and security, including the unauthorized disclosure of information and technology and the diversion of nuclear materials. Key NRC regulations in this area (10 CFR Parts 73, 74, and 95) provide comprehensive requirements governing the control of, and access to, information, physical security of materials and facilities, and material control and accounting. As appropriate, the NRC may supplement these requirements by order consistent with its statutory obligation under the AEA to protect the *common defense and security and public health and safety. While the AEA does not prescribe that NRC explicitly consider nuclear proliferation as a prerequisite to domestic licensing, the NRC's security requirements related to information and material control address nonproliferation concerns.*

In a matter regarding the Louisiana Energy Services Facility (LES), the Commission noted the Supreme Court's decision (Department of Transp. v. Public Citizen, 541 U.S. 752, 767 (2004)) that NEPA requires a "reasonably close causal relationship" between the alleged environmental effect and the alleged cause, and found that nuclear nonproliferation issues "span a host of factors far removed from" and "far afield from our decision whether to license the facility..." (NRC, 2005). Following LES, the Commission, in USEC Inc. (American Centrifuge Plant), reiterated that position. The Commission held that nuclear nonproliferation issues are outside of the scope NRC's environmental analysis because they do not have a close causal relationship with an NRC licensing decision and instead are "dependent upon the actions and decisions of the President, Congress, international organizations, and officials of other nations," are "issues of international policy unrelated to the NRC's licensing criteria ..." (NRC, 2006).

Given the NRC's comprehensive regulatory framework, ongoing oversight, and active inter-agency cooperation, it is the NRC's current view that a formal nuclear nonproliferation assessment is not necessary to ensure the protection of the common defense and security.

Similar to the nuclear proliferation issues, the Commission has ruled in a series of adjudicatory decisions that NEPA does not require the NRC to consider the environmental impacts from hypothetical terrorist attacks. See Amergen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-07-8, 65 NRC 124 (2007). The Commission position rests on Supreme Court NEPA decisions that require a showing of a close causal relationship—analogous to the "proximate cause" requirement in tort law—between agency action and environmental consequences that require NEPA analysis. The Commission has found that there is no such relationship between NRC licensing actions and terrorism. The Federal courts are split on the issue, with the Third Circuit upholding the Commission's view, and the Ninth Circuit disagreeing with it. Hence, for facilities located in the Ninth Circuit, the NRC does perform a NEPA-terrorism review.

As the commenter noted, the NRC does consider the environmental consequences of facility accidents within the scope of the EIS, even when the results of the accidents considered and the potential terrorist actions may be similar. Accidents are considered because there is a reasonably close causal relationship between the Federal action of licensing a facility and potential accidents at the licensed facility. As indicated in the Commission decision regarding Private Fuel Storage (NRC, 2002), and reiterated in the Oyster Creek decision (NRC, 2007), the Commission holds that "The 'environmental' effect caused by third party miscreants is…simply too far removed from the natural or expected consequences of agency action to require a study under NEPA."

Comment: PMT-1-005-3

The commenter recognizes the sensitive nature of uranium enrichment technology and believes that a robust U.S. enrichment program that is capable of supplying the world with a reliable source of affordable nuclear fuel will dissuade other nations from building their own enrichment facilities (which could be misused or converted to produce weapons grade uranium).

Response: *The NRC acknowledges the comment.*

J.32 General Comments

Comment: PMT-2-001-1; PMT-2-001-2; PMT-2-001-3

The commenter asked where and how uranium is mined and shipped to the site of the proposed action.

Response: *Uranium is mined throughout the world, including Kazakhstan, Canada, Australia, Namibia, South Africa, and the United States. The United States produces approximately 3-4 percent of the total uranium mined each year. Uranium can be extracted from the earth as an ore or dissolved in a liquid (in situ). The ore is converted in a conversion facility from an oxide form (commonly* U_3O_8*) to uranium hexafluoride (*UF_6*).*

As noted in Section 4.2.10 and Appendix D, unenriched UF_6 *would be transported to the proposed facility as a solid, in 2.5-ton steel cylinders. At an enrichment facility, the* UF_6 *is converted directly from a solid to a gas before being fed into the enrichment process. Once the enrichment process is finished, the depleted* UF_6 *is converted back to a solid for storage or shipment in 2.5-ton steel cylinders. The enriched* UF_6 *would be sent to a fuel fabrication facility, including the GNF-A facility at the Wilmington Site.*

J.33 References

(GLE, 2008) GE-Hitachi Global Laser Enrichment LLC. “Environmental Report for the GLE Commercial Facility, Revision 0.” December. ADAMS Accession No. ML090910573.

(GLE, 2009a) GE-Hitachi Global Laser Enrichment LLC. Letter from T.G. Orr (GE-Hitachi Global Laser Enrichment LLC) to M. Weber (U.S. Nuclear Regulatory Commission) dated June 26. “Subject: GE-Hitachi Global Laser Enrichment LLC License Application Submittal.” ADAMS Accession No. ML091870998.

(GLE, 2009b) GE-Hitachi Global Laser Enrichment LLC. “Environmental Report Supplement 1 – Early Construction.” July. ADAMS Accession No. ML092100528.

(GLE, 2009c) GE-Hitachi Global Laser Enrichment LLC. Letter from J. Olivier (GE-Hitachi Global Laser Enrichment LLC) to J. Davis (U.S. Nuclear Regulatory Commission) dated December 29. “Subject: Submittal of GLE Procedure for Unanticipated Discovery of Human Remains/Artifacts.” ADAMS Accession No. ML093631158.

(NCDCR, 2011) North Carolina Department of Cultural Resources, State Historic Preservation Office. Letter from R. Gledhill-Earley (State Historic Preservation Office) to K. Hsueh (U.S. Nuclear Regulatory Commission) dated April 5. “Subject: General Electric-Hitachi Laser-Based Uranium Enrichment Facility near Wilmington, Docket 70-7016, New Hanover County, ER 07-2157.” ADAMS Accession No. ML110950680.

(NRC, 2002) U.S. Nuclear Regulatory Commission. “Private Fuel Storage.” CLI-02-25. December. ADAMS Accession No. ML023520349.

(NRC, 2005) U.S. Nuclear Regulatory Commission. “Louisiana Energy Services, L.P.” CLI-05-28. November. ADAMS Accession No. ML053250203.

(NRC, 2006) U.S. Nuclear Regulatory Commission. "USEC Inc." CLI-06-10. April. ADAMS Accession No. ML060930763.

(NRC, 2007) U.S. Nuclear Regulatory Commission. "Amergen Energy Company LLC" CLI-07-08. February. ADAMS Accession No. ML070570511.

(NRC, 2009) U.S. Nuclear Regulatory Commission. Letter from D. Dorman (U.S. Nuclear Regulatory Commission) to A. Kennedy (GE-Hitachi Global Laser Enrichment LLC) dated January 13. "Subject: Approval of GE-Hitachi Exemption Request Related to Environmental Report Submittal." ADAMS Accession Number ML083460224.

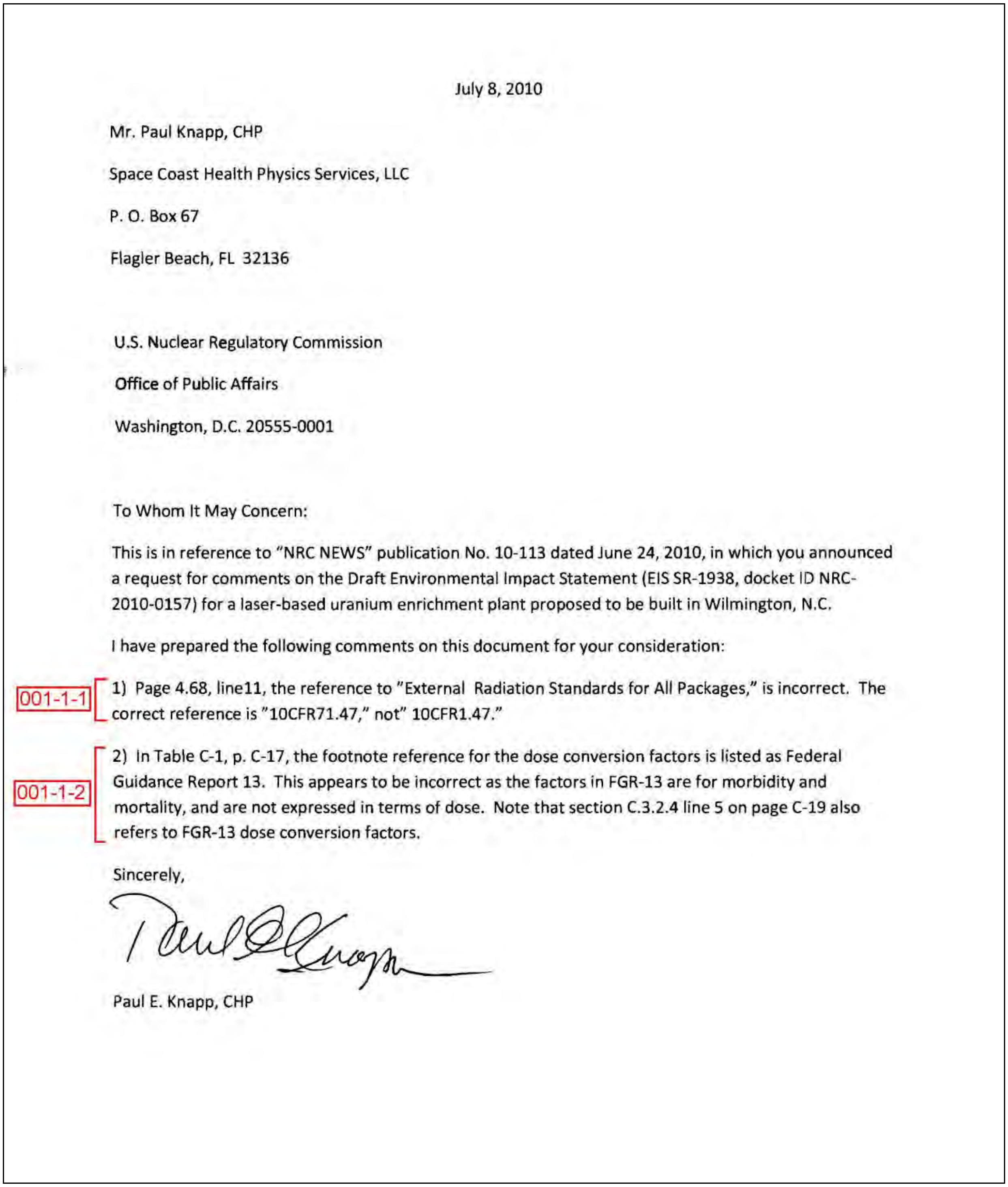
(NRC, 2010) U.S. Nuclear Regulatory Commission. Memorandum from J. Davis (U.S. Nuclear Regulatory Commission) to D. Skeen (U.S. Nuclear Regulatory Commission) dated November 9. "Subject: September 3, 2010, Teleconference Summary: Regarding the Proposed General Electric-Hitachi Global Laser Enrichment Facility." ADAMS Accession No. ML103060397.

(NRC, 2011a) U.S. Nuclear Regulatory Commission. Letter from A. Hsia (U.S. Nuclear Regulatory Commission) to S. Shakir (AREVA Enrichment Services, LLC) dated October 12. "Subject: License for the AREVA Enrichment Services Eagle Rock Enrichment Facility." ADAMS Accession No. ML111650384.

(NRC, 2011b) U.S. Nuclear Regulatory Commission. Letter from K. Hsueh (U.S. Nuclear Regulatory Commission) to R. Gledhill-Earley (State Historic Preservation Office) dated March 28. "Subject: General Electric-Hitachi Laser-Based Uranium Enrichment Facility Near Wilmington, North Carolina (State Historic Preservation Tracking Number ER 07-2157)." ADAMS Accession No. ML110840685.

APPENDIX K
PUBLIC COMMENT LETTERS AND TRANSCRIPTS

APPENDIX K
PUBLIC COMMENT LETTERS AND TRANSCRIPTS



July 8, 2010

Mr. Paul Knapp, CHP

Space Coast Health Physics Services, LLC

P. O. Box 67

Flagler Beach, FL 32136

U.S. Nuclear Regulatory Commission

Office of Public Affairs

Washington, D.C. 20555-0001

To Whom It May Concern:

This is in reference to "NRC NEWS" publication No. 10-113 dated June 24, 2010, in which you announced a request for comments on the Draft Environmental Impact Statement (EIS SR-1938, docket ID NRC-2010-0157) for a laser-based uranium enrichment plant proposed to be built in Wilmington, N.C.

I have prepared the following comments on this document for your consideration:

001-1-1

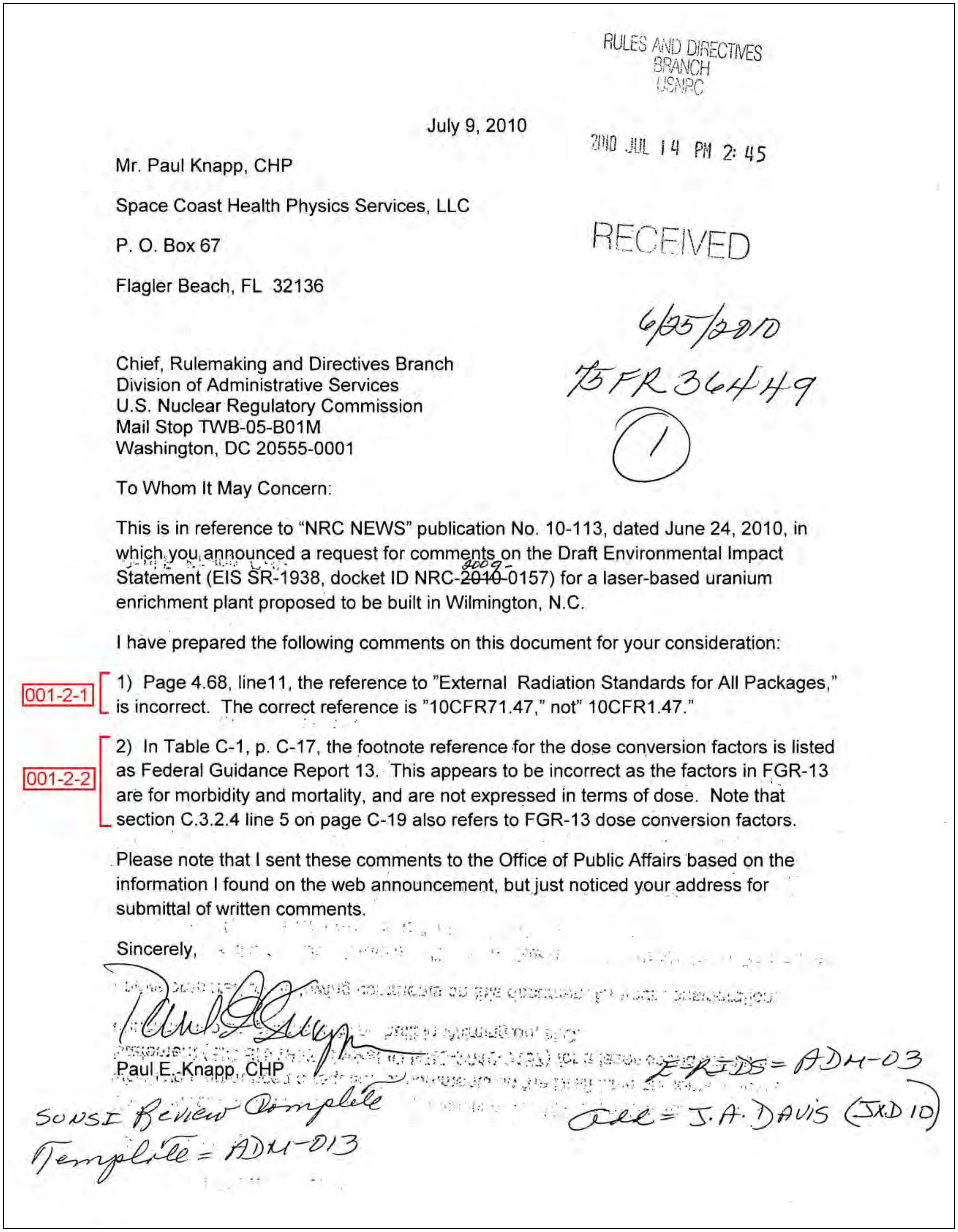
1) Page 4.68, line11, the reference to "External Radiation Standards for All Packages," is incorrect. The correct reference is "10CFR71.47," not" 10CFR1.47."

001-1-2

2) In Table C-1, p. C-17, the footnote reference for the dose conversion factors is listed as Federal Guidance Report 13. This appears to be incorrect as the factors in FGR-13 are for morbidity and mortality, and are not expressed in terms of dose. Note that section C.3.2.4 line 5 on page C-19 also refers to FGR-13 dose conversion factors.

Sincerely,

Paul E. Knapp, CHP



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USNRC

2010 JUL 14 PM 2: 45

RECEIVED

July 9, 2010

Mr. Paul Knapp, CHP

Space Coast Health Physics Services, LLC

P. O. Box 67

Flagler Beach, FL 32136

6/25/2010
75 FR 36449
①

Chief, Rulemaking and Directives Branch
Division of Administrative Services
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01M
Washington, DC 20555-0001

To Whom It May Concern:

This is in reference to "NRC NEWS" publication No. 10-113, dated June 24, 2010, in which you announced a request for comments on the Draft Environmental Impact Statement (EIS SR-1938, docket ID NRC-~~2010~~ 2009-0157) for a laser-based uranium enrichment plant proposed to be built in Wilmington, N.C.

I have prepared the following comments on this document for your consideration:

001-2-1

1) Page 4.68, line11, the reference to "External Radiation Standards for All Packages," is incorrect. The correct reference is "10CFR71.47," not" 10CFR1.47."

001-2-2

2) In Table C-1, p. C-17, the footnote reference for the dose conversion factors is listed as Federal Guidance Report 13. This appears to be incorrect as the factors in FGR-13 are for morbidity and mortality, and are not expressed in terms of dose. Note that section C.3.2.4 line 5 on page C-19 also refers to FGR-13 dose conversion factors.

Please note that I sent these comments to the Office of Public Affairs based on the information I found on the web announcement, but just noticed your address for submittal of written comments.

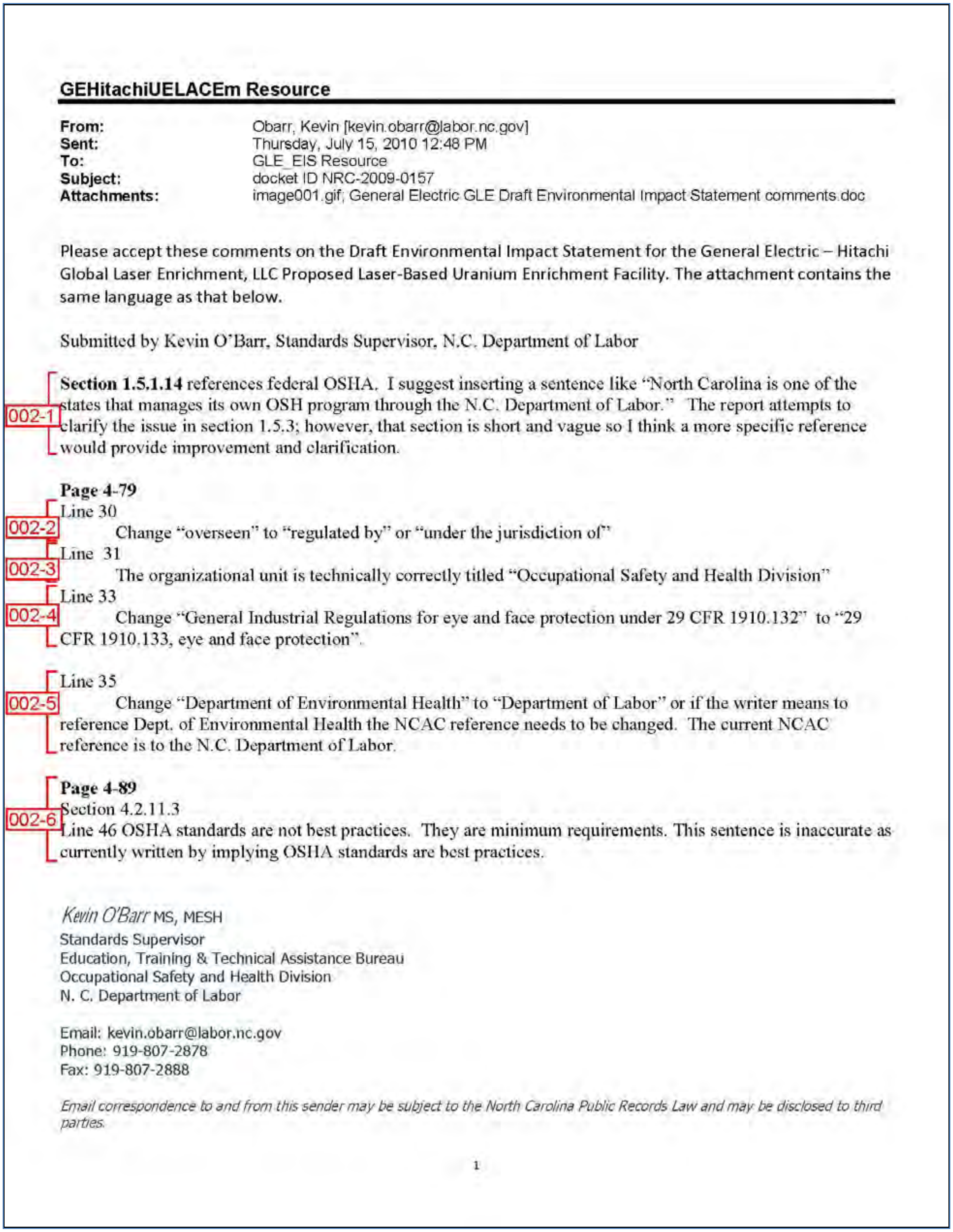
Sincerely,

Paul E. Knapp, CHP

E-RIDS = ADM-03

SUNSI Review Complete
Template = ADM-013

Add = J. A. Davis (JXD10)



GEHitachiUELACEm Resource

From: Obarr, Kevin [kevin.obarr@labor.nc.gov]
Sent: Thursday, July 15, 2010 12:48 PM
To: GLE_EIS Resource
Subject: docket ID NRC-2009-0157
Attachments: image001.gif; General Electric GLE Draft Environmental Impact Statement comments.doc

Please accept these comments on the Draft Environmental Impact Statement for the General Electric – Hitachi Global Laser Enrichment, LLC Proposed Laser-Based Uranium Enrichment Facility. The attachment contains the same language as that below.

Submitted by Kevin O'Barr, Standards Supervisor, N.C. Department of Labor

002-1 **Section 1.5.1.14** references federal OSHA. I suggest inserting a sentence like "North Carolina is one of the states that manages its own OSH program through the N.C. Department of Labor." The report attempts to clarify the issue in section 1.5.3; however, that section is short and vague so I think a more specific reference would provide improvement and clarification.

Page 4-79

002-2 Line 30
Change "overseen" to "regulated by" or "under the jurisdiction of"

002-3 Line 31
The organizational unit is technically correctly titled "Occupational Safety and Health Division"

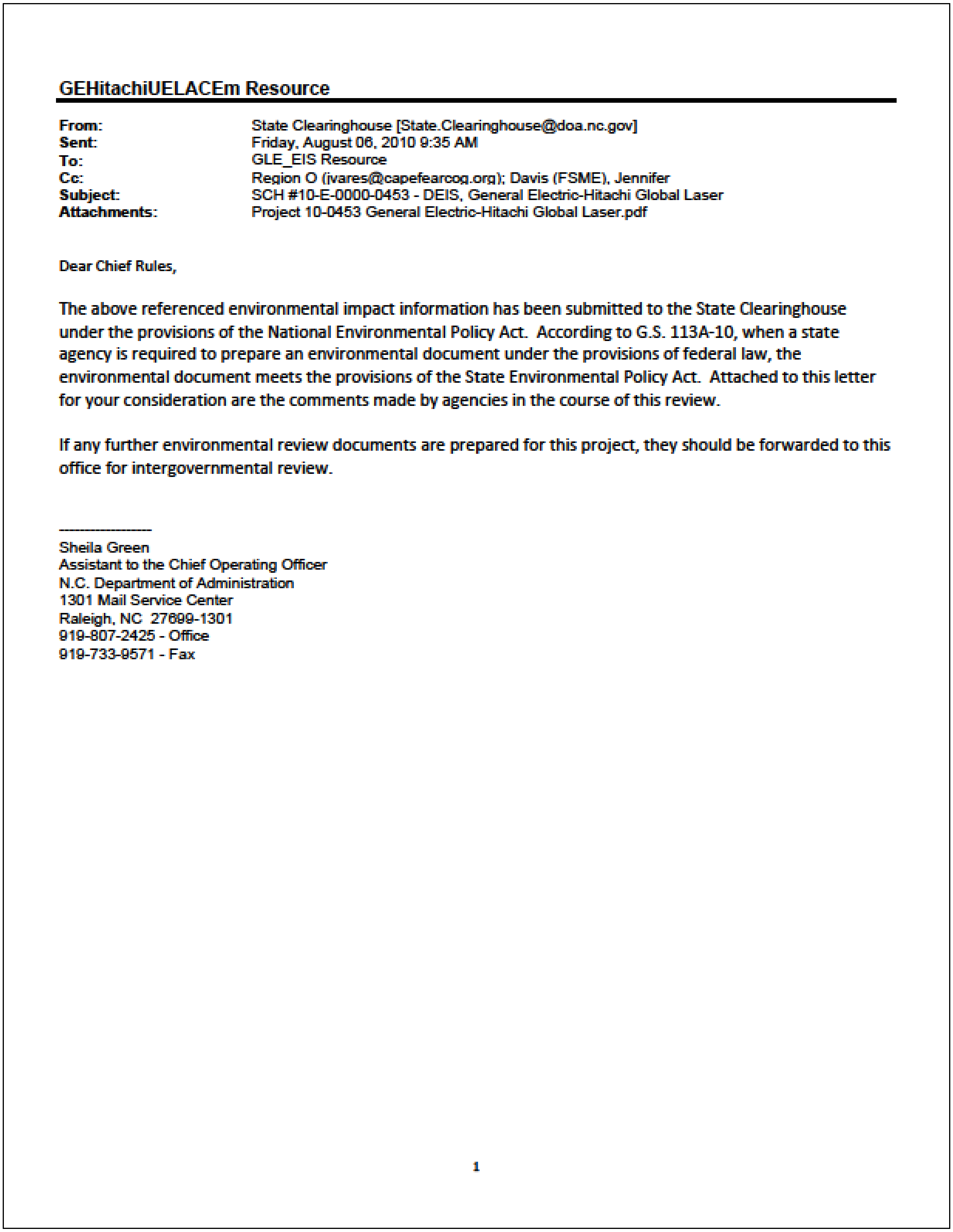
002-4 Line 33
Change "General Industrial Regulations for eye and face protection under 29 CFR 1910.132" to "29 CFR 1910.133, eye and face protection".

002-5 Line 35
Change "Department of Environmental Health" to "Department of Labor" or if the writer means to reference Dept. of Environmental Health the NCAC reference needs to be changed. The current NCAC reference is to the N.C. Department of Labor.

002-6 **Page 4-89**
Section 4.2.11.3
Line 46 OSHA standards are not best practices. They are minimum requirements. This sentence is inaccurate as currently written by implying OSHA standards are best practices.

Kevin O'Barr MS, MESH
Standards Supervisor
Education, Training & Technical Assistance Bureau
Occupational Safety and Health Division
N. C. Department of Labor

Email: kevin.obarr@labor.nc.gov
Phone: 919-807-2878
Fax: 919-807-2888



GEHitachiUELACEm Resource

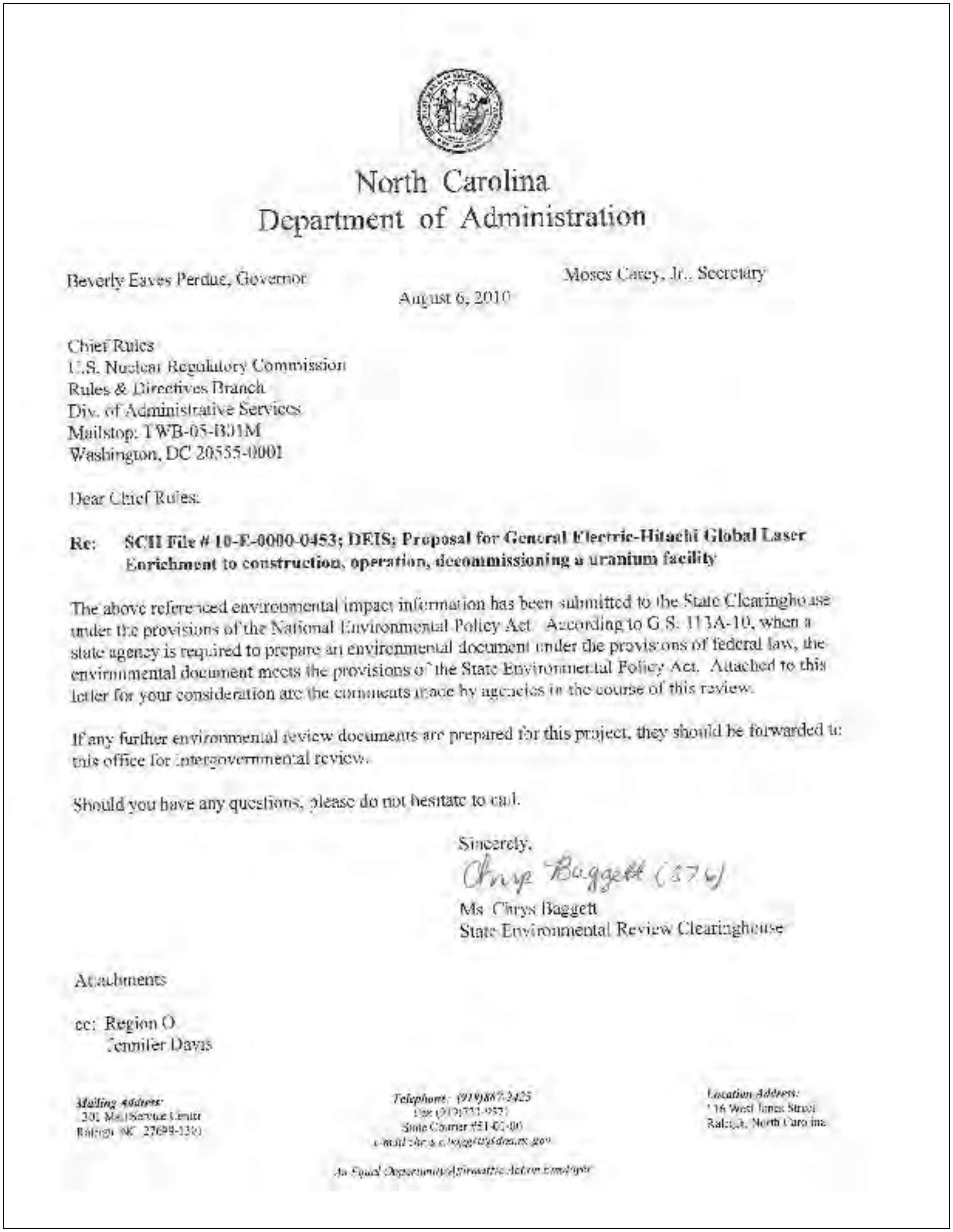
From: State Clearinghouse [State.Clearinghouse@doa.nc.gov]
Sent: Friday, August 06, 2010 9:35 AM
To: GLE_EIS Resource
Cc: Region O (jvares@capefearcog.org); Davis (FSME), Jennifer
Subject: SCH #10-E-0000-0453 - DEIS, General Electric-Hitachi Global Laser
Attachments: Project 10-0453 General Electric-Hitachi Global Laser.pdf

Dear Chief Rules,

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

\-
Sheila Green
Assistant to the Chief Operating Officer
N.C. Department of Administration
1301 Mail Service Center
Raleigh, NC 27699-1301
919-807-2425 - Office
919-733-9571 - Fax



North Carolina
Department of Administration

Beverly Eaves Perdue, Governor
Moses Carey, Jr., Secretary

August 6, 2010

Chief Rules
U.S. Nuclear Regulatory Commission
Rules & Directives Branch
Div. of Administrative Services
Mailstop: TWB-05-B01M
Washington, DC 20555-0001

Dear Chief Rules:

Re: SCH File # 10-E-0000-0453; DEIS; Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Chrys Baggett

Ms. Chrys Baggett
State Environmental Review Clearinghouse

Attachments

cc: Region O
Jennifer Davis

Mailing Address:
1301 Mail Service Center
Raleigh NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail chrys.baggett@doa.nc.gov

Location Address:
116 West Jones Street
Raleigh, North Carolina

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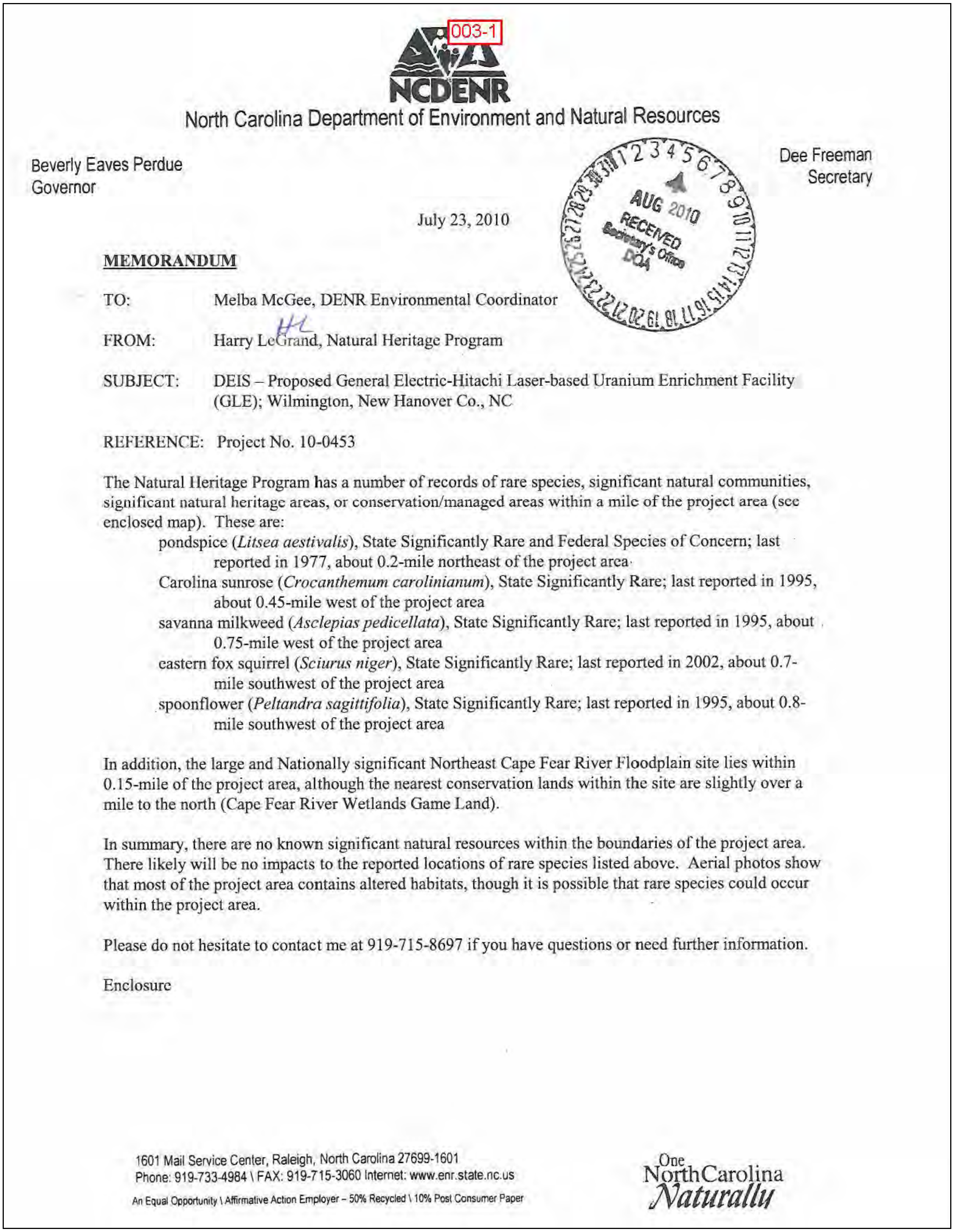

003-1

NCDENR

North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

AUG 2010
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July 23, 2010

MEMORANDUM

TO: Melba McGee, DENR Environmental Coordinator

FROM: Harry LeGrand, Natural Heritage Program HL

SUBJECT: DEIS – Proposed General Electric-Hitachi Laser-based Uranium Enrichment Facility (GLE); Wilmington, New Hanover Co., NC

REFERENCE: Project No. 10-0453

The Natural Heritage Program has a number of records of rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas within a mile of the project area (see enclosed map). These are:

pondspice (*Litsea aestivalis*), State Significantly Rare and Federal Species of Concern; last reported in 1977, about 0.2-mile northeast of the project area

Carolina sunrose (*Crocanthemum carolinianum*), State Significantly Rare; last reported in 1995, about 0.45-mile west of the project area

savanna milkweed (*Asclepias pedicellata*), State Significantly Rare; last reported in 1995, about 0.75-mile west of the project area

eastern fox squirrel (*Sciurus niger*), State Significantly Rare; last reported in 2002, about 0.7-mile southwest of the project area

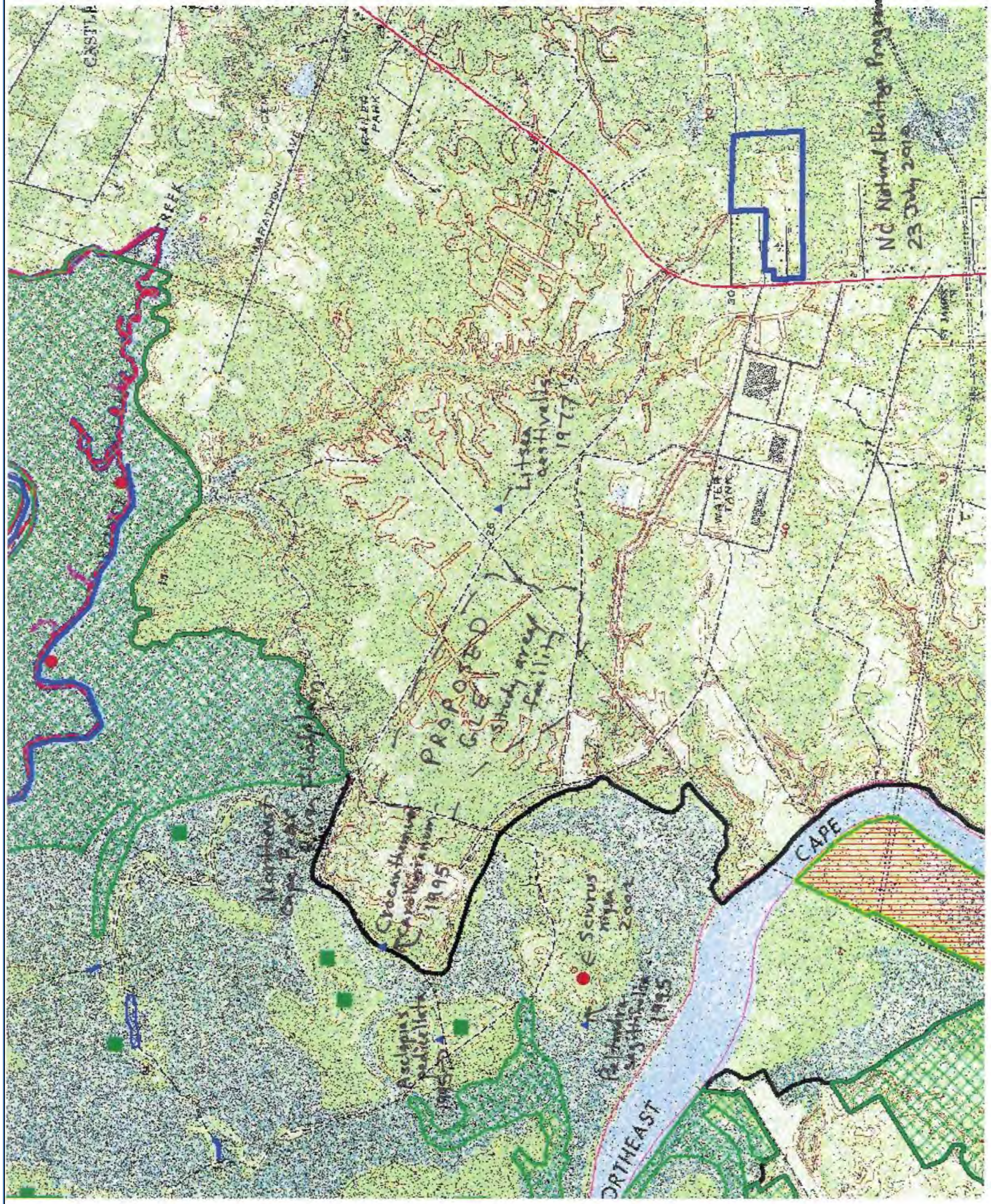
spoonflower (*Peltandra sagittifolia*), State Significantly Rare; last reported in 1995, about 0.8-mile southwest of the project area

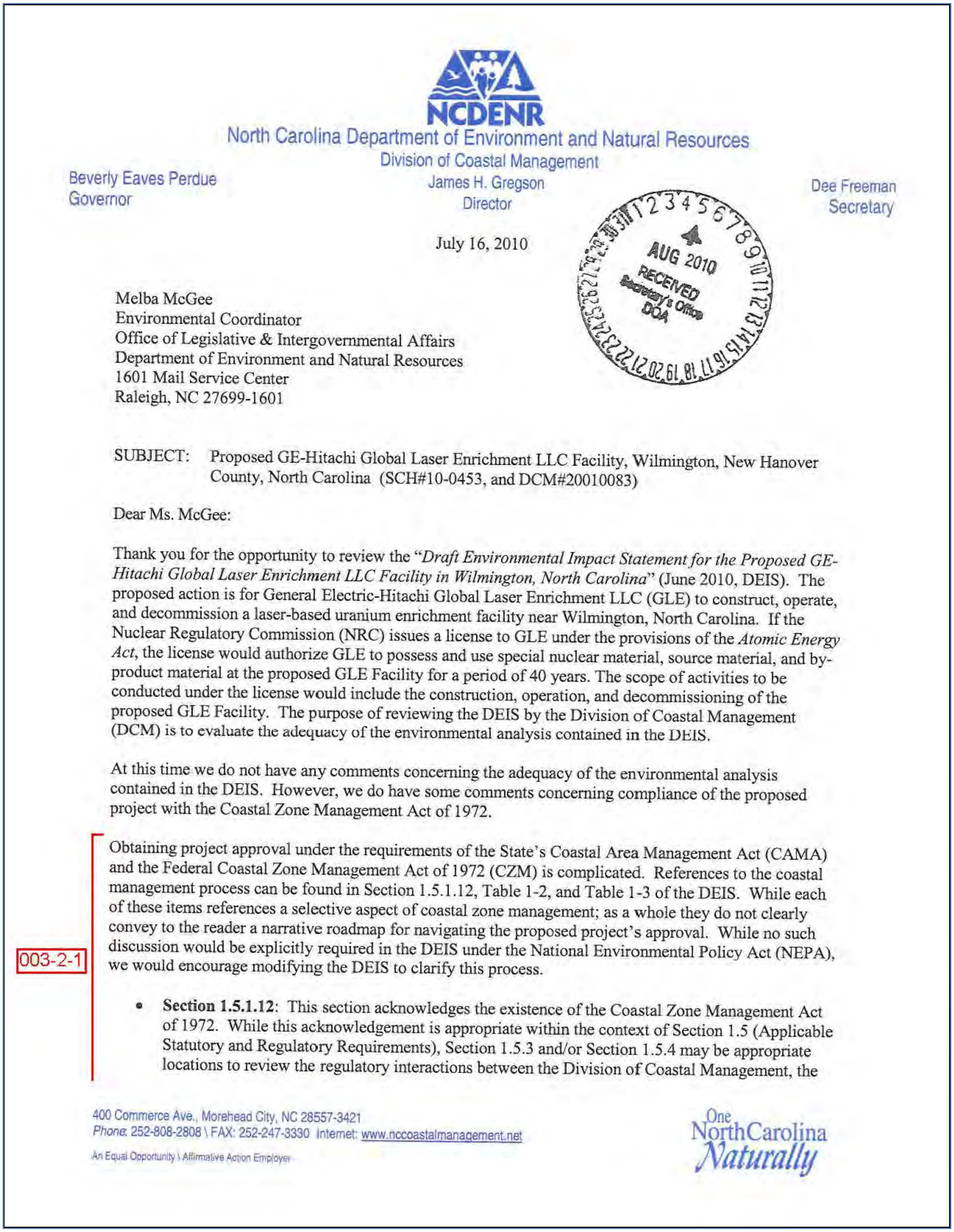
In addition, the large and Nationally significant Northeast Cape Fear River Floodplain site lies within 0.15-mile of the project area, although the nearest conservation lands within the site are slightly over a mile to the north (Cape Fear River Wetlands Game Land).

In summary, there are no known significant natural resources within the boundaries of the project area. There likely will be no impacts to the reported locations of rare species listed above. Aerial photos show that most of the project area contains altered habitats, though it is possible that rare species could occur within the project area.

Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

Enclosure


NC Natural Heritage Program
23 July 2010
PROPOSED GLE study area facility
Litsea aestivalis 1977
Northeast Cape Fear Floodplain
Crocanthemum carolinianum 1995
Sciurus niger 2002
Asclepias pedicellata 1995
CREEK
WATER TANK
CAPE
NORTHEAST



NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management

Beverly Eaves Perdue
Governor

James H. Gregson
Director

Dee Freeman
Secretary

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July 16, 2010

Melba McGee
Environmental Coordinator
Office of Legislative & Intergovernmental Affairs
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

SUBJECT: Proposed GE-Hitachi Global Laser Enrichment LLC Facility, Wilmington, New Hanover County, North Carolina (SCH#10-0453, and DCM#20010083)

Dear Ms. McGee:

Thank you for the opportunity to review the "*Draft Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina*" (June 2010, DEIS). The proposed action is for General Electric-Hitachi Global Laser Enrichment LLC (GLE) to construct, operate, and decommission a laser-based uranium enrichment facility near Wilmington, North Carolina. If the Nuclear Regulatory Commission (NRC) issues a license to GLE under the provisions of the *Atomic Energy Act*, the license would authorize GLE to possess and use special nuclear material, source material, and by-product material at the proposed GLE Facility for a period of 40 years. The scope of activities to be conducted under the license would include the construction, operation, and decommissioning of the proposed GLE Facility. The purpose of reviewing the DEIS by the Division of Coastal Management (DCM) is to evaluate the adequacy of the environmental analysis contained in the DEIS.

At this time we do not have any comments concerning the adequacy of the environmental analysis contained in the DEIS. However, we do have some comments concerning compliance of the proposed project with the Coastal Zone Management Act of 1972.

003-2-1

Obtaining project approval under the requirements of the State's Coastal Area Management Act (CAMA) and the Federal Coastal Zone Management Act of 1972 (CZM) is complicated. References to the coastal management process can be found in Section 1.5.1.12, Table 1-2, and Table 1-3 of the DEIS. While each of these items references a selective aspect of coastal zone management; as a whole they do not clearly convey to the reader a narrative roadmap for navigating the proposed project's approval. While no such discussion would be explicitly required in the DEIS under the National Environmental Policy Act (NEPA), we would encourage modifying the DEIS to clarify this process.

- **Section 1.5.1.12**: This section acknowledges the existence of the Coastal Zone Management Act of 1972. While this acknowledgement is appropriate within the context of Section 1.5 (Applicable Statutory and Regulatory Requirements), Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the

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Phone: 252-808-2808 \ FAX: 252-247-3330 Internet: www.nccoastalmanagement.net
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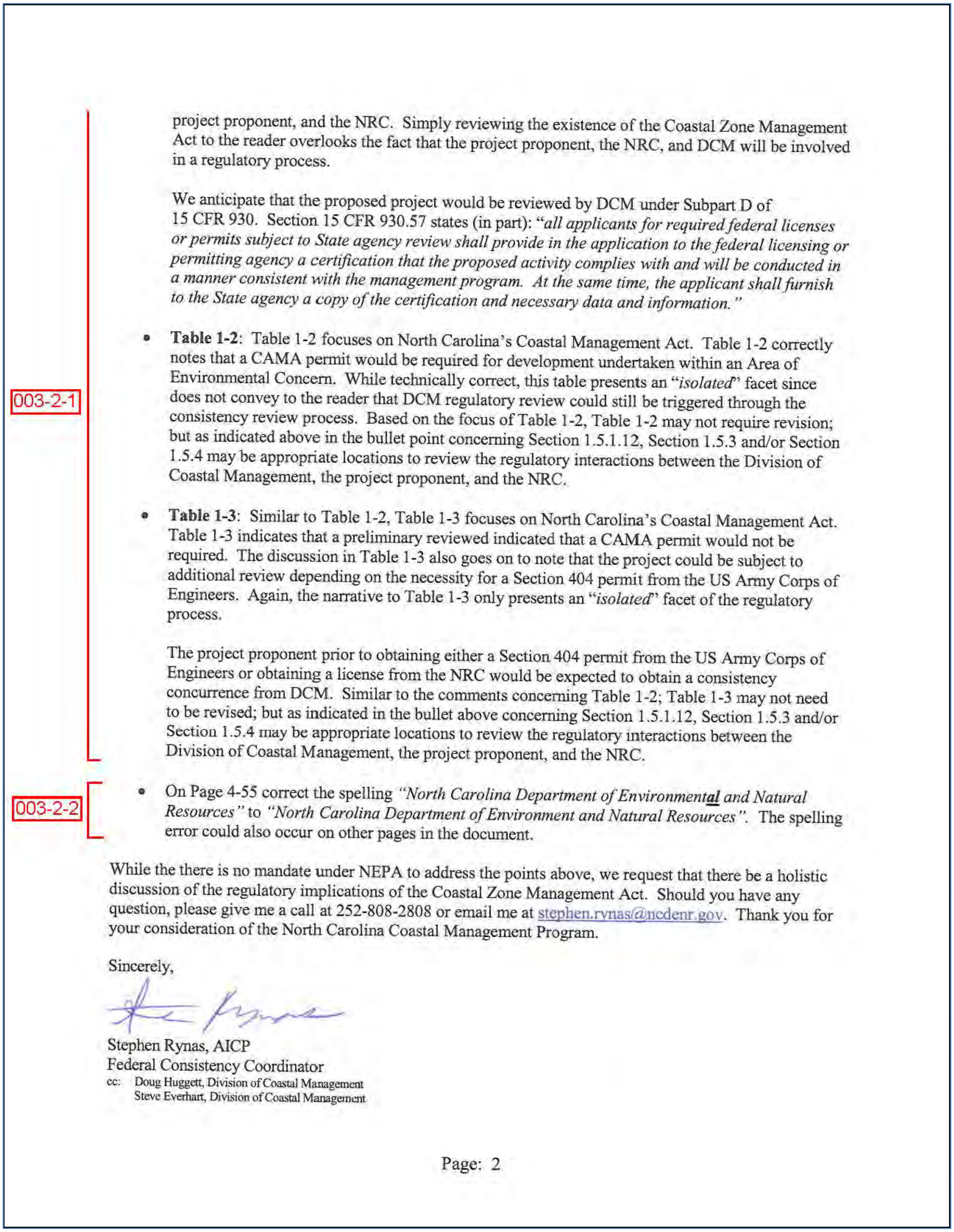


003-2-1

project proponent, and the NRC. Simply reviewing the existence of the Coastal Zone Management Act to the reader overlooks the fact that the project proponent, the NRC, and DCM will be involved in a regulatory process.

We anticipate that the proposed project would be reviewed by DCM under Subpart D of 15 CFR 930. Section 15 CFR 930.57 states (in part): "*all applicants for required federal licenses or permits subject to State agency review shall provide in the application to the federal licensing or permitting agency a certification that the proposed activity complies with and will be conducted in a manner consistent with the management program. At the same time, the applicant shall furnish to the State agency a copy of the certification and necessary data and information.*"

- **Table 1-2**: Table 1-2 focuses on North Carolina's Coastal Management Act. Table 1-2 correctly notes that a CAMA permit would be required for development undertaken within an Area of Environmental Concern. While technically correct, this table presents an "*isolated*" facet since does not convey to the reader that DCM regulatory review could still be triggered through the consistency review process. Based on the focus of Table 1-2, Table 1-2 may not require revision; but as indicated above in the bullet point concerning Section 1.5.1.12, Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the project proponent, and the NRC.

- **Table 1-3**: Similar to Table 1-2, Table 1-3 focuses on North Carolina's Coastal Management Act. Table 1-3 indicates that a preliminary reviewed indicated that a CAMA permit would not be required. The discussion in Table 1-3 also goes on to note that the project could be subject to additional review depending on the necessity for a Section 404 permit from the US Army Corps of Engineers. Again, the narrative to Table 1-3 only presents an "*isolated*" facet of the regulatory process.

  The project proponent prior to obtaining either a Section 404 permit from the US Army Corps of Engineers or obtaining a license from the NRC would be expected to obtain a consistency concurrence from DCM. Similar to the comments concerning Table 1-2; Table 1-3 may not need to be revised; but as indicated in the bullet above concerning Section 1.5.1.12, Section 1.5.3 and/or Section 1.5.4 may be appropriate locations to review the regulatory interactions between the Division of Coastal Management, the project proponent, and the NRC.

003-2-2

- On Page 4-55 correct the spelling *"North Carolina Department of Environment**al** and Natural Resources"* to *"North Carolina Department of Environment and Natural Resources"*. The spelling error could also occur on other pages in the document.

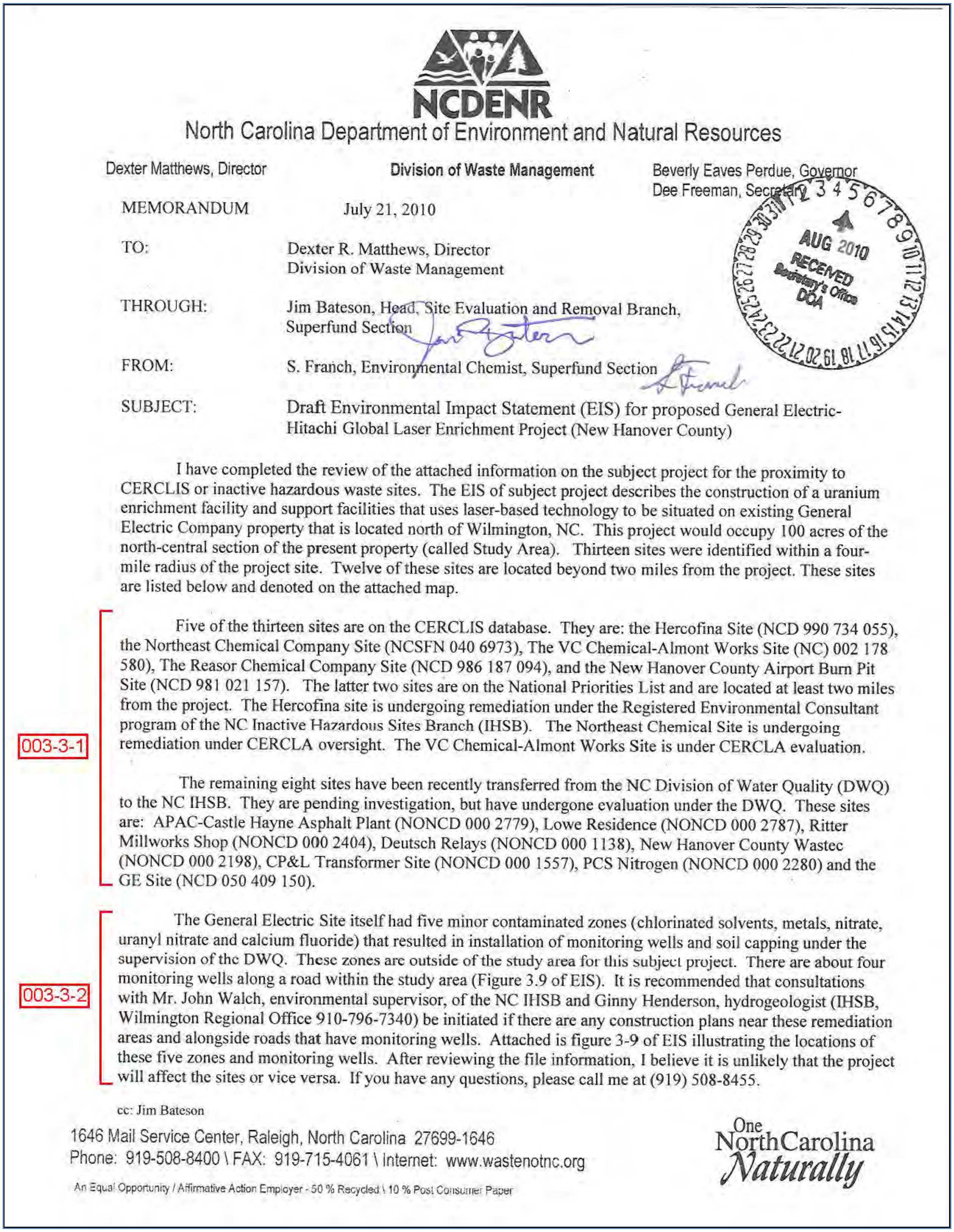
While the there is no mandate under NEPA to address the points above, we request that there be a holistic discussion of the regulatory implications of the Coastal Zone Management Act. Should you have any question, please give me a call at 252-808-2808 or email me at stephen.rynas@ncdenr.gov. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Stephen Rynas, AICP
Federal Consistency Coordinator

cc: Doug Huggett, Division of Coastal Management
Steve Everhart, Division of Coastal Management

Page: 2



NCDENR
North Carolina Department of Environment and Natural Resources

Dexter Matthews, Director
Division of Waste Management
Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

AUG 2010
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Secretary's Office
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MEMORANDUM July 21, 2010

TO: Dexter R. Matthews, Director
Division of Waste Management

THROUGH: Jim Bateson, Head, Site Evaluation and Removal Branch,
Superfund Section

FROM: S. Franch, Environmental Chemist, Superfund Section

SUBJECT: Draft Environmental Impact Statement (EIS) for proposed General Electric-Hitachi Global Laser Enrichment Project (New Hanover County)

I have completed the review of the attached information on the subject project for the proximity to CERCLIS or inactive hazardous waste sites. The EIS of subject project describes the construction of a uranium enrichment facility and support facilities that uses laser-based technology to be situated on existing General Electric Company property that is located north of Wilmington, NC. This project would occupy 100 acres of the north-central section of the present property (called Study Area). Thirteen sites were identified within a four-mile radius of the project site. Twelve of these sites are located beyond two miles from the project. These sites are listed below and denoted on the attached map.

Five of the thirteen sites are on the CERCLIS database. They are: the Hercofina Site (NCD 990 734 055), the Northeast Chemical Company Site (NCSFN 040 6973), The VC Chemical-Almont Works Site (NC) 002 178 580), The Reasor Chemical Company Site (NCD 986 187 094), and the New Hanover County Airport Burn Pit Site (NCD 981 021 157). The latter two sites are on the National Priorities List and are located at least two miles from the project. The Hercofina site is undergoing remediation under the Registered Environmental Consultant program of the NC Inactive Hazardous Sites Branch (IHSB). The Northeast Chemical Site is undergoing remediation under CERCLA oversight. The VC Chemical-Almont Works Site is under CERCLA evaluation.

003-3-1

The remaining eight sites have been recently transferred from the NC Division of Water Quality (DWQ) to the NC IHSB. They are pending investigation, but have undergone evaluation under the DWQ. These sites are: APAC-Castle Hayne Asphalt Plant (NONCD 000 2779), Lowe Residence (NONCD 000 2787), Ritter Millworks Shop (NONCD 000 2404), Deutsch Relays (NONCD 000 1138), New Hanover County Wastec (NONCD 000 2198), CP&L Transformer Site (NONCD 000 1557), PCS Nitrogen (NONCD 000 2280) and the GE Site (NCD 050 409 150).

003-3-2

The General Electric Site itself had five minor contaminated zones (chlorinated solvents, metals, nitrate, uranyl nitrate and calcium fluoride) that resulted in installation of monitoring wells and soil capping under the supervision of the DWQ. These zones are outside of the study area for this subject project. There are about four monitoring wells along a road within the study area (Figure 3.9 of EIS). It is recommended that consultations with Mr. John Walch, environmental supervisor, of the NC IHSB and Ginny Henderson, hydrogeologist (IHSB, Wilmington Regional Office 910-796-7340) be initiated if there are any construction plans near these remediation areas and alongside roads that have monitoring wells. Attached is figure 3-9 of EIS illustrating the locations of these five zones and monitoring wells. After reviewing the file information, I believe it is unlikely that the project will affect the sites or vice versa. If you have any questions, please call me at (919) 508-8455.

cc: Jim Bateson

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-715-4061 \ Internet: www.wastenotnc.org

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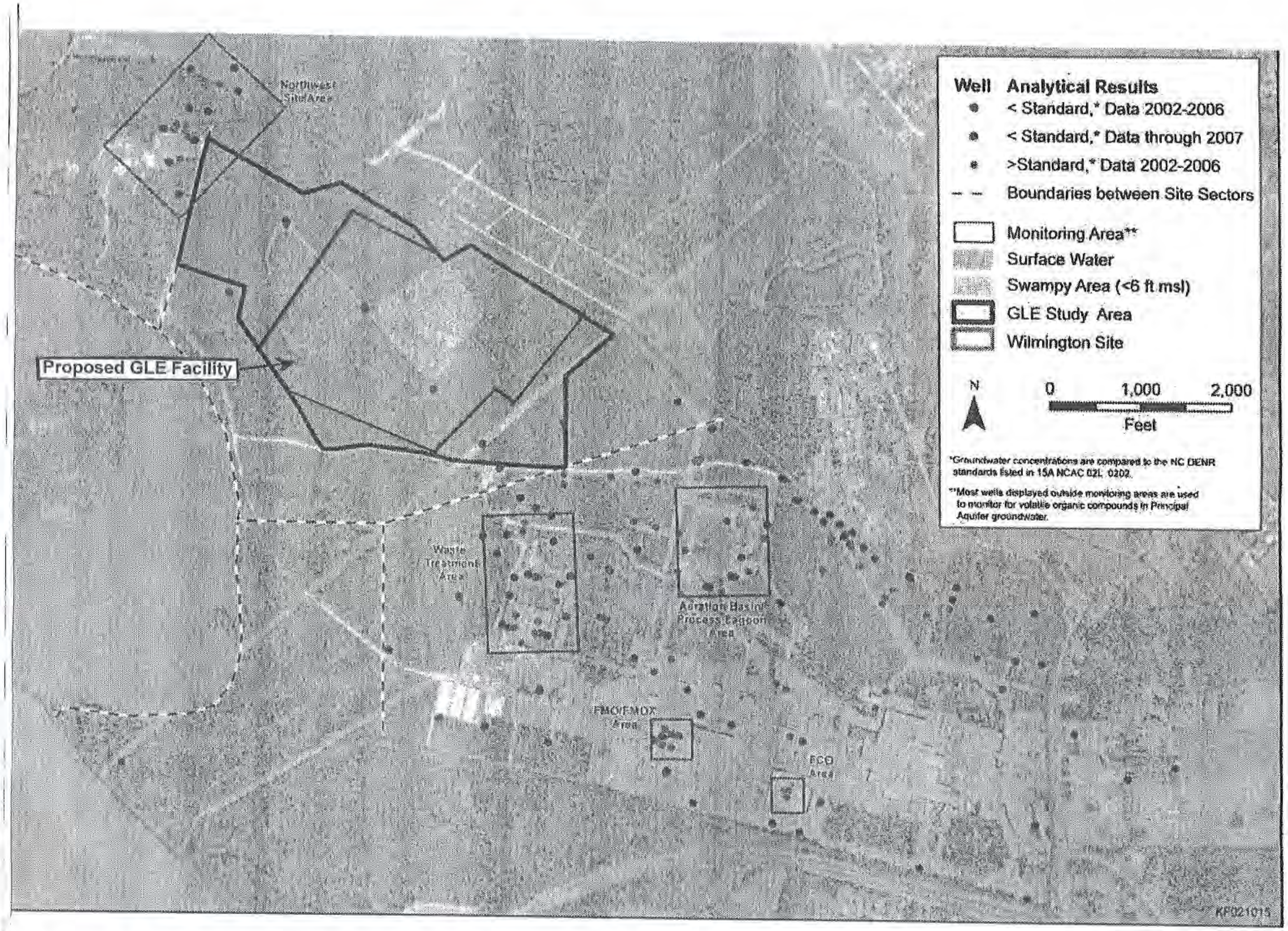


Figure 3-9 Groundwater Monitoring at the Wilmington Site (Modified from GLE, 2008)

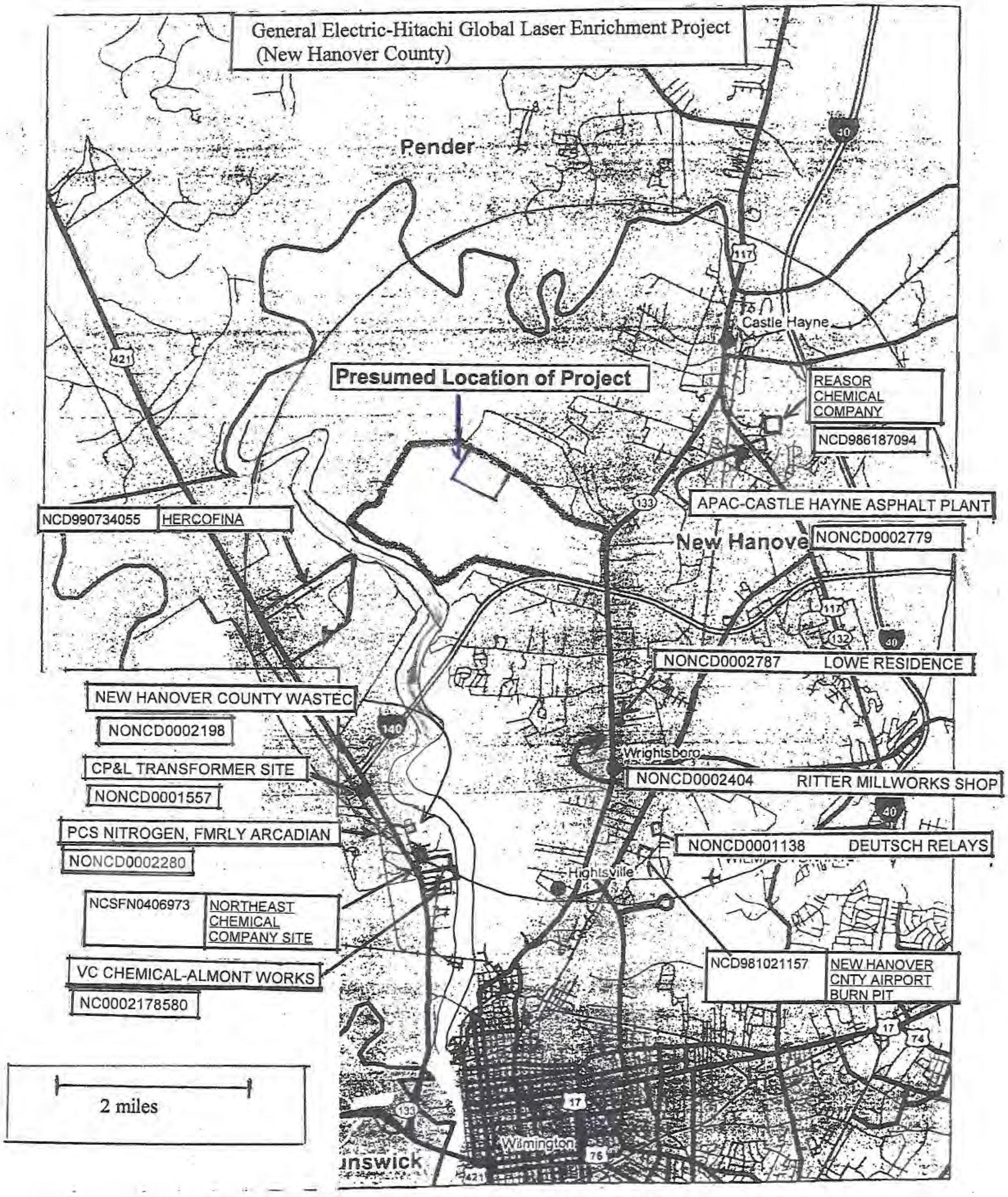
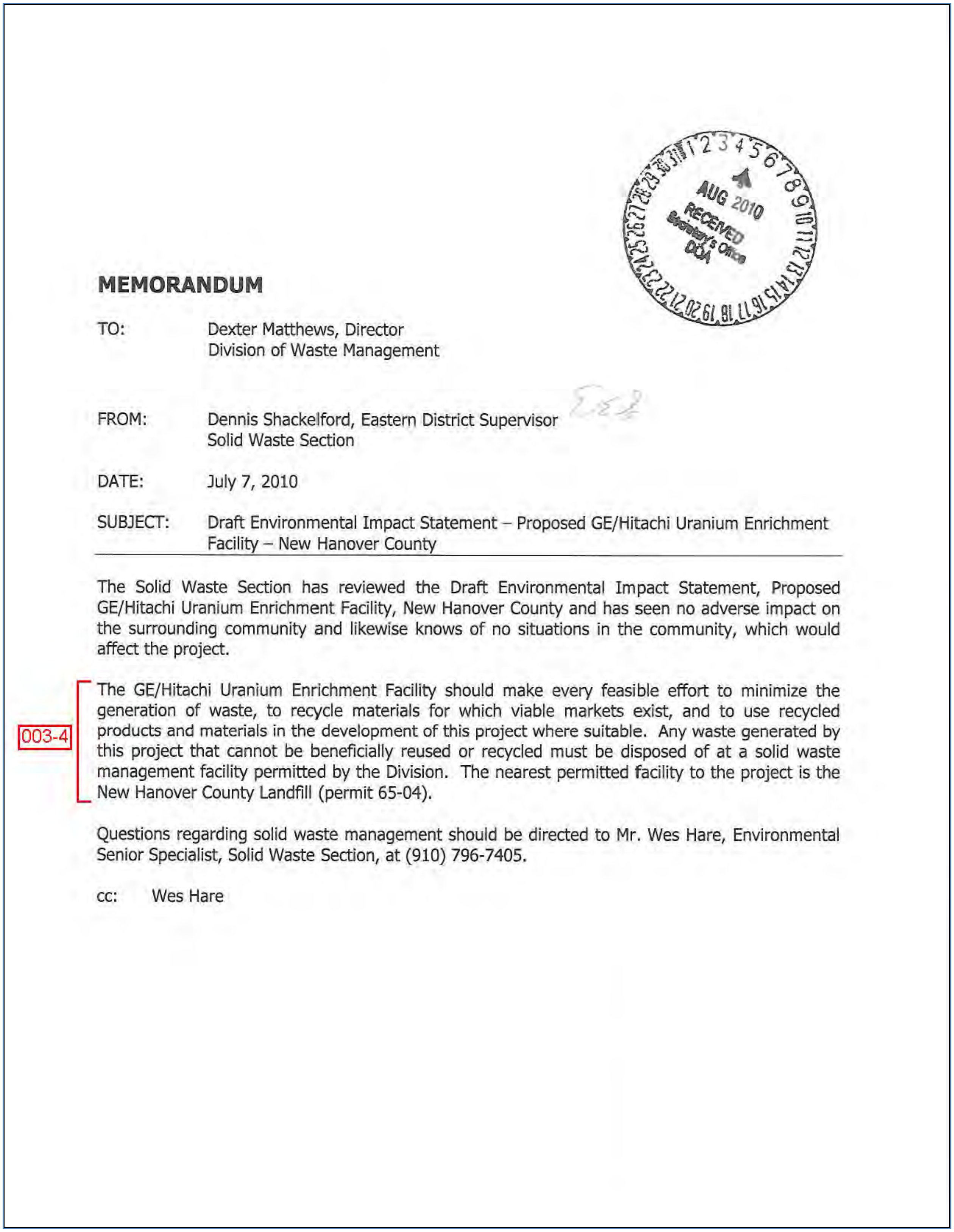


Figure ES-1. Wilmington Site location and vicinity.



AUG 2010
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Secretary's Office
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MEMORANDUM

TO: Dexter Matthews, Director
Division of Waste Management

FROM: Dennis Shackelford, Eastern District Supervisor
Solid Waste Section

DATE: July 7, 2010

SUBJECT: Draft Environmental Impact Statement – Proposed GE/Hitachi Uranium Enrichment Facility – New Hanover County

---

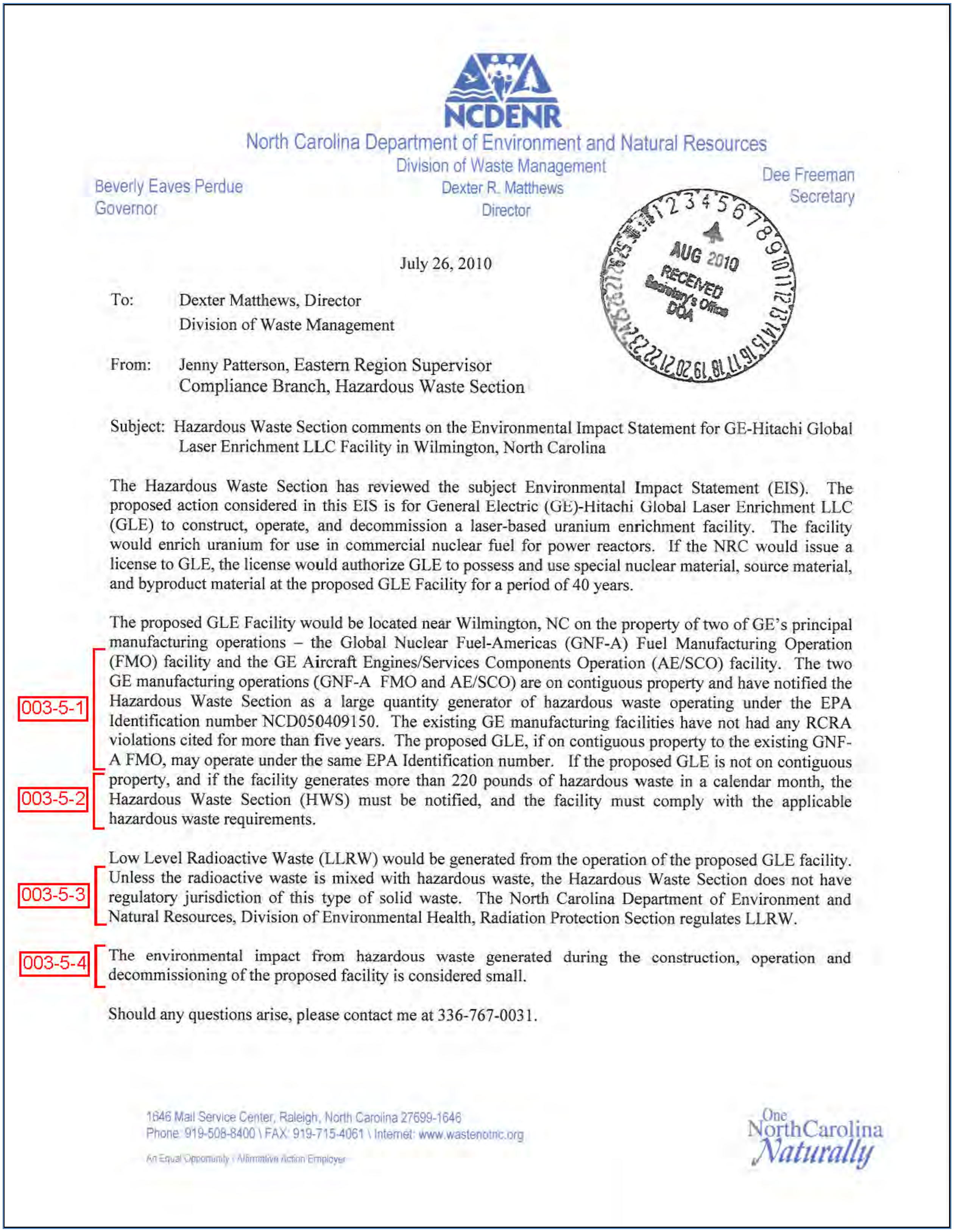
The Solid Waste Section has reviewed the Draft Environmental Impact Statement, Proposed GE/Hitachi Uranium Enrichment Facility, New Hanover County and has seen no adverse impact on the surrounding community and likewise knows of no situations in the community, which would affect the project.

003-4

The GE/Hitachi Uranium Enrichment Facility should make every feasible effort to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable. Any waste generated by this project that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility permitted by the Division. The nearest permitted facility to the project is the New Hanover County Landfill (permit 65-04).

Questions regarding solid waste management should be directed to Mr. Wes Hare, Environmental Senior Specialist, Solid Waste Section, at (910) 796-7405.

cc: Wes Hare



NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Dexter R. Matthews
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

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July 26, 2010

To: Dexter Matthews, Director
Division of Waste Management

From: Jenny Patterson, Eastern Region Supervisor
Compliance Branch, Hazardous Waste Section

Subject: Hazardous Waste Section comments on the Environmental Impact Statement for GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina

The Hazardous Waste Section has reviewed the subject Environmental Impact Statement (EIS). The proposed action considered in this EIS is for General Electric (GE)-Hitachi Global Laser Enrichment LLC (GLE) to construct, operate, and decommission a laser-based uranium enrichment facility. The facility would enrich uranium for use in commercial nuclear fuel for power reactors. If the NRC would issue a license to GLE, the license would authorize GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility for a period of 40 years.

003-5-1

The proposed GLE Facility would be located near Wilmington, NC on the property of two of GE's principal manufacturing operations – the Global Nuclear Fuel-Americas (GNF-A) Fuel Manufacturing Operation (FMO) facility and the GE Aircraft Engines/Services Components Operation (AE/SCO) facility. The two GE manufacturing operations (GNF-A FMO and AE/SCO) are on contiguous property and have notified the Hazardous Waste Section as a large quantity generator of hazardous waste operating under the EPA Identification number NCD050409150. The existing GE manufacturing facilities have not had any RCRA violations cited for more than five years. The proposed GLE, if on contiguous property to the existing GNF-A FMO, may operate under the same EPA Identification number.

003-5-2

If the proposed GLE is not on contiguous property, and if the facility generates more than 220 pounds of hazardous waste in a calendar month, the Hazardous Waste Section (HWS) must be notified, and the facility must comply with the applicable hazardous waste requirements.

003-5-3

Low Level Radioactive Waste (LLRW) would be generated from the operation of the proposed GLE facility. Unless the radioactive waste is mixed with hazardous waste, the Hazardous Waste Section does not have regulatory jurisdiction of this type of solid waste. The North Carolina Department of Environment and Natural Resources, Division of Environmental Health, Radiation Protection Section regulates LLRW.

003-5-4

The environmental impact from hazardous waste generated during the construction, operation and decommissioning of the proposed facility is considered small.

Should any questions arise, please contact me at 336-767-0031.

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-715-4061 \ Internet: www.wastenotnc.org
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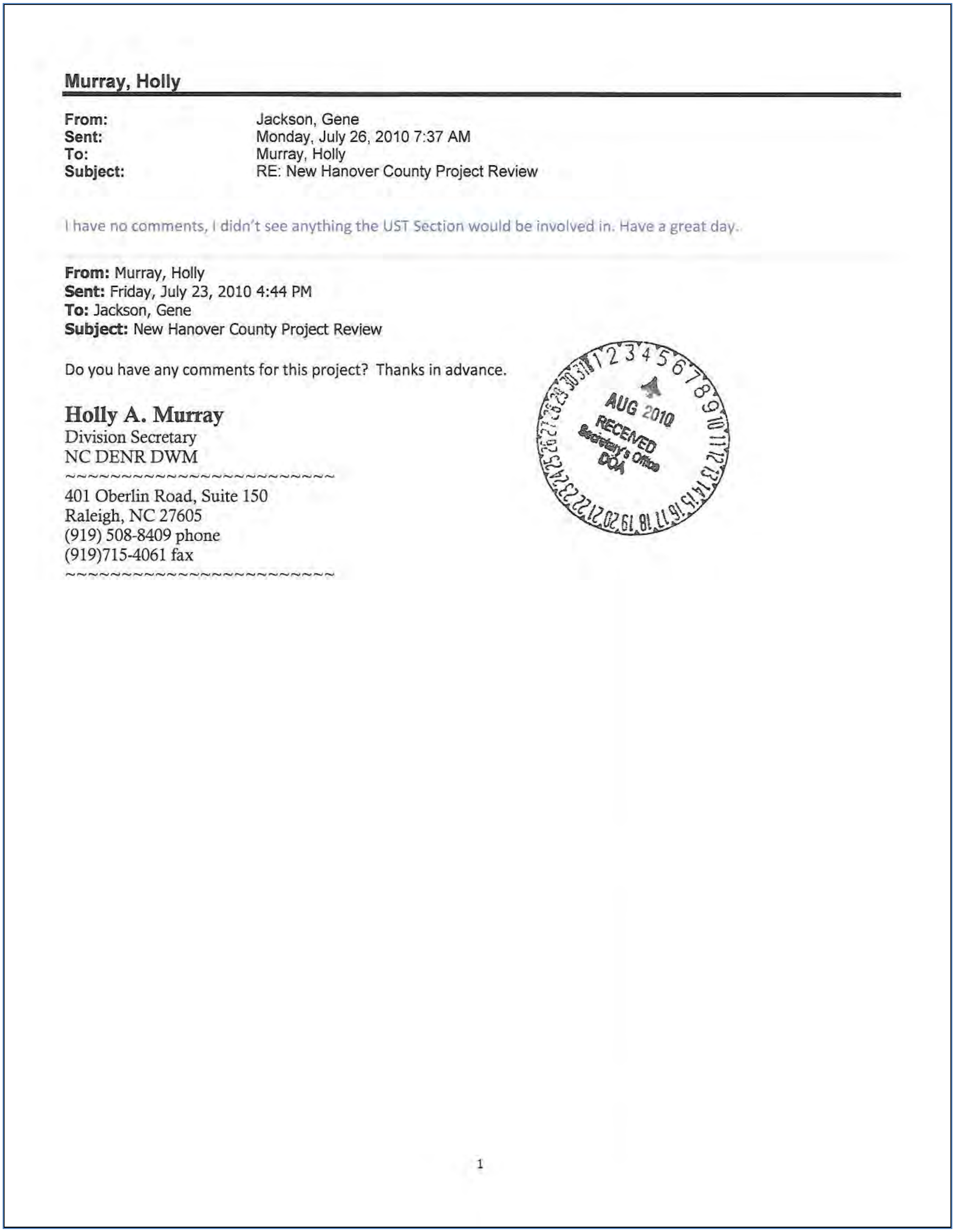

Murray, Holly

From: Jackson, Gene
Sent: Monday, July 26, 2010 7:37 AM
To: Murray, Holly
Subject: RE: New Hanover County Project Review

I have no comments, I didn't see anything the UST Section would be involved in. Have a great day.

From: Murray, Holly
Sent: Friday, July 23, 2010 4:44 PM
To: Jackson, Gene
Subject: New Hanover County Project Review

Do you have any comments for this project? Thanks in advance.

Holly A. Murray
Division Secretary
NC DENR DWM
~~~~~~~~~~~~~~~~~~~~~~~~~
401 Oberlin Road, Suite 150
Raleigh, NC 27605
(919) 508-8409 phone
(919)715-4061 fax
~~~~~~~~~~~~~~~~~~~~~~~~~

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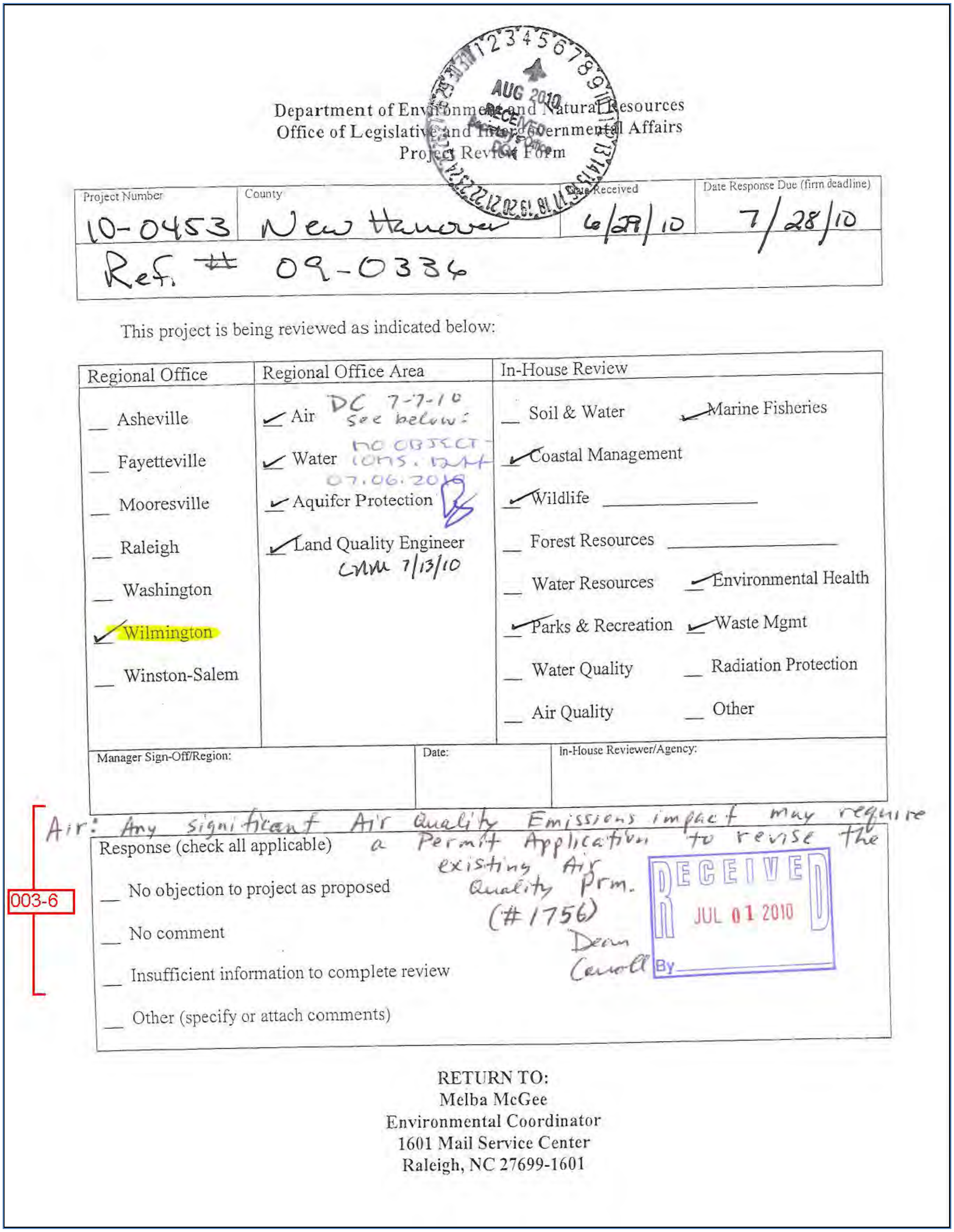

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Department of Environment and Natural Resources
Office of Legislative and Intergovernmental Affairs
Project Review Form

Project Number	County	Date Received	Date Response Due (firm deadline)
10-0453	New Hanover	6/29/10	7/28/10

Ref. # 09-0336

This project is being reviewed as indicated below:

Regional Office

- __ Asheville
- __ Fayetteville
- __ Mooresville
- __ Raleigh
- __ Washington
- ✓ Wilmington
- __ Winston-Salem

Regional Office Area

- ✓ Air DC 7-7-10 see below:
- ✓ Water NO OBJECT- IONS. DWH 07.06.2010
- ✓ Aquifer Protection
- ✓ Land Quality Engineer CMM 7/13/10

In-House Review

- __ Soil & Water
- ✓ Marine Fisheries
- ✓ Coastal Management
- ✓ Wildlife ____________
- __ Forest Resources ____________
- __ Water Resources
- ✓ Environmental Health
- ✓ Parks & Recreation
- ✓ Waste Mgmt
- __ Water Quality
- __ Radiation Protection
- __ Air Quality
- __ Other

Manager Sign-Off/Region:

Date:

In-House Reviewer/Agency:

003-6

Air: Any significant Air Quality Emissions impact may require a Permit Application to revise the existing Air Quality Prm. (#1756) Dean Carroll

Response (check all applicable)

- __ No objection to project as proposed
- __ No comment
- __ Insufficient information to complete review
- __ Other (specify or attach comments)

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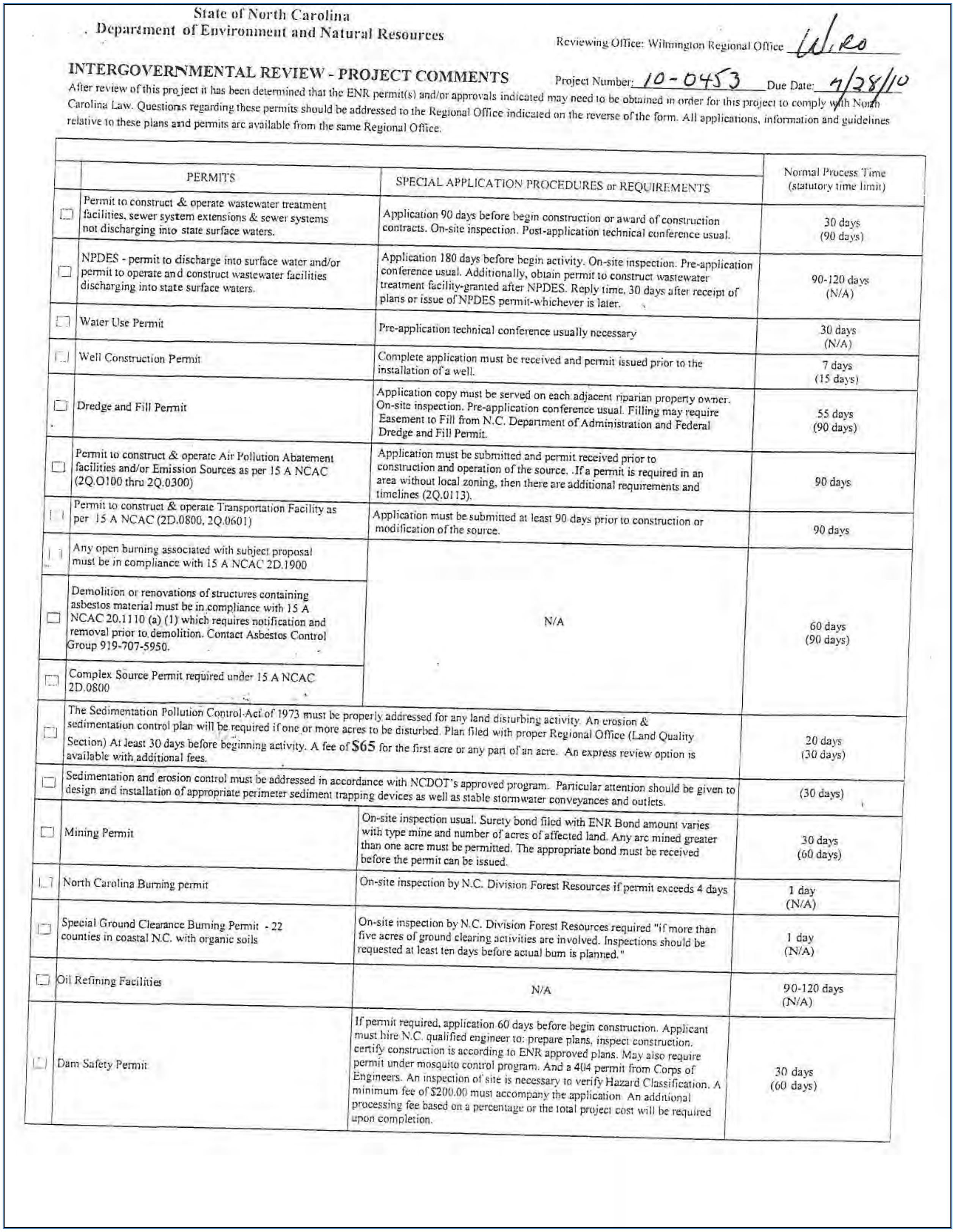
JUL 01 2010
By____________

RETURN TO:
Melba McGee
Environmental Coordinator
1601 Mail Service Center
Raleigh, NC 27699-1601



State of North Carolina
Department of Environment and Natural Resources

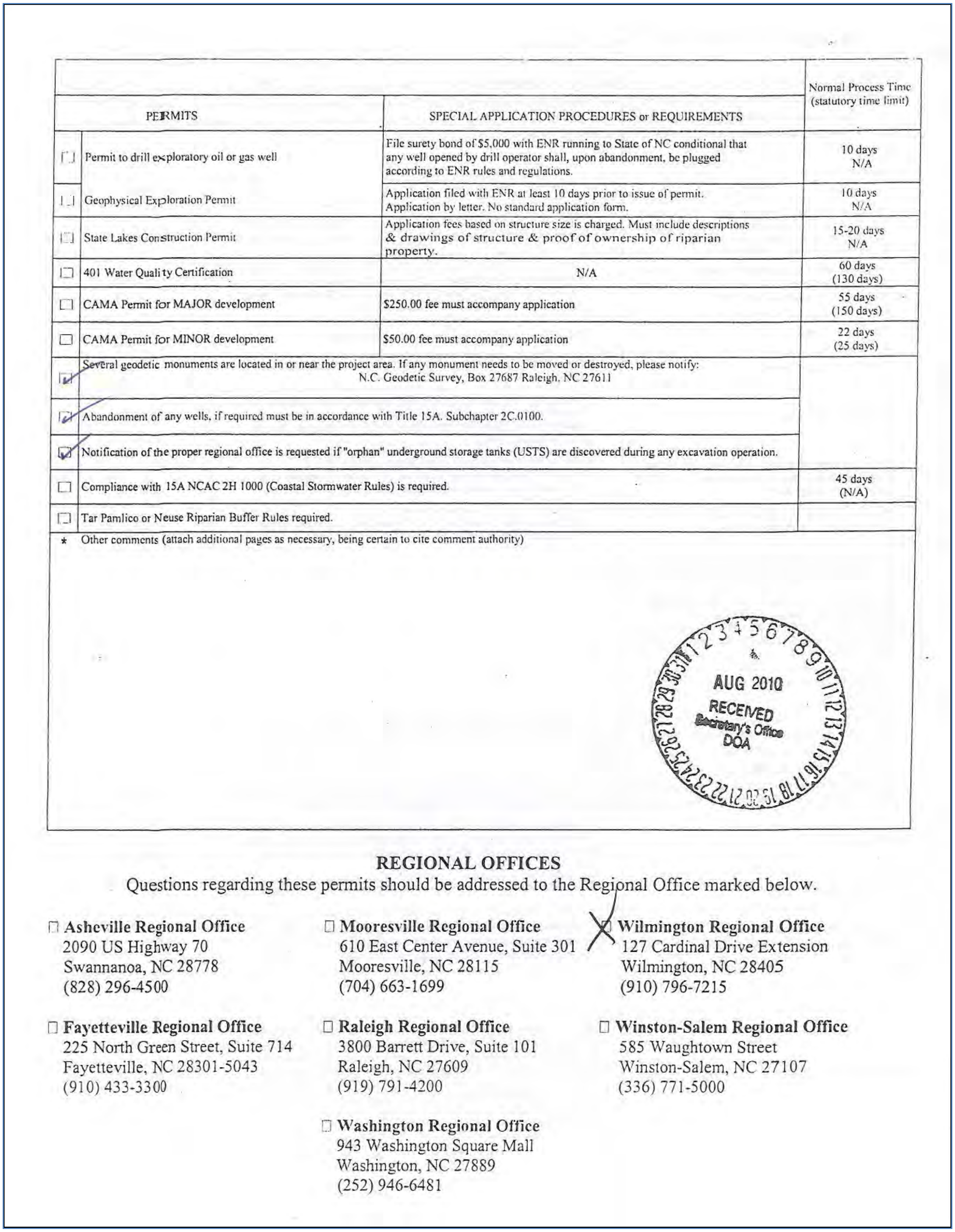
Reviewing Office: Wilmington Regional Office WiRO

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

Project Number: 10-0453 Due Date: 4/28/10

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☐	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
☐	Permit to construct & operate Transportation Facility as per 15 A NCAC (2D.0800, 2Q.0601)	Application must be submitted at least 90 days prior to construction or modification of the source.	90 days
☐	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
☐	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
☐	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) At least 30 days before beginning activity. A fee of $65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
☐	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.		(30 days)
☐	Mining Permit	On-site inspection usual. Surety bond filed with ENR Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion.	30 days (60 days)



	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days N/A
☐	401 Water Quality Certification	N/A	60 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	55 days (150 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☑	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, NC 27611		
☑	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☑	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☐	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
☐	Tar Pamlico or Neuse Riparian Buffer Rules required.		
*	Other comments (attach additional pages as necessary, being certain to cite comment authority)		

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 US Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ **Fayetteville Regional Office**
225 North Green Street, Suite 714
Fayetteville, NC 28301-5043
(910) 433-3300

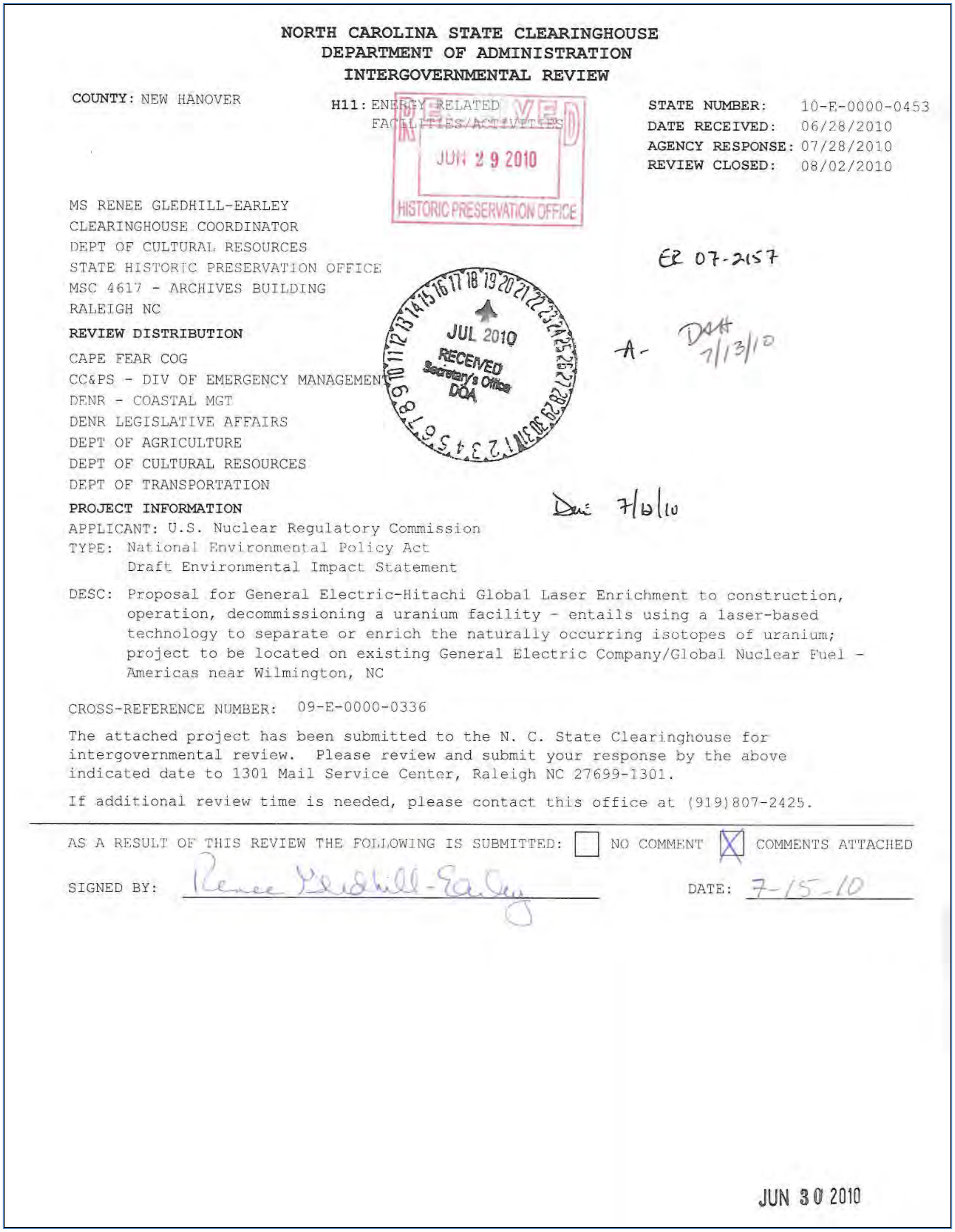
☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☐ **Raleigh Regional Office**
3800 Barrett Drive, Suite 101
Raleigh, NC 27609
(919) 791-4200

☐ **Washington Regional Office**
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

☒ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000



NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: NEW HANOVER

H11: ENERGY RELATED
FACILITIES/ACTIVITIES

RECEIVED
JUN 29 2010
HISTORIC PRESERVATION OFFICE

STATE NUMBER: 10-E-0000-0453
DATE RECEIVED: 06/28/2010
AGENCY RESPONSE: 07/28/2010
REVIEW CLOSED: 08/02/2010

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF CULTURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

ER 07-2157

JUL 2010
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A- DAH 7/13/10

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DENR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CULTURAL RESOURCES
DEPT OF TRANSPORTATION

Due: 7/6/10

PROJECT INFORMATION

APPLICANT: U.S. Nuclear Regulatory Commission

TYPE: National Environmental Policy Act
Draft Environmental Impact Statement

DESC: Proposal for General Electric-Hitachi Global Laser Enrichment to construction, operation, decommissioning a uranium facility - entails using a laser-based technology to separate or enrich the naturally occurring isotopes of uranium; project to be located on existing General Electric Company/Global Nuclear Fuel - Americas near Wilmington, NC

CROSS-REFERENCE NUMBER: 09-E-0000-0336

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

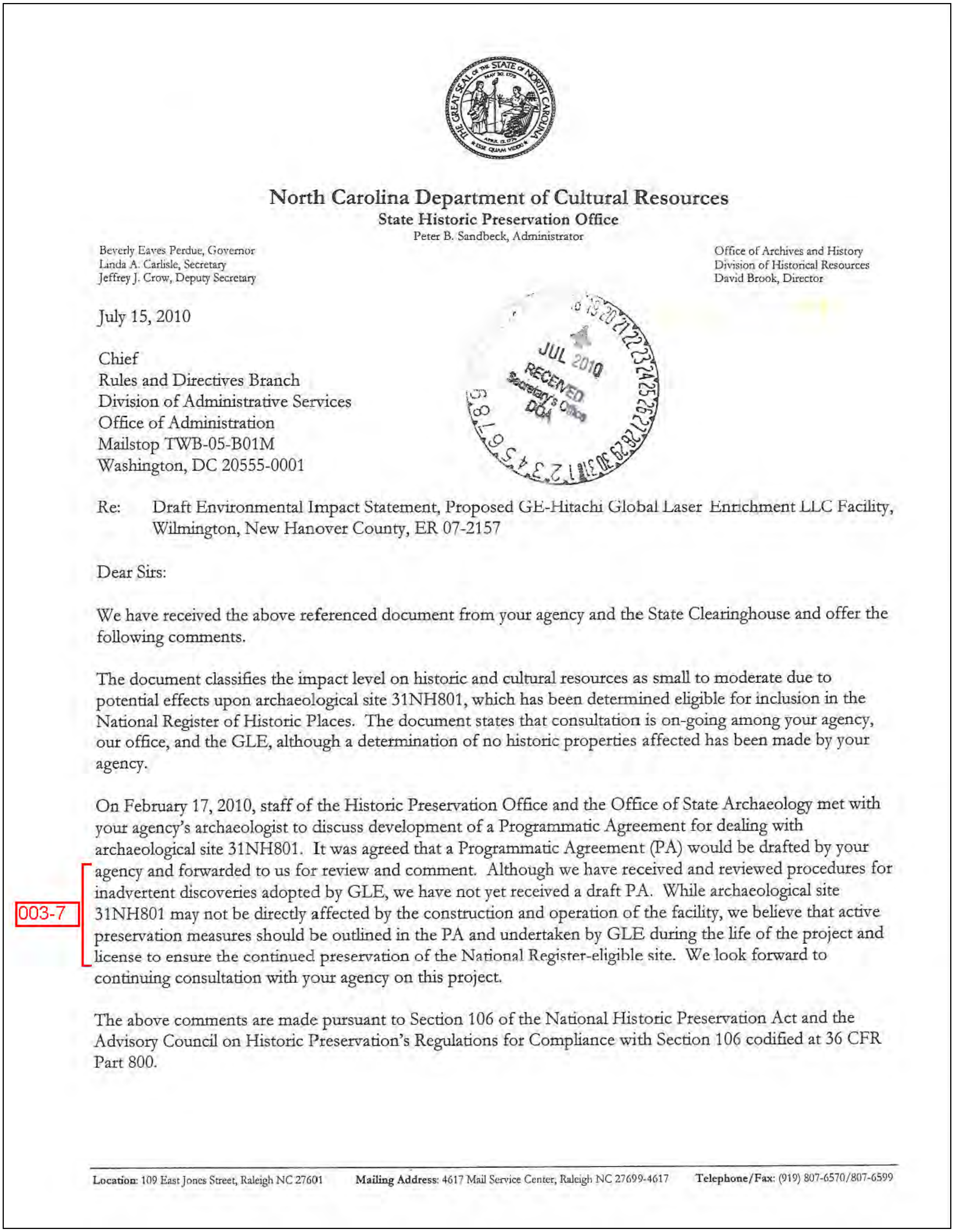
If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley

DATE: 7-15-10

JUN 30 2010



North Carolina Department of Cultural Resources
State Historic Preservation Office
Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 15, 2010

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Chief
Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop TWB-05-B01M
Washington, DC 20555-0001

Re: Draft Environmental Impact Statement, Proposed GE-Hitachi Global Laser Enrichment LLC Facility, Wilmington, New Hanover County, ER 07-2157

Dear Sirs:

We have received the above referenced document from your agency and the State Clearinghouse and offer the following comments.

The document classifies the impact level on historic and cultural resources as small to moderate due to potential effects upon archaeological site 31NH801, which has been determined eligible for inclusion in the National Register of Historic Places. The document states that consultation is on-going among your agency, our office, and the GLE, although a determination of no historic properties affected has been made by your agency.

003-7

On February 17, 2010, staff of the Historic Preservation Office and the Office of State Archaeology met with your agency's archaeologist to discuss development of a Programmatic Agreement for dealing with archaeological site 31NH801. It was agreed that a Programmatic Agreement (PA) would be drafted by your agency and forwarded to us for review and comment. Although we have received and reviewed procedures for inadvertent discoveries adopted by GLE, we have not yet received a draft PA. While archaeological site 31NH801 may not be directly affected by the construction and operation of the facility, we believe that active preservation measures should be outlined in the PA and undertaken by GLE during the life of the project and license to ensure the continued preservation of the National Register-eligible site. We look forward to continuing consultation with your agency on this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Location: 109 East Jones Street, Raleigh NC 27601 **Mailing Address:** 4617 Mail Service Center, Raleigh NC 27699-4617 **Telephone/Fax:** (919) 807-6570/807-6599

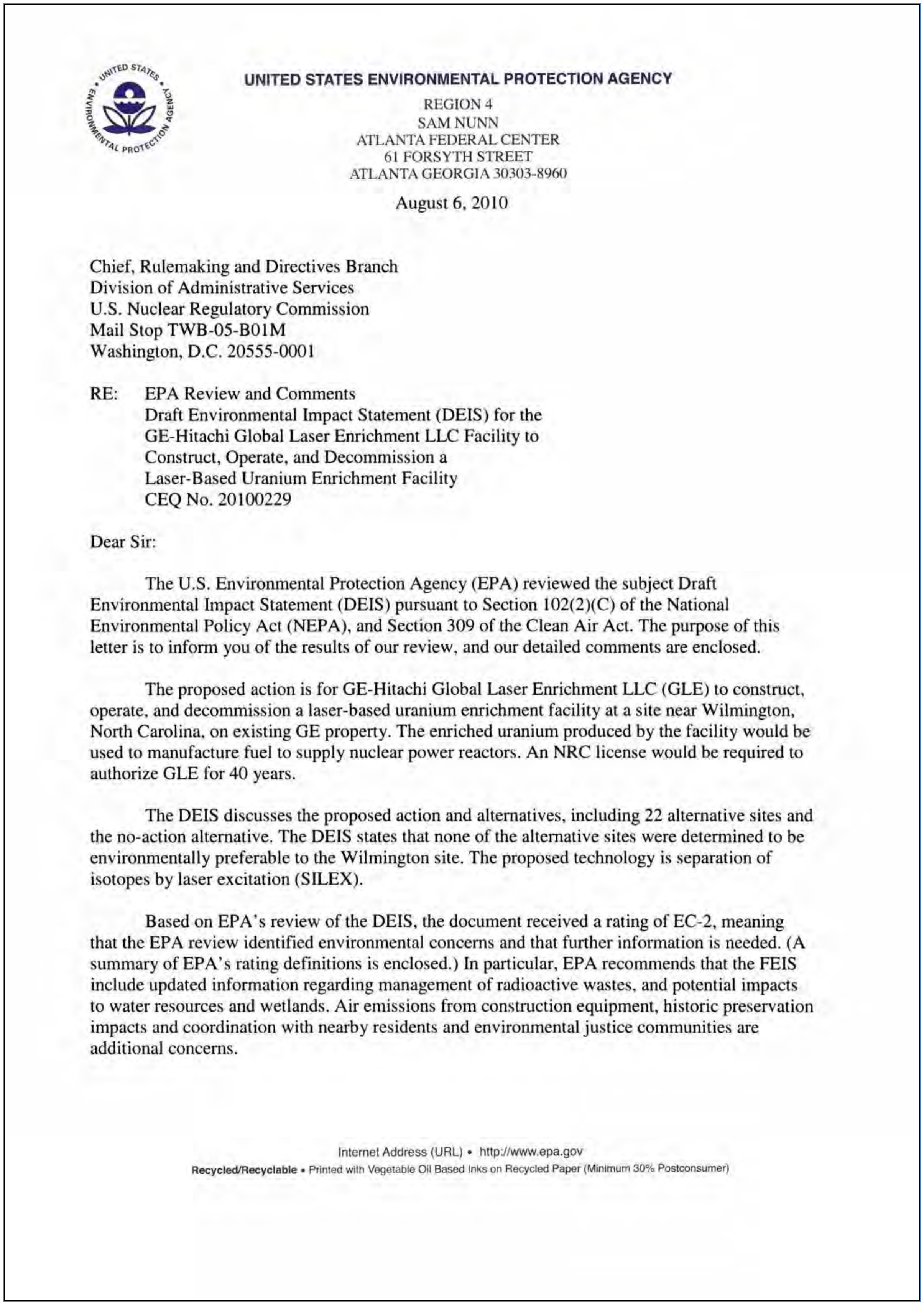
Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Peter Sandbeck

cc: State Clearinghouse
Advisory Council on Historic Preservation



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
SAM NUNN
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

August 6, 2010

Chief, Rulemaking and Directives Branch
Division of Administrative Services
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01M
Washington, D.C. 20555-0001

RE: EPA Review and Comments
Draft Environmental Impact Statement (DEIS) for the
GE-Hitachi Global Laser Enrichment LLC Facility to
Construct, Operate, and Decommission a
Laser-Based Uranium Enrichment Facility
CEQ No. 20100229

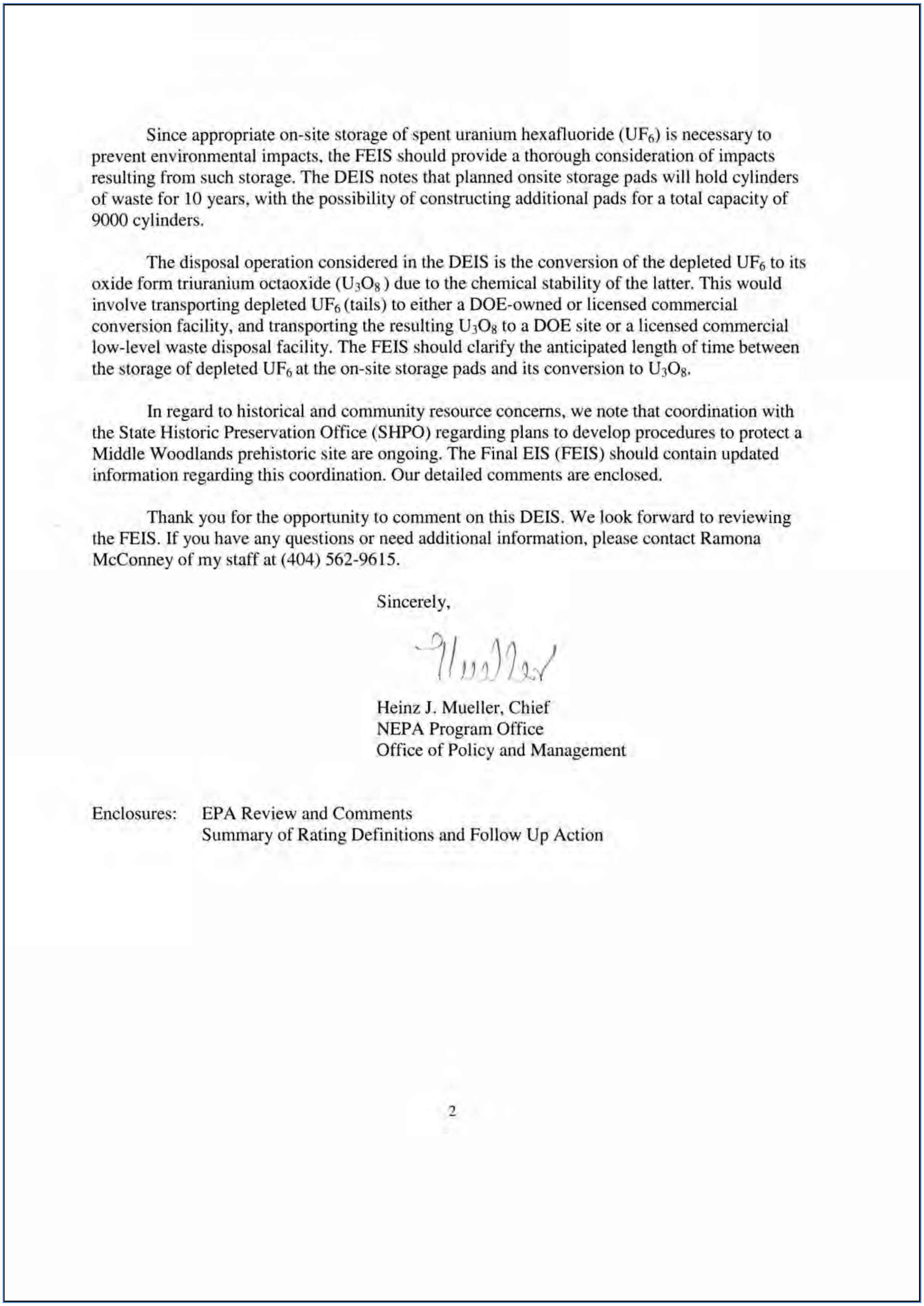
Dear Sir:

The U.S. Environmental Protection Agency (EPA) reviewed the subject Draft Environmental Impact Statement (DEIS) pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), and Section 309 of the Clean Air Act. The purpose of this letter is to inform you of the results of our review, and our detailed comments are enclosed.

The proposed action is for GE-Hitachi Global Laser Enrichment LLC (GLE) to construct, operate, and decommission a laser-based uranium enrichment facility at a site near Wilmington, North Carolina, on existing GE property. The enriched uranium produced by the facility would be used to manufacture fuel to supply nuclear power reactors. An NRC license would be required to authorize GLE for 40 years.

The DEIS discusses the proposed action and alternatives, including 22 alternative sites and the no-action alternative. The DEIS states that none of the alternative sites were determined to be environmentally preferable to the Wilmington site. The proposed technology is separation of isotopes by laser excitation (SILEX).

Based on EPA's review of the DEIS, the document received a rating of EC-2, meaning that the EPA review identified environmental concerns and that further information is needed. (A summary of EPA's rating definitions is enclosed.) In particular, EPA recommends that the FEIS include updated information regarding management of radioactive wastes, and potential impacts to water resources and wetlands. Air emissions from construction equipment, historic preservation impacts and coordination with nearby residents and environmental justice communities are additional concerns.



Since appropriate on-site storage of spent uranium hexafluoride (UF_6) is necessary to prevent environmental impacts, the FEIS should provide a thorough consideration of impacts resulting from such storage. The DEIS notes that planned onsite storage pads will hold cylinders of waste for 10 years, with the possibility of constructing additional pads for a total capacity of 9000 cylinders.

The disposal operation considered in the DEIS is the conversion of the depleted UF_6 to its oxide form triuranium octaoxide (U_3O_8) due to the chemical stability of the latter. This would involve transporting depleted UF_6 (tails) to either a DOE-owned or licensed commercial conversion facility, and transporting the resulting U_3O_8 to a DOE site or a licensed commercial low-level waste disposal facility. The FEIS should clarify the anticipated length of time between the storage of depleted UF_6 at the on-site storage pads and its conversion to U_3O_8.

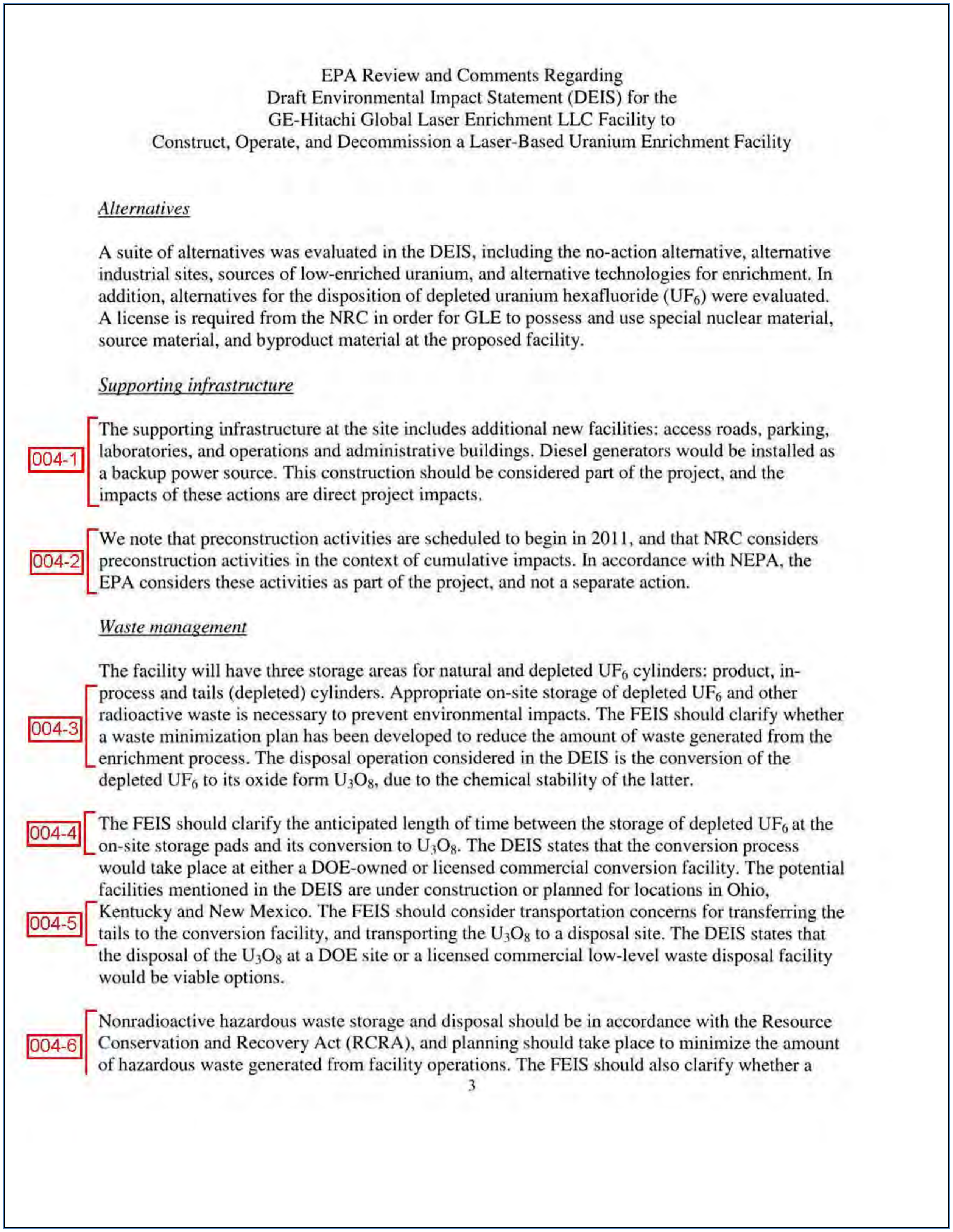
In regard to historical and community resource concerns, we note that coordination with the State Historic Preservation Office (SHPO) regarding plans to develop procedures to protect a Middle Woodlands prehistoric site are ongoing. The Final EIS (FEIS) should contain updated information regarding this coordination. Our detailed comments are enclosed.

Thank you for the opportunity to comment on this DEIS. We look forward to reviewing the FEIS. If you have any questions or need additional information, please contact Ramona McConney of my staff at (404) 562-9615.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosures: EPA Review and Comments
Summary of Rating Definitions and Follow Up Action



EPA Review and Comments Regarding
Draft Environmental Impact Statement (DEIS) for the
GE-Hitachi Global Laser Enrichment LLC Facility to
Construct, Operate, and Decommission a Laser-Based Uranium Enrichment Facility

Alternatives

A suite of alternatives was evaluated in the DEIS, including the no-action alternative, alternative industrial sites, sources of low-enriched uranium, and alternative technologies for enrichment. In addition, alternatives for the disposition of depleted uranium hexafluoride (UF_6) were evaluated. A license is required from the NRC in order for GLE to possess and use special nuclear material, source material, and byproduct material at the proposed facility.

Supporting infrastructure

004-1 The supporting infrastructure at the site includes additional new facilities: access roads, parking, laboratories, and operations and administrative buildings. Diesel generators would be installed as a backup power source. This construction should be considered part of the project, and the impacts of these actions are direct project impacts.

004-2 We note that preconstruction activities are scheduled to begin in 2011, and that NRC considers preconstruction activities in the context of cumulative impacts. In accordance with NEPA, the EPA considers these activities as part of the project, and not a separate action.

Waste management

The facility will have three storage areas for natural and depleted UF_6 cylinders: product, in-
004-3 process and tails (depleted) cylinders. Appropriate on-site storage of depleted UF_6 and other radioactive waste is necessary to prevent environmental impacts. The FEIS should clarify whether a waste minimization plan has been developed to reduce the amount of waste generated from the enrichment process. The disposal operation considered in the DEIS is the conversion of the depleted UF_6 to its oxide form U_3O_8, due to the chemical stability of the latter.

004-4 The FEIS should clarify the anticipated length of time between the storage of depleted UF_6 at the on-site storage pads and its conversion to U_3O_8. The DEIS states that the conversion process would take place at either a DOE-owned or licensed commercial conversion facility. The potential facilities mentioned in the DEIS are under construction or planned for locations in Ohio,
004-5 Kentucky and New Mexico. The FEIS should consider transportation concerns for transferring the tails to the conversion facility, and transporting the U_3O_8 to a disposal site. The DEIS states that the disposal of the U_3O_8 at a DOE site or a licensed commercial low-level waste disposal facility would be viable options.

004-6 Nonradioactive hazardous waste storage and disposal should be in accordance with the Resource Conservation and Recovery Act (RCRA), and planning should take place to minimize the amount of hazardous waste generated from facility operations. The FEIS should also clarify whether a

004-6 waste minimization plan has been developed to reduce the amount of hazardous waste, and to what extent recycling and reuse are feasible.

Air impacts

The DEIS states that the proposed facility would not use any continuous combustion activities during operation, and therefore criteria pollutant and hazardous air pollutant (HAP) emission rates are expected to be small. In addition, ozone precursor emissions are expected to be small.

Preconstruction and construction traffic, along with the operation of construction equipment are projected to cause an increase in particulate matter having a mean diameter of 10 micrometers or
004-7 less (PM_{10}), exceeding the air quality standard (page 4-108). Best management practices should be used to control dust and other particulates to the maximum extent feasible.

Greenhouse Gases (GHGs)

004-8 EPA recommends that the discussion of mitigation in the FEIS consider opportunities to reduce Greenhouse Gases (GHGs) and other air emissions during construction and operation of the facility. Specifically, energy efficiency should be a consideration in the construction and
004-9 operation of facility buildings, equipment, and vehicles. Equipment and vehicles that use conventional petroleum (e.g., diesel) should incorporate clean diesel technologies and fuels to reduced emissions of GHGs and other pollutants and should adhere to anti-idling policies to the extent possible. Alternate fuel vehicles (e.g., natural gas, electric) are also possibilities.

004-10 CEQ's Draft NEPA Guidance on Consideration of the Effects of Climate Change and GHGs is a helpful reference: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

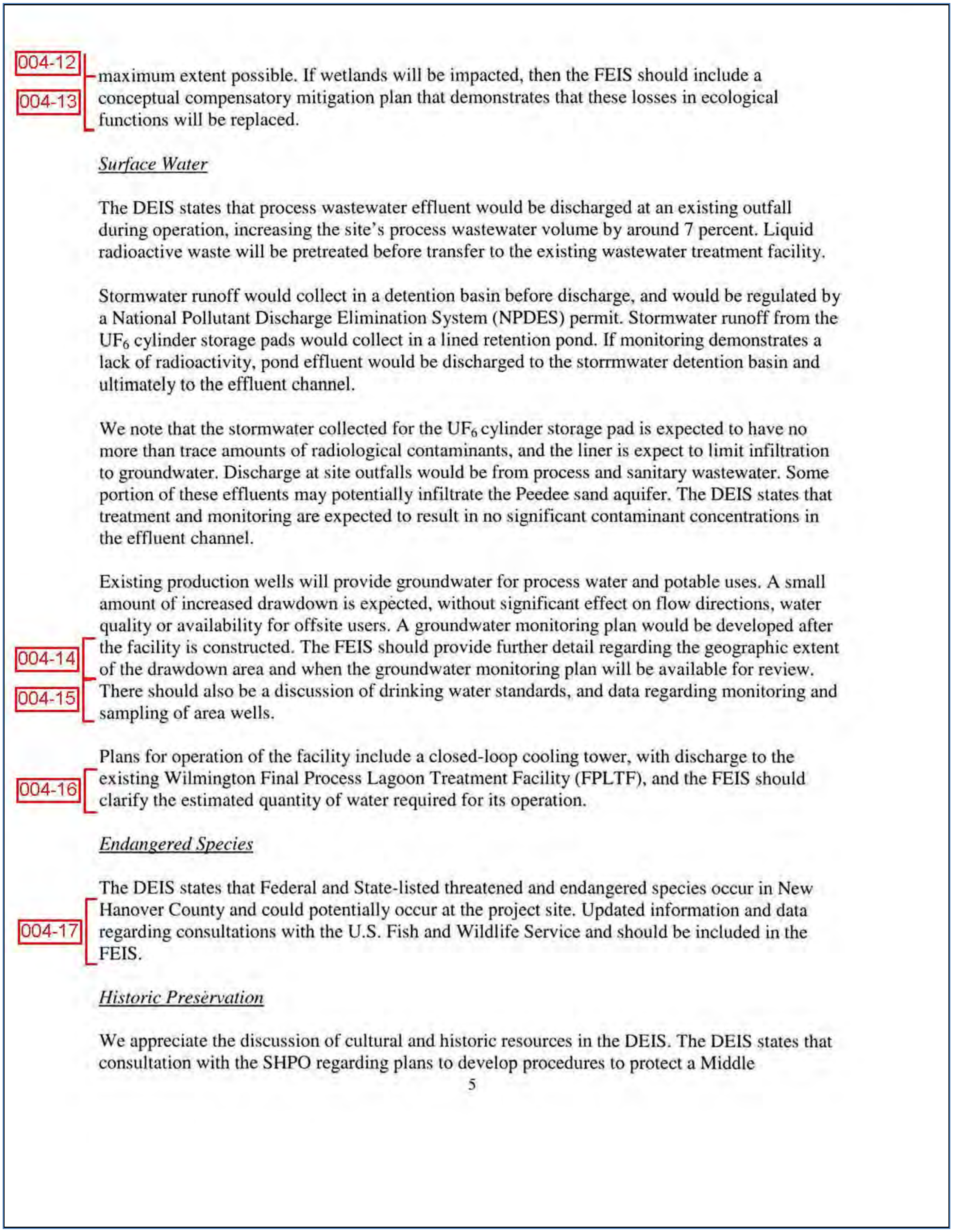
Estimated Risks

Potential accident scenarios were analyzed in the DEIS. The particular contaminants of concern from accidents are UF_6 liquids and vapors. GLE has committed to a number of measures to prevent contaminant releases resulting from a fire or other emergency. The DEIS evaluates accident risks to workers, the public, and the environment, and states that terrorism risk assessment is not included in the scope of this document.

Wetlands and Streams

004-11 Some jurisdictional and isolated wetlands occur within the corridor for the access roads, and may require a Section 404 permit or Isolated Wetland Permit for impacts. A more precise determination of the potential type and extent of impacts to wetlands is needed, and the DEIS states that analysis will occur as facility design plans are refined. The FEIS should include updated information, if available.

004-12 The FEIS should identify the least environmentally damaging practicable alternative (LEDPA) and demonstrate how this alternative has avoided wetlands and other water impacts to the



004-12 maximum extent possible. If wetlands will be impacted, then the FEIS should include a
004-13 conceptual compensatory mitigation plan that demonstrates that these losses in ecological functions will be replaced.

Surface Water

The DEIS states that process wastewater effluent would be discharged at an existing outfall during operation, increasing the site's process wastewater volume by around 7 percent. Liquid radioactive waste will be pretreated before transfer to the existing wastewater treatment facility.

Stormwater runoff would collect in a detention basin before discharge, and would be regulated by a National Pollutant Discharge Elimination System (NPDES) permit. Stormwater runoff from the UF_6 cylinder storage pads would collect in a lined retention pond. If monitoring demonstrates a lack of radioactivity, pond effluent would be discharged to the storrmwater detention basin and ultimately to the effluent channel.

We note that the stormwater collected for the UF_6 cylinder storage pad is expected to have no more than trace amounts of radiological contaminants, and the liner is expect to limit infiltration to groundwater. Discharge at site outfalls would be from process and sanitary wastewater. Some portion of these effluents may potentially infiltrate the Peedee sand aquifer. The DEIS states that treatment and monitoring are expected to result in no significant contaminant concentrations in the effluent channel.

Existing production wells will provide groundwater for process water and potable uses. A small amount of increased drawdown is expected, without significant effect on flow directions, water quality or availability for offsite users. A groundwater monitoring plan would be developed after
004-14 the facility is constructed. The FEIS should provide further detail regarding the geographic extent of the drawdown area and when the groundwater monitoring plan will be available for review.
004-15 There should also be a discussion of drinking water standards, and data regarding monitoring and sampling of area wells.

Plans for operation of the facility include a closed-loop cooling tower, with discharge to the
004-16 existing Wilmington Final Process Lagoon Treatment Facility (FPLTF), and the FEIS should clarify the estimated quantity of water required for its operation.

Endangered Species

The DEIS states that Federal and State-listed threatened and endangered species occur in New
004-17 Hanover County and could potentially occur at the project site. Updated information and data regarding consultations with the U.S. Fish and Wildlife Service and should be included in the FEIS.

Historic Preservation

We appreciate the discussion of cultural and historic resources in the DEIS. The DEIS states that consultation with the SHPO regarding plans to develop procedures to protect a Middle

004-18 Woodlands prehistoric site (31NH801) are ongoing, and the FEIS should include an update of these coordination activities.

Environmental Justice (EJ)

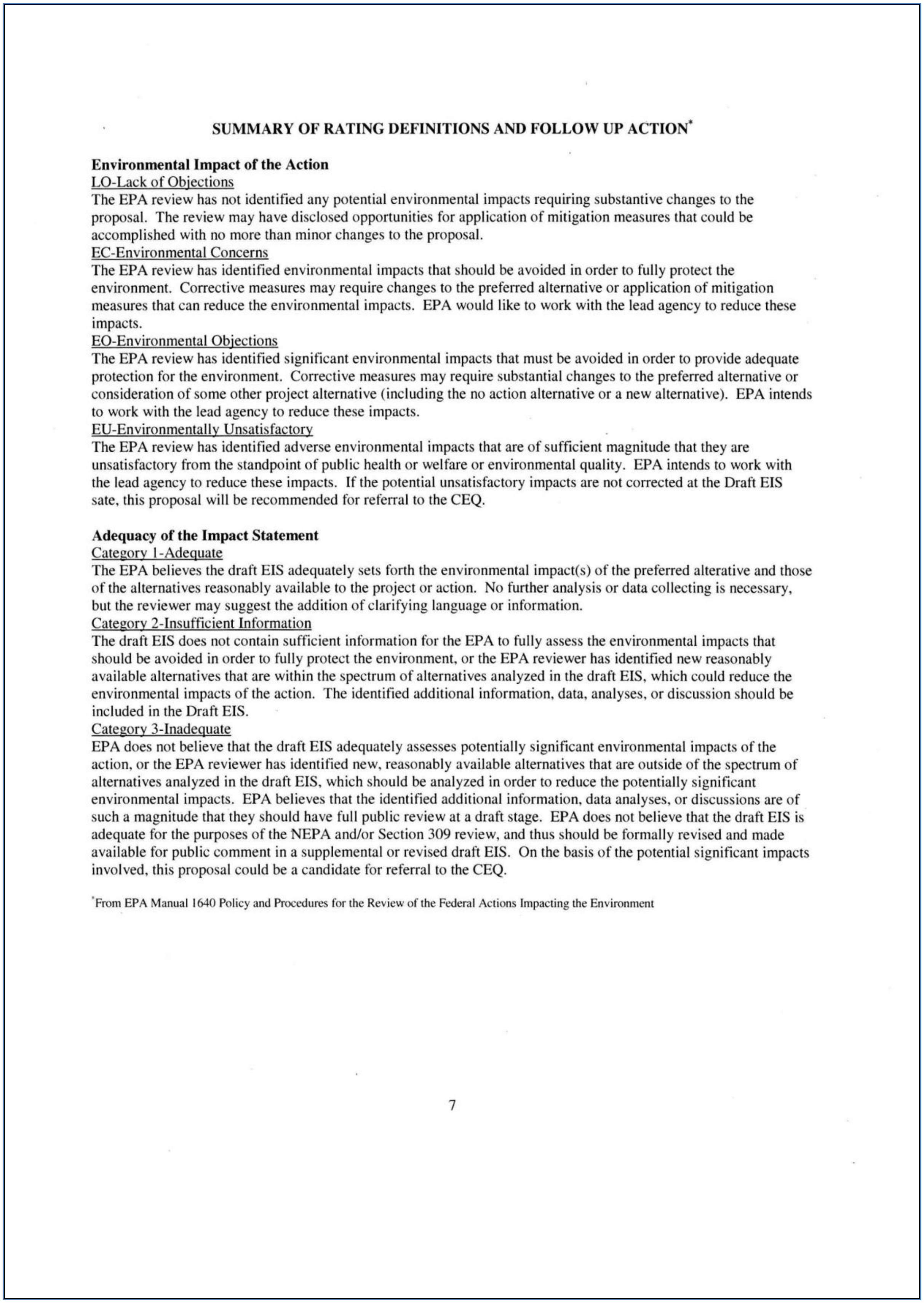
004-19 The DEIS states that impacts from the project to EJ communities would be small to moderate. The DEIS examined demographics using 2000 Census Data. Nearby local residents are vulnerable to noise, aesthetics, odors, fugitive dust or localized air pollutants and light. In addition, increased truck traffic and roadway congestion can affect residents and those living along nearby access roads. Potential mitigation measures to address some of the traffic related impacts should be considered.

The DEIS identified potential EJ communities within a 4-mile radius of the project site. Three Census block groups that contain minority populations are located within the vicinity of the proposed GLE site. Two block groups contain minority populations that exceed the county average by more than 20 percent and one Census block group also exceeds the State Average by more than 20 percent. In addition, two of these Census block groups also have minority populations that exceed 50 percent of the total population.

In one Census block group, the low-income population was more than 20 percentage points higher than both the State and county average. However, the Census block group within the immediate vicinity of the proposed GLE Facility contains a minority population comprising 18.3 percent of the total population, while the low-income population accounts for seven percent of the residents within the block group.

004-20 The EPA believes it is important to meaningfully engage the affected communities within the vicinity of the site throughout this project regarding issues that have the potential to impact them. Ongoing community engagement is especially important given that construction, operation and decommissioning of the facility may take place over a period of 40 years or more and could potentially result in adverse community impacts. The FEIS should clarify whether a community advisory group currently exists, whether complaints have been received from the community regarding the existing facility, and how those issues have been addressed.

004-21 The NRC and the applicant should make every effort to ensure that residents nearby have an opportunity to receive training and compete for jobs at the facility. In addition, efforts to work with and improve schools within the vicinity of the project site should also continue, to ensure that existing and future generations are being prepared to fill those jobs.



SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION[*]

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the Draft EIS sate, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1-Adequate

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alterative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the Draft EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

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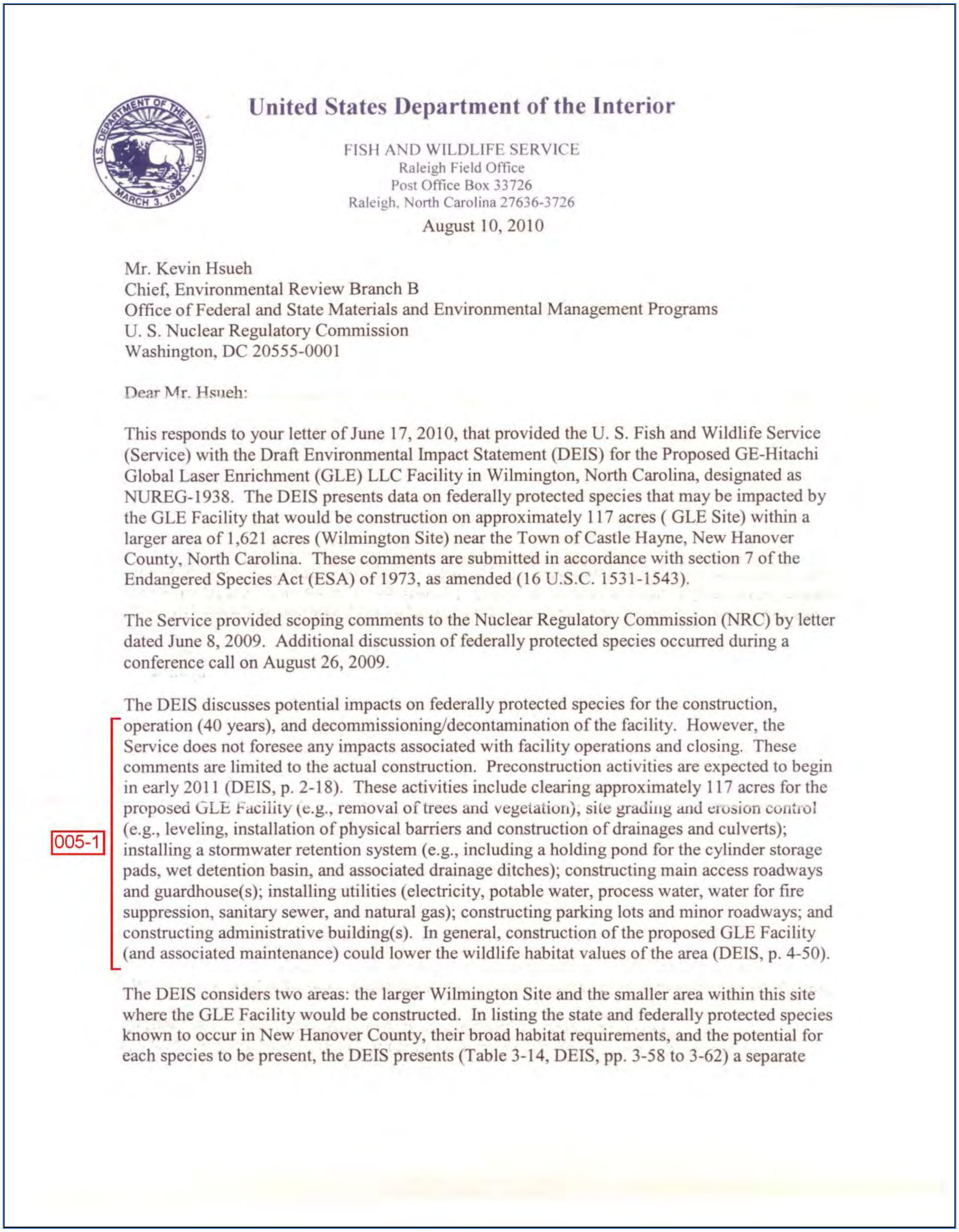
[*] From EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment



MARCH 3, 1849

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

August 10, 2010

Mr. Kevin Hsueh
Chief, Environmental Review Branch B
Office of Federal and State Materials and Environmental Management Programs
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Hsueh:

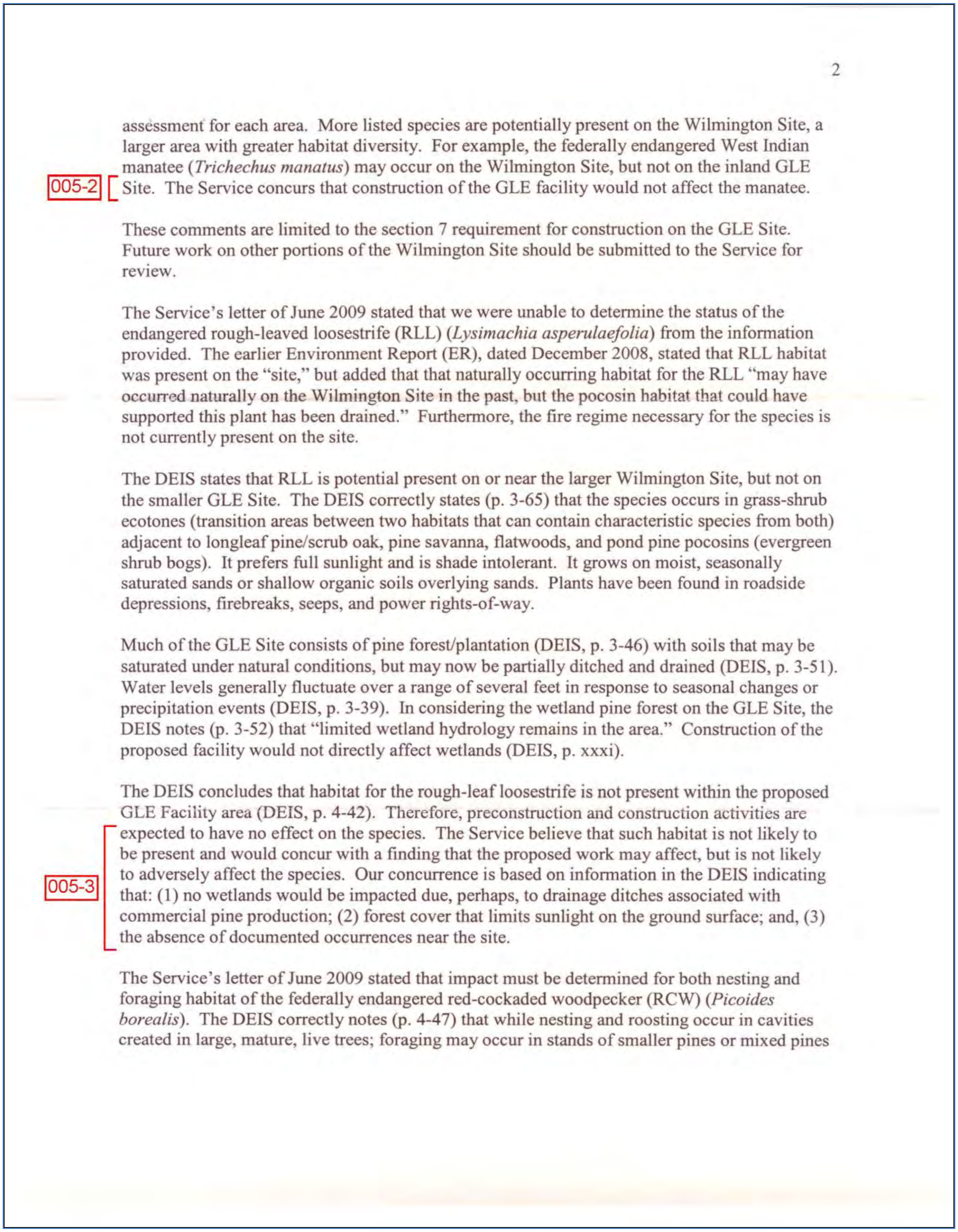
This responds to your letter of June 17, 2010, that provided the U. S. Fish and Wildlife Service (Service) with the Draft Environmental Impact Statement (DEIS) for the Proposed GE-Hitachi Global Laser Enrichment (GLE) LLC Facility in Wilmington, North Carolina, designated as NUREG-1938. The DEIS presents data on federally protected species that may be impacted by the GLE Facility that would be construction on approximately 117 acres (GLE Site) within a larger area of 1,621 acres (Wilmington Site) near the Town of Castle Hayne, New Hanover County, North Carolina. These comments are submitted in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

The Service provided scoping comments to the Nuclear Regulatory Commission (NRC) by letter dated June 8, 2009. Additional discussion of federally protected species occurred during a conference call on August 26, 2009.

005-1

The DEIS discusses potential impacts on federally protected species for the construction, operation (40 years), and decommissioning/decontamination of the facility. However, the Service does not foresee any impacts associated with facility operations and closing. These comments are limited to the actual construction. Preconstruction activities are expected to begin in early 2011 (DEIS, p. 2-18). These activities include clearing approximately 117 acres for the proposed GLE Facility (e.g., removal of trees and vegetation), site grading and erosion control (e.g., leveling, installation of physical barriers and construction of drainages and culverts); installing a stormwater retention system (e.g., including a holding pond for the cylinder storage pads, wet detention basin, and associated drainage ditches); constructing main access roadways and guardhouse(s); installing utilities (electricity, potable water, process water, water for fire suppression, sanitary sewer, and natural gas); constructing parking lots and minor roadways; and constructing administrative building(s). In general, construction of the proposed GLE Facility (and associated maintenance) could lower the wildlife habitat values of the area (DEIS, p. 4-50).

The DEIS considers two areas: the larger Wilmington Site and the smaller area within this site where the GLE Facility would be constructed. In listing the state and federally protected species known to occur in New Hanover County, their broad habitat requirements, and the potential for each species to be present, the DEIS presents (Table 3-14, DEIS, pp. 3-58 to 3-62) a separate



assessment for each area. More listed species are potentially present on the Wilmington Site, a larger area with greater habitat diversity. For example, the federally endangered West Indian manatee (*Trichechus manatus*) may occur on the Wilmington Site, but not on the inland GLE Site. 005-2 The Service concurs that construction of the GLE facility would not affect the manatee.

These comments are limited to the section 7 requirement for construction on the GLE Site. Future work on other portions of the Wilmington Site should be submitted to the Service for review.

The Service's letter of June 2009 stated that we were unable to determine the status of the endangered rough-leaved loosestrife (RLL) (*Lysimachia asperulaefolia*) from the information provided. The earlier Environment Report (ER), dated December 2008, stated that RLL habitat was present on the "site," but added that that naturally occurring habitat for the RLL "may have occurred naturally on the Wilmington Site in the past, but the pocosin habitat that could have supported this plant has been drained." Furthermore, the fire regime necessary for the species is not currently present on the site.

The DEIS states that RLL is potential present on or near the larger Wilmington Site, but not on the smaller GLE Site. The DEIS correctly states (p. 3-65) that the species occurs in grass-shrub ecotones (transition areas between two habitats that can contain characteristic species from both) adjacent to longleaf pine/scrub oak, pine savanna, flatwoods, and pond pine pocosins (evergreen shrub bogs). It prefers full sunlight and is shade intolerant. It grows on moist, seasonally saturated sands or shallow organic soils overlying sands. Plants have been found in roadside depressions, firebreaks, seeps, and power rights-of-way.

Much of the GLE Site consists of pine forest/plantation (DEIS, p. 3-46) with soils that may be saturated under natural conditions, but may now be partially ditched and drained (DEIS, p. 3-51). Water levels generally fluctuate over a range of several feet in response to seasonal changes or precipitation events (DEIS, p. 3-39). In considering the wetland pine forest on the GLE Site, the DEIS notes (p. 3-52) that "limited wetland hydrology remains in the area." Construction of the proposed facility would not directly affect wetlands (DEIS, p. xxxi).

The DEIS concludes that habitat for the rough-leaf loosestrife is not present within the proposed GLE Facility area (DEIS, p. 4-42). Therefore, preconstruction and construction activities are 005-3 expected to have no effect on the species. The Service believe that such habitat is not likely to be present and would concur with a finding that the proposed work may affect, but is not likely to adversely affect the species. Our concurrence is based on information in the DEIS indicating that: (1) no wetlands would be impacted due, perhaps, to drainage ditches associated with commercial pine production; (2) forest cover that limits sunlight on the ground surface; and, (3) the absence of documented occurrences near the site.

The Service's letter of June 2009 stated that impact must be determined for both nesting and foraging habitat of the federally endangered red-cockaded woodpecker (RCW) (*Picoides borealis*). The DEIS correctly notes (p. 4-47) that while nesting and roosting occur in cavities created in large, mature, live trees; foraging may occur in stands of smaller pines or mixed pines and hardwoods that are over 30 years old. In southeastern North Carolina, RCWs may forage in pines as smaller as six inches diameter breast height (dbh).

Based on field surveys conducted for the 2008 ER, the DEIS reiterates (p. 4-47) that no RCW cavity trees were observed on the Wilmington Site. More specifically, no cavity trees or trees more than 30 years old were observed in the proposed GLE Site. The Service would concur that current forest conditions on the GLE Site are not suitable for RCW nesting.

005-4

While the GLE Site does not have cavity trees, a separate analysis is necessary to determine whether the area serves as foraging habitat for active RCW clusters outside the Wilmington Site. The RCW exists in northern New Hanover County (DEIS, p. 4-47). An active RCW cluster occurs approximately five miles northeast of the Wilmington Site (DEIS, p. 4-47). It is located just north of the Northeast Cape Fear River along NC 117 in Pender County (GLE, 2008). There are several occurrence records for the RCW within two miles of the western border of the Wilmington Site. The Sledge Forest, a property containing over 4,000 acres of high-quality forests directly adjacent to, and north of, the Wilmington Site, does contain loblolly (*Pinus taeda*) and longleaf (*P. palustris*) pine trees that are over 300 years old. This area would be suitable as nesting and roosting habitat for the RCW.

Some forested habitats on the Wilmington Site meet the minimum area requirements needed for foraging habitat (DEIS, p. 4-47). However, the lack of mature forests would limit the value of the Wilmington Site as foraging habitat. The DEIS states (p. 4-47) that RCWs nesting and foraging in the Sledge Forest could occasionally forage within the western forested portion of the Wilmington Site, outside the GLE Facility Site, where Figure 3-12 (p. 3-49) shows a small area has trees that are greater than 40 years old.

Within the GLE Facility Site the Service recognizes that the younger pines are just approaching a size where RCW foraging would be possible and have probably not been foraging habitat in the recent past. Most of the area within the proposed GLE Facility Site has been logged within the last 20 years or less (GLE, 2008). Figure 3-12 (p. 3-49) indicates that most trees within the GLE Site are less than 20 years old and the rest are 20-29 years old. Trees within the GLE Facility Site were thinned in 2009. The DEIS concludes (p. 4-47) that "it is not expected that habitat suitable for the red-cockaded woodpecker would be impacted by preconstruction and construction activities for the proposed GLE Facility; therefore, these activities would have no effect on the species."

In evaluating the project impact on the RCW, the Service has considered the current ecological monitoring program for the Wilmington Site (DEIS, p. 6-10) that consists of a forestry management plan to improve natural habitats on the Wilmington Site. This program would also provide appropriate monitoring and habitat management for the proposed GLE Facility. Monitoring would include ecological surveys to identify potential issues and habitat areas that need improvement.

Part of the program includes mitigation for the loss of mature trees (DEIS, p. 6-10) as determined by GLE surveys for trees greater than 24 inches in diameter in areas that would be affected by preconstruction activities and construction of the proposed GLE Facility. These surveys would determine compensatory requirements for tree plantings that would be performed elsewhere on the Wilmington Site. The DEIS proposes (p. 4-56) to mitigate the loss of each large tree by planting of one 24-inch diameter tree, two 12-inch diameter trees, or three 8-inch diameter trees elsewhere on the Wilmington Site.

005-5

For the benefit of RCWs that may inhabit adjacent areas, the Service recommends an alternative tree mitigation program. Planting, or transplanting, large trees would be difficult, expensive, and long-term survival is likely to be low. A mature tree should not be defined as one with a dbh of 24 inches or greater. In an area composed primarily of trees less than 30 years old, such trees may not be present. The Service proposes that compensation should be provided for pines with a dbh of ten inches or more. Mitigation for the loss of these pines would consist of planting longleaf pine seedlings in appropriate habitat. We recommend that one longleaf pine seedling be planted for every two inches of dbh lost. For example, five seedlings would be planted for the loss of a 10-inch dbh pine. The dhb of pines lost would be rounded up to the nearest two inches. For example, a pine with a dbh of 10.5 inches would be rounded up to 12 inches and require the planting of six longleaf seedlings. Professional foresters could designate the appropriate spacing of the seedling and suitable habitat. This mitigation would be limited to the amount of suitable habitat. Trees planted as mitigation should have long-term protection. Longleaf pines seedlings could be planted as landscaping around buildings and parking lots. Once all suitable habitats that could be protected have been planted, additional mitigation would not be required. Such mitigation areas should be areas identified in the forest management plan as excluded from all future development.

005-6

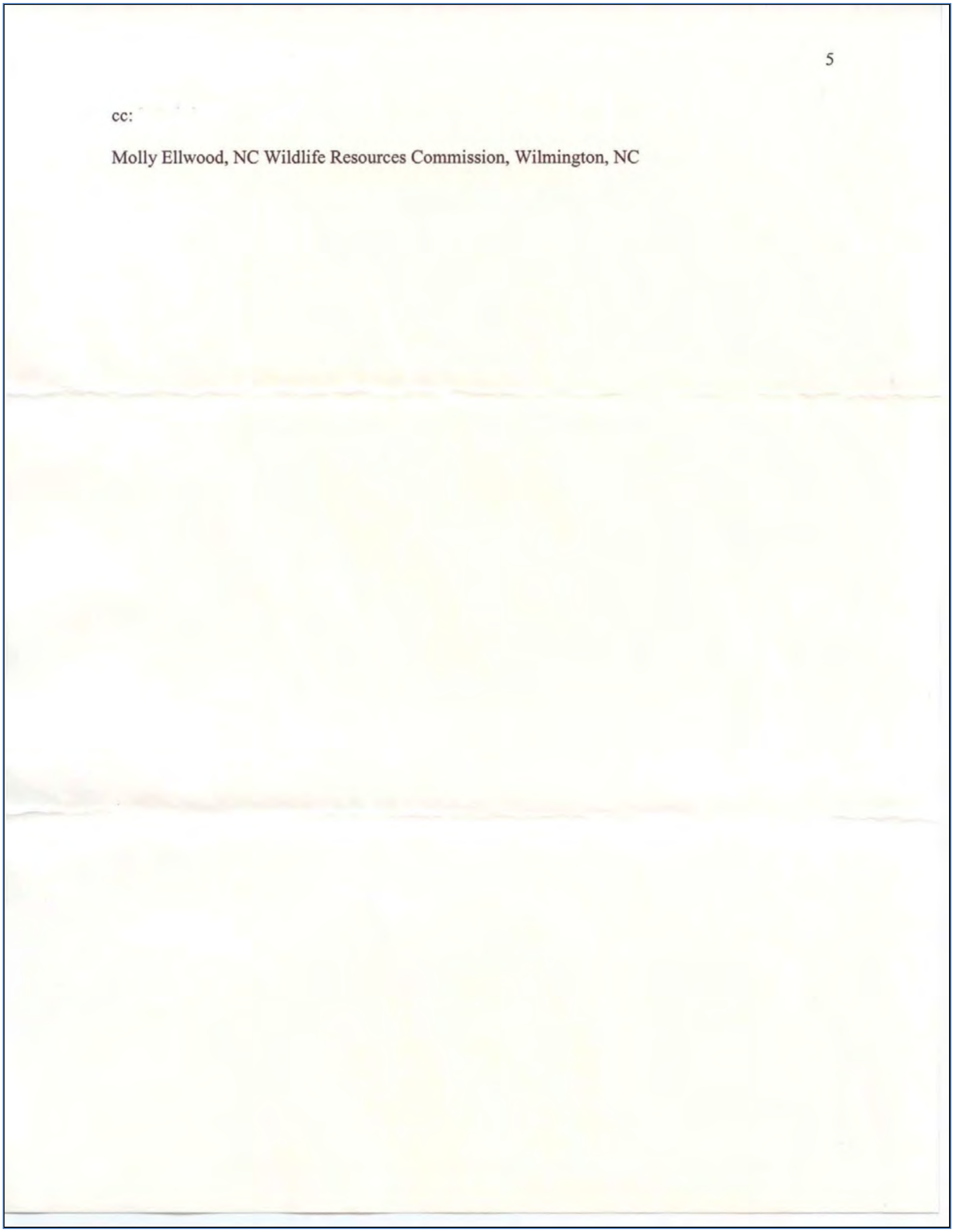
Your letter states that the NRC staff has made a "preliminary conclusion" that the construction, operation and decommissioning of the proposed GLE facility is expected to have no effect on federally protected species. It is the opinion of the Service, based on the information provided, the proposed tree mitigation program (which should focus on longleaf pine restoration), and other information available, that the work may affect, but is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for your project. Please remember that obligations of the NRC under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

The Service appreciates the opportunity to provide these comments on the DEIS. If you have questions regarding these comments, please contact Howard Hall at 919-856-4520, ext. 27 or by e-mail at < howard_hall@fws.gov >.

Sincerely,

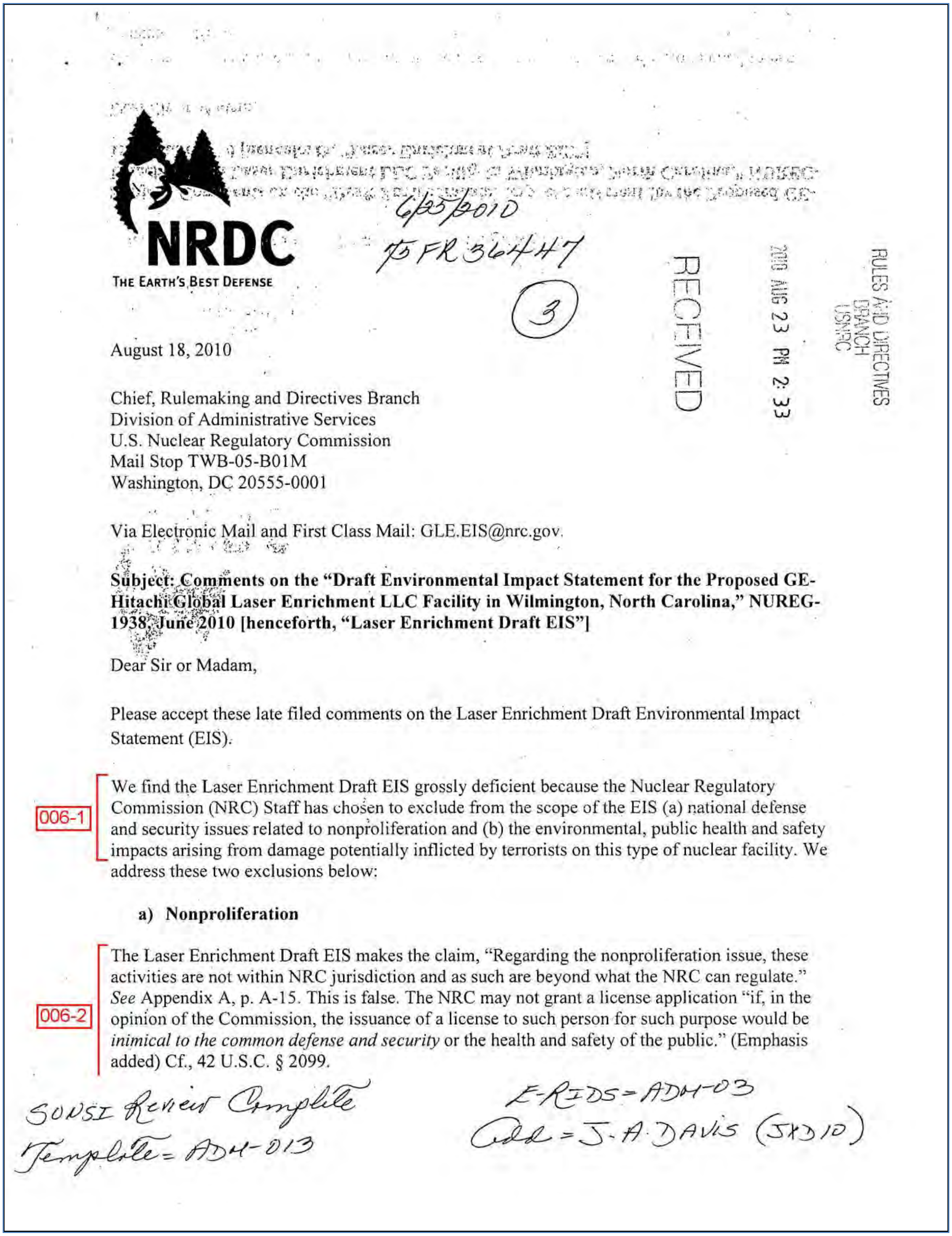
Howard F. Hall

for Pete Benjamin
Field Supervisor



cc:

Molly Ellwood, NC Wildlife Resources Commission, Wilmington, NC



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Chief, Rulemaking and Directives Branch
Division of Administrative Services
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01M
Washington, DC 20555-0001

Via Electronic Mail and First Class Mail: GLE.EIS@nrc.gov

Subject: Comments on the "Draft Environmental Impact Statement for the Proposed GE-Hitachi Global Laser Enrichment LLC Facility in Wilmington, North Carolina," NUREG-1938, June 2010 [henceforth, "Laser Enrichment Draft EIS"]

Dear Sir or Madam,

Please accept these late filed comments on the Laser Enrichment Draft Environmental Impact Statement (EIS).

006-1

We find the Laser Enrichment Draft EIS grossly deficient because the Nuclear Regulatory Commission (NRC) Staff has chosen to exclude from the scope of the EIS (a) national defense and security issues related to nonproliferation and (b) the environmental, public health and safety impacts arising from damage potentially inflicted by terrorists on this type of nuclear facility. We address these two exclusions below:

a) Nonproliferation

006-2

The Laser Enrichment Draft EIS makes the claim, "Regarding the nonproliferation issue, these activities are not within NRC jurisdiction and as such are beyond what the NRC can regulate." *See* Appendix A, p. A-15. This is false. The NRC may not grant a license application "if, in the opinion of the Commission, the issuance of a license to such person for such purpose would be *inimical to the common defense and security* or the health and safety of the public." (Emphasis added) Cf., 42 U.S.C. § 2099.

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Template = ADM-013

E-RIDS = ADM-03
Add = J. A. Davis (JXD10)

In other words, the Commission has a legal and non-discretionary duty to consider whether a decision to grant a first-of-a kind commercial license for laser enrichment could abet the proliferation of this technology to other nations, and hence be inimical to the common defense and security of the United States or the health and safety of the public. The Commission's NEPA analysis must consider the full range of risks to the common defense and security potentially arising from its licensing decision, and must consider all reasonable alternatives that could eliminate or mitigate those risks.

Proliferation and security issues have been a part of National Environmental Policy Act (NEPA) decisions since the beginning of its application. See *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission*, 481 F.2d 1079 (D.C. Cir. 1973). The United States Court of Appeals sustained the position of the Natural Resources Defense Council (NRC) and required the AEC to prepare a programmatic environmental impact statement on the AEC's Liquid Metal Fast Breeder Reactor (LMFBR) Program. Nonproliferation and terrorism were addressed in the subsequent LMGBR EIS.

006-2

At the preliminary injunction hearing in the 1974 case, *West Michigan Environmental Action Council v. AEC,* the AEC offered to prepare a generic Programmatic EIS on plutonium recycle, which later came to be known as the Generic Environmental Statement on Mixed Oxide Fuel (GESMO), No. RM-50-1, (a document subsequently initiated by NRC as the successor to AEC for these matters). In 1976, the NRC began extensive administrative proceedings to compile a record on whether or not it was wise to reprocess spent nuclear fuel and recycle the recovered plutonium. In preparing a Draft EIS the NRC attempted to narrow the scope of the proceeding as it is doing now with the Laser Enrichment Draft EIS. This position was challenged and in 1976 the NRC was required to supplement its GESMO Statement to cover issues related to protecting plutonium from theft, diversion, or sabotage. Shortly after President Jimmy Carter took office the GESMO proceedings were suspended pending an evaluation of the impact of President Carter's decision to indefinitely defer plutonium recycle. The proceedings were never resumed.

More recently, the U.S. Department of Energy (DOE) was required to address nonproliferation issues in its preparation of the Draft Global Nuclear Energy Partnership Programmatic Environmental Impact Statement (GNEP PEIS; DOE/EIS-0396). It attempted to do so by relying on a separate "Nonproliferation Impact Assessment: Companion to the Global Nuclear Energy Partnership Programmatic Environmental Impact Statement," prepared by the Office of Nonproliferation and International Security of the National Nuclear Security Administration (NNSA). Along with several other NEPA matters, this artificial separation was challenged by NRDC. Subsequent to those critical comments DOE ceased all work on the GNEP PEIS.

Defying logic, the NRC Staff seemingly considers national security concerns to be within the scope of the EIS (See Laser Enrichment Draft EIS Sections 1.3.2 Need for Domestic Supplies of Enriched Uranium for National Energy Security and 7.3.3.2 National Energy Security) when energy security is the issue, but when national security concerns derive from the proliferation

006-2 implications of laser enrichment, they are excluded from the scope of the EIS. In other words, if a national security case can be made for licensing the facility the NRC Staff will discuss the issue in the EIS, but if a national security concern argues against licensing the Staff will claim it is beyond the scope of the EIS. This blatant double standard is arbitrary and capricious and will not withstand judicial scrutiny. 006-3 In passing we note that with three new gas centrifuge enrichment facilities about to be built in the United States, the assertion that there is "a reliability risk in U.S. domestic enrichment capacity" (Laser Enrichment Draft EIS p. 1-8) requiring mitigation by the proposed laser facility is simply not credible, while the use of lasers for clandestine enrichment research is already an accomplished fact in several countries.

006-4 In our view the EIS must contain a thorough analysis and discussion of the proliferation implications of commercializing the SILEX technology. This discussion must address and answer the question whether commercialization will lead to wide-spread use, as occurred with commercialization of gas centrifuge technology. As gas centrifuge technology turned out to be a greater proliferation risk than gaseous diffusion technology, will SILEX in turn pose an even greater potential for clandestine enrichment? Can the facility blueprints be readily stolen and replicated? Can the facility be more easily hidden? Can the process be readily converted to produce highly enriched uranium? Is widespread use of this technology inimical to the common defense and security of the United States?

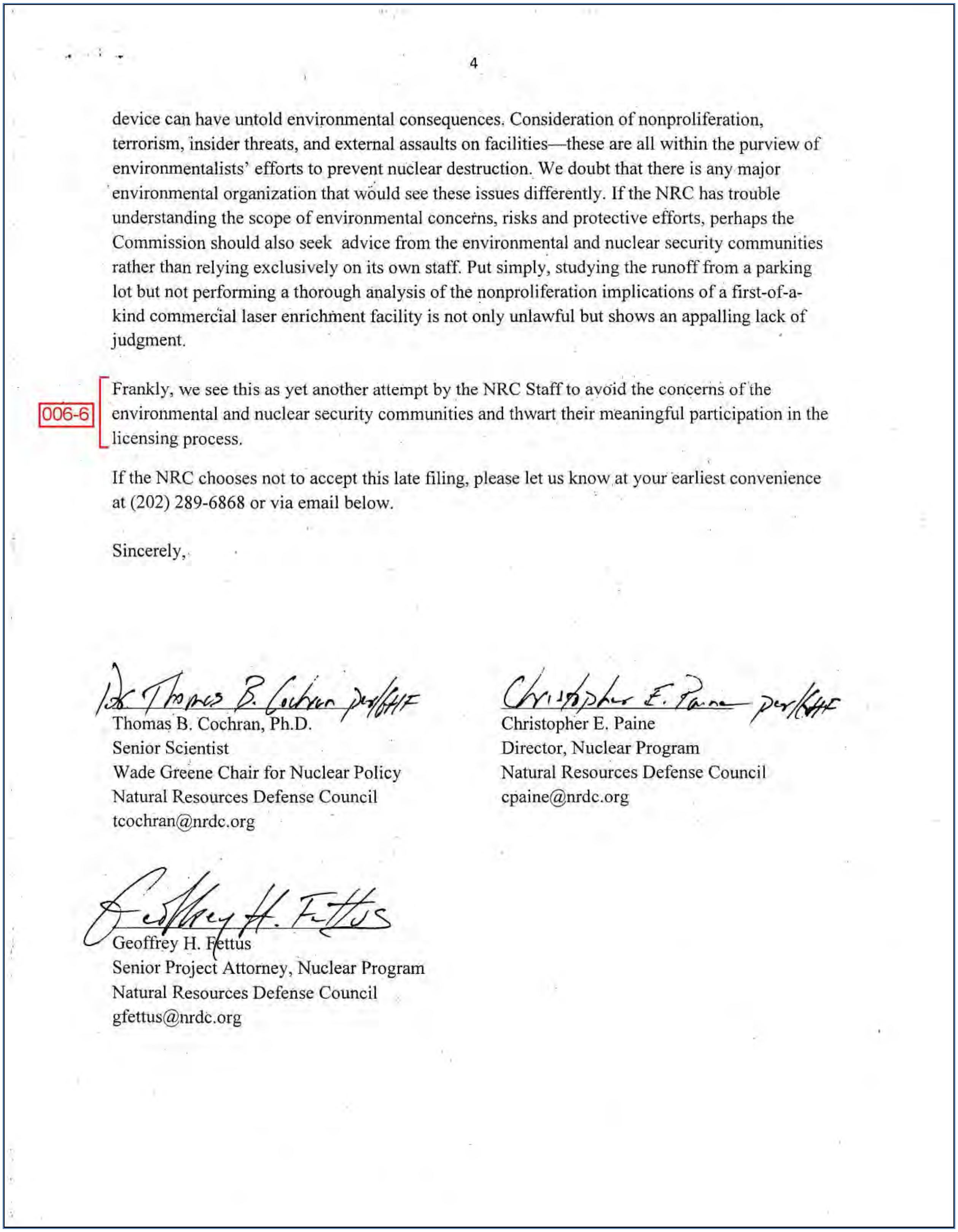
Since none of these matters were discussed in the draft EIS, either the draft must be revised and reissued for public comment or it must be supplemented.

b) Terrorism

006-5 We find it incomprehensible that the NRC would regulate the security of nuclear materials and facilities, and at the same time claim that the potential damage to the human and natural environment from a potential terrorist attack is beyond the scope of a NEPA-required environmental review. The Commission considers the environmental consequences of accidents, including those caused by human error, as within the scope of an EIS. But the Staff claims here that if the very same consequences—indeed the very same accident scenario— is initiated by intent rather than by error, then the consequences and the security requirements are beyond the scope of the EIS. Along with ignoring statutory obligations, such a position defies common sense. Our longstanding interest in this issue is evidenced by the Petition of NRDC, *Emergency Safeguards For Nuclear Facilities*, Nos. 70-8, et al. (filed with NRC in 1976).

Closing remarks

The NRDC is one of the largest environmental organizations in the United States. NRDC's objective is to safeguard the earth—its people, its plants and animals and the natural systems on which all life depends. For forty years, NRDC has worked on nuclear issues and nonproliferation and terrorism have been core environmental concerns of NRDC. The explosion of a nuclear



device can have untold environmental consequences. Consideration of nonproliferation, terrorism, insider threats, and external assaults on facilities—these are all within the purview of environmentalists' efforts to prevent nuclear destruction. We doubt that there is any major environmental organization that would see these issues differently. If the NRC has trouble understanding the scope of environmental concerns, risks and protective efforts, perhaps the Commission should also seek advice from the environmental and nuclear security communities rather than relying exclusively on its own staff. Put simply, studying the runoff from a parking lot but not performing a thorough analysis of the nonproliferation implications of a first-of-a-kind commercial laser enrichment facility is not only unlawful but shows an appalling lack of judgment.

006-6 Frankly, we see this as yet another attempt by the NRC Staff to avoid the concerns of the environmental and nuclear security communities and thwart their meaningful participation in the licensing process.

If the NRC chooses not to accept this late filing, please let us know at your earliest convenience at (202) 289-6868 or via email below.

Sincerely,

Dr. Thomas B. Cochran per/GHF
Thomas B. Cochran, Ph.D.
Senior Scientist
Wade Greene Chair for Nuclear Policy
Natural Resources Defense Council
tcochran@nrdc.org

Christopher E. Paine per/GHF
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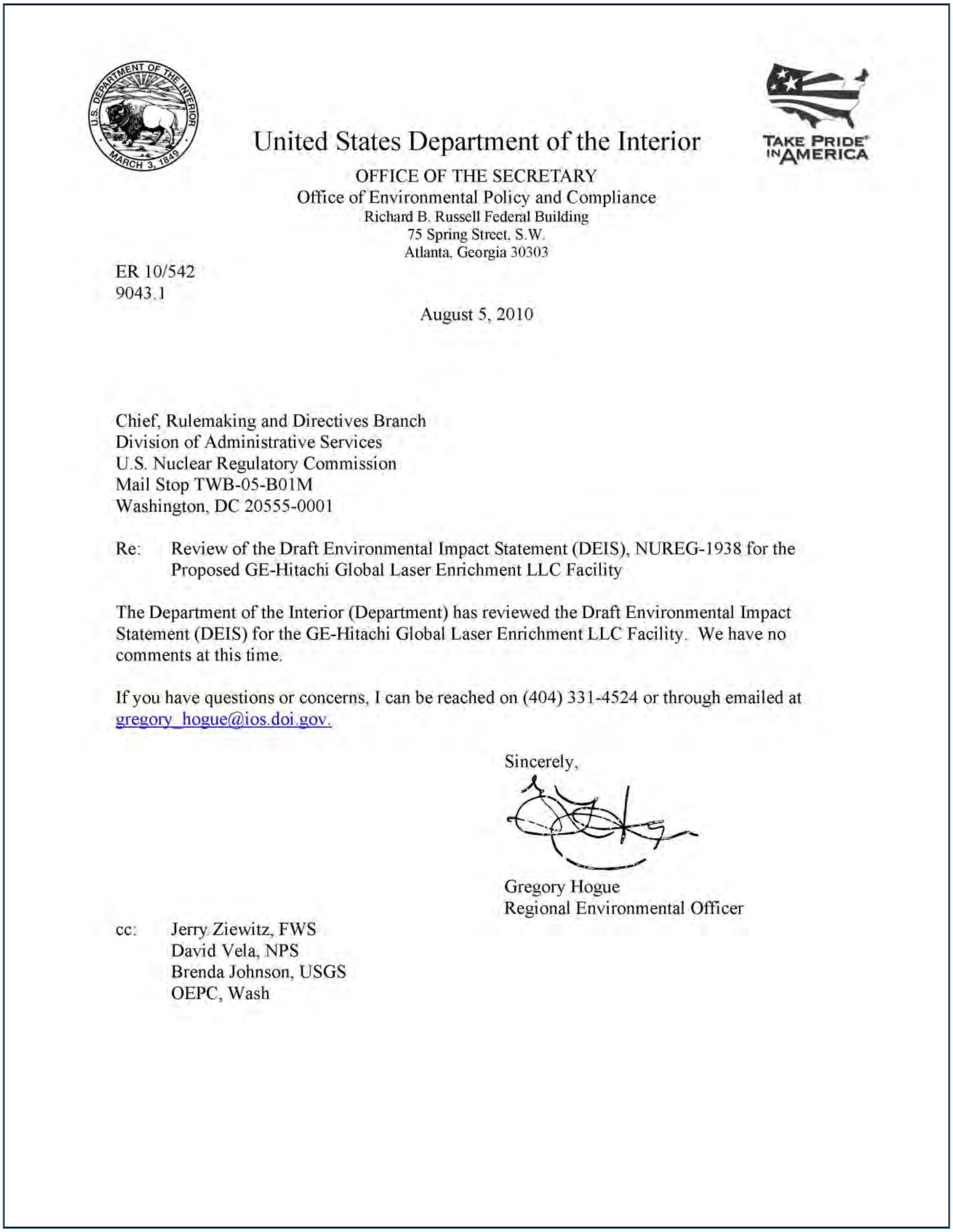

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August 5, 2010

Chief, Rulemaking and Directives Branch
Division of Administrative Services
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01M
Washington, DC 20555-0001

Re: Review of the Draft Environmental Impact Statement (DEIS), NUREG-1938 for the Proposed GE-Hitachi Global Laser Enrichment LLC Facility

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the GE-Hitachi Global Laser Enrichment LLC Facility. We have no comments at this time.

If you have questions or concerns, I can be reached on (404) 331-4524 or through emailed at gregory_hogue@ios.doi.gov.

Sincerely,

Gregory Hogue
Regional Environmental Officer

cc: Jerry Ziewitz, FWS
David Vela, NPS
Brenda Johnson, USGS
OEPC, Wash

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION
CORRECTED TRANSCRIPT

Title: General Electric-Hitachi Global Laser
Enrichment Facility Draft EIS
Public Meeting: Afternoon Session

Docket Number: 70-7016

Location: Wilmington, North Carolina

Date: Thursday, July 22, 2010

Work Order No.: NRC-354 Pages 1-63

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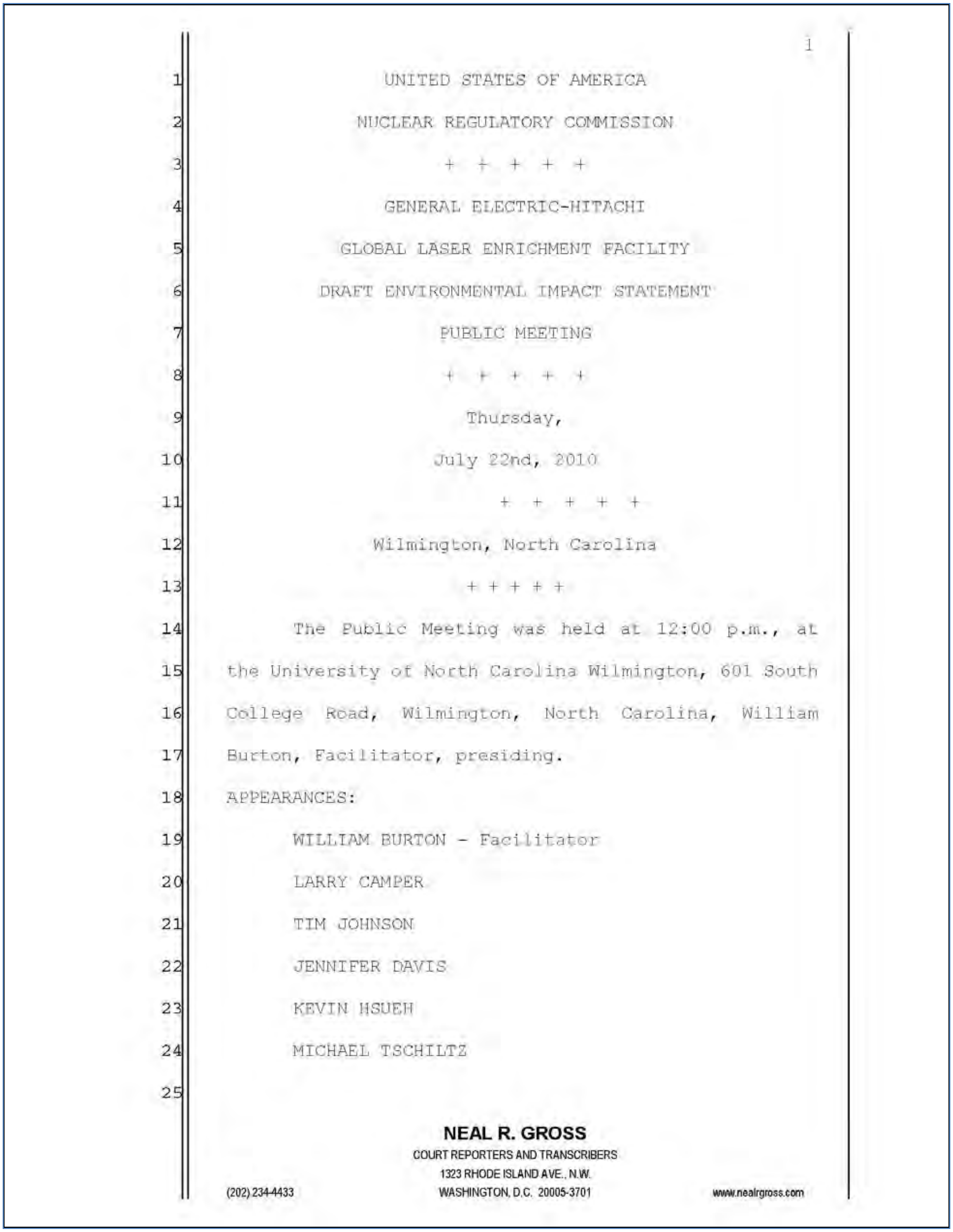

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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GENERAL ELECTRIC-HITACHI
GLOBAL LASER ENRICHMENT FACILITY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PUBLIC MEETING

+ + + + +

Thursday,
July 22nd, 2010

+ + + + +

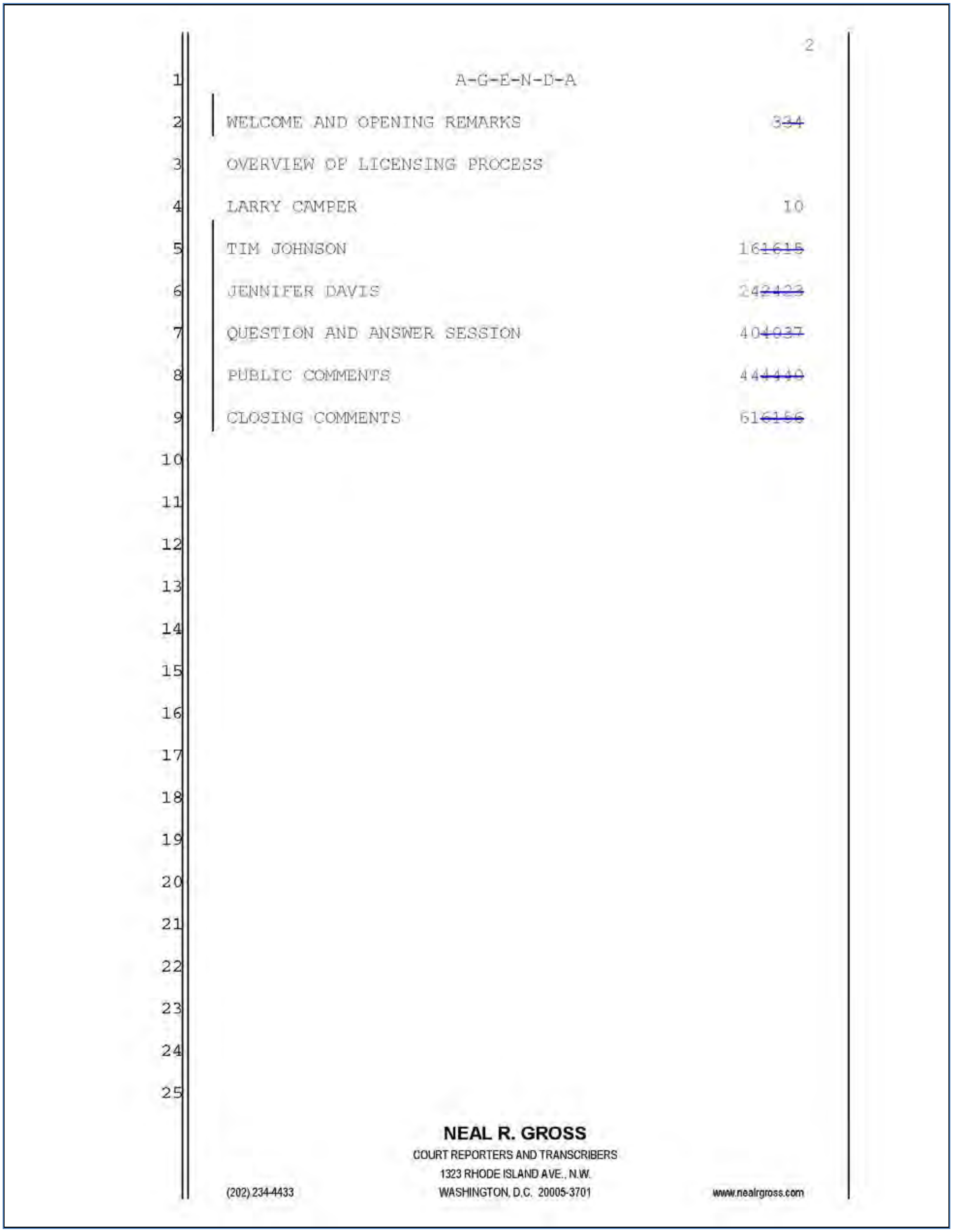
Wilmington, North Carolina

+ + + + +

The Public Meeting was held at 12:00 p.m., at the University of North Carolina Wilmington, 601 South College Road, Wilmington, North Carolina, William Burton, Facilitator, presiding.

APPEARANCES:

WILLIAM BURTON - Facilitator
LARRY CAMPER
TIM JOHNSON
JENNIFER DAVIS
KEVIN HSUEH
MICHAEL TSCHILTZ



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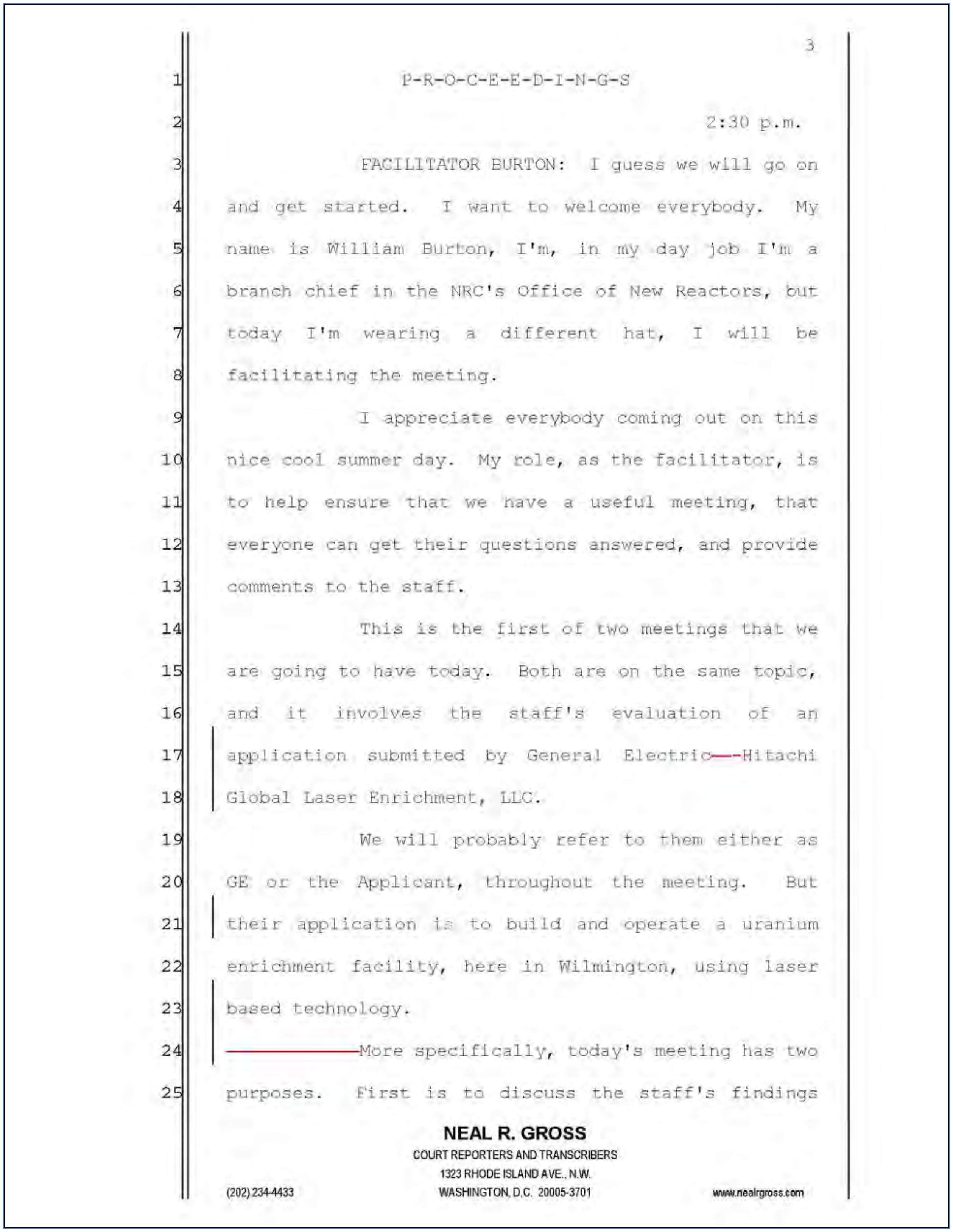


P-R-O-C-E-E-D-I-N-G-S

2:30 p.m.

FACILITATOR BURTON: I guess we will go on and get started. I want to welcome everybody. My name is William Burton, I'm, in my day job I'm a branch chief in the NRC's Office of New Reactors, but today I'm wearing a different hat, I will be facilitating the meeting.

I appreciate everybody coming out on this nice cool summer day. My role, as the facilitator, is to help ensure that we have a useful meeting, that everyone can get their questions answered, and provide comments to the staff.

This is the first of two meetings that we are going to have today. Both are on the same topic, and it involves the staff's evaluation of an application submitted by General Electric-Hitachi Global Laser Enrichment, LLC.

We will probably refer to them either as GE or the Applicant, throughout the meeting. But their application is to build and operate a uranium enrichment facility, here in Wilmington, using laser based technology.

More specifically, today's meeting has two purposes. First is to discuss the staff's findings from the staff's ~~E~~environmental ~~R~~review of GE's application, and share those findings with you.

And~~,~~ secondly, to provide an opportunity for you to comment on the staff's draft findings. The staff performed this review in coordination with other federal and state agencies, and reviewed the Environmental Report that was submitted by GE.

We documented the findings in the Draft Environmental Impact Statement, which hopefully many of you have had an opportunity to look at.

I want to talk a little bit about the format of the meeting, and also go over some ground rules.

The format of the meeting. First, what is going to happen is we are going to have a series of speakers who are going to present to you the role, and responsibilities~~,~~ of the NRC during the review, provide an overview of the licensing process, and then we will provide the ~~D~~draft ~~F~~findings from the staff's review.

After that, we are going to have a short Q&A session~~,~~ that is going to be an opportunity for you to ask us any questions you may have about the ~~E~~environmental ~~R~~review ~~P~~process.

And then after that we are going to go

into what is really the heart of the meeting, which is for us to hear your comments, and an opportunity for you to provide input to us on the findings from the ~~E~~environmental ~~R~~review that we performed.

A little bit about the ground rules. We all want to have a good meeting, and we have done this for quite a while. And so there are some things that we would like to share with you, to help ensure that we do have a smooth meeting.

First of all, we do want to have your questions, but we would prefer that you hold your questions until after the presentations.

The presentations ~~is~~are an opportunity to give a complete overview of the staff's draft findings, so it is important that we be able to communicate that.

As I mentioned before, the Q&A session will be following immediately after the presentations, and that will be your opportunity to ask whatever questions you may have.

We have brought several people, from the staff, who hopefully will be able to answer all the questions you may have. If for some reason we can't, we will make sure that we get back to you with an answer. We do try to close the loop with you on that.

When we go into the comments portion, you need to know that the entire meeting is transcribed. We have Mr. Ed Johns here, who will be our transcriber, and all of the comments that you provide this evening will also be included with any written comments that are provided to us during the comment period.

And I just wanted to let you know that any comments that you provide here today~~,~~ carry the same weight as any written comments that are provided during the comment period.

We do ask that we have only one speaker at a time. The reason being is because it is being transcribed, it is very important that we get a clean transcript. So we do ask that we have one conversation, one speaker at a time.

It is important that everyone who does speak, that we give them the proper respect. We are going to have varying views of this project, but we do want to make sure that every speaker gets the respect that they deserve.

If anybody has their cell phones on, if you could turn them off~~,~~ or put them on vibrate, that would be a great benefit to us. I was asked to let you know that there are certain places that you can park, and there are certain places you shouldn't park.

If you've parked some place that you shouldn't, you should be okay. Officer Albertson, in the back, if you wind up getting a ticket, just see him, and he will take care of it. I could have used him many times in the past.

A quick comment. Rest—rooms are off the hallway directly behind here, if you need to go. Hopefully everyone has grabbed a set of slides, presentation slides. If you haven't, we do have copies at the front table.

One of the things that we try to do here, at the NRC, we do a lot of public meetings, and we are always looking to improve how we do them. And so as part of that, one of the things that we also have on the front table are feedback forms.

So if you have any strong comments, or any feedback that you want to give us on how we can improve our future public meetings, please let us know, you can use that form.

Questions about anything, anything I have said so far?

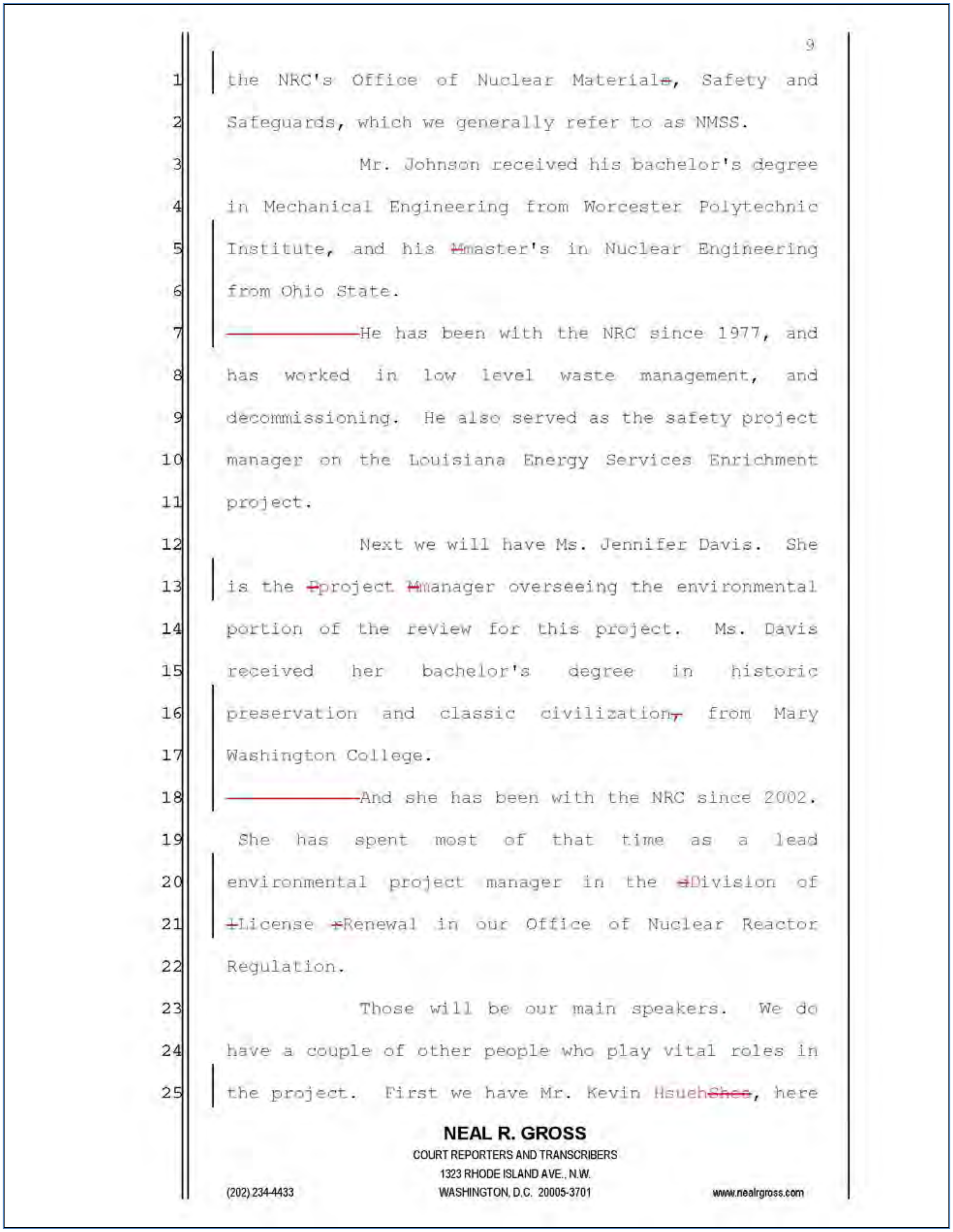
(No response.)

FACILITATOR BURTON: Okay, so far so good. Next thing I want to do is briefly introduce our main presenters~~,~~ and some of the other key staff from the Agency, and then after that we will get into the heart of the meeting.

Our first presenter is going to be Mr. Larry Camper, here in the middle. Mr. Camper is the Director of the Division of Waste Management and Environmental Programs in the NRC's Office of Federal and State Materials and Environmental Management Programs. That is a mouthful. We generally refer to that office as FSME. So you may hear that this evening. Mr. Camper received his bachelor's degree in Radiological Science, and an MBA from George Washington University, and he has over 36 years of experience in the nuclear field, both public and private.

Currently he serves as the USA representative to the Waste Safety Standard Advisory Committee of the International Atomic Energy Agency in Vienna. He is also a member of the Board of Directors, and Program Advisory Committee for the Waste Management Symposium. He will be our first presenter.

After Mr. Camper, we will have Mr. Tim Johnson. Mr. Johnson has served as the ~~S~~safety ~~P~~project ~~M~~manager for this project. Mr. Johnson is in



the NRC's Office of Nuclear Material~~s~~, Safety and Safeguards, which we generally refer to as NMSS.

Mr. Johnson received his bachelor's degree in Mechanical Engineering from Worcester Polytechnic Institute, and his ~~M~~master's in Nuclear Engineering from Ohio State.

He has been with the NRC since 1977, and has worked in low level waste management, and decommissioning. He also served as the safety project manager on the Louisiana Energy Services Enrichment project.

Next we will have Ms. Jennifer Davis. She is the ~~P~~project ~~M~~manager overseeing the environmental portion of the review for this project. Ms. Davis received her bachelor's degree in historic preservation and classic civilization~~,~~ from Mary Washington College.

And she has been with the NRC since 2002. She has spent most of that time as a lead environmental project manager in the ~~d~~Division of ~~l~~License ~~r~~Renewal in our Office of Nuclear Reactor Regulation.

Those will be our main speakers. We do have a couple of other people who play vital roles in the project. First we have Mr. Kevin Hsueh~~Shee~~, here

~~i~~In the end. He is the chief of the Environmental Projects Branch that is overseeing the environmental portion of the review.

And then we also have Mr. Mike Tschiltz~~Schultz~~. Mike is the Deputy Director in the Division of Fuel Cycle Facility Licensing in NMSS. So these are some of the major players that have been involved in the staff's review of the application. We wanted to make sure that you knew who they were.

So, with that, I will turn it over to our first speaker, Mr. Camper.

MR. CAMPER: Thank you very much. Good afternoon, everyone. It is a pleasure to be here. Amongst the things that we do as a regulator, frankly, getting out and doing meetings like this is amongst the most important things, and in many ways some of the most enjoyable things.

It is important that we get out and communicate with you about whatever particular regulatory issue is at hand at the moment, and today it is the Environmental Impact Statement that we are conducting for the GE-Hitachi facility, as our facilitator mentioned.

Again, I'm Larry Camper, I'm the Director of the Division of Waste Management and Environmental

Protection at the NRC. My division has responsibility for a number of key activities. But amongst those is the development of Environmental Impact Statements and other environmental assessments for activities that fall within my office, and also the ~~o~~Office of Nuclear Material Safety and Safeguards, which is the office that is responsible for issuing, or addressing the license application from GE-Hitachi.

We do a lot of Environmental Impact Statements. For example, at this moment in time we are also conducting the Environmental Impact Statement for the AREVA~~reva~~ facility that will be built at Eagle Rock, in Idaho.

That is actually going on right now. We are getting ready to start the scoping process for the International Isotopes Deconversion Facility in Hobbs, New Mexico. So I have the good fortune of having an excellent staff that brings to bear a great deal of experience, and that is being brought to bear in this review, as well.

There are a number of other NRC staff members around the audience. And so during breaks, or other opportunities, don't feel shy about asking any one of us questions.

Also we will be here tonight, of course.

And we do welcome the opportunity to interface with you.

As was mentioned in the opening remarks, we are here to conduct two meetings today, one this afternoon, and one tonight, to solicit comments on the Draft Environmental Impact Statement.

I emphasize, again, solicit comments on the Draft Environmental Impact Statement. This is an opportunity, we are transcribing the meeting. All the remarks will be, of course, put down for the record.

The staff will review all comments that are made. So it is an opportunity, good, bad or ugly, it is an opportunity to provide comments, and we encourage you to do that.

Next slide, please. So in terms of the Nuclear Regulatory Commission, some of you may know a lot about us, and some of you may not know much about us.

Who are we, and why are we doing this, what is our role in this process? The Nuclear Regulatory Commission is an independent federal regulatory agency.

And by meaning independent, what I mean is we are not part of the Executive Branch. We report directly to the Congress of the United States, to

Congressional Oversight Committees.

And, as such, we have authority invested in our agency under the Atomic Energy Act, as amended, to carry out regulation of the commercial nuclear power, and other nuclear uses in this country.

And, as an independent federal regulator I would, again, emphasize we report directly to Congressional Oversight Committees.

Our mission is to ensure protection of the property, and workers health and safety in the use of radioactive materials. We do not build, we do not operate, and we do not promote the use of nuclear power or nuclear materials.

Rather we exist primarily, and only, for the reason of protecting public health and safety. That is our mission. Next slide, please.

Now, this afternoon you are going to hear from two of our presenters;~~,~~ Tim Johnson is going to be talking about the ~~s~~Safety ~~r~~Review part of our program, and Jennifer Davis, later, will be talking about the ~~e~~Environmental ~~r~~Review ~~p~~Program.

The point of being here is that GE-Hitachi wants to build a GE-Hitachi ~~g~~Global ~~l~~Laser ~~e~~Enrichment facility nearby, on a property that is north of Wilmington.

To build that facility, and then to operate that facility, requires that a license be received from the Nuclear Regulatory Commission.

And so the ~~S~~safety ~~R~~review, as well as the ~~E~~environmental ~~R~~review, that you are going to hear about today, are two major components, both of which are required in order for us to be able to ultimately issue a license for this facility to be built and operated.

Next slide, please.

The Environmental Impact Statement is a key component in this review. And the document, the Draft Environmental Impact Statement, NUREG~~—~~-1938, is now published in draft for comment.

Jennifer will be talking about this in much more detail. The comment period goes until the ~~8~~9th of August, I believe it is, Jennifer? Until the ~~8~~9th of August.

It is a fairly extensive and I would suggest a very well done document. And, obviously, if you have not had a chance yet to look at it, we would like for you to do so.

The ~~E~~environmental ~~R~~review that we conduct, the Environmental Impact Statement that we prepare, is required by the National Environmental

Policy Act of 1969.

Our regulations in 10 CFR Part 51 are the regulations that we use to implement the requirements of NEPA, as it is known. The product for doing that, in a licensing activity of this type, is an Environmental Impact Statement.

Next slide, please.

So, primarily, what we want to do today is present the results of the Environmental Impact Statement that we have prepared, thus far.

To share with you the approach that is involved with conducting the ~~S~~safety ~~R~~review, how these two documents come together. We want to listen to your comments, and once again I urge comments. We like to hear comments, please.

And then, of course, to let you know that all the comments that are made today, all the comments that are provided in written form will be considered by the staff, will be analyzed by the staff, and will be documented as comments received, and will go into the development of the ultimate final Environmental Impact Statement. And Jennifer will tell you much more about that in detail.

So I think with that I will stop. I just want to, again, thank all of you for being here. And

Tim Johnson will now present the ~~S~~safety ~~R~~review side of the process. Thank you.

MR. JOHNSON: Thank you very much. This is considered one of our agency's most important licensing actions, so I really appreciate the opportunity to talk to you today.

The objectives that I have are to give you a brief summary of the GE project and, also, to talk about our licensing process. GE is proposing to build an enrichment facility, using laser technology, at its site on the north side of Wilmington, on Castle Hayne Road~~Boulevard~~, near the intersection of I-140.

And the product from this plant will be used for fuel for nuclear power plants.

How does this process fit in with overall fuel production? Well, first of all, uranium turns out to be fairly ubiquitous in the earth's crust.

And there are places in the world where the concentrations and deposits are high enough that it can be mined economically. And uranium is mined by a couple of different methods.

And it is processed to separate the uranium from the remaining rock. And then it is chemically converted into a compound called uranium hexafluoride. And it is that compound that is sent to an enrichment plant for enrichment.

What GE is proposing is to use a laser-based system, based on technology that was originally developed by the Australian company Silex Ltd. And in this process it will separate isotopes of uranium 235 and 238, to increase the concentration of U235 to up to 8 percent.

Now, if we can all go back in a time machine to your days in high school chemistry~~,~~ -- and I hope I'm not bringing back bad memories for you~~,~~-- ~~B~~but in your high school chemistry class, one of the things that you learned was that elements normally contain more than one isotope.

An isotope is an atom that has the same amount of protons, but different -- but can have different numbers of neutrons. It would have the same chemical properties, in general, but has different atomic properties.

And for uranium, naturally occurring uranium~~,~~ has three primary isotopes, 99.3 percent of that natural uranium is of the isotope U-238. About 0.7 percent is the isotope U-235. And there is a smaller amount of U-234.

But the important isotope here is U-235, because that is the only fissionable nuclide of uranium that is found in nature. And to be useful in the power plants that we use in this country, the concentration of U-235 needs to be increased from .7 percent to, generally, on the order of 3 to 5 percent, which is the concentration of U-235 in the current uses of fuel today, nuclear fuel.

These concentration levels are well below those needed to produce nuclear weapons.

The product from this plant would then be shipped to a fuel fabrication facility, where it would be further processed into fuel pellets, and loaded into fuel assemblies and, ultimately, sent to a nuclear power plant to produce power.

One of the fuel facilities that could be used here is the one that GE operates at its site on Castle Hayne Road~~Boulevard~~, and GE has operated this fuel fabrication facility since 1967.

The laser enrichment process is new. This is the first application of it, and because it is new, GE is developing this project in two primary phases.

The first phase is a demonstration test loop phase, in which they want to demonstrate that the process can be made economically viable from a business sense.

And they received a license, in May of

2008 for this test loop facility, and they have been conducting tests there for over a year. And they are going to continue to do testing there on larger pieces of equipment later on next year.

Based on the results of this testing, GE will decide whether or not to go forward and build a commercial facility. And it is the commercial facility that we are in the process of licensing right now.

And now I'd like to talk about, you know, what we are going to do with this license application. And I want to re-emphasize what Larry talked about, is that the NRC is an independent agency responsible for ensuring public and worker health in the commercial use of radioactive materials.

Our jurisdiction resides with commercial uses of nuclear materials. We don't have jurisdiction over the Department of Energy, or national defense activities that use radioactive materials, except in a handful of cases where Congress has specifically designated the NRC to review those projects.

Now, some uses of radioactive materials are regulated by states. We refer to them as ~~a~~Agreement ~~s~~States. And they have specific limitations on what the state can license.

But North Carolina, for example, is an agreement state. And, because of that, it regulates radioactive materials use at facilities such as hospitals, research organizations, universities, and a number of industrial users of radioactive materials.

But the state's jurisdiction does not ~~fall for~~include enrichment plants. And so, therefore, NRC would regulate this enrichment facility.

Again, the NRC is not a promoter of this project. Our job is to regulate the health and safety aspects of it.

Some aspects of the licensing that are important.

First of all, the enrichment facility construction cannot begin until a license is ~~going to be~~ issued. And we are not going to issue a license until GE can demonstrate to us that it can meet our health and safety requirements.

There may be some construction activities that take place at the site before licensing. But these would be construction activities that fall outside of our regulatory jurisdiction. For example, clearing of land.

That, really, doesn't involve the construction of the facility, per se, and GE could do those kinds of activities. But they would still need to get any federal, state, or local and county permits, for doing that construction, the same as anyone would do.

Another aspect of the facility is laser safety. And this falls outside of our jurisdiction. And that would be regulated by the State of North Carolina Department of Labor.

Back in January of last year GE submitted its Environmental Report~~view~~ for the project. And six months later submitted a license application. And the NRC has been involved in that since that time, in the review of those documents.

One of the things that we are going to be doing is a technical review of their application, with the objective of ensuring that it meets our health and safety requirements.

We are also preparing an Environmental Impact Statement, which Larry discussed, and Jennifer will talk about in more detail.

Our technical review is expected to take 18 months from the date the application was submitted. And in that technical review we will be looking at GE's proposed radiation~~radioactive~~ protection program, its program for nuclear criticality safety, fire and chemical safety.

We will look at its decommissioning program and financial assurance proposals. We also look at emergency preparedness, physical protection, and materials control and accountability, which relates to ensuring that diversion of the enriched product doesn't occur.

We will review the application in those areas, and we will document that review, that ~~S~~safety ~~R~~review~~.~~ ~~And~~ in what we refer to as a Safety Evaluation Report. Right now our schedule is to complete that Safety Evaluation Report in December of this year.

Also a part of this process involves hearings. And hearings fall under two categories. The first one is a mandatory hearing, that is required by law, for this type of facility.

And this hearing is held by a Licensing Board that consists of Administrative Law Judges, three Administrative Law Judges. And their objective is to review the Safety Evaluation Report that we generate, as well as the Environmental Impact Statement, and make a determination as to whether it is adequate to protect health and safety~~,~~ and meet the requirements of the National Environmental Policy Act.

Another category of hearings is, we refer to as a contested hearing. And in a contested hearing, an opportunity for the public to petition for a hearing is made. And this opportunity was provided on January 7th of this year.

And 60 days were allocated for a member of the public to petition for a hearing, if they wanted to. And in that they would also identify the areas that they wanted to litigate.

But after that 60 day period, we received no petitions for a hearing. So the only hearing that will take place at this point, is the mandatory hearing that I have talked about.

And that would take place after we complete our Environmental Impact Statement, and our Safety Evaluation Report. So that process should begin early in 2011.

There are also going to be some other points where we come and talk to the public. In May 2009 we had public meetings on Environmental Impact Statement~~s~~ scoping. And based on the comments that we received, we prepared a Scoping Summary Report that was issued in November of 2009.

We are having these meetings to take your comments on the Draft Environmental Impact Statement.

And when the Final Environmental Impact Statement and Safety Evaluation Report are completed, we will come back, again, and talk to you about the results of those reviews.

And if a license is ultimately issued, after the hearings, we will set up another public meeting to talk about how we intend to inspect the construction and operation of the facility.

We set up, on the NRC's website, information on uranium enrichment, and the GE project in particular. And I provided, in the handouts, the addresses if you wish to look at that~~,~~ and read the information on those areas.

And in the -- if you have any questions, at all, there are two contacts with contact information. My phone and email address are provided, as well as Jennifer Davis, if you have questions on the environmental side of the review.

So what I have talked about is I have given a general overview of the project, and talked about our licensing process. So now I will turn it over to Jennifer, and she can talk in more detail about the Draft Environmental Impact Statement. Thank you very much.

MS. DAVIS: Thank you, Tim. My name is

Jennifer Davis, I'm the ~~E~~environmental ~~P~~project ~~M~~manager for the proposed GE-Hitachi Laser Enrichment Facility.

I would like to thank everybody for coming out today, out of your busy schedules, to give us feedback on our Draft Environmental Impact Statement.

The NRC has prepared this Draft Environmental Impact Statement for the NRC's regulations at 10 CFR Part 51, as Larry mentioned earlier.

10 CFR Part 51 are the NRC's regulations that implement the National Environmental Policy Act. The license, if granted, would authorize GE-Hitachi to construct, operate, and decommission, the GE Global Laser Enrichment Facility.

As indicated on this slide, the proposed facility would be located in the north central sector of the existing General Electric property which is, approximately, six miles north of Wilmington.

This map is from the Applicant's Environmental Report. And I would like to draw your attention to the bottom left-corner of this slide.

On this slide, we have the ADAMS accession number. And I would like to briefly explain what ADAMS is. ADAMS stands for Agency~~-W~~wide Documents

Access and Management System. It is a searchable data base for public information, publicly available information regarding any environmental site, nuclear power plant site, enrichment facility site.

And what we have here, we have provided a link to ADAMS that will get you there, and the accession number for the Environmental ~~r~~Report. Also, please note, at the end of the presentation we have provided the website and accession numbers for the Draft Environmental Impact Statement.

So if you will take these home you will have the ML accession numbers at your hand, so you can access the documents straight away.

As Larry talked about, earlier, and touched upon, this slide is giving you a general overview of the process. The green box is currently where we are at in the process.

Earlier we were out here for scoping, back in May of ~~this year~~2009. We would like to note that all comments were addressed in a ~~s~~Scoping ~~s~~Summary ~~r~~Report, which was issued in November.

But let me just start from the beginning, and I will be very brief. We accepted the ~~e~~Environmental ~~r~~Report from there we issued our Federal Register Notice of Intent to prepare an EIS and conduct scoping.

We came out to the area in May ~~of this year~~ 2009 to conduct scoping meetings, to garner any additional information, or areas where you, the public, feel that we should incorporate into our review, and that is when we also began engaging with other federal, state, local and tribal authorities.

From there we published a ~~s~~Scoping ~~s~~Summary ~~r~~Report, from that point, and identified and analyzed any information that we picked up from the consultation process.

We start with the Applicant's ~~e~~Environmental ~~r~~Report, and then we move on for information from other agencies, other permitting authorities. And then we compile all that information, asses the impacts, and compile the Draft Environmental Impact Statement.

Now, the Draft Environmental Impact Statement was issued on June the 18th. The comment period started on June 25th, and that starts with the EPA's Notice of Filing of an Environmental Impact Statement.

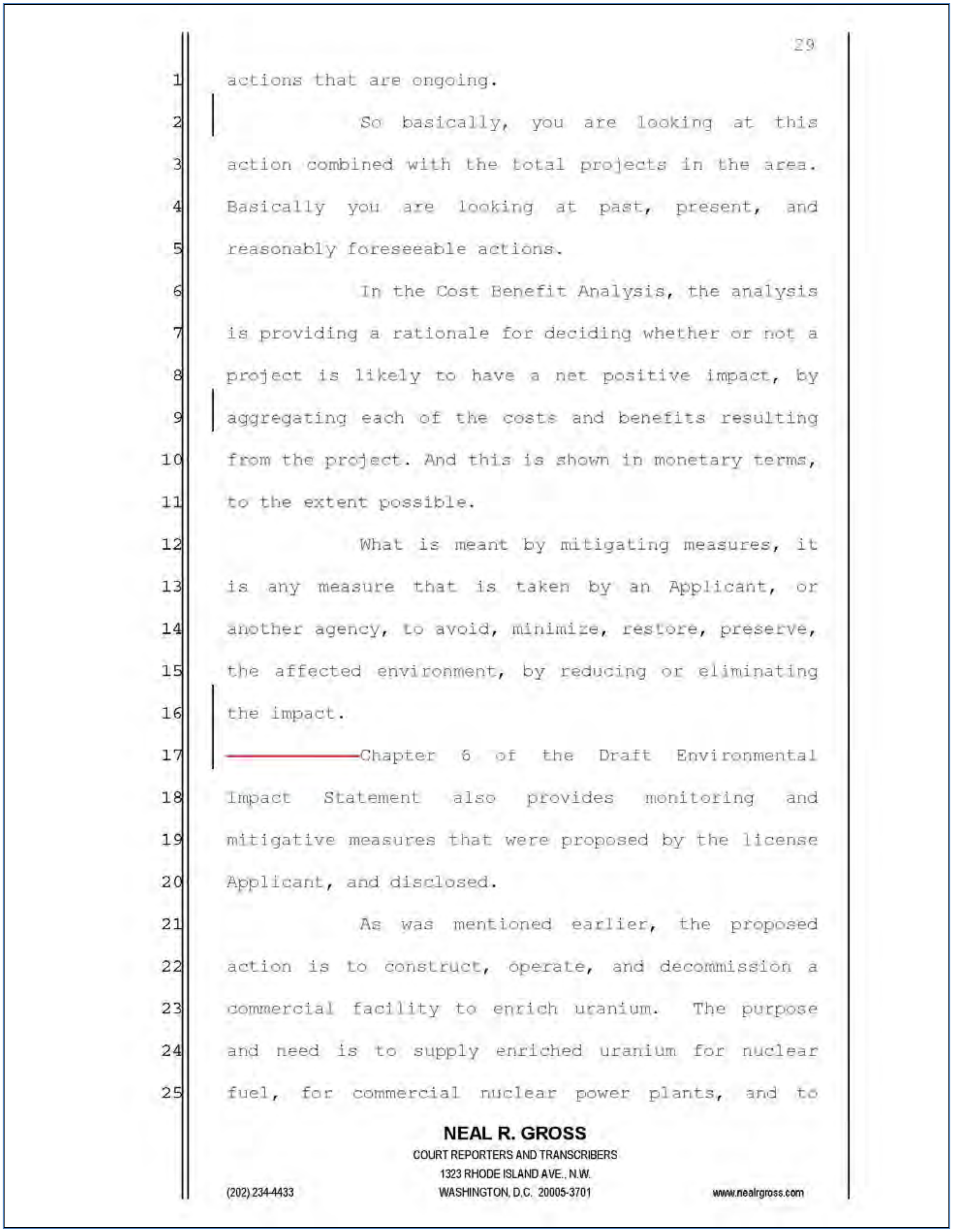
It is a 45~~-~~-day comment period, and the comment period is scheduled to end on August the 9th. The NRC staff looks at any comments, submitted by that date. And if you happen to give a comment to us a little late, if it is practical, we will include it.

We will make an attempt to address all comments, and they will be included in the Final Environmental Impact Statement.

As shown on the slide, the main topics covered in this Draft Environmental Impact Statement, include a description of the proposed action, along with its purpose and need; alternatives to the proposed action, including a no-action alternative, which is not building or licensing the facility; a description of the affected environment, a discussion of the direct, indirect, and cumulative impacts associated with the proposed action; cost and benefits, and mitigative measures that the Applicant has proposed in order to minimize or avoid impacts.

Direct effects are effects that are caused by the proposed action, and will occur at the same time and place. Indirect effects are those that are caused by the action, and are later in time, or further removed in distance, but are still reasonably~~e~~ foreseeable.

Cumulative impacts~~,~~ are the impacts~~,~~ on the environment, which result from the proposed action, but also other federal, non-federal, private



actions that are ongoing.

So basically, you are looking at this action combined with the total projects in the area. Basically you are looking at past, present, and reasonably foreseeable actions.

In the Cost Benefit Analysis, the analysis is providing a rationale for deciding whether or not a project is likely to have a net positive impact, by aggregating each of the costs and benefits resulting from the project. And this is shown in monetary terms, to the extent possible.

What is meant by mitigating measures, it is any measure that is taken by an Applicant, or another agency, to avoid, minimize, restore, preserve, the affected environment, by reducing or eliminating the impact.

Chapter 6 of the Draft Environmental Impact Statement also provides monitoring and mitigative measures that were proposed by the license Applicant, and disclosed.

As was mentioned earlier, the proposed action is to construct, operate, and decommission a commercial facility to enrich uranium. The purpose and need is to supply enriched uranium for nuclear fuel, for commercial nuclear power plants, and to fulfill electricity demands.

But, also, to supply a domestic supply of enriched uranium for national energy security. I would like to note that alternatives of the proposed action are based upon the purpose and need, and I will talk about alternatives on the next slide.

The range of alternatives is based upon the purpose~~s~~ and need, as I just indicated. The staff identified gas centrifuge technology as a reasonable alternative, in the Draft Environmental Impact Statement, along with the no-action alternative.

Other alternatives included looking at additional sites. However, they were eliminated from~~er~~ detailed analyses. The proposed site was found to be most suitable for accommodating the footprint of the proposed facility, and resulted~~s~~ in fewer environmental impacts.

Other alternative technologies were also considered, but eliminated from additional analys~~e~~is, due to high energy requirements, slow production, high cost of energy concerns, or the technology has been superseded.

The rationale behind looking at gas centrifuge, we basically took the approach of siting a similarly sized facility, within the GE property.

This is a technically and commercially viable technology that is currently in use, I believe, one facility is under review and two are, actually, under construction.

Next slide.

The NRC classifies impacts into three categories, small, moderate, and large. And by looking at the slide, it is going to look, what does this mean?

But these are the questions that we ask ourselves when we are, actually, compiling the information. When we think of small we are asking ourselves, is the effect minor?~~,~~ ~~i~~Is it noticeable?

For moderate, does the effect noticeably alter important and attributes of a resource? Large, does the effect destabilize important attributes of the resource. For example, an example that I would use is fish populations within a local waterway.

For a small impact, the facility construction and operation would have no noticeable impact. You don't see an impact on populations~~, or what not~~.

A moderate impact, you see a population of fish that may decline, however, stabilize at a lower level. A large impact involves a population decline and it is not recovering.

Whenever we encounter a moderate or a large impact, they typically need to have some sort of mitigation involved. And that, also, especially in the case of fish, would involve consultation with other federal and state agencies.

The staff evaluated environmental impacts in each of the following resource areas. Resource areas in bold have small to moderate impacts. All others are small.

I will discuss the small to moderate findings on the following slide. However, I would like to note here that some were small to moderate, or some ranged small to moderate, and others were just moderate.

For transportation,~~.~~ ~~T~~the greatest impact that we would see would be during initial land clearing activities and, also, facility construction. Construction truck traffic would result in a small overall impact increase on the local roads.

When you start seeing construction advancing, you start seeing more trips, construction materials hauled in, hauled out. You see a construction work force coming in.

And during construction it is anticipated between 600 to 800 additional trips by construction personnel. And this is expected to have a moderate impact only on local traffic within the area. Regional traffic you are not going to expect, it is going to be small.

Now, the operations phase would overlap with the construction's phase for approximately five years. During this time vehicular traffic would add to the increased traffic from construction activities.

Traffic in the vicinity of Castle Hayne Road could increase, ~~i~~on ~~the~~ I-140, near the site entrance, may become congested during shift changes. Thus we came to the small to moderate impact level range. Impacts could be lessened if shift changes were shifted, so they wouldn't coincide with local traffic.

Most construction activities would occur in areas that have already been disturbed by site preparation activities. Impacts to vegetation would occur, primarily, from clearing habitat, vegetation clearing, habitat fragmentation, alteration of topography, changes in drainage patterns, and soil compaction.

Therefore we found that during construction the overall impacts could be moderate.

No wetlands would be directly impacted by the construction of the proposed facility. However, since GE submitted its ~~a~~Supplement 2~~two~~, to revise their entrance, three jurisdictional wetlands, and one isolated wetland occur within the corridor of the revised entrance and roadway.

However, it is possible that the isolated wetland could be directly impacted, resulting in wetland loss. However, if you look at state guidelines, the wetland is considered to be of low value.

For the three jurisdictional wetlands, the disturbance would be limited to, approximately, 60 feet. And they believe that they can avoid impacting those wetlands.

Any involvement with wetlands would involve consultation with the Army Corps of Engineers. From our review we also determined that no environmentally sensitive areas would be directly impacted by construction.

Impacts on wildlife, from construction, could include habitat disturbance, wildlife disturbance, or injury, or mortality of wildlife. Habitats within the footprint disturbed by construction, could be reduced or altered, and construction activities would result in habitat fragmentation.

No population of threatened and endangered species and other ~~s~~State-listed species, no population level impacts would be expected. Similarly, no population level impacts would be -- sorry, for state, federal, and also no environmentally sensitive areas, again, would be impacted.

The staff's analysis for air quality focused on emissions associated with the entire life span of the project, which included assessing the construction, land clearing, building, start-up, and final construction and operations.

Air quality impacts will be the highest during road construction and land clearing. The impacts would be moderate, primarily, from fugitive dust emissions, but would be temporary in nature.

The Applicant has committed to take mitigative measures to limit dust emissions. Impacts during plant operations are expected to be small. Also no criteria pollutants would be generated, because no combustion is involved.

During construction, vehicular traffic~~,~~ around the proposed facility, along with nearby traffic routes, would generate intermittent noise.

Noise would generally be limited to the immediate vicinity.

However, most of the noise would be associated with diesel engines. Again, most of the impacts would be associated with land clearing activities, site preparation, and construction.

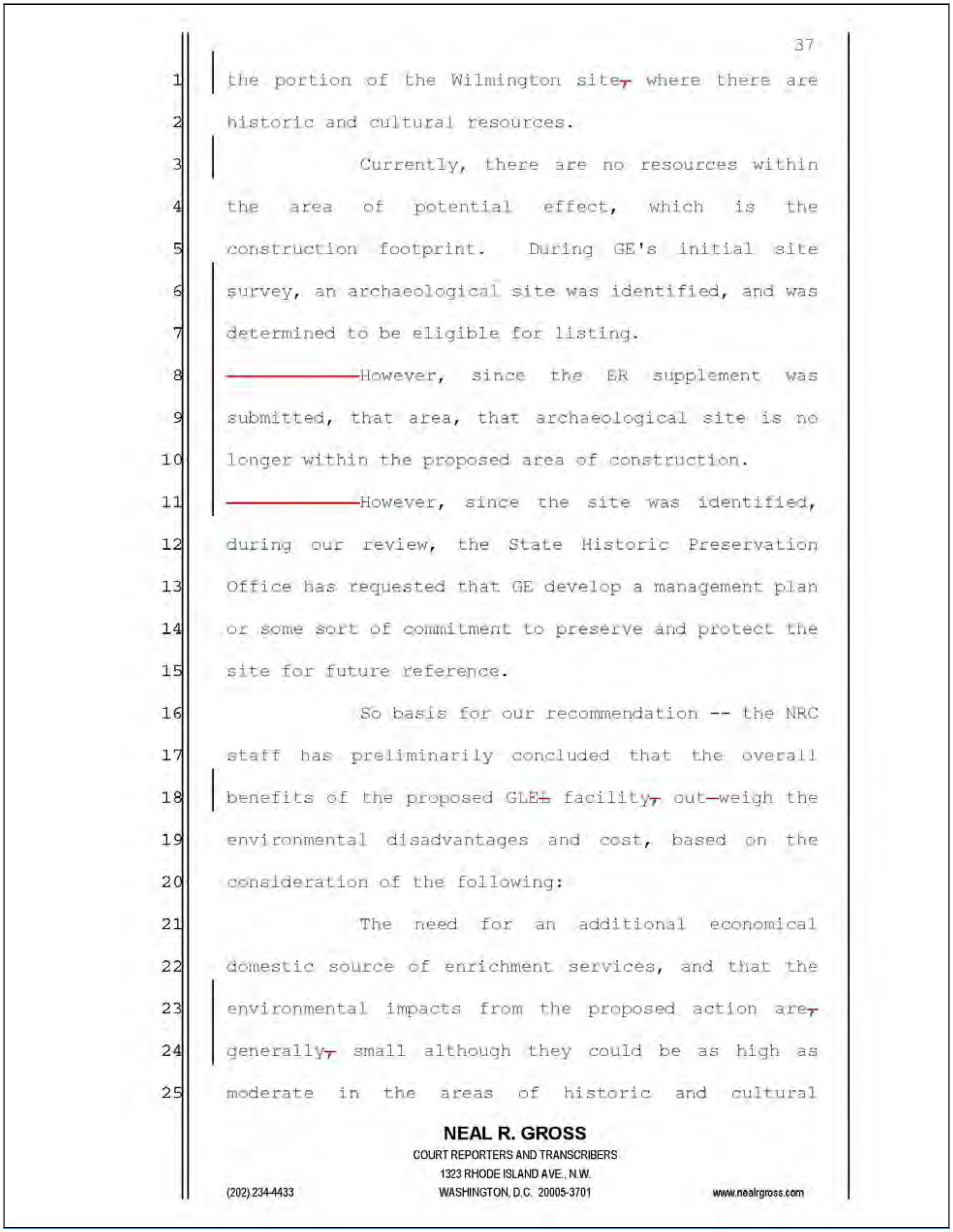
These potential impacts, in the surrounding community, would represent a moderate impact. However, they would be temporary in nature. Noise impacts during operations would be ~~limited to~~ enclosed within buildings, other sources would include vehicular traffic, and hauling vehicles.

Noise levels at the fence line, near the subdivision, would be small.

Section 106 of the National Historic Preservat~~T~~ion Act requires federal agencies to consider the effects of its undertakings on historic properties.

The study area for this review is 263 acres. Construction would take place on ground that has been previously disturbed~~,~~ by logging activities, but also by site preparation activities.

In preparation for the license application, GE commissioned a study~~,~~ in 2008. No construction activities are expected to occur within



the portion of the Wilmington site~~,~~ where there are historic and cultural resources.

Currently, there are no resources within the area of potential effect, which is the construction footprint. During GE's initial site survey, an archaeological site was identified, and was determined to be eligible for listing.

~~--~~However, since the ER supplement was submitted, that area, that archaeological site is no longer within the proposed area of construction.

However, since the site was identified, during our review, the State Historic Preservation Office has requested that GE develop a management plan or some sort of commitment to preserve and protect the site for future reference.

So basis for our recommendation -- the NRC staff has preliminarily concluded that the overall benefits of the proposed GLE~~L~~ facility~~,~~ out~~-~~weigh the environmental disadvantages and cost, based on the consideration of the following:

The need for an additional economical domestic source of enrichment services, and that the environmental impacts from the proposed action are~~,~~ generally~~,~~ small although they could be as high as moderate in the areas of historic and cultural resources, ecological resources, noise, and transportation.

The NRC staff preliminarily recommends that unless safety issues mandate otherwise, that the proposed license be issued to GLE. The NRC staff has concluded that the environmental impacts are~~,~~ generally~~,~~ small and taken in combination with applicable environmental monitoring program, and the proposed mitigation measures by GE, they would eliminate or substantially lessen any potential adverse impacts of the proposed action.

This slide is just mainly pointing out where the Draft Environmental Impact Statement is located on the NRC's website. You can either go directly to the link above, or you could go through the electronic reading room. Or there are copies of a CD~~,~~ and a hard copy available at the New Hanover County Library.

Additional information about the actual project, and the schedule, and any updates, we have a web link for that, as well. Also in our ADAMS data base, should you perform a search, use the docket number, which is indicated here, and that will allow you to pull up any documents that are related to this review.

~~Rem~~Mind you, that these are the only publicly available documents that are in this management system. At the bottom of our slide is our contact information. If you have questions regarding the ~~S~~safety ~~R~~review, contact Tim Johnson at the phone number and email listed on the slide. If you have any questions regarding the ~~E~~environmental ~~R~~review, feel free to contact me.

As Larry indicated~~,~~ earlier today, the main purpose of today's meeting is to listen and to gather your comments. Many of you have signed up to speak during today's meeting.

However, if you are not comfortable speaking, please feel free to either talk to us afterwards, you can fax your comments, you can email comments, there are many different ways to do that.

And the mechanism for this is presented on the slide, along with the comment period, the end of the comment period. Thank you very much.

FACILITATOR BURTON: Thank you, Jenny. And thank you, also, Tim and Larry. That concludes the presentation part of the meeting. The next part we are going to go into Q&A.

This is going to be an opportunity for anyone who has any questions about the ~~E~~environmental

~~R~~review that the staff performed, anything about the process. Are there any questions from anyone?

If you would just raise your hand and I will bring the microphone to you.

(No response.)

FACILITATOR BURTON: Boy, I think this is a first for me, no questions. Is that a good thing, or a bad thing? We are going to be following this, apparently, very shortly with the comment period.

Anyone questions? We do have a question. And just give us your name, and ask your question.

MS. BUTLER: Thank you. My name is Deborah Butler. And I apologize. Of course I have not read the DEIS, which I will do tonight when I have insomnia, perhaps.

PMT-1-001-1

But I just had a quick question about the relative proximity to the proposed Titan Cement facility, which is in this region, and whether or not the Draft Environmental Impact Statement addresses those two projects, because they seem to be sort of to have a synergistic possibility between the two of them.

FACILITATOR BURTON: Jen?

MS. DAVIS: Yes, we do actually talk about the Titan Cement Project within our cumulative impacts assessment~~ignment,.~~ ~~A~~about the interrelation between the two.

We are looking at it more from the environmental standpoint of added pressure to the local environment. You know, you are taking a look at the incremental impact of all projects in the area.

But we do address and acknowledge it within our cumulative impact session.

FACILITATOR BURTON: Do you want to go into more detail?

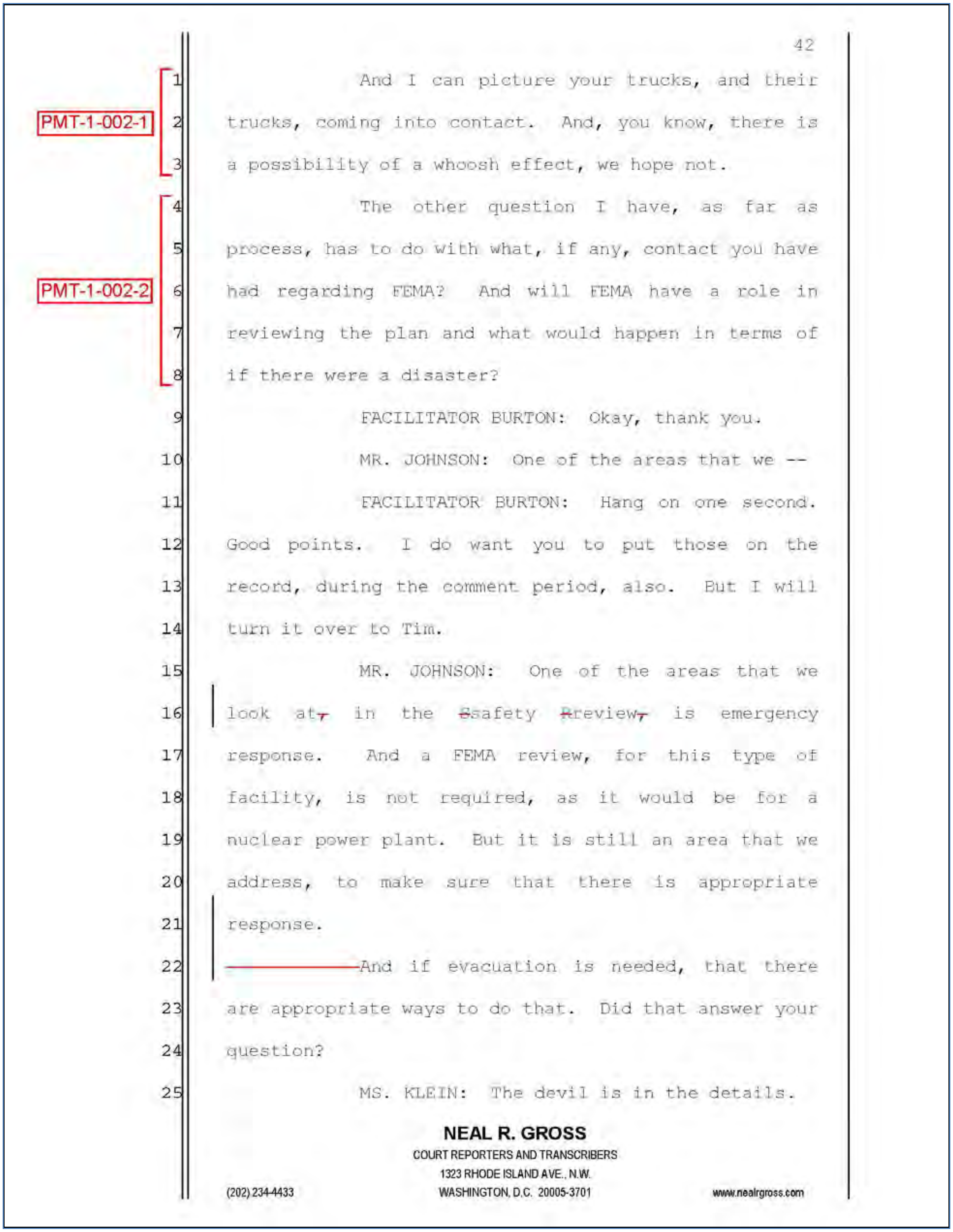
MS. DAVIS: The question was asking about the --

FACILITATOR BURTON: Just more detail about the cement, in the environmental impact.

MS. DAVIS: Actually, if I could get back with her later. But the overall impacts, I believe, they were small. It wasn't adding too much. Let me get back to her.

FACILITATOR BURTON: Yes, maybe after the meeting the two of you can talk and work it out.

MS. KLEIN: This might come more under comments, but I would think that it is important, for the people here, to ~~found~~hear on record what you found, especially because Titan is going to have a major impact to the area.



PMT-1-002-1

And I can picture your trucks, and their trucks, coming into contact. And, you know, there is a possibility of a whoosh effect, we hope not.

PMT-1-002-2

The other question I have, as far as process, has to do with what, if any, contact you have had regarding FEMA? And will FEMA have a role in reviewing the plan and what would happen in terms of if there were a disaster?

FACILITATOR BURTON: Okay, thank you.

MR. JOHNSON: One of the areas that we --

FACILITATOR BURTON: Hang on one second. Good points. I do want you to put those on the record, during the comment period, also. But I will turn it over to Tim.

MR. JOHNSON: One of the areas that we look at~~,~~ in the ~~S~~safety ~~R~~review~~,~~ is emergency response. And a FEMA review, for this type of facility, is not required, as it would be for a nuclear power plant. But it is still an area that we address, to make sure that there is appropriate response. And if evacuation is needed, that there are appropriate ways to do that. Did that answer your question?

MS. KLEIN: The devil is in the details.

FACILITATOR BURTON: Yes. And we may be able to speak more on it, after the meeting, to get you the detail you want. Because some of the information may be available to you.

MS. DAVIS: And what I will do is I can get up afterwards and finish the response here.

FACILITATOR BURTON: Good start. Other questions, anyone?

(No response.)

FACILITATOR BURTON: Well, I appreciate the two that we got. I guess we will go into the main part of the meeting, which is an opportunity for you to provide your comment and input on the draft findings~~,~~ that are documented in the Draft Environmental Impact Statement.

I think what I will do is to ask those folks who signed up to speak, I will just leave the microphone here, and you can come up and make your comment.

Now, I will say that, so far, we only have four speakers, which is a first for me, personally. We generally, if anyone would like to make a comment, we prefer that you fill out one of these yellow cards. And I do have a few extra.

We like these because we need them to make sure we know who is speaking, to capture it on the transcript, and also to help manage the time for the remainder of the meeting.

Given four speakers, I think we can be pretty liberal with the time. Is there anyone else who would like to speak? The blue card is general attendance. The yellow card is to speak.

Okay, so this should be fairly easy. Our first speaker is going to be Andy Yates. And I will apologize, up front, if I mess up people's names. But that one I think I got.

MR. YATES: My name is Andy Yates. I just want to thank everyone for giving me the opportunity to speak. And~~,~~ don't worry, I printed these in large print, I'm not going to be here for an hour or anything.

I just printed them so I could read them. Again, my name is Andy Yates, and I'm here to speak on the behalf of Ilario Pantano, he is the Republican candidate for North Carolina 7th Congressional District.

Ilario would like to express his regret that he was not able to be here, personally, to address the Commission. He had a scheduling conflict that he could not avoid.

PMT-1-003-1

I'm here on his behalf to speak in support of the proposed GE-Hitachi Global Laser ~~e~~Enrichment project. I want to commend the NRC staff for doing a thorough job of evaluating the impacts of the project, and I would like to urge the Commission to move expeditiously~~,~~ to approve the GE-Hitachi license application.

First I want to thank GE for four decades in New Hanover County as a good corporate citizen. We appreciate GE's investment in our community. GE has provided us with good jobs, and pay substantial state and local taxes.

We also appreciate the many volunteer contributions made to the community by GE, and GE employees. Finally, we appreciate GE's respect for our laws protecting public health and the environment.

We look forward to expanding our mutual beneficial relationship, with GE's decision to locate an advanced enrichment facility here in New Hanover County.

To the NRC staff I say, welcome to our community. We appreciate your ongoing efforts to assure that both the GE-Hitachi and Progress Energy Brunswick facilities in our community are designed, built, and operated safely.

PMT-1-003-1

We count on your expertise and commitment to the public interest, to protect the community from significant adverse impacts in the new enrichment project.

We appreciate your diligent review of the laser enrichment facility license application, as evidenced by your 800--page report. Although this advanced enrichment technology is difficult for a layman to understand, you can tell from the review, that the potential impact of the facility, on the community, was broad and deep.

To both NRC and GE-Hitachi, I say, let us move forward with the project. Our country needs to develop its commercial nuclear infrastructure as a matter of sound energy policy.

Nuclear power is reliable, affordable, clean and safe. We need more of it, especially for domestic sources, like this proposed project.

I'm frustrated while the nuclear renaissance moves ahead in the rest of the world, here in America, the birth place of peaceful nuclear energy, new reactor projects spend forever in regulatory reviews.

We want to congratulate the NRC for having the integrity, courage, and fortitude to deny the mention from the Department of Energy to withdraw with prejudice the license to open the deep geologic repository at Yucca Mountain.

That project which would put nuclear waste from plants like Brunswick, in a deep geological repository, is tied up in political wrangling and electoral politics. Don't let this happen here.

PMT-1-003-2

On the basis of our review of the NRC's staff report, we believe that the GE-Hitachi project will be good for our community, our citizens and our country. It should move forward.

We found the following statements in the report particularly persuasive. Enriched~~ment~~ uranium provides 20 percent of U.S. electricity from 104 domestic reactors. But production from our only current domestic supply provides about ten to fifteen percent of U.S. enrichment uranium needs.

The rest comes from foreign sources, mostly Russia. This is a reliability risk to the fuel supply for our U.S. reactor fleet. We need this facility to make the U.S. energy supply more secure, and more independent.

The GE laser-based process is a step forward in nuclear technology~~,~~ and should offer economic and environmental advantages over both the

PMT-1-003-2

enrichment process now used by the industry.

The project will average 1,550 jobs during construction, and 732 jobs during operation. Those are jobs that are desperately needed in southeastern North Carolina right now.

This project will generate income and sales tax revenues of four million dollars per year during facility operation, and 8.7 million per year in property taxes.

The staff includes in the report that the environmental impacts in the project are small in magnitude, and small in comparison to the local and national benefits.

Upon review of the report this is something that we definitely agree with. This project will provide economic, fiscal, and in particular energy security benefits at both the local and national levels.

On the basis of these findings and conclusions, and on the basis of GE's long standing record of corporate citizenship, we recommend that the Commission approve the GE-Hitachi license application.

PMT-1-003-3

We have a final request. We urge the Commission and staff to act as expeditiously as possible to approve the application. Southeastern

North Carolina has been hard hit by the current recession.

Our employment rate has been near ten percent for over a year, in New Hanover ~~c~~County, and many of the surroundings counties have well over ten percent unemployment.

Local budgets are squeezed, and important public services are being cut. The laser enrichment project will be a huge shot in the arm for our economy.

PMT-1-003-3

The NRC staff has done a great job in looking at the impact of the project. Please do not make us wait endlessly for needless bureaucratic reviews before we can reap the great benefits of this project.

Remember delay will not just hurt GE-Hitachi, it will hurt you and me, our community, and our economy. We need these green jobs. Thank you for the opportunity to be heard.

FACILITATOR BURTON: Next we have John Monroe.

MR. MONROE: Good afternoon. My name is John Monroe, I'm a retiree living here in New Hanover County. I have been very impressed with the DEIS review, and how thorough you folks are about going

PMT-1-004-1

about this study.

I'm here to support GE for many reasons. They have been an outstanding corporate citizen here for over 40 years, with respect to the environment, and the safety of their operations, it is a blue chip company.

I have known and worked with many of the senior managers for many years. They bring outstanding leadership to our community, and I'm urging you to move forward with this project.

PMT-1-004-1

And while I have been impressed, very much, with the environmental impact study, I'm interested, very much, in the economy. It seems to me that the number one issue in our nation today is the economy, having to do with jobs.

And the tax base that we need here. We have, right now, about 9,500 people looking for jobs in New Hanover County. And I think there is an opportunity here for this expansion to meet those needs.

I noted in your report something about the economic impact. And I assume that there may be more details about that in the study. I want to look at that to see just what that impact might be. But we need those jobs.

PMT-1-004-1

Our country needs energy, our state needs energy, our county needs energy, we need jobs, we need tax relief, a tax base, and we need the community leadership that GE can provide.

So I urge you~~,~~ and encourage you~~,~~ to continue with the thorough review and process that you have underway. And thank you, again, for giving the public the opportunity to ask question and make comments.

FACILITATOR BURTON: All right, thank you, Mr. Monroe. Next we will have Ms. Ellie Klein.

MS. KLEIN: My name is Ellie Klein, I'm a New Hanover ~~c~~County and Wilmington resident. And, unlike some, I didn't plan to speak but the panel prompted some questions, and I thank you for being here.

I wish more of my fellow citizens would be here. Like Deborah Butler who is a concerned New Hanover citizen and, actually, is -- I hope will represent us on the New Hanover County Commission, I won't be reading the report, the study.

And I'm sure like most of the residents here, I try to find the balance between doing a job, and presenting information in a way that will entice people like me, who are basically somewhat uninformed and lazy, to know what is happening.

So, again, Ms. Butler will read it, I won't. And that is why my question to Ms. Davis, and why I think it is important for the information to be presented in a forum and via the media.

PMT-1-002-3

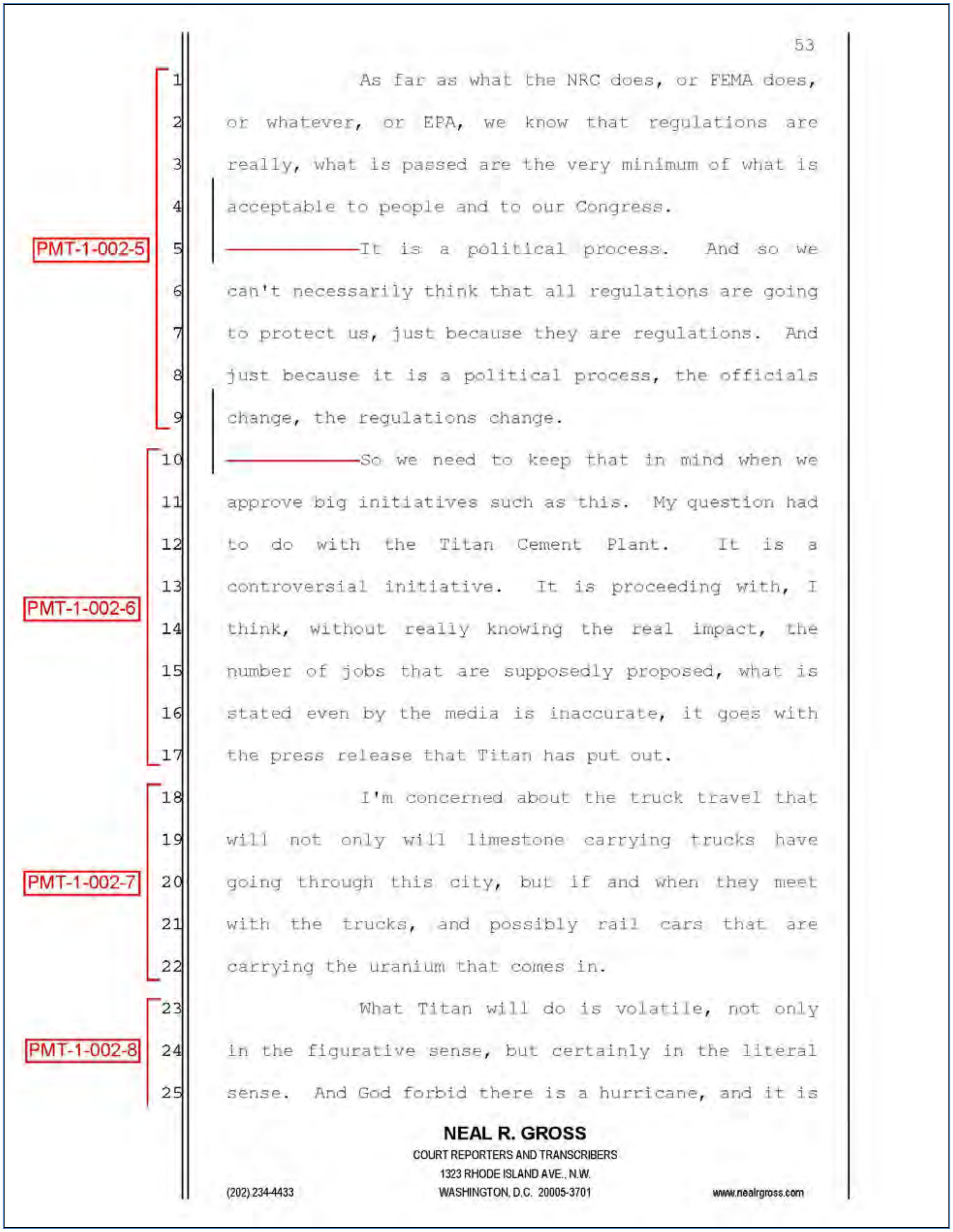
Although I don't count on the media for, necessarily, accurate information, information that I subscribe to. But it is important that you get the information out to the public.

GE is a really good company here in town and, in fact, I would have liked a job with GE. And I think it is important to note that, as a nation, we do, even though I wish we didn't need to, make use of uranium, we need to accept that as a fact of life.

PMT-1-002-4

One question that I have, that I hope you also will address, is what happens to the waste that might be produced here. We know we are not going to get it here, luckily Wilmington isn't one of the areas that will have to deal with it, unlike Yucca Mountain.

But that certainly is of concern to me, but that doesn't mean that I'm against this particular initiative. I'm here to fact--find. And unlike with some of the initiatives that are proposed for this area, I'm more inclined to be for it, but I would like you to address the concerns.



PMT-1-002-5

As far as what the NRC does, or FEMA does, or whatever, or EPA, we know that regulations are really, what is passed are the very minimum of what is acceptable to people and to our Congress.

It is a political process. And so we can't necessarily think that all regulations are going to protect us, just because they are regulations. And just because it is a political process, the officials change, the regulations change.

PMT-1-002-6

So we need to keep that in mind when we approve big initiatives such as this. My question had to do with the Titan Cement Plant. It is a controversial initiative. It is proceeding with, I think, without really knowing the real impact, the number of jobs that are supposedly proposed, what is stated even by the media is inaccurate, it goes with the press release that Titan has put out.

PMT-1-002-7

I'm concerned about the truck travel that will not only will limestone carrying trucks have going through this city, but if and when they meet with the trucks, and possibly rail cars that are carrying the uranium that comes in.

PMT-1-002-8

What Titan will do is volatile, not only in the figurative sense, but certainly in the literal sense. And God forbid there is a hurricane, and it is compounded.

PMT-1-002-8

What happens with Titan is compounded by what the GE plant intends to do. And I'm very against Titan, and I'm more against it because of this proposal.

And I think it is important for the public to understand that interface. The other part that I was concerned about, you said -- and this will be my last point.

PMT-1-002-9

You said that you are concerned with the environmental impact and that the GE proposal has to go through and maybe go across, jump across different hurdles. But they are allowed to start construction.

So very often, whether it is with paring down a building in downtown, for something that might be built, or construction for this project, somehow once something is started, even if other factors show that the initiative should be stopped, then there is the statement that, oh well, we have already spent so much money, we can't stop it now.

And that part of it would concern me. And I would hope that even though within your purview, that GE, or any other initiative is allowed to get started, I would hope that nothing can be started until all the hurdles are met.

Thank you for listening.

FACILITATOR BURTON: Thank you, Ms. Klein, I appreciate it. Next speaker -- now, remember I apologized for mangling names. Cornelius Milmoe.

MR. MILMOE: I am Cornelius Milmoe, you did pronounce my name correctly. I'm a proud resident of Wilmington, and I'm also senior policy council to the ~~n~~Nuclear ~~i~~Infrastructure ~~c~~Council.

The ~~c~~Council is an association of nuclear companies, like GE-Hitachi, who serve the owner-operators of the 104 reactors in the U.S. nuclear fleet.

PMT-1-005-1

My remarks are supported by the ~~c~~Council, but are not necessarily supported by all of its members. And they will address the national benefits of the proposed project, which I think the NRC staff has done a good job in the Draft Environmental Impact Statement of identifying, and I appreciate the good job you did in doing that.

The Nuclear Infrastructure Council has five policy objectives. First, build new reactors in the United States. Second, expand nuclear industry infrastructure. Third, assure effective regulation of nuclear facilities; fourth, develop a sustainable nuclear fuel cycle; and five, prevent proliferation and non-peaceful use of nuclear technology.

PMT-1-005-1

Licensing the proposed GE-Hitachi enrichment facility would serve each of these objectives. First, build new reactors in the United States. The American public supports constructing new reactors to supply reliable, affordable, clean and safe nuclear electricity.

In terms of reliability, they see nuclear as a way to make America more energy secure and independent. But, as noted in your Environmental Impact Statement, U.S. reactors currently get about 85 percent of their requirements for enrichment uranium, from foreign sources, primarily Russia.

In order for new reactors to make us more energy independent and secure, we need more domestic enrichment facilities like the one proposed by GE-Hitachi.

Second, expand nuclear energy infrastructure. The GE-Hitachi facility can be an important part of the front end facilities that will support an expanded reactor fleet in the United States.

We also welcome Louisiana Energy Services recently completed centrifuge facility in New Mexico, USEC's proposed enrichment facility in Ohio, and

AREVA~~Areva~~'s planned centrifuge in Idaho.

If all the increased capacity comes on line, the United States could meet about 80 percent of its requirement~~,~~ for the existing fleet~~,~~ from domestic sources, making us more energy secure and independent.

Three, assure effective regulation of nuclear facilities. We recognize the thorough and professional job that the NRC staff has done in evaluating the impact of the GE-Hitachi project, and preparing the Environmental Impact Statement.

PMT-1-005-2

Effective regulation means timely review and decision making, and we hope the NRC will stay on schedule with this licensing process.

As a personal aside, I would like to compliment the NRC staff on the work it continues to do on the Yucca Mountain license application against political headwinds.

And congratulate the NRC construction authorization board for its correct and courageous decision to let the NRC continue to do its job at Yucca Mountain.

Four, develop a sustainable nuclear fuel cycle, building a modern, efficient enrichment facility, will not only enhance the front end of nuclear fuel infrastructure, but the back end as well.

We believe that the country will move to recycle spent nuclear fuel, drastically reduce the waste that would go to places like Yucca Mountain, and become self-sufficient in nuclear fuel in the foreseeable future.

PMT-1-005-3

Five, prevent proliferation and non-peaceful use of nuclear technology. We recognize the sensitive nature of enrichment technology. We believe that having a robust U.S. enrichment capability, able to supply the world with a reliable source of affordable nuclear fuel, will convince other nations that they have no need to build their own facilities.

Those facilities could be misused, supposedly used for peaceful purposes, they could be converted to produce weapons grade material.

PMT-1-005-4

My thanks to the NRC staff for this opportunity to speak. You have, appropriately, identified important national benefits from the proposed facility.~~,~~ ~~k~~Keep up the good work, and let's get this facility licensed.

FACILITATOR BURTON: Thank you, Mr. Milmoe. Our last speaker is Tom Goolsby.

MR. GOOLSBY: My name is Tom Goolsby, I'm the Republican candidate here, in New Hanover County, for the North Carolina ~~s~~State ~~s~~Senate.

PMT-1-006-1

And I'm excited -- first off, we appreciate GE and their presence here in our area over many, many years. It is exciting that we have, and I can't really get an explanation from anybody.

I guess it truly is top secret, the technology that is going to be used to help enrich this uranium and will be, really, one of the first, if not the first, cutting~~-~~-edge facility to actually do this.

PMT-1-006-2

So that is exciting. We appreciate the NRC's work to make sure that the impact on our environment is negligible. Of course you guys are going to put it in the same site where you already have space, and you provide us lots of jobs in the county.

I'm looking at 550 jobs in our local county during construction, 732 jobs during operation, revenues to our county of four million a year, and incoming sales taxes will be 8.7 million a year, and property taxes.

Thank you.~~,~~ I hope that it will start as soon as possible, we could use it. As your ~~s~~State ~~s~~Senator, hopefully, I promise I will do everything I can to assist you in any way, that is GE, in making sure that this is a tax favorable place for you to do more business, that we can reduce our policies of tax and spend, and continuing to increase your cost of doing business here.

We are going to try to change that come November. So we welcome you. Anything I can do, if I get up to the Senate, to help you I will do. And we want to encourage you, and do everything we can to bring those jobs here, to bring those opportunities here, and to make the U.S. and North Carolina truly energy independent. Thank you.

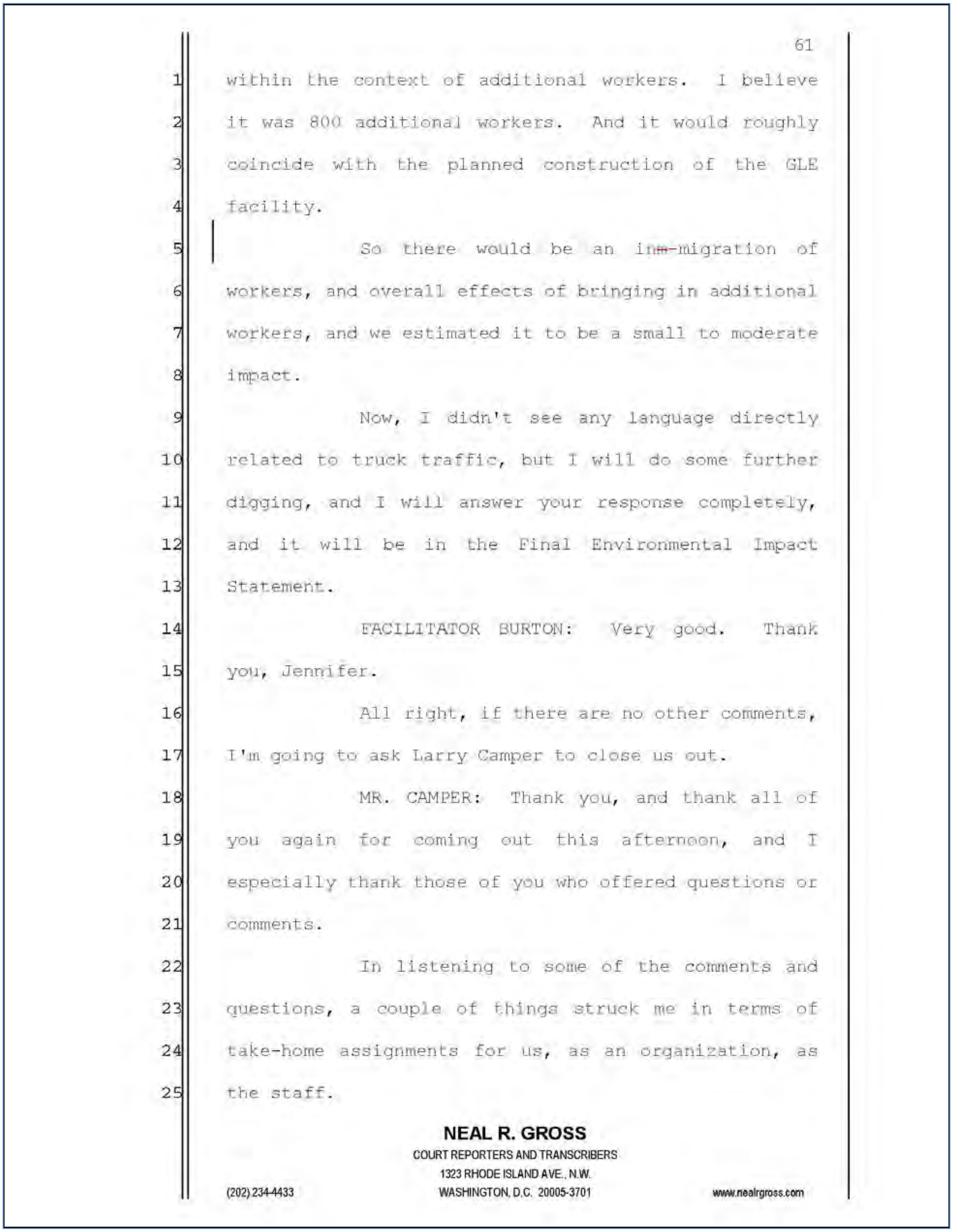
FACILITATOR BURTON: Thank you, Mr. Goolsby. That was our last speaker. I wanted to give you another opportunity, if anyone would like to speak, make a comment? Anyone?

MS. DAVIS: Actually, could I respond to Ms. Kline?

FACILITATOR BURTON: Please do, sure.

MS. DAVIS: I did a quick sweep. Sorry for -- I wanted to give you as detailed an answer as possible, but I wanted to verify my information first. Also to let you know that any comment that is made here today, we will respond to fully, and it will be documented in the Final Environmental Impact Statement.

We did discuss the Titan Cement plant



within the context of additional workers. I believe it was 800 additional workers. And it would roughly coincide with the planned construction of the GLE facility.

So there would be an in~~m-~~migration of workers, and overall effects of bringing in additional workers, and we estimated it to be a small to moderate impact.

Now, I didn't see any language directly related to truck traffic, but I will do some further digging, and I will answer your response completely, and it will be in the Final Environmental Impact Statement.

FACILITATOR BURTON: Very good. Thank you, Jennifer.

All right, if there are no other comments, I'm going to ask Larry Camper to close us out.

MR. CAMPER: Thank you, and thank all of you again for coming out this afternoon, and I especially thank those of you who offered questions or comments.

In listening to some of the comments and questions, a couple of things struck me in terms of take-home assignments for us, as an organization, as the staff.

Clearly, Jennifer was just pointing out this issue of the Titan Cement project, and the related traffic, and any synergistic implications there, in terms of cumulative impacts.

Ellie, your point was well-~~–~~made. Jennifer gave you an answer for the moment, but that will be clearly addressed as part of the Final Environmental Impact Statement.

So we heard that point and that concern. I don't blame you, I wouldn't necessarily read the report, either. But your friend is going to do that, so you have a good source to turn to.

You mentioned the waste. You are right, the waste does not remain here. The waste that comes out of this type of facility is known as depleted uranium.

At some point it ceases to be an asset, because it can't be reprocessed further for additional enrichment recovery. At some point it does become a waste. That waste has been dispositioned to a commercial disposal facility, or through the Department of Energy, through a commercial disposal facility at the Nevada Test Site.

So the waste is not destined to stay here, that is correct. You mentioned safety and your concerns about safety. Hopefully, you believe us when we tell you that is our most paramount concern.

Construction of this facility will not take place until such time as all of our regulatory requirements have been met. There has been an exemption granted to allow certain pre-licensing activities to take place which is, predominantly, clearing of land to facilitate certain construction later.

But once our ~~S~~safety ~~R~~review is complete, there will be another public meeting that we will conduct, that will explain the outcome of the Safety Evaluation Review findings, as well as our Final Environmental Impact Statement, and the relationship between the two.

Similarly, once you have construction you proceed toward actually to build. We will also have a public meeting to discuss the inspection process that will be in place during the construction of the building.

And then subsequently, of course, any nuclear facility, whether it be this one, or any one that we regulate, all have ongoing regular inspection activities during the course of operations.

So I think those were some of the things that I heard in terms of our responsibility relative to either the Safety Evaluation Report, or the ~~E~~environmental ~~R~~review.

Again, we thank you for those comments, and we thank you for your time and attention in coming out today. Thank you very much.

(Whereupon, at 3:54 p.m., the above-entitled matter was concluded.)

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION
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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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GENERAL ELECTRIC-HITACHI

GLOBAL LASER ENRICHMENT FACILITY

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PUBLIC MEETING

+ + + + +

Thursday,

July 22nd, 2010

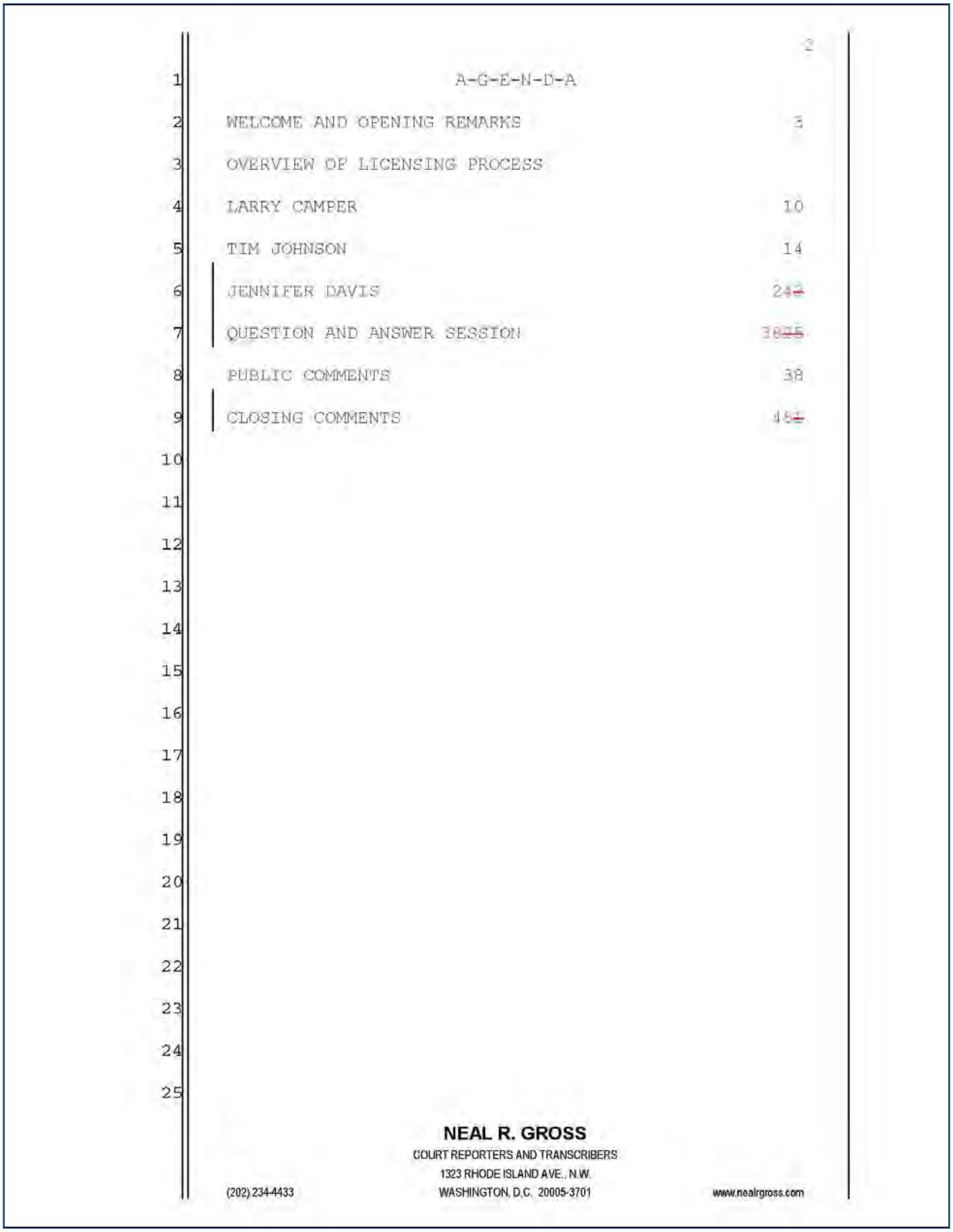
+ + + + +

Wilmington, North Carolina

The Public Meeting was held at 7:30 p.m., at the University of North Carolina Wilmington, 601 South College Road, Wilmington, North Carolina, William Burton, Facilitator, presiding.

APPEARANCES:

WILLIAM BURTON - Facilitator
LARRY CAMPER
TIM JOHNSON
JENNIFER DAVIS
KEVIN HSUEH
MICHAEL TSCHILTZ



A-G-E-N-D-A

P-R-O-C-E-E-D-I-N-G-S

7:30 p.m.

FACILITATOR BURTON: I think we will go on and get started. Good evening, my name is William Burton, and I'm with the U.S. Nuclear Regulatory Commission. And I will just say, right off the bat, William was my granddaddy, I generally go by Butch, just so you all know.

I want to welcome you here. And I have to do this. Just a quick show of hands. Raise your hand if you were here at the earlier meeting today. Welcome back, we do have a few new people. That is good, that is good.

I'm going to be serving as your facilitator, and in that role my job is to make sure that the meeting goes smoothly, and that it is efficient, effective, and that we get to accomplish our objectives, which are two-fold.

The topic of both meetings, today, concern the staff's evaluation of an application to build and operate a uranium enrichment facility here in Wilmington, using laser~~-~~-based technology.

That application was submitted by General Electric-Hitachi Global Laser Enrichment, LLC,~~.~~ ~~W~~which we will generally refer to as either as GE~~,~~ or the Applicant.

The purpose of tonight's meeting is, really, two-fold. First is an opportunity to discuss the staff's findings from the staff's ~~E~~environmental ~~R~~review of GE's application, and number two, to provide an opportunity for you, the public, to comment and provide feedback on the staff's draft findings.

The staff performed this review in coordination with other federal and state agencies, and reviewed the Environmental Report that was submitted by GE.

The draft findings are documented in the staff's Draft Environmental Impact Statement;~~,~~ ~~wi~~we'll hear that referred to as either an EIS, or a DEIS.

I want to talk a little bit about the format of the meeting, and also go over some ground rules to ensure that we have a good meeting.

The format of the meeting. First, what is going to happen is we are going to have a series of speakers who are going to discuss the roles and responsibilities of the staff, in its review. You are going to hear an overview of the licensing process, and then we will provide the Draft Findings from the staff's review.

After that, we are going to have a short Q&A session~~,~~ that is going to be an opportunity for you to ask us any questions you may have about the ~~E~~environmental ~~R~~review ~~P~~process.

And then after that, we are going to go into the main body of the meeting, which is an opportunity for us to listen to you, and hear any comments or any feedback that you may have about the staff's ~~E~~environmental ~~R~~review, and its ~~D~~draft ~~F~~findings.

A little bit about the ground rules. We do prefer that you hold your questions until after the presentations are made. We want to make sure that everybody gets a comprehensive overview of all of the issues that were involved in the review.

Your questions, we welcome your questions during the Q&A period, and we do have members of the staff available to answer those questions. And if you have any comments, again, on the ~~E~~environmental ~~R~~review, we prefer that you hold those until the comment period.

The entire meeting is being transcribed.~~,~~ ~~w~~We have our transcriber, Mr. Ed Johns, who does a fantastic job for us. But in order for us to get a clean transcript, we do request that there only be one speaker at a time, and to minimize the side conversations.

And that is because it is being transcribed, and we do want to make sure that we have a clean transcript in the end. We also want to make sure that each speaker has our full attention.

If you have any cell phones, if you could turn them off or put them on vibrate, that would be appreciated. Again, for reasons that we want to have a clean transcript.

I have been asked to let you know that there are certain places where you can park~~,~~ and where you can't park. If, by chance, you parked somewhere where you shouldn't have parked, and you get a ticket, Officer Albertson, who is not here right now, but if you find that you got a ticket, he has said to contact him, and he will make sure that he gets it taken care of.

And that is Officer Albertson, A-L-B-E-R-T-S-O-N, just in case.

Rest~~-~~rooms are off the hallway directly behind here, if you need to go. Hopefully everyone has grabbed a set of slides, presentation slides. If you haven't, we do have copies at the front table.

We do ask that, as people have varying

positions and views about the project --~~,~~ and you may hear comments that you don't agree with~~.~~ -- ~~B~~but we do ask that everyone treat each other with respect, and the speakers with respect.

That is always a way to ensure that we have a good, cooperative meeting. So any questions on anything I have said so far? Does it make sense?

(No response.)

FACILITATOR BURTON: Okay. Let's see. Next thing I want to do is to briefly introduce both the main presenters, and a couple of other people who play a big role in the staff's review.

Our first presenter is going to be Mr. Larry Camper. Mr. Camper is the Director of the Division of Waste Management and Environmental Programs. Let me say that~~,~~ again:~~,~~ Federal and ~~s~~State Materials and Environmental Management Programs. That is a mouthful. You can see I'm not used to it, we generally call that office FSME, so you may hear that. So you may hear that this evening.

Mr. Camper received his bachelor's degree in Radiological Science, and an MBA from George Washington University, and he has over 36 years of experience in the nuclear field, both public and private sector.

Currently, in addition to his position as division director, he also serves as the USA representative to the Waste Safety Standard Advisory Committee of the International Atomic Energy Agency in Vienna. He is also a member of the Board of Directors~~,~~ and Program Advisory Committee for the Waste Management Symposium. Mr. Larry Camper.

After Mr. Camper we will have Mr. Tim Johnson. He is the project manager overseeing the safety portion of the staff's review. Mr. Johnson is in the NRC's Office of Nuclear Material~~s~~, Safety and Safeguards, which we generally refer to as NMSS.

Mr. Johnson received his bachelor's degree in Mechanical Engineering from Worcester Polytechnic Institute, and his ~~M~~master's in Nuclear Engineering from Ohio State.

He has been with the NRC since 1977, and has worked in the areas of low level waste management~~,~~ and decommissioning. He also served as the safety project manager on the Louisiana Energy Services Enrichment project.

After Mr. Johnson we will have Ms. Jennifer Davis. She is the ~~P~~project ~~M~~manager overseeing the environmental portion of the staff's review for this project. Ms. Davis received her bachelor's degree in historic preservation and classic civilization~~,~~ from Mary Washington College.

And she has been with the agency since 2002. She has spent most of that time as a lead environmental project manager in the ~~d~~Division of ~~l~~License ~~r~~Renewal in our Office of Nuclear Reactor Regulation.

Those will be our primary presenters this evening. But in addition to them, I wanted to introduce you to a couple of key players in the review.

First we have Mr. Kevin Hsueh~~Shea~~, here ~~i~~on the end. He is the chief of the Environmental Projects Branch that is overseeing the environmental portion of the review. He is also in FSME.

And in addition, last but not least, we have Mr. Mike Tschiltz~~Schultz~~. Mike is the Deputy Director in the Division of Fuel Cycle Facility Licensing in NMSS. And it is his division that oversees the safety portion of the project.

So those are the main introductions. Before I have them come up to start their presentations, are there any questions, anything that I said that wasn't clear?

(No response.)

FACILITATOR BURTON: Okay. I will let Larry Camper start us off.

MR. CAMPER: I see some familiar faces from this afternoon, and I see some new faces. For those of you who were here today, welcome back, and for those of you this evening, we are glad to have you.

I'm Larry Camper.~~,~~ I'm the Director of the Division of Waste Management and Environmental Protection. And what I want to do is to make a few opening comments about our meeting this evening, and our process at large.

I do this because the responsibility for conducting Environmental Impact Statement falls within my division. We are developing the Environmental Impact Statement for the General Electric-Hitachi site. I will call it GEH tonight.

We are also, for example, currently conducting the Environmental Impact Statement for the AREVA~~Areva~~ Facility, which will be built in Eagle Rock, in Idaho Falls, a different uranium enrichment technology.

We are about to start the public scoping process for the development of the deconversion facility, which will be built by International

Isotopes, in Hobbs, New Mexico.

So we have a staff that is doing an awful lot of environmental work relative to uranium, and uranium enrichment, as well as other technical disciplines in the nuclear arena.

So the staff brings a lot of expertise to bear. We are here to conduct~~,~~ -- this is the second public meeting, as Butch pointed out~~,~~ -- to discuss our ~~E~~environmental ~~R~~review, of the General Electric-Hitachi facility.

And, as we step through the evening, Tim Johnson will talk to you more about the ~~S~~safety ~~R~~review side of issues, and then Jennifer will talk with you about the ~~E~~environmental ~~R~~review side.

So in terms of the Nuclear Regulatory Commission, what is our role in this? The Nuclear Regulatory Commission is an independent federal regulatory agency.

And by meaning independent, what I mean is we are empowered by the Atomic Energy Act of 1954, as amended, to carry out the oversight and regulation of the commercial uses of nuclear materials in the United States.

We report directly to the Congress of the United States, to Congressional Oversight Committees.

We are not part of the Executive Branch. Rather, we report directly to the Congress of the United States, through its oversight committees.

And we are empowered to make a number of decisions, in terms of regulating the commercial use of radioactive materials in the United States.

Our mission is to ensure protection of the public, and worker~~s~~ health and safety in the use of radioactive materials. We do not build, we do not operate, and we do not promote the use of nuclear power or nuclear materials.

Rather, we strictly regulate the oversight of the commercial uses of nuclear material in the United States.

Our involvement here, for this particular site, is that the General Electric-Hitachi Global Laser Enrichment, LLC, GEH, proposes to build a GE-Hitachi ~~g~~Global ~~l~~Laser ~~e~~Enrichment ~~f~~Facility nearby, on a property that is north of Wilmington. And Tim will tell you a lot about that during his comments.

To build that facility, and then to operate that facility, requires that a license be issued by our agency for that to take place.

And so the ~~S~~safety ~~R~~review, as well as the ~~E~~environmental ~~R~~review, and the Environmental Impact

Statement that we prepare, is the product to document that review, are a critical and essential part of the licensing process.

The ~~E~~environmental ~~R~~review activities that we carry out are designed to satisfy the National Environmental Policy Act of 1969, known as NEPA.

Our regulations, in implementing NEPA~~part of our regulations~~ are in 10 CFR Part 51. And the product that will document this major federal action~~,~~ is the Environmental Impact Statement.

So what we would like to do this evening, simply, is to present the results of the Draft Environmental Impact Statement, which was published recently, NUREG~~-~~-1938.

It makes for some very interesting reading. I think it is a very thorough analysis that is prepared by the staff, along with Argonne National Laboratory working for us.

And we want to, above all, get your comments. Today, a couple of times in my remarks, and I emphasize comments, I will do that again now. We like to have comments;~~,~~ that is the purpose for being here.

And, of course, everything that is being said tonight is being transcribed. We have our recorder, here, transcribing. The staff will go back and analyze all the comments.

We will go through the formal process of analyzing those comments, grouping those comments, and responding to those comments. So this is an opportunity to provide the staff with comments on the Draft Environmental Impact Statement.

Of course, the Draft Environmental Impact Statement is up for comment right now. I think the comment period closes August the ~~2~~9th, so you have an opportunity to provide written comments.

But tonight is another opportunity, so we do encourage you to please tell us anything on your mind of concern about the Environmental Impact Statement.

With that, I will stop and ask Tim Johnson, who is the project manager for this particular facility, to come up and talk to you about the licensing process, and the ~~S~~safety ~~R~~review process.

MR. JOHNSON: Thank you very much. This is considered one of our agency's major licensing actions, so I really appreciate the opportunity to talk to you this evening.

The objectives that I have are to give you a brief overview of the proposed ~~of the~~ GE project and, also, to talk about our licensing process.

General Electric is proposing to build an enrichment facility, using laser technology, at its site on the north side of Wilmington, on Castle Hayne Boulevard, near the intersection of I-140.

And the product from this facility will be used for fuel for nuclear power plants.

And how does this process fit in with overall fuel production? Well, first of all, uranium turns out to be very commonly found element in the earth's crust.

And there are a number of places in the world where the concentrations and deposits are high enough that it can be mined economically. And uranium is mined and processed, to separate it out from the rest of the rock in the ores.

And then it is chemically converted into a compound called uranium hexafluoride. And it is that compound that is sent to an enrichment plant for enrichment.

What GE is proposing here is to use a laser-based system, based on technology that was originally developed by the Australian company Silex Ltd. And in this process, it will separate isotopes of uranium 235 from uranium 238 isotopes, to increase the concentration of U-235.

And as you recall from your high school chemistry, and I hope that only brings back for you the most wonderful memories of your high school days.

But in your high school chemistry class one of the things that you learned was that elements normally contain more than one isotope.

And isotopes are ~~an~~ atoms that have~~e~~ the same amount of protons, but different numbers of neutrons. It would have the same chemical properties, in general, but have very different nuclear properties.

And for uranium, naturally occurring uranium~~,~~ has three primary isotopes~~,~~ associated with it; ~~—~~99.3 percent of that natural uranium is of the isotope U-238. About 0.7 percent is the uranium 235. And there is a smaller fraction is U-234.

But the important isotope here is U-235, because that is the only fissionable uranium nuclide that is found in nature. And to be useful in the power plants that we use in this country, the concentration of it needs to be increased from 0.7 percent, as it is found in nature, to about 3 to 5 percent, for use in the nuclear power plants.

These concentration levels are well below those needed to produce nuclear weapons.

The product from this facility, the enriched uranium, would then be shipped to a fuel fabrication facility, where it would be further processed into fuel pellets~~,~~ and loaded into fuel assemblies and, ultimately, shipped for nuclear power plants as fuel.

One of the fuel fabrication facilities in this country~~,~~ is the one that is operated at the Wilmington site, operated by GE. This plant has been making reactor fuel since 1967.

And this is one of the potential locations for the shipment of the enriched product from this enrichment plant.

This is the first application of a laser-~~-~~based system for enrichment.

And GE is approaching this as a two-phase project. The first phase is to demonstrate, for their business purposes, whether or not the approach can be used on a commercially viable basis.

And we issued GE a license, in May of 2008, to conduct laboratory scale testing in what is referred to as a test loop. And GE has been doing tests on this over the last year, and will continue to do testing on larger~~-~~-scale equipment~~,~~ that will be put into operation later this year, and into next year.

The NRC licensing process. Again, I want to re-emphasize what Larry talked about, and that is that NRC is an independent agency responsible for protecting public and worker health in the commercial use of radioactive materials.

And our jurisdiction extends to, primarily, to commercial uses of radioactive materials;~~,~~ it does not include DOE facilities~~,~~ and Defense facilities.

There are a couple of DOE activities that are, specifically, set aside by Congress for us to regulate, but that is the exception, rather than the rule.

There are also certain uses of radioactive materials that are regulated by individual states. We refer to these as ~~a~~Agreement ~~s~~States. And one of these ~~a~~Agreement ~~s~~States is the ~~s~~State of North Carolina.

And they have the authority to regulate the uses of radioactive material in hospitals, universities, research facilities, and within industry.

But that authority does not include the regulation of uranium enrichment plants. And that is why we are doing the licensing of it.

Another point that I want to emphasize is that NRC is not the promoter of this project. Our job is to regulate the health and safety aspects of the facility.

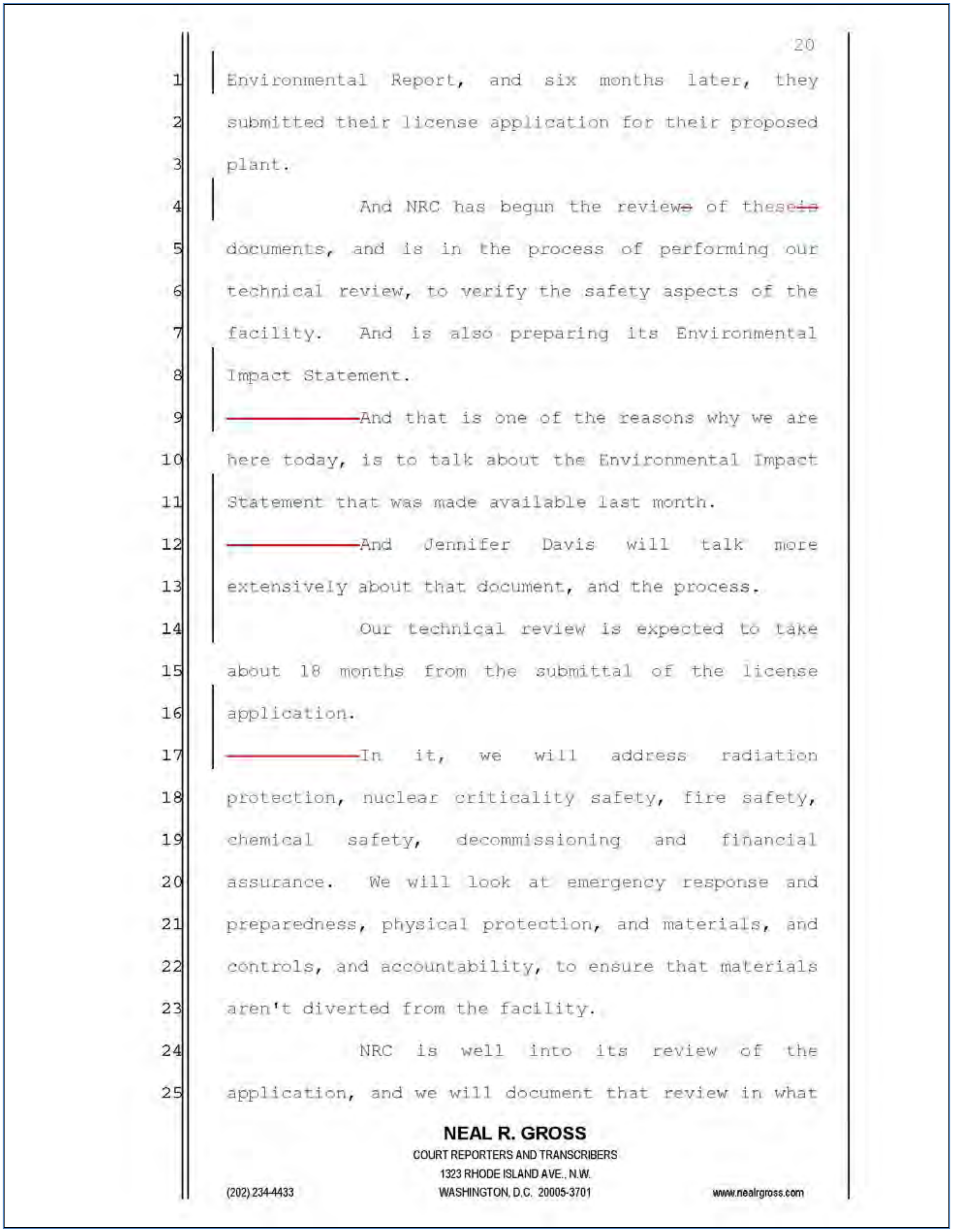
And we will grant a license to GE only if they can demonstrate that they meet our health and safety requirements.

One of the requirements for an enrichment plant is that construction cannot begin until a license has been issued.

And there may be some exceptions to this, for construction, that may take place outside of our jurisdiction, for example the clearing of land. But in the case GE does this kind of activity, they would still need to get any federal, state, or county permits as any organization that was taking on this type of construction activity.

The laser safety aspect of this project is outside of NRC's jurisdiction~~,~~ and is regulated within the Department of Labor, within the ~~s~~State of North Carolina.

In January of 2009, GE submitted an



Environmental Report, and six months later, they submitted their license application for their proposed plant.

And NRC has begun the review~~e~~ of these~~is~~ documents, and is in the process of performing our technical review, to verify the safety aspects of the facility. And is also preparing its Environmental Impact Statement.

And that is one of the reasons why we are here today, is to talk about the Environmental Impact Statement that was made available last month.

And Jennifer Davis will talk more extensively about that document, and the process.

Our technical review is expected to take about 18 months from the submittal of the license application.

In it, we will address radiation protection, nuclear criticality safety, fire safety, chemical safety, decommissioning and financial assurance. We will look at emergency response and preparedness, physical protection, and materials, and controls, and accountability, to ensure that materials aren't diverted from the facility.

NRC is well into its review of the application, and we will document that review in what we refer to as a Safety Evaluation Report. And our schedule is to complete the Safety Evaluation Report in December of this year.

Also associated with the uranium enrichment facility are two types of hearings. ~~And hearings fall under two categories.~~ The first one is a mandatory hearing~~,~~ that is required by law, for this type of facility.

And this hearing is held by a Licensing Board that consists of three Administrative Law Judges, and their objective is to review the Safety Evaluation Report that we generate, as well as the Environmental Impact Statement, and make a determination as to whether it is adequate to protect health and safety, and meet the legal requirements under the Atomic Energy Act~~,~~ and the National Environmental Policy Act.

Another category of hearings is, we refer to as a contested hearing. And this is a hearing that is intended to litigate contentions that are raised by members of the public.

In January of this year, the Commission issued an order initiating a licensing process, and also offering an opportunity for the public to petition for a hearing.

Sixty days were given to provide a response, but no petitions for a hearing were presented. So it looks like the only hearing that will be applicable to this plant is the mandatory hearing that I talked about.

And that would be conducted after we prepare the Safety Evaluation Report~~,~~ and the Environmental Impact Statement. And it would probably take an additional four to six months to complete, assuming the Board makes that its schedule.

The Environmental Impact Statement is an important document. And associated with that are opportunities for public input. We had, in May of 2009, a scoping meeting here in this facility, in which we asked the public to provide input on the areas that needed to be considered in the Environmental Impact Statement.

And a report was written of the scoping work that was done, and issued in November of last year. The next step is to issue the Draft Environmental Impact Statement~~,~~ and request public comments on it.

And that is the purpose of our meeting here, and Jennifer will discuss that in more detail. We also plan on conducting several other public meetings throughout the process.

When we publish the Final Environmental Impact Statement~~,~~ and our Safety Evaluation Report, we will come back here, again, and talk about the results of those documents.

If a license is ultimately issued, we would also come back to talk about the inspection program that the NRC will conduct for the construction and operation of this facility.

I have a couple of slides, here, of information and contact information. The NRC has a website with pages that specifically discuss uranium enrichment~~,~~ and the GE project, in particular. And I have given the addresses here on this slide.

And if you have any questions, I'm also providing some contact information for me and also for Jennifer Davis. Again, if you have questions regarding the licensing~~,~~ or the environmental process, you are encouraged to please contact either of us, so that we can answer those questions and respond to them.

Basically, what I have talked about here is an overview of the project, and our licensing process. And right now I will turn it over to Jennifer, who will talk more in detail about the

~~S~~environmental ~~R~~review.

MS. DAVIS: Thank you, Tim. My name is Jennifer Davis, I'm the Environmental Project Manager for the proposed GE-Hitachi Global Laser Enrichment Facility review.

I would like to thank everybody for coming out tonight, and giving us your feedback. As Larry stated earlier, under 10 CFR Part 51, the NRC's regulations that implement National Environmental Policy Act, ~~the National Environmental Policy Act,~~ the staff has prepared a Draft Environmental Impact Statement.

The proposed facility would be located in the north~~-~~-central sector of the existing GE property, near Wilmington, North Carolina. The actual site is approximately six miles north of Wilmington.

The map on this slide is contained in the Applicant's Environmental Report. The Environmental Report is submitted as part of the license application, and the Environmental Report provides a starting point for our review.

If you note, we provide a web link, and an ML accession number. And this is linked to our ~~a~~Agency~~-~~-wide ~~d~~Documents ~~a~~Access and ~~m~~Management ~~s~~System data~~-~~-base, called AD~~D~~AMS. This is a searchable data~~-~~base for public information, publicly available information regarding any environmental site, nuclear power plant site, enrichment facility site.

I would also like to note that the website~~,~~ and accession number for the Draft Environmental Impact Statement, are also given for reference at the end of this review. So if you take your handouts home you will have the web location, as well as the accession number for the Draft Environmental Impact Statement.

As Larry talked about~~,~~ earlier~~,~~ and touched upon, this slide is giving you a general overview of the process. The green box is currently where we are at in the process.

To just briefly recap, we received the Applicant's Environmental Report in January of 2009. The staff performed an acceptance review of that application~~,~~ and issued a *Federal Register* Notice of Intent to prepare an EIS and conduct scoping.

Scoping meetings were held in the Wilmington area in May of 2009, and the staff also began to engage with other federal, state, tribal, and local agencies.

From the public scoping meetings, we

gathered comments, and we developed a ~~s~~Scoping ~~s~~Summary ~~r~~Report, which was issued in November of 2009.

From the information that we gathered, from the consulting parties, as well as the Applicant's Environmental Report, Request for Additional Information input, we were able to identify and analyze the environmental impacts associated with this proposed action.

From there, we published an Environmental Impact Statement, and we issued the document on June 18th, 2010. The comment period started one week after that, with the EPA's Notice of Filing.

And today, we are actually here to collect your public comments on the document, that is the green highlight. Once we receive the public comments, we will address them, as necessary, and they will be published within our Final Environmental Impact Statement.

After the Final Environmental Impact Statement is issued, and the Final SER is issued, we will once again come out~~,~~ for an additional public meeting, to discuss the findings.

From there, the mandatory hearing would begin, and the licensing action, whether or not to issue or deny the license, would occur.

As shown on the slide, the main topics covered in this Draft Environmental Impact Statement~~,~~ include a description of the proposed action, along with its purpose and need; alternatives to the proposed action, including a no-action alternative, which is not building or licensing the facility; a description of the affected environment, a discussion of the direct, indirect, and cumulative impacts associated with the proposed action; cost and benefits, associated with the action, along with mitigative measures that the Applicant has proposed in order to minimize or avoid impacts to resources.

I will take a moment to just briefly describe what the definitions are for direct, indirect, and cumulative. Direct effects are effects that are caused by the proposed action, and will occur at the same time and place.

Indirect effects are those that are caused by the action, and are later in time, or further removed in distance, but are still reasonably~~e~~ foreseeable.

For cumulative effects, it is the sum total. You look at the action, look at other projects that are happening within the local vicinity, whether they be federal, non-federal, private or otherwise, and look at the sum total of the effects of all the projects together.

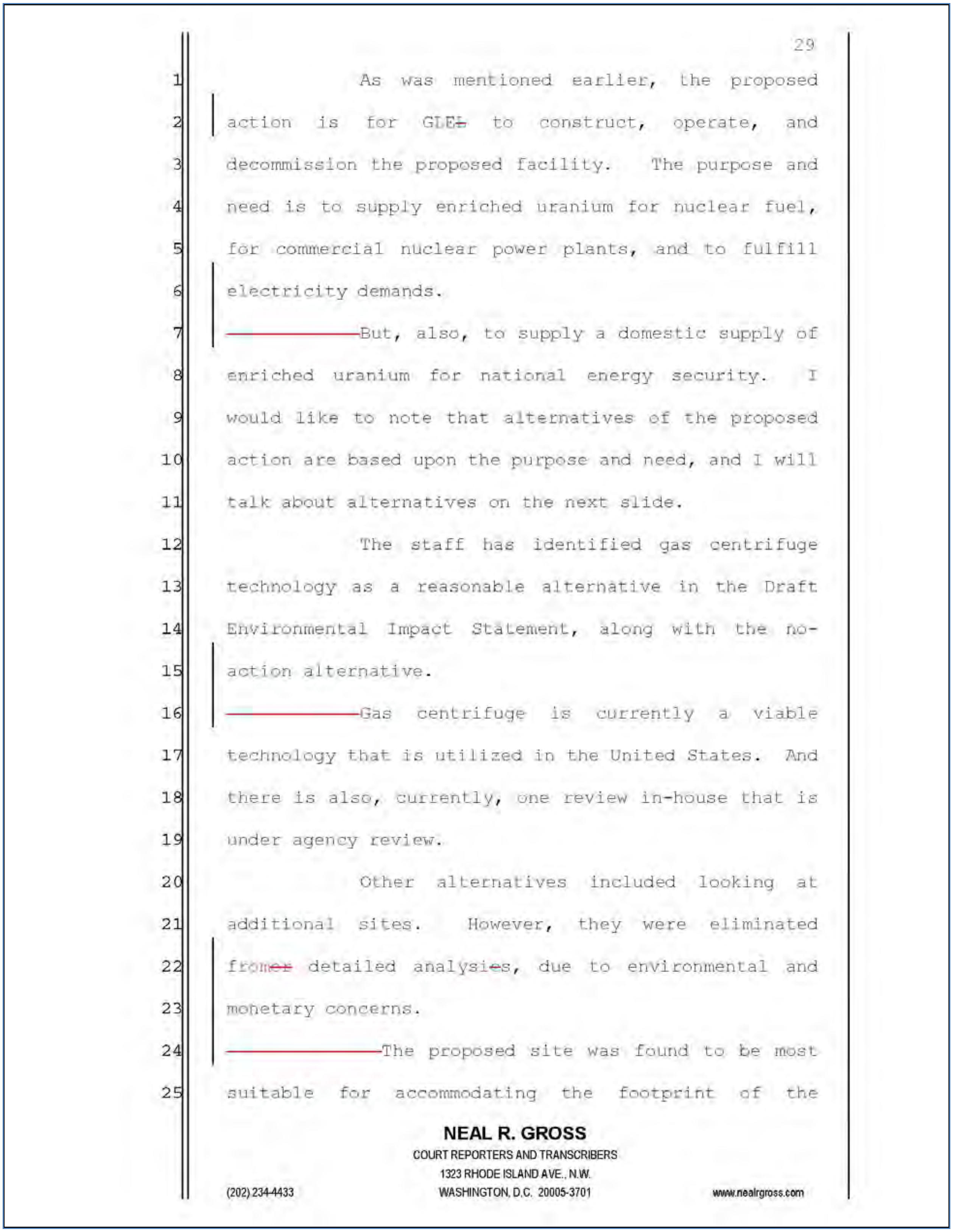
We are looking at the incremental effect of our proposed action, compared with everything else in the area.

Going on to the Cost Benefit Analysis, the analysis is providing a rationale for deciding whether or not a project is likely to have a net positive impact, by aggregating each of the costs and benefits resulting from the project.

Cost Benefit Analysis involves valuing the benefits, and costs, by showing them in monetary terms.

What is meant by mitigating measures?~~,~~ ~~i~~It is any measure that is taken by an Applicant, or another agency, to avoid, minimize, restore, or preserve, the affected environment, by reducing or eliminating the impact by preservation, or maintenance operations, during the life of the action.

And if you refer to Chapter 6 of the Draft Environmental Impact Statement, you will see a discussion of the monitoring programs proposed by the Applicant, as well as any mitigating actions that the Applicant has agreed to do.



As was mentioned earlier, the proposed action is for GLE~~L~~ to construct, operate, and decommission the proposed facility. The purpose and need is to supply enriched uranium for nuclear fuel, for commercial nuclear power plants, and to fulfill electricity demands.

But, also, to supply a domestic supply of enriched uranium for national energy security. I would like to note that alternatives of the proposed action are based upon the purpose and need, and I will talk about alternatives on the next slide.

The staff has identified gas centrifuge technology as a reasonable alternative in the Draft Environmental Impact Statement, along with the no-action alternative.

Gas centrifuge is currently a viable technology that is utilized in the United States. And there is also, currently, one review in-house that is under agency review.

Other alternatives included looking at additional sites. However, they were eliminated from~~er~~ detailed analysi~~e~~s, due to environmental and monetary concerns.

The proposed site was found to be most suitable for accommodating the footprint of the proposed facility, and results in fewer environmental impacts.

Other alternative technologies were also considered, but eliminated, the rationale was due to high energy requirements, slow production, high cost of energy concerns, or the technology has been superseded.

The NRC classifies impacts into three categories, small, moderate, and large. And by looking at the slide, ~~it is going to look,~~ you may ask what does this mean?

But these are the questions that we ask ourselves when we are, actually, compiling the information. When we think of small we are asking ourselves, is the effect minor?~~,~~ ~~i~~Is it noticeable?

For moderate, does the effect noticeably alter important ~~and~~ attributes of a resource? Large, does the effect destabilize important attributes of the resource. For example, an example that I would use is fish populations within a local waterway.

For a small impact the facility construction and operation would have no noticeable impact. You don't see an impact on populations, do you see a trend down?~~.~~ If you don't see anything, we generally think of that as a small impact.

A moderate impact, you see a population of fish that goes down, but it will level off, but it sustains at that lower level. A large impact is a population decreases ~~that~~and does not recover.

~~   ~~Whenever you have moderate or large impacts, mitigative measures are almost always called for.

The staff evaluated environmental impacts for each of these resource areas on the slide. The Draft Environmental Impact Statement addresses the impacts of construction, facility operation, ~~construction operation,~~ and decommissioning.

The resource areas, in bold, have small to moderate impacts, or moderate impacts altogether. What the ranges represent is that some impacts have moderate findings, but also had small pieces, small impact findings associated with them. So that is why you ~~do~~ see a range.

For transportation, the impacts to local -- local impacts range from small to moderate. This deals mainly with construction truck traffic, regional effects from the site preparation, as well as construction, are small.

Commuter traffic, considering work force and other special, you know, service employees, would be -- would have ~~a~~ small to moderate effects on local roads. Whereas regional impacts are expected to be small.

We also considered vehicular risks from accidents with trucks, and cargo-related risks from uranium cargo during construction, operations, and decommissioning. Both vehicular risks~~,~~ and cargo-related risks were deemed to be small.

Most construction activities would occur in areas that have already been disturbed by site preparation, and prior logging activities.

Impacts to vegetation would occur primarily from vegetation clearing, habitat loss, alteration of topography, change in drainage patterns, and soil compaction.

No wetlands would be directly impacted by construction of the proposed facility. However, three jurisdictional wetlands~~,~~ and one isolated wetland occur within the corridor of the revised entrance and roadway.

It is possible that the isolated wetland would be directly impacted, thus resulting in the loss, wetland loss. However, following state guidelines, it has been considered that the wetland is of low value.

Also it has been determined that the road may not impact the three jurisdictional wetlands.

Impacts on wildlife, from construction, could include habitat disturbance, wildlife disturbance, injury or mortality of wildlife.

Habitats within the footprint disturbed by construction~~,~~ would be reduced, altered, and construction activities would result in habitat fragmentation.

Construction would also cause a loss of habitat, which could result in long-term reduction in wildlife, abundance, and richness.

No population~~-~~-level impacts would be expected on any federally listed, threatened, endangered, or other special status species from construction activities.

Similarly, no population level impacts would be expected to any ~~s~~State~~-~~-listed species. No environmentally sensitive areas would be impacted by operations, either.

For the staff's air quality analysis, we focused on emissions associated with the life span of the entire project, which includes access road construction and clearing, building construction, start-up, and final construction, along with operations.

Air quality impacts would be the highest during road construction, land clearing, and building, ~~.~~ ~~A~~and, thus, were assessed as moderate, because of fugitive dust emissions. However, the impact would be temporary in nature.

The Applicant has committed to take mitigative measures to limit dust emissions. Impacts during plant operations are small, as no criteria pollutants would be generated, because no combustion is involved.

Most noise would be generated during land clearing activities, and construction activities associated with the site. Impacts on the nearest residences, during this time of road construction, could be moderate. The primary construction noise source would be from diesel engines. Noise impacts during operations are expected to be small.

Section 106 of the National Historic Preservation Act~~,~~ requires all federal agencies to consider the effects of their undertakings on historic properties. The study area, which is commonly called the area of potential effect, is comprised of 263 acres. Construction would take place on this ground that has been previously disturbed by logging activities, and site preparation activities.

In preparation for the license application GE conducted a study of the area in 2008. No construction activities are expected to occur in any portion of the Wilmington site where historic and cultural resources are present.

No sites are known to exist within the study area. However, GE has developed a plan for addressing unanticipated discoveries.

During GE's initial site survey, an archeological site was identified within the area of potential effect, which -- and it was determined to be eligible for listing on the National Register of Historic Places.

However, since GE has revised their roadway entrance, this archeological site is no longer within the area of potential effect~~,~~ and would not be affected by facility construction~~,~~ or land clearing activities.

However, since it was identified, during the course of the NRC's review, the SHPO has requested that GE develop a management plan for the site. Consultation is ongoing. Therefore, the impacts range from small to moderate.

The NRC staff has preliminarily concluded that the overall benefits of the proposed GLE~~L~~ facility outweigh the environmental disadvantages and costs, based on consideration of the following.

The need for an additional, economical, domestic source of enrichment services, and the environmental impacts from the proposed Action are generally small, although they could be as high as moderate in the areas of historic and cultural resources, ecological resources, noise, and transportation.

Therefore the NRC staff preliminarily recommends that unless safety issues mandate otherwise, the proposed license be issued to GEL. In this regard the NRC staff has concluded that the environmental impacts are generally small.

And taken in combination with the applicable environmental monitoring programs~~,~~ and proposed mitigation measures~~,~~ would eliminate or substantially lessen any potential adverse impacts associated with the proposed action.

On this slide, we have various web links. And the first link is to the document itself, the Draft EIS. If you click on this link, it will take you to the PDF file that is located at our website, nrc.gov.

The second bullet is a link to the AD~~B~~AMS reading room, and the acc~~es~~ession number for the Draft EIS is presented there. Also CD copies, as well as a paper copy, are located at the New Hanover County Library in Wilmington.

This slide just contains additional information about the process. Also in our AD~~B~~AMS data base, should you perform a search, we recommend that you use the docket number. And it is pointed on the slide as 70-716.

This will help you pull up documents related to the review, in AD~~B~~AMS. At the bottom of the slide is our contact information. If you have questions regarding the ~~S~~safety ~~R~~review, please contact Tim Johnson, at the phone number and email listed on the slide, and I have also provided my own contact information.

As Larry stated, earlier, the main purpose of tonight's meeting is to listen to you, and to gather your comments on the Draft Environmental Impact Statement.

Many -- well, we had many this afternoon. Many of you may have signed up already to speak.

However, if you are not comfortable speaking in front of a large crowd, or you need to leave early, there is a table at the back of the room.

You can write a comment and we can hand it over to the court reporter as well. Or, if you think of something later, please feel free to send us an email at the address provided. You could submit them on line, mail them, fax them, whatever.

And one other item I forgot to mention, our comment period does end on the 9th of August. Thank you.

FACILITATOR BURTON: Thank you, Jenny, thank you Tim, thank you Larry.

That concludes the staff's presentations. We are now going to take some time to answer any questions that any of you may have about what you have heard, the review process in general.

If anyone has a comment, just raise your hand, I will bring you the microphone, let us know who you are, and ask your question. Anybody?

(No response.)

FACILITATOR BURTON: No questions. So everything was crystal clear? Thank you.

PMT-2-001-1

MS. DAWSON: Simple clarification. My name is Beth Dawson. You mentioned about the mining

PMT-2-001-1

of uranium. Where is -- is that going to be brought into this site, or where is that done?

MR. JOHNSON: I'm sorry, I didn't quite get the question. Where is the mining of uranium done? It is done in a number of places across the world. In 2009 Kazakh~~-~~stan became the highest producing country of uranium.

Canada had been the previous highest producer for many years before that. The third largest producer is Australia. There is also a fairly significant production in Namibia, in South Africa.

The United States only produces about three to four percent of the total uranium that is generated every year. But most of it comes from Canada, Kazakhstan, and Australia.

PMT-2-001-2

MS. DAWSON: It will be shipped via ports, or rail, or --

MR. JOHNSON: At the mine it comes out as ore, or as a liquid if they are dissolving the uranium, in an in-situ~~NC2~~ process, that is a process to separate out the rock, the non-uranium components of it.

And it comes out as a powder that is generally referred to as yellow~~-~~cake. The compound is~~,~~ essentially~~,~~ U_3O_8. And it is that compound that goes to a conversion facility, what we call a conversion facility, where it is chemically converted from the oxide into uranium he~~a~~xafluoride.

Uranium in these deposits varies quite a bit in terms of the concentrations. Most mineable concentrations are, you know, in the tenths of a percent uranium.

Some of the deposits in Canada go up over 25 percent uranium, which is a very high concentration. And in these cases, the mining is actually done remotely, with remote equipment, because the radiation levels inside the mine are so high.

FACILITATOR BURTON: And just for clarification, it is in that uranium hexafluoride form that it will be coming onto the proposed Wilmington site?

MR. JOHNSON: Yes. The compound that is used within the enrichment plant~~,~~ is uranium hexafluoride.

PMT-2-001-3

MS. DAWSON: How will that, I mean, you didn't clarify how it is going to be transported to here.

MR. JOHNSON: Uranium hexafluoride comes in, in 14-~~-~~ton steel cylinders. It is a solid at room temperature~~,~~ and atmospheric pressure. If you raise the temperature slightly, and lower the pressure, it sublimes off the solid as a gas.

And that is the proposed approach for using, for feeding the uranium into the process here. If you increase the temperature further, it can melt to produce a liquid.

But the only place in this facility where uranium hexafluoride is proposed, as it is proposed, would be a liquid ~~would be~~ in a sampling system, where they would heat the product in a pressure vessel, and so that you can get a liquid sample of it.

When uranium hexafluoride, in order to get a representative sample, you need to convert it to a liquid, and drain the liquid off, so that it becomes a homogenous material.

And the samples are taken, and assays are done to ensure that it meets the customer specifications.

And just one other thing. In the transportation section, in the Draft Environmental Impact Statement, does ~~we~~ get into a discussion~~, at all,~~ about the transportation methods, and how it comes on-site. So if you go to the Draft Environmental Impact Statement you can probably get more.

Or if you want to discuss it more, after the meeting, we can do that.

FACILITATOR BURTON: Good question, thank you. Other questions? Good, we are starting to roll now.

MR. SPARKS: I don't know if this is the right point for this, but I'm Ronald Sparks, for the court reporter. I'm a Wilmington City Councilman, and I'm a physicist, and a professional engineer, so this stuff is down my alley.

PMT-2-002-1

The things I wanted to say to you all, for the record, is to thank you all for the process. As you stated earlier in your comments, your mission is not to promote nuclear energy.

Your mission is the safety of our area, and that is mission-critical to us on the City Council, and we are glad~~,~~ you made that clear in the very first meeting that we had a year ago.

And I encouraged you then to follow your process~~,~~ and make sure that the product and the systems that are installed here will be safe for our citizens.

Because the other issue, as a politician, that we get into is jobs. This facility is going to bring significant high earnings potential to our area.

PMT-2-002-1

GE has been a good neighbor to us, as far back as I can remember. I'm a native of Wilmington, so I remember when the plant was put there.

And, just in general, to give you all a statement of support. It is dangerous for a politician to go out and say, yes, I support you, in this, in my town here, because sometimes folks get excited.

But I want to let you know that I support the project, I'm fully aware how the uranium hexafluoride process works, and I'm glad to see that your number-cruncher indicated that the other process, which was used in Oak ~~r~~Ridge, it is time to move on to a better process. It is high energy draining, and this process is much more controllable.

And I really appreciate~~,~~ Wilmington, North Carolina being put on the map as the world leader in this new process. And with that, that is it. Wish you all luck.

FACILITATOR BURTON: All right, thank you. I think Councilman Sparks got a little bit ahead of us. I think that was actually very good for our comment period.

Perfectly fine, I think the timing was pretty good, because I don't think we are going to have any more questions.

So we are now going to go into the comment period, and I think Councilman Sparks led us off. This is an opportunity for you all to give us input, provide comments to us.

We are in listening mode now. Anything that you would like to share. What I will do is, if any of you do have a comment, I will put the mic~~ke~~ here, you can come up and speak.

After you speak, since whoever comes up hasn't signed up already, I will give you a yellow card that you will need to fill out, to make sure that we have your name correct on the transcript.

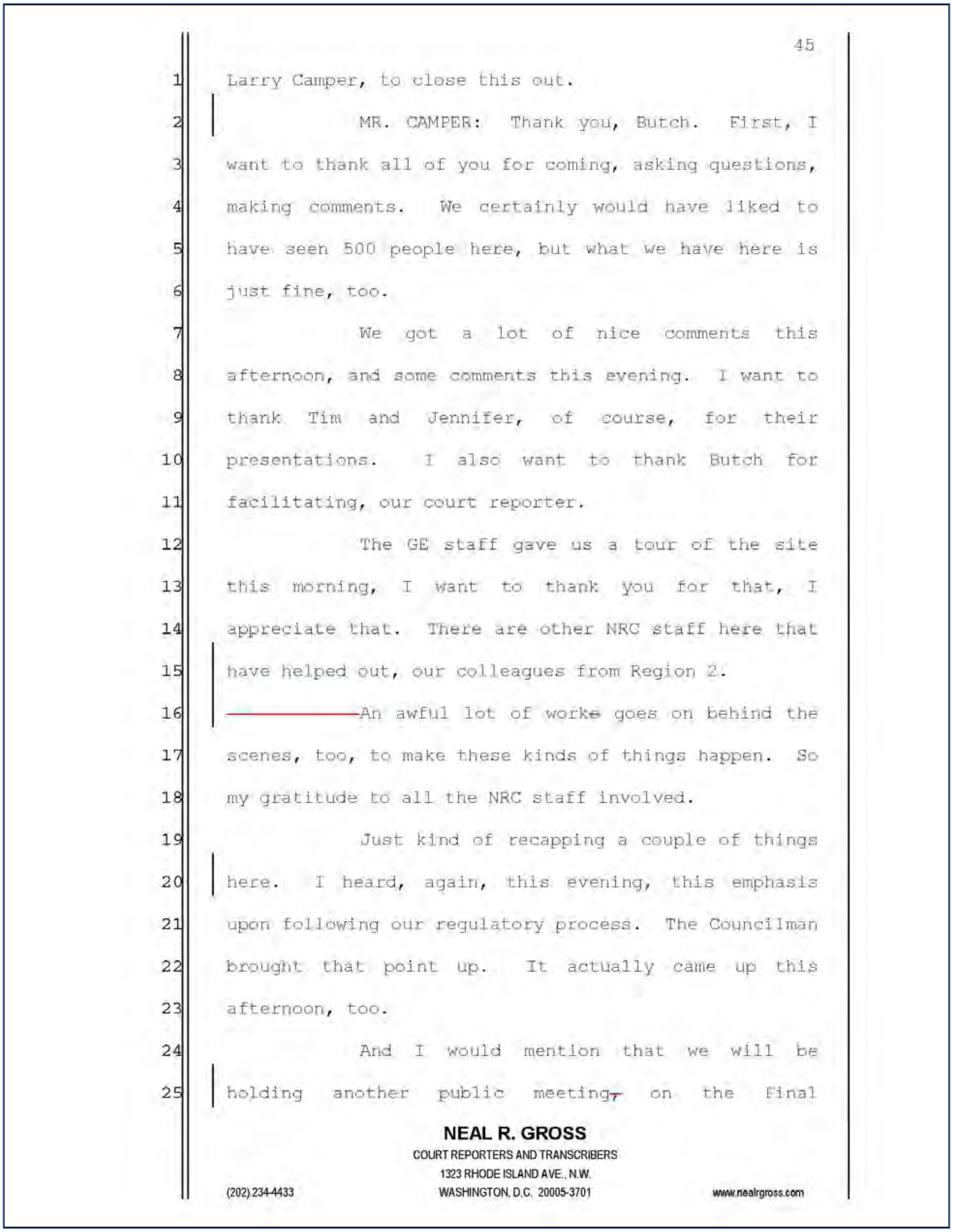
So do we have anyone who would like to come and give comments?

(No response.)

FACILITATOR BURTON: No comments at all, okay. Well then I guess what I will do is we are going to wrap up.

One last thing is that we are always trying to improve our meetings, and so one of the things that we have is a meeting feedback form, which we have on the table up front. We really appreciate your comments, if any of you would like to give any.

And with that, I will turn it back over to



Larry Camper, to close this out.

MR. CAMPER: Thank you, Butch. First, I want to thank all of you for coming, asking questions, making comments. We certainly would have liked to have seen 500 people here, but what we have here is just fine, too.

We got a lot of nice comments this afternoon, and some comments this evening. I want to thank Tim and Jennifer, of course, for their presentations. I also want to thank Butch for facilitating, our court reporter.

The GE staff gave us a tour of the site this morning, I want to thank you for that, I appreciate that. There are other NRC staff here that have helped out, our colleagues from Region 2.

An awful lot of work~~e~~ goes on behind the scenes, too, to make these kinds of things happen. So my gratitude to all the NRC staff involved.

Just kind of recapping a couple of things here. I heard, again, this evening, this emphasis upon following our regulatory process. The Councilman brought that point up. It actually came up this afternoon, too.

And I would mention that we will be holding another public meeting~~,~~ on the Final

Environmental Impact Statement~~,~~ and on the Safety Evaluation Report.

Should a license be issued to General Electric-Hitachi to build this facility, then there will a public meeting to discuss the inspection process associated with that construction process, and the actual inspecting thereof.

And then, of course, there is an inspection process that goes on for this facility, or any facility, while conducting nuclear operat~~I~~ions.

We had an ~~e~~inquiry this evening about the uranium being shipped to the facility. And Tim provided an explanation about uranium, ~~uranium~~ U_3O_8, uranium hexafluoride, the form in which it comes here.

But it comes here in the cylinders, of course, that he mentioned in his comments.

Earlier today, for the benefit of those of you who were not here, and Councilman you may be particularly interested in this, sir.

It was brought up this afternoon about the Titan Cement plant and some concerns that at least one citizen, or two citizens had. Some of the concerns about the synergistic impacts that might take place between those two facilities in particular, trucking, and trucks passing each other, and so forth and so on.

So transportation, primarily, was the concern. There was a question raised about the waste, and the fact that the waste would not remain on this site. That is correct;~~,~~ ultimately, the depleted uranium would be removed for commercial disposal.

And Jennifer, in looking at the questions raised by transportation, what sections of the document did you find for the transportation being better defined?

MS. DAVIS: Transportation is addressed in section 4.2.10, in the impact section and also, I believe, it is 3.2.10 in ~~c~~Chapter 3. Chapter 3 is the affected environment, and ~~c~~Chapter 4 the impacts associated with the proposed action. I will double check that real quick. And cumulative effects. It is also evaluated in cumulative effects.

MR. CAMPER: With that, again, I would thank all of you for coming out. It is an important part of the process. We have two interns with us this evening, they are working at the GE plant as well. I hope you find this enlightening.

And it is always nice to see the next generation of us coming along. And so, again, thank you all for coming out, thank you for your comments and your questions, and good evening.

(Whereupon, at 8:30 p.m., the above-entitled matter was concluded.)

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(See instructions on the reverse)

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10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

On January 30, 2009, General Electric (GE)-Hitachi Global Laser Enrichment, LLC (GLE) submitted an environmental report to the U.S. Nuclear Regulatory Commission (NRC) for a license to construct and operate the GLE Global Laser Enrichment Facility. GLE submitted the remainder of the license application on June 26, 2009. The proposed GLE Facility would be located in the North-Central Sector of the existing GE property near Wilmington, North Carolina. The proposed GLE Facility, if licensed, would enrich uranium for use in manufacturing nuclear fuel for commercial power reactors. Feed material for the proposed GLE Facility would be comprised of non-enriched uranium hexafluoride (UF6). GLE would employ a laser-based enrichment process to enrich uranium up to 8 percent uranium-235 by weight, with an initial planned maximum target production of 6 million separative work units (SWU) per year. The proposed GLE Facility would be licensed in accordance with the provisions of the Atomic Energy Act. Specifically, an NRC license under Title 10, "Energy," of the U.S. Code of Regulations (10 CFR) Parts 30, 40, and 70 would be required to authorize GLE to possess and use special nuclear material, source material, and byproduct material at the proposed GLE Facility site.

This environmental impact statement (EIS) was prepared in compliance with the National Environmental Policy Act of 1969, as amended, and the NRC's regulations for implementing the Act (10 CFR Part 51). This EIS evaluates the potential environmental impacts of the proposed action and reasonable alternatives and responds to public comments.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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