



Modernization and Revitalization of Barge Berths

North Carolina State Ports Authority

Port of Morehead City

2024 Port Infrastructure Development Narrative

May 10, 2024



Required Field	Modernization and Revitalization of Barge Berths Project
Name of Applicant	North Carolina State Ports Authority
Is the applicant applying as a lead applicant with any joint applicants?	No
Project Name	Modernization and Revitalization of Barge Berths
Project Description	Modernization and Revitalization of Barge Berths project will rebuild the barge berths at the Port of Morehead City in the area of the port used by Nutrien; this investment will extend the life of the barge berths for fifty years and allow Nutrien to continue serving worldwide customers via barge and keep cargo off highways and railroads.
Is this a planning project?	No
Is this a project at a coastal, Great Lakes, or inland river port?	Coastal Port
Is this project located in a noncontiguous State or U.S. territory?	No
Geographic Coordinates (in Latitude and Longitude format)	34.72200, -76.69629
Is this project in an urban or rural area?	Rural
Project Zip Code	28557
Is the project located in a Historically Disadvantaged Community or a Community Development Zone? (A CDZ is a Choice Neighborhood, Empowerment Zone, Opportunity Zone, or Promise Zone.)	According to the USDOT Project Location Verification Tool, the project is in a Rural Area, Historically Disadvantage Community, and Area of Persistent Poverty.
Has the same project been previously submitted for PIDP funding?	No
Is the applicant applying for other discretionary grant programs in 2023 for the same work or related scopes of work?	RAISE FY2024, same scope as this PID project
Has the applicant previously received TIGER, BUILD, RAISE, FASTLANE, INFRA or PID funding?	FY2021 and FY2023 PID funding; FY2022 RAISE funding
PIDP Grant Amount Requested	\$14,921,158
Total Project Cost	\$18,887,540
Total Federal Funding	\$14,921,158
Total Non-Federal Funding	\$3,966,382
Will RRIF or TIFIA funds be used as part of the project financing?	No

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Project Description

The North Carolina State Ports Authority (the “Authority”) requests PID funding to upgrade barge berths and return cargo handling to full capacity and efficiency at the Port of Morehead City (the “Port”). The North and the East Barge Berths of the Phosphoric Acid Terminal have been in operation for over 56 years, and without the ***Modernization and Revitalization of Barge Berths*** project, these berths will be fully closed within the next few years. The project aims to protect Port assets, restore cargo handling with purpose-built and resilient infrastructure, and eliminate the need to divert cargo to other modes of transportation.

The Port of Morehead City is one of two deep water ports owned by the Authority, integral to the global supply chain needs of the region’s businesses, offering bulk, breakbulk, specialty cargo, and warehousing services that connect the state with the global economy. Located four miles off the Atlantic Ocean, within 700 miles of more than 70% of the US industrial base, and with over one million square feet of covered storage, the Port is well poised to address current and future cargo needs. Rail service, including on-dock rail, is provided by Norfolk Southern and a short line railroad, Carolina Coastal Railway. In FY23, the Port of Morehead City facilitated the movement of nearly 1.4 million short tons of bulk and breakbulk cargo, reflecting 12% year-on-year growth.¹ This growth was driven in large part by agricultural commodities, such as fertilizer, grain, feed, and forest products.

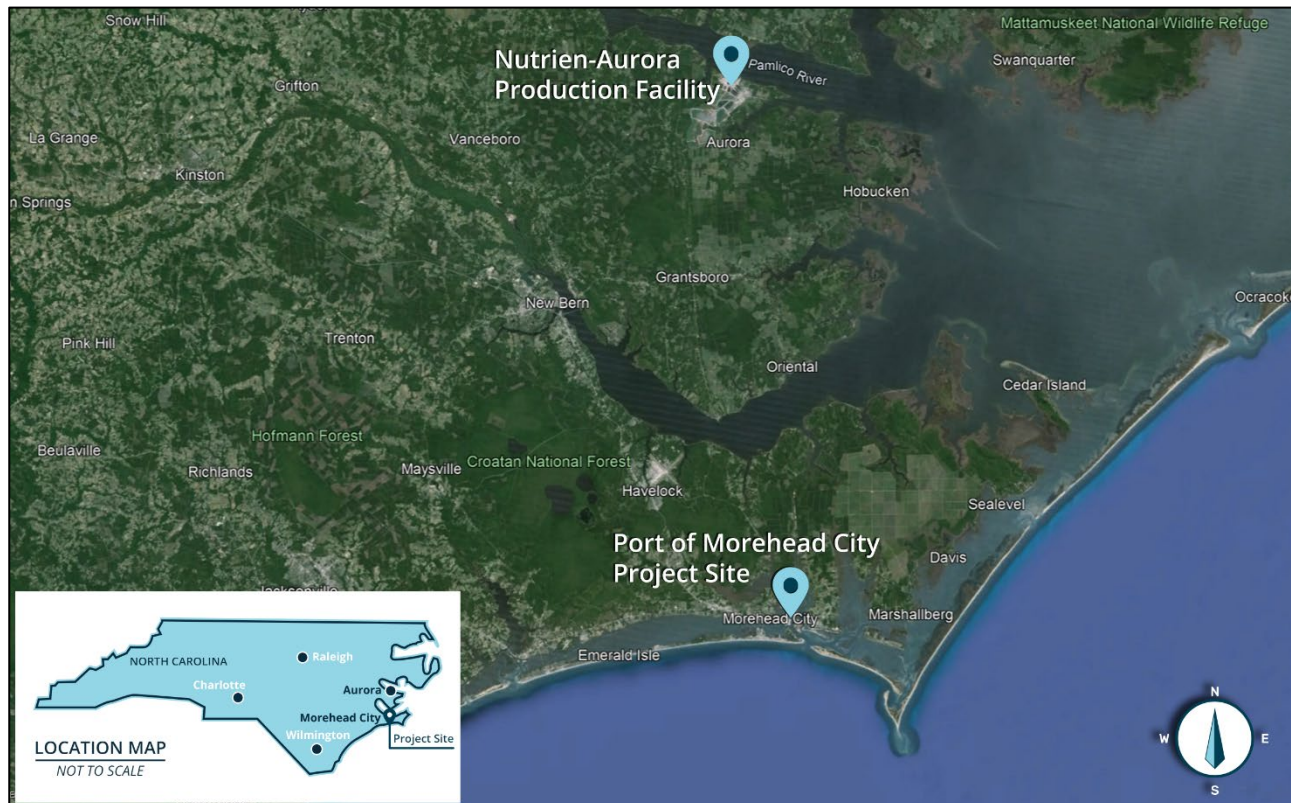


Figure 1. The project at the Port of Morehead City will support the Port's largest tenant, Nutrien, which ships cargo from their production facility 57 nautical miles upriver in Aurora.

¹ [North Carolina Ports 2023 Annual Report.](#)

The barge berths at the Port’s Phosphoric Acid Terminal are leased by the Port’s largest tenant by volume: Nutrien, commonly called PCS, which is the world’s largest provider of crop inputs and services, primarily shipping dry and liquid fertilizer products through the Port. Nutrien is the Port of Morehead City’s oldest and most trusted customer. The phosphate deposit was discovered in Aurora, North Carolina in 1955 and was developed primarily by the Texas Gulf company, known for its sulfur mining operations in Texas. PotashCorp (PCS) bought it from Texas Gulf in 1995 and then Nutrien acquired it from PCS in 2018.

The Nutrien mine and plant is located on the Pamlico River in Aurora, North Carolina, and barges move its export material to market via the Atlantic Intracoastal Waterway, designated as Marine Highway 95 (M-95) through the deep-water port at Morehead City. The Port completed construction of purpose-built barge berths directly adjacent to phosphoric acid storage infrastructure to support these global export operations in 1968. Well-engineered berths of this type have a life expectancy of approximately 50 years; the existing barge berths are now 56 years old. Nutrien is the second-largest producer of phosphate in North America. Nutrien’s Aurora plant is located in rural eastern North Carolina and is one of two large integrated phosphate facilities in the United States. Nutrien is the area’s largest employer, with nearly 1,000 permanent and 1,000 contract employees; in 2023, Nutrien contributed \$250 million in spending to the state and \$8 million in state and

local taxes. The mine produces approximately five million tons of phosphate ore a year, which the plant turns into approximately one million tons of phosphoric acid. Phosphate is a key nutrient to grow food, raise livestock, and produce commodities like toothpaste, vegetable oil, and jams. These operations support regional agriculture industries in the U.S. and exports through the Port of Morehead City help to feed the rest of the world.

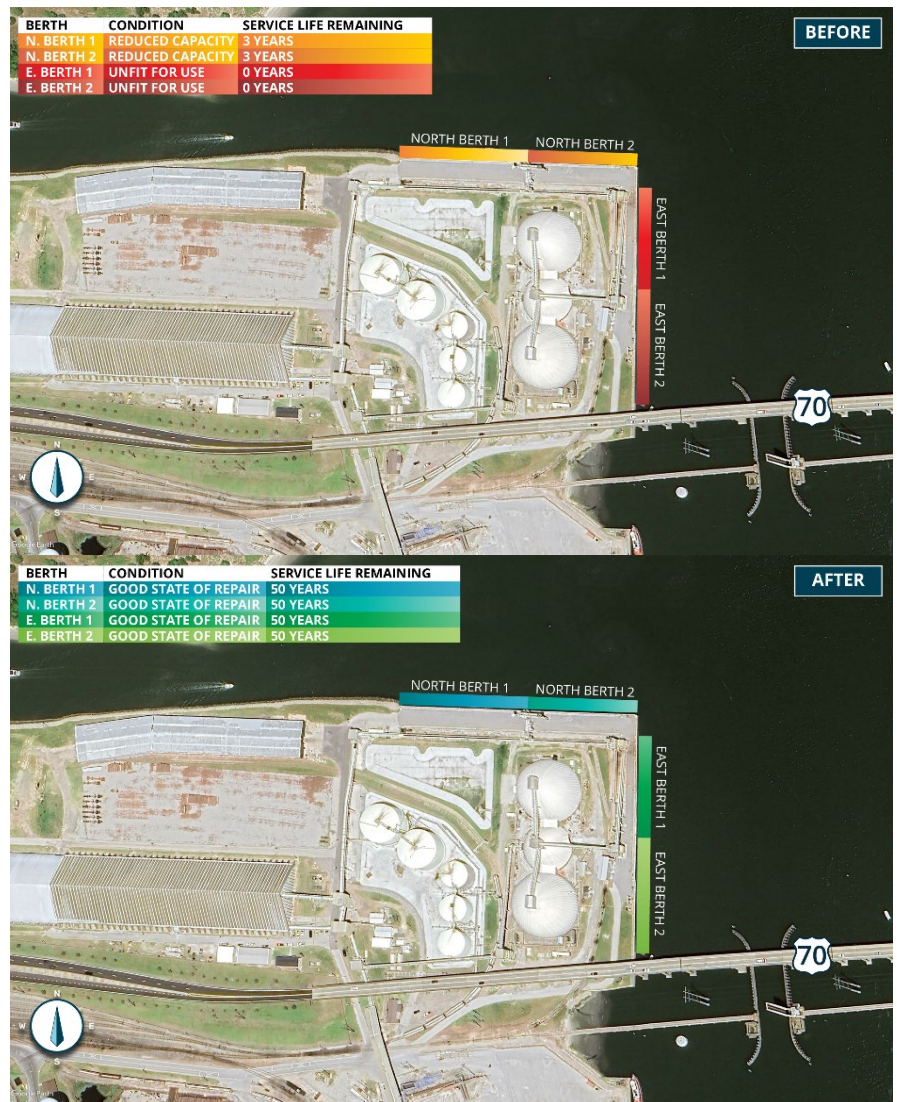


Figure 2. Without the Project, all barge berths at the terminal will be too unsafe to use within the next three years.

In May 2022, Nutrien conducted a stability analysis of the terminal's eastern bulkhead. This analysis found that **most of the bulkhead has already reached the end of its useful life with failure of the remaining components imminent**. As a result of these findings, the East Barge Berths, which formerly accommodated liquid barges, have been closed and the North Barge Berths, which accommodates dry barges, are currently operating at reduced capacity and will be closed by 2027 due to safety concerns.

Scope of Work

The existing bulkhead consists of a Z-type sheet pile with a reinforced concrete cap that provides protection and stability against the aggressive marine environment. The 2022 stability analysis report revealed substantial corrosion in the sheet piles, as well as extensive voids, porosity, and reinforcing steel loss in the concrete cap at multiple locations. The bollards across the terminal's barge berths have exhibited moderate to severe corrosion, and existing fenders lack sufficient thickness to properly absorb berthing impact energy. Additionally, a geotechnical report from August 2023 revealed signs of scouring at the southeast and northeast corners exceeding 40 feet below the mean low water level. The *Modernization and Revitalization of Barge Berths* project will address these compounding deficiencies to restore the Port's currently limited cargo handling capabilities.

The proposed project will construct new sheet pile bulkheads in front of the existing bulkheads at the North, East, and South Barge Berths (the South Berth does not accept cargo and functions as a stabilizing area). The project scope also includes the installation of a modern anchorage system, including a redesigned concrete cap, high-performance fenders, and upgraded mooring hardware to enhance barge berth stability. The project will also refurbish existing appurtenances such as trestles, fixed cranes and hoists. The project improvements will stay within the footprint of the existing bulkhead and do not include changes to utilities, stormwater infrastructure, or site drainage.

The length of the proposed bulkhead is approximately 1,496 linear feet and will consist of steel sheet piles. The bulkhead is designed to handle a mooring load of 18 tons for design vessels with dimensions of 260' x 52' x 14'. The existing timber bull rail on the East Barge Berth will be replaced with a new yellow fiberglass rail to enhance site safety. Existing bollards will be field cleaned using abrasive material to eliminate flaked steel, rust, and existing coatings. Subsequently, new three-part marine coatings will be applied for corrosion protection. Riprap will be installed on the ground below to prevent further scouring at the southeast and northeast corners of the bulkhead.

Transportation Challenge

The East Barge Berths have been removed from service due to safety concerns. Without this project, the North Barge Berths will also be removed from service sometime during the next three years. The Phosphoric Acid Terminal was purpose-built to accommodate this cargo, with liquid storage tanks and dry storage silos, manifold and conveyor systems, and high-strength "booster pumps" on-site. Without the ability to access the barges berths at the terminal, Nutrien must use other berths at the Port, undertaking additional operational costs and navigating significant inefficiencies, as well as increasing port congestion and delaying other vessels.

Nutrien is currently using Berth 1, as marked in Figure 3, to offload the liquid barges that formerly used the East Barge Berths. This liquid cargo must be pumped to the storage tanks, a distance approximately three times farther from Berth 1 than under normal operations and

without the specialized equipment at the East Barge Berths. Nutrien is currently renting loading equipment at Berth 1, in addition to using barge pumps to maintain liquid operations, which is costly and generates unnecessary wear on its barge fleet.



Figure 3. Without the Project, liquid barges are required to navigate beneath the Newport River (US 70) Bridge to Berth 1, where cargo is pumped 1,400' (280%) farther using rented equipment that is less efficient with more safety risks.

The North Barge Berths are restricted to unloading only one barge at a time due to near-term stability concerns at either end of the bulkhead. However, after the year 2027, the risk of failure will be too great, and the barge berths will be closed completely. Due to the large volume of liquid barges that would already be traveling the narrow marine passage under the Newport River Bridge and using the Port's other berths, along with all other Port tenants on a first-come, first-served basis, it will not be viable to continue transporting dry cargo by barge after the North Barge Berths' failure. Diversion to rail is also significantly constrained by limited capacity at the Port, which would result in the majority of this hazardous cargo being transported by truck along a 70-mile highway route to reach the Port. This diversion would mean over 26,000 additional truck trips each year would travel through the rural, disadvantaged community of Morehead City, which has a population under 10,000. In addition to noise pollution and roadway deterioration, additional truck traffic would lead to substantial increases in freight costs, greenhouse gas emissions, highway congestion, and the risk of crashes resulting in property damage, injuries, and fatalities.

The ***Modernization and Revitalization of Barge Berths*** will restore the terminal bulkhead to a state of good repair, restoring its full barge berthing capacity and keeping this cargo moving by marine highway versus surface transportation. The project is anticipated to produce over \$60 million of benefits in avoided emissions, highway congestion, noise, crashes, and vessel congestion; operational and labor efficiencies; and supply chain savings, with a total Benefit Cost Analysis ratio of 3.53.

Project Location

Morehead City is a port town located on the eastern coast of North Carolina with a population of 9,560 (2020 Census). The Port of Morehead City and the project are located in Carteret County Census Tract 9704.02. According to the USDOT Project Location Verification Tool, the project is in a rural area, Historically Disadvantaged Community, and Area of Persistent Poverty.

According to the EPA's EJScreen, 29% of the population of Morehead City are people of color, 46% are low income, and 18% have less than a high school education. EJScreen also reports that Census Tract 9704.02 falls in the 77th percentile in the state for limited English-speaking households. According to the USDOT Equity Explorer, this tract ranks in the 85th percentile for transportation cost burden and is disadvantaged for both environmental burden and social vulnerability.

Nutrien's exports through the Port originate from its phosphate operations facility in Aurora, North Carolina, 57 nautical miles upstream. This facility – which supports over 2,000 permanent and contracted jobs – is located in Beaufort County Census Tract 9308, which is also identified by the USDOT tool as a Historically Disadvantaged Community. According to current EPA CJEST data, this community falls in the 79th percentile for low-income and unemployment and at or above the 94th percentile for four of the five climate change indicators.

The Port of Morehead City operates under Foreign Trade Zone 214, attracting businesses involved in international trade such as Nutrien. The Port is also one of fifteen Strategic Seaports as designated by the U.S. Department of Defense, and as such, must maintain the capability and capacity to meet the national security needs of the nation. The Port must have a readiness plan for how the Port will be used during a contingency, training of personnel, and security. Improved infrastructure will promote the retention of the Strategic Seaport designation and ensure the Port's capabilities to respond to national emergencies and provide transportation and material readiness. The Port of Morehead City is also the port of embarkation and debarkation for U.S. Marine Corps at Camp Lejeune and Cherry Point. Visiting Navy ships also use the Port's deep-water berths and the state-owned ramps at the terminal for loading amphibious ships. Vessels operated by or chartered to the Military Sealift Command berth at the Aviation Fuel Terminal on Radio Island.

The Port of Morehead City terminal is accessible via water, rail, and truck. Interstates 95 and 40 are easily accessed via US Highways 70 and 17. The Atlantic Intracoastal Waterway connecting Aurora to Morehead City is part of designated M-95, a marine alternative to I-95 as part of America's Marine Highway Program, an initiative to move more cargo on the water rather than on crowded highways. The strategic advantage of the Port is further amplified by its proximity to the Coastal Carolina Regional Airport (EWN), a full-service commercial airport spanning over 785 acres. This positioning and access to a multimodal transportation network make the Port an attractive choice for suppliers seeking efficient transportation to and from major industrial centers. Therefore, the ***Modernization and Revitalization of Barge Berths*** project aligns with broader economic goals, promising to foster businesses, create job opportunities, and support sustained economic growth through this PID grant.

Grant Funds, Sources, and Use of Project Funding

The total cost to reconstruct the barge berths is \$18,887,540. The North Carolina State Port Authority is requesting \$14,921,158 (79%) in PID funding to restore this critical Port infrastructure to a state of good repair.

This project is a Public Private Partnership between Nutrien and the Port. Nutrien covered the cost of and collaborated with the Authority throughout the design of the Project, which is currently at 90% design plans, and was engaged throughout development of this application. The Authority and Nutrien have committed to a combined local match of \$3,966,382 (21%), providing \$1,983,191 (10.5%) each, as documented in the Memorandum of Understanding and cost commitment letters submitted with the application. The Authority will serve as the lead applicant, ensuring delivery of the Project, completing all required reporting and audits, and obtaining all necessary permits. Nutrien will support the Authority in obtaining permits, providing signage and public acknowledgements, and with other construction activities for the project.

Federal Funding and Project Delivery

The Authority possesses a well-established track record of effective administration of Federal funds and delivering complex construction projects on time and within budget. The Authority was awarded a FY21 PID grant to rebuild the rail tracks on Radio Island (\$2.1M), a FY22 RAISE grant to build a new intermodal facility at the Port of Wilmington (\$22M), and a FY23 PID grant to relocate the Port of Wilmington’s North Gate (\$11M). Additionally, between 2001 and 2024, the Authority has received and effectively executed 30 grants from the Department of Homeland Security's Port Security Grant Program (PSGP), demonstrating its experience in Federal grant management, administration, and execution. The Authority’s recent investment in capital improvements at both the Port of Morehead City and the Port of Wilmington has surpassed \$350 million.²

The Authority has full confidence that funds can be obligated in advance of the June 30, 2028, deadline and expended well ahead of 2033. As will be described further in the Schedule section, the Authority is ready to deliver the Project expeditiously to address urgent safety and operational needs, with the reconstructed barge berths anticipated to be operational and the project complete in 2027. The Authority will manage its contract bid process, with the Authority’s Board of Directors and North Carolina State Construction Office providing final authority.

Funding Source	Port of Morehead City Modernization and Revitalization of Barge Berths Project
PID Funds	\$14,921,158
Other Federal Funds	\$0
Non-Federal Funds	\$3,966,382
Total	\$18,887,540

² <https://ncports.com/wp-content/uploads/2023/08/Port-Improvements-Flyer-2023.pdf>

Cost Estimate

The Project costs were developed in January 2024, based upon a 90% level of design by a nationally recognized engineering firm³. The estimate assumes the implementation of a soldier pile wall option for the southeast corner, excludes a management reserve, and does not account for construction supervision and administration costs, which would be provided by the Authority in-kind.

Table 2: Project Costs

Activity	Total
Demolition	\$901,400
Site Preparation	\$454,500
Construction	\$14,383,716
Subtotal	\$15,739,616
Mobilization (10%)	\$1,573,962
Contingency (10%)	\$1,573,962
TOTAL	\$18,887,540
PID Request (79%)	\$14,921,158
Local Match/Contribution (21%)	\$3,966,382

³ <https://connect.ncdot.gov/resources/PORTS2024/Pages/default.aspx>

Merit Criteria

Achieving Safety, Efficiency, or Reliability Improvements

Safety

The lack of safe operating conditions at the Phosphoric Acid Terminal barge berths is the primary reason they are not currently being optimized by the Port. As mentioned in the project Description, Nutrien conducted a stability analysis of the terminal's eastern bulkhead in 2022. This analysis found several structural deficiencies, also found at the North Barge Berths, that could individually cause failure of the bulkhead: scour exceeding the bending capacity of the sheet pile, weak concrete cap, and sheet pile corrosion. **It is not a matter of if the existing bulkhead will fail, but when.** Because workers' safety is of the utmost importance, the East Barge Berths have been closed to service and the North Barge Berths are operating at half-capacity until they too will be closed in 2027.

The *Modernization and Revitalization of Barge Berths* project will restore a safe environment for workers by repairing and refurbishing the barge berths to provide structural stability, restore use of purpose-built infrastructure, and improve painting and striping. Without the project, dry cargo calling on the North Barge Berths will be diverted to truck and rail to make the over 70-mile trip from the Nutrien-Aurora Production Facility to the Authority's terminal for storage and export. The reconstructed berths will maintain transport by barge, avoiding over 26,000 truck and 100 train trips between Aurora and Morehead City every year. The project would realize over \$500,000 in total benefits from avoided crashes, injuries, and fatalities over the next 20 years.

Further, the cargo this terminal accommodates – potash, fertilizer, and liquid acid – are classified as hazardous material (hazmat). Transporting these goods by barge is safer than rail or truck because it offers the lowest spillage rate by mode and routes hazmat away from populated communities. Without the project, the liquid cargo that would ordinarily utilize the East Barge Berths must use Berth 1, in a workaround as pictured in Figures 3 and 4, that requires the use of an on-site generator and barge pumps to power manifold operations. The use of this temporary equipment further increases the risk of potential leakage as compared to using the infrastructure alongside the East Barge Berths specifically made for unloading liquid fertilizer.

A study by the Texas Transportation Institute's Center for Ports and Waterways found that between 2001 and 2019, trucks and railcars had 239% and 287%, respectively, more hazmat incidents than barges. The study also found truck freight resulted in over 1,100 injuries per billion ton-miles, as compared to just one injury resulting from barge freight.⁴ Nutrien and the Authority take the safety risks associated with transporting these products very seriously. In 2022, Nutrien developed an agricultural hazardous materials course and hosted over ten pilot training sessions to train emergency first responders in North Carolina and Georgia.⁵

Efficiency

The current operational workaround to the closure of the East Barge Berths at the terminal requires liquid barges to navigate to the south side of the Newport River Bridge (US 70) to

⁴ A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2019. Center for Ports and Waterways.

<https://www.nationalwaterwaysfoundation.org/file/28/TTI%202022%20FINAL%20Report%20001-2019%201.pdf>

⁵ [2023 Environmental, Social and Governance Report](#). Nutrien.

unload at Berth 1, as shown in Figures 3 and 4. The passage under the bridge has a narrow clearance that requires an experienced hand and calm weather conditions, with many scenarios that could delay safe passage through for hours or days at a time. During inclement weather, the closure of the East Barge Berths increases the distance barges must travel to reach a safe place to tie down. With the project, acid barges would not need to attempt this passage at all.

The modal diversion that would be required to accommodate dry cargo storage for export would also significantly increase operational delay. While a 3,000-ton barge can be unloaded in about eight hours, it would take approximately 40 hours to unload the same tonnage by truck and 15 hours by rail.

The project would restore efficient cargo handling capacity for phosphate operations at the Port, resulting in \$49.5-61.3 million of total benefits over a 20-year analysis period.



Figure 4. Without the Project, acid barges must navigate the narrow passage beneath the Newport River Bridge (US 70) to unload at Berth 1.

Reliability

As described within the previous sections, the project addresses critical structural deficiencies at the terminal's North and East Barge Berths to restore safe working conditions and full cargo handling capacity. The reconstruction of this asset will maintain dependable maritime cargo operations for the Port's largest tenant; restore use of purpose-built infrastructure at the terminal; and reduce risk of damage to US 70 – one of the only major roadways providing connectivity to the rural, disadvantaged community of Morehead City, as further described in Port Resilience.

Labor availability to accommodate the necessary modal shift without the project is another risk to reliable Port operations with the national truck driver shortage still keenly felt in North Carolina. Transporting the 367,000 tons of dry cargo Nutrien unloads at the Port each year requires approximately 13,250 hours of labor by barge as compared to over 53,000 hours by truck.

Supporting Economic Vitality at the Regional or National Level

The project supports economic vitality at the regional and national level by providing North Carolina businesses unrestricted access to the global marketplace. A study by NC State University determined that the Authority contributed approximately \$16.1 billion annually to the state's economy between July 1, 2020 and June 30, 2021.⁶ The Authority directly and indirectly supports more than 88,200 jobs across North Carolina, which comprises a substantial portion of the state's economy. Indeed, the Port of Morehead City broadly is a tremendous catalyst for economic growth and development throughout North Carolina and the region.

As mentioned, the North and East Barge Berths serve Nutrien, the Port of Morehead City's largest tenant by volume. Nutrien moves nearly 800,000 tons of cargo by barge and vessel annually through the Port of Morehead City. Nutrien is the second-largest producer of phosphate in North America, with two large integrated phosphate facilities and four regional product upgrade facilities in the US, and among the top three producers of potash and nitrogen fertilizer in the world. The Nutrien-Aurora production facility employs 1,000 permanent and 1,000 contract employees and is the area's largest private employer, contributing approximately \$250 million in spending in the state in 2023 and \$8 million in state and local taxes annually. Without the project, the significant inefficiencies in Nutrien's operations (including required diversion to other modes) would likely reduce production and as a result, could decrease the number of jobs Nutrien is able to provide. The *Modernization and Revitalization of Barge Berths* project is necessary to not just maintain Nutrien's local presence and current production capacity but continue growing and increasing economic opportunity for North Carolinians.

Benefit-Cost Analysis

Two No-Build scenarios were assessed for the project: one which assumes the maximum diversion to rail of dry cargo currently utilizing the North Barge Berth that Port capacity will allow (8.5% of dry cargo) with the remainder transported by truck, and one which assumes 100% diversion of that same dry cargo to truck given the uncertainties of providing cost-effective rail service for such a small scale. Both scenarios assume that Berth 1 will continue to service both liquid barges and ships to handle the liquid cargo that ordinarily would use the East Barge Berth, using temporary equipment to unload and contributing to increased vessel congestion and dwell time. Results across a 20-year analysis period yielded a benefit-cost ratio (BCR) of 3.53 for the project with multimodal diversion (net present value of \$44,069,645), or a BCR of 2.84 with 100% diversion of dry cargo to truck (net present value of \$32,077,610). As a conservative approach, the Benefit Cost Analysis (BCA) only considers loaded trips (not return trips) – the project is anticipated to deliver nearly twice as many benefits when considering the avoided return trips.

Personnel and travel time savings comprise the largest benefit of the project, ranging from \$14.5 to \$16.6 million depending on the diversion scenario. As mentioned in the Efficiency section, both route and unloading times are significantly longer in the No-Build scenario. As compared to a 57-nautical mile route by barge, the shortest diversion route by truck measures over 70 miles and over 100 miles by rail. Unloading the same volume of cargo takes five times longer by truck and nearly twice as long by railcar (which is not a viable diversion option at scale for the project due to limited site capacity).

⁶ <https://connect.ncdot.gov/resources/PORTS2024/Pages/default.aspx>

Emissions reductions also generate significant benefits. The avoidance of over 293,000 loaded truck trips (return trips were not included in the BCA) over the analysis period results in total discounted benefits of over \$7 million. Using the latest USDOT methodology for calculating emissions by rail and assuming a very conservative route with only 30 total minutes of idling per train across loading, unloading, and switching operations, these benefits are calculated at over \$20 million in the multimodal diversion scenario. Avoided diversion accounts for several other benefits as shown in Table 3, including avoided roadway maintenance, congestion, noise; reduced crashes, injuries, and fatalities; and operating cost savings. Depending on the diversion scenario, these total discounted benefits range from \$14.3 to \$13.6 million over the analysis period.

Restoration of the East Barge Berths for liquid cargo will result in \$3.8 million in avoided barge depreciation by eliminating the need to power manifolding operations with vessel pumps, \$1.3 million in supply chain savings by allowing Nutrien to berth two barges and an export ship at the same time, and over \$240,000 in dock maintenance savings due to reduced wear on Berth 1. The other tenants of the Port of Morehead City will also see increased efficiency valued at nearly \$1.6 million in discounted benefits as a result of the *Modernization and Revitalization of Barge Berths* project. In the No-Build scenario, 11% of other vessels at the Port would see an average of one day delay due to the congestion generated by Nutrien's additional 22 barges traveling through the Newport River (US 70) Bridge passage to Berth 1. The Authority's ability to regain productive use of Berth 1 was not monetized to avoid double counting.

Additional benefits not monetized include:

- The inefficiency of dry cargo operations with the North Barge Berths operating at half capacity until 2027,
- Additional delays, emissions, and operational expenses likely from stops at railyards and increased truck congestion within the Port,
- Increased emissions and downstream supply chain impacts resulting from vessel congestion in the No-Build scenario,
- Additional barge delay waiting for safe weather conditions to accommodate passage under the Newport River Bridge,
- Any potential recovery and restoration costs that would be incurred if the failed bulkhead broke off and entered the waterway, and
- Any potential reduction in production and associated job loss should Nutrien not be able to accommodate its export operations.

Table 3: Benefit-Cost Analysis Summary for Diversion Scenarios

	Truck & Rail Diversion Scenario Present Value (\$2022)	100% Truck Diversion Scenario Present Value (\$2022)
Discounted Benefits		
Liquid Barge Depreciation Savings	\$ 3,796,212	\$ 3,796,212
Avoided Vessel Congestion	\$ 1,599,454	\$ 1,599,454
Liquid Cargo Supply Chain Savings	\$ 1,350,073	\$ 1,350,073
Liquid Barge Berth O&M Savings	\$ 243,590	\$ 243,590
Personnel Time Savings	\$ 14,506,079	\$ 16,622,240
Dry Cargo Operating Savings <i>(Conservative Accounting for Barge Depreciation in Build Scenario)</i>	\$ 6,868,827	\$ 5,509,723
Safety Benefits	\$ 508,408	\$ 521,861
Avoided External Highway Use	\$ 6,167,010	\$ 6,740,686
Avoided Emissions	\$ 20,278,922	\$ 7,042,745
Dry Barge Berth O&M Costs	(\$ 487,181)	(\$ 487,181)
Residual Value	\$ 5,282,749	\$ 5,282,749
Total Discounted Benefits	\$ 61,309,302	\$ 49,528,488
Discounted Costs		
Project Capital Costs	\$ 17,450,878	\$ 17,450,878
Benefit-Cost Ratio	3.53	2.84
Net Present Value	\$ 44,069,645	\$ 32,077,610

Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment

As mentioned, the project is a Public Private Partnership made possible by private investment in Port infrastructure. Nutrien paid for the design of the dock and worked closely with the Authority throughout the design phase, which has been completed up to a 90% level of design. Nutrien and the Authority are prepared to each provide \$1,983,191 or 10.5% of total project costs, a 21% total cost-share. Moving forward, Nutrien will continue to collaborate with the Authority to provide the best solutions to restore the critical Port infrastructure to a state of good repair. Additionally, the Authority proposes to fund design, National Environmental Policy Act (NEPA) review, and construction supervision and administration separately from the project as additional in-kind match.

Port Resilience

According to the North Carolina Institute for Climate Studies, global sea levels will rise within a range of one to four feet by the year 2100. Addressing rising sea levels is crucial to prevent extensive harm to North Carolina’s property, tourism, and agriculture. North Carolina’s coastline, especially in the northern Coastal Plain, is highly vulnerable to natural disasters such as hurricanes, tropical storms, and tornadoes. On average, a high-intensity storm makes landfall once every two to three years.⁷ Notably, Hurricane Florence in September 2018 caused \$16-40

⁷ Kunkel, K.E., et al. 2020: North Carolina Climate Science Report. North Carolina Institute for Climate Studies, pg. 171. <https://ncics.org/programs/nccsr/>

billion in damages due to record-breaking rainfall.⁸ Florence made landfall in Wrightsville Beach, North Carolina, and a multitude of cities along the coast were plagued with torrential downpours for over two days. Morehead City, while over 90 miles away, recorded over 20 inches of rain, as shown in Figure 5.

In 2022, the North Carolina State Climate Office highlighted the extreme weather experienced in the state through a year-long series of articles. Figure 6 shows that some of the most extreme hurricanes in North Carolina's history, as measured by low pressure or high wind speed, have made landfall in or near Morehead City.

The project will incorporate current design standards to enhance the infrastructure's resiliency to extreme weather events and natural disasters. The reconstructed North and East Barge Berths will follow Federal Flood Risk Management standards and have been designed to withstand wave action and high winds. The design includes a new fendering system to help absorb impacts from vessels and barges. The new design will also address any washout from behind the existing seawall that has occurred and incorporate a newer, more durable tie-back system.

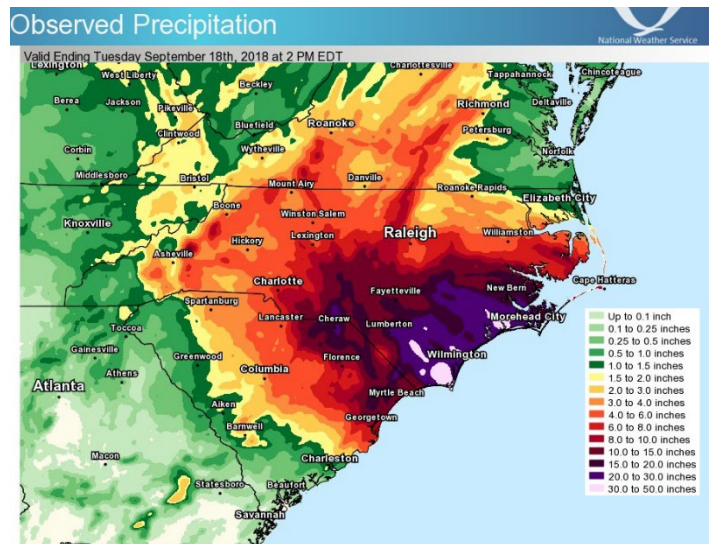


Figure 5. National Weather Service Observed Precipitation of Hurricane Florence. Morehead City experienced over 20 inches of rain.

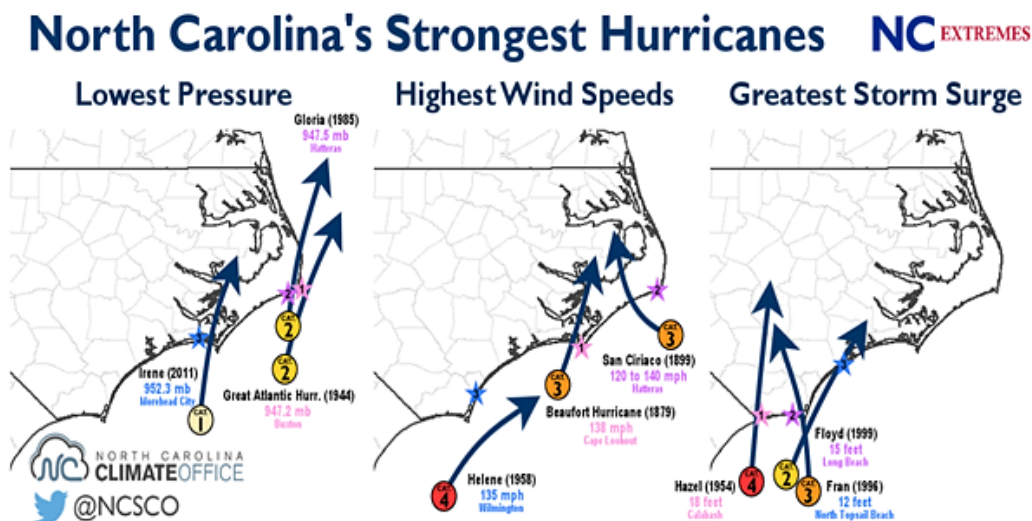


Figure 6. North Carolina State Climate Office maps show the lowest pressure and highest wind speed hurricanes crossed Morehead City.

⁸ Paul, S.; Ghebreyesus, D.; Sharif, H.O. Brief Communication: Analysis of the Fatalities and Socio-Economic Impacts Caused by Hurricane Florence. *Geosciences* 2019, 9, 58. <https://doi.org/10.3390/geosciences9020058>

As described in the Safety, Efficiency, and Reliability section, the disrepair of the East Barge Berths requires liquid goods to be unloaded at Berth 1, which is three times further from the storage facilities at the Phosphoric Acid Terminal. In addition to a further transport distance, the use of temporary versus purpose-built unloading equipment increases safety risks, including those resulting from human error. Potential risks include failure of the manifold system, damage to equipment, and spillage – all of which could cause injuries due to phosphoric acid exposure, such as skin irritation and burns, as well as potential loss of life in severe cases. Further, leaks and spills often result in negative environmental impacts and supply chain impacts due to lost goods and lost time.

The project also increases resiliency to the human-caused risk of a barge striking or otherwise damaging the Newport River (US 70) Bridge. Restoration of the East Barge Berths would avoid over 500 barge trips through this narrow marine passage each year. As evidenced by recent barge strikes in Pittsburgh⁹, eastern Oklahoma¹⁰, and the collapse of Baltimore’s Francis Scott Key Bridge¹¹, the impacts of these events can range from hours of travel delay and minor repair costs to devastating fatalities and complete infrastructure reconstruction. The Newport River Bridge is the primary roadway connection for both the Port and the rural, disadvantaged community of Morehead City.

The Authority is always looking for ways to build resilience and reduce the vulnerability of human and natural systems to unavoidable climate impacts. The Authority has several ongoing infrastructure projects to enhance the Port’s ability to withstand weather and climate-related events as well as cybersecurity and operations-related emergencies, such as improved access, flooding mitigation, and operational improvements. The Authority is currently increasing hardening at the security gates, and upgrading rail and rail crossings throughout the Port of Morehead City for improved infrastructure resilience. Resiliency in the form of operational and security improvements include terminal operating systems (i.e., information technology) deployment and cyber security implementation.

The project’s alignment with several state plans related to decarbonization as well as anticipated emissions reduction benefits are described in the Climate Change and Sustainability selection consideration. These local plans are aligned with the USDOT Climate Action Resilience Plan¹² by including emphases on the best-available science, prioritizing equity and those most vulnerable to climate impacts, preserving ecosystems, and fostering collaboration to build community relationships. Like USDOT, the Authority seeks to ensure its facilities and assets are resilient to the effects of climate change, including an increased number and severity of hurricanes and floods, to ensure asset longevity and minimize disruption to Port operations. The project is also in alignment with objectives 2, 3, and 6 of the National Climate Resilience Framework¹³. Objective 6 is also supported by the Port’s status as a Strategic Seaport as described in the Project Location.

⁹ <https://www.pbs.org/newshour/nation/barges-damage-a-marina-hit-a-bridge-after-breaking-loose-on-ohio-river-in-pittsburgh>

¹⁰ <https://www.kiro7.com/news/trending/barge-strikes-bridge-arkansas-river-oklahoma-delays-traffic-several-hours/NNEDARHF3ZDS5DSAIBC4X4C2NU/>

¹¹ <https://apnews.com/article/baltimore-bridge-collapse-53169b379820032f832de4016c655d1b>

¹² https://www.transportation.gov/sites/dot.gov/files/2022-04/Climate_Action_Plan.pdf

¹³ <https://www.whitehouse.gov/wp-content/uploads/2023/09/National-Climate-Resilience-Framework-FINAL.pdf>

Selection Considerations

Climate Change and Sustainability

The ***Modernization and Revitalization of Barge Berths*** project aligns with several state planning efforts. The project is consistent with the state’s climate and clean energy objectives as identified in the NCDOT Clean Transportation Plan¹⁴. The project also complements North Carolina’s Carbon Reduction Strategy efforts, which aim to cut carbon emissions by at least 50% below 2005 levels by 2030 as outlined in Governor Roy Cooper’s Executive Order 246. The project benefits also aid the state’s trajectory towards achieving net-zero emissions across the transportation sector by 2050, as identified in the 2023 North Carolina Deep Decarbonization Pathways Analysis¹⁵.

The Authority seeks to broadly improve resilience to climate change, as described in the Port Resilience section, and reduce emissions where possible and conducts thoughtful planning prior to any equipment deployment or new infrastructure construction. This project would avoid over 26,000 annual truck trips between the Port and the Nutrien-Aurora facility, producing emissions reduction benefits of over \$7 million as calculated with the latest USDOT BCA methodology, which included consideration of the emissions produced by barge transport in the Build scenario.

The North Carolina Department of Environmental Quality 2024 Greenhouse Gas Inventory¹⁶ underscores the environmental advantages of maritime transportation over trucking. According to a National Waterways Foundation-published report conducted by the Texas Transportation Institute, barge transport emits nearly 90% less carbon dioxide per ton-mile of cargo transported compared to trucking.¹⁷ Through the restoration of full berthing capacity north of the Newport River Bridge, this project is positioned to significantly reduce greenhouse gas emissions and mitigate the environmental and health impacts of landside freight transportation on communities along North Carolina’s coast. By preserving the mode of maritime transportation, the project is aligned with the second prong of the U.S. National Blueprint for Transportation Decarbonization¹⁸, improving efficiency, and enhances environmental justice and equity as described in the following selection criteria.

The Authority commits to developing a plan to document emissions savings resulting from the project. Annually, the Authority reviews and restates its formal Environmental Policy Statement commitment; “the Authority will serve as a good steward of North Carolina’s natural environment...and is committed to environmental compliance, sustainable environmental performance with a focus on continuous improvement, and effective engagement with employees, communities, port users, and cargo owners,” as signed by Brian Clark, Executive Director on August 23, 2023. This emissions reduction strategy directly supports the Authority’s existing Environmental Management System which is based on the ISO 14001 Standard. Through this strategy, the Authority is committed to developing a comprehensive idle-reduction

¹⁴ <https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/clean-transportation-plan.aspx>

¹⁵ <https://governor.nc.gov/nc-pathways-report/open>

¹⁶ <https://www.deq.nc.gov/energy-climate/climate-change/greenhouse-gas-inventory>

¹⁷ A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2019. Texas A&M Transportation Institute. January 2022.

<https://www.nationalwaterwaysfoundation.org/file/28/TTI%202022%20FINAL%20Report%202001-2019%201.pdf>
<https://www.nationalwaterwaysfoundation.org/file/28/TTI%202022%20FINAL%20Report%202001-2019%201.pdf>

¹⁸ <https://www.transportation.gov/priorities/climate-and-sustainability/us-national-blueprint-transportation-decarbonization>

policy for both external Port users and Port employees by the end of this project. The idle-reduction program will focus on those diesel engine vehicles that are responsible for a majority of PM_{2.5} and/or NO_x emissions. The policy will be designed to promote and continue efforts to reduce emissions after the project has ended.

The Authority also commits to developing a comprehensive baseline mobile source emission inventory for PM_{2.5} and/or NO_x before the end of the project period. This inventory will be developed in part using the Environmental Protection Agency guidance released in April of 2022, *Port Emissions Inventory Guidance (Methodologies for Estimating Port Related and Goods Movement Mobile Source Emissions)*. Once the baseline mobile source inventory is determined, the Authority commits to develop a plan to reduce mobile source emissions and intends to finalize the plan and make it publicly available before the end of the project period. This plan will include specific PM_{2.5} and/or NO_x emission targets.

The Authority has an existing process through its public website to address community concerns and complaints specific to air quality or other concerns broader in scope. Input received from the public is promptly addressed by the most appropriate subject matter expert within the organization. The Authority's Director of Safety and Security is also listed by name, e-mail, and phone number on the website as a clear point of contact for any environmental concerns. This position is responsible for the Authority's Environmental Management System.

Equity and Justice⁴⁰

Equity Considerations

The Authority understands and values Morehead City's long history with the waterfront, supporting a strong tradition of recreational fishing and tourism, and aims to be a good neighbor. In addition to providing over 50 good-paying local jobs, the Authority maintains assets for the rural, low-income Morehead City community which improve quality of life including a water tower, public beach, and public pier. The Newport River Pier and Boat Ramp on Radio Island leased to the town of Morehead City features a fishing pier and is a popular casting spot for a wide array of fish. In July of 1999, the Authority partnered with Carteret County to build and lease an area for public beach recreation. East Beach includes more than eleven acres with approximately 1,200 feet of beach/water frontage open to the public. These Authority-provided public facilities are shown in Figure 7. According to the USDOT Equity Explorer, Morehead City has a large share of residents over 65 (77th national percentile), with cancer (74th), and high blood pressure (70th) who could especially benefit from these active recreational amenities. By restoring critical Port infrastructure to a state of good repair and retaining its largest tenant, the Authority aims to continue providing these community benefits, in addition to minimizing the impact of its operations.

Ensuring cargo can travel by waterway keeps trucks off this community's limited roadway network, improving their safety, quality of life, and air quality. According to the EPA's EJScreen, Tract 9704.02 where the project is located has critical transportation service gaps and is identified as a food desert. Without the project, over 26,000 additional annual truck trips would be routed through Morehead City, increasing congestion and wear on the community's primary east-west roadway. Additionally, there are several at-grade rail crossings in Morehead City; any additional rail traffic generated to accommodate cargo without the project would also increase travel time and idling emissions for the public and local businesses.

In addition to identification as a Historically Disadvantaged community and Area of Persistent

Poverty, EPA's Climate and Economic Justice Screening Tool (CEJST) notes Tract 9704.02 as disadvantaged as it is in the 77th percentile for low income and the 94th percentile for flood risk, expected loss rate due to natural hazards, and unemployment. In addition to providing good-paying jobs, the project will mitigate the community's risk of infrastructure damage during flood events such as the dilapidated bulkhead coming loose or barge strikes. The USDOT Equity Explorer reinforces the town's climate risks, falling in the 97th national percentile for annualized disaster losses.

Tract 9308, where the Nutrien-Aurora facility is located, ranks high for all five indicators of climate disadvantage and is also identified as disadvantaged by CEJST. The project also supports over 1,000 good-paying permanent jobs and 1,000 contracted positions at this facility by ensuring its continued viability. According to EJScreen, Aurora is listed at or above the 85th percentile for environmental, health and socioeconomic indicators as compared to the rest of the nation, including flood risk, heart disease, persons with disabilities, and low life expectancy. The project helps mitigate against these outcomes by preserving good-paying jobs with healthcare benefits (higher income is directly related to better health conditions¹⁹) as well as facilitating the potential for Nutrien to grow its operations and create jobs.



Figure 7. Upper: East Beach on Radio Island offers calm, relaxing waters. Lower: The dry bulk storage silos of the Port's Phosphoric Acid Terminal can be seen from the Newport River Pier and Boat Ramp.

Image Credits: Visit Beaufort NC, Crystal Coast NC

¹⁹ Zhang, S., Xiang, W. Income gradient in health-related quality of life — the role of social networking time. *Int J Equity Health* 18, 44 (2019). <https://doi.org/10.1186/s12939-019-0942-1>

The Authority will build on past engagement efforts to develop a robust stakeholder outreach plan for the ***Modernization and Revitalization of Barge Berths*** project, to begin during the NEPA process and finalization of design, continuing through project delivery and implementation. There are no known or anticipated contentious issues related to the project and the prior public engagement conducted for a recent PID grant at the Port of Morehead City (Radio Island) has established good working relationships between the Authority and the surrounding community. Stakeholders will include those identified in prior outreach, the town of Morehead City, and other tenants at the Port. Equity Explorer identifies 32.7% of households lack internet access; the Authority will utilize digital and physical outreach tactics in its outreach to minimize barriers to engaging with the project. The Authority's community engagement is in full compliance with USDOT's civil rights obligations and nondiscrimination laws, including Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990 (ADA), Section 504 of the Rehabilitation Act, and all other civil rights requirements and accompanying regulations including reasonable accommodations for limited English proficiency (LEP).

Justice40 Considerations

The project generates significant benefits for the disadvantaged communities immediately surrounding the Port by reducing emissions through avoided diversion as described in the Climate Change and Sustainability selection consideration, though emissions benefits will extend to residents statewide and beyond. Additionally, avoided truck and rail miles traveled will further reduce congestion, noise, crashes, and pavement wear/damage for residents along the landside routes between the Port and Nutrien-Aurora, which includes 11 census tracts identified as disadvantaged by CJEST. These monetized benefits do not account for the added safety benefits of keeping this cargo, classified as hazardous material, off roads and rail and away from communities, by ensuring the continued viability of maritime transport.

Additionally, the project will benefit workers – including members of the International Longshoreman's Association – by restoring safe work conditions at the reconstructed berths that allow for the use of purpose-built equipment and transport hazardous cargo the shortest distance to and from storage areas. These employment opportunities are essential for a community with some of the highest unemployment rates in the nation (as cited in Equity Considerations). The project will create additional economic opportunities for diverse businesses as discussed in the Workforce Development selection consideration.

Disadvantaged communities in and near Morehead City and Aurora will also directly benefit from the employment opportunities the project supports. Of Morehead City's approximately 9,500 residents, EJScreen reports 20% are people of color and 29% are low income with a 4% unemployment rate. The town is also in the 83rd percentile in the state for traffic proximity, which is calculated by dividing annual average daily traffic by the distance to the road. This data is higher in the census tract where the project is located, with people of color comprising 29% of the population and 46% identified as low income. The census tract was in the 93rd percentile in the state for traffic proximity. The median household income in Morehead City per U.S. Census Bureau data in 2022 dollars is \$51,716, with a per capita income of \$37,849. The Census Tract where the Nutrien-Aurora facility is located has a population of just over 2,300 people, 52% of which are people of color and 43% of which are low income.

The project is not anticipated to significantly burden disadvantaged communities or members of the public because construction and operations will take place within the existing terminal footprint at the Port. Some materials will likely be transported landside, which would result in

temporary increases of truck and/or rail traffic, and associated emissions, road deterioration, and congestion. However, the impacts of this temporary construction traffic are a fraction of the No-Build Scenario, which would generate more truck trips in one year of diversion than during full construction of the project (which will transport materials by both barge and landside). The project will also develop and implement mitigation strategies to address the environmental risks of construction in open water as further described in Project Readiness.

Workforce Development, Job Quality, and Wealth Creation

As mentioned, this project will maintain over 2,050 good-paying permanent and contracted jobs with Nutrien and the Authority in North Carolina and encourage the use of Historically Underutilized Businesses. The region needs to maintain a skilled workforce to remain competitive in the future. In the Authority's 2021 Strategic Plan²⁰, *Developing the Talent Pipeline* was identified as one of the four core pillars needed for future success. As one supporting strategy, the Authority has formalized an apprenticeship and internship program by partnering with the local county school districts – particularly trade schools, high school dual enrollment programs, and local community colleges – providing hands-on job training. The Authority recognizes that an effective and efficient organization requires the talents, skills, and abilities of all qualified and available individuals, and actively seeks opportunities to promote diversity and inclusion at all occupational levels of the workforce through equal employment opportunity workforce planning initiatives. The Authority recruits through diverse avenues and sources including military/veteran events, career fairs and counseling programs, and job skills events. The Authority has partnerships with local non-profits working to assist underemployed and underrepresented communities such as StepUp Wilmington, a mentoring organization to empower individuals to reach their full potential and lead stable lives through satisfying work, and the NC Works veteran program in Jacksonville, North Carolina.

The Authority grows internal talent and creates opportunities for advancement through its Ports University (Ports U) program. During FY23 and FY24, three employees are in pursuit of post-secondary degrees, one is participating in a crane electrical apprenticeship program, six were enrolled in various leadership programs including a certificate program through the American Association of Port Authorities, and all managers/supervisors (41) completed a frontline leadership certificate program. Additionally, 15 employees received technical skills training and each month all team members are invited to enroll in online educational development opportunities through Cape Fear and Carteret Community Colleges.

The project sustains jobs in Morehead City, Wilmington, and Aurora, North Carolina, including Port staff, stevedores, and longshoremen, captains and deckhands, and production facility workers. The Authority has over 250 employees, including 50 in Morehead City. Longshoremen are members of the International Longshoreman's Association Local 1807. The Authority offers full benefits including medical, dental, vision and supplemental insurance, and participates in the Teachers' and State Employees' Retirement System.

Nutrien actively collaborates with East Carolina University, NC State University, and Virginia Tech in the recruitment of engineering students to help improve its talent pool, support current business needs, and facilitate succession planning. The site has launched Operator-in-Training programs, Maintenance Apprenticeships and Engineer-in-Training roles to develop workforce skills and provide access to new opportunities. Nutrien-Aurora has operated a registered NC

²⁰ <https://connect.ncdot.gov/resources/PORTS2024/Pages/default.aspx>

Apprenticeship Program since 1984, when the program began with two maintenance trades and has continued to expand to broader maintenance crafts and operating departments. Nutrien played a key role in developing the Master Craftsman Program in 2000 for a statewide recognized program. The Aurora site currently has 51 trades in the NC Community College Apprenticeship Programs; to date, over 1,700 Journeyman and 300 Master Craftsman have graduated from the programs. Nutrien-Aurora also partners with Beaufort Community College on the delivery of its Maintenance Craft Training Program, which includes customized curriculum, as well as the Volt Center at Craven Community College, which offers National Center for Construction Education and Research (NCCER) certification for welders and mechanics. As mentioned in the Safety Section, in 2022, Nutrien developed an agricultural hazardous materials course and hosted over ten pilot training sessions to train emergency first responders in North Carolina and Georgia.²¹

Nutrien provides Diversity, Equity, Inclusion, and Accessibility (DEIA) training for all employees, supports scholarships and internships associated with diverse groups, and hosts diversity-related career events to promote job opportunities to women and other underrepresented groups. Nutrien tracks several environmental, social, and governance metrics, which are publicly available²², including progress towards a number of targets. In 2023, women comprised 23% of senior leadership and 33% of the Board of Directors.

The Authority encourages inclusivity in hiring through the utilization of Disadvantaged Business Enterprises (DBE), Minority-owned Businesses, and Women-owned businesses and sets a 10% participation goal for all contracts in alignment with state requirements. Authority procurement staff track total spending by percent of Historically Underutilized Businesses (HUB), which has ranged from 5 to over 20% in recent quarters. Spending on DBE/HUB businesses will be documented and reported for the project and the Authority will distribute information about contracting opportunities widely, including to existing HUB partners. All bids will require a minority participation document and successful bidders must file an affidavit describing the work and value provided by DBE firms (or good faith efforts to recruit them).

Project Readiness

Technical Capacity

Prior Experience with Federal Funding and Similar Projects

The Authority is experienced in receiving and administering Federal funding and port infrastructure reconstruction projects, having received PID funding in FY2021 and FY2023, and a RAISE grant in FY2022. The Authority has also demonstrated its capability to manage construction projects by successfully completing various capital projects in recent years, highlighted in Table 5, including the \$47 million replacement of Berth 8 to accommodate larger cranes and vessels and the \$23.2 million relocation of a liquid bulk pier and dredging of the turning basin to allow for larger ships.

²¹ [2023 Environmental, Social and Governance Report](#). Nutrien.

²² <https://apps.indigotools.com/IR/iac/?ticker=NTR&exchange=NYSE>

Table 4: Recent Successfully Delivered Projects of Similar Scope and Complexity

Project Name	Description	Project Cost
Berth 8 Replacement	Replacement of Berth 8 entirely to facilitate the accommodation of larger cranes and vessels. Completed in 2018.	\$47 M
Relocation of Liquid Bulk Pier at Port of Wilmington	Relocation of the liquid bulk transfer facility serving Kinder Morgan to Berth 1 and dredging the turning basin to accommodate larger ships was completed in 2020.	\$23.2 M
Refrigerated Container Yard at Port of Wilmington	Development of a state-of-the-art refrigerated container yard with racks and plugs for 540 new refrigerated containers. Completed in 2020.	\$13.5 M
Container Yard Paving	Redevelopment of the area into a storage yard capable of handling containers, with upgraded utilities and lighting. Completed in 2020.	\$5.1M
Automated Container Interchange Gate Complex	Development of a fully automated container gate with advanced technologies to increase capacity at the Port of Wilmington. Completed in 2021.	\$25 M

Project Schedule

The *Modernization and Revitalization of Barge Berths* project is prepared to begin immediately upon USDOT award. Assuming this occurs by third quarter (Q3) of 2024, construction is anticipated to be completed by second quarter (Q2) of 2027. The project has been developed as far as recommended by the Maritime Administration (MARAD), with 90% design completed and the National Environmental Policy Act (NEPA) process ready to begin immediately upon award. Cost estimates were prepared by an engineer using a cost database in January 2024 alongside development of project design. The Authority proposes to fund all NEPA and design work separately from the project.

If awarded a PID grant, the Authority anticipates the grant scope items to start in fourth quarter (Q4) of 2024. Permits from the US Army Corps of Engineers (USACE) and North Carolina Department of Environmental Quality (NCDEQ) will be required, and their approval process will begin after the 100% design completion. The Coastal Area Management Act (CAMA) permit will need to be revised as part of the design and permitting process. Real estate and right-of-way acquisition plans will not be required, as improvements will take place within the existing Port footprint. With a PID award, construction is expected to begin in 2025 with operations commencing during 2027. Both dry and liquid cargo services will be maintained throughout the construction period. Barges will dock and unload at Berths 1, 2, and 3 until the barge berths at the Phosphoric Acid Terminal are available for use again. Table 4 indicates the major milestone start and end dates for this capital improvement project.

Table 5: Project Schedule

Project Milestones	2024		2025				2026				2027	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Yearly Quarter												
USDOT Award Announcement												
Environmental Review & Final Design												
Required Approvals and Permits												
USDOT Grant Agreement												
Procurement												
Construction												
Project Closeout												
Stakeholder & Community Engagement												

Project Risks and Mitigation Strategies

As the project is located within the bulkhead’s existing footprint, environmental uncertainties and risks are anticipated to be minimal and there are no risks associated with real estate acquisition. The Authority and Nutrien are fully committed to funding the 21% cost share and any potential cost overruns, as evidenced in the MOU submitted alongside this application, mitigating risk associated with local match. Given that the project will take place within the footprint of the existing barge berths and the Authority has a positive working relationship with its surrounding communities as demonstrated by previous public engagement and the letters of support included in this application, the risk from lack of support is also very low.

The Authority prioritizes the use of goods, products, and materials produced in the United States by all of America's workers by incorporating these terms and conditions into Federal financial assistance awards. The Authority does not anticipate any iron/steel, manufactured materials, or construction materials needed for this project that would not comply with Build America, Buy America requirements. The Authority shall follow the guidance, terms, and conditions of applicable awards and shall include language in bidding contracts that none of the funds provided under the award may be used for these infrastructure types unless it meets the requirements.

Environmental Risk

NEPA Status

NEPA review has not yet started. While the barge berths will be replaced within the bulkhead's existing footprint, an Environmental Assessment (EA) is anticipated because the work will take place in water. With a grant award in 2024 Q3, the Authority anticipates beginning the EA by 2024 Q4 and receiving environmental approval mid-2025.

The Authority has had conversations with the region's MARAD NEPA Coordinator and Gateway Director in early 2024 to discuss the NEPA and permitting processes for this project, including necessary modification of the existing CAMA permit. Given that the project is currently at 90% design, MARAD advised the Authority to pause work until a grant is awarded. The Authority remains ready to quickly deliver the project to meet critical operational needs.

NHPA Status

No consultations under Section 106 of the National Historic Preservation Act have been completed yet but are anticipated to begin concurrently with NEPA review and be complete in advance of the mid-2025 anticipated NEPA approval.

The Authority is experienced in navigating similar Federal review processes and has been awarded five Port Security Grant Program grants at the Port of Morehead City since 2019 with project costs totaling over \$2 million for which the Authority successfully completed the Federal Emergency Management Agency's Environmental and Historic Preservation (EHP) review process.

Environmental Permits and Review

It is anticipated that the Authority will apply for and obtain all necessary permits prior to the start of construction, including USACE Section 404/408 permits and compliance with Section 106, Section 7 of the Endangered Species Act with coordination with USFWS and NOAA Fisheries, and revisions to the Port's existing NCDEQ CAMA permit. A Section 401 water quality certification may be required depending on whether a Nationwide Permit or Individual Permit is appropriate. Permitting process requirements will include compliance with Federal laws to safeguard people's health, the environment, endangered species, and cultural resources. The project will perform any environmental, biological, or cultural analyses or assessments necessary as determined by these processes to protect environmental resources.

The project schedule anticipates the typical timeframe for acquiring these permits, including preparation of permit requests, pre-application meetings, environmental analyses, and review periods. Permits are anticipated to require a total of five to seven months from preparation to approval. The Authority is prepared to begin this process immediately upon award and does not anticipate any delays associated with these permits.

The Authority hosted public meetings related to a PIDP grant it received in FY2021 for rail improvements on Radio Island, which is directly east of this project within the Port of Morehead City complex. The improvements at the Radio Island Terminal have allowed the Authority to further develop relationships with the local community, including stakeholders in the hospitality and tourism sector, government sector including military bases Camp Lejeune and Marine Corps Air Station in Cherry Point, and educational organizations including Carteret County Schools and Carteret County Community College. Part of this prior outreach also included sending letters and email notifications to Homeowner’s Associations (HOAs) in the area. For the 2021 PID project, the HOAs asked the Authority to adjust the schedule to avoid high tourist season. The Authority adjusted the previous project schedule to accommodate this request and has integrated this feedback proactively into this project schedule.

The Authority will build on these past engagement efforts to develop a robust stakeholder outreach plan for the *Modernization and Revitalization of Barge Berths* project during the NEPA and design finalization processes, project delivery, and implementation. Stakeholders will include those identified in prior outreach, the town of Morehead City, and other tenants at the Port. There are no known or anticipated contentious issues related to the project and the prior public engagement conducted for a recent grant at the Port has established good working relationships between the Authority and the surrounding community.

State and Local Approvals

The project application includes a cost commitment letters from the Authority and Nutrien, a resolution of support from the Down East Rural Planning Organization (RPO), and a letter of support from NCDOT Secretary Hopkins. An MOU outlining project roles and responsibilities between Nutrien and the Authority, as well as cost commitment letters are included.²³

The Authority has actively collaborated with Carteret County to integrate its projects related to road and rail access into the county's long-range transportation planning efforts. Several improvements at the Port of Morehead City are documented in the current Carteret County Comprehensive Transportation Plan²⁴ and the Authority will coordinate with both the County and City of Morehead City as the project progresses, though they will not issue any required permits or approvals.

Environmental Reviews, Approvals, and Permits by Other Agencies

While the project will require USACE approval of Section 404/408 permits as described in Environmental Permits and Review, it is not dependent on USACE investment or planned activities.

²³ <https://connect.ncdot.gov/resources/PORTS2024/Pages/default.aspx>

²⁴ <https://www.carteretcountync.gov/2191/Comprehensive-Transportation-Plan-CTP>

Determinations

Statutory Determination

1. The project improves the safety, efficiency, or reliability of the movement of goods through a port or intermodal connection to the port.

2. The project is cost effective.

Guidance

The project significantly improves safety by restoring safe working conditions using purpose-built infrastructure that requires minimum transport distances at the North and East Barge Berths. The project will also eliminate the need for Nutrien's liquid barges to navigate the passage beneath the Newport River Bridge, reducing the safety risks associated with potential infrastructure damage. Avoiding the modal shift of all dry cargo from barge to truck and potentially rail also avoids potential crashes, which would involve hazardous material damaging to both humans and the natural environment.

The project improves efficiency by restoring the capability to berth two barges at a time (reducing turnaround time by 23 hours per barge), load liquid export ships while unloading barges, and faster unloading times with the purpose-built infrastructure (six versus nine hours per barge). By preventing over 500 additional barge trips through the maritime passage to Berth 1, the project will also avoid over 14 days of delay for other Port and tenant vessels.

Together, these safety and efficiency benefits will enhance the reliability of goods movement through the Port of Morehead City. Further, maintaining transport by barge mitigates against the potential risk of labor shortage as transporting the 367,000 tons of dry cargo Nutrien unloads at the Port each year requires approximately 13,250 hours of labor by barge as compared to over 53,000 hours by truck.

Results yielded a benefit-cost ratio (BCR) of 3.53 for the project with diversion of dry cargo to both truck and rail (net present value of \$44,069,645), or a BCR of 2.84 with 100% diversion of dry cargo to truck (net present value of \$32,077,610). Both the North and East Barge Berths would be closed due to poor state of repair by 2027, when construction of the project is anticipated to complete with a PID grant award. project benefits include operational efficiencies and supply chain savings related to liquid barge operations, as well as those associated with avoided modal diversion of dry cargo (operating and personnel time savings; avoided maintenance, crashes, and emissions; and external highway use benefits). The project will also have significant residual value with 30 years of life remaining after the 20-year analysis period.

3. The eligible applicant has the authority to carry out the project.

The applicant, the North Carolina State Ports Authority (NCSPA), is the owner of all assets at the Port of Morehead City. Under Chapter 136 – Transportation, Article 20 –North Carolina General Statute, the NCSPA has the powers and authority to carry out a project of this scale, as also evidenced by the list of successfully completed similar projects in Table 5.

4. The eligible applicant has sufficient funding available to meet the matching requirements.

The Authority and Nutrien, as demonstrated in the joint MOU submitted with this application, have committed to a combined local match of \$3,966,382 (21%) and are fully committed to covering the remaining project design, NEPA review, construction management and administration, and any potential cost overruns. The Authority and Nutrien will each provide \$1,983,191 (10.5%).

5. The project will be completed without unreasonable delay.

The project is currently at 90% design and has not undergone NEPA review, at MARAD’s direction. With a grant award in 2024 Q3, the Authority anticipates receiving environmental approval by mid- 2025. The Authority is prepared to begin work as soon as funding and the proper approvals are received, with obligation in 2025 Q2, construction beginning by 2025 Q4, and construction complete with operations commencing in 2027 Q2. Both dry and liquid cargo services will be maintained throughout the construction period. Barges will dock at Berths 1, 2, and 3 until the barge berths at the Phosphoric Acid Terminal are available for use again.

6. The project cannot be easily and efficiently completed without Federal funding or financial assistance available to the project sponsor.

If PID funds were not received for this project, the Authority would not be able to reconstruct the berths at the Phosphoric Acid Terminal. With the inability to use the East Barge Berths, and the anticipated closure of the North Barge Berths in 2027, liquid cargo would continue to be unloaded/loaded at a limited capacity at the Berth 1 south of the Newport River Bridge; dry cargo would be diverted to other modes of transportation such as rail and truck, significantly impacting the surrounding rural, disadvantaged community. A PID grant in 2024 is imperative to construct the ***Modernization and Revitalization of Barge Berths*** project before the North Barge Berths close and costly workarounds begin impacting not just Port operations but the surrounding community.