PORT BIENVILLE RAILROAD

DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Prepared for:

FEDERAL RAIL ADMINISTRATION

Mississippi Department of Transportation

April 2018

FEDERAL RAILROAD ADMINISTRATION

Port Bienville Railroad
Draft Environmental Impact Statement

Prepared by
U.S. Department of Transportation Federal Railroad Administration
and
Mississippi Department of Transportation

Pursuant to

National Environmental Policy Act (42 U.S.C. §4332 et seq.), and implementing regulations (40 CFR Parts 1500-1508), 64 FR 28545, 23 CFR §771, 49 U.S.C. §303 (formerly Department of Transportation Act of 1966, Section 4(f); National Historic Preservation Act (16 U.S.C. §470); Clean Air Act as amended (42 U.S.C. §7401 et seq. and 40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 U.S.C. §1531-1544); the Clean Water Act (33 U.S.C. §1251-1387; and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. §3601)

FRA will issue a single document that consists of the Final Environmental Impact Statement and Record of Decision pursuant to Pub. L. 112-141, 126 Stat. 405, Section 1319(b) unless FRA determines statutory criteria or practicability considerations preclude issuance of such a combined document.

Sept 11, 2018
Date of Approval

Paul Nissenbaum, Associate Administrator
Office of Railroad Policy and Development
Federal Railroad Administration

9/11/2018
Date of Approval

Mississippi Department Of Transportation

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This draft environmental impact statement (EIS) evaluates a new freight rail line that would provide a direct connection between the Port Bienville Railroad (PBRR) and the Norfolk Southern (NS) rail line near Interstate 59 (I-59), north of NASA's John C. Stennis Space Center (SSC). This connection would provide a second Class I rail connection to Port Bienville and the Port Bienville Industrial Park.

The Federal Railroad Administration (FRA), an operating administration within the U.S. Department of Transportation, agreed to serve as the lead Federal agency in the preparation of this Environmental Impact Statement (EIS). The build alternative would provide a direct connection between the PBRR and the NS rail line near I-59, north of SSC.

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EXECUTIVE SUMMARY

Federal Railroad Administration

Administrative Action – Environmental Impact Statement (EIS)

(X) Draft EIS ( ) Final EIS

( ) Section 4(f) Statement attached

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The Proposed Action

The Mississippi Department of Transportation (MDOT), and the Hancock County Port and Harbor Commission (HCPHC) are proposing a new freight rail line that would provide a direct connection between the Port Bienville Railroad (PBRR) and the Norfolk Southern (NS) rail line near Interstate 59 (I-59), north of NASA's John C. Stennis Space Center (SSC). This connection would provide a second Class I rail connection to Port Bienville and the Port Bienville Industrial Park.

The Federal Railroad Administration (FRA), an operating administration within the U.S. Department of Transportation, agreed to serve as the lead Federal agency in the preparation of this Environmental Impact Statement (EIS).

The following Federal agencies agreed to participate in the development of this EIS as cooperating agencies:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Surface Transportation Board

The following agencies agreed to participate in the development of the EIS as participating agencies:

- Mississippi Department of Marine Resources
- US Environmental Protection Agency (EPA)

Currently, there is no funding or Project Sponsor identified for construction of the Project. If FRA funding is used to construct the Project, FRA would require the future Project Sponsor to comply with the commitments and mitigation measures outlined in this document.

Purpose and Need

Freight transportation represents a key competitiveness factor for Hancock County. Businesses today compete on the basis of product quality, timeliness, and cost. The transportation network that serves their facilities must provide reliable connections to customers and access to a multitude of markets, ensure timely deliveries of goods and services, and provide access for employees and customers. The purpose of the Project is to provide dual Class I access to the Port Bienville Industrial Park to support the needs of its tenants and other industries in the area.

Providing dual Class I access to the Port Bienville Industrial Park Project would address the following needs:

- Improve rail transport time, reliability and cost;
- Foster greater economic opportunities and attract new industries to Hancock and Pearl River Counties;
- Create flexibility and resilience in rail transportation options during storms and other emergencies.

Summary of Major Alternatives

The alternatives in this study are:

- No-Build Alternative
- Build Alternative

The No-Build Alternative would allow existing conditions to be maintained. The proposed new rail line would not be constructed and there would be no impacts to wetlands, streams, floodplains, and water quality. Noise and vibration impacts, impacts to cultural resources, farmlands, and oil and gas pipelines would also not occur. However, the No-Build alternative would not meet the Purpose and Need goals of providing improved rail transport time, reliability, and costs, fostering greater economic opportunities, and creating flexibility and resiliency in transportation options.

The Build Alternative includes the construction of a new proposed rail line, approximately 24 miles in length. The proposed rail line would provide a direct connection between the PBRR and the NS rail line near I-59, north of SSC. A Feasibility Study was conducted in 2013 as a first step in developing the Project; this study developed and analyzed a number of alternatives for the proposed rail corridor alignment. The streamlined screening and selection process for this Project incorporated geographic information systems (GIS) analysis, an automated corridor analysis tool called the Alignment Alternatives Research Tool (AART), limited field reconnaissance and data validation, engineering design criteria, and review and evaluation by professional planners and engineers that comprise the Project team. These activities were performed as part of the National Environmental Policy Act (NEPA) process and incorporated client input, public and other stakeholder comments and concerns, as well as consideration of previous studies. The alternatives development process was iterative in nature, providing a continuous quantification and

comparison of impacts to an equal level of detail as the alternatives were modified based on design criteria, cost, and other considerations during Project development. One main corridor of least impact was identified for the majority of the alignment; four segments along the corridor still had multiple alternates. As these segments were evaluated using an impact matrix, alternate segments were eliminated, and a reasonable Build Alternative was brought forward for detailed study.

Preliminary cost estimates were updated for the Build Alternative identified. Quantities were estimated from conceptual designs and unit cost data for similar type rail construction was used to estimate the construction costs including right of way, earthwork and drainage, track work, bridges and grade crossings. The estimated cost for the Build Alternative is **$118,151,000** in 2016 dollars.

The Build Alternative has been identified as the Preferred Alternative for the Project; it will be reviewed during distribution of the DEIS and during the public hearing. Any changes made to the Preferred Alternative based on comments received will be addressed in the FEIS/Record of Decision (ROD).

Summary of Impacts

The No-Build Alternative would not meet the Purpose and Need for this Project but was considered as a baseline for the comparison of impacts with the Build Alternative. The No-Build Alternative would not impact either the natural or human environment; however, the anticipated economic benefits of the proposed Project would also not be realized. The Build Alternative would impact both the natural and human environment. As summarized in **Table ES 1**, the primary impacts would include streams, wetlands, farmlands, floodplains, noise, vibration, and safety of at-grade crossings.

Table ES 1: Summary of Impacts and Costs

Impact Category (Units)	No-Build Alternative	Build Alternative
HUMAN ENVIRONMENT		
Cultural Resources (Sites)	N/A	0
Farmland (Acres)	N/A	222
Noise (No.)	N/A	2 Severe/12 Moderate
Vibration (No.)	N/A	3
Residential Relocations (No.)	N/A	0
Hazardous Materials (Sites)	N/A	1
Business Relocations (No.)	N/A	0
Environmental Justice Impacted Census Blocks (No.)	N/A	4
NATURAL ENVIRONMENT		
Streams (LF)[1]	N/A	2,482
Wetlands (Acres)[1]	N/A	171.58
Other Waters (Acres)[1]	N/A	2.01
Floodplains (Acres)	N/A	96.74
Threatened and Endangered Species (affect/impact)	N/A	7[2]
ENGINEERING		
Gas Pipelines (Crossings No.)	N/A	8
Railroad Bridges Over Roadways (No.)	N/A	4
Railroad Bridges Over Streams (No.)	N/A	2

Impact Category (Units)	No-Build Alternative	Build Alternative
SAFETY AND MOBILITY		
At-Grade Crossings (No.)	N/A	22
Construction Costs	N/A	$ 118,151,058

(1) Based on detail field work.
(2) Two of the species are State Listed Species

Areas of Controversy

Federal and state agencies have been involved in the process since the beginning of the Phase 1 feasibility study. Also, Project stakeholders, local officials, and the public have been engaged in the planning process and Project development. Stakeholders, local officials, and the public have been supportive of the Project and controversy over the Project has been limited. The consensus is that this is a much-needed Project for Hancock County, the region, and the state.

Impacts to natural resources, including wetlands and streams, within this area is a major concern. Resource agencies, including USACE, MDEQ and EPA have expressed that maintaining the hydrology and sheet flow within this area is of high importance. Although the design elements of the Project are conceptual at this point, efforts to minimize impacts to both the human and natural environments will continue during Project development.

Coordination Required

A U.S. Army Corps of Engineers Section 404 permit will be required for construction of the Build Alternative. Section 404 of the Clean Water Act, requires that the proposed Project be permitted before any construction activities, including dredging or fill, occur within waters of the U.S. Mississippi Department of Environmental Quality (MDEQ). The future Project sponsor will be responsible for obtaining the permits. Permitting would be coordinated with requirements of the Clean Water Act to ensure that water quality is maintained. Coordination with the United States Fish and Wildlife Service (USFWS) is underway for any potential impacts to threatened and/or endangered species. Also, coordination will be required with the Federal Emergency Management Agency (FEMA) during Project design to ensure that there are no encroachments to the floodway. Coordination with the State Historic Preservation Office (SHPO) and the Mississippi Department of Archives and History (MDAH) for any impacts to cultural resources is ongoing. MDAH/SHPO does agree that the construction of the Project would not have an adverse impact on any of the identified cultural resource sites. Coordination with utility companies, pipelines, and other infrastructure facilities will be ongoing through Project development.

Summary of Environmental Consequences

If FRA funding is used to construct the Project, FRA would require the future Project Sponsor to comply with any commitments and mitigation measures outlined in this section.

Land Use

Because 76% of the land within the Study Area is within the SSC acoustical buffer zone, land use changes are not anticipated in the area.

South of U.S. 90, the alignment exits the SSC acoustical buffer zone and continues south for 1.7 miles to PBRR; future land use within this section of the Study Area has the highest potential to change as a result

of the Build Alternative, where industrial and other commercial development could occur between the Build Alternative and Port Bienville Industrial Park. These potential land use changes are consistent with future land use designations identified in the Hancock County Comprehensive Plan, where this area is designated for industrial, office park and office retail uses.

Farmland

NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score; the assessment is completed using form NRCS-CPA-106, Farmland Conversion Impact Rating For Corridor Type Projects. The resulting site assessment score is under 160, the threshold for determining impacts to protected farmland. For Projects with a score less than 160, no alternative actions (alternative sites, modifications or mitigation) need to be considered for farmlands impacts. Coordination with NRCS was initiated in the form of a written letter, Project description and map and NRCS-CPA-106 form to the state soil scientist on October 19, 2016.

Socioeconomics

The Build Alternative would provide a link between the PBRR and the Norfolk Southern line, which would support economic development and growth in Hancock County and the Port Bienville Industrial Park. This would provide dual Class I rail service, at the Park, which would make the area more appealing to industries that benefit from or require this rail service. Potential benefits of this service would be attracting new businesses that would provide job growth; reducing rail shipping costs; additional transportation options for moving freight; and providing alternative response options in the event of emergency and natural disaster situations.

With the benefits of attracting new businesses and increasing workforce expected by the proposed Project, it is likely that increases in employment and income may be experienced in the region.

Relocations

There are no relocations associated with the proposed Project.

Environmental Justice

The Build Alternative would have no disproportionately high or adverse effects to environmental justice populations. No relocations are anticipated, and access would be maintained for all property owners during and post construction.

Cultural Resources

Archaeological Sites

Thirteen of the 24 linear sites have been determined as not eligible for listing on the NRHP. Eleven sites are considered as unknown for their eligibility determination. While sites with an NRHP eligibility determination of "unknown" are present, FRA has determined the construction of the Project would not have an adverse impact on these sites. Coordination with the State Historic Preservation Office (SHPO) has been conducted and the MDAH/SHPO have concurred.

If unanticipated cultural materials (e.g., large, intact artifacts or animal bones; large soils stains or patterns of soil stains; buried brick or stone structures; clusters of brick or stone) or human skeletal remains are discovered during construction activities, then the appropriate construction engineer shall be immediately notified and all work in the vicinity of the discovered materials shall cease until an evaluation can be made by the MDOT archaeologist in consultation with the MDAH/SHPO.

Historic Structures

Three historic structures were identified within the architectural APE. Resource 1 is an approximately 145-foot-long open-deck timber trestle over Second Alligator Branch. Resource 2 is an approximately 145-foot-long two-span through plate girder bridge over Alligator Branch. Resource 3 is a prefabricated corrugated metal pipe culvert over Indian Camp Branch. None of these resources were determined to be eligible for the NRHP. Coordination with the State Historic Preservation Office (SHPO) is ongoing.

Air Quality

Air quality impacts are possible during construction of the Project. Emissions from construction vehicles and equipment can be minimized by employment of several BMPs: (1) properly maintaining and tuning equipment; (2) reducing equipment idling time; (3) planning efficient routes from construction material loading sites to the construction site; and, (4) using alternative fuels for construction equipment, when feasible. Emissions from local vehicles resulting from detours and other traffic delays during construction can also be minimized by implementing BMPs during construction, including properly planning traffic control in work zones and signage. Dust generated by construction activities can be minimized by providing water suppression controls and soil stabilizers. The future Project Sponsor identified for construction of the Project will be responsible for implementing BMPs for air quality.

Noise and Vibration

Noise and vibration associated with the proposed Project has the potential to affect residential and commercial properties adjacent to the rail line near Nicholson. Using methods published by the FTA/FRA, Project-related noise and vibration were evaluated to assess the potential for impacts. Analysis results indicate that Project-related noise and vibration has the potential to exceed impact thresholds as defined by the FTA/FRA. It has been determined that 12 receptors could experience moderate noise impacts and two receptors have the potential to experience severe noise impacts. FRA does not require mitigation for moderate noise impacts, because the magnitude of the change in noise levels or overall noise level is modest and not projected to substantially affect sleep or other activities. Noise mitigation for severe impacts may include: eliminating locomotive horn use at the U.S. 11 at-grade crossing, retrofitting buildings with air conditioning and improved storm doors and windows, or settlements. These would only be considered where severe noise impacts are projected to occur prior to the Final Environmental Impacts Statement (FEIS). The future Project Sponsor would be responsible for implementation of noise mitigation measures. Results of the general vibration assessment indicate that vibration impacts are projected to occur at a distance of 169 feet from the rail line. Based on this distance, three receptors have potential to experience vibration impacts. There are no practical means of mitigating ground-borne vibration impacts.

Wetlands/Waters of the U.S.

In developing the Build Alternative, considerable time was taken to avoid waters of the U.S., including wetlands, during the planning and preliminary design process. Impacts to wetlands and other waters have been minimized by modifying the alignment to the extent practicable. During the design phase, construction limits would be defined; construction limits are estimated to be approximately 75 feet wide, which would further reduce wetland impacts.

The future Project Sponsor would be responsible for implementation of mitigation measures for wetlands/waters of the U.S. Best management practices (BMPs) would be implemented by the contractor to avoid and minimize impacts to wetlands and streams, where practicable. Surface matting is an option that would reduce soil disturbance, and silt fencing where activities are occurring adjacent to streams would be implemented. Permanent impacts or conversion to uplands would be confined to the surface area

occupied by the new rail embankment. Post-construction, temporary impact areas would be restored to pre-construction elevation, and native vegetation would be planted to re-establish native vegetation quickly. No conversion of wetlands or net loss habitat is anticipated from the rehabilitation/construction of the existing portion of the Project.

Construction of the proposed Project would require a permit under Section 404 of the Clean Water Act (CWA) to authorize impacts to waters of the U.S., including wetlands. The compensatory mitigation requirements under Section 404 would provide for the replacement of the functions of wetlands and water impacted by the proposed Project. Because the proposed Project would not appreciably diminish the availability of functional wetlands and other waters, there would be no fragmentation of wetland vegetative communities. Therefore, short-term and long-term impacts would be localized and minor.

Floodplains

The Project would be designed to include features, such as bridges and culverts, so that it would not create over a foot of rise of flood water within the Study Area. Floodplain impacts typically require coordination and approval from FEMA and the local floodplain administrator(s), which include Hancock and Pearl River Counties. During the permitting process, FEMA and Hancock and Pearl River Counties would be contacted for permit and review requirements for the Project.

Water Resources

No permanent impacts to water quality are anticipated as the result of the Build Alternative. Railroads typically do not contribute much to surface water or groundwater contamination. Localized water quality could be temporarily affected during construction, but use of BMPs would minimize potential water quality impacts. Consultation with the Mississippi Department of Environmental Quality (MDEQ) and EPA would be initiated to identify appropriate measures to minimize these impacts.

A Section 401 Permit (Water Quality Certification) would be required from the MDEQ's Environmental Permits Division, Office of Pollution Control prior to construction. Any water quality impacts would be mitigated as part of the 404/401 permit process.

Vegetation and Wildlife

The future Project Sponsor would be responsible for implementation of minimization and mitigation measures for vegetation and wildlife. BMPs would be used to the extent practicable to further reduce the impact to wildlife and habitat. Vegetation clearing for construction activities would be planned outside of migratory bird breeding season for the area. In addition, areas disturbed for stockpiling materials or equipment staging yards would be placed in uplands where possible and restored to pre-construction elevations and re-seeded with native species to re-establish the vegetation community. During construction, sediment run-off would be controlled near streams through the use of silt fencing and other methods to reduce turbidity and any potential effects on aquatic species.

Threatened and Endangered Species

For all species, construction activities could cause temporary displacement or stress. However, these impacts would be temporary and would return to normal levels post-construction. Also, listed species are typically lower in abundance than other species, so the probability of encountering and therefore affecting a listed species within the Project right of way is lower than other species of abundant wildlife (raccoons, possums, squirrels, etc.). If any of the identified threatened and endangered species were found in the right

of way of the Build Alternative during construction, additional coordination with USFWS would be required.

Due to potential suitable habitat observed within the survey corridor, the Project may affect/impact, but is not likely to adversely affect/impact, the following five federally-listed species: Louisiana quillwort, eastern indigo snake, red-cockaded woodpecker, wood stork, and the Florida panther. There are two state-listed species within the corridor having suitable habitat which are the Louisiana Black Bear and the Rainbow snake. No protected species were observed during field reconnaissance.

Based on the literature review conducted for this EIS, the only documented occurrence of any state or federally listed threatened or endangered species or candidate species within the Study Area is the state-listed rainbow snake. The rainbow snake may be adversely impacted with the conversion of wetland and aquatic habitats to uplands as part of the proposed construction of the rail Project. This construction may reduce the vegetative cover (habitat) and food source of the rainbow snake within the right of way and cause displacement. Potential impacts include being struck by construction equipment and vehicles when trying to escape its burrow/habitat, stress, and exposure to predators from lack of suitable cover.

Hazardous Waste

The Build Alternative is located within the Hancock County Bombing and Gunnery Range. As such, Unexploded Ordnance (UXO) may pose a risk of detonation during construction. To reduce the risk of encountering UXO, a thorough search using metal detectors of all areas within the proposed right of way that fall within the Hancock County Bombing and Gunnery Range, and where the soil would be disturbed or heavy equipment utilized, will be conducted prior to construction. In the event that a UXO is discovered, all activity will immediately cease; the area will be evacuated, and local authorities will be contacted to dispatch a bomb disposal unit to the UXO location.

Transportation and Safety

In accordance with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD), traffic control for grade crossings includes all signs, signals, markings, other warning devices, and their supports along highways approaching at-grade crossings. The function of this type of traffic control is to promote safety and provide effective operation of rail and highway traffic at grade crossings. Before any new highway-rail grade crossing traffic control system is installed, or before modifications are made to an existing system, approval will be obtained from the highway agency with the jurisdictional and/or statutory authority, and from the railroad company with ownership of the rail line. [1]

Highway-rail grade crossing traffic control measures would be implemented in accordance with the MUTCD standards as part of the Project. Recommended traffic control for highway-rail at-grade crossings would include, at a minimum, one grade crossing (crossbuck) sign on each highway approach to every highway-rail grade crossing, alone or in combination with other traffic control devices. The crossbuck sign is a warning to on-coming traffic of a highway-rail grade crossing and a driver's responsibility to yield to rail traffic if a train is approaching the crossings. Also, a Grade Crossing Advance Warning sign will be used on each highway in advance of every public highway-rail grade crossing.

[1] Federal Highway Administration (FHWA). 2009. Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways. 2009 Edition. Updated in 2012.

Utilities and Pipelines

Specific utility information such as pipeline depths, overhead clearances for power lines, and the location of utility poles within the Project right of way is unknown at this time. Project design will include utility surveys and subsurface utility investigations to determine the horizontal and vertical location of utility infrastructure. During design phase services, surveys will be conducted to identify potential utility impacts and potential relocations or adjustments.

All modifications, relocations or adjustments of utilities will remain subject to coordination with the affected utilities. For pipelines and other underground infrastructure, Mississippi's "One Call" underground utility notification service (Mississippi 811, Inc.)[2] will be contacted before commencing construction operations. Coordination will be required to ensure that overhead and underground utilities meet American Railway Engineering and Maintenance Association (AREMA) standards within the proposed right of way.

Construction Impacts

Construction impacts will be controlled, minimized, or mitigated by closely adhering to applicable federal, state and local laws governing safety, health, and sanitation and through conformance with established construction methods. Most of the proposed rail alignment is located away from residential, public, and business structures, so construction impacts to citizens and business operations, such as noise, would be limited.

[2] Mississippi 811, Inc. (http://ms1call.org/) is a non-profit organization providing underground utility notification service under Mississippi Code of 1972, Chapter 13, Sections 77-13-1 through 77-13-23.

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1.0 INTRODUCTION

Signed into law on January 1, 1970, the National Environmental Policy Act (NEPA) of 1969 established a national environmental policy and a framework for considering the environment in decision-making for Federal actions. NEPA applies to Federal government activities and it requires all Federal agencies to:

- assess the environmental impacts of major Federal projects or decisions such as issuing permits, spending Federal money, or affecting Federal lands;
- consider the environmental impacts when making decisions; and
- disclose the environmental impacts to the public.

NEPA also established the Council on Environmental Quality, which oversees NEPA for all Federal agencies. CEQ developed regulations for implementing the law (Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR §§ 1500-08)). These regulations require all Federal agencies to write their own regulations for implementing NEPA.

NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. An Environmental Impact Statement (EIS) is a document that "shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.[1] An EIS considers the purpose and need for the action, reasonable alternatives to the proposed action, including "no action," relevant environmental impacts and potential mitigation measures.[2] An EIS is required when a proposed action could significantly affecting the quality of the human environment.

More information on NEPA can be found through the CEQ publication "A Citizen's Guide to NEPA", which is an informational guide that provides an explanation of NEPA, how it is implemented and how the public can participate in the assessment of environmental impacts conducted by Federal agencies.[3] This can be found on the CEQ's website at: http://ceq.hss.doe.gov/publications/citizens_guide_to_nepa.html.

The Mississippi Department of Transportation (MDOT), Federal Railroad Administration (FRA), and Hancock County Ports and Harbor Commission (HCPHC) have prepared this Draft Environmental Impact Statement (DEIS) in accordance with NEPA, the CEQ regulations implementing NEPA) and FRA's Procedures for Considering Environmental Impacts.[4]

Currently, there is no funding or Project Sponsor identified for construction of the Project. If FRA funding is used to construct the Project, FRA would require the future Project Sponsor to comply with the commitments and mitigation measures outlined in this document.

[1] 40 CFR 1502.1
[2] https://www.epa.gov/laws-regulations/summary-national-environmental-policy-act, accessed 9/25/17
[3] https://ceq.doe.gov/docs/get-involved/Citizens_Guide_Dec07.pdf, accessed 9/25/17
[4] 64 FR 28545 (May 26, 1999)

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2.0 PURPOSE AND NEED

The MDOT, FRA and the HCPHC are preparing this DEIS to evaluate a proposed new freight rail line that would provide a single-track, direct connection between the Port Bienville Railroad (PBRR) and the Norfolk Southern (NS) rail line near Interstate 59 (I-59), north of the National Aeronautics and Space Administration's **(**NASA) John C. Stennis Space Center (SSC) (hereinafter referred to as the "Project"). Port Bienville is currently served by one Class I rail connection, CSX Transportation (CSX). The Project would provide connection to a second Class I rail line for Port Bienville and the Port Bienville Industrial Park.

2.1 Project Location and Study Area Description

The Project is located in the southwestern portion of the state of Mississippi and encompasses a portion of Hancock and Pearl River Counties. The "Study Area" is generally bound by (the communities of) Nicholson and Kiln to the north, Port Bienville to the south, the Pearl River to the west, and Stennis International Airport and Airpark and State Road (SR) 603/43 to the east, representing a study area of approximately 231 square miles (see **Figure 2.1**) (hereinafter referred to as the "Study Area").

The Study Area is bisected by I-10, while I-59 passes through a small portion of the Study Area to the north. Other major features within the Study Area include wetlands, wetland mitigation banks, forests, open pit sand mines, SSC, and a 125,000-acre acoustical buffer zone (buffer zone) surrounding the SSC that is used for testing of large-scale rocket engines and components. This acoustical buffer makes up the majority of the Study Area and restricts development of this large area of land outside SSC. The two major facilities and key economic factors within the Study Area are Port Bienville Industrial Park and NASA's SSC.

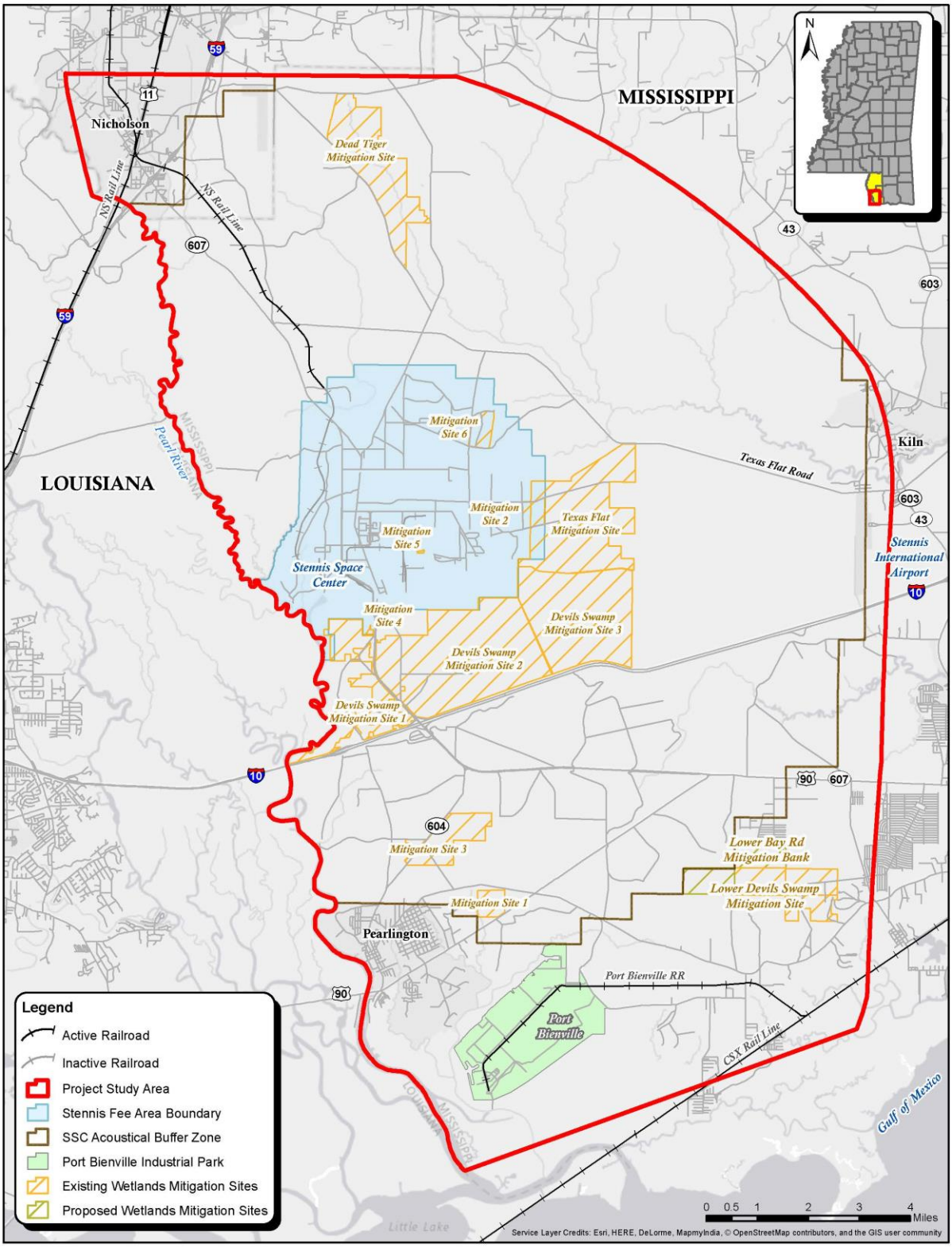
Port Bienville Industrial Park – Port Bienville is a shallow twelve-foot deep draft barge port in southwest Mississippi, located off the Intracoastal Waterway near mile marker 24 on Mullatto Bayou in Hancock County. It is one of four ports serving Mississippi's gulf coast. The Port Bienville property encompasses approximately 3,600 acres, including the Port Bienville airport facility, industrial park, and the port. Approximately 800 people are employed at the companies located in the Port Bienville Industrial Park.[5] The barge port has six employees and the Port Bienville Railroad employs eight people.[6] Seven companies are engaged in manufacturing and research and development involving plastics, chemicals, and metals. Both raw materials including coal, sheet steel, and chemicals and finished materials such as polymers and plastics pellets, steel pipe, beams, and specialty fabricated metals are shipped via the port.[7] Three businesses at the park provide logistics services including shipping and warehousing, and one is part of a large nationwide firm that leases and repairs rail cars.

[5] 2012 interviews with Port Bienville Industrial Park businesses and information from Hancock Port and Harbor Commission for the Port Bienville Railroad Economic Feasibility and Economic Development Benefits and Opportunities Analysis

[6] Employment figures provided by Beau Gex, Government and Industrial Relations Manager, Hancock County Port and Harbor Commission on November 23, 2015.

[7] From interviews with firms at Stennis and Port Bienville Business Parks and Port Bienville Rail Road in September and October 2012.

Figure 2.1: Project Study Area



Several businesses within the industrial park are currently major rail users, relying on rail for both incoming raw materials and outbound shipments. Companies also use a combination of the modes available within the park: truck, rail, and barge. Several businesses receive products that come by container ship, often to the Port of New Orleans, and then the product travels to or from Port Bienville by rail, barge, or truck to the Port of New Orleans. A number of companies in the industrial park currently export finished goods to international customers in Mexico, Brazil, Peru, Panama, and Canada.

John C. Stennis Space Center – For more than four decades, SSC in Hancock County has served as NASA's primary rocket propulsion testing ground. Today, SSC has evolved into a multidisciplinary facility that includes NASA research facilities and other resident agencies engaged in space and environmental programs and national defense, including the U.S. Navy's oceanographic research community. It provides propulsion test services to NASA, the Department of Defense, and the private sector. SSC is home to NASA's Rocket Propulsion Test Program, which manages all of the agency's propulsion test facilities. Approximately 5,000 people work at the SSC.[8]

The SSC includes propulsion test facilities, a canal system, and the 125,000-acre acoustical buffer zone that surrounds SSC, which provide testing locations for large-scale rocket engines and components. Development within the acoustical buffer zone is governed by development restrictions purchased by the Federal Government. Some of the land within the buffer zone was purchased by the government, but the majority of this property remains in private ownership subject to development restrictions that do not allow any inhabitable buildings within the buffer area.

2.2 Purpose

Freight transportation represents a key competitiveness factor for Hancock County. Businesses today compete on the basis of product quality, timeliness, and cost. The transportation network that serves their facilities must provide reliable connections to customers and access to a multitude of markets, ensure timely deliveries of goods and services, and provide access for employees and customers. The purpose of the Project is to provide dual Class I access to the Port Bienville Industrial Park to support the access needs, reliability and competitiveness of its tenants and other industries in the area.

2.2.1 Project Background

Mississippi's waterborne transportation is a critical component to the state's economy, as identified through MDOT's long-range planning in the 2035 MULTIPLAN.[9] Port Bienville is a shallow draft barge port and is one of four ports serving Mississippi's gulf coast. The Port Bienville Industrial Park and PBRR provide intermodal connections to support surface transportation freight movement from Port Bienville.

CSX and NS both provide Class I rail service to markets east of the Mississippi River. PBRR provides shippers at the industrial park with an existing connection to CSX on the shortline railroad east of the industrial park; however, there is no existing connection to the NS line, which is located in the northwest section of the Study Area.

[8] https://www.nasa.gov/centers/stennis/pdf/626857main_2012-Mission

[9] Mississippi's Unified Long-Range Transportation Infrastructure Plan, Final Report May 2011, MDOT

The Project received an earmark in the amount of $2.16 million in the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)[10] in 2005.

In 2013, the *Port Bienville Rail Feasibility Study,* completed during Phase 1, was prepared for the Project to determine the potential economic benefits of the proposed railroad and to evaluate initial corridors for that railroad. Phase 1 concluded that the construction of the rail line would bring economic benefits to Hancock County; in addition, initial alternatives were developed and feasible segments were recommended for further consideration in the Feasibility Study. The Phase 1 study reports included the *Port Bienville Rail Feasibility Study, Port Bienville Economic Development Benefits and Opportunities Analysis,* and the *Port Bienville Rail Alternatives Development Technical Methodology*. These documents can be found in **Appendix A** or on MDOT's website at: http://sp.mdot.ms.gov/Environmental/Environmental%20Projects/Port%20of%20Bienville%20(Hancock%20County)/Port%20Bienville%20Feasibility%20%20Report.pdf.

At the initiation of Phase 2, the EIS, a Notice of Intent (NOI) was published in the Federal Register on June 2, 2015.[11]

2.2.2 Regional Rail Dependency

The Hancock County Port and Harbor Commission identified four major growth sectors for the community: aerospace and aviation, cargo-oriented development, polymers and advanced composite materials, and geospatial technology. Transportation research data indicates that most of these industries are highly dependent on freight rail service, as shown in **Table 2.1**. Relating these existing and emerging businesses to the transportation dependence of their associated business sectors underscores the critical relationship between Hancock County's economy and multimodal transportation network.

Table 2.1: Transportation Dependence Rating of Hancock County's Top Industries

Industry Sector	Highways	Freight Rail	Waterways/ Ports	Air	Transportation Cost per Dollar of Output
Aerospace & Aviation	High	High	High	High	9%
Cargo-Oriented Development	High	High	High	Medium	9%
Polymers & Composite Materials	High	High	Medium	Low	9%
Geospatial Technology	High	Medium	Low	High	6.5%

The proposed rail connection would provide existing businesses access to dual Class I rail service, improving transit times and reliability of deliveries to customers. Dual Class I rail access would enable Hancock and Pearl River Counties to better serve existing industries and attract new industries to this region that require this level of rail service, creating new quality jobs and investment to help this area to continue to recover from recent disasters that have significantly affected their economies.

[10] FHWA/ https://www.fhwa.dot.gov/safetealu/, accessed 9/25/17

[11] Federal Register / Vol. 80, No. 105 / Tuesday, June 2, 2015 / Notices – Federal Railroad Administration, Environmental Impact Statement for Port Bienville Railroad Project

2.3 Need

Providing dual Class I access to the Port Bienville Industrial Park project would address the following needs:

- Improve rail transport time, reliability and cost;
- Foster greater economic opportunities and attract new industries to Hancock and Pearl River Counties;
- Create flexibility and resilience in rail transportation options during storms and other emergencies.

2.3.1 Improve Rail Transport Time, Reliability and Cost

Companies within the Port Bienville Industrial Park depend upon reliable transportation services to meet their customer's delivery and production schedules, and on competitive transportation rates to keep their customers' business. Reliability and speed to market were determined to be critical factors of competitiveness for 85 percent of these businesses based on the *Port Bienville Rail Feasibility Study*.

At present, rail freight bound for Port Bienville must travel to the Gentilly Switching Yard in New Orleans, where trains are reconfigured for specific destinations, and then be back-hauled to Port Bienville. This additional time and distance increases the cost of rail transport. The Gentilly Yard is also often congested. It is not unusual for cars to take at least seven days to move from the Gentilly Yard back to Port Bienville, and transit times as long as 28 days were reported by Port Bienville Industrial Park rail users. This is more than an inconvenience; in the past, one Port Bienville Industrial Park business had to hire hundreds of trucks to offload a rail shipment in order to avoid a customer penalty for late delivery, and another business faced a plant shutdown when raw materials were held up.[12] Local businesses must consider timeliness of deliveries and reliability, as their customers' value transit time and predictability of shipments.

Dual Class I rail service would offer options to utilize two independent rail networks, potentially bypassing Gentilly Yard, thereby improving reliability and reducing rail delivery times to a number of strategic markets for existing and potential businesses in Hancock and Pearl River counties.

For those who ship or receive heavy or oversized materials, or who receive or ship large quantities, freight rail can be much more cost effective than other modes, including trucking. A study of U.S. chemical producers (a significant industrial sector in the Port Bienville Industrial Park) found that average rail shipping rates for captive production facilities (providing connection to only one Class I rail service)[13] were 30 percent higher than non-captive facilities when considering comparable volumes, distances, and services.[14] In addition to reliability of service, providing dual Class I rail service to Port Bienville would also result in competitive pricing that would lower rail transportation costs.

Existing and potential businesses would benefit from the transportation savings and improved transportation services that historically are realized with access to two Class I railroads. Dual Class I rail service would improve delivery time to customers and reduce potential delays to certain key markets, and has the potential to reduce transportation costs by up to 30 percent. Improvements in transportation costs

[12] Port Bienville Rail Economic Feasibility Study: Economic Benefits and Opportunities Analysis, Mississippi Department of Transportation, 2013

[13] Captive rail facilities are those with access to only one Class I rail service provider.

[14] Veris Consulting for the American Chemistry Council. 2012. "Analysis of Freight Rail Rates for Chemical Shippers."

and services would substantially affect a company's profitability. Lower transportation costs and more reliable freight rail service would help reduce the cost of materials, and thus overall production costs. Reliable delivery of materials would enhance productivity, reduce distribution costs to the consumer, and may also improve their competitiveness.

2.3.2 Economic Opportunities

The economic prosperity of Hancock County and south Mississippi depends upon the businesses and industries within the region, and the ability to meet their unique requirements for workforce, land, transportation, utilities, and other services. Transportation factors, such as accessibility to highways, airport, port and railroad services, along with other competitive conditions including the availability of land and buildings, occupancy and construction costs, corporate tax rates, incentives, and labor costs, influence the site decisions that businesses make when locating, expanding, or consolidating operations. While freight rail transportation alone would not foster economic growth, improved freight services and connectivity, multi-modal transportation services, and competitive costs can significantly differentiate the region's economic environment, providing opportunities to attract and retain businesses and jobs for Hancock County and the region in the future.

Access to dual Class I rail service is a critical factor for economic competitiveness for existing businesses, and it is a significant factor for many companies considering sites for new or expanded business operations. Industrial parks providing dual Class I rail services are a scarce resource in the U.S., and for certain significant industrial locations access to dual rail service is imperative; these sites are considered the "crown jewel" in the industrial development profession.[15] Access to two Class I railroads would position Hancock County and Port Bienville in this elite group of industrial parks.

In addition, the need for dual Class I rail service to improve freight mobility was reiterated by business owners and managers at both Port Bienville Industrial Park and Stennis International Airport and Airpark[16] when they were interviewed in 2012 during the development of the *Port Bienville Rail Feasibility Study* (**see Appendix A**). Several Port Bienville Industrial Park tenant owners and managers noted their plans for expansion would hinge on the availability of dual Class I rail service.

The most significant long term economic development benefits and opportunities resulting from this rail connector would be generated from new employment and additional investment in plant and equipment by existing businesses, and the location of new companies that require or would benefit from access to dual Class I rail services. The new rail line would be directly accessible to the Port Bienville Industrial Park, which has over 3,000 available acres available for future industrial development in addition to the existing rail users already in operation in this industrial park.

Hancock County has over 6,600 acres of industrial land available for lease or sale and has identified 1,500 acres for future industrial development. Industries in both Hancock and Pearl River Counties could access the new rail line via the transload facility[17] or through truck-rail intermodal operations.

[15] Mark Sweeney, McCallum Sweeney Group, IEDC Industrial Site Location Panel 2010

[16] Stennis Airpark is a 1,800 acre business park adjacent to Stennis International Airport. Some of this property is accessible to the airport's 8,500 foot runway that can accommodate the largest cargo plane currently in use internationally.

[17] http://www.investopedia.com/terms/t/transloading.asp; accessed 8/10/2017

With this substantial industrial land inventory and access to dual Class I rail services directly or via spurs, Hancock County could meet the site location requirements of a significant number of the mega-projects and major industrial facilities that have located in the U.S. over the past ten years.

For additional information regarding economic benefits related to the Project see the *Port Bienville Economic Development Benefits and Opportunities Analysis* in **Appendix A.**

2.3.3 Flexibility and Resilience

The connection to CSX is along the coast and serves as a primary east/west rail connection; there is currently no north/south rail connection at the Port Bienville Industrial Park site. Traversing the Gulf Coast, this existing CSX rail line is located within the storm surge zone and has experienced significant service disruptions in the past due to natural disasters (lasting up to six months), thereby limiting intermodal connections into and out of the Port and resulting in rail closures in the wake of these events.

In a future hazard event or disaster, the proposed rail line connection would provide significant improvement in rail transportation resilience for this coastal region by enabling existing rail carriers to position equipment and material out of harm's way and allowing businesses in the industrial park to strategically deploy equipment and materials, enabling operations to restart more quickly after an event.

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3.0 ALTERNATIVE ANALYSIS

The alternative selection process for any transportation facility begins with the development and quantification of a "universe" of preliminary alternatives that are further refined to provide a range of feasible alternatives that best solve a project's purpose, needs, and objectives. For this Project, a two-phase process was used to achieve the identification and evaluation of preliminary alternatives, selection of reasonable alternatives, and the recommendation of a build alternative. The first phase of the Project was the development of a Feasibility Study (Phase 1);[18] this phase initiated the NEPA process and included establishment of a Study Area, development of engineering criteria, creation of a range of alternatives, and development of preliminary cost estimates to determine the feasibility of the Project. The alternatives screening and selection process during Phase 1 incorporated geographic information systems (GIS), an automated corridor analysis tool called the Alignment Alternatives Research Tool (AART), limited field reconnaissance and data validation, and engineering design criteria. All reviews and evaluations were conducted by the Project team which consists of scientists, planners, and engineers. The process also incorporated state and federal agency input, public and other stakeholder comments and concerns, as well as consideration of previous studies. At the end of Phase 1, a range of reasonable alternative segments were defined and progressed into Phase 2 of Project development.

The goal for Phase 2 was the completion of an Environmental Impact Statement (EIS) for the proposed action. A key milestone in the EIS process is the identification of a range of reasonable alternatives to be evaluated. The alternatives analysis process was iterative in nature, providing a continuous quantification and comparison of impacts to all resources at an equal level of detail at each stage of the analyses and refinement. Impact comparisons were determined for the various alternative segments based on design criteria, cost, and other considerations throughout the alternative analysis.

The No-Build Alternative

Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur. There are no planned/proposed improvements to the existing Port Bienville shortline rail line, therefore no changes would be made to this line under the No-Build Alternative. The No-Build alternative would not provide a connection to the Norfolk Southern (NS) rail line and therefore, would not provide dual Class I service to Port Bienville or the Port Bienville Industrial Park. The No-Build Alternative does not meet the Purpose and Need for the project but is brought forward for further analysis and evaluation under NEPA to serve as the basis for comparison of the environmental impacts associated with the Build Alternative.

[18] Port Bienville Rail Alternatives Development Technical Methodology Report, September 19, 2013

3.1 Phase 1 – Initial Alternative Development

3.1.1 Study Area

The Study Area, in general, encompasses a portion of Hancock and Pearl River Counties. The Study Area is bounded by the community of Nicholson to the north, Port Bienville Industrial Park to the south, the Pearl River to the west, and Stennis International Airport and the community of Kiln to the east, representing a Study Area of approximately 231 square miles. The proposed railway corridor is expected to be approximately 24 miles in length, and extends from Nicolson to Port Bienville where it connects to the PBRR.

3.1.2 Engineering Criteria

To meet engineering requirements for this type of railroad, a horizontal curve of three degrees thirty minutes (1,637 feet) was used for the initial corridors. This minimum curve radius corresponds to a travel speed of 49 miles per hour.

3.1.3 Alignment Alternatives Research Tool (AART)

The initial selection of alternatives included the use of an automated tool to assist and accelerate the identification and evaluation of the preliminary alternatives. The AART is a series of GIS-based spatial analysis functions designed to route conceptual alignments among the various natural and human resources within a project Study Area. The tool is capable of running numerous alignment scenarios to produce alternatives that avoid and minimize impacts on the natural and human environment. The AART is combined with field reconnaissance and data validation, engineering design criteria, and review by the Project team to identify and efficiently evaluate many preliminary alternatives within a large Study Area.

The alternatives were developed through a simple "avoidance and minimization" approach. This approach allowed the Project team, which includes experts in various fields, to assess resources within the Project boundaries efficiently. Sensitive site-specific resources can be set as "avoids", and weighted values (1-9) are given for other types of resources that have been mapped to the grid cells in the Study Area. The tool routes alignments between user-selected endpoints through an artificial "terrain" comprised of areas of value and unique site-specific resources. Areas that have been set as "avoids" are automatically avoided while locating a path that minimizes impacts to the remaining resources based on their weighted values.

The AART program allows users to interactively weight geographic features and attributes collected from public and project-derived databases. Individual data layers are assigned sensitivity rankings to provide criteria for the AART to create a path of least impact. Areas with lower sensitivity rankings are used over areas with higher sensitivity rankings. The desired corridor width is then applied, and the environmental and cultural impacts of the corridor are calculated. The AART is used to summarize the impacts for each alternative alignment and display a potential alignment for each model run. In summary, the "corridors" are developed through a simple "opportunities and constraints" approach.

3.1.4 Rail Connections

During Phase 1, it was deemed prudent to consider two possible tie-in locations along the PBRR. Two tie-in locations would provide an alternative route in the event that constraints and/or significant concerns from an agency or tribal consultation were identified at one location.

In moving forward with the Phase 2 analysis, this same philosophy carries through the comparison of segments. The first connection point with PBRR include Segments 2a, 2b and 2c, which are located approximately 1.64 miles east of the entrance to the Port Bienville Industrial Park. The second connection point with PBRR is located approximately 2.64 miles east of the entrance to the Port Bienville Industrial Park and begins as Segment 1a (see **Figure 3.1**).

Figure 3.1: PBRR Connection Point

3.1.5 Data Collection

To create a complete picture of the Study Area, generate the best corridor locations, and calculate accurate impacts, it was necessary to compile GIS data for the Study Area in the following categories: natural/environmental features, cultural and man-made features, and infrastructure (see **Table 3.1**). Most of the datasets were downloaded from the Mississippi Automated Resource Information System (MARIS) website (http://www.maris.state.ms.U.S./). Historical data was obtained from the Mississippi Department of Archives and History (MDAH) through the Department's website.

Table 3.1: GIS Data for PBRR Study Area

Natural/Environmental Features	Man-Made/Cultural Features	Infrastructure
▪ Wetlands (fill and shading impacts) ▪ Mitigation Banks ▪ Streams ▪ 303(d) Streams ▪ Threatened & Endangered Species	▪ Haz Mat/CERCLA sites ▪ Archaeological sites ▪ Known Historic sites ▪ Farmlands ▪ Mines ▪ Bombing ranges ▪ Parks & Wildlife Refuges	▪ Water wells ▪ Transmissions lines ▪ Gas lines ▪ Road crossings

Because the Study Area contains the Stennis Space Center (SSC), it was also necessary to submit a Freedom of Information Act (FOIA) request to obtain GIS data for areas inside the SSC boundaries. Current aerial photography for the Study Area was provided by the Mississippi Department of Transportation (MDOT).

Data for source water protection areas (SWPAs) were obtained through a direct request from the Mississippi Department of Environmental Quality (MDEQ). This data was deemed more accurate and current than the source water data available from the MARIS website. As there was not a single comprehensive source for wetland information, the data for this layer was compiled from three sources: the U.S. Army Corps of Engineers (USACE), MARIS, and Wetlands Solutions LLC. The USACE and Wetland Solutions LLC also

provided data for proposed wetland mitigation banks. Except for the mines data, all of the GIS data were preexisting. Although there are a significant number of mines in the Study Area, there was no readily available GIS data layer showing their locations. The only available mine information was a list of mine locations containing township and range information obtained from the MDEQ. By using the list of mines, a township and range layer, a parcel layer and aerial photography, a new mines layer was created.

3.1.6 Initial Agency and Public Comment

3.1.6.1 Initial Agency Coordination

On August 23, 2012, a meeting was conducted with various federal and state agencies to review the methodology proposed to develop the alternatives, and to allow input from the agencies on ranking the various resources. Agency involvement in ranking the various resources provided input criteria for the AART to create paths of least impact. In general, areas with lower sensitivity rankings are used over areas with higher sensitivity rankings. Although the tool attempts to utilize the lower-ranked areas as much as possible, it also tries to minimize the overall length of the path/corridor. In some cases, the AART may impact a few acres of highly ranked areas if the overall impacts of the path are less than those areas that were avoided. For more information on the ranking process, refer to the *Port Bienville Rail Alternatives Development Technical Methodology Report, September 19, 2013* in **Appendix A**.

3.1.6.2 Public Meeting October 16, 2012

A Public Information Meeting was held on October 16, 2012 from 5:00 – 7:00 p.m. in Bay St. Louis, MS at the St. Louis Public Library. The meeting was hosted by MDOT in cooperation with HCPHC, and was conducted in an open house format which invited the public to comment on the Feasibility Study for PBRR. The Project team provided graphic displays showing the Study Area, wetlands, parcels, constraint mapping, and locations of the existing rail lines within the Study Area. The Project team answered questions about the Project and provided comment sheets for the attendees to provide input on the Project. Forty people attended the meeting. A total of four comments were received, all in favor of the Project.

3.1.7 Corridor Development and Refinement Process

3.1.7.1 AART Runs

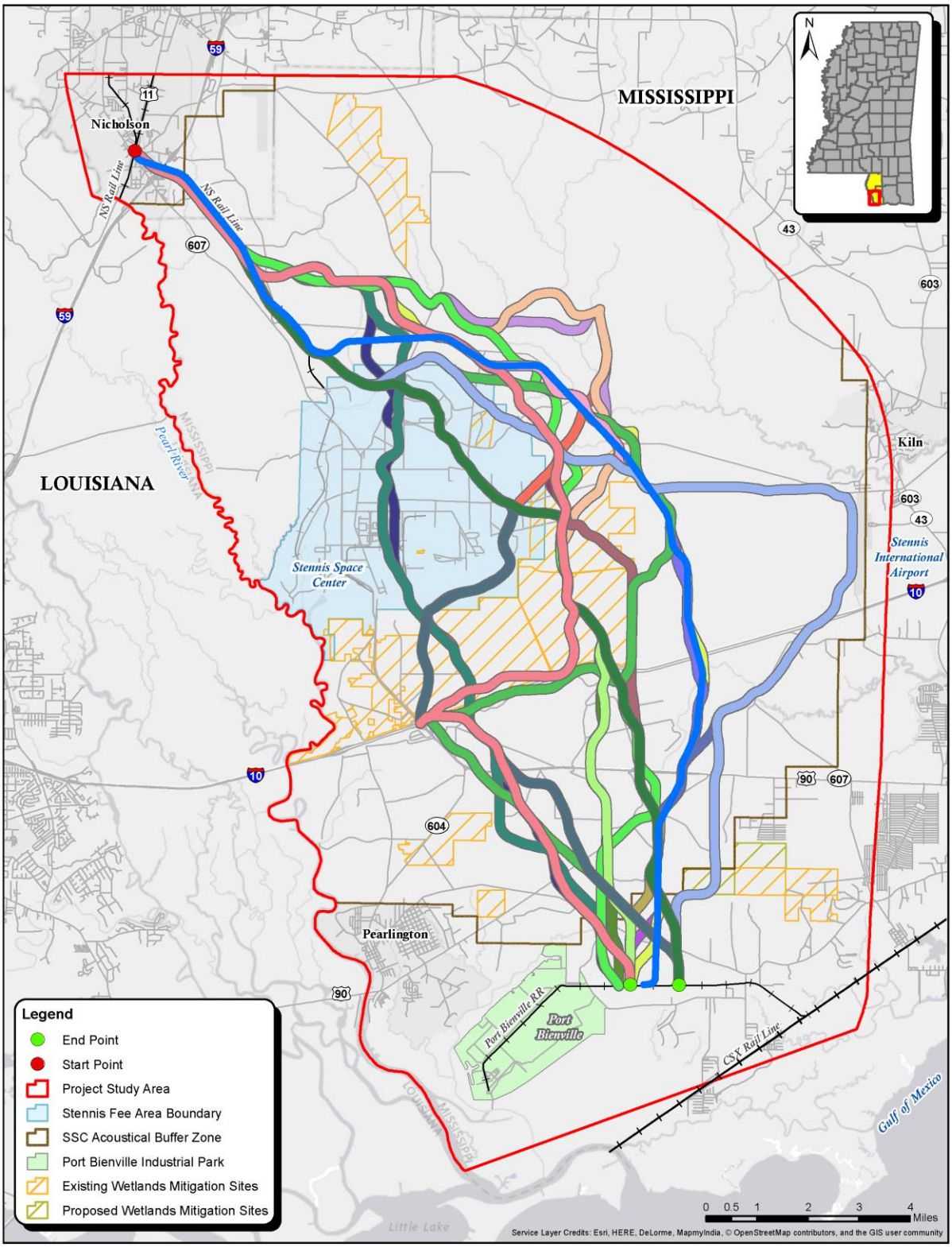
In developing the range of feasible alternatives, the AART was used to create approximately 90 alignments through the Study Area. Impacts were summarized based on 1,000-foot wide corridors. The impacts within these 1,000-foot wide corridors and the initial cost estimates were used for comparing one alternative to another at a high level for further refinement. See **Figure 3.2.**

3.1.7.2 Refinement of the Alternative Corridors

Once the initial AART-developed alternative corridors were identified, the refinement process began. Early on, quite a few corridors were eliminated from further study for various reasons that are documented in the *Port Bienville Rail Alternatives Development Technical Methodology Report, September 19, 2013* (see **Appendix A**).

After the initial elimination of infeasible alternatives, 12 alternatives remained for further refinement (see **Figure 3.2**). By using the standard fixed-width corridors and the irregular corridor zones generated by AART, the Project team made slight adjustments to the alignments to meet the engineering design criteria for the proposed rail line. The AART also generates irregular corridor zones which depict the percentage impact variance from the absolute “best fit” line (in other words, the “next-best” corridors).

Figure 3.2: AART Run Alignments



The Project team engineers identified 14 manual alignments for consideration taking into account these "next best" corridors. These new alignments were developed with the intent to minimize impacts to the environment while meeting the design criteria. These engineered alignments were then used to generate new 1,000-foot corridors. A new set of corridor impact reports were generated and initial cost estimates for each corridor were prepared. This information was compiled in a matrix format. Impacts were summarized based on the 1,000-foot wide corridors. The impacts within these wide corridors and the initial cost estimates for the engineered alignments were used for comparing one alternative to another (see *Port Bienville Rail Alternatives Development Technical Methodology Report, September 19, 2013*, **Appendix A)**.

Once the corridor matrix was completed and alternatives were compared, one primary corridor centrally located within the Study Area emerged as the least costly and least impactful. However, two distinct corridors on the north end of the Project were identified and four corridors on the southern end were identified. See **Figure 3.3**.

3.1.8 Follow Up Agency Coordination

A second agency coordination meeting was held on December 18, 2012, with resource and regulatory agencies. Representatives from MDOT, FRA, and HCPHC were also in attendance. The Project team provided a summary of the previous meeting and presented the results of the potential impacts associated with the alternative corridors identified, including the criteria followed to analyze and refine the corridor alignments.

The meeting presented the initially identified corridors, refinements made to the corridors, and the recommended alternatives along with the impact matrix used during the refinement process (see *Port Bienville Rail Alternatives Development Technical Methodology Report, September 19, 2013* in **Appendix A**). The recommended alternative alignments had common segments that made up much of the alignments. However, there were four areas identified as having competing segments. Two of these areas were located north of I-10 and the remaining two were located south of U.S. Highway 90. At the conclusion of this meeting, a recommendation was made to divide the alternatives into segments for future analysis and for the completion of the feasibility study.

The Project team divided the advanced corridors into segments as identified in **Table 3.2** and shown in **Figure 3.3**. These 17 segments represent a possible combination of 40 potential corridors. Following the development of the segments, the Project team re-quantified impacts and cost by segment. Additionally, the costs estimates were further refined by considering anticipated bridging of streams and high value wetlands. These costs estimates are considered all-inclusive and represent potential "implementation costs", including costs for final design, right-of-way acquisition, construction, and inspection services. The cost estimates are based on the conceptual engineered alignments within each refined corridor. Unit costs were based on 2015 data derived from other similar freight rail construction projects.

Figure 3.3: Corridor Segments

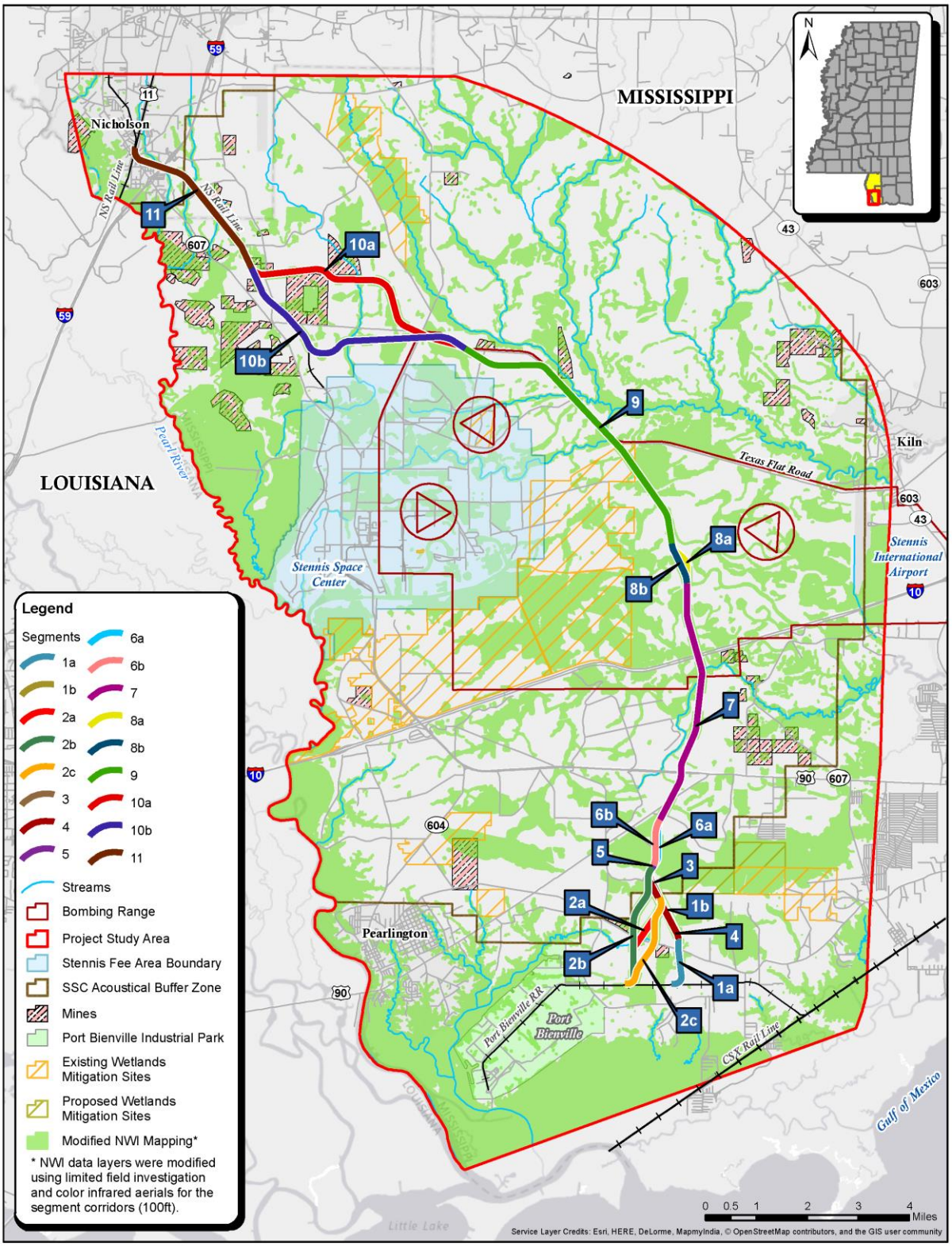


Table 3.2: Corridor Segments

Segments	Competing Segments (Y/N)	Description
SOUTHERN SEGMENTS (Below IH 10)		
Segment 1a	**Yes**	Segment 1a begins at the Port Bienville Railroad (PBRR) tracks extending north with what would become the southern terminus of the new location rail line. Segment 1a starts approximately 2.64 miles east of where Lower Bay Road crosses the PBRR tracks. Segment 1a extends north and crosses Old Lower Bay Road approximately 0.2 mile east of a mine/quarry site. Once it crosses Old Lower Bay Road, Segment 1a connects to segment 1b.
Segment 1b	**Yes**	Segment 1b extends from Segment 1a in a northwesterly direction paralleling an unimproved roadbed. Segment 1b then connects to Segment 3.
Segment 2a	**Yes**	Segment 2a begins at the PBRR short line, but 1 mile closer to the Port Bienville Industrial Park. Segment 2a extends north for approximately 1 mile, then turns northeast and crosses Old Lower Bay Road, then turns northwest to connect to Segment 3.
Segment 2b	**Yes**	Segment 2b also begins at the PBRR short line, closer to the Port Bienville Industrial Park. Segment 2b extends north for approximately 1.5 miles. After crossing Old Lower Bay Road, the segment turns northeast for 0.5 mile before turning north again to connect to Segment 5.
Segment 2c	**Yes**	Segment 2c begins at the PBRR short line, close to the Port Bienville Industrial Park. Segment 2c extends in a northeasterly direction, and crosses Old Lower Bay Road west of a mine/quarry site. Its alignment meanders in an "S" shape as it extends to connect to Segment 3.
Segment 3	**Yes**	Segment 3, extends northwesterly until it curves to the northeast before connecting to Segment 5
Segment 4	**Yes**	Segment 4 parallels Segments 1b and 3 to the west. Segment 4 then turns to the northeast to connect to Segment 5.
Segment 5	**No**	Segment 5 is the shortest segment and begins at the northern terminus of Segments 2b, 3 and 4, extending north connecting to Segments 6a and 6b.
Segment 6a	**Yes**	Segment 6a begins at the northern terminus of Segment 5, extending north between Old Lower Bay Road and ending south of U.S. Hwy 90, for approximately 0.92-mile before connecting to Segment 7. The segment parallels a utility corridor on the east for most of its length.
Segment 6b	**Yes**	Segment 6b begins at the northern terminus of Segment 5, extending north between Old Lower Bay Road and ending south of U.S. Hwy 90, for approximately 0.92-mile before connecting to Segment 7. Similar to Segment 6a, Segment 6b parallels the same utility corridor but on the west side for most of its length.
Segment 7	**No**	Segment 7 is approximately 4.8 miles long and is located between Segments 6a/6b and 8a/8b. This segment begins 0.2 miles south of U.S. Hwy 90 and ends approximately 1.5 miles north of I-10.

Segments	Competing Segments (Y/N)	Description
NORTHERN SEGMENTS (Above IH 10)		
Segment 8a	**Yes**	Segment 8a begins at the northern terminus of Segment 7, east of the Texas Flat Mitigation Site, extending northwest for approximately 0.88-mile before tying into Segment 9. This segment extends through the central area of a former military bombing range. Segment 8a contains a slight curve to the east that does not occur in Segment 8b, which was introduced to avoid a small wetland before it joins with Segment 9.
Segment 8b	**Yes**	Segment 8b also begins at the northern terminus of Segment 7, east of Texas Flat Mitigation Site. It extends northwest for approximately 0.83 mile before tying into Segment 9. Similar to Segment 8a, Segment 8b extends northwest through the former military bombing range.
Segment 9	**No**	Segment 9 is approximately 6.0 miles long and is located between Segments 8a/8a and 10a/10b. This segment begins approximately 2.2 miles north of I-10 and ends immediately north of SSC.
Segment 10a	**Yes**	Segment 10a begins at the north termini of Segment 9 and extends north crossing Texas Flat Road at a new at-grade crossing approximately 2.5 miles east of the existing at-grade rail crossing. The segment continues to extend north and then west avoiding and/or minimizing impacts to isolated pockets of wetlands and open pit mines. Segment 10a eventually connects to Segment 11 approximately 3 miles south of the Town of Nicholson.
Segment 10b	**Yes**	Segment 10b begins at the north termini of Segment 9 and extends west avoiding and/or minimizing impacts to isolated pockets of wetlands. For approximately 2 miles, Segment 10b parallels a utility corridor on the south before turning north. Shortly after turning north, the segment connects to the existing NS rail line between NASA's John C. Stennis Space Center (SSC) and Nicholson, and continues along this rail line for approximately 2 miles to the beginning of Segment 11. Although the existing NS rail line is in place, it has not been used in over a decade and would require maintenance and upgrade before it can be put back in service. Segment 10b would utilize the existing at-grade crossing of Texas Flat Road.
Segment 11	**No**	Segment 11 represents a portion of the existing NS rail line that extends from the Fee Area of SSC to the NS mainline in Nicholson. Segment 11 is approximately 3.5 miles long and begins at the northern termini of Segment 10a/10b and follows the existing NS rail line to Nicholson. The existing NS rail line has not been used in over a decade and would require maintenance and upgrade before it can be put back in service.

3.1.9 Agency/Public Scoping Meeting

On August 19, 2015, a scoping meeting with resource and regulatory agencies was held at MDOT in Jackson, Mississippi. Representatives from MDOT, FRA, and HCPHC were also in attendance. A presentation of Project history along with the findings of the feasibility study was provided (see **Appendix A**). A Study Area map, proposed segments, and segment impact matrix were provided. The meeting discussed the scope and schedule for Phase 2 of the Study which includes NEPA and preliminary design. An overview of the agency coordination and public involvement plan was also provided (see Chapter 5 Agency Coordination).

Additionally, on August 20, 2015, a public scoping meeting was held at the Port Bienville Training Facility located in Pearlington, Mississippi. A handout was provided outlining the purpose of the Project, Project history, Project facts, feasibility study findings, and a map of the proposed rail alignment segments. Approximately sixteen people attended the meeting and two written comments were received both in favor of the Project.

3.2 Phase 2 - Segment Screening

At the initiation of the Phase 2 alternatives analysis, there were 40 potential alternatives carried forward from Phase 1. To determine which alternatives would be further evaluated in the EIS, the alignments from these alternatives were further refined as described below and the Project team performed further screenings of the segments.

The Phase 2 screenings began with field investigations and review of color infrared aerial photography in order to update and refine wetland boundaries from the National Wetland Inventory (NWI) mapping, which was used during Phase 1. After review, the NWI mapping file was updated within a 1,000-foot wide corridor along each segment with refined wetland boundaries. Based on these initial field efforts, most of the segments were found to contain more wetlands than what is shown on the NWI mapping.

A cultural resources predictive model study was performed to identify high, medium, and low probability areas for potential impacts to archaeological resources. The results of this study were mapped in a GIS file and added to the Project database. Additionally, new GIS data files of the Study Area were obtained and added to the database of information. A re-quantification of impacts for each segment was prepared utilizing this updated and more detailed information.

Following the update of all GIS data for the Study Area, the segment corridor widths were refined to a 200-foot buffer around the centerline of each rail segment. It is anticipated that the right-of-way for the new rail bed would be less than 100 feet; therefore, a 200-foot-wide corridor assessment was used to provide a conservative approach that would allow for a complete review of all potential impacts. Impacts for each segment were recalculated using refined GIS data. Engineering, operations, cost, and other associated factors were considered for each alternative.

3.2.1 Competing Segment Analysis

As stated previously, several corridors centrally located within the Study Area emerged as the least costly and least impacting. Every one of these corridors shared four common segments. These common segments included Segment 5, Segment 7, Segment 9, and Segment 11. The remaining segments were considered as competing segments and are further discussed below and seen in **Figure 3.3**.

Competing segments include seven segments south of U.S. Highway 90 (1a, 1b, 2a, 2b, 2c, 3, and 4) and are located outside of the SSC acoustical buffer zone. These segments, when combined, represent 5 potential routes connecting to the existing PBRR and standalone Segment 5. These five routes are 1a+1b+3, 1a+4, 2a+3, 2b, and 2c+3.

The remaining competing segments are north of Segment 5 and consist of three pairs of competing segments. These competing pairs are 6a or 6b; 8a or 8b; and 10a or 10b. To compare competing segments, evaluation measures were established to provide criteria to evaluate each of the competing segments equally.

3.2.1.1 Evaluation Measures

Evaluation measures were identified and used to compare similar (competing) segments. These measures were divided into four sections as follows: Engineering Criteria, Natural Features, Man-made Features and Infrastructure. In order to standardize the comparison, the segments were compared from common connection points. For some comparisons, segments were combined, but in all cases, they were compared equally from a common beginning and ending point.

- **Engineering Criteria** - The engineering factors were calculated based upon the preliminary alignment geometry for each segment, and comparison to aerial photography and GIS data. The engineering factors considered for comparison include the following:

  - Alignment Information - The alignment statistics include total length of the new alignment, length of existing NS spur line utilized, length of existing PBRR utilized east of beginning point of Segment 2a, the number of new at-grade crossings on paved roadways and the estimated total length of bridges/trestles over streams and wetlands.

  - Implementation Cost - After the alignments were developed, preliminary cost estimates were prepared for the railroad design, right-of-way acquisition and construction. Unit costs were derived from average cost history for similar type of rail construction. Separate estimates were developed for the upgrade of the portion of the existing rail bed between SSC and Nicholson for the segments that incorporate this section of NS rail line.

- **Natural Features -** The natural features were summarized for each segment based upon the preliminary rail alignments and a corridor width of 200 feet centered along the alignments. The Natural Features were determined from GIS data.

  - The Natural Features include the acres of wetlands, the acres of wetland mitigation bank impacted, the number of stream crossings, and the estimated mitigation cost for these crossings.

- **Man-made Features –** Most of the Study Area is undeveloped because of the building restrictions on the land within the SSC acoustical buffer zone. These restrictions prohibit the construction of any habitable buildings. However, other man-made features are allowed and were considered when comparing segments. Additionally, the very northern portion of the Study Area and the very southern portion of the Study Area lie outside of the SSC acoustical buffer zone. The man-made features include hazardous material sites, farmland (prime, prime if drained, and statewide importance), open pit mines and properties with mining permits, the former military bombing range, and potential archaeological sites.

- **Infrastructure –** The final category of features taken into consideration when comparing segments included existing infrastructure. The uniqueness of the SSC acoustical buffer zone greatly limits the type and number of infrastructure within the Study Area. This category includes major utilities such as power transmission lines and natural gas pipelines that may be crossed by segments and water supply wells that may encounter proximity impacts.

3.2.1.2 Competing Segment Analysis for Southern Termini

Segments 1a, 1b, 2a, 2b, 2c, 3 and 4, located south of U.S. 90/Chef Menteur Highway, are the seven segments that represent the southernmost portion of the Study Area. The majority of these segments are located outside of the SSC acoustical buffer zone. These segments, when combined, represent five potential routes that would provide the first section of the new rail alignment to connect the PBRR, north through Hancock and Pearl River Counties to the NS railroad line in Nicholson, MS. The segments were combined in order to create five alignments that could be compared equally.

The five potential route combinations, which were created by combining the Phase 1 segments, are shown in **Figure 3.4:**

- 1a + 1b + 3
- 1a + 4
- 2a + 3
- 2b
- 2c and+ 3

Western Tie-In
Three of these potential routes, each beginning with Segment 2, would connect with the PBRR approximately 1.64 miles east of the entrance to the Port Bienville Industrial Park.

Segments 2a + 3 begin at the PBRR tracks, but 1 mile closer to the Port Bienville Industrial Park. Segment 2a extends north for approximately 1 mile, then turns northeast and crosses Old Lower Bay Road, then turns northwest to connect to Segment 3. Segment 3 extends northwesterly until it curves to the northeast to connect to Segment 5. The total length for this potential route is 2.59 miles.

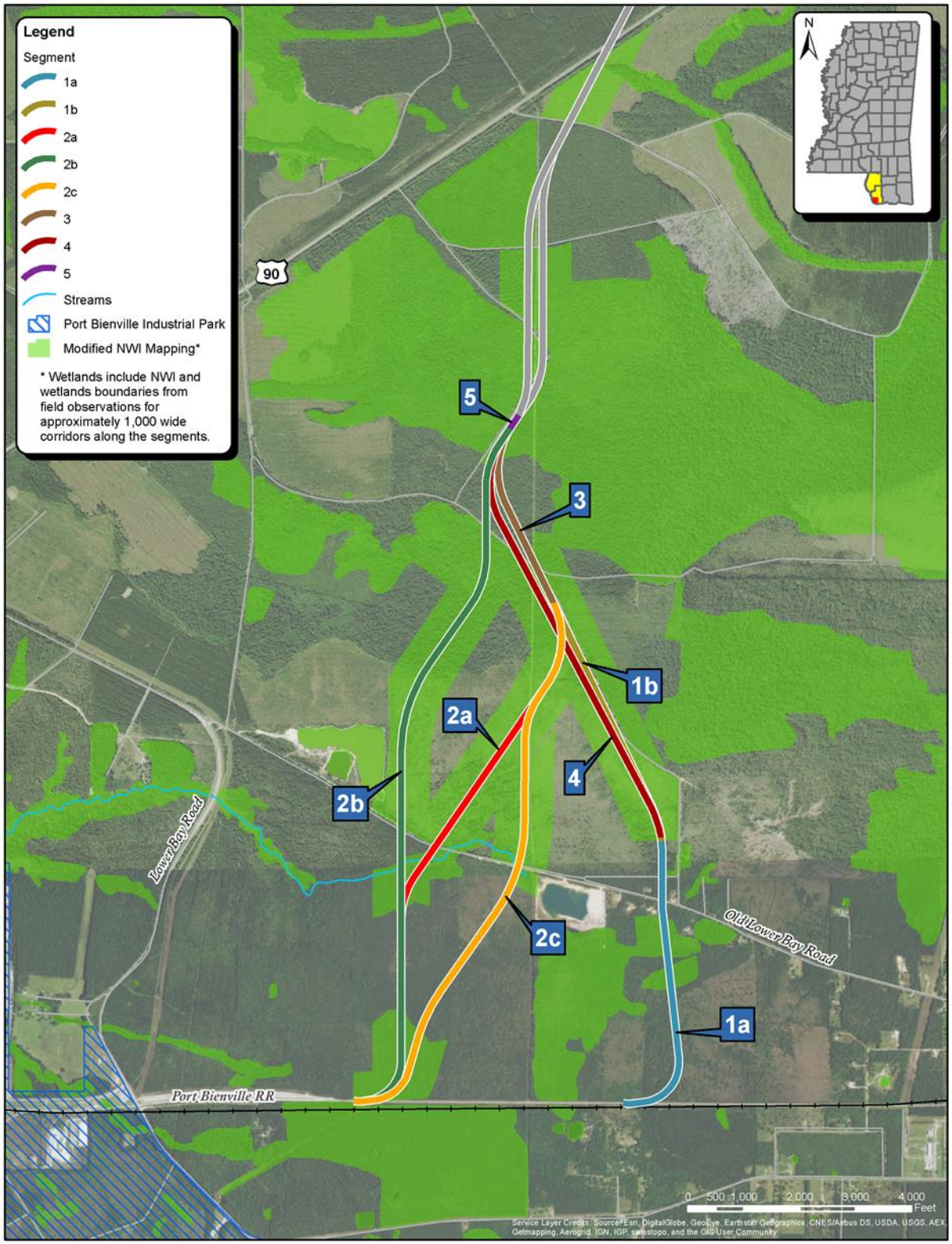
Segment 2b also begins at the PBRR tracks, closer to the Port Bienville Industrial Park. Segment 2b extends north for approximately 1.5 miles. After crossing Old Lower Bay Road, the segment turns northeast for 0.5 mile before turning north again to connect to Segment 5. The total length of this potential route is 2.47 miles.

Segments 2c + 3 also begin at the PBRR tracks, close to the Port Bienville Industrial Park. Segment 2c extends in a northeasterly direction, and crosses Old Lower Bay Road west of a mine/quarry site. Its alignment meanders in an "S" shape as it extends to connect to Segment 3. Segment 3 extends northwesterly until it curves to the northeast before connecting to Segment 5. The total length of this potential route is 2.59 miles.

Eastern Tie-In
The other two potential routes, each beginning with Segment 1a, would connect with the PBRR approximately 2.64 miles east of the Port Bienville Industrial Park. The eastern route combinations would utilize one additional mile of the existing PBRR rail line, making the total length longer than the routes that begin to the west. No cost or environmental impacts have been identified with this additional track length since it is the existing PBRR track, which is in good working condition, and would not require upgrade or modification. However, travel time and maintenance costs associated with this extra mile of travel were considered.

Segment 5 would be the common northern junction point for all five of these southernmost potential routes. During the Phase 1 evaluation, these routes were found to have similar potential environmental impacts and costs; therefore, as none of the possible routes stood out as a preferred option, it was recommended that they all be carried forward to Phase 2 for further investigation.

Figure 3.4: Potential Southern Route Combinations



Segments 1a+ 1b+ 3 would become the southern terminus of the new location rail line. Segment 1a starts approximately 2.64 miles east of where Lower Bay Road crosses the existing PBRR tracks. Segment 1a extends north and crosses Old Lower Bay Road approximately 0.2 mile east of a mine/quarry site. Approximately 0.2 mile north of Old Lower Bay Road, Segment 1a meets Segment 1b, which extends in a northwesterly direction parallel to an unimproved roadbed. Segment 1b then connects to Segment 3, which extends northwester, curves to the northeast, and connects to Segment 5. The total length for the three segments is 2.55 miles. The additional 1 mile of track usage along the existing PBRR totals 3.55 miles for this potential route.

Segments 1a + 4 begin at the PBRR tracks extending north with what would become the southern terminus of the new location rail line. Segment 1a starts approximately 2.64 miles east of where Lower Bay Road crosses the existing PBRR tracks. Segment 1a extends north and crosses Old Lower Bay Road approximately 0.2 mile east of a mine/quarry site. Once it crosses Old Lower Bay Road, Segment 1a connects to Segment 4, which parallels Segments 1b and 3 to the west. Segment 4 then turns to the northeast to connect to Segment 5. The total length for the two segments is 2.56 miles. The additional 1 mile of track usage along the existing PBRR totals 3.56 miles for this potential route.

These potential route combinations are described below and shown in **Figure 3.4**. For a side by side impacts comparison of the route combinations refer to **Table 3.3**.

Conclusion and Recommendations for Eastern Tie-In

The following is a summary of the advantages and disadvantages of Segments 1a+1b+3 as compared to Segments 1a+4:

- Advantages of 1a+1b+3 are as follows:
  - Less costly implementation ($0.12 million less)
  - Has the least wetland impacts (2.54 acres less and $76,200 lower mitigation costs)
  - Less potential impact to farmland (Prime if Drained) (0.46-acre less)
  - Slightly shorter overall length (0.01-mile shorter)

- Disadvantages of 1a+1b+3 are as follows:
  - Higher potential of cultural resources impacts (0.46-acre more “High Probability” impact and 1.71 acres more “Medium Probability” impacts)

Table 3.3: Comparison Matrix for Southern Combined Segments

Description	Unit of Measure	Segment(s)				
		1a+1b+3	1a+4	2a+3	2b	2c +3
		Eastern Tie-In		Western Tie-In		
ENGINEERING CRITERIA						
Total Length	Miles	2.55	2.56	2.59	2.47	2.59
Length Utilizing the Existing NS Rail Bed	Miles	0.00	0.00	0.00	0.00	0.00
Length Utilizing the Existing PBRR east of 2a, 2b & 2c	Miles	1.00	1.00	0.00	0.00	0.00
New At-Grade Rail Crossings (Paved Roads)	# of Crossings	1	1	0	0	0
Total Estimated Implementation Cost *(1)*	$ Millions	$10.87	$10.99	$11.58	$11.39	$11.44
NATURAL FEATURES						
Wetland Impacts *(2)*	Acreage	29.03	31.57	41.60	42.57	35.48
Cost of Wetland Mitigation *(3)*	$60K per acre @ 50%	$870,900	$947,100	$1,248,000	$1,277,100	$1,064,400
Texas Flat Mitigation Bank Impacts	Acreage	0.00	0.00	0.00	0.00	0.00
Cost of Mitigating Impacts to Mitigation Bank	$120K per acre @ 50%	$0	$0	$0	$0	$0
Streams 303(d)/TMDL's[4]	# of Crossings	0	0	0	0	0
Streams 303(d)/TMDL's[4]	Length (miles)	0.00	0.00	0.00	0.00	0.00
Stream Crossings	# of Crossings	0	0	1	1	1
Total Stream Impacts	Linear Feet	0	0	265	250	290
Cost of Stream Mitigation *(3)*	$200 per linear feet @ 50%	$0	$0	$26,500	$25,000	$29,000
MAN-MADE FEATURES						
MDEQ CERCLA/Haz Mat sites	Acreage	0.00	0.00	0.00	0.00	0.00
Archaeological Sites						
High Probability	Acreage	28.21	27.75	17.66	13.87	15.59
Medium Probability	Acreage	14.76	13.05	19.96	17.24	26.74
Farmland (Prime)	Acreage	1.49	1.49	0.00	0.00	0.28
Farmland (Prime if Drained)	Acreage	18.38	18.84	22.37	19.05	22.59
Farmland (Statewide Importance)	Acreage	0.00	0.00	0.00	0.00	0.00
Mines	Acreage	0.00	0.00	0.00	5.78	2.26
Bombing Ranges	Acreage	0.00	0.00	0.00	0.00	0.00
INFRASTRUCTURE						
Water Wells	Acreage	0.00	0.00	0.00	0.00	0.00
Transmission Line Crossings	#	0	0	0	0	0
Gas Line Crossings	#	0	0	0	0	0

(1) Cost Estimates updated in October 2015

(2) Wetland Impacts are based on NWI mapping and ground truthing performed in the spring of 2015

(3) Cost assumes a 100-foot right-of-way (50 percent of the 200-foot corridor)

(4) 303 (d) Program established lists of impaired waters

Conclusion and Recommendations for Western Tie-In

The following is a summary of the advantages and disadvantages of Segment 2b as compared to Segments 2a+3 and Segments 2c+3:

- Advantages of 2b are as follows:
  - Slightly shorter overall length (0.12-mile shorter).
  - Less costly implementation ($0.19 million less than Segments 2a+3 and $0.05 million less than Segments 2c+3)
  - Lower stream impacts (15 linear feet less stream crossings than Segments 2a+3 and 40 linear feet less stream crossings than Segments 2c+3)
  - Less overall potential of cultural resources impacts (3.79 acre less "High Probability" impact than Segments 2a+3 and 1.72 acres less than Segments 2c+3; 2.72 acres less "Medium Probability" impacts than Segments 2a+3 and 9.5 acres less than Segments 2c+3)
  - Less potential impact to farmland (0.28-acre less to Prime than 2c+3 and 3.32 acres less to Prime if Drained than Segments 2a+3 and 3.54 less than Segments 2c+3)

- Disadvantages of 2b are as follows:
  - Higher impact to wetlands (0.97 acres more than Segments 2a+3 and $29,100 additional mitigation costs; 7.09 acres more than Segments 2c+3 and $212,700 additional mitigation costs)
  - Higher potential to impact mines (3.52 acres more than Segments 2c+3 and 5.78 acres more than Segments 2a+3)

Based on the analysis above Segments 1a+4, Segments 2a+3, and Segments 2c+3 were eliminated from further study.

3.2.1.3 Competing Segment Analysis for Segments 6a and 6b

Segments 6a and 6b are located in the southern portion of the Study Area, south of U.S. 90/Chef Menteur Highway. They are essentially parallel segments, with Segment 6a being located more easterly. Both segments begin at the northern end of Segment 5 and extend due north to meet the southern node of Segment 7. During the Phase 1 evaluation the segments were found to have similar potential impacts and costs; therefore, as neither segment stood out as a preferred option, it was recommended that they both be carried forward to Phase 2 for further investigation.

Segment 6a begins at the northern terminus of Segment 5, extending north between Old Lower Bay Road and ending south of U.S. 90/Chef Menteur Highway, for approximately 0.92 mile before connecting to Segment 7. The segment parallels a utility corridor on the east for most of its length. Potential impacts include archaeological sites, farmland, and wetlands.

Segment 6b also begins at the northern terminus of Segment 5, extending north between Old Lower Bay Road and ending south of U.S. 90/Chef Menteur Highway, for approximately 0.92 mile before connecting to Segment 7. Similar to Segment 6a, Segment 6b parallels the same utility corridor but on the west side for most of its length. The segment impacts potential archaeological sites, farmland, and wetlands. See **Figure 3.5**.

Table 3.4 contains a side by side comparison of Segments 6a and 6b.

Figure 3.5: Segments 6a and 6b

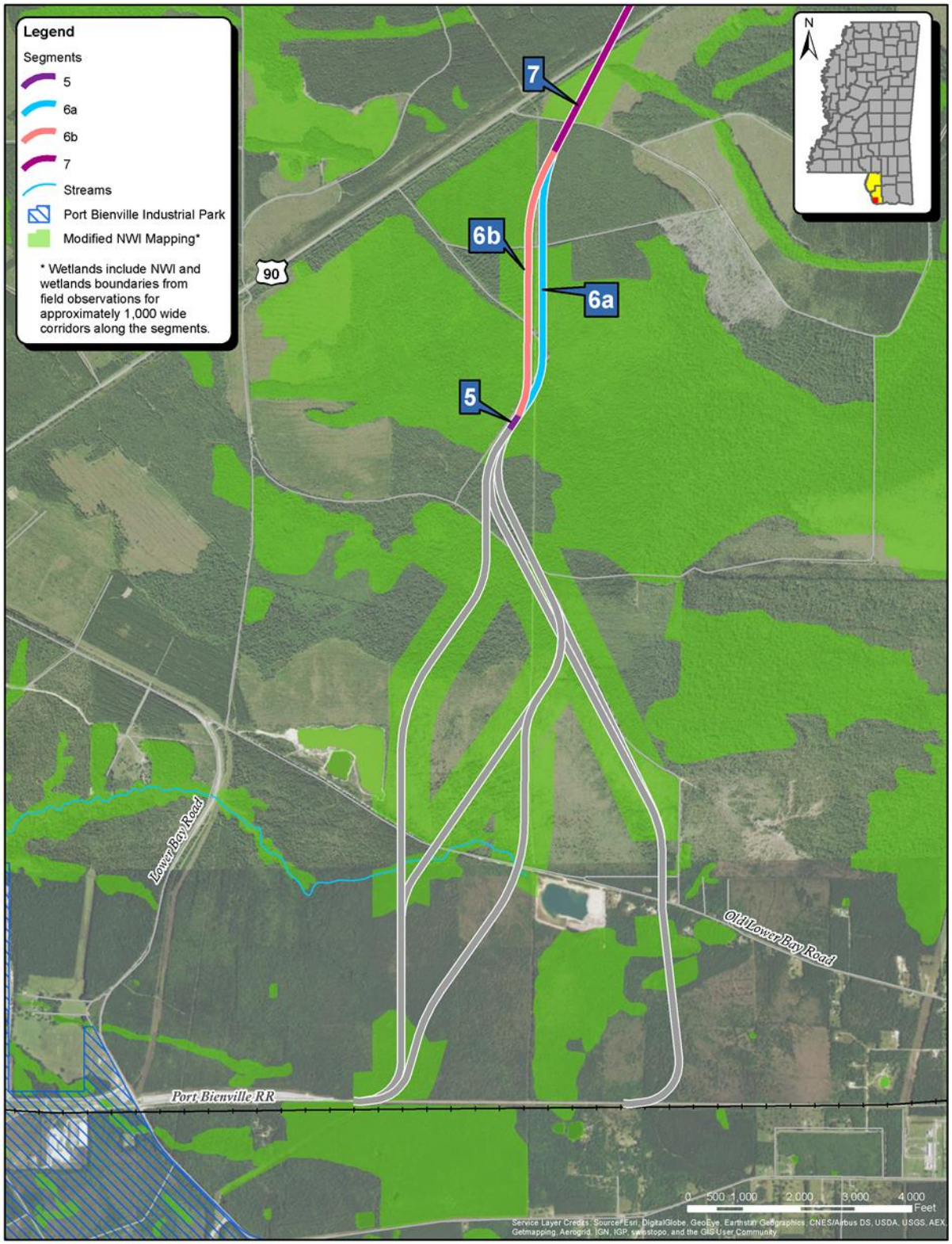


Table 3.4: Comparison Matrix for Segments 6a and 6b

Description	Unit of Measure	Segment	
		6a	6b
ENGINEERING CRITERIA			
Total Length	Miles	0.92	0.92
Length Utilizing the Existing NS Rail Bed	Miles	0.00	0.00
Length Utilizing the Existing PBRR east of 2a, 2b & 2c	Miles	0.00	0.00
New At-Grade Rail Crossings (Paved Roads)	# of Crossings	0	0
Total Estimated Implementation Cost **(1)**	$ Millions	$7.25	$14.47
NATURAL FEATURES			
Wetland Impacts **(2)**	Acreage	11.02	16.51
Cost of Wetland Mitigation **(3)**	$60K per acre @ 50%	$330,600	$495,300
Texas Flat Mitigation Bank Impacts	Acreage	0.00	0.00
Cost of Mitigating Impacts to Mitigation Bank	$120K per acre @ 50%	$0	$0
Streams 303(d)/TMDL's[4]	# of Crossings	0	0
Streams 303(d)/TMDL's[4]	Length (miles)	0.00	0.00
Stream Crossings	# of Crossings	0	0
Total Stream Impacts	Feet	0	0
Cost of Stream Mitigation **(3)**	$200 per linear feet @ 50%	$0	$0
MAN-MADE FEATURES			
MDEQ CERCLA/Haz Mat sites	Acreage	0.00	0.00
Potential Archaeological Sites			
High Probability	Acreage	0.03	0.61
Medium Probability	Acreage	2.85	5.98
Farmland (Prime)	Acreage	0.00	0.00
Farmland (Prime if Drained)	Acreage	12.52	11.95
Farmland (Statewide Importance)	Acreage	0.00	0.00
Mines	Acreage	0.00	0.00
Bombing Ranges	Acreage	0.00	0.00
INFRASTRUCTURE			
Water Wells	Acreage	0.00	0.00
Transmission Line Crossings	#	0	0
Gas Line Crossings	#	0	0

(1) Cost Estimates updated in October 2015

(2) Wetland Impacts are based on NWI mapping and ground truthing performed in the spring of 2015

(3) Cost assumes a 100-foot right-of-way (50 percent of the 200-foot corridor)

(4) 303 (d) Program established lists of impaired waters

Conclusion and Recommendations

The following is a summary of the advantages and disadvantages of Segment 6a as compared to 6b:

- The advantages of 6a are as follows:
  - Less costly implementation ($7.2 M less than 6b, approximately half the total implementation cost)
  - Less wetland impacts (6.0 acres less)
  - Less probability of overall cultural resources impacts (0.58-acre less "High Probability" impact and 3.31 acres less "Medium Probability" impact)
  - Less wetland mitigation cost ($164,700 less)

- Disadvantages of 6a are as follows:
  - Higher potential for "Farmland (Prime if Drained) impacts (0.57 acre more than 6b)

Because Segment 6a was slightly better than Segment 6b in most impact categories, and minimized wetlands impacts, Segment 6b was eliminated from further study.

3.2.1.4 Competing Segment Analysis for Segments 8a and 8b

Segments 8a and 8b are located in the central portion of the Study Area, to the east of the Texas Flat Mitigation Site.[19] They are essentially parallel segments, with Segment 8a containing a curve and being located more easterly. Both segments begin at the northern end of Segment 7 and extend northwest to meet at the southern junction of Segment 9 (See **Figure 3.6**). During the Phase 1 evaluation these segments were found to have similar potential impacts and costs; therefore, as neither segment stood out as a preferred option, it was recommended that they both be carried forward to Phase 2 for further investigation.

Segment 8a begins at the northern terminus of Segment 7, east of the Texas Flat Mitigation Site, extending northwest for approximately 0.88-mile before tying into Segment 9. The segment extends northwest impacting potential archaeological sites, farmland, and pockets of wetlands. This segment extends through the central area of a former military bombing range with the potential for unexploded ordnance. Segment 8a contains a slight curve to the east that does not occur in Segment 8b, which was introduced to avoid a small wetland area before it joins with Segment 9.

Segment 8b also begins at the northern terminus of Segment 7, east of the Texas Flat Mitigation Site. It extends northwest for approximately 0.83 mile before tying into Segment 9. Similar to Segment 8a, Segment 8b extends northwest through the former military bombing range with potential impacts to archaeological sites, farmland, and wetlands.

Table 3.5 contains a side by side comparison of Segments 8a and 8b.

[19] The 1,985-acre Texas Flat Mitigation Site is a commercial wetland mitigation bank that was approved by USACE Mobile District in 2013. The bank is located in the center of the Study Area, to the southeast of SSC; it comprises over 6 miles of streams and over 1,700 acres of wet pine flats and bottomland hardwood forests with both stream and wetland credits available for purchase.

Figure 3.6: Segments 8a and 8b

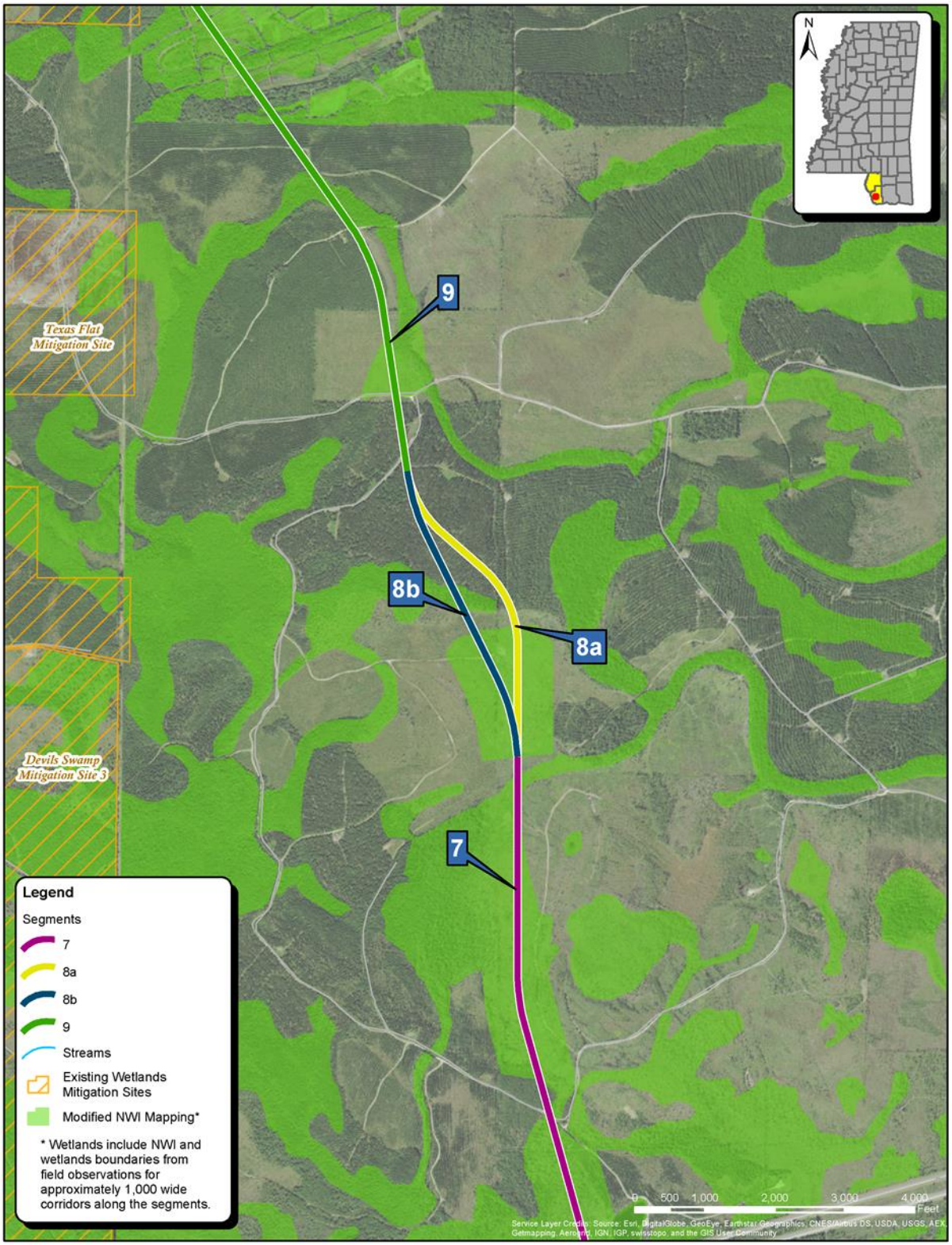


Table 3.5: Comparison Matrix for Segments 8a and 8b

Description	Unit of Measure	Segment	
		8a	8b
ENGINEERING CRITERIA			
Total Length	Miles	0.88	0.83
Length Utilizing the Existing NS Rail Bed	Miles	0.00	0.00
Length Utilizing the Existing PBRR east of 2a, 2b & 2c	Miles	0.00	0.00
New At-Grade Rail Crossings (Paved Roads)	# of Crossings	0	0
Total Estimated Implementation Cost *(1)*	$ Millions	$2.44	$2.42
NATURAL FEATURES			
Wetland Impacts *(2)*	Acreage	8.49	10.39
Cost of Wetland Mitigation *(3)*	$60K per acre @ 50%	$254,700	$311,700
Texas Flat Mitigation Bank Impacts	Acreage	0.00	0.00
Cost of Mitigating Impacts to Mitigation Bank	$120K per acre @ 50%	$0	$0
Streams 303(d)/TMDL's[4]	# of Crossings	0	0
Streams 303(d)/TMDL's[4]	Length (miles)	0.00	0.00
Stream Crossings	# of Crossings	0	0
Total Stream Impacts	Feet	0	0
Cost of Stream Mitigation *(3)*	$200 per linear feet @ 50%	$0	$0
MAN-MADE FEATURES			
MDEQ CERCLA/Haz Mat sites	Acreage	0.00	0.00
Potential Archaeological Sites			
High Probability	Acreage	2.69	2.72
Medium Probability	Acreage	12.85	10.23
Farmland (Prime)	Acreage	7.05	4.05
Farmland (Prime if Drained)	Acreage	6.61	8.98
Farmland (Statewide Importance)	Acreage	1.39	1.99
Mines	Acreage	0.00	0.00
Bombing Ranges	Acreage	21.33	20.24
INFRASTRUCTURE			
Water Wells	Acreage	0.00	0.00
Transmission Line Crossings	#	0	0
Gas Line Crossings	#	0	0

(1) Cost Estimates updated in October 2015
(2) Wetland Impacts are based on NWI mapping and ground truthing performed in the spring of 2015
(3) Cost assumes a 100-foot right-of-way (50 percent of the 200-foot corridor)
(4) 303 (d) Program established lists of impaired waters

Conclusion and Recommendations

The following is a summary of the advantages and disadvantages of Segment 8a as compared to 8b:

- The advantages of 8a are as follows:
  - Less impacts to wetlands, which lowers costs (2.0 acres of fewer impacts = $57,000 less in cost)
  - Less potential for "High Probability" cultural resources impacts (0.03-acre less)

  - Less potential for Farmland impacts, (2.37 acres less "Prime if Drained, and 0.60-acre less "Statewide Importance")

- Disadvantages of 8a are as follows:
  - Higher potential for "Medium Probability" cultural resources impacts (2.62 acres more)
  - Higher Farmland "Prime" impacts, (3.0 acres more)
  - Higher overall impacts to former military bombing ranges (1.09 acres more)
  - Slightly longer in overall length (0.05-mile longer than 8b, due to curve)
  - Higher overall cost ($20,000 more)

Because the impacts of these segments were similar, the Project team considered the avoidance/minimization of the wetland impacts as a primary factor in the decision-making process. Based on this, Segment 8b was eliminated from further study.

3.2.1.5 Competing Segment Analysis for Segments 10a and 10b

Segments 10a and 10b are located in the northern portion of the Study Area approaching the town of Nicholson. These are competing segments and a comparison of each was performed during Phase 1. Both segments were found to have similar impacts and cost based on the level of analysis performed during Phase 1. Since a clear determination of which segment was best could not be determined at that time both segments were recommended to carry forward to Phase 2 for further investigation. Both of these segments have the same beginning and ending nodes, with both beginning at the northern end of Segment 9 and ending at the southern end or beginning of Segment 11. See **Figure 3.7**.

Segment 10a begins at the north termini of Segment 9 and extends north crossing Texas Flat Road at a new at-grade rail crossing approximately 2.5 miles east of the existing at-grade rail crossing. The segment continues to extend north and then west avoiding and/or minimizing impacts to isolated pockets of wetlands and open pit mines. Segment 10a connects to Segment 11 approximately 3 miles south of the Town of Nicholson. Segment 11 represents an existing NS rail line that extends from the Fee Area of SSC to the NS mainline in Nicholson.

Segment 10b begins at the north termini of Segment 9 and extends west avoiding and/or minimizing impacts to isolated pockets of wetlands. For approximately 2 miles, Segment 10b parallels a utility corridor on the south before turning north. Shortly after turning north, the segment connects to the existing NS rail line between SSC and Nicholson, and continues along this rail line for a distance of approximately 2 miles to the beginning of Segment 11. Although the existing NS rail line is in place, it has not been used in over a decade and would require maintenance and upgrade before it can be put back in service. Segment 10b would utilize the existing at-grade crossing of Texas Flat Road.

Table 3.6 contains a side by side comparison of Segments 10a and 10b.

Figure 3.7: Segments 10a and 10b

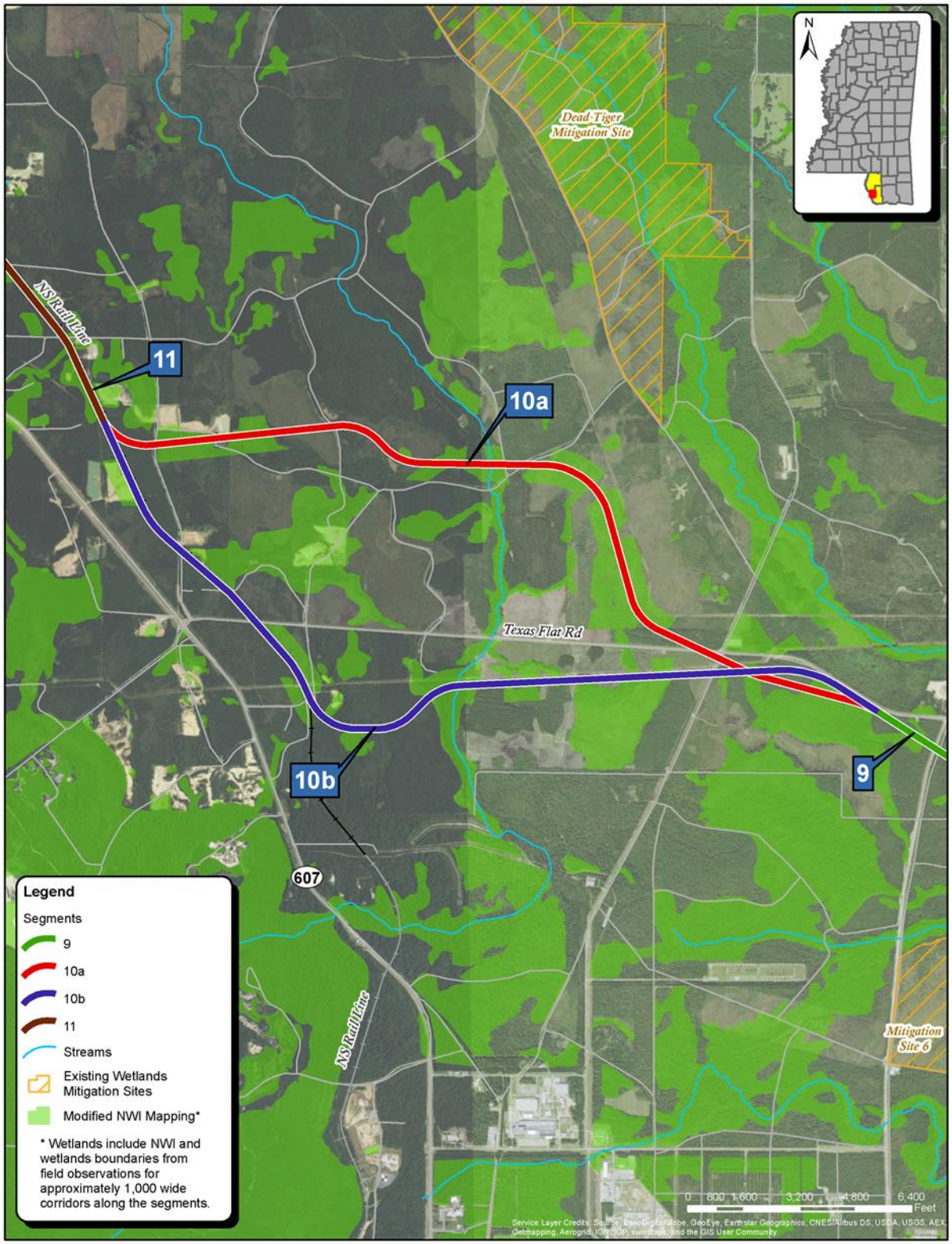


Table 3.6: Comparison Matrix for Segments 10a and 10b

Description	Unit of Measure	Segment	
		10a	10b
ENGINEERING CRITERIA			
Total Length	Miles	4.95	5.18
Length Utilizing the Existing NS Rail Bed	Miles	0.00	1.95
Length Utilizing the Existing PBRR east of 2a, 2b & 2c	Miles	0	0
New At-Grade Rail Crossings (Paved Roads)	# of Crossings	1	0
Total Estimated Implementation Cost **(1)**	$ Millions	$25.91	$23.08
NATURAL FEATURES			
Wetland Impacts **(2)**	Acreage	55.53	25.71
Cost of Wetland Mitigation **(3)**	$60K per acre @ 50%	$1,665,900	$771,300
Texas Flat Mitigation Bank Impacts	Acreage	0.00	0.00
Cost of Mitigating Impacts to Mitigation Banks	$120K per acre @ 50%	$0	$0
Streams 303(d)/TMDL's[4]	# of Crossings	1	1
Streams 303(d)/TMDL's[4]	Length (miles)	0.04	0.04
Other Stream Crossings	# of Crossings	1	1
Total Stream Impacts	Linear Feet	202	204
Cost of Stream Mitigation **(3)**	$200 per linear feet @ 50%	$20,200	$20,400
MAN-MADE FEATURES			
MDEQ CERCLA/Haz Mat sites	Acreage	0.00	0.00
Potential Archaeological Sites			
High Probability	Acreage	20.72	29.77
Medium Probability	Acreage	74.89	60.34
Farmland (Prime)	Acreage	44.72	51.42
Farmland (Prime if Drained)	Acreage	25.80	45.23
Farmland (Statewide Importance)	Acreage	0.00	0.70
Mines	Acreage	2.34	0.84
Bombing Ranges	Acreage	23.18	24.09
INFRASTRUCTURE			
Water Wells	Acreage	0	0.23
Transmission Line Crossings	#	0	0
Gas Line Crossings	#	2	0

(1) Cost Estimates updated in October 2015
(2) Wetland Impacts are based on NWI Mapping & Ground Truthing performed in the Spring 2015
(3) Cost assumes a 100-foot right-of-way (50 percent of the 200-foot corridor)
(4) 303 (d) Program established lists of impaired waters

Conclusion and Recommendations

The following is a summary of the advantages and disadvantages of Segment 10a as compared to 10b:

- The advantages of 10b are as follows:
  - Has the least wetland impacts (30 acres less wetland impacts)
  - Less costly implementation ($2.83 million less)
  - Utilizes 1.95 miles of the existing NS rail bed (10a is entirely on new location)
  - Utilizes the existing at-grade rail crossing on Texas Flat Road
  - Easier potential future rail connection for SSC
  - Less potential for mine impacts (1.5 acres less)
  - Less probability of "Medium Probability" cultural resources impacts, (14.55 acres less)
  - Less gas line crossings (2 less)

- Disadvantages of 10b are as follows:
  - Slightly longer in overall length (0.23-mile longer)
  - Higher probability of "High Probability" cultural resources impacts (9.05 acres more)
  - Higher "Farmland" impacts, (Prime - 6.7 acres more, Prime if Drained - 19.43 acres more, Statewide Importance - 0.70 acres more)
  - Slighter higher acreage in a former military bombing range (0.91 acres more)

Based on the above analysis, Segment 10a was eliminated from further study.

3.2.2 Competing Segment Analysis Results

Upon completion of the above segment comparisons and the elimination of segments from further study, 11 segments remained (1a, 1b, 3, 2b, 5, 6a, 7, 8a, 9, 10b, and 11), which were combined to create two continuous alternatives. Alternative A consists of segments 2b, 5, 6a, 7, 8a, 9, 10b, and 11. Alternative B incorporated segments1a, 1b, 3, 5, 6a, 7, 8a, 9, 10b, and 11. See **Figure 3.8.**

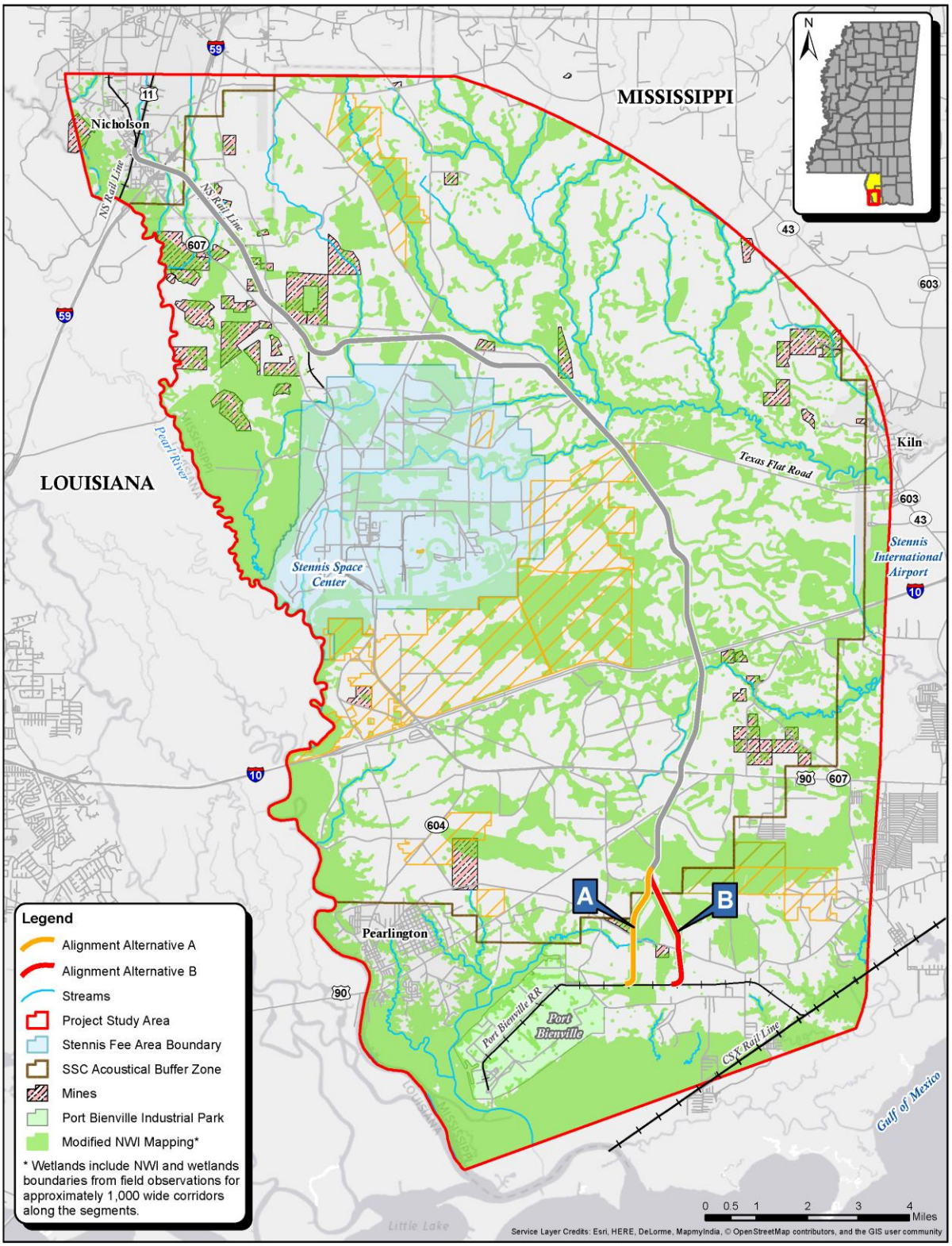
3.2.3 Additional Considerations for the Southern Connections

At the completion of the competing segment analysis, the Project team including FRA and MDOT determined that detailed analysis would begin on the two alternatives and would include environmental, social, cultural, and physical investigations. Since detailed field surveys would only be conducted for the preferred alternative, it was determined that field work could begin on sections that were shared by both alternatives.

During the months of March and April 2016, field work was completed for cultural and natural resources, including wetland delineations, for most of the proposed alignment north of I-10. In addition to delineations north of I-10, preliminary field investigations (not delineation) were conducted south of I-10, which revealed that the Study Area south of I-10 is predominantly inundated with water, most of which would be considered wetlands. Based on these observations, the wetland mapping along the southern segments was modified for the second time, indicating more wetlands. Small pockets of upland areas were identified on aerial mapping within this area where residential development also occurred.

During Phase 2 of the Project development, planners, scientist, and engineers continued the alternative refinement to avoid and/or minimize impacts as new data became available. In this case, as more accurate wetland data became available, opportunities arose for the Project team to revisit the southern segments and refine the two routes south of I-10 to help minimize impacts to residential areas.

Figure 3.8: Alternatives A and B



As stated above, several key factors were identified during the preliminary field investigations south of I-10. The key factors in this refinement process included:

- The Study Area below I-10 was observed to contain more wetland areas than originally anticipated;
- Upland areas tend to have residential development associated with them;
- Residential areas appear to be lower-income;
- Colonial Pipeline has an existing utility corridor approximately 100 feet wide that begins near Segment 6A and travels due south to the PBRR and beyond. This utility corridor is an existing disturbed corridor through a generally remote and wooded area. The utility corridor is cleared and maintained.

Following field work, including the delineation of wetlands within segment 6a, 7, 8a, 9, and 10b, the NWI mapping was updated for a second time along the southern segments based on these more recent field observations. Using this updated information, the Project team reassessed the two alternative options for the southern section. These options were identified as Segments 2b+5+6a (Alternative A) and Segments 1a+1b+3+5+6a (Alternative B). See **Table 3.7**. One of the deciding factors in the original segment selection was wetland impacts. Because it was determined that the majority of the area south of I-10 contains numerous wetlands, and impacts would be equitable between all segments in the area, other resources, such as proximity to residences, became more significant in the analysis and comparison of impacts. Segments 3, 5, and 6a were developed to avoid high quality wetlands, which introduced curves within the alignment. Based on the second round of field observations, these curves were determined to be unnecessary. Additionally, the Project team determined that by paralleling the existing disturbed utility corridor (Colonial Pipeline) and utilizing former rail beds in the area, that potential impacts to existing residences along Old Lower Bay Road could be avoided and/or minimized.

Table 3.7: Segments within Southern Alternatives

Description	Segments in Alternatives A and B										
	1a	1b	2b	3	5	6a	7	8a	9	10b	11
Alternative A			X		X	X	X	X	X	X	X
Alternative B	X	X		X	X	X	X	X	X	X	X

With the intent of minimizing impacts on existing residences in the area, the Project team assessed additional criteria to develop, refine and re-evaluate these southern segments.

The additional criteria included:

- Number of residential homes located within 1,000 feet from the railroad centerline;
- Number of residential homes located within 200-400 feet from the railroad centerline;

- Length of the segments paralleling the existing (already disturbed) utility corridor;
- Length of the segments utilizing former rail beds; and
- Total length of new track from the PBRR's switch point to the location the alignment ties into the PBRR.

3.2.3.1 Refinement of Alternatives A and B

Alternative A was re-evaluated and determined that the curves in segments 3, 5, and 6a were also not necessary as stated above. Alternative A was initially identified as having fewer wetlands. However, subsequent field efforts revealed this initial evaluation to be inaccurate and Alternative A has a higher potential for wetland impacts than Alternative B. Alternative A would parallel the Colonial Pipeline corridor for a portion of its length but would not utilize any of the former rail beds. Also, the tie-in location to the PBRR was determined to be within 370 feet of the existing switch point which is undesirable from a train operational perspective.

The Project team decided that, instead of modifying Alternative A, an additional option could be created to assist in minimizing and reducing impacts. This revised alternative is identified as "**Alternative C**" and would deviate after leaving the southern terminus of Segment 7. Alternative C would then travel south paralleling the Colonial pipeline right-of-way on the eastern side of the corridor. The option would continue south until it approaches the sand mine located adjacent to Old Lower Bay Road. The alignment would cross over the petroleum pipeline corridor in a southwestern direction and continues south paralleling the petroleum pipeline corridor on the western side to connect with the PBRR. This option was determined to be the most direct route of the southern alignments, and would provide a desirable tie-in distance of 0.4 miles to the PBRR's switch point which would better support railroad operations at the industrial park (**Figure 3.9**).

Alternative B was also re-evaluated and determined that the curves in Segments 3, 5, and 6a were not necessary to avoid and minimize impacts primarily to wetlands. Also, as Alternative B crosses over Old Lower Bay Road, the alignment is situated within 200 to 400 feet of four single-family homes. Alternative B also utilizes an existing former rail bed for a portion of the segment. However, the former rail bed continues in a southeasterly direction then turns south to the PBRR. Alternative B is also located near the existing Colonial Pipeline corridor, and briefly parallels this already disturbed corridor.

The Project team decided that, instead of modifying Alternative B, a continuous segment could be created using various parts of the original segments to assist in minimizing and reducing impacts. This revised alternative is identified as "**Alternative D**" and deviates from the main alignment at the southern terminus of Segment 7. Alternative D travels south paralleling the Colonial Pipeline right-of-way on the eastern side of the corridor. This option would utilize the former rail bed in a southeasterly direction then turning south at a point farther away from the residential development, potentially reducing impacts. This option would also provide the greatest distance to the PBRR's switch point (**Figure 3.10**).

Figure 3.9: Alternative A and Alternative C

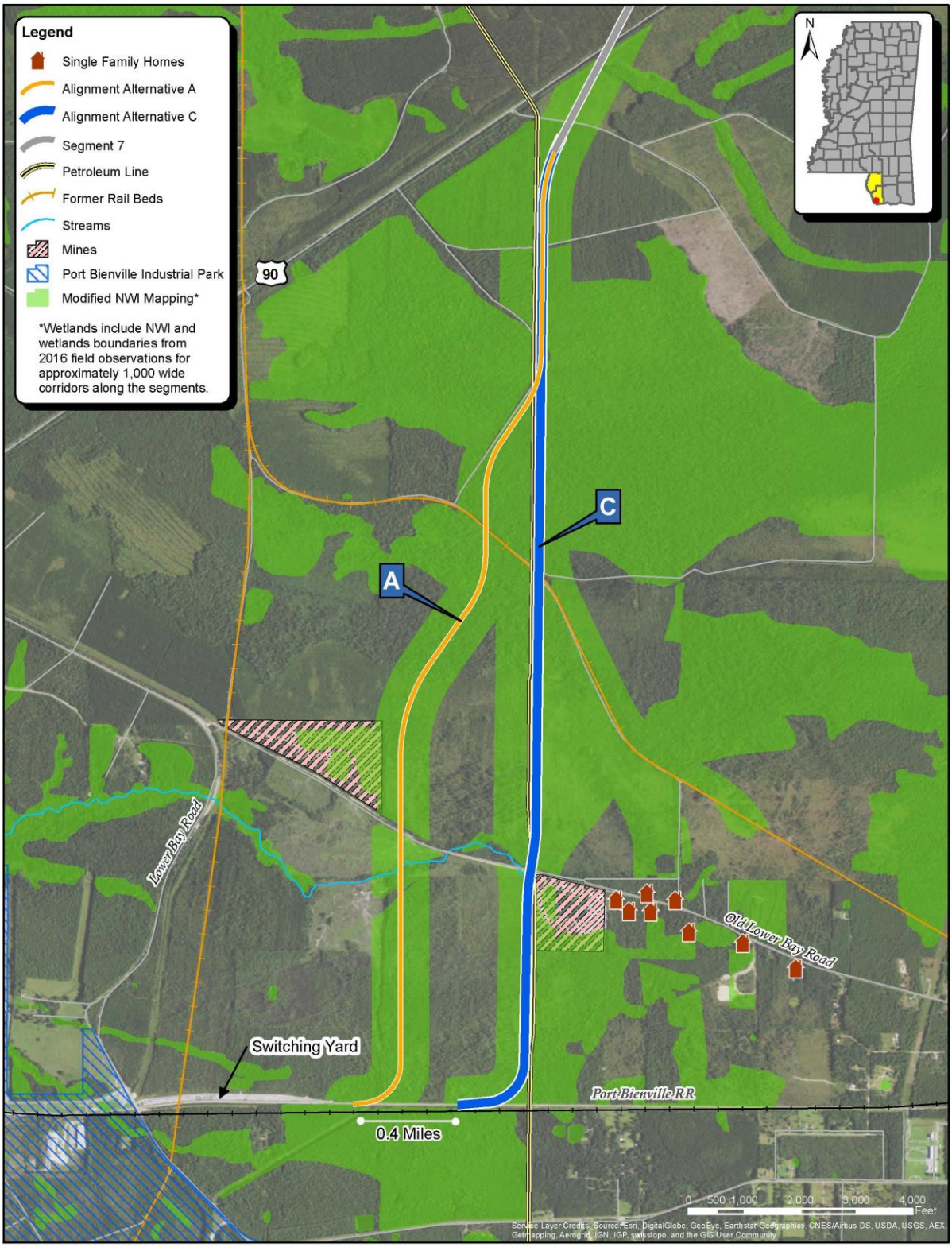
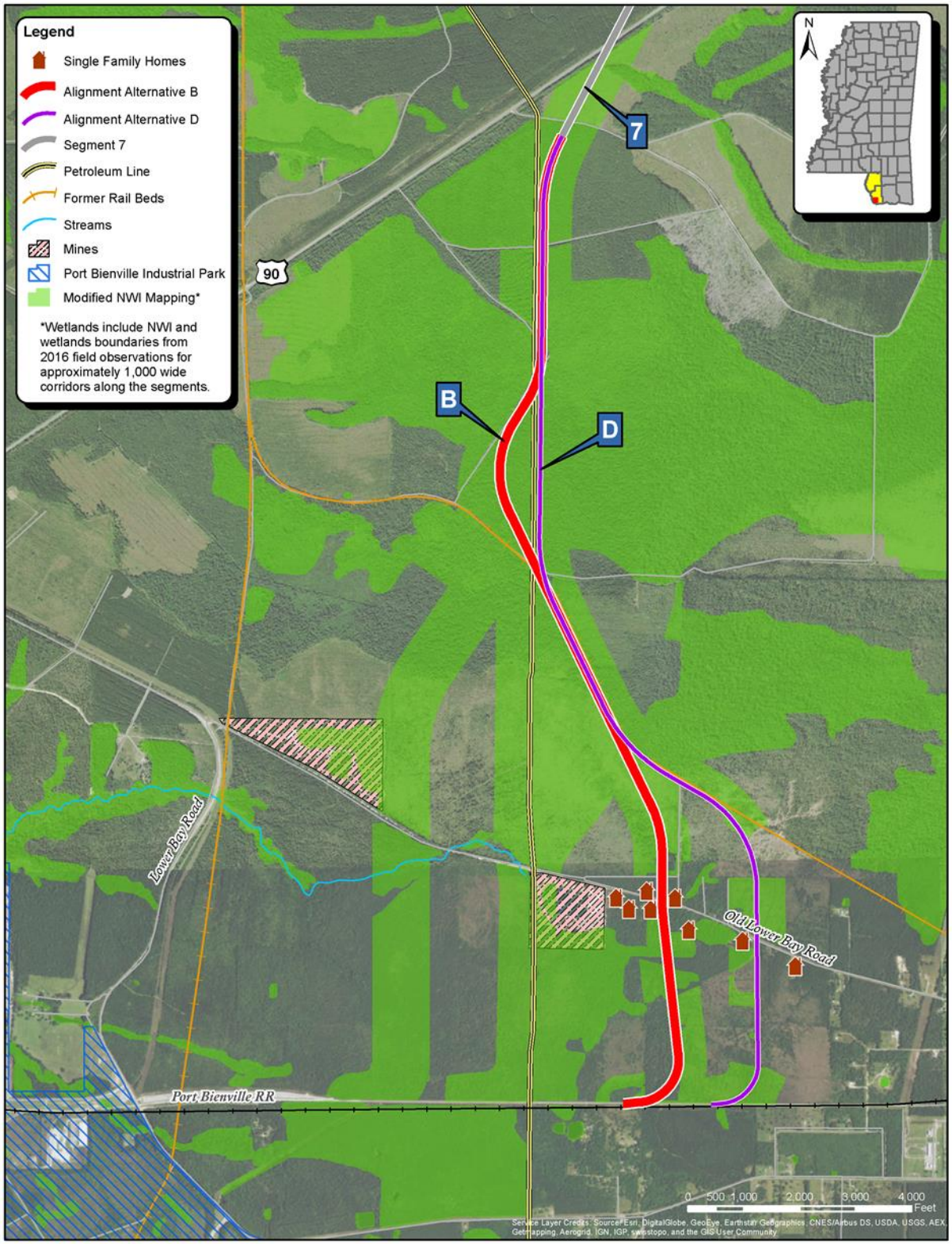


Figure 3.10: Alternative B and Alternative D



3.2.3.2 Evaluation of the Southern Alternatives

To be consistent with previous evaluations and segment comparisons, the two new alternatives were developed to the same levels as both alternative "A" and "B." Impact analysis was conducted on all four alternatives (A, B, C, and D) beginning at the southern terminus of Segment 7 and ending at their individual termini along the PBRR (See **Figure 3.11**). The Project team used both the criteria from the original comparisons and several new criteria to develop a revised impact matrix to compare the four alternatives as indicated below in **Table 3.8**. New criteria included distance of the rail line to residences, length of track to the switch, and length of the corridor along an existing disturbed utility corridor.

Alternative A – Compared to the other three options, this alignment would be located farthest from residential areas. However, this option would have the highest wetland impacts, highest estimated costs, and highest stream impacts. Also, from an operational standpoint this alignment would tie into the PBRR a very short distance from the switch point (370 feet), which makes it less desirable from an operational perspective. This alignment would parallel the Colonial Pipeline corridor for a short distance but would not utilize any of the former rail beds. The Project team recommended to eliminate this alternative due to cost, highest stream crossings, and highest wetland impacts. MDOT, HCPHC, and FRA agreed to eliminate this alignment alternative from further study.

Alternative B – Compared to the other three options this alignment is the least costly. Also from an operational standpoint, it would tie into the PBRR switch at an optimal distance to the switch point. It also would have lower wetland impacts than two of the other options. This alignment parallels the Colonial Pipe line corridor for 0.61 miles and would also followed the former rail bed for 0.66 miles. However, this alignment would have the highest impacts to the residences in the area. The Project team recommended that this alternative be eliminated due to potential residential impacts, (four residents within several hundred feet of the centerline). MDOT, HCPHC, and FRA agreed to eliminate this alternative from further study.

Alternative C (Preferred) – Compared to the other three options, this alignment would be the most direct route, with the shortest distance between Segment 7 and the PBRR. This alignment would be located west of the residential development and the existing paved roadway of Old Lower Bay Road and would not impact any residential areas. This option fell in the median range for wetland impacts and cost and would have lower stream impacts. From a rail operational standpoint, this alignment would tie into the PBRR at an optimal distance from the switch point of 0.4 mile. This alignment would also parallel the Colonial Pipeline corridor for the entire length of the segment. Existing school bus routes for South Hancock Elementary School do not appear to extend out to the new at-grade crossing for the proposed Project, meaning school bus delays and safety issues associated with rail operations would be minimal. Noise and vibration impacts on existing residences in the area would be avoided.

Figure 3.11: Alternatives A, B, C and D

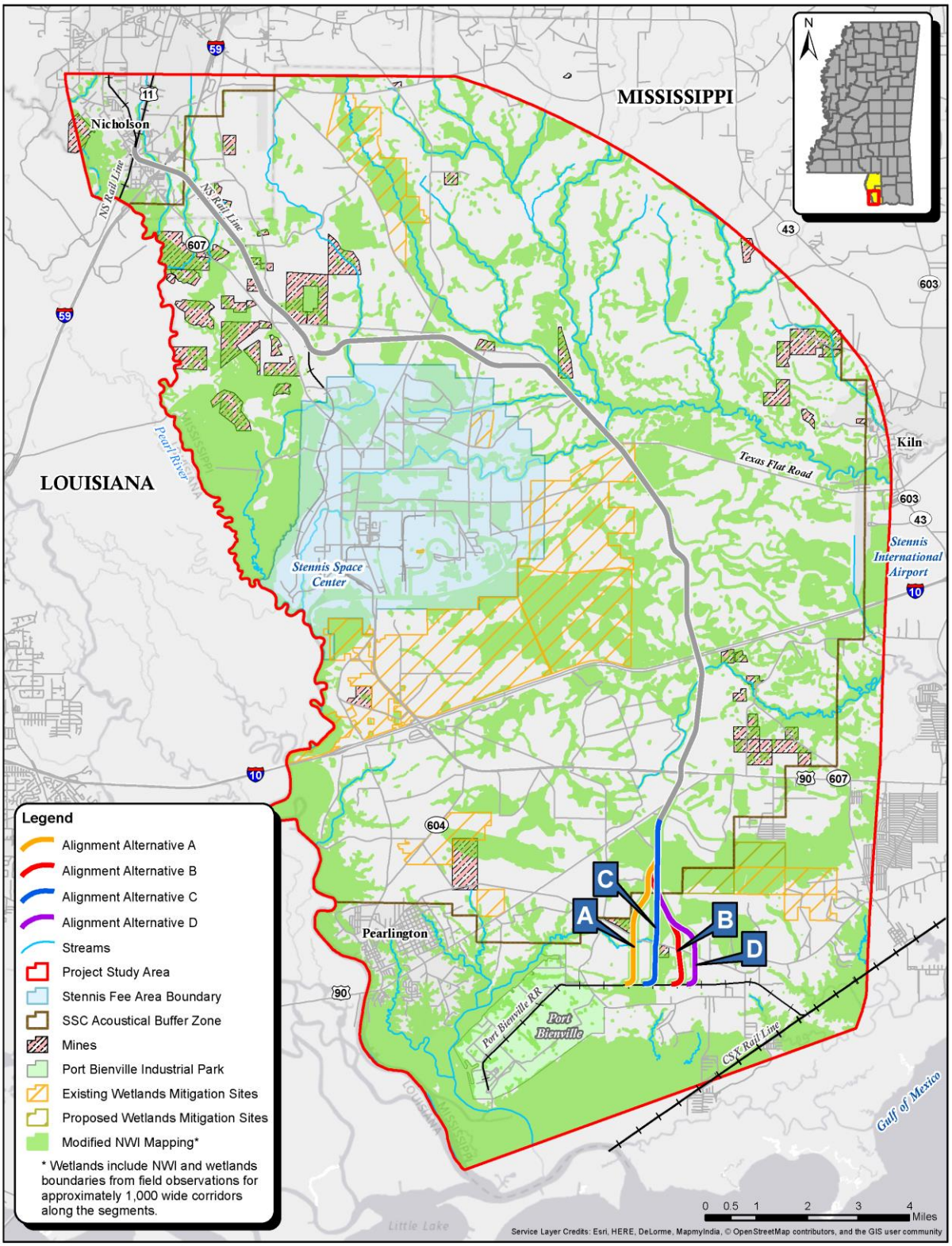


Table 3.8: Southern Options Comparison Matrix

Description	Unit of Measure	Alternative(s)			
		Alt A (Option) (2b+5+6a)	Alt B (Option) (1a+1b+3+5+6a)	Alt C (Option)	Alt D (Option)
ENGINEERING CRITERIA					
Total Length	Miles	3.50	3.56	3.45	3.66
Length to PBRR switch	Miles	0.07	0.97	0.40	1.20
Length Utilizing Former Rail bed	Miles	0.00	0.66	0.00	0.95
Length Paralleling Existing Utility Corridor	Miles	0.61	0.61	3.04	1.23
New At-Grade Rail Crossings (Paved Roads)	# of Crossings	0	1	0	1
Total Estimated Implementation Cost *(1)*	$ Millions	$22.04	$21.61	$21.79	$21.64
NATURAL FEATURES					
Wetland Impacts *(2)*	Acreage	80.80	66.85	79.27	63.46
Cost of Impacts to Wetlands *(3)*	$ Millions	$2.42	$2.01	$2.38	$1.90
Stream Crossings	# of Crossings	1	0	1	0
Total Stream Impacts	Feet	250	0	40	0
Cost of Impacts to Streams *(3)*	$200 per linear feet @ 50%	$25,000	$0	$4,000	$0
MAN-MADE FEATURES					
MDEQ CERCLA/Haz Mat sites	Acreage	0.00	0.00	0.00	0.00
ARCHAEOLOGICAL SITES					
High Probability	Acreage	13.85	28.11	14.09	20.07
Medium Probability	Acreage	20.45	17.89	28.08	28.77
Residential Homes within 200 - 400ft of centerline	# of homes	0.00	4.00	0.00	1.00
Residential Homes within 1,000ft of centerline *(4)*	# of homes	0.00	6.00	0.00	2.00
16th Sections Land	Acreage	0.00	0.00	0.00	11.00
Farmland (Prime)	Acreage	0.00	1.32	2.46	1.98
Farmland (Prime if Drained)	Acreage	31.47	30.90	32.51	31.08
Mines	Acreage	0.00	0.00	0.00	0.00

(1) Cost Estimates updated in May 2016
(2) Wetland Impacts are based on NWI Mapping and field observation performed in the Spring 2016
(3) Cost assumes a 100-foot right-of-way (50 percent of the 200-foot corridor)
(4) The number of homes includes homes within 200 – 400ft of center line.

Alternative D – Compared to the other three options, this alignment would have the lowest estimated cost. From an operational standpoint, it would tie into the PBRR's switch at the greatest distance providing operational benefits. It also would have lower wetland impacts than the other three options. This alignment parallels the Colonial Pipeline corridor and would also follow the former rail bed for over half its length. However, this option would have the potential to impact one to two residences with noise and vibration impacts and a new at-grade crossing would be introduced through the existing paved section of Old Lower Bay Road. This at-grade crossing would potentially impact the existing South Hancock Elementary School bus route increasing concerns for bus operations and safety. The alignment would also impact 16th Section Land. The 16th Section Land was established from the Land Ordinance of 1785 to help fund public schools. The Project team recommended that this alternative be eliminated due to potential residential impacts and

additional safety concerns associated with a new at-grade rail crossing and because of the additional travel time and distance associated with the longer alternative. MDOT, HCPHC, and FRA agreed to eliminate this alternative from further study.

3.2.3.3 Conclusions and Recommendations for Southern Option Comparisons

The following is a summary of the advantages and disadvantages of **Alternative C** as compared to A, B, and D.

- The advantages of Alternative C are as follows:
  - Utilizes shortest Route
  - Follows an existing utility corridor (3.04 miles)
  - Lower cost for implementation then Alternative A ($0.25 m less)
  - Optimal distance to the PBRR switch.
  - No impacts to residences (both alternative B and D impact residences)

- The disadvantages of Alternative C are as follows:
  - Higher wetland impacts (Alternative A has the highest)
  - Higher probability of "High Probability" cultural resources impacts (Alternative B has the highest)
  - Higher "Farmland" impacts, (Prime – 2.46 acres more, Prime if Drained – 32.51 acres more)

Based on the above analysis, Alternatives A, B, and D are eliminated from further study.

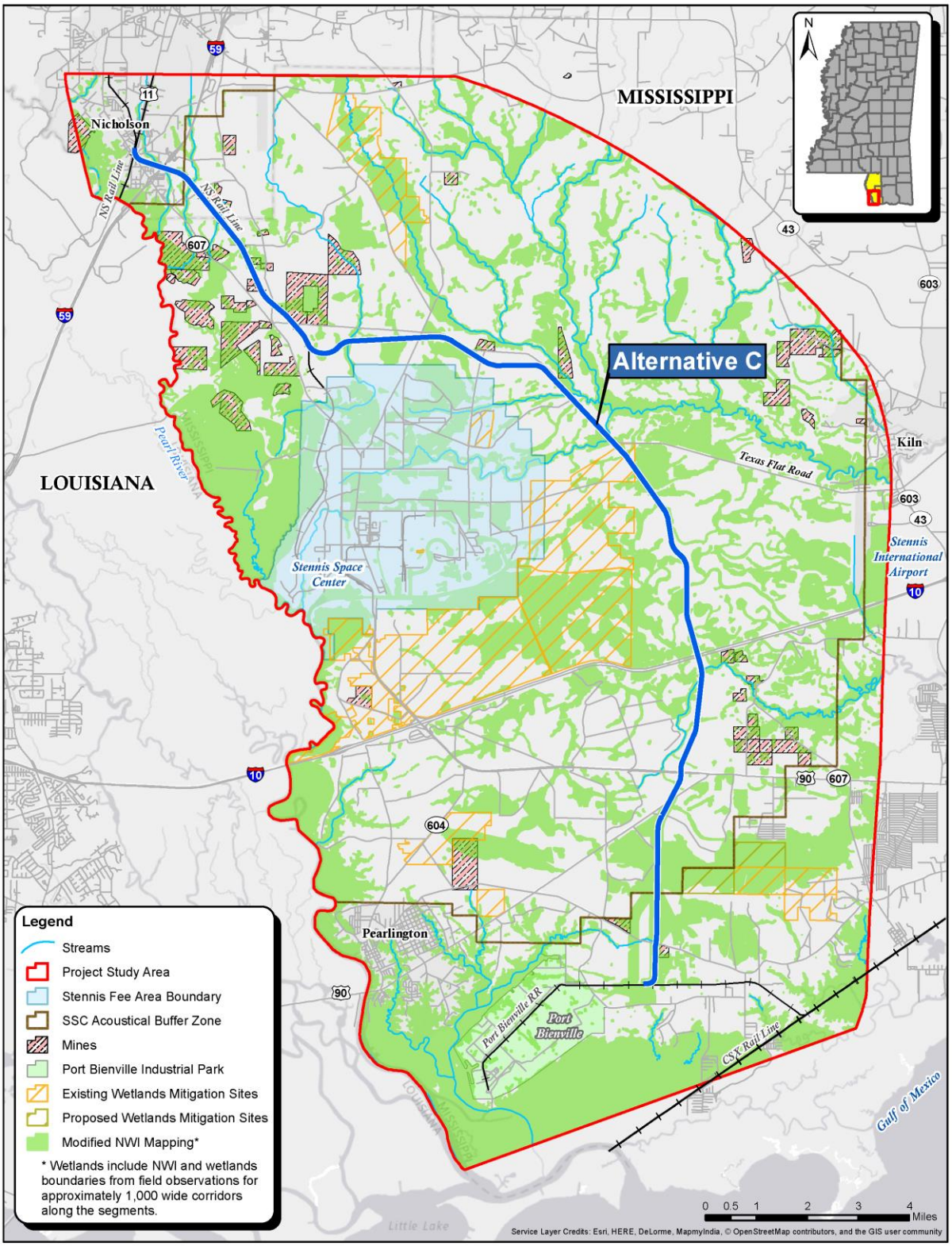
3.3 Build (Preferred) Alternative

Based on these alternative comparisons and the elimination of competing segments from further study, there are six segments that were combined to create the Build Alternative that was further studied in this Draft EIS. This alternative will be compared to a No-Build Alternative**.**

The Build Alternative would begin in the northern section of the Study Area in Nicholson, Mississippi and would continue southwest along the existing NS rail line (Segment 11). It would leave the existing rail south of Texas Flat Road and continue in easterly direction (along Segment 10b). It would turn to the southeast (along Segment 9) and would turn and travel south (along Segment 8a and Segment 7). The alignment continues in a southerly direction along the southern option "C" and ties into the existing Port Bienville Rail Road. **Figure 3.12** shows the proposed alignment of the Build Alternative.

Based on these studies, FRA has identified the Build Alternative as the Preferred Alternative for the Project; the Preferred Alternative will be reviewed during distribution of the Draft EIS and during the public comment period. Any changes made to the Preferred Alternative based on comments received during the comment period will be addressed in the FEIS/Record of Decision (ROD).

Figure 3.12: Build Alternative



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4.0 AFFECTED ENVIRONMENT

This chapter provides a general description of the natural environment and the existing social and economic characteristics of the Study Area. The descriptions establish a baseline condition of the social and environmental settings of the Study Area and provide a basis for determining the environmental consequences of the Build alternative, which is discussed in **Chapter 4** of this report.

4.1 Study Area

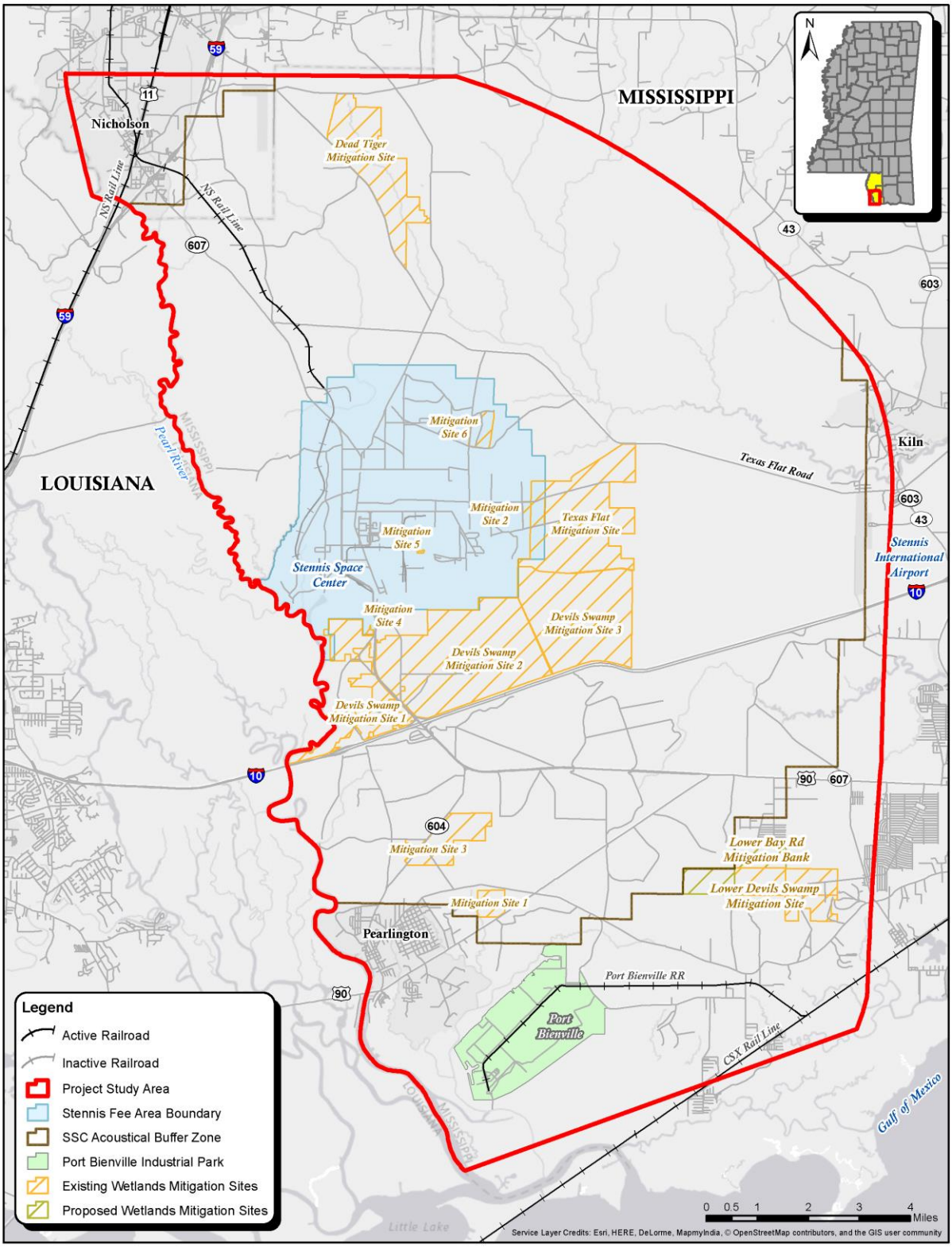
The Study Area encompasses a portion of Hancock and Pearl River Counties. The Study Area is bounded by the communities of Nicholson to the north, Port Bienville to the south, the Pearl River to the west and Stennis International Airport and SR 603/43 to the east, representing a Study Area of approximately 231 square miles (see **Figure 4.1**).

The Study Area is bisected by Interstate 10 (I-10), while Interstate 59 (I-59) passes through a small portion of the Study Area to the north. Other significant features within the Study Area include wetlands, wetland mitigation banks, forests, mines, the John C. Stennis Space Center (SSC), and a 125,000-acre acoustical buffer zone surrounding the SSC. This acoustical buffer zone makes up the majority of the Study Area. The two major facilities and key economic factors within the Study Area are Port Bienville Industrial Park and NASA's SSC, both of which are important to the local and state economy.

For the assessment of some resources, including cultural resources, wetlands, habitat, and threatened and endangered species, a smaller corridor was used to evaluate existing conditions instead of the entire Study Area. This was due to the intensive field work required to survey for these resources, which would be cost prohibitive for the entire 231-square mile Study Area. Throughout this chapter several terms are used to describe these different areas of effect and/or corridors assessed for the proposed Project. These terms are described below:

- **Study Area** – 231 square mile area of Hancock and Pearl River Counties, bounded by the community of Nicholson to the north, Port Bienville Industrial Park to the south, the Pearl River to the west, and Stennis International Airport and the community of Kiln to the east.
- **Project Corridor** – 200-foot corridor within which the proposed rail line will be constructed.
- **Archaeological Area of Potential Effect (APE)** - 200-foot wide buffer along the identified rail alignment that was surveyed for archaeological resources.
- **Architectural APE** – Approximately 700-foot wide buffer along the alignment that was surveyed for architectural resources.
- **Survey Corridor** - 200-foot wide buffer along the identified rail alignment that was surveyed in the field for wetlands, habitat, and threatened and endangered species.

Figure 4.1: Study Area



4.1.1 Key Features of the Study Area

Port Bienville Industrial Park - Port Bienville is a shallow draft barge port in southwest Mississippi, located on the Intracoastal Waterway near mile marker 24 on Mullatto Bayou in Hancock County. The Port Bienville property encompasses approximately 3,600 acres, including an industrial park and the port facility.

John C. Stennis Space Center - For more than four decades, SSC in Hancock County has served as NASA's primary rocket propulsion testing ground. Today, the center provides propulsion test services for NASA and the Department of Defense and the private sector. Stennis is home to NASA's Rocket Propulsion Test Program, which manages all of the agency's propulsion test facilities. State-of-the-art facilities, a 7.5 -mile canal waterway system, and the 125,000-acre acoustical buffer zone that surrounds SSC enable delivery and testing of large-scale rocket engines and components. Development within the acoustical buffer zone is governed by development restrictions purchased by the federal government. The government purchased some of the lands within the acoustical buffer zone, but the majority of this property remains in private ownership subject to the development restrictions that prohibits any inhabitable buildings within the acoustical buffer zone.

Wetland Mitigation Banks - A large portion of the Study Area is made up of wetland mitigation banks. The establishment of the acoustical buffer zone for SSC restricted land uses and all development within the boundary. The area is inundated with wetlands and when combined with limited development opportunities, it has made the Study Area conducive for the development of wetland mitigation banks.

A wetland mitigation bank is an aquatic resource (wetlands and/or streams), including some surrounding property, that has been set aside for the protection of the resource. A boundary of the property is established with a legal instrument and includes deed restrictions placed upon the property. A formal agreement is established with regulatory agencies on the restoration, enhancement, and preservation of the resource for perpetuity. The agreement also establishes a number of credits available once the restoration is complete. These credits can then be purchased by developers and infrastructure projects as mitigation for their impacts on similar types of resources.

The Study Area contains six mitigation sites owned by NASA, eight privately owned banks and two proposed banks for a total of 16 sites. These mitigation banks encompass approximately 13,471 acres and contain both wetlands and streams. Wetland mitigation banks comprise approximately 9 percent of the Study Area and were avoided to the extent possible during Project development. Wetland mitigation banks are discussed further in **Section 4.12**.

4.2 Land Use

Land use planning for the Study Area is guided by two main governing bodies that include Pearl River County (5 percent of the Study Area) and Hancock County (95 percent of the Study Area). The Study Area begins within the southernmost part of Pearl River County, and continues into Hancock County. Planning documents that regulate both existing and future land uses within these counties include:

- Pearl River County 2010 Smart Growth Plan
- Pearl River County Subdivision Regulations
- Pearl River County Strategic Plan 2002
- SSC Acoustical Buffer Zone

- Hancock County Interim Comprehensive Plan (2008)
- Hancock County Zoning Ordinance
- Hancock County Flood Damage Prevention Ordinance
- Hancock County Subdivision Regulations

The Pearl River County 2010 Smart Growth Plan identifies development regulations that maintain the rural nature of agricultural and timber lands while allowing the traditional homesteading. The plan recommends flexibility in development requirements to maintain a balance between the rural and small-town characteristics of the county.

The SSC in Hancock County is surrounded by a 125,000-acre acoustical buffer zone that is governed by development restrictions purchased by the federal government. Some of the lands within the acoustical buffer zone were directly purchased by the government; however, although much of this property remains in private ownership, development restrictions prohibit any inhabitable buildings to be located within the acoustical buffer zone area (see **Figure 4.2**).

Hancock County is predominantly rural in nature, and various land uses include agriculture and natural resource preservation. The county consists of residential (26 percent) and undeveloped land (65 percent). Most of the undeveloped land is used for silviculture operations, sand mines, and wetland mitigation banks.

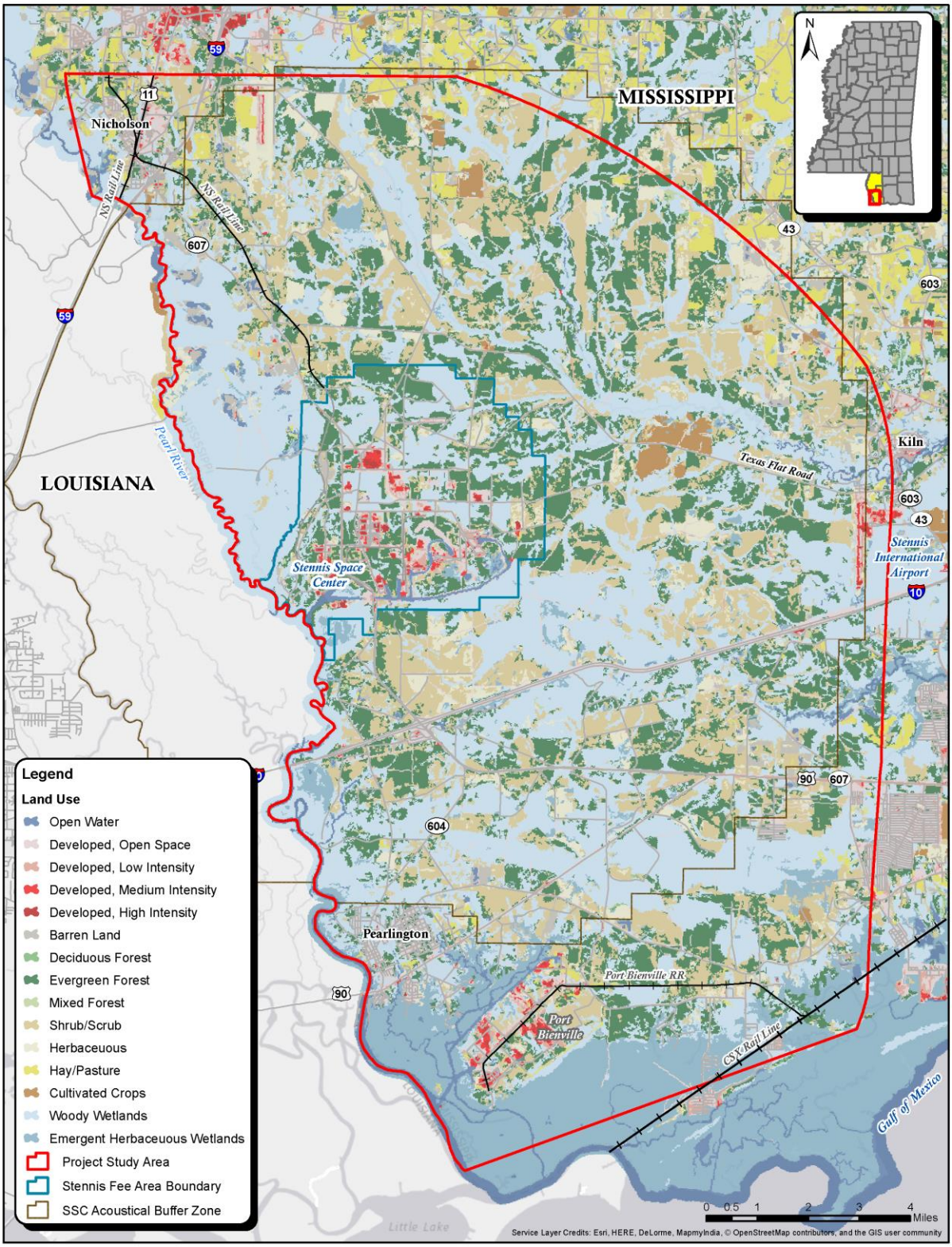
4.2.1 Pearl River County

As stated above, only a small portion of the Study Area falls within Pearl River County. Just over half of this area is outside the SSC acoustical buffer zone. In 2010, most of Pearl River County was rural in nature, with 87 percent of land falling into forested or agricultural uses. Land within the SSC acoustical buffer zone, along the existing rail line consists of forested and agricultural areas. Outside of the SCC acoustical buffer zone, land use begins to change to rural residential, agricultural and low density residential adjacent to the boundary line. Further north, there is high density residential development, with commercial/industrial/institutional uses at its center.

The census-designated place of Nicholson lies in the northwestern corner of the Study Area. There is a mix of residential single-family and industrial/commercial land uses. Residential areas are both high density and low density neighborhoods. The inactive Norfolk Southern rail line ties into an active NS line at the intersection of U.S. 11 and SR 607 in Nicholson. The active line parallels U.S. 11, where the land use includes infrastructure and high-density residential. U.S. 11 connects Nicholson to Picayune, three miles to the north.

A growth corridor has been designated by Pearl River County 2010 Smart Growth Plan along both I-59 and U.S. 11 within the northern section of the Study Area. Growth is expected to occur primarily within the cities of Poplarville and Picayune, which are both outside of the Study Area. In the future, land use within Pearl River County within the Study Area is still projected to be forest, agricultural, rural residential and commercial/industrial/institutional. A portion of the forested area is expected to convert to residential and commercial/industrial/institutional uses. Commercial uses, specifically, and low-density residential areas are expected to expand along U.S. 11 and its intersection with I-59.

Figure 4.2: Acoustical Buffer Zone and Land Use



The Study Area is located in unincorporated Pearl River County, for which no zoning or growth plans were included. The future growth maps in the Land Use section of the 2010 Comprehensive Plan only offer predictions, based on the assumption that growth of a specific type (i.e., low density residential) would occur adjacent to areas devoted to that land use type in 2010.

4.2.2 Hancock County

The Existing Land Use Map included in the 2008 Hancock County Mississippi Comprehensive Plan identified residential, hotels/motels, industrial/manufacturing, transportation/communication, retail, services, public use, churches, cultural and parks, resource extraction, and undeveloped land within the Study Area (See **Table 4.1**). Port Bienville Industrial Park is a 3,600-acre industrial site at the southern end of the Study Area.

Table 4.1: Hancock and Pearl River Counties Land Use Categories

Land Use Categories	Hancock County	Pearl River County
Residential	26.0%	8.5%
Hotel/Motel	0.0%	N/A
Industrial/Manufacturing	0.8%	1%
Transportation/Communication	0.8%	0.7%
Retail	0.4%	>1%
Services	0.3%	N/A
Public Use	0.3%	N/A
Churches	0.4%	N/A
Cultural and Parks	1.9%	0.12%
Resource Extraction	2.0%	N/A
Undeveloped Land	67.6%	87.0%

The Hancock County Interim Comprehensive Plan November 2, 2008
Pearl River County 2010 Smart Growth Plan, May 27, 2010 (some data not available (N/A)

Within the Town of Pearlington, there is a mix of residential single-family and vacant land use, with institutional/school uses in the northern section. North of the SR 607/ U.S. 90 intersection, the land use is largely park/open space/protected land use, except for a small section of right-of-way west of the proposed alignment on I-10 and the fee area of SSC, which is primarily office, with small areas of institutional/school designations.

Changes in future land uses, as shown in the Hancock County Mississippi Comprehensive Plan, are minimal. The future land use map shows low density residential and undeveloped land as the major land use within the Study Area, which is consistent with current conditions. In and around Pearlington, there is primarily medium density residential with commercial and mixed uses. Between Pearlington and the Port Bienville Industrial Park is another area of low-density residential housing.

4.3 Farmland

Farmland is defined as land used for crop production including livestock and timber. The Farmland Protection Policy Act (FPPA) enacted in 1981 (7 U.S.C. §4201) is intended to reduce and minimize the impacts of federal projects on area farmlands and to protect farmlands from conversion to non-agricultural uses. Prior to farmlands being used for a federal project, an assessment must be completed to determine if prime, unique, statewide or locally important farmlands would be converted to non-agricultural uses. If the assessment determines the use of farmland for the project is in excess of the parameters defined by the Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture (USDA), as well as the lead federal agency must take measures to minimize the impacts of the project to these farmlands.

The NRCS is the lead agency that determines the suitability of farmlands. NRCS characterizes eligible farmland as being "prime", "unique", or of "statewide or local importance." The designations are based on NRCS soil types and are protected by federal and state legislation.

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, or oil-seed and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor without intolerable soil erosion (7 U.S.C. §4201(c)(1)(A)). Prime farmland includes land that possesses the above characteristics and may include land currently used as cropland, pastureland, rangeland, or forestland. Prime farmland does not include land already in or committed to urban development or water storage.

Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops (7 U.S.C. §4201(c)(1)(B)). It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include lentils, nuts, annually cropped white wheat, cranberries, citrus and other fruits, olives, and vegetables.

Statewide or locally important farmland is land that has been designated of state or local importance for the production of food, feed, fiber, forage, or oil-seed crops as determined by state or local government agencies, but is not of national significance (7 U.S.C. §4201(c)(1)(C)).

Although some prime, unique and statewide important soils are located in the Study Area, the majority of this area is being used for silviculture, which is the growth and cultivation of trees. There are minimal farming investments such as barns, irrigation, etc. that are used for growing crops.

As can be seen in **Table 4.2** and **Table 4.3**, prime soils make up approximately 44 percent of the 147,789 acres of the Study Area.

Table 4.2: Pearl River County Farmlands within the Study Area (Prime/Statewide Importance)

Soil Type	Farmland Type	Acres in Study Area	Percent of Study Area
Basin loam, 0 to 2 percent slopes	Prime	37	3%
Bassfield sandy loam, 0 to 3 percent slopes	Prime	114	<1%
Benndale sandy loam, 0 to 2 percent slopes	Prime	58	<1%
Escambia fine sandy loam, 0 to 2 percent slopes	Prime	2198	1%
Escambia loam, 0 to 2 percent slopes	Prime	2	<1%
Latonia fine sandy loam, 0 to 2 percent slopes	Prime	20	<1%
Malbis fine sandy loam, 5 to 8 percent slopes	Prime	1	<1%
Poarch loam, 0 to 2 percent slopes	Prime	1461	1%
Poarch loam, 2 to 5 percent slopes	Prime	335	<1%
Poarch loam, 5 to 8 percent slopes	Prime	137	<1%
Saucier loam, 0 to 2 percent slopes	Prime	8	<1%
Saucier fine sandy loam, 2 to 5 percent slopes	Prime	24	<1%
Smithton sandy loam	Prime	1059	1%
Smithton association occasionally flooded	Prime	42	<1%
Smithton fine sandy loam	Prime	3	<1%
Total Acres of Prime Farmland		**5,499**	**4%**

Table 4.3: Hancock County Farmlands Within the Study Area (Prime/Statewide Importance)

Soil Type	Farmland Type	Acres in Study Area	Percent of Study Area
Lucedale fine sandy loam, 0 to 2 percent slopes	Prime	29	<1%
Escambia loam, 0 to 2 percent slopes	Prime	8853	6%
Escambia loam, 2 to 5 percent slopes	Prime	3308	2%
Guyton silt loam, 0 to 2 percent slopes	Prime	10615	7%
Harleston fine sandy loam, 0 to 2 percent slopes	Prime	7667	5%
Harleston fine sandy loam, 2 to 5 percent slopes	Prime	3188	2%
Malbis fine sandy loam, 0 to 2 percent slopes	Prime	50	<1%
Malbis fine sandy loam, 2 to 5 percent slopes	Prime	164	<1%
Malbis fine sandy loam, 5 to 8 percent slopes	Prime	84	<1%
The McLaurin fine sandy loam, 2 to 5 percent slopes	Prime	365	<1%
Poarch fine sandy loam, 0 to 2 percent slopes	Prime	2284	2%
Poarch fine sandy loam, 2 to 5 percent slopes	Prime	8241	6%
Ruston fine sandy loam, 0 to 2 percent slopes	Prime	191	<1%
Ruston fine sandy loam, 5 to 8 percent slopes	Prime	48	<1%
Saucier loam, 0 to 2 percent slopes	Prime	1294	1%
Saucier fine sandy loam, 2 to 5 percent slopes	Prime	2406	2%
Smithton fine sandy loam	Prime	4612	3%
Total Acres of Prime Farmland		**53,401**	**36%**
Poarch fine sandy loam, 8 to 12 percent slope	Statewide	23	<1%
Eustis loamy fine sand, 2 to 5 percent slopes	Statewide	645	<1%
McLaurin fine sandy loam, 5 to 8 percent slopes	Statewide	74	<1%
Poarch fine sandy loam, 5 to 8 percent slopes	Statewide	1295	1%
Saucier fine sandy loam, 5 to 8 percent slopes	Statewide	677	<1%
Saucier fine sandy loam, 8 to 12 percent slopes	Statewide	103	<1%
Total Acres of Statewide Important Farmland		**2,817**	**2%**

4.3.1 Conservation Easements

Also under the NRCS, the Agricultural Conservation Easement Program (ACEP) provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands easement programs to landowners who want to maintain or enhance their land in a way beneficial to agriculture and/or the environment.

There are no conservation easements that were identified with Study Area.

4.4 Socioeconomics

Based on the American Community Survey (ACS) 2011-2015 estimates, Mississippi has a population of approximately 2,988,081. Overall, Pearl River County has a population of approximately 55,196 and Hancock County has a population of approximately 45,627. The median age of the population is 41 years for both counties, with approximately 29 to 30 percent of the population having graduated from high school. Unemployment rates for the both counties average an estimated 11 to 12 percent. The median household income for Hancock County is $43,355 and the Pearl River County median household income is $40,976. Hancock County has an estimated 20 percent of their populations living below the poverty line, while Pearl River County is estimated at 21%. Overall, the characteristics of the populations within Hancock and Pearl River are comparable to Mississippi (See **Table 4.4**.).

4.4.1 Population

Although the SSC acoustical buffer zone has no residential population, and makes up much of Hancock County, the overall population of Hancock County is not much lower than Pearl River County. This is due to the relatively large population of Bay St. Louis (10,838 people). Over a five-year period from 2010 to 2014, Hancock County saw the highest percentage of population growth at 4.4 percent, compared to the state at 0.9 percent and Pearl River, which saw a decline at 0.9 percent.

4.4.2 Age/Employment/Education

Approximately 59 percent of the population of Mississippi, Hancock County, and Pearl River County is within the 20-64 age range, which is the primary workforce. Pearl River County does fall 3 percent lower at 56 percent and also has a lower population of 53 percent in the labor forces when compared to Mississippi (58%) and Hancock County (56%). The percentage of those employed is again comparable to the state at 52 percent, with Hancock County at approximately 50 percent and Pearl River County lower at 46 percent. According to the July 2016 U.S. Department of Commerce Employment Report the national unemployment rate stayed at 4.9 percent. All three of the discussion areas are more than double this percentage, with Mississippi and Hancock County at 10 percent and Pearl River County at 12 percent.

The state of Mississippi's population that graduated from high school is approximately 30 percent and 19 percent graduated from college. Hancock County is slightly lower with 29 percent high school graduates and 19 percent with college degrees. Pearl River County is 30 percent high school graduates with only 3 percent having college degrees.

Table 4.4: Population Characteristics

	Mississippi		Hancock County		Pearl River County	
	Population Total	Population Percent	Population Total	Population Percent	Population Total	Population Percent
POPULATION						
	2,988,081	--	45,627	--	55,196	--
AGES						
Infant to 19 years of age	824,710	28%	11,224	25%	15,069	27%
20 to 64 years of age	1,751,015	59%	26,555	58%	31,075	56%
65 years of age and over	415,343	14%	7,985	18%	9,052	16%
Median Age	36.5	--	41.8	--	40.7	--
EDUCATIONAL ATTAINMENT (18 years and over)						
Less than high school	2,251,908	18%	35,311	16%	42,054	16%
High school graduate		30%		29%		30%
Some college or associate's		26%		35%		52%
Bachelor's Degree or Higher		19%		19%		3%
EMPLOYMENT STATUS (16 and over)						
In labor force	--	58%	--	56%	--	53%
Employed	--	52%	--	50%	--	46%
Unemployment rate	--	10%	--	10%	--	12%
Mean travel time to work (minutes)	24	--	29	--	N*	--
INCOME						
Per Capita Income (in 2014 inflation-adjusted dollars)	$21,057	--	$22,286	--	$19,786	--
Median Income (dollars) by households	$39,665	--	$43,355	--	$40,976	--
HOUSING						
Total Housing Units	1,289,704	--	23,196	--	24,423	--
Occupied housing units	1,096,593	85%	18,591	80%	20,606	84%
Average Household size	--	2.64	--	2.43	--	2.61
2-person household	--	44%	--	49%	--	45%
3-person household	--	24%	--	22%	--	23%
4 or more person household	--	19%	--	18%	--	20%
Owner occupied	749,982	68%	13,270	71%	15,710	76%
Renter occupied	346,611	32%	5,321	29%	4,896	24%
Median Home Value — Owner Occupied	$71,00		$92,500		$76,500	
Home Values‡ — Less than $50,000	154,701	21%	1,709	13%	2168	14%
Home Values‡ — $50,000 to $99,000	210,938	28%	2,987	23%	4620	29%
Home Values‡ — $100,000 to $199,999	240,375	32%	5,428	41%	6,153	39%

Source –U.S. Census data, ACS 2011-2015 5-Year Estimates

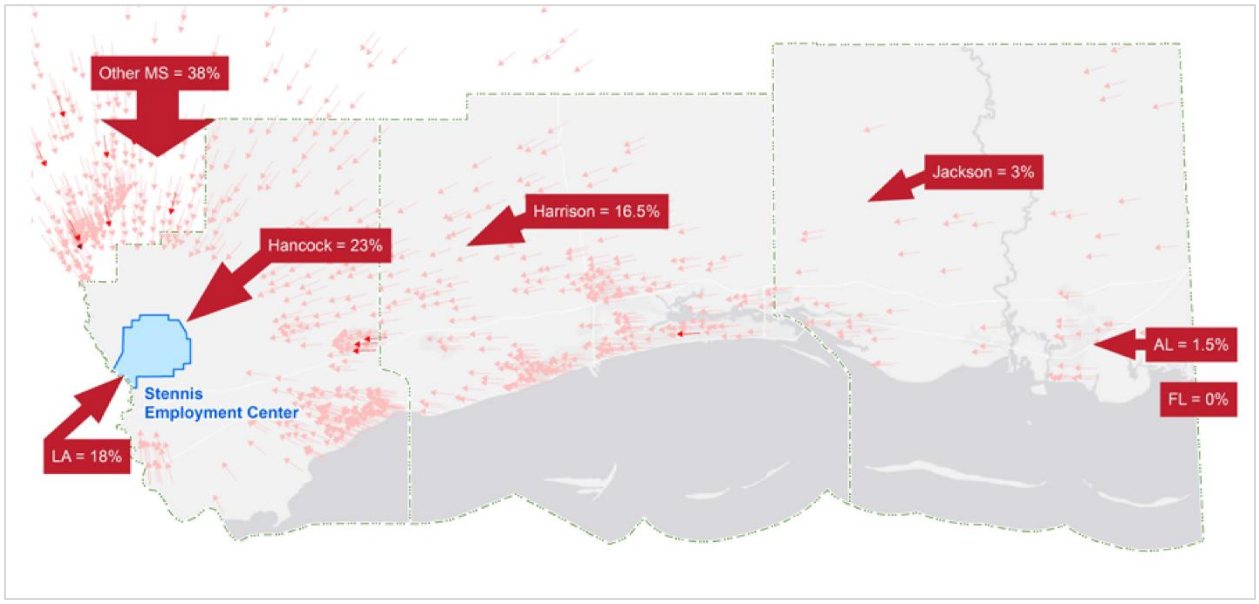
**An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.*

SSC provides employment opportunities in coastal Mississippi, drawing workers from, Mississippi, Louisiana and Alabama. According to the Gulf Coast Plan for Opportunity individuals traveling to work at SSC breaks down as:

- 23 percent from Hancock County, Mississippi;
- 16.5 percent from Harrison County, Mississippi;
- 3 percent from Jackson County, Mississippi;
- 38 percent from counties north of the Mississippi coast;
- 18 percent from Louisiana; and
- 1.5 percent from Alabama.

Figure 4.3 illustrates those commute patterns.

Figure 4.3: Commute Pattern



Source: Plan For Opportunity, Mississippi Gulf Coast Sustainable Communities Initiative, Scenario Planning Map Book, April 2013, page 25, Criterion Planners.

The mean travel time to work within Mississippi is 24 minutes. Hancock County is marginally higher at 29 minutes and Pearl River has the highest commute time at 34 minutes. However, none of these are exceptionally long commute times as they are rural areas without urban congestion.

4.4.3 Income

Per capita income, or average income, measures the average income earned per person in a given area in a specified year. It is calculated by dividing the area's total income by its total population. The median income is the amount that divides the income distribution into two equal groups, half having income above the median amount, and half having income below the median amount. In both per capita and median income, the counties are greater than the state. Hancock County's per capita income is the highest at $22,286, with Mississippi next at $21.057 and Pearl River County at $19,786. The per capita income of Mississippi is lower than other neighboring southern states. Hancock County and Pearl River County falls at the low end of that spectrum.

For median income, Hancock County is the highest at $43,355, with Pearl River at $40,976 and Mississippi at $39,665. The median income in Hancock County is comparable to other neighboring southern states, while Pearl River County and the State of Mississippi come in somewhat lower.

4.4.4 Housing

Overall average household size for the two counties are again comparable to the state. The counties, at 2.43 in Hancock County and 2.61 persons in Pearl River County, are slightly lower than the state national average, of 2.64 persons. The counties exceed the state in owner-occupied residences: Hancock County has 71 percent, Pearl River County has 76 percent, and Mississippi has 68 percent. The number of owner-occupied homes is noteworthy in light of the unemployment rate.

With regard to the median home values for owner-occupied housing units, Hancock County has the highest median home value at $92,500, and Pearl River County second with a median home value at $76,500. The State of Mississippi median home value is $71,000.

4.4.5 Elderly, Disabled and Youth

Elderly, disabled and youth populations can be especially vulnerable to or effected by transportation actions. Several laws help to protect these populations from discrimination including:

- The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination on the basis of disability. Among other things, it requires that transportation projects incorporate ADA compliant features into the design and construction while not creating barriers to accessibility.
- The Architectural Barriers Act of 1968 requires federal agencies to assure accessibility when funding the design and construction of projects.
- Executive Order (EO) 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires federal agencies to minimize environmental health and safety risks to children, and to prioritize the identification and assessment of environmental health and safety risks that may have a disproportionate impact on children.

4.4.5.1 Elderly, Disabled and Youth Populations

The Study Area encompasses two counties, Hancock and Pearl River. Some of the census data for this evaluation is not available at the census track or block group level, therefore the county level census data is used throughout this section. Additionally, population cohort component numbers are based on 2014 census estimates rather than the 2010 numbers which are six years old. The use of these numbers is also consistent with the census information used in the other sections of the EIS. **Table 4.5** shows the area population numbers for the elderly, disabled and youth groups.

Table 4.5: Elderly, Disabled and Youth Populations within the Study Area

	Hancock	Pearl River	Total	Percentage of Population
Total Population	45,627	55,196	100,823	100%
Elderly (65 and over)	7,985	9,052	17,037	17%*
Disabled	8,053	10,559	18,612	19%
Youth (under 19)	11,244	15,069	26,313	26%

Source: U.S. census 2011-2015 American Community Survey 5-year Estimates.
**percent estimated from total civilian noninstutional population 45,447 Hancock County and 54,332 Pearl River County*

The elderly population within the Study Area is 17,037 and represents approximately 17 percent of the population. Based on a review of the previous census information, this indicates that this is a growing population. The 2000 census showed the elderly population to be between 13 and 14 percent. In general, this group exhibits higher instances of mobility, visual, auditory or cognitive impairments due to the aging process or as a side effect to medication.

The disabled population is approximately 19 percent of the area population and includes all age categories.

4.5 Environmental Justice

Executive Order (EO) 12898,[20] issued in 1994, requires federal agencies, to the greatest extent practicable and permitted by law, to identify and address the potential disproportionately high and adverse human health and environmental impacts of their programs, policies and activities on minority and low income populations. Federal agency responsibilities under this EO also apply to Native American programs.

The U.S. Department of Transportation (DOT) Order 5610.2 was issued in 1997 to comply with EO 12898. The policy of the DOT Order is to promote the principles of environmental justice in all DOT programs, which includes the FRA.

EO 12898 provides guidance for identifying and addressing potential project related adverse (or positive) effects to low-income and minority populations. Important discussion terms are defined below. [21]

- **Low-income person(s)** – Those whose median income is at or below the Department of Health and Human Services poverty guidelines.
- **Low-income population(s)** – Any readily identifiable group of low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed federal program, policy or activity.
- **Minority** – A person who is Black/African American, Hispanic or Latino,22 Asian American, American Indian and Alaskan Native, and/or Native Hawaiian and Other Pacific Islander.
- **Minority Population(s)** – Any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed federal program, policy or activity.
- **Adverse Effects –** The totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of human-made or natural resources; destruction or

[20] https://www.gpo.gov/fdsys/pkg/FR-1994-02-16/html/94-3685.htm; accessed 9/25/17

[21] http://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/orders/order_56102a , site visited 7.13.16. Definitions for Section 2.1 were also found on this site, which was a redirect from the FRA website.

[22]The U.S. Census defines Hispanic or Latino Origin as,"…a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish cultural or origin regardless of race." For respondents unable to identify with the five face categories used since 1997, "Some Other Race" was included on the 2000 and 2010 Census questionnaires. http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf, website visited 10.4.16.

diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of benefits of federal programs, policies, or activities.

- **Disproportionately High and Adverse Effect on Minority and Low-Income Populations** - An Adverse Effect that:
  - is predominantly borne by a minority population and/or a low-income population; or
  - will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Per FRA guidance, there are three fundamental environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The United Census Bureau American Fact Finder website[23] was utilized to gather the raw demographic data. Because the American Community Survey (ACS) provided low-income, and minority populations, as well as elderly and the disabled, ACS data was used for the analysis, as opposed to a specific census year, the 2010-2014 5-year estimates were used for this report. See **Section 4.4.3** for Elderly, Disabled and Youth discussions.

The U.S. Census Bureau developed a system to divide physical area to gather census data. These areas are defined below.

- **Census tracts (CT)** - are small, relatively permanent geographic entities within counties (or the statistical equivalent of counties), which generally have 2,500 to 8,000 residents (4,000 is optimal). Their boundaries follow visible features. They should be as contiguous as possible with respect to population characteristics, economic status, and living conditions.
- **Block groups (BG)** - are statistical divisions of census tracts. They are the smallest geographic units used to provide public information on population.

[23] http://factfind.census.gov, website visited July through September 2016

- **Block** – are the smallest geographic unit used for tabulation of 100-percent data (data collected from all houses, rather than a sample of houses).[24]

The BG was used to determine both minority and low income populations.

4.5.1 Low-Income Population

The Department of Health and Human Services poverty guidelines have shown that for a family/household of 3 persons the poverty threshold is $20,090. [25] The ACS 5-year 2011-2015 estimates that the average household size for Mississippi is 2.64. Hancock County has an average household size of 2.43 and Pear River County is 2.61.

As of 2015, 14 percent of U.S. households are living below the poverty level based on ACS data. It was also estimated that 21 percent of the total household incomes in Mississippi are living below the poverty level. Poverty levels within the state have increased from 16 percent in 2000 to 23 percent in 2015. In comparison, poverty levels in the U.S. have increased from 11 percent in 2000 to 16 percent in 2015.[26] This shows that Mississippi poverty levels increased by 6.3 percent whereas the country, as a whole, increased by only 4.3 percent.

From the 2011-2015 5-year Estimates, Hancock County contains 18,591 total households. Of these, 3,798 or 20.4 percent were below the poverty level. Pearl River County contains 20,606 total households. Of these, 4,229 households or 21 percent of all households are below the poverty level. Both are comparable to Mississippi in 2015, but higher than the U.S. average (see **Table 4.6)**.

Table 4.6: Low-Income Data

	United States	Mississippi	Hancock County	Pearl River County
Total Households	116,926,305	1,096,593	18,591	20,606
Households with Incomes below the poverty level	16,811,595	234,066	3,798	4,229
Percentage of Total Household Incomes below the poverty level	14%	21%	20.4%	21%

Source: U.S. Census Bureau, ACS 2011-2015 5-Year Estimates

[24] Data from blocks is not available for these categories.
[25] https://aspe.hhs.gov/prior-hhs-poverty-guidelines-and-federal-register-references, website visited 7.13.16
[26] Source: U.S. Census Bureau

Low-income data can be analyzed at the BG level regarding the number of households below the poverty level. **Table 4.7** and **Figure 4.4** provide low-income data for all Census Tracts and Block Groups located within the Study Area. There are eleven block groups within the Study Area; of those tracts, seven BG have higher percentages of low-income populations than their respective counties, CT 302, BG 5; CT 303, BG 8; CT 304, BG 2; CT 306.2, BG 3; CT 9505.01, BG 1; CT 9507, BG 2; and CT 9507, BG 4.

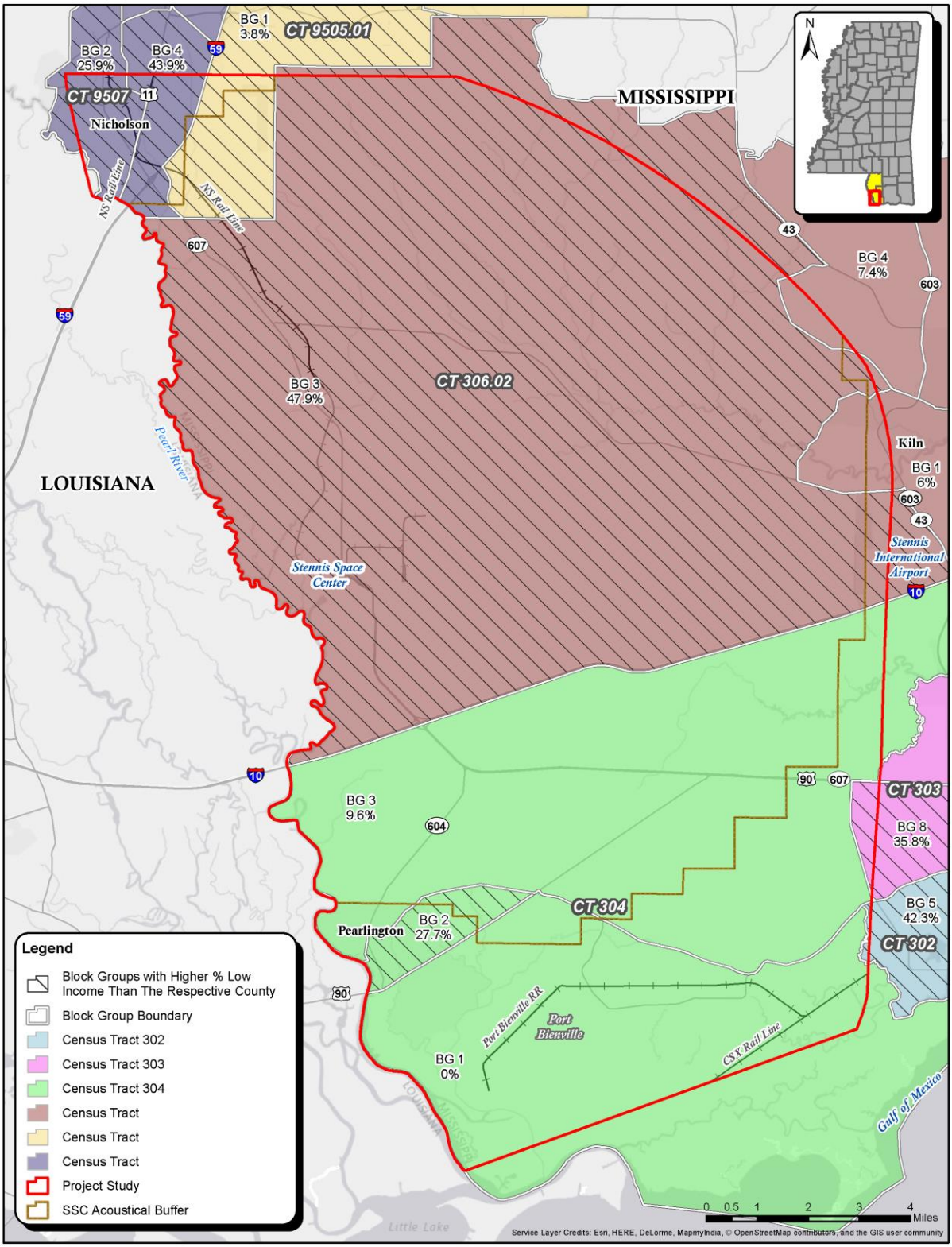
Table 4.7: Low-Income Data by Block Group – Income in 2013 Below Poverty Level

	Hancock County									Pearl River County			
	Total County	CT 302, BG 5	CT 303, BG 8	CT 304, BG 1	CT 304, BG 2	CT 304, BG 3	CT 306.2, BG 1	CT 306.2, BG 3	CT 306.2, BG 4	Total County	CT 9505.01, BG 1	CT 9507, BG 2	CT9507 BG 4
Total Households	18,591	149	996	260	346	416	581	421	471	20,606	749	1,013	837
Income below poverty level	3,798	63	357	0	96	40	35	202	35	4,229	285	263	364
Percentage of Total Household Incomes below the poverty level	20.0%	42.3%	35.8%	0%	27.7%	9.6%	6.0%	47.9%	7.4%	21.0%	38.0%	25.9%	43.4%

Source: U.S. Census Bureau, ACS 2011-2015 5-Year Estimates

In Hancock County, Census Tract 306.2, BG 3, has 47.9 percent of households below the poverty level; this is higher than Hancock County as a whole, with 20.0 percent (a difference of 27.9%). This Block Group is located from approximately I-10 north to Pearl River County, west to Louisiana and east to Kiln. This area has no inhabitants due to the SSC acoustical buffer zone.

Figure 4.4: Low Income Population



4.5.1 Minority Populations

According to 2010 census data, the U.S. had 74 percent of the population identified as white, with 26 percent of the population identified as minorities. In comparison, the state of Mississippi, has identified 59 percent of the population as white and 41 percent identified as minority.

According to the ACS 2011-2015 5-year estimates, both counties in the Study Area are predominantly white at 87 percent in Hancock County and 84 percent in Pearl River County. Minority population is estimated at 13 percent for Hancock County and 16 percent in Pearl River County. The largest minority population in both counties is Black/African Americans at 9 percent in Hancock County and 14 percent in Pearl River County. All other minorities combined in Hancock County comprise approximately 4.0 percent of the overall population and in Pearl River County they comprise approximately 2.0 percent. **Table 4.8** shows the comparison between the U.S., State of Mississippi, and counties within the Study Area.

Table 4.8: Minority Data

	United States	Mississippi	Hancock County	Pearl River County
Total Population Race	316,515,021	2,988,081	45,627	55,196
White	74%	59%	87%	84%
Minority	26%	41%	13%	16%

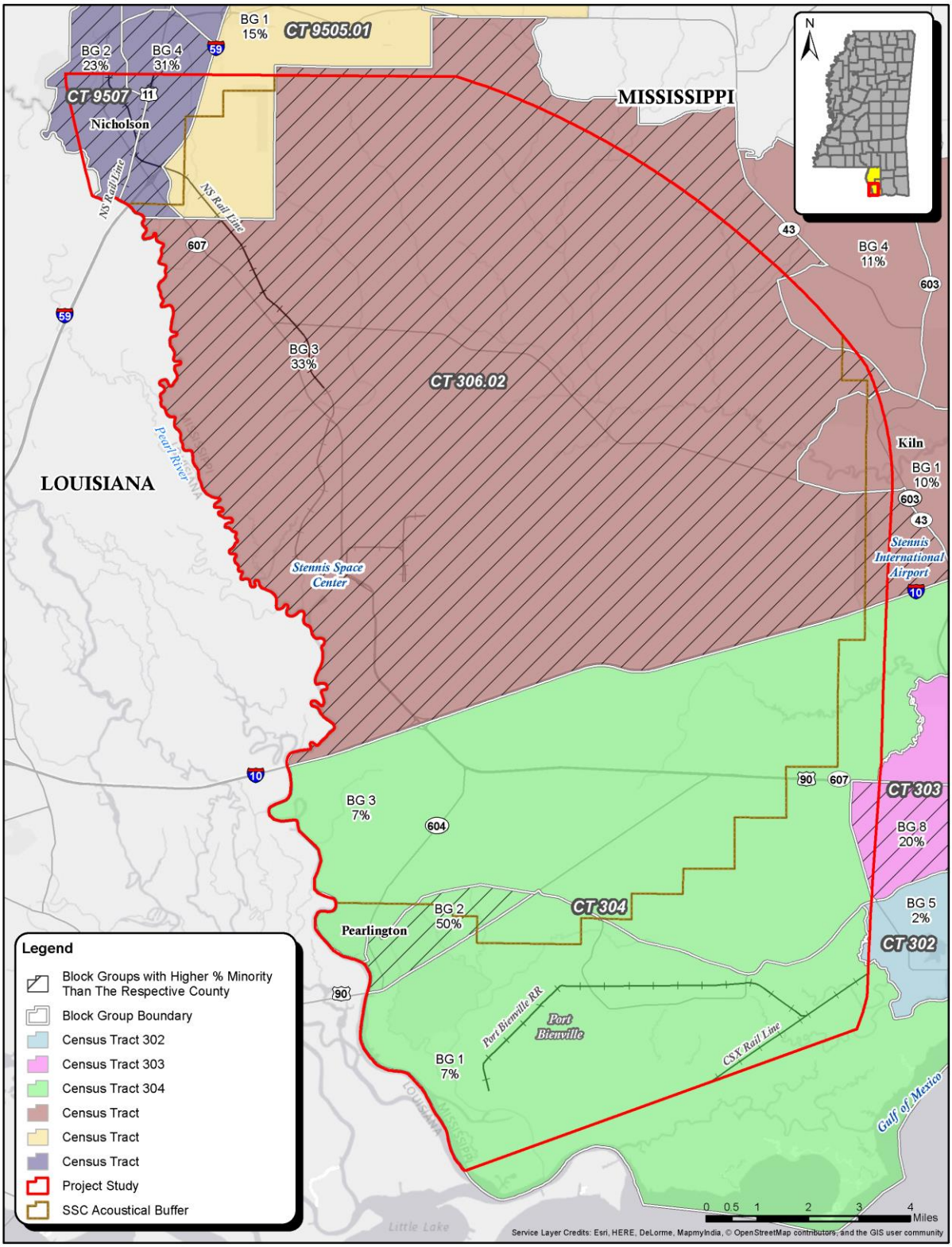
As noted previously, there are eleven block groups within the Study Area. Of those tracts, five BG have higher percentages of minority populations than their respective counties; CT 303, BG 8; CT 304, BG 2; CT 306.2, BG 3; CT 9507, BG 2; and CT 9507, BG 4 (see **Table 4.9** and **Figure 4.5**).

Table 4.9: Minority Populations by Block Group

	Race	Total Population	White	Minority
HANCOCK COUNTY MISSISSIPPI				
Total County	Number	45,627	39,686	5,941
	% of Total	100%	87%	13%
CT 302, BG 5	Number	425	417	8
	% of Total	100%	98%	2%
CT 303, BG 8	Number	2,667	2,124	543
	% of Total	100%	80%	**20%**
CT 304, BG 1	Number	686	637	49
	% of Total	100%	93%	7%
CT 304, BG 2	Number	870	431	439
	% of Total	100%	50%	50%
CT 304, BG 3	Number	926	858	68
	% of Total	100%	93%	**7%**
CT 306.02, BG 1	Number	1,540	1388	152
	% of Total	100%	90%	10%
CT 306.02, BG 3	Number	810	546	264
	% of Total	100%	67%	33%
CT 306.02, BG 4	Number	1,083	959	124
	% of Total	100%	89%	**11%**
PEARL RIVER COUNTY MISSISSIPPI				
Total County	Number	55,196	46,411	8,785
	% of Total	100%	84%	16%
CT 9505.01, BG 1	Number	2,027	1,732	295
	% of Total	100%	85%	15%
CT 9507, BG 2	Number	2,930	2,268	662
	% of Total	100%	77%	**23%**
CT 9507, BG 4	Number	2,213	1,533	680
	% of Total	100%	69%	**31%**

Source: U.S. Census Bureau, ACS 2011-2015 5-Year Estimates, Block Groups in blue are those which have higher percentages than their respective counties.

Figure 4.5: Minority Population



4.6 Communities and Community Facilities

There are three named communities (census designated places – CDP) within the Study Area: Nicholson, located in Pearl River County, and Pearlington and Kiln, located in Hancock County. (See **Table 4.10** and **Figure 4.6**) Also, there are two rural residential areas, the Joe Fleming Road neighborhood in Pearl River County and Old Lower Bay Road neighborhood in Hancock County. Several schools, churches, cemeteries, public facilities, parks and recreation and emergency services facilities are also present within the Study Area. Resources near, but outside the Study Area boundary have also been identified to determine if their access would be affected by project implementation. Most the Study Area is within an acoustical buffer zone that was established by SSC. All residents were evacuated from this acoustical buffer zone in July 1964, and inhabitable structures were no longer allowed in this area.[27] Therefore, much of the Study Area is located within a federally regulated undevelopable/unpopulated area.

Table 4.10: Communities

Road Name	Type of Community	Within the Study Area?
PEARL RIVER COUNTY		
Picayune	Incorporated	No
Nicholson	CDP**	Yes
Joe Fleming Road neighborhood	Neighborhood	Yes
HANCOCK COUNTY		
Pearlington	CDP**	Yes
Ansley	Community*	Yes
Old Lower Bay Road neighborhood	Neighborhood	Yes
Kiln	CDP**	Yes, partially
Bayside Park	Residential Community	No
Waveland	Incorporated	No
Lakeshore	Unincorporated	No
Clermont Harbor	Unincorporated	No

**Ansley is too small to be included in the U.S. Census data collection as a community by itself.*

***A **census-designated place** (**CDP**) is a concentration of population identified by the United States Census Bureau for statistical purposes. CDPs are delineated for each decennial census as the statistical counterparts of incorporated places, such as cities, towns, and villages, but which lack separate municipal governments.*

4.6.1 Parks and Recreation

There are 11 parks and recreation areas within or immediately adjacent to the Study Area. These areas are located within Hancock County and include: three parks (one is a nature trail only), four boat launches, three RV parks/campgrounds and one fish camp. The location of the facilities can be found on **Figure 4.7** and are listed in **Table 4.11**.

[27] NASA - Stennis Space Center, www.ssc.nasa.gov, website visited 3.23.16

Figure 4.6: Communities

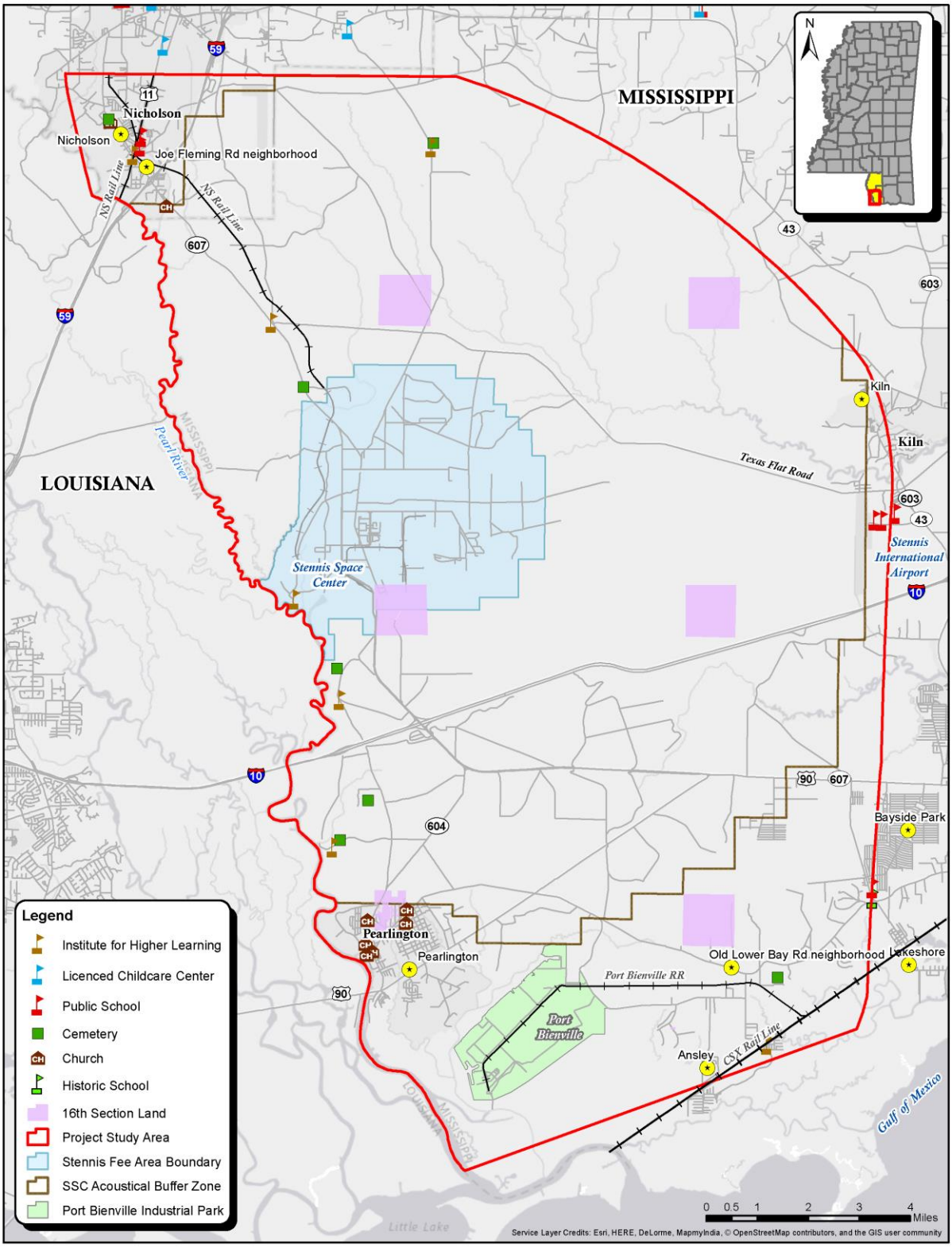


Figure 4.7: Park and Recreation Areas

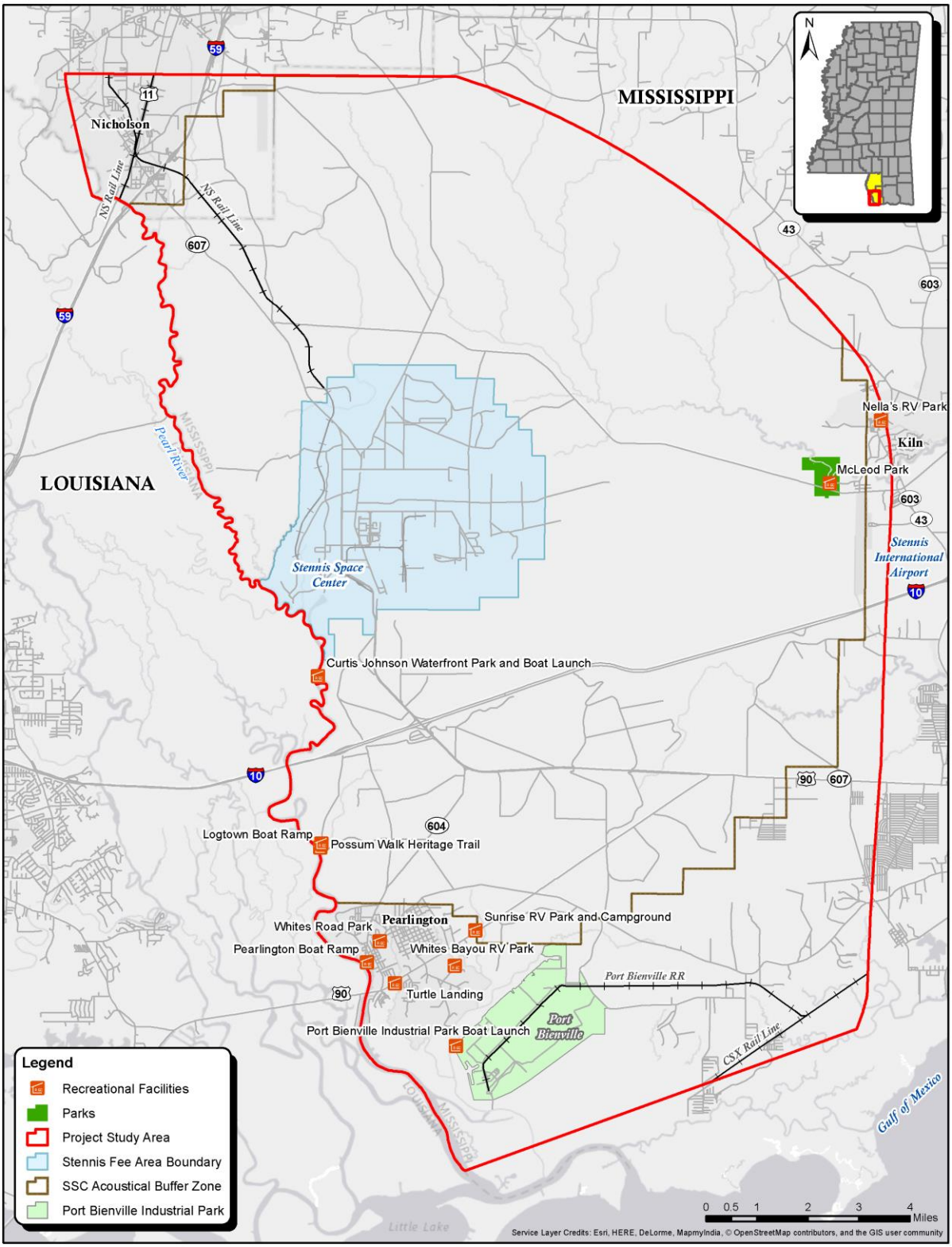


Table 4.11: Hancock County Parks and Recreation Areas

Name	Location	Type of Facility
PARKS		
Possum Walk Heritage Trail	Unincorporated Hancock/Pearlington	Public
McLeod Park	Kiln	Public
Whites Road Park	Pearlington	Public
RECREATION FACILITIES		
Port Bienville Industrial Park Boat Launch	Unincorporated Port Bienville	Public
Pearlington Landing Boat Launch	Unincorporated Pearlington	Public
Turtle Landing Fish Camp	Unincorporated Pearlington	Private
Curtis Johnson Waterfront Park and Boat Launch	Unincorporated Hancock County	Public
Logtown Boat Launch	Unincorporated Hancock County	Public
Sunrise RV Park and Campground	Pearlington	Private
White's Bayou RV Park	Pearlington	Private
Nella's RV Park	Kiln	Private

The three park facilities in the Study Area include:

- Possum Walk Heritage Trail is a 3-mile path that runs from the INFINITY Science Center at SSC to the historic site of Logtown, near Pearlington. The trail itself ends at the Logtown Boat Launch. Possum Walk was an African-American community and markers on the trail tell its history. The path can be walked or an electric-powered shaded tram is available for a fee.

- McLeod Park is owned by the Pearl River Basin Development District and is operated and maintained by the Hancock County Board of Supervisors. The park is located on Texas Flat Road in Kiln within the SSC buffer zone, west of Stennis International Airport. The 328-acre park is on the Jourdan River and lake. It offers fishing, swimming, boating, and a 1.25-mile natural trail. One of the main features of the park is a 95-site campground, which includes both RV and tent camping. Other amenities include a playground, basketball court, beaches, and picnic pavilions. The park is handicap accessible.

- Whites Road Park, located in Pearlington is approximately 0.43-acre. Amenities include a basketball court, playground equipment, and a picnic tables, including a picnic shelter on the edge of a wooded area.

In addition, five public recreational facilities are located within or adjacent to the Study Area:

- Port Bienville Industrial Park Boat Launch is a county-owned boat launch located within Port Bienville Industrial Park. A concrete ramp/launch provides access to the industrial channel off the Pearl River. The site was upgraded in 2014 to include an improved ramp, piers and walkways.

- Pearlington Landing Boat Launch is public boat launch owned by Hancock County. It includes a concrete ramp and two fishing piers, which provide access to the Pearl River.

- Turtle Landing Fish Camp, a privately-owned resource, is located adjacent to U.S. 90, southeast of Pearlington. It includes a boat launch, fishing pier, store and restaurant. Although it is privately owned, the boat launch is open to the public.

- The Curtis Johnson Waterfront Park and Boat Launch is also located within the Study Area, on the Pearl River, approximately 6.5 miles from the SSC. It is sponsored by the Hancock County Board of Supervisors. The amenities include a boat launch and two fishing piers.

- Logtown Boat Launch and the Pearlington Landing Boat Launch, both located on the Pearl River, are operated by the Hancock County Board of Supervisors. The Logtown location is the northern of the two. It has only a dirt and gravel ramp/launch. Any dock or permeable ramp that may have existed prior to Hurricane Katrina in 2005 has not been replaced. The Pearlington Landing Boat Launch is immediately west of Pearlington and has a boat launch and two fishing piers.

There are also three RV parks/campgrounds located within the Study Area: Nella's RV Park in Kiln; Sunrise RV Park and Campground in Pearlington; and White's Bayou RV Park, also in Pearlington. Nella's is located on 3 acres and offers 32 full hookup RV sites. Sunrise RV Park and Campground in Pearlington, is located on 5 acres and offers 15 RV full hookups and an unlimited area for tent camping. The facility is approximately 3.0 miles from the Pearl River and is convenient to boating, cycling, fishing, and birding trails. White's Bayou RV Park in Pearlington is located on 3.5 acres and it offers 30 hookup RV sites, as well as bayou water access with a pier and boat launch. There are also fish camp sites, but tent camping is not offered.

4.6.2 Community Services

An essential part of any community is the services and resources available, whether they be public or private facilities. Generally, community public facilities include, but are not limited to buildings, recreation areas, and roads, owned, leased, or otherwise operated, or funded by a governmental body or public entity. Specific examples may include: hospitals, schools, fire and police stations; sports venues; exhibition and convention centers; and cultural and community centers. Some of those mentioned may also be privately owned but open to the public. Additional examples may include: theaters, live performance venues, and cultural organizations such as science centers and museums, among others.

4.6.2.1 Schools

Within this Study Area, there are two school districts, Picayune and Hancock County. There are 20 public schools within these two school districts serving a total of approximately 9,550 students.

The Picayune School District at the northern section of the Study Area includes 12 schools, including one Catholic School (see **Table 4.12** and **Figure 4.8**). Approximately 4,363 students attend pre-school through the 12th grade in the Picayune School District. Of the 12 schools within the Picayune School District, only Nichols Elementary School is located within the Study Area.

The Hancock County School District covers the southern portion of the Study Area and includes eight schools, six of which are in Kiln. Also in Kiln is the Hancock County school bus maintenance facility. Approximately 5,187 students attend pre-school through the 12th grade in the Hancock County School District. Of the eight schools within the Hancock County School District, only South Hancock Elementary, Hancock Middle School, and Hancock High School are located within the Study Area.

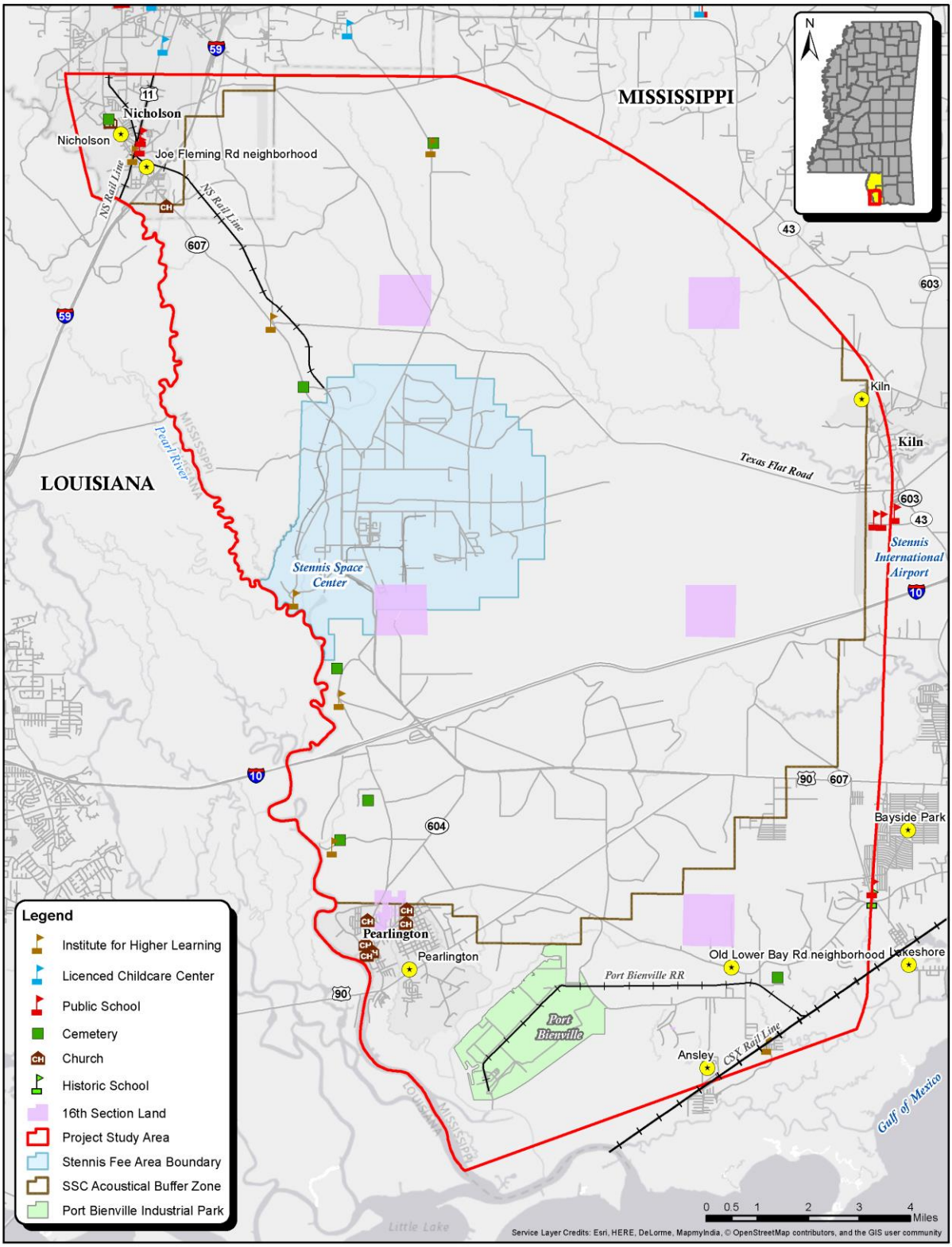
Also within the Study Area are trust lands known as 16th Section Land (see **Figure 4.8**). The State of Mississippi owns these lands and the Mississippi public school districts serve as trustees for these lands. The Mississippi Secretary of State supervises the trustees. These lands were set aside by the Land Ordinance of 1785 for the use and benefit of public schools.

Table 4.12: Public Schools Within or Adjacent to Study Area

Picayune School District	Hancock County School District
ELEMENTARY SCHOOLS	
Nicholson Elementary School 1887 Highway 11 South Picayune, MS 39466	East Hancock Elementary School 4221 Kiln Delisle Rd. Kiln, MS 39556
West Side Elementary School 111 Kirkwood St. Picayune, MS 39466	Hancock North Central Elementary School 6122 Cuevas Town Rd. Kiln, MS 39556
South Side Upper Elementary 1500 Rosa St. Picayune, MS 39466	South Hancock Elementary 6590 Lakeshore Rd. Bay St. Louis, MS 39520
South Side Lower Elementary 400 South Beech St. Picayune, MS 39466	West Hancock Elementary School 23350 Highway 43 Picayune, MS 39466
Roseland Park Elementary School 1610 Gilcrease Ave. Picayune, MS 39466601	
Early Head Start Nicholson 1865 Hwy 11 South Picayune, MS 39466	
Picayune Early Head Start 1620 Rosa Street Picayune, MS 39466	
MIDDLE/JUNIOR HIGH/HIGH SCHOOLS	
Picayune Junior High School 702 Goodyear Blvd, Picayune, MS 39466	Hancock Middle School 7070 Stennis Airport Rd Kiln, MS 39556
Picayune Memorial High School 800 5th Ave. Picayune, MS 39466	Hancock High School 7084 Stennis Airport Dr. Kiln, MS 39556
ALTERNATIVE EDUCATION/CAREER AND TECHNICAL CENTERS	
Center for Alternative Education 900 East Third St. Picayune, MS 39466	Hancock Alternative Education Setting 7060 Stennis Airport Dr. Kiln, MS 39556
PMHS Career and Tech Center 600 Goodyear Blvd. Picayune, MS 39466	Hancock County Career Technical Center 7180 Stennis Airport Rd. Kiln, MS 39556
PRIVATE SCHOOLS	
St. Charles Borromeo Catholic School 1006 Goodyear Blvd. Picayune, MS 39466	

Note: The schools in shaded boxes are located within the Study Area.

Figure 4.8: Schools/Churches/Cemeteries



4.6.2.2 Churches and Cemeteries

There are 35 churches and 17 cemeteries identified within and immediately adjacent to the Study Area. Only 8 churches and 8 cemeteries (two cemeteries are associated with a church) are located inside the Study Area, all in Hancock County. The cemeteries shown on **Figure 4.8** and listed in **Table 4.13** are only those that appear to be open to the public as opposed to private family cemeteries.

Table 4.13: Churches and Cemeteries in Study Area

Name	Location	County
CHURCHES IN STUDY AREA		
First Southern Baptist Church	Pearlington	Hancock
New Hope Baptist Church (and Cemetery)	Pearlington	Hancock
Homes Chapel United Methodist	Pearlington	Hancock
Greater Mt. Zion AME Church	Pearlington	Hancock
Pearlington United Methodist Church	Pearlington	Hancock
Pearlington Church of Christ	Pearlington	Hancock
Cedar Grove Church	Nicholson	Pearl River
Old Palestine Landmark Church (and Cemetery)	Nicholson	Pearl River
CEMETERIES IN STUDY AREA		
Bayou Caddy Cemetery	Bay St. Louis	Hancock
Logtown Cemetery	Pearlington	Hancock
The Point Cemetery	Pearlington	Hancock
Napoleon Cemetery	Pearlington	Hancock
Turtleskin Cemetery	Unincorporated Hancock County	Hancock
Flat Top-Harmony Baptist Church Cemetery	Unincorporated Hancock County	Hancock

4.6.2.3 Public Government Facilities

There are a total 18 public facilities that are owned by federal, state, or county agencies in Hancock and Pearl River Counties within and near the Study Area. Of the eleven facilities in Hancock County, eight are within the Study Area and are shown in **Table 4.14**. There is one additional facility in the Study Area in Pearl River County, the Nicholson U.S. Post Office. The SCC facility is closed to the public except for the visitor center/INFINITY Science Center.

Table 4.14: Public Government Facilities

Name	Location	Facility Type	County
FEDERAL			
National Aeronautics and Space Administration (NASA) – Stennis Space Center (SSC)	SSC	Public	Hancock
General Services Administration (GSA)	SSC	Public	Hancock
Environmental Protection Agency (EPA)/Environmental Chemistry	SSC	Public	Hancock
National Weather Service(NWS)/National Data Buoy Center	SSC	Public	Hancock
U.S. Post Office	Nicholson	Public	Pearl River
COUNTIES			
Port Bienville Industrial Park	Waveland	Public	Hancock
Hancock County Public Safety Complex	Bay St. Louis	Public	Hancock
Hancock County Animal Shelter	Kiln	Public	Hancock

4.6.2.4 Public/Private Social and Cultural Facilities

Facilities that provide cultural, educational or social opportunities have also been identified within the Study Area. There is one facility within the Study Area in Hancock County, which is the science museum and visitor center at SSC called INFINITY. Originally, visitors to SSC could tour a small visitor center, StenniSphere, to learn about the federal and state labs located in the research complex hosted by NASA. In 2001, a non-profit foundation was formed to create a science center that would serve as a regional focal point for science research and science education. This goal developed into INFINITY, a non-profit science museum that opened in 2013, which is "…dedicated to providing a quality fun, and fascinating learning experience."[28]

4.6.2.5 Medical and Health Services

North of the Study Area is Hattiesburg Clinic – Picayune and the Gulf Coast Mental Health Clinic. To the south of the Study Area, is the Hancock Medical Center in Bay St. Louis and Waveland Medical Center in Waveland, Mississippi. The Hancock Medical Center – Family Health Clinic (Medical Services Port), located within the Port Bienville Industrial Park is the only medical center located within the Study Area. See **Figure 4.9**.

The closest emergency rooms to the Study Area are available at Hancock Medical Center in Bay St. Louis, approximately 13 miles from the Study Area and Pearl River County Hospital in Poplarville, Mississippi, approximately 32 miles from the Study Area. At the southern end of the Study Area, the closest ambulance services are provided by American Medical Response in Bay St. Louis. The closest ambulance services at the northern end of the Study Area are provided by AAA Ambulance Services in Hattiesburg.

4.6.2.6 Emergency Services – Law Enforcement and Emergency Management

Law Enforcement

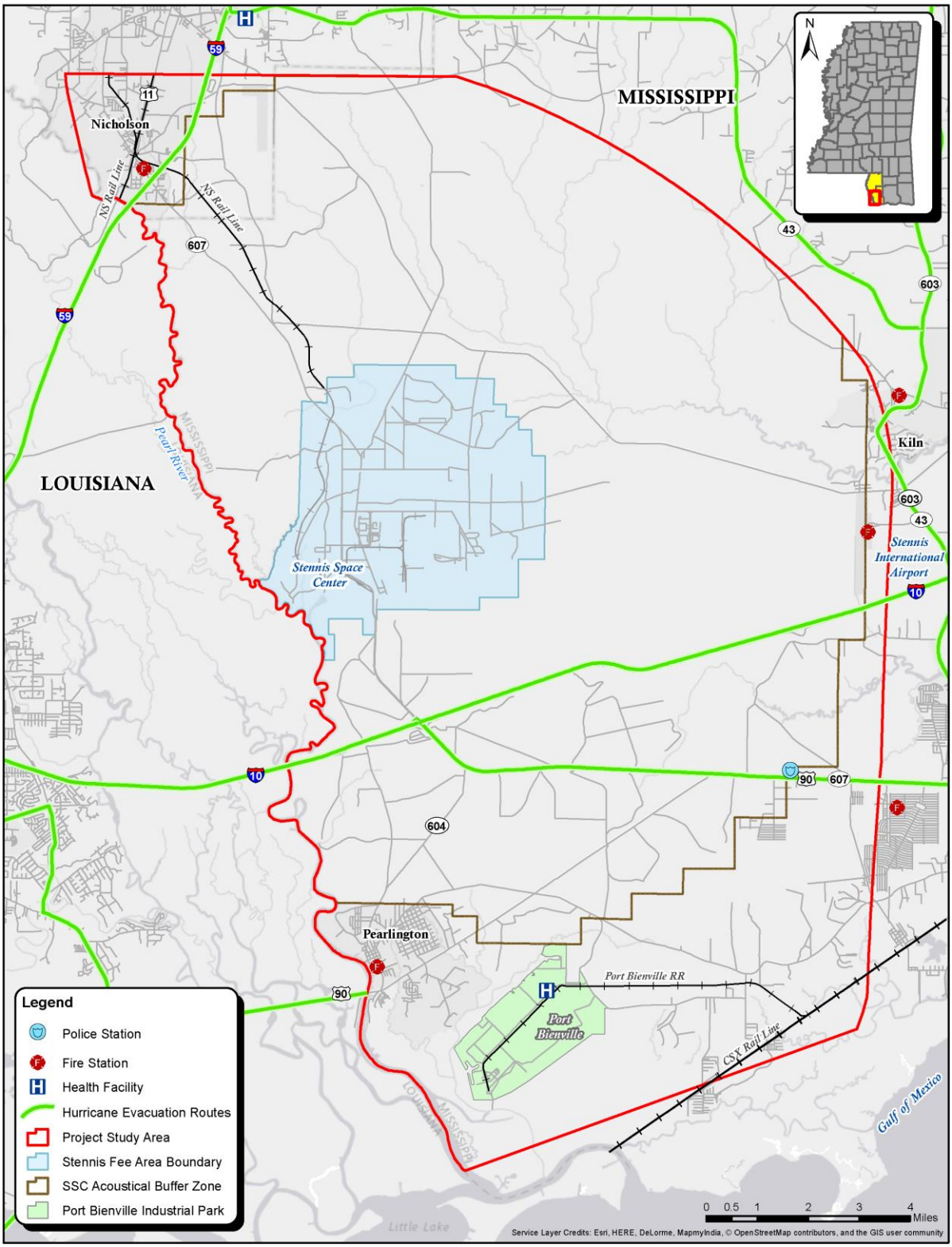
The Study Area falls primarily under the jurisdiction of the Hancock County Sheriff's office, with the area in Picayune falling under the jurisdiction of the Picayune Police Department. Generally, most law enforcement and fire departments have mutual aid agreements, so that they assist each other if larger scale incidents occur. Five police/sheriff stations are located within 10 miles of the Study Area - four in Hancock County, and one in Pearl River County. The Hancock County Public Safety Complex is the only one within the Study Area (see **Figure 4.9** and **Table 4.15**).

Table 4.15: Law Enforcement and Fire Departments

Name	Location	Facility Type	County
POLICE/SHERIFF			
Hancock Public Safety Complex	Bay St. Louis	Public	Hancock
FIRE DEPARTMENTS			
SSC	SSC	Private	Hancock
West Hancock Volunteer Fire Department	Pearlington	Public	Hancock
Nicholson Volunteer Fire Department	Nicholson	Public	Pearl River

[28] http://www.visitinfinity.com/about/our-history/, website visited 9.19.16

Figure 4.9: Medical and Emergency Services and Evacuation Routes Map



The Hancock County Public Safety Complex, which is located on U.S. 90, includes a county jail. The Hancock County Sheriff's Office patrols all unincorporated areas plus SSC, and Diamondhead[29], although the SSC complex has their own security contractor that offers a "911" dispatch center.[30]

Fire Departments

Three fire departments are located in the Study Area (see **Table 4.15**):

- West Hancock Volunteer Fire Department in Pearlington;
- SSC Fire Department within SSC;
- Nicholson Volunteer Fire Department in Nicholson.

Emergency Management

The Federal Emergency Management Agency (FEMA) has a national alert system to disseminate information across the entire country as needed. They also assist with post-disaster relief. The Mississippi Emergency Management Agency (MEMA) also has an alert system in place. MEMA has nine districts, each with an area coordinator, within their emergency management program. Both Hancock and Pearl River Counties are within MEMA District 9. The MEMA website provides emergency preparedness information, including evacuation procedures and surge mapping.[31] The Mississippi Department of Transportation (MDOT) also offers emergency services under their Office of Enforcement. This includes, "…emergency plan development and maintenance; coordination of emergency response operations, coordination of state and federal emergency preparedness and response programs; and coordination of Homeland Security initiatives."[32] Hancock County provides a service for which residents can register called, FirstCall. This Emergency Notification Service can immediately deliver emergency alerts to citizens and first responders regarding important timely information about hurricanes and other high profile events occurring in the area.

These alerts are sent to landlines, cell phones, SMS text messaging devices, and emails. Mass numbers of residents can be alerted with important information in five minutes or less.[33] Bay St. Louis uses a similar system called Blackboard Connect.[34] These types of alert systems allow citizens to more quickly and efficiently access appropriate routes in times when evacuations are necessary. The Pearl River County website also offers guidance for disaster preparedness related to hurricanes, tornados, earthquakes, nuclear, floods, winter weather, and disaster kit preparation.

The Hancock County Emergency Management Agency, located in Pearl, Mississippi, provided evacuation zone and route maps; however, no specific emergency plans or evacuation plans were made available. The following are the closest ***evacuation routes*** within the Study Area: I-10, U.S. 90, SR 607 and I-59 (see **Figure 4.9**). SR 43 and SR 603 are also designated Evacuation Routes; however, they would be utilized traveling north from Kiln, which is outside of the Study Area.

[29] http://www.hancockso.com/faqs.html, website visited 9.19.16

[30] http://www.nasa.gov/sites/default/files/atoms/files/doing_business_with_ssc_2016.pdf, website visited 9.19.16

[31] http://www.msema.org.php53-4.dfw1-2.websitetestlink.com/county-emergency-management/, website visited 9.19.16. The Hancock County website provides similar information, but references the MEMA Area Coordinator.

[32] http://mdot.ms.gov/portal/emergency_services.aspx?open=Hurricane%20Evacuation, website visited 9.19.16

[33] http://www.hancockcounty.ms.gov/Pages/E-911.aspx, website visited 9.19.16

[34] http://baystlouis-ms.gov/index.php?option=com_content&view=article&id=85&Itemid=87, website visited 9.19.16

4.7 Cultural Resources

The Project is subject to compliance with the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. § 470, et seq.) and its implementing regulations (36 C.F.R. 800). Specifically, Section 106 of the NHPA requires that the responsible federal agency consider the effects of its actions on historic properties, which are properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and provide the federal Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking.

Each cultural resource encountered as part of the Project investigation is documented in the *Draft Cultural Resource Report* (See **Appendix B**) and was assessed for potential eligibility for listing on the NRHP based on the significance criteria set forth in 36 CFR Part 60.4, shown below. The Criteria for Evaluation are based on the quality of significance in American history architecture, archaeology, engineering, and culture are present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or

B. Are associated with the lives of significant persons in or past; or

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded or may be likely to yield, information important in history or prehistory.[35]

A resource may be eligible under one or more of these criteria. Criteria A, B, and C are most frequently applied to historic buildings, structures, objects, districts, or non- archaeological sites (e.g., battlefields, natural features, designed landscapes, or cemeteries). The eligibility of archaeological sites is most frequently considered with respect to Criterion D. Also, a general guideline of 50 years of age is employed to define "historic" in the NRHP evaluation process. That is, all resources greater than 50 years of age may be considered. However, more recent resources may be considered if they display "exceptional" significance.

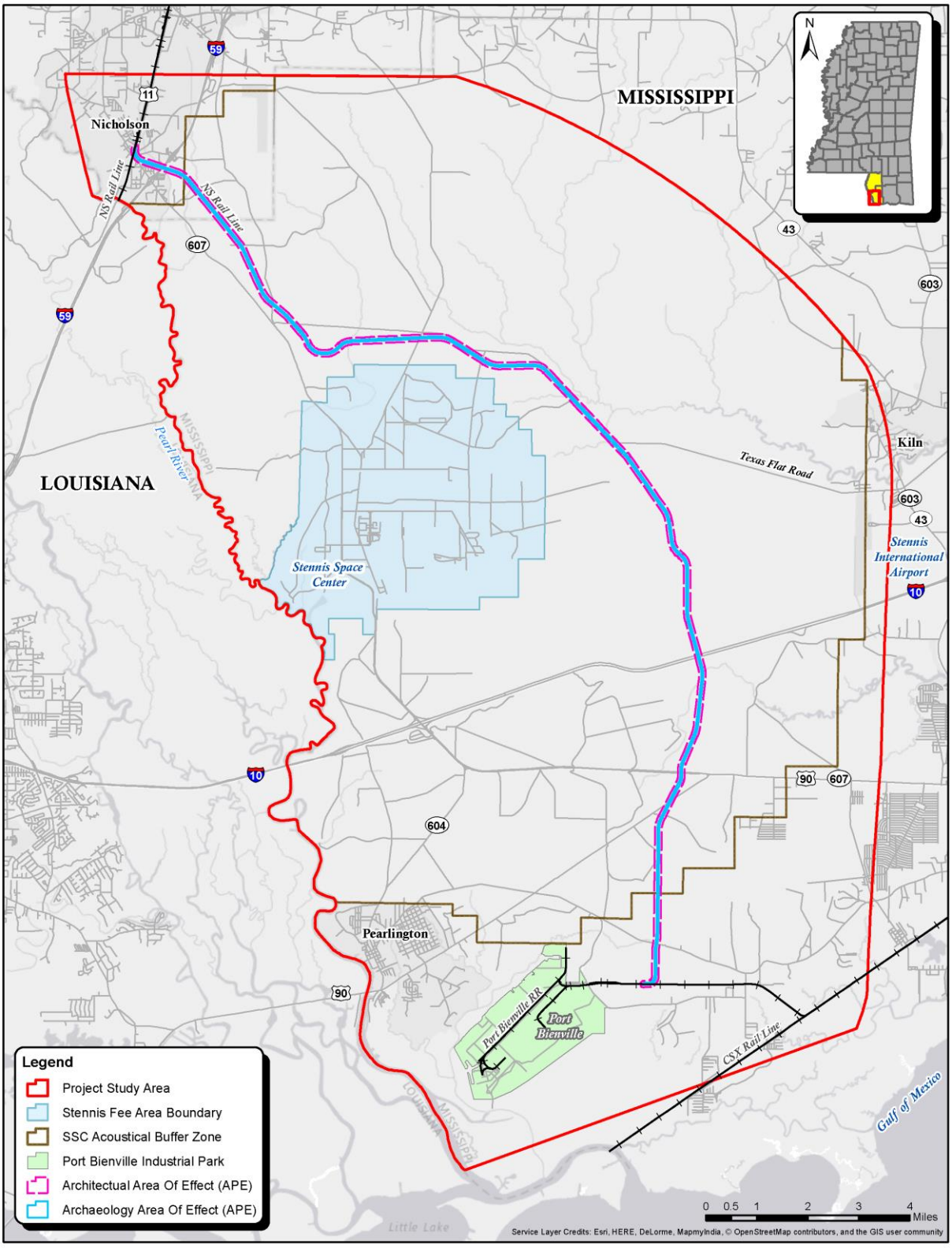
4.7.1 Archaeological Resources

The archaeological APE was established as a 100-foot buffer on either side of the centerline of the proposed rail line, resulting in a total Survey Corridor width of 200 feet. See **Figure 4.10.** The APE was presented to MDAH in a field survey methodology report in March 2016; MDAH concurred with methodology, including the APE. See **Appendix H, Agency Correspondence.**

The archaeological site files at the MDAH were consulted to determine the archaeological sites on record within one kilometer of the APE. A total of 19 sites were identified, 14 in Hancock County and five in Pearl River County (See *Draft Cultural Resource Report* in **Appendix B**). None of these sites are within the Archaeological APE.

[35] http://history.nd.gov/hp/nreligibility.html, accessed 9.25.17

Figure 4.10: Cultural Resources APEs



A total of 24 previously unrecorded archaeological sites were identified within the APE during the field surveys. Thirteen of the 24 linear sites have been determined as not eligible for listing on the NRHP. Eleven sites are considered as unknown for their eligibility determination.

4.7.2 Architectural Resources

The architectural APE was established as being a 246.06-foot (75 meter) buffer around the archaeological APE, resulting in a Survey Corridor width of approximately 700 feet. See **Figure 4.10.** The APE was presented to MDAH in a field survey methodology report in March 2016; MDAH concurred with the methodology, including the APE. See **Appendix H, Agency Correspondence**.

The architectural site files at MDAH were consulted to determine the architectural sites on record within one kilometer of the APE. A total of five previously recorded cultural sites were identified (See *Draft Cultural Resource Report* in **Appendix B**) within one kilometer of the APE. However, none of these sites fall within the Architectural APE.

- The Hancock County Bombing Range is identified as site 045-BSL-6003. Its historic use is listed is military, miscellaneous, and is associated with the World War II theme. No specific site location is given. However, the bombing range's historic boundaries are known and a small part lies within the Architectural APE.

- Site 109-NIC-0001 is the Nicholson School (White) complex. It is located at 1887 Highway 11, South, in Nicholson, Pearl River County. Site 109-NIC-0001.1 is the Administration Building for the Nicholson School (White) complex located in Nicholson, Pearl River County. It was designed by Robert Watts in the Colonial Revival style and built in 1951. It is not located within the Architectural APE.

- Site 109-NIC-0001.2-X is the Teacher's House associated with the Nicholson School (White) complex located in Nicholson, Pearl River County. It is a Craftsman Bungalow and its estimated date of construction is circa 1930.

- Site 109-NIC-3001 is the (old) Alligator Creek Bridge. It is located along SR 607 near Nicholson in Pearl River County and its estimated construction is circa 1930.

- The Rocket Propulsion Test Complex at Stennis Space Center received National Historic Landmark designation and NRHP listing in 1985, for its association with the Apollo program. Those same structures were determined eligible as part of the Space Shuttle program, evaluated in 2008.

Three newly recorded historic resources were identified within the Architechural APE during the field survey. All three were built by Southern Railway for transporting construction materials and other material to the Mississippi Test Operations site, now known as the John C. Stennis Space Center. None of these sites are considered eligible for listing in the NRHP. The three resources are described below:

- Southern Railroad Bridge over Second Alligator Creek is an open-deck timber trestle, approximately 145 feet long. The trestle bridge design includes five timber piles, sway bracing, and reinforced concrete bent caps. The bridge was a part of the Southern Railway's 10.5 mile track between New Orleans and Northeastern main line in Nicholson, and what was originally known as NASA's Mississippi Test Operations site. Work began on the line in March 1963 and was

completed in May 1963. NASA used the line, known locally as "the NASA Turn" to transport construction materials for its facility.

- Southern Railroad Bridge over I-59 and Alligator Branch is a two-span through plate girder bridge, approximately 145 feet long. Bridge design includes two concrete piers that serve as abutments on either side of the divided highway and a two-part concrete bent in the median. The bridge was a part of the Southern Railway's 10.5 mile track between New Orleans and Northeastern main line in Nicholson, and what was originally known as NASA's Mississippi Test Operations site. Work began on the line in March 1963 and was completed in May 1963. NASA used the line, known locally as "the NASA Turn" to transport construction materials for its facility.

- Southern Railroad Culvert over Indian Camp Branch is a tow-part, prefabricated corrugated metal pipe culvert. The culvert design is simply the two large, unconnected pipes with no wing walls or headwall. Given that the culvert was prefabricated and then placed in its current location, it is difficult to determine if this is the original drainage structure for the Southern Railway extension to the NASA facility, which was built in 1963. The bridge was a part of the Southern Railway's 10.5 mile track between New Orleans and Northeastern main line in Nicholson, and what was originally known as NASA's Mississippi Test Operations site. Work began on the line in March 1963 and was completed in May 1963. NASA used the line, known locally as "the NASA Turn" to transport construction materials for its facility.

4.7.3 Tribal Coordination

FRA and MDOT have initiated coordination with Native American Tribes. The tribes were sent Project information, maps and GIS data related to the study area.

The following federally recognized Native American tribes were contacted:

- Mississippi Band of Choctaw Indians
- Chickasaw Nation
- Jena Band of Choctaw
- Tunica-Biloxi Indians of Louisiana, Inc.
- Choctaw Nation of Oklahoma
- Quapaw Tribe of Oklahoma
- Alabama-Coushatta Tribe of Texas
- Muscogee Creek Nation

The Muscogee Creek Nation responded that they had no objections to the Project. The Muscogee Creek Nation, Alabama Coushatta Tribe and Jena Band of Choctaw requested the Cultural Resources studies, once completed.

4.8 Federally Funded and Protected Public Facilities

Certain classes of properties have special federal protection and must be considered when assessing the potential effects of a proposed U.S. Department of Transportation (DOT) project. This section addresses both Section 4(f) and Section 6(f) properties.

4.8.1 Section 4(f)

Properties that are designated as being historic sites, public parks/recreation areas, as well as wildlife/waterfowl refuges are protected under Section 4(f) of the Transportation Act of 1966 (49 U.S.C. Section 303(c)). FRA cannot approve the use of these properties for transportation projects. There are three standard categories under which changes to land use occur.

1. Permanent Incorporation – land acquisition
2. Temporary Occupancy – such as construction staging or closing of a portion of the property
3. Constructive Use – usually access or noise related

Transportation projects may not encroach or in any way infringe upon Section 4(f) properties unless there is:

- No feasible and prudent alternative to avoid the protected property, and
- The proposed Project includes all possible planning to minimize harm to the protected property.

In August 2005, Section 4(f) requirements were revised to simplify the process and approvals on project that have a de minimis impact and moves Section 4(f) regulations to 23 CFR 774. There are no historic sites within the APE for the Project. There are no wildlife/waterfowl refuges within the Study Area. There are four parks identified as Section 4(f) properties that area located within the Study Area, including McLeod Park, Whites Road Park, Pearlington Boat Launch and Curtis Johnson Boat Launch; all are in Hancock County. These properties are shown in **Figure 4.11**.

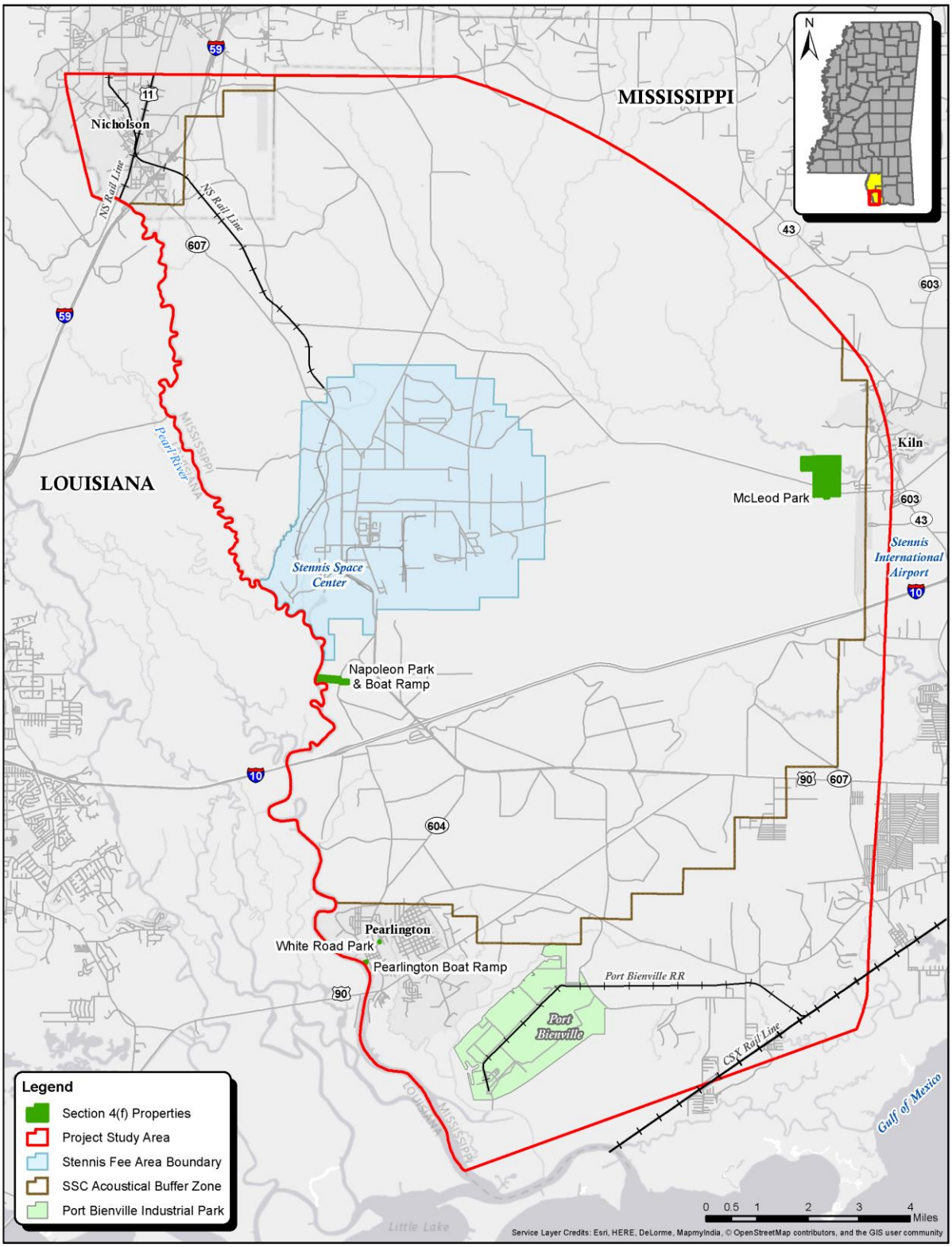
McLeod Park is located at 8100 Texas Flat Road, Kiln, MS and is located within the SSC acoustical buffer zone. The 328-acre public park located on the Jourdan River offers boating, fishing, swimming, hiking, both RV and tent camping, picnicking and a playground. Hours of operation are from 7:00 AM to 5:00 PM. It is owned by Pearl River Basin Development District and operated and maintained by Hancock County Board of Supervisors.

Whites Road Park is located 16641 Whites Road in Pearlington. This is a small roadside park with some play equipment, a basketball court and a picnic shelter. The hours of operation are not listed for this public park.

The **Pearlington Boat Launch** is located at 17094 Monroe Street, Pearlington MS, 39572. The boat launch is open to the public from 1 hour before sunrise to 1 hour after sunset.

The **Curtis Johnson Boat Launch** is located on a dirt road leading to the Pearl River. It is north of I-10 and off Shuttle Parkway. This county maintained public boat launch is also known as Napoleon landing. The boat launch is approximately 7.4 miles from the reasonable alternative corridor.

Figure 4.11: Section 4(f) and 6(f) Properties



4.8.2 Section 6(f)

Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) provides another class of federally protected properties. The properties within this group received LWCFA funding to purchase or develop lands for recreation use. The purpose of Section 6(f) is to preserve lands having received these funds for continual public recreational use.

In addition to being protected as Section 4(f) properties, both McLeod Park and Whites Road Park received Section 6(f) funds.

4.9 Air Quality

4.9.1 Air Quality and Climate Change

U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants that are considered harmful to public health in accordance with the Clean Air Act of 1970.[36] The MDEQ Air Division is responsible for regulating and ensuring compliance with the Clean Air Act in Mississippi. The criteria pollutants that are measured under NAAQS are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

The United States is divided into geographical areas that are classified as either in attainment or non-attainment for air quality. Geographic areas that have criteria pollutants below NAAQS standards are considered to be in attainment. If an area has exceeded the NAAQS levels for any of the six criteria pollutants, then it is in non-attainment for those pollutants. In non-attainment areas, the General Conformity rule ensures that the actions taken by federal agencies do not contribute to violations of the NAAQS and/or interfere with a state's plans to attain national standards for air quality.

The Study Area is lightly populated, with undeveloped land and scattered industrial infrastructure, including the SSC. The area within approximately 10 miles of the Project corridor is classified as in "attainment" for all NAAQS. St. Bernard Parish in Louisiana, which borders the southern side of Hancock County, is designated as nonattainment for the sulfur dioxide (SO2) NAAQS. However, this is due to emissions in the New Orleans area, well over 10 miles from the Study Area.

The nearest air quality monitoring site is in Waveland, approximately 10 miles east-northeast of the southern end of the proposed Study Area. The monitor in Waveland is located at 400 Baltic Street, and has monitors for ozone (O_3) and particles under 2.5 microns in diameter ($PM_{2.5}$). EPA uses an average across the most recent three years of monitor data to determine whether a given area is meeting the NAAQS. **Table 4.16** shows a summary of 2013-2015 monitor data for the Waveland site, indicating compliance with the NAAQS for 8-hour average O_3 concentration and for 24-hour (average 98th percentile) and annual average $PM_{2.5}$ concentrations.

[36] https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act#caa70; accessed 10/30/17

Table 4.16: Summary of Local Air Quality Monitoring Data

Year	O_3 (ppm)	$PM_{2.5}$ (µg/m3)	
	Fourth Max 8Hr	24-hr 98th %	Annual Mean
2013	0.063	16	8
2014	0.069	21	9
2015	0.061	18	8.9
Average	0.064	18	8.6
NAAQS	0.070	35	12

https://www3.epa.gov/airdata/

While elevated levels of O_3 and $PM_{2.5}$ can be caused by emissions from distant sources, elevated levels of the remainder of the NAAQS-regulated pollutants are generally caused only by large localized sources of emissions.

Based on EPA's most recent (2011) National Emissions Inventory (NEI) database, NAAQS-regulated pollutant sources within 10 miles of the Study Area had only small to moderate emissions, at less than 1 ton/year to under 200 tons/year per facility. There were only about dozen of these facilities within a few miles of the Study Area, and therefore, the Study Area is expected to remain in "attainment" for all NAAQS-regulated pollutants for the foreseeable future. For this reason, a conformity analysis is not required.

4.10 Noise and Vibration

The noise and vibrations assessments were performed in accordance with the general assessment procedures outlined in the Transit Noise and Vibration Impact Assessment report (FTA-VA-90-1003-06) adopted by the Federal Transit Administration (FTA) in May 2006. Noise and vibration assessments were also performed based on an FRA guidance document (Final EIS for locomotive horn rule),[37] with recommended adjustments to apply FTA methodologies to freight train analyses.

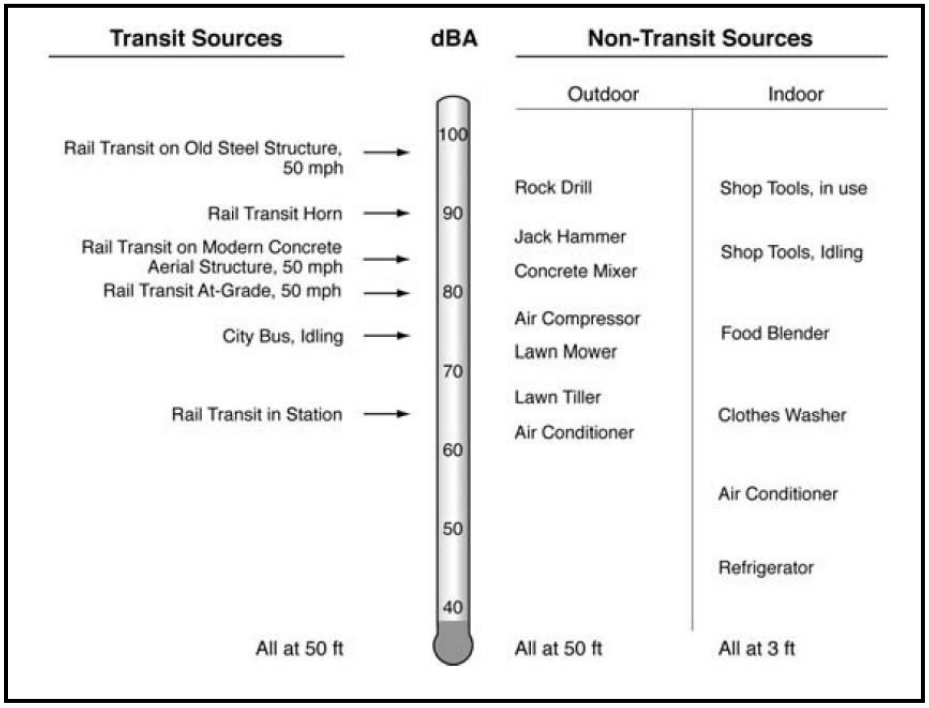
4.10.1 Noise Descriptors

Noise is unwanted or undesirable sound. The intensity or loudness of a sound is determined by how much the sound pressure fluctuates. For convenience, sound pressure is expressed in decibel (dB) notation.

Most sounds consist of a broad range of sound frequencies, from low frequencies to high frequencies. The average human ear does not perceive all frequencies equally. The A-weighting scale represents noise levels to approximate the way the human ear responds to sound levels, applying less "weight" to frequencies we do not hear well, and more "weight" to frequencies we do hear well. Typical A-weighted noise levels for sound sources are summarized in **Figure 4.12**.

[37] https://www.fra.dot.gov/Page/P0889, accessed 9/25/17.

Figure 4.12: Typical Noise Levels



Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

The equivalent average sound level (L_{eq}) describes sound levels that vary over a 1-hour period. The L_{eq} is often described as the constant sound level that is an equivalent exposure level to the actual time-varying sound level over the period (hour).

A common community noise rating is the Day-Night Average Sound Level (DNL or L_{dn}). The L_{dn} is the 24-hour L_{eq} but includes a 10-dBA penalty on noise that occurs during the nighttime hours (between 10 PM and 7 AM) where sleep interference might be an issue. The 10-dBA penalty makes the L_{dn} useful when assessing noise in residential areas or for land uses where overnight sleep occurs.

4.10.2 Noise Evaluation Criteria

4.10.2.1 Noise Sensitive Land Uses

FTA/FRA noise impact thresholds are a function of land use type and existing noise exposure. The FTA/FRA differentiates noise-sensitive land uses into three distinct categories. **Table 4.17** summarizes the land use categories and associated noise metrics.

Table 4.17: Land Use Categories and Metrics for Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
Category 1	Outdoor Leq (h) [a]	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
Category 2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
Category 3	Outdoor Leq (h) [a]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered in this category. Certain historical sites and parks are also included.

Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

[a] L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity

Parks that are used for passive recreation such as reading, meditation or sedate conversation are noise sensitive Category 3 land uses, whereas parks used for active recreation such as sporting fields, playgrounds, or areas where social groups gather are not considered noise-sensitive.

The L_{dn} descriptor is used to assess transit-related noise for residential areas and land uses where overnight sleep occurs (Category 2). The L_{eq} descriptor is used to assess transit-related noise at other noise-sensitive land uses (Category 1 and Category 3), specifically during the noisiest hour of transit-related activity concurrent with the receptors' hours of noise sensitivity.

A unique aspect of the study area is the Stennis Space Center (SSC), a NASA facility centrally located within the study area. The SSC is surrounded by a 125,000-acre acoustical buffer zone which makes up the majority of the study area. The purpose of the buffer is to mitigate noise impacts associated with the testing of various rocket engines. Habitation and building structures that could be inhabited are strictly prohibited within the buffer zone, which is enforced by SSC. Since no inhabitable structures are allowed within the SSC buffer zone, there are no receptors within this area.

Since no receptors are located within the SSC acoustical buffer zone, this noise assessment applies only to the very northern-most portion of the study area and the southern-most portion of the Study Area where the track alignment extends and terminates beyond the limits of the buffer zone.

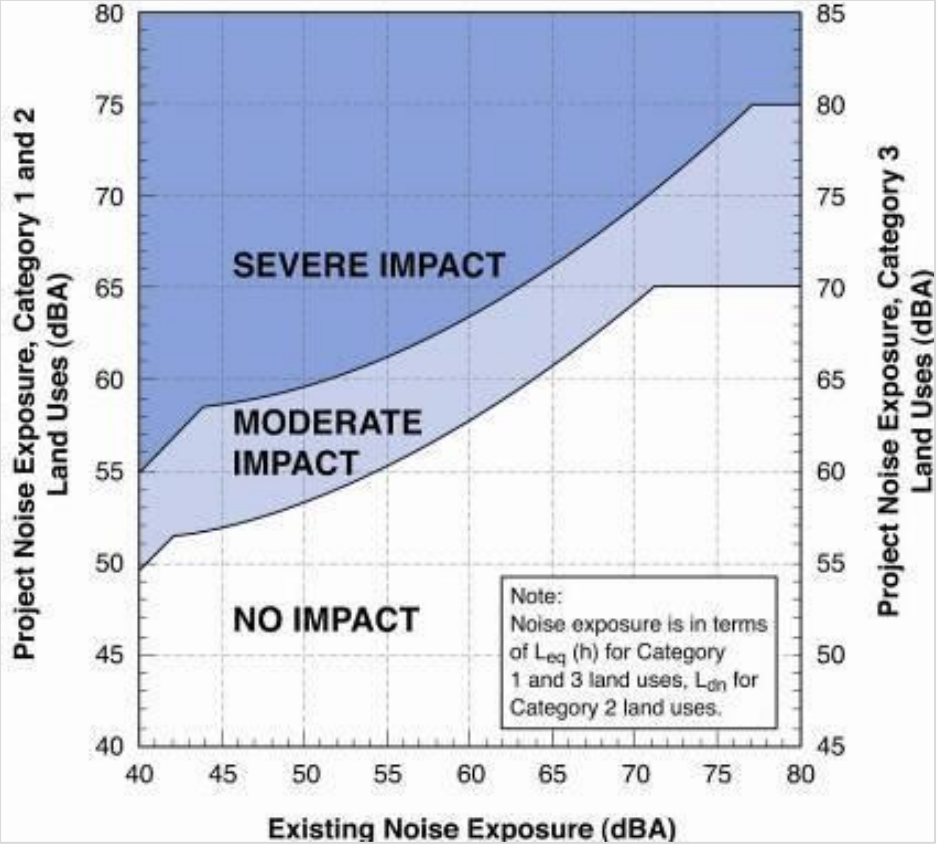
The Project corridor extends approximately 1.2 miles north of the SSC acoustical buffer, towards and into the town of Nicholson, MS. Land use in this northern portion of the Project includes rural undeveloped (wooded) in the areas closest to the SSC, a highway, and scattered residences as the corridor moves closer

to the town of Nicholson. The Project corridor also extends approximately 2 miles south of the SSC. Land use adjacent to this portion of the corridor is largely undeveloped, with a few scattered homes along local roadways. Noise-sensitive land uses are shown in aerial photographs that appear later in this section.

4.10.2.2 Noise Impact Thresholds

The FRA/FTA noise impact criteria are used to predict future noise impacts from transit operations. The FRA/FTA noise impact criteria are shown in **Figure 4.13**. The figure illustrates existing noise exposure and project-related noise exposure, and shows how FRA/FTA noise impact thresholds vary with existing noise levels.

Figure 4.13: FRA/FTA Noise Impact Criteria



Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

The FRA and FTA define three types of noise impacts as described below. The magnitude of impact affects whether noise mitigation is investigated or implemented.

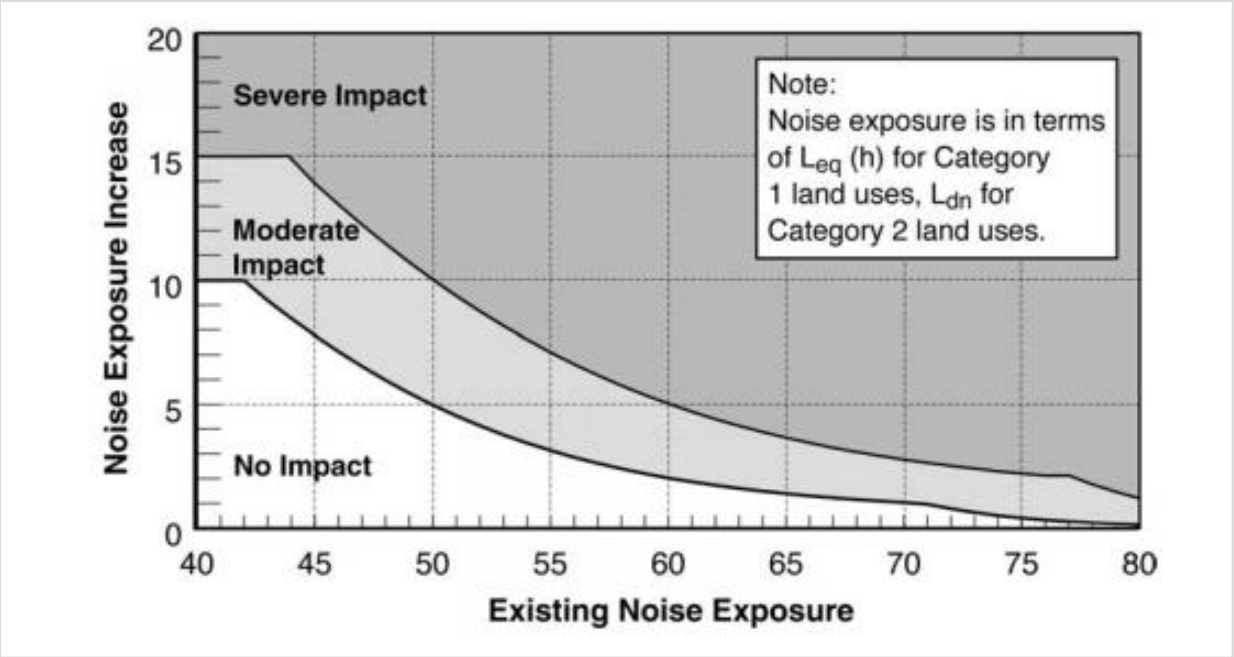
- **Severe Impact:** A significant percentage of people are highly annoyed by noise in this range. Noise mitigation would normally be specified for severe impact areas unless there is no practical method of mitigating the impact.
- **Moderate Impact:** In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. Other factors include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing

outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

- No Impact: In this range, the introduction of the project will result in an insignificant increase in the number of people highly annoyed by the new noise.

Figure 4.14 is also taken from the FRA/FTA guidance document (FTA-VA-90-1003-06) and shows the limits of allowable increase in noise level based on the existing noise level. The increases shown are consistent with the combined existing and project related noise levels previously shown in **Figure 4.12**.

Figure 4.14: Increase in Cumulative Noise Levels Allowed by FTA/FRA Criteria



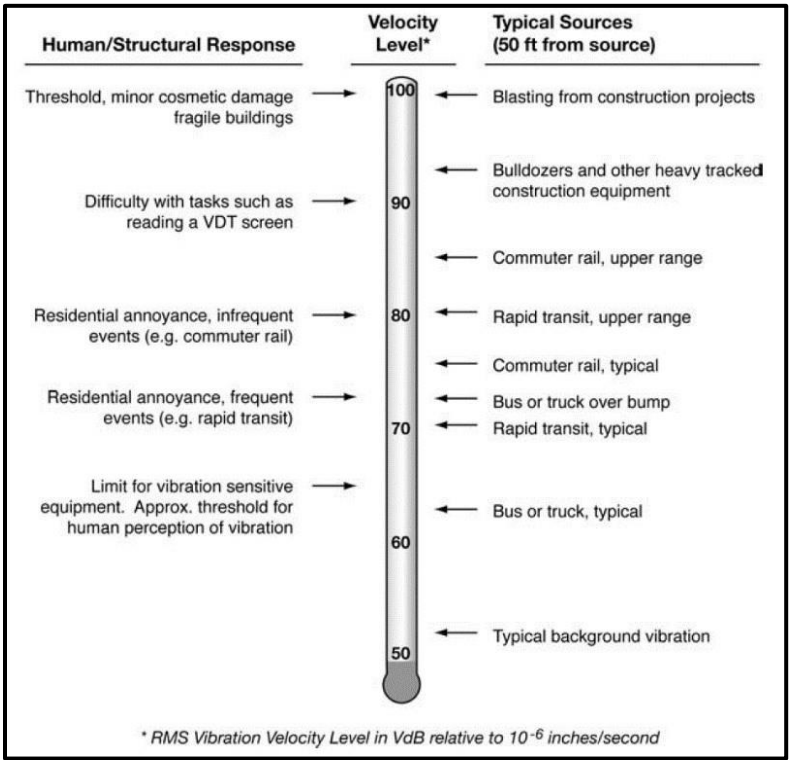
Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

4.10.3 Vibration Descriptors

Vibration consists of rapidly fluctuating motions. However, human response to vibration is a function of the average motion over a longer (but still short) time, such as 1 second. For convenience, decibel notation is used to describe vibration relative to a reference quantity. The FRA/FTA has adopted the notation VdB (for vibration decibels), which is decibels relative to a reference quantity of 1 microinch per second (10^{-6} in/s).

Railway operations induce vibrations in the ground – ground-borne vibrations (GBV). In contrast to airborne noise, GBV is not an everyday experience for most people. The background vibration level in residential areas is usually 50 VdB or lower—well below the threshold of perception for humans, which is around 65 VdB. **Figure 4.15** illustrates common vibration sources and the human and structural response to various levels of ground-borne vibration.

Figure 4.15: Typical Vibration Levels and Responses



Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

Ground-borne noise (GBN) is a rumble sound created by GBV, and is often masked by airborne-noise; therefore, GBN criteria are primarily applied to subway operations in which airborne noise is negligible.

4.10.4 Vibration Evaluation Criteria

4.10.4.1 Vibration-Sensitive Land Uses

The FRA and FTA differentiate vibration-sensitive land uses into three distinct categories which are similar, but not identical to the noise-sensitive land use categories presented in **Table 4.18**. These categories are one factor for setting the vibration impact threshold.

Table 4.18: Land Use Categories for Transit Vibration Impact Criteria

Land Use Category	Description of Land Use Category
Category 1	High Vibration Sensitivity. Buildings where ambient vibration well below levels associated with human annoyance is essential for equipment or operations within the building. Typically includes vibration-sensitive research and manufacturing facilities, hospitals, and university research operations.
Category 2	Residential. Includes all residential land uses and any building where people sleep, such as hotels and hospitals.
Category 3	Institutional. Schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. Includes certain office buildings, but not all buildings that have office space.

Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

Vibration-sensitive land uses are shown in aerial photographs that appear later in this section.

4.10.4.2 Vibration Impact Thresholds

The FRA/FTA vibration impact criteria are used to predict future vibration impacts from transit operations. The thresholds are differentiated between vibration sensitive land uses and the frequency of vibration events.

- Frequent Events**:** More than 70 vibration events per day. Most rapid transit projects fall into this category.
- Occasional Events: Between 30 and 70 vibration events of the same source per day. Most commuter trunk lines along main corridors fall into this category.
- Infrequent Events: Fewer than 30 vibration events per day. This category includes most commuter rail branch lines along corridors that are less frequently traveled.

The impact criteria for ground-borne vibration are related to levels causing human annoyance or interfering with the use of vibration-sensitive equipment. The root mean square (RMS) amplitude of a motion over a 1-second period is commonly used to predict human response to vibration. The basis for evaluating FRA/FTA vibration impact thresholds is the highest expected RMS vibration level for repeated vibration events from the same source. Ground-borne noise impacts are assessed based on criteria for human annoyance and activity interference.

Table 4.19 shows the ground-borne vibration and ground-borne noise impact criteria for a general assessment (the detailed vibration assessment utilizes different impact thresholds).

Table 4.19: Ground-borne Vibration and Ground-borne Noise Impact Thresholds

Land Use Category	Ground-borne Vibration Impact Level (VdB re 1 micro inch/second)			Ground-borne Noise Impact Level (dBA re 20 micropascals)		
	Frequent Events	Occasional Events	Infrequent Events	Frequent Events	Occasional Events	Infrequent Events
Category 1 (highly sensitive, where vibration would interfere with operations)	65 [a]	65 [a]	65 [a]	N/A [b]	N/A [b]	N/A [b]
Category 2 (where overnight sleep occurs)	72	75	80	35	38	43
Category 3 (institutional with primarily daytime use)	75	78	83	40	43	48

Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

[a] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

[b] Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

The impact thresholds for vibration from rail transit systems are also used to assess vibration impact from freight trains in shared right of way situations. However, for freight trains, the locomotive and rail car vibration are considered separately due to the significantly greater length, weight, and axle loads of a typical line-haul freight train. Locomotive vibration only lasts for a very short time; therefore, locomotive event frequency is the same as the train event frequency. However, the rail car vibration of a typical line-haul freight train lasts for several minutes. Therefore, each freight car is considered a separate event.

The frequency of existing trains in the rail corridor will direct the assessment of potentially adverse vibration impacts:

- **Infrequently-Used Rail Corridor:** fewer than 5 trains per day. The project vibration levels are assessed using the general vibration criteria in **Table 4.19**.
- **Moderately-Used Rail Corridor:** 5 to 12 trains per day. If the existing vibration levels already exceed the impact criterion at a vibration-sensitive receptor and the project-related vibration levels are at least 5 VdB less than the existing train vibration, then the project will not cause additional impact. Otherwise, the project vibration levels are assessed using the general vibration criteria in **Table 4.19**.
- **Heavily-Used Rail Corridor:** more than 12 trains per day. If the existing vibration levels already exceed the impact criterion at a vibration-sensitive receptor and the number of vibration events significantly increases (approximately double) due to the proposed Project, then the project will cause an additional impact. Otherwise, if the project results in vibration levels that are 3 VdB or more higher than existing vibration, then the project will have additional impact.
- **Moving Existing Tracks:** shifting the location of existing railroad tracks or existing railroad traffic. If the track relocation and reconstruction results in lower vibration levels, then the project will benefit the receptor and will not cause an adverse impact. If the existing vibration levels already exceed the impact criterion at a vibration-sensitive receptor and the relocation results in vibration levels that are 3 VdB or more higher than existing vibration, then the project will cause additional impact. Otherwise, if vibration levels increase due to the track relocation, then the project vibration levels are assessed using the general vibration criteria in **Table 4.19**.

4.10.5 Assessment Approach

From a high-level overview, both the noise and the vibration assessments follow the same general steps:

1. Establish the boundaries of the noise or vibration study areas.
2. Identify the potentially noise- or vibration-sensitive receptors within the study area, based upon land use.
3. Evaluate existing noise and vibration conditions of the receptors.
4. Set impact thresholds based upon land uses and existing conditions.
5. Estimate the noise and vibration levels from the project using the FRA/FTA "General Assessment" methods.
6. Identify receptors anticipated to experience noise or vibration impacts; the receptors with the highest magnitude of impact may merit additional assessment.
7. Evaluate existing and project-related noise and vibration levels using the FRA/FTA "Detailed Assessment" methods.
8. Assess the magnitude of noise or vibration impacts and examine the effects of potential mitigation for reducing noise or vibration effects.

4.10.5.1 Identifying Potentially Sensitive Receptors

Receptor identification for both noise-sensitive and vibration-sensitive land uses included a review of land use-related GIS data, review of digital aerial photographs, and review of other publicly available information and imagery. Receptors in the Study Area were identified and categorized for noise-sensitive land uses and vibration-sensitive land uses according to FRA/FTA categories.

A unique aspect of the Study Area is the Stennis Space Center (SSC), a NASA facility centrally located within the Study Area. The SSC is surrounded by a 125,000-acre acoustical buffer zone which makes up the majority of the Study Area. The purpose of the buffer is to mitigate noise impacts associated with the testing of various rocket engines. Development or the construction of any standing structures is strictly prohibited within the buffer zone and is enforced by SSC.

Since no receptors are located within the SSC acoustical buffer zone, this noise assessment applies only to the very northern-most portion of the Study Area and the southern-most portion of the Study Area where the track alignment extends and terminates beyond the limits of the buffer zone.

The Project corridor extends approximately 1.2 miles north of the SSC acoustical buffer, towards and into the town of Nicholson, MS. Land use in this northern portion of the Project includes rural undeveloped (wooded) in the areas closest to the SSC, a highway, and scattered residences as the corridor moves closer to the town of Nicholson. The Project corridor also extends approximately 2 miles south of the SSC. Land use adjacent to this portion of the corridor is largely undeveloped, with a few scattered homes along local roadways. Noise-sensitive land uses are shown in aerial photographs that appear later in this section.

4.10.5.2 General Assessment Methods

The noise assessment and the vibration assessment were conducted according to the General Assessment methods from FRA/FTA guidance. [38]

Evaluating Existing Noise Conditions

The existing noise conditions or baseline noise levels throughout the noise Study Area were estimated by evaluating the proximity to nearby active transportation routes and by the population density. This estimation method is detailed in the FRA/FTA guidance documents. In general, this method is designed to slightly underestimate the existing noise level, which in turn limits the impact threshold for project-related noise to a more restrictive level. Using FRA/FTA methods, existing noise levels in areas where residences exist were determined to be 45 dBA on an Ldn basis.

Estimating Project-Related Noise Levels

The approach to estimating the Project-related noise levels follows the following procedure:

- Calculate the noise emission levels of Project-related sources using equations from the FRA/FTA manual.
- Calculate the propagation of noise from the Project-related sources to the impact thresholds.
- Calculate the noise impact contours for locomotive horn noise using the FRA spreadsheet model.
- Overlay moderate noise impact contours and severe noise impact contours upon digital aerial photographs using GIS technology.

[38] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf; accessed 9/25/17

Using this approach, the noise-sensitive receptors within the impact contours are projected to experience noise impacts from the proposed Project.

Noise Modeling Assumptions

Certain characteristics of the Project have direct influence on the noise and vibration effects due to the Project. The critical assumptions include the following:

- This assessment assumes 1 train per day (both inbound and outbound directions) with 65 freight rail cars and 2 diesel-electric locomotives.
- Trains occur in equal probability during daytime hours (7:00 AM to 10:00 PM) or in nighttime hours (10:00 PM to 7:00 AM).
- Train speeds are around 39 mph.

These characteristics are used as inputs for modeling the noise emission of each project-related noise source as a sound pressure level at 50 feet from the source.

Evaluating Existing Vibration Conditions

In most buildings and structures, much of the vibration is due to internal sources such as mechanical equipment, motorized appliances, and human activity such as footfall vibrations or door- closing impacts. As discussed in the section on Vibration Evaluation Criteria, the existing vibration environment can be neglected when considering a new train vibration source.

Estimating Project-Related Vibration Levels

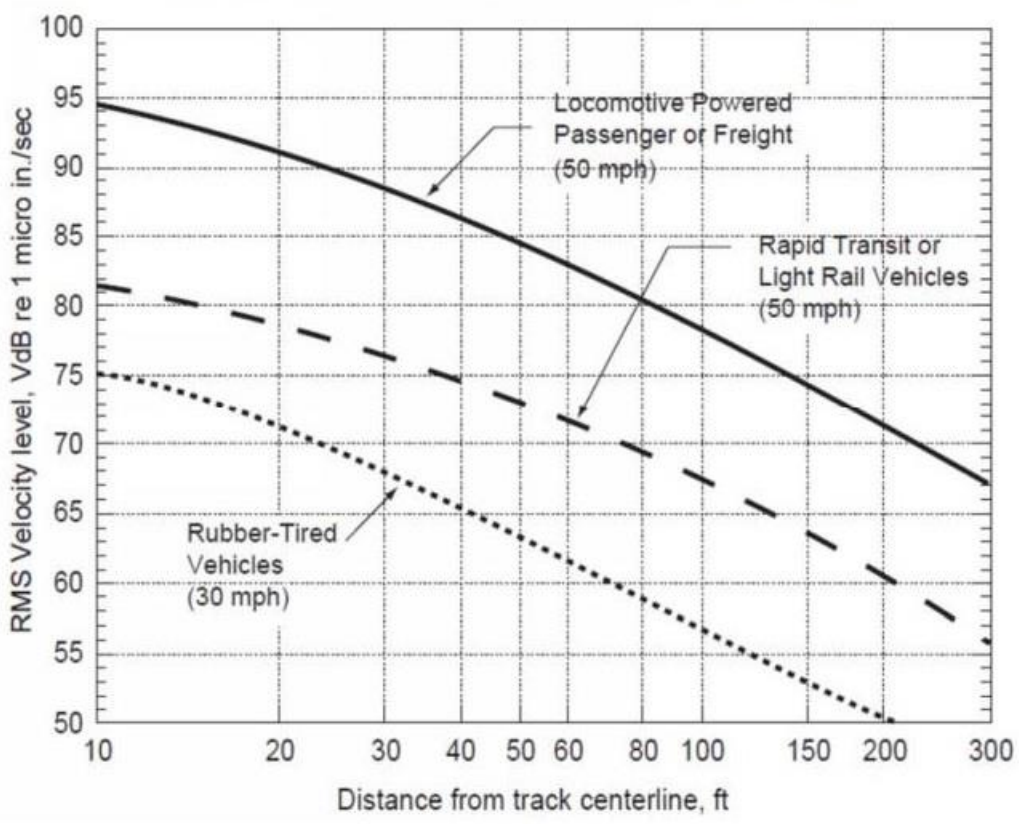
In overview, the vibration assessment consists of the following general steps:

- Select the appropriate generalized vibration curve from FRA/FTA guidance.
- Select appropriate adjustment factors for the structures anticipated to be on each land use including corrections for speed, track configuration, geological conditions, and building/foundation type.
- Determine the distance to impact for each land use.
- Overlay vibration impact contours upon digital aerial photographs using GIS technology.

Vibration Modeling Assumptions

The generalized vibration curve for this vibration assessment is the "Locomotive Powered Passenger or Freight (50 mph)" curve. This curve is provided in FRA/FTA guidance, and the figure with the curve is reproduced in **Figure 4.16**.

Figure 4.16: Generalized Ground Surface Vibration Curves



Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)

4.11 Geological Resources

The state of Mississippi lies almost entirely within what is known as the Gulf Coastal Plain, which is contiguous to the east with the Atlantic Coastal Plain. The Gulf Coastal Plain is subdivided along the Mississippi River into the East Gulf Coastal Plain and the West Gulf Coastal Plain. The Mississippi River Alluvial Plain is to the northwest. It consists of level and nearly level floodplains that extend to the foothills of the loess bluffs which form a crescent at the region's eastern edge.

4.11.1 Soils

The bedrock underlying Pearl River and Hancock Counties include Graham Ferry and Pascagoula Formations, Citronelle Formation, High Terrace deposits, Pamiloco Sand, alluvium, coastal deposits, and eolian sand (see **Table 4.20** and **Table 4.21**). Coastal deposits include fine to medium quartz sand with shell fragments and accessory heavy minerals found along Gulf coastal beaches. In the Mississippi Sound, Little Lagoon, bays, lakes, streams are fine to medium quartz sand, silt, clay, peat, mud and ooze (Nicholas et al. 1983:2; Smith et al. 1981:2; USGS 2016).

Table 4.20: Pearl River County Soils Summary

Soil Type	Soil Description	Acres in Study Area	Percent of Study Area
Bd	Bibb sandy loam	2.0	0.7
EaA	Escambia fine sandy loam, 0 to 2 percent slopes	13.4	4.8
Pa	Pits	5.7	2.0
PoA	Poarch loam, 0 to 2 percent slopes	5.0	1.8
SaA	Saucier loam, 0 to 2 percent slopes	1.7	0.6
Subtotals for Soil Survey Area		27.7	9.9

Table 4.21: Hancock County Soils Summary

Soil Type	Soil Description	Acres in Study Area	Percent of Study Area
At	Atmore silt loam, 0 to 2 percent slopes	51.2	17.8
Be	Beauregard silt loam	13.3	4.6
EsA	Escambia loam, 0 to 2 percent slopes	27.1	9.4
EsB	Escambia loam, 2 to 5 percent slopes	7.0	2.4
EuB	Eustis loamy fine sand, 2 to 5 percent slopes	0.9	0.3
Gu	Guyton silt loam, 0 to 1 percent slopes, rarely flooded	27.0	9.4
HlA	Harleston fine sandy loam, 0 to 2 percent slopes	5.8	2.0
HlB	Harleston fine sandy loam, 2 to 5 percent slopes	3.7	1.3
MaB	Malbis fine sandy loam, 2 to 5 percent slopes	2.7	0.9
McB	McLaurin fine sandy loam, 2 to 5 percent slopes	6.2	2.2
PoA	Poarch fine sandy loam, 0 to 2 percent slopes	1.2	0.4
PoB	Poarch fine sandy loam, 2 to 5 percent slopes	11.2	3.9
PoC	Poarch fine sandy loam, 5 to 8 percent slopes	0.3	0.1
SaA	Saucier fine sandy loam, 0 to 2 percent slopes	8.0	2.8
SaB	Saucier fine sandy loam, 2 to 5 percent slopes	3.4	1.2
ScB	Saucier-Susquehanna complex, 2 to 5 percent slopes	5.1	1.8
St	Smithton fine sandy loam	30.4	10.6
Su	Smithton fine sandy loam, frequently flooded	20.9	7.3
SW	Smithton association, frequently flooded	26.8	9.3
TR	Trebloc association, frequently flooded	7.6	2.7
Subtotals for Soil Survey Area		**259.7**	90.4

There are 23 different soil series within the Study Area. These are Atmore silt loam (At), Beauregard silt loam (Be), Bibb sandy loam (Bd), Escambia fine sandy loam, zero to two percent slopes (EaA), Escambia loam, zero to two percent slopes (EsA), Escambia loam, two to five percent slopes (EsB), Eustis loamy fine sand, two to five percent slopes (EuB), Guyton silt loam (Gu), Harleston fine sandy loam, zero to two percent slopes (HlA), Harleston fine sandy loam, two to five percent slopes (HlB), Malbis fine sandy loam, two to five percent slopes (MaB), McLaurin fine sandy loam, two to five percent slopes (McB), Pits (Pa), Poarch fine sandy loam, zero to two percent slopes (PoA), Poarch fine sandy loam, two to five percent slopes (PoB), Poarch fine sandy loam, five to eight percent slopes (PoC), Saucier fine sandy loam, zero to two percent slopes (SaA), Saucier fine sandy loam, two to five percent slopes (SaB), Saucier-Susquehanna complex, two to five percent slopes (ScB), Smithton association, frequently flooded (SW), Smithton fine sandy loam (St), Smithton fine sandy loam, frequently flooded (Su), Trebloc association, frequently flooded (TR). A map of the soil types is presented in **Figure 4.17**.

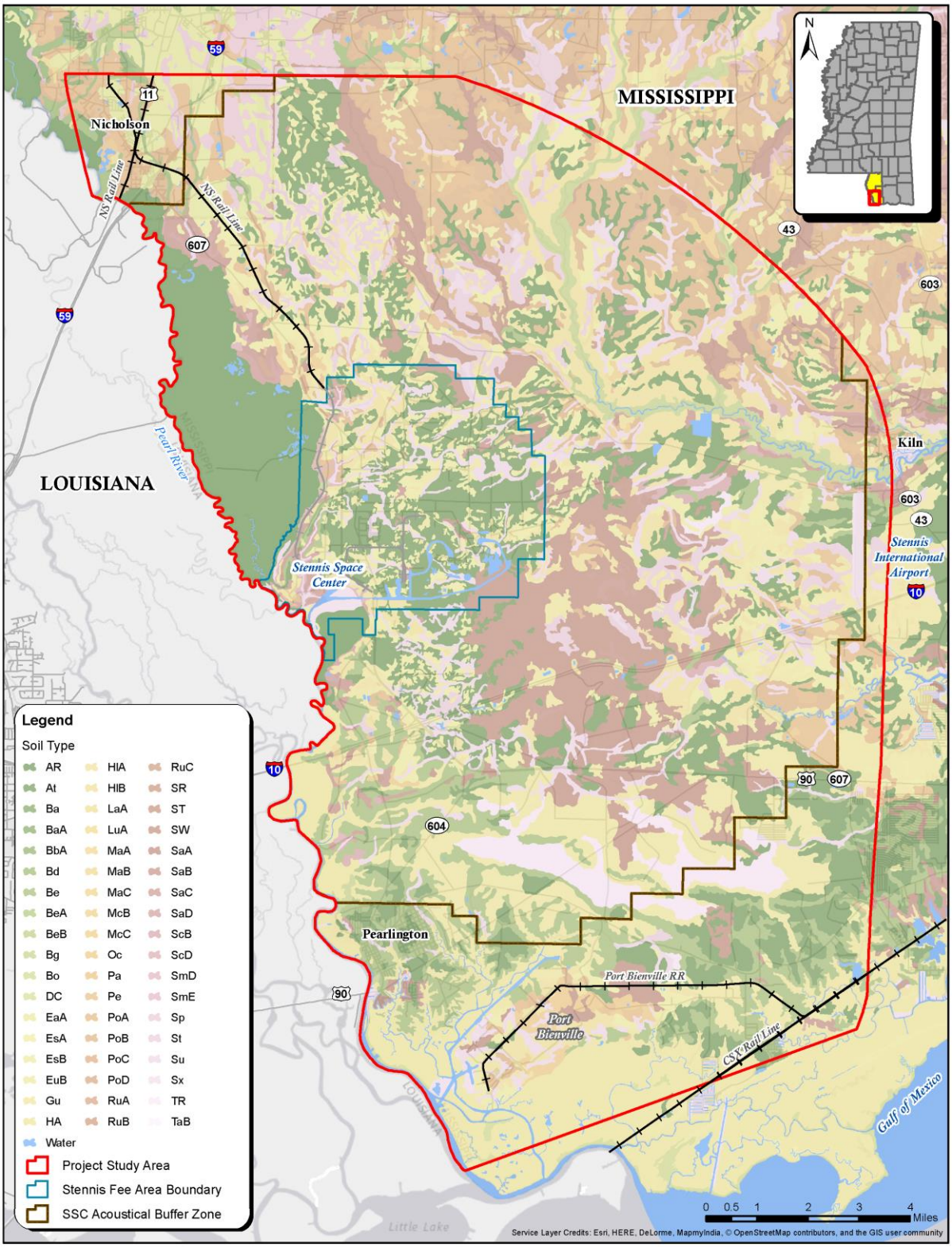
Soil data and descriptions for the Study Area were derived from U.S. Department of Agriculture (USDA) Web Soil Survey system.

Atmore silt loam (At) soil is made up of one major component (Atmore) and three minor components (Harleston, Poarch, and Escambia). Slopes are zero to two percent. This soil type is found on terraces on coastal plains. The parent material consists of silty alluvium over fine-loamy alluvium derived from sedimentary rock. Depth to a root restrictive layer, plinthite, is 24 to 50 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at four inches during March, April, October. Organic matter content in the surface horizon is about two percent. This soil does meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Beauregard silt loam (Be) soil is made up of one major component (Beauregard), and four minor components (Atmore, Smithton, Escambia, and Harleston). Slopes are zero to one percent. This soil type is found on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 27 inches during January, February, March, and December. Organic matter content in the surface horizon is about three percent. This soil does not meet hydric criteria.

Bibb sandy loam (Bd) soils are made up of one major component (Bibb) and one minor component (Dovoran). This component is on flood plains. The parent material consists of sandy and loamy alluvium deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at nine inches during January, February, March, April, and December. Organic matter content in the surface horizon is about two percent. This soil meets hydric criteria.

Figure 4.17: Soils Map



The Escambia fine sandy loam, zero to two percent slopes (EaA) soils is made up of one major component (Escambia) and three minor components (Atmore, Malbis, and Poarch). Slopes are zero to two percent. This soil type is on coastal plains, interfluves. The parent material consists of loamy fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 15 inches during January, February, March, and December. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Escambia loam, zero to two percent slopes (EsA) soils are made up of one major component (Escambia) and five minor components (Guyton, Harleston, Saucier, Atmore, and Poarch). This soil type is on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, and December. Organic matter content in the surface horizon is about one percent. This soil does not meet hydric criteria.

Escambia loam, two to five percent slopes (EsB) soils consist of one major component (Escambia) and five minor components (Atmore, Harleston, Guyton, Poarch, and Saucier). Slopes are two to five percent. This soil type is on hillslopes. The parent material consists of Sandy Marine Deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about one percent. This soil does not meet hydric criteria.

Eustis loamy fine sand, two to five percent slopes (EuB) soils consist of one major component (Eustis) and three minor components (Escambia, Harleston, and Poarch). Slopes are two to five percent. This soil type is on hillslopes. The parent material consists of Sandy Marine Deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Non-irrigated land capability classification is 3s. This soil does not meet hydric criteria .

The Guyton silt loam (Gu) soils are made up of one major component (Guyton) and three minor components (Myatt, Abita, and Stough). The Guyton component makes up 90 percent of the map unit. Slopes are zero to one percent. This soil type is on fluviomarine terraces, flood-plain steps. The parent material consists of late Plisetocene age terraces with loamy alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at nine inches during January, February, March, April, May, and December. Organic matter

content in the surface horizon is about two percent. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Harleston fine sandy loam, zero to two percent slopes (HlA) soils consist of one major component (Harleston) and three minor components (Bibb, Smithton, and Stough). Slopes are zero to two percent. This soil type is on stream terraces on coastal plains. The parent material consists of loamy alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 22 inches during January, February, March, April, May, and December. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Harleston fine sandy loam, two to five percent slopes (HlB) soils consist of one major component (Harleston) and three minor components (Bibb, Smithton, and Stough). Slopes are two to five percent. This soil type is on marine terraces on coastal plains. The parent material consists of loamy alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 22 inches during January, February, March, April, May, and December. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Malbis fine sandy loam, two to five percent slopes (MaB) soils consist of one major component (Malbis) and four minor components (Saucier, Poarch, Benndale, and Escambia). Slopes are two to five percent. This soil type is on fluviomarine terraces on coastal plains. The parent material consists of fine-loamy marine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 39 inches during January, February, March, and December. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface .

The McLaurin fine sandy loam, two to five percent slopes (McB) is made up of one major component (McLaurin) and two minor components (Smithdale, and Benndale). Slopes are two to five percent. This soil type is on dissected fluviomarine terraces on coastal plains. The parent material consists of loamy fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Pits (Pa) are open excavations from which soil and commonly underlying material have been removed, exposing either rock or other material.

Poarch fine sandy loam, zero to two percent slopes (PoA) soils are made up of one major component (Poarch) and one minor component (Smithton). Slopes are zero to two percent. This soil type is on ridges. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 45 inches during January, February, March, and December. Organic matter content in the surface horizon is about one percent. This soil does not meet hydric criteria.

Poarch fine sandy loam, two to five percent slopes (PoB) soils consist of one major component (Poarch) and three minor components (Escambia, Malbis, and Harleston). Slopes are two to five percent. This soil type is on broad ridges on dissected uplands coastal plains. The parent material consists of loamy fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 45 inches during January, February, March, and December. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Poarch fine sandy loam, five to eight percent slopes (PoC) soils consist of one major component (Poarch) and three minor components (Harleston, Smithton, and Escambia). Slopes are five to eight percent. This soil type is on hillslopes. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 45 inches during January, February, March, and December. Organic matter content in the surface horizon is about one percent. This soil does not meet hydric criteria.

Poarch loam, zero to two percent slopes (PoA) soils consist of one major component (Poarch) and one minor component (Smithton). Slopes are zero to two percent. This soil type is on ridges. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 45 inches during January, February, March, and December. Organic matter content in the surface horizon is about one percent. This soil does not meet hydric criteria.

Saucier fine sandy loam, zero to two percent slopes (SaA) soils consist of one major component (Saucier) and four minor components (Malbis, Poarch, Escambia, and Atmore). Slopes are zero to two percent. This soil type is on fluviomarine terraces, coastal plains. The parent material consists of loamy over clayey fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, and March. Organic matter content in the surface horizon is about three percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

The Saucier fine sandy loam, two to five percent slopes (SaB) are made up of one major component (Saucier) and four minor components (Malbis, Poarch, Escambia, and Atmore). Slopes are two to five percent. This soil type is on fluviomarine terraces, coastal plains. The parent material consists of loamy over clayey fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, and March. Organic matter content in the surface horizon is about three percent. This soil does not meet hydric There are no saline horizons within 30 inches of the soil surface.

Saucier loam, zero to two percent slopes (SaA) is made up of one major component (Saucier) and one minor component (Smithton). Slopes are zero to two percent. This soil type is on coastal plains. The parent material consists of loamy over clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 39 inches during January, February, and March. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria.

Saucier-Susquehanna complex, two to five percent slopes (ScB) soils consist of two major components (Saucier and Susquehanna). Saucier soils have a slope of two to five percent. This soil type is on fluviomarine terraces, coastal plains. The parent material consists of loamy over clayey fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, and March. Organic matter content in the surface horizon is about three percent. Non-irrigated land capability classification is 2e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. Susquehanna soils have a slope of two to five percent. This component is on erosional uplands fluviomarine terraces on coastal plains. The parent material consists of silty clay fluviomarine deposits over clayey fluviomarine deposits derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is very high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about two percent. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Smithton association, frequently flooded (SW) soils consist of one major component (Smithton) and three minor components (Trebloc, Harleston, and Bibb). Slopes are zero to two percent. This soil type is on terraces. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at six inches during January, February, March, April, May, and December. Organic matter content in the surface horizon is about two percent. This soil meets hydric criteria.

Smithton fine sandy loam (St) soils consist of one major component (Smithton) and four minor components (Atmore, Harleston, Guyton, and Plummer). Slopes are zero to two percent. This soil type is on terraces. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at six inches during January, February, March, April, May, and December. Organic matter content in the surface horizon is about two percent. This soil meets hydric criteria.

Smithton fine sandy loam, frequently flooded (Su) soils consist of one major component (Smithton) and four minor components (Guyton, Harleston, Plummer, and Atmore). Slopes are zero to two percent. This soil type is on terraces. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at six inches during January, February, March, April, May, and December. Organic matter content in the surface horizon is about two percent. This soil meets hydric criteria.

Trebloc association, frequently flooded (TR) soils consist of one major component (Trebloc) and four minor components (Smithton, Harleston, Atmore, and Guyton). Slopes are zero to two percent. This soil type is on terraces. The parent material consists of silty alluvium deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at nine inches during January, February, March, and April. Organic matter content in the surface horizon is about two percent. This soil meets hydric criteria.

4.12 Wetlands

4.12.1 Wetlands, Streams and Other Water Bodies

Wetlands are one of the most productive ecosystems in nature. They provide critical habitat for fish and other wildlife; serve as natural filtration and storage systems for water; provide protection against wind and tidal forces; control sediment erosion; and offer commercial and recreational benefits to humans. In recent years, activities associated with development have begun to threaten these thriving ecosystems. Consequently, wetlands have been granted protection under the Clean Water Act (CWA)(33 U.S.C. §§ 1251-1387).

Wetlands are defined by the U.S. Army Corps of Engineers (USACE), which has regulatory authority over waters of the United States, as "those areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[39] Classification of a wetland requires the presence of wetland hydrology, hydric soils, and hydrophytic vegetation. Under Section 404 of the CWA, any activity that includes the placement of fill or dredged material within wetlands is regulated by the USACE and requires a permit prior to commencing fill activities.

[39] http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/rw_bro.pdf; accessed 9/25/17

A field delineation and proposed jurisdictional determination for waters of the U.S., including wetlands, was completed by CDM Smith and HDR during the spring (March) and summer (June) of 2016. The Study Area for wetlands is Hancock and Pearl River Counties; the Survey Corridor refers to the 200-foot wide buffer along the Build rail alignment that was surveyed in the field. Wetlands observed within the Survey Corridor included palustrine emergent wetlands (PEM), palustrine scrub-shrub wetlands (PSS) and palustrine forested wetlands (PFO), the dominant wetland type. Emergent wetlands were observed in transmission line and pipeline rights-of-way. Scrub-shrub and forested wetlands were observed in, near or adjacent to pine plantations or within floodplains adjacent to perennial and intermittent streams. A detailed description of each wetland habitat type and the results of the field delineation and proposed jurisdictional determination can be found in the *Wetlands and Threatened and Endangered Species Report* located in **Appendix C**.

Fill activities within the ordinary high water mark (OHWM) of streams and open water habitat are also regulated under Section 404 of the CWA and require a permit prior to commencing fill activities. Examples of fill activities within streams and open waters include any fill activities or alterations to channel morphology resulting from the construction of bridge crossings and the installation of culverts or pipes within stream beds. During the field delineation, streams, open water habitat and drainage features were also inspected on-site according to the Rapanos Guidance (2007)[40] to determine USACE jurisdiction. The streams identified within the Survey Corridor include Mulatto Bayou, Lower Devils Swamp, Bayou Lacroix, Lion Branch, Wolf Branch, Turtleskin Creek, Indian Camp Branch, an unnamed tributary of Indian Camp Branch, and Second Alligator Branch. Additionally, one open water pond was identified during the field delineation. The hydrology and channel morphology of most of these waters have been heavily altered through silviculture practices and development. Wetlands, streams and open water habitat delineated within the Study Area are displayed in **Figure 4.18**.

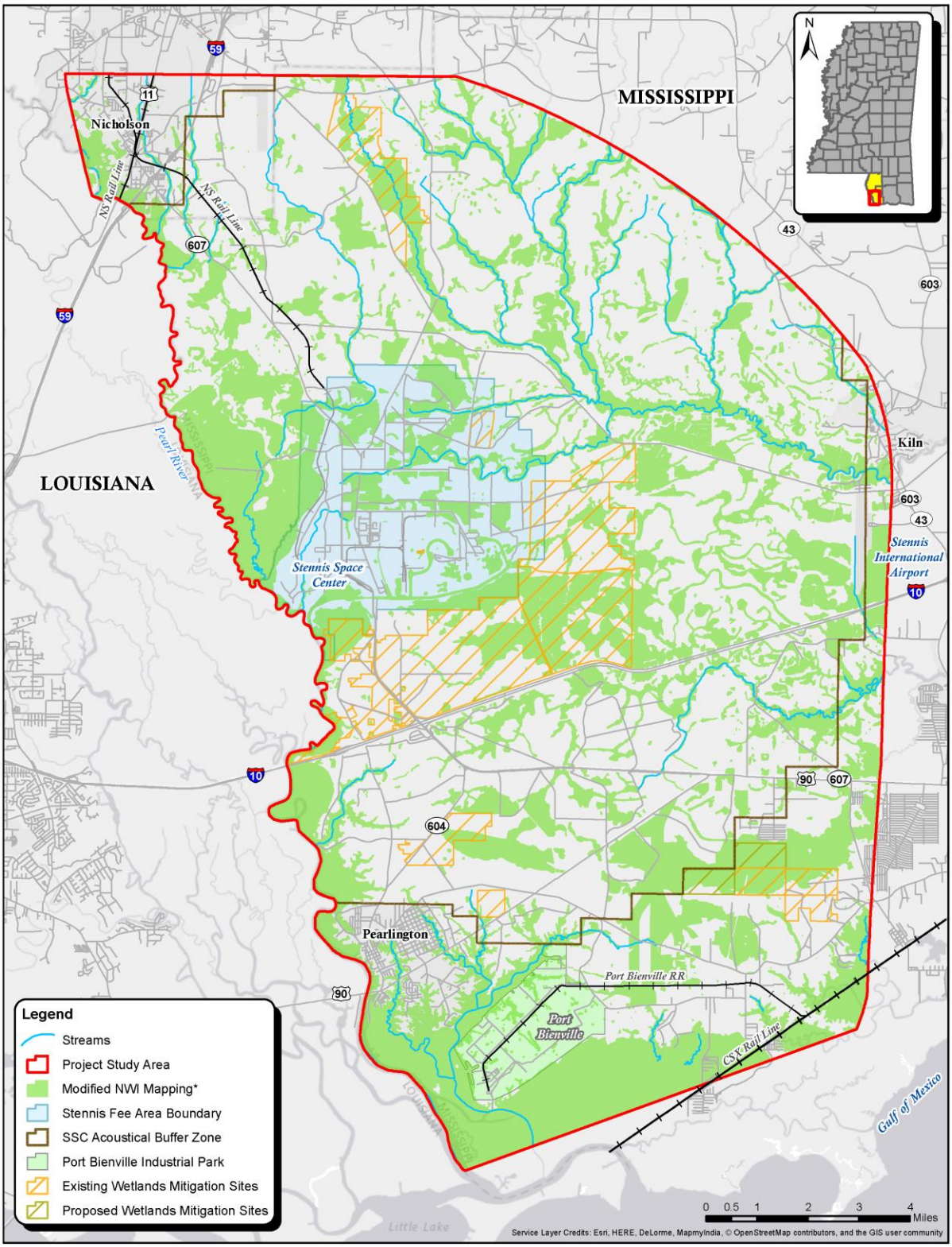
The Survey Corridor also contains many ditches and drainage features that are considered unlikely to be waters of the U.S. (i.e., non-jurisdictional), based on current regulations,[41] due to their likely excavation in uplands for surrounding development and/or lack of surface hydrologic connection to a water of the U.S.

Although a defined surface hydrologic connection to the Pearl River is not clearly apparent in all areas, it is assumed that all wetlands, streams and open water habitat in the Study Area would be considered jurisdictional due to their location within the floodplain. These wetlands are considered potentially jurisdictional (i.e., waters of the U.S.) until concurrence is given by a representative of the USACE Regulatory Branch through the jurisdictional determination process. Fill impacts to waters, including wetlands, identified as jurisdictional, would likely require a Section 404 USACE permit.

[40] Guidance based on "Rapanos" Supreme Court Case 126 S. Ct. 2208 (2006)

[41] USACE & EPA. 2007. Clean Water Act Jurisdictional Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States Accessed June 6, 2017. https://www.epa.gov/sites/production/files/2016-04/documents/rapanosguidance6507.pdf and USACE & EPA. 2008. Clean Water Act Jurisdictional Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States Accessed June 6, 2017. Available at: https://www.epa.gov/sites/production/files/2016-02/documents/cwa_jurisdiction_following_rapanos120208.pdf

Figure 4.18: Wetlands Map



4.12.2 Mitigation Banks

A wetland mitigation bank is an aquatic resource (wetlands and/or streams), including some surrounding property, that has been set aside for the protection of the resource. A boundary of the property is established with a legal instrument and includes deed restrictions placed upon the property. A formal agreement is established with regulatory agencies on the restoration, enhancement, and preservation of the resource for perpetuity. The agreement also establishes a number of credits available once the restoration is complete. These credits can then be purchased by developers and infrastructure projects as mitigation for their impacts on similar types of resources.

The Survey Corridor crossed through one mitigation bank, Texas Flat Mitigation Bank, which is a 1,985-acre commercial wetland mitigation bank that was approved by USACE Mobile District in 2013. The bank is located in the center of the Study Area, to the southeast of SSC; it comprises over 6 miles of streams and over 1,700 acres of wet pine flats and bottomland hardwood forests with both stream and wetland credits available for purchase.

4.13 Floodplains

EO 11988, Floodplain Management, requires federal agencies to avoid to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect (induced) development in floodplains wherever there is a practicable alternative. The Federal Emergency Management Agency (FEMA) defines floodplains,[42] regulatory floodways[43] and flood zones as follows:

- A *floodplain* is any land area susceptible to being inundated by floodwaters from any source.
- A *regulatory floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
- A *flood zone* is a geographical area shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map that reflects the severity or type of flooding in the area.

Floodplains, floodways and flood zones were evaluated by reviewing Geographic Information System (GIS) data from the Flood Map Service Center,[44] maintained by FEMA, and other existing documentation, including aerial photography and water related regulations.

FEMA issues Flood Insurance Rate Maps as a part of the National Flood Insurance Program, which designate the Special Flood Hazard Area in land areas covered by the floodwaters of the 1 percent annual chance flood, also referred to as the 100-year floodplain. The Study Area contains areas within the designated 100-year floodplain.

Flood zones range from lower risk (X zones) to higher risk (A and AE zones). Areas classified as Zone A are subject to the 1 percent annual chance flood (100-year floodplain) where no Base Flood Elevations

[42] https://www.fema.gov/national-flood-insurance-program/definitions#F, accessed on August 23, 2016.
[43] http://www.fema.gov/floodway, accessed on August 23, 2016.
[44] https://msc.fema.gov/portal, accessed on September 28, 2017

(BFEs) have been established by FEMA.[45] Areas classified as Zone AE are subject to the 1 percent annual chance flood where BFEs have been established. Areas classified as Zone X are generally subject to the 0.2 percent annual chance flood (500-year floodplain).

Figure 4.19 displays zones within the Study Area with 1 percent and 0.2 percent annual chance of flooding based on GIS data downloaded from FEMA's Flood Map Service Center.[46] No regulatory floodways are located in the Study Area. Additional information on the FEMA National Flood Hazard Panels, effective dates and flood zones, and more detailed floodplain maps of the Study Area are included in **Appendix C** (*Wetlands and Threatened and Endangered Species Report*).

4.14 Water Resources

4.14.1.1 Surface Water

The Study Area's surface water is comprised of many bayous and unnamed tributaries within the Pearl River Basin and the Lower Pearl River Watershed. The Pearl River Basin covers over 8,700 square miles and drains all or parts of 24 counties in Mississippi and three parishes in Louisiana. Over 16,000 miles of streams and rivers flow through the basin which eventually drains into the Gulf of Mexico.[47] Average annual rainfall within Hancock and Pearl River Counties is approximately 64 inches, contributing to the overall water supply of the watershed.[48]

The natural hydrology of the Study Area has been heavily altered due to silviculture activities including ditching, creating rows for planting, and logging within the pine plantations that account for most of the Survey Corridor. The Survey Corridor refers to the 200-foot wide buffer along the identified rail alignment that was surveyed in the field. The saturated and flooded conditions observed in the Survey Corridor during field surveys can be attributed to riverine influences of the Pearl River through its bayous and tributaries, a high-water table, high average annual rainfall and geographic location within the 100-year floodplain.

4.14.1.2 Water Quality

Under CWA Section 303(d), every two years the MDEQ develops, and the Environmental Protection Agency (EPA) reviews and approves, a list of Mississippi water bodies that do not meet water quality standards for designated uses. Examples of designated uses under the CWA include recreation, fish consumption, aquatic life support, and drinking water supply. Waters that do not meet water quality standards for one or more designated uses are "impaired" waters for which Total Maximum Daily Load (TMDL) standards are set to improve water quality. A TMDL establishes the maximum amount of a pollutant allowed in a waterbody and serves as a planning tool for restoring water quality.

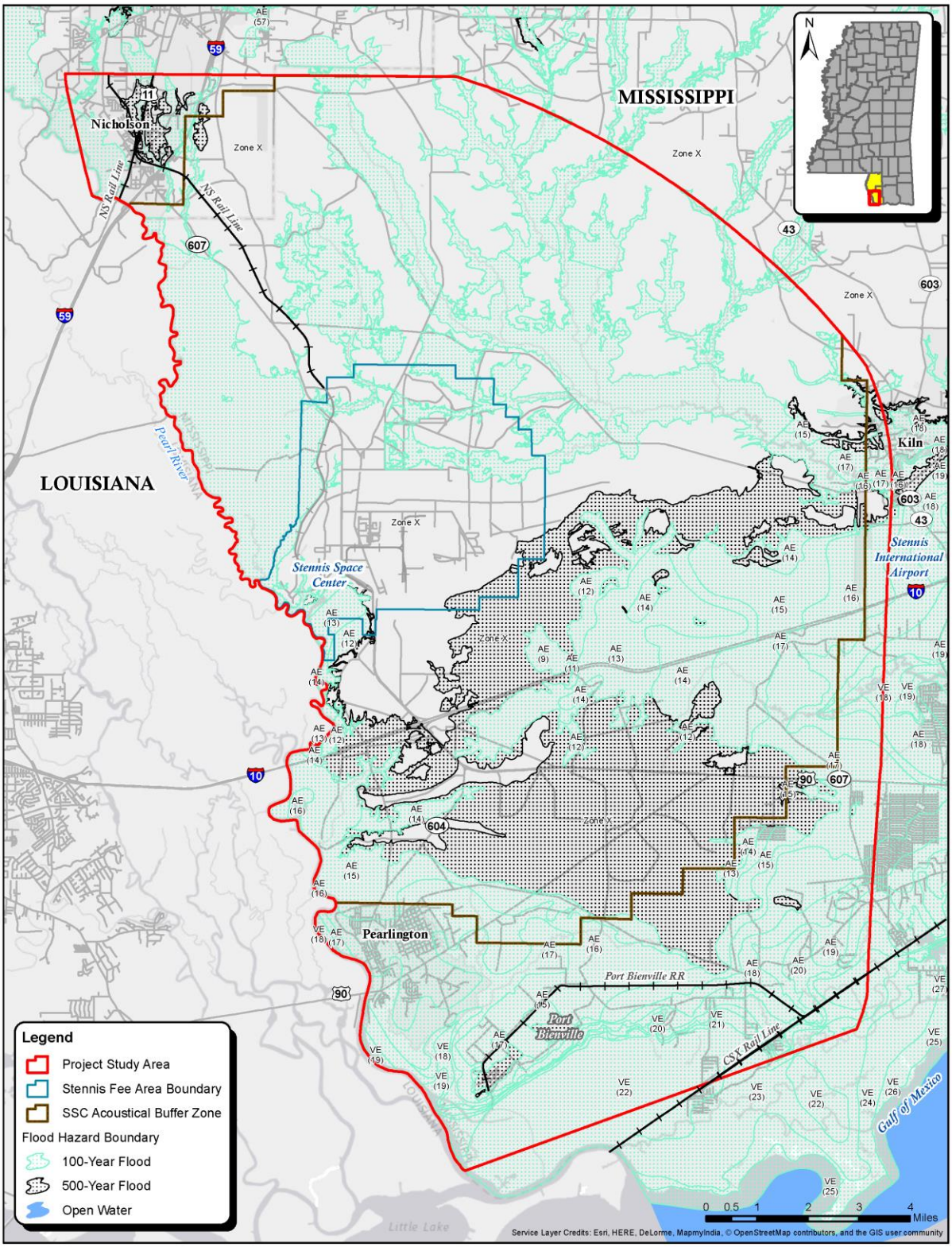
[45] BFEs are the computed elevation to which floodwater is anticipated to rise during the base flood. BFEs are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium.

[46] http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cbe088e7c8704464aa0fc34eb99e7f30, accessed on August 31, 2016

[47] Mississippi Department of Environmental Quality (MDEQ). 2007. Citizen's Guide to Water Quality in the Pearl River Basin. January 2007.

[48] www.ncdc.noaa.gov, accessed on July 10, 2016

Figure 4.19: Floodplain Map



Within the Study Area, three water bodies are listed in the final 2014 Section 303(d) List of Impaired Water Bodies.[49] The list includes the type of pollutant causing the impairment, e.g., biological impairment, pH, organic enrichment/low dissolved oxygen, total nitrogen, or total phosphorus. Turtle Skin Creek, Dead Tiger Creek and Catahoula Creek are listed for biological impairment (**Table 4.22**). Biological impairment represents degraded biological conditions for which the stressors, or causes, are unknown. These same three water bodies are also listed in the draft 2016 303(d) List[50]. TMDLs have not been set for these streams, and the "TMDL Priority" is listed as "Low" in the draft 2016 303(d) report. Due to the nature of the monitoring and listings for 2014, the sources of the impairment for Turtle Skin Creek, Dead Tiger Creek and Catahoula Creek are not known, because they are generally non-point source issues that are difficult to identify without specific analysis.

Table 4.22: Impaired Water Bodies within the Study Area

Basin	Water Body Name	Water Body ID	County	Impaired Use	Pollutant	Location	First Listed
Pearl River	Turtle Skin Creek	520511	Hancock	Fish & Wildlife (Aquatic Life Use Support)	Biological Impairment	Near Santa Rosa from headwaters to confluence with Mikes River	2002
Coastal Streams	Dead Tiger Creek	203711	Hancock	Fish & Wildlife (Aquatic Life Use Support)	Biological Impairment	Near Kiln from headwaters to confluence with Catahoula Creek	2006
Coastal Streams	Catahoula Creek	203311	Hancock	Fish & Wildlife (Aquatic Life Use Support)	Biological Impairment	Near Santa Rosa from headwaters to confluence with Jourdan River	2012

Source: Extracted from Mississippi Department of Environmental Quality, Surface Water Division of the Office of Pollution Control, Mississippi 2014 Section 303(d) List of Impaired Water Bodies. Final July 24, 2014 and Mississippi 2016 Section 303(d) List of Impaired Water Bodies. Draft February 8, 2016.

National Wild and Scenic Rivers

The National Wild and Scenic Rivers System Act (Act) was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act provides protection over those rivers and adjacent environments that have been designated as Wild and Scenic.

The only river in Mississippi that has been designated as a National Wild and Scenic River is a 21-mile segment of Black Creek.[51] Black Creek is located outside of the Study Area, near Wiggins, Mississippi.

Mississippi Statewide Scenic Stream Stewardship Program[52]

The Mississippi Statewide Scenic Stream Stewardship Program (Mississippi Code § 51-4-23 (2013)) is a non-regulatory program organized by the state of Mississippi that encourages voluntary conservation of certain rivers and streams located within the state. The Mississippi Statewide Scenic Stream Stewardship Program is administered by the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP). The MDWFP inventories and evaluates Mississippi streams and identifies the streams or stream segments which

[49] Mississippi Department of Environmental Quality, Surface Water Division of the Office of Pollution Control. 2014. *Mississippi 2014 Section 303(d) List of Impaired Water Bodies.* Final July 24, 2014.

[50] Mississippi Department of Environmental Quality, Surface Water Division of the Office of Pollution Control. 2016. *Mississippi 2016 Section 303(d) List of Impaired Water Bodies.* Draft February 8, 2016.

[51] https://www.rivers.gov/mississippi.php, accessed on September 2, 2016

[52] https://www.mdwfp.com/fishing-boating/public-waters/scenic-streams-program.aspx, accessed on September 2, 2016.

possess unique or outstanding scenic, recreational, geological, botanical, fish, wildlife, historic or cultural values based on the criteria established under the Mississippi Statewide Scenic Stream Stewardship Program.

Mississippi has 11 stream/river segments designated as scenic streams that are included in the Mississippi State Scenic Streams Stewardship Program; however, the Wolf River is the only designated State Scenic Stream listed in Hancock and Pearl River Counties. Wolf River does not cross the Study Area.

Ground Water

The Study Area lies within the Coastal Lowlands Aquifer System.[53] It consists of unconsolidated to poorly consolidated beds of sand, silt and clay and extends and thickens coastward. The Coastal Lowlands Aquifer System provides water for agricultural, public, domestic, commercial and industrial uses. Public drinking water in Hancock County is acquired from water wells connected to the Graham Ferry and Pascagoula aquifers, which are part of the Coastal Lowlands Aquifer System.[54]

4.15 Habitat and Wildlife

4.15.1 Terrain

Terrain is described as the vertical and horizontal dimensions of the surface of the land. Existing terrain was assessed within the Survey Corridor, which refers to the 200-foot wide buffer along the identified rail alignment that was surveyed in the field. The terrain within the Survey Corridor is flat with minor undulations at drainage features and streams in the rural agricultural areas and nearby floodplains/floodways. The elevations for the Survey Corridor range from a high point of approximately 25 feet above sea level to a low point of approximately 8 feet above sea level.

4.15.2 Vegetation

The information contained in this section is based on field investigations conducted in March and June 2016 of the 200-foot Survey Corridor and text taken from the *Wetlands and Threatened and Endangered Species Report* located in **Appendix C**. The Survey Corridor contains six broadly determined habitat types (**Table 4.23**). These are broadly determined from the dominant vegetation present and may contain some overlap of species.

Table 4.23: Dominant Vegetation Types

Dominant Vegetation Types	Wetland/Upland Classification	Cowardin[1] Wetland Classification
Pine Plantation	Upland	N/A
Early Succession Pine Plantation	Upland	N/A
Pine Savannah/Pine Flatwoods	Wetland	Palustrine Forested Wetlands (PFO)
Bottomland Hardwoods	Wetland	Palustrine Forested Wetlands (PFO)
Scrub-Shrub	Wetland	Palustrine Scrub-Shrub Wetlands (PSS)
Emergent	Wetland	Palustrine Emergent Wetlands (PEM)

[1]The Cowardin wetland classification is a comprehensive classification system of wetlands and deepwater habitats that was developed for the U.S. Fish and Wildlife Service in 1979.

[53] http://cida.usgs.gov/ngwmn/index.jsp, accessed on August 30, 2016
[54] Phone conversation with Bay St. Louis Public Works Department on August 26, 2016.

Pine Plantation – Upland

Upland pine plantations contain a variety of planted pine species but the majority observed during field investigations were loblolly and slash pine. Sandy, slightly higher elevations towards the town of Nicholson contained longleaf pine. Most of these pine stands contain a dominant understory species, depending on how often the pine stands have been thinned, and little to no herbaceous ground cover or understory. Where a midstory was present, the dominant species were sweet gum and red maple. In the open thinned pine stands, the shrub layer consisted of wax myrtle, redbay, fetterbush, and Vaccinium. If present, the herbaceous layer was composed primarily of dwarf palmetto, longleaf woodoats, plumegrass, giant cane, Virginia chain fern, cinnamon fern, and netted chain fern. In addition, these areas appeared to be well sloped and well drained with little to no oxidizing in the sampled soils.

Early Succession Pine Plantation – Upland

Early successional pine plantation habitat originates from the harvest and replanting of a mature upland pine plantation community that previously existed in the area. Soils and hydrology are characteristic of an upland pine plantation, including well drained soils with no indication of saturation or presence of surface water. Regrowth in early successional habitats include a sapling and scrub/shrub overstory interspersed with a grass and forb understory. Dominant species observed include loblolly pine saplings and gallberry, interspersed with broomsedge bluestem.

Pine Savannah/Pine Flatwoods – Wetland

This wetland habitat is the most common habitat type found throughout the Survey Corridor. Many of these pine savannah/pine flatwoods areas are maintained for silviculture and are constantly changing. This habitat is essentially flat or rolling topography with a canopy of pines along with a well-developed subcanopy of several tall shrub or understory species. The soils are usually sandy with a high-water table. Similar to the upland pine plantations, the pine flatwoods contain a variety of planted pine species with the majority being loblolly and slash pine. Longleaf pine may be present but has mostly been removed in favor of the faster growing species such as loblolly and slash pine.

In contrast to the pine plantation, a clear herbaceous understory is present, and where not maintained, it is dominated by one or two species throughout. These were generally Swamp titi and fetterbush. Other species include inkberry, wax myrtle, sweetbay, and redbay. The groundcover contains a variety of panic grasses, blazing-stars, St. John's worts, and broom sedges. Some of the less-common, but ecologically important herbs, included pitcher plants, sundews, and club mosses.

Bottomland Hardwoods – Wetland

Bottomland hardwood forests are typically associated with floodplains of rivers and streams. These forests are characterized and maintained by a natural hydrologic regime of alternating wet and dry periods generally following seasonal flooding events. These habitats can vary widely in species and water level fluctuations depending on proximity to the associated water source and rainfall events throughout the year.

The species observed in the bottomland/hardwood communities of the Survey Corridor were swamp tupelo, bald cypress, red maple, sweetgum, boxelder, cherrybark oak and American sycamore. During parts of the year, particularly in wetter months, there may be little to no herbaceous vegetation present due to standing water throughout these flooded forests. A subcanopy of early successional species, plus many tall shrubs were present. These included Chinese privet, arrowwood viburnum, wax myrtle, and black willow. Vines were also very common in these communities, including greenbrier, poison ivy, and muscadine grape.

Scrub Shrub – Wetland

Scrub-shrub wetlands are usually a low, flat wetland community dominated by woody vegetation less than 20 feet tall. Soils are very poorly drained. Surface water is present for extended periods, sometimes drying during late summer or during drought. Species include true shrubs, young trees, and shrubs with dominant shrub species being wax myrtle, swamp titi, fetterbush, and gallberry. Redbay and stunted bald cypress were also observed in several areas.

Emergent – Wetland

Emergent wetlands, also referred to as freshwater marshes, are common in maintained utility rights of way throughout the study corridor. These areas were often found alongside or adjacent to a forested wetland habitat type. This community is dominated by grasses and sedges as well as other herbs, including panic grasses, beak sedges, sedges, black needlerush, cattails, and water pennyworts. These areas were mostly found near gas pipelines or rights of way for overhead transmission lines where woody vegetation is removed to maintain the herbaceous community. Many of these areas were extremely wet with water as high as 3 to 4 feet deep.

4.15.3 Faunal and Floral Communities

As described in the previous section, the Survey Corridor contains a combination of uplands (pine plantations) and wetlands (pine savannah/pine flatwoods, bottomland hardwoods, scrub-shrub and emergent wetlands). Fauna typically found in southern Mississippi pine plantations and wetlands are migratory birds, squirrels, raccoons, wild turkey, turtles, snakes, ducks, fish, feral hogs, and white tail deer.

Flora primarily consists of loblolly and slash pine, deciduous hardwoods such as various species of oak, maple, and ash, bottomland species such as bald cypress, and scrub-shrub areas of baccharis and young trees as mentioned above with the addition of bays and hollies. Most of the Survey Corridor is farmed pine plantations that vary in their stage of maturity. These areas provide nesting habitat for birds of the area.

Although hardwood areas of the Survey Corridor contain various oaks, it is not a dominant species of the habitat, and food sources (acorns) are limited for wildlife such as squirrels and white-tail deer. These bottomland areas also lack other hardwood species that typically provide food such as persimmon. These wildlife species may inhabit the Survey Corridor and forage on other sources of nutrients such as plants, insects and twigs. Except for the scrub-shrub areas of the Survey Corridor, the habitat lacks ideal "bedding" areas for white-tail deer. However, surveyed wetland areas contained plants that provide an ideal food source for birds, turtles, frogs, and snakes. Pitcher plant bogs also provide distinct habitat for reptiles and amphibians in the area.

4.15.4 Threatened and Endangered Species

Plants and animals with federal and state classifications of Threatened or Endangered (T&E) species are protected under Section 9 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. § 1539) and Mississippi state law (Mississippi Code 49-5-109).

Section 7 of the ESA requires federal agencies to consult with the United States Fish and Wildlife Service (USFWS) prior to any federal action regarding any actions that may adversely affect listed species or their habitat within the affected environment (87 Stat. 884, as amended; 16 U.S.C. § 1536). In addition, candidate species have sufficient information to warrant listing, but statutory protection is precluded by higher listing priorities. Although not afforded statutory protection, given the typically long schedules of many proposed projects, a project lead agency should initiate an informal conference with the USFWS if a candidate or

proposed species may be affected. Mississippi state-listed species are managed through the Mississippi Department of Wildlife, Fisheries, & Parks (MDWFP).

The affected environment for T&E species are described in the following sections. A desktop survey was conducted for the Study Area, which for T&E includes the entirety of Hancock and Pearl River Counties. For further evaluation of potential T&E habitat, a 200-foot corridor that buffers the preferred project (rail) alignment was surveyed in the field. For additional information on the field surveys, refer to the *Wetlands and Threatened and Endangered Species Report* (**Appendix C**).

The USFWS's Information Planning and Conservation (IPaC) online database and the Mississippi Natural Heritage Program (MNHP) online database, which contain publicly available information regarding federal and state protected species, were queried in June 2016 for the Study Area. The database queries identified 30 federally and/or state-listed plant and animal species with the potential to occur within Hancock and Pearl River Counties.

Based upon a review of the USFWS Critical Habitat Mapper, no record of critical habitat has been designated for any of the protected species within the Study Area. As defined in the ESA, critical habitat is any habitat given special protection for the benefit of the survival of a listed species.

Based on literature review and the report entitled *Endangered Species of Mississippi*,[55] no documented occurrences, except for the rainbow snake, of any state or federally listed threatened or endangered species or candidate species have been recorded within the Survey Corridor.

4.15.4.1 Potential of Listed T&E Species to Occur in the Survey Corridor

For each of the 30 federal and state T&E plant and animal species listed within Hancock and Pearl River Counties, species habitat requirements, literature reviews, field observations, aerial photographs, and street level views (Google Maps) were reviewed to determine if potential suitable habitat exists within the Study Area.

No protected species were observed during field reconnaissance. Habitats observations from the field survey were used to evaluate whether the 30-listed species would have the potential to occur in the Survey Corridor.

Table 4.24 provides a summary of the 30 federal and state species and summarizes the findings for each, including brief habitat descriptions; whether suitable habitat exists within the Survey Corridor (Yes/No); whether there are known occurrences (Yes/No); whether critical habitat exists (Yes/No); and the potential for occurrence (High/Low/Not Likely to Occur).

[55] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

Table 4.24: Evaluation of T&E Species in the Survey Corridor

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Alabama (=inflated) heelsplitter *Potamilus inflatus*	T	E	Inhabits slow- to moderate-flowing rivers with stable sand, mud and/or silt bottoms. In Mississippi, the heelsplitter still occurs in part of the Tombigbee River drainage.	Yes	No	No	Not Likely to Occur
Crystal darter *Crystallaria asprella*	_	E	In Mississippi, occurs in Bayou Pierre, Homochitto, Pearl River and Tombigbee watersheds; inhabits large creeks and rivers with clean sand and gravel substrates often near tributary confluences	No	No	No	Not Likely to Occur
Ironcolor shiner *Notropis chalybaeus*	_	E	In Mississippi, it historically occurred along the coastal area of the state in coastal river drainages, Pascagoula drainage and Pearl River systems. Lowland streams with abundant aquatic vegetation, open swamp habitat, and/or areas draining densely canopied woodlands.	Yes	No	No	Low
Pearl darter *Percina aurora*	C	E	It is assumed extirpated from Pearl River drainage, now only occurring in the Pascagoula River drainage and its freshwater tributaries. Prefers slow flowing waters along the downstream edge sandbar point bars, pools and/or deep runs over bedrock substrate.	No	No	No	Not Likely to Occur
Frecklebelly madtom *Noturus munitus*	_	E	In Mississippi, it occurs in major tributaries of the Tombigbee River and lower portions of the Pearl River drainage. Preferred habitat includes stable gravel or rubble riffles and rapids in main river channels and large tributaries	No	No	No	Not Likely to Occur
Atlantic sturgeon (Gulf subspecies) *Acipenser oxyrinchus desotoi*	T	E	In Mississippi, previously collected in the Pearl River upstream of Madison County and in the Bogue Chitto River upstream to Pike County; found in all saltwater habitats, except during spawning season when found in major rivers that empty into the Gulf of Mexico, including the Mississippi River and Pearl River.	No	No	No	Not Likely to Occur

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Smalltooth sawfish *Pristis pectinata*	E	–	Shallow waters very close to shore over muddy and sandy bottoms. They are often found in sheltered bays, on shallow banks, and in estuaries or river mouths. They prefer warmer water temperature and are known to ascend inland in river systems	No	No	No	Not Likely to Occur
Louisiana quillwort *Isoetes louisianensis*	E	–	Slow-moving freshwater streams	Yes	No	No	Low
Eastern indigo Snake *Drymarchon couperi*	T	E	In the Southeast, indigo snakes are restricted to areas of xeric pine-oak sandhills, which are usually inhabited by gopher tortoises. These snakes use gopher tortoise burrows as shelter during the winter and during the warmer months for nesting and refuge from intense summer heat.	Yes	No	No	Low
Southern hognose snake *Heterodon simus*	–	E	Habitat includes open or sparsely wooded dry areas with deep sandy or sandy-loam soils.	No	No	No	Not Likely to Occur
Black pine snake *Pituophis melanoleucus lodingi*	T	E	14 counties in southern Mississippi; inhabits mature longleaf pine forests with sandy soil, an open canopy, moderately fire suppressed midstory, and a thick grassy understory	Yes	No	No	Low
Rainbow snake *Farancia erytrogramma*	–	E	Inhabits rivers, streams, springs, ponds and lakes associated with soils which are sandy enough to allow it to burrow	Yes	No	No	Low
Gopher tortoise *Gopherus polyphemus*	T	E	Dry, sandy uplands, such as oak-sandhills, scrub, pine flatwoods and coastal dunes of the southeastern United States.	No	No	No	Not Likely to Occur
Ringed map turtle *Graptemys oculifera*	T	E	Native to the Pearl River watershed of Mississippi and Louisiana; requires structure on which it can safely bask protected from predation and suitable nesting habitat (large, high sandbars adjacent to a river).	No	No	No	Low
Kemp's ridley sea turtle *Lepidochelys kempii*	E	E	Warm bays and coastal waters; tidal rivers; estuaries; sea grass beds; sandy coastal beaches are used for nesting	No	No	No	Not Likely to Occur
Leatherback sea turtle *Dermochelys coriacea*	E	E	Open ocean; deeper waters of the Gulf and coastal bays; coastal beaches and barrier islands suitable for nesting	No	No	No	Not Likely to Occur

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Loggerhead sea turtle *Caretta caretta*	T	E	Marine open waters, inshore areas such as bays lagoons, salt marshes, creeks, ship channels, and mouths of large rivers; sandy coastal beaches are used for nesting	No	No	No	Not Likely to Occur
Hawksbill sea turtle *Eretmochelys imbricate*	E	E	Warm bays and shallow portions of oceans; seagrass beds; estuaries; mainland beaches and islands used for nesting	No	No	No	Not Likely to Occur
Peregrine falcon *Falco peregrinus*	DL	E	Known to migrate through inland Mississippi and along the Gulf Coast, occasionally wintering on the coast. Also occurs in a wide variety of habitats including Arctic Tundra, dense forested areas and coastal cliffs.	No	No	No	Not Likely to Occur
Piping plover *Charadrius melodus*	E[7]T[8]	E	Wintering habitat - open, sparsely vegetated coastal beaches and sandy mud flats; in Louisiana, habitat includes beaches and mudflats of barrier islands in southeastern coastal Parishes	No	No	No	Not Likely to Occur
Southeastern snowy plover *Charadrius nivosus*	–	E	In Mississippi, nests on the barrier islands and occasionally on mainland beaches in Harrison County. Any plovers breeding in Mississippi are assumed to be year-round residents. Inhabits expanses of flat, dry sand along seacoast beaches and forages at the edge of the water or on sand flats at tidal creeks	No	No	No	Not Likely to Occur
Red knot *Calidris canutus rufa*	T	_	Wintering habitat – intertidal marine habitats, especially near coastal inlets, estuaries, and bays, or along resting formations	No	No	No	Not Likely to Occur
Red-cockaded woodpecker *Picoides borealis*	E	E	Older, mature pine forest	Yes	No	No	Low
Wood stork *Mycteria americana*	T	E	In Mississippi, found along western edge of state in counties bordering the Mississippi River and some along the eastern edge of the state. Freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps using sloughs or swamps for foraging habitat.	Yes	No	No	Low

Common Name/Scientific Name	Federal Listing Status[1]	State Listing Status[1]	Habitat Description[2]	Suitable Habitat (Yes/No)[3]	Known Occurrences (Yes/No)[4]	Critical Habitat (Yes/No)[5]	Potential to Occur[6]
Brown pelican *Pelecanus occidentalis*	DL	E	The brown pelican has been in decline along the Gulf Coast since the 1960s and is now protected. In Mississippi, they are an uncommon but regular visitor. They nest and forage from barrier islands as far as 12 miles from the coastline.	No	No	No	Not Likely to Occur
Black bear ***Ursus americanus***	DL	E	In Mississippi, found in counties along the Mississippi River, lower Pearl River and Pascagoula watersheds	Yes	No	No	Low
Florida panther ***Puma concolor coryi***	E	E	Presumed extirpated from Mississippi; inhabits mixed swamp forests and hardwood hammocks, less frequently occurring in upland pine forests and pine savannahs.	Yes	No	No	Not Likely to Occur
Fin or finback whale *Balaenoptera physalus*	E	—	Open Ocean	No	No	No	Not Likely to Occur
Humpback whale *Megaptera novaeangliae*	E	_	Open Ocean	No	No	No	Not Likely to Occur
West Indian manatee *Trichechus manatus*	E	E	In Mississippi, observed at a number of sites inshore along the Mississippi coast. Inhabits warm, marine open water, bays, and rivers where submerged aquatic and floating vegetation is found for foraging	No	No	No	Not Likely to Occur

[1] E = Endangered; T = Threatened; C = Candidate species; DL = Delisted; - = not listed

[2] All species descriptions, preferred habitat, and location of known occurrences are summarized from the IPaC database (Federal species) and from a report entitled Endangered Species of Mississippi[56].

[3] Suitable habitat determined based on field observations.

[4] Known occurrences based on desktop literature review for the study area.

[5] Critical habitat based on USFWS IPaC database.

[6] Potential to Occur: This classifies the likelihood of potential to occur within the Survey Corridor. ***Not likely to occur*** *= the Survey Corridor may contain suitable habitat; however, the current known range and distribution data available does not include the Survey Corridor;* ***Low*** *= the Survey Corridor is within the breeding and/or winter range of the species, suitable habitat is present, but there are no documented occurrences of the species within the Survey Corridor; High = suitable habitat is present and occurrence in the Survey Corridor is documented by MNHP or other credible sources*

[7] Only the population within the Great Lakes Watershed

[8] All populations except the Great Lakes Watershed

[56] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

An initial T&E species field survey was conducted in March 2016. In the days prior to the first field survey, Louisiana and parts of Southwest Mississippi experienced record rainfall and flooding.[57] The Survey Corridor is situated within the Pearl River Basin. Due to flooding, the Pearl River experienced its second highest crest in history of 20.35 feet on March 14, 2016, the day fieldwork began.[58] Flood stage for the Pearl River is 14 feet.[59] The heavy rainfall and flood stage of the Pearl River caused flooding throughout the extent of the survey area and conditions may have been wetter than normal. During a second field survey for the southern portion of the preferred rail alignment in June 2016 under normal conditions, portions of the Survey Corridor were still heavily saturated or ponded with standing water varying between 3 to 12 inches.

4.16 Hazardous Materials

Hazardous materials are generally defined as any material that has or will have, alone or when combined with other materials, a harmful effect on humans or the natural environment. They may be characterized as reactive, toxic, infectious, flammable, explosive, corrosive, or radioactive and can be in the form of a solid, sludge, liquid, or gas. Hazardous materials and waste sites are regulated primarily by the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC § 6901),[60] as amended; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)(42 USC § 1906);[61] and the Superfund Amendments and Reauthorization Act of 1986 (SARA)(42 USC § 9601).[62]

4.16.1 Hazardous Waste

Numerous federal, state, local, and tribal environmental regulatory databases were utilized to identify hazardous materials sites that could potentially impact the proposed Project. An environmental data company, Environmental Data Resources, Inc. (EDR) was contracted to search all available environmental databases within a quarter-mile radius from the proposed Project. The results of this search may be found in **Appendix F**, EDR DataMap Environmental Atlas (EDR Report).[63] A complete listing of all databases searched may be found in the Executive Summary of the EDR Report.

For the purposes of this Draft EIS, only regulatory listings noted to be within the quarter-mile search radius and of potential concern to the proposed Project were analyzed and are listed below.

4.16.1.1 MS LUST

The Mississippi Leaking Underground Storage Tank (LUST) database contains an inventory of reported leaking underground storage tank incidents maintained by MDEQ (http://www.deq.state.mi.us/sid-web/LUST_Search.aspx). One MS LUST listing was noted within the search radius as described below.

Nicholson Quick Stop is a fueling station located on U.S. Highway 11 near Second Avenue in Nicholson, Mississippi. This facility is approximately 1,000 feet from the proposed Project and has had a total of four LUST incidents:

[57] http://w2.weather.gov/climate/getclimate.php?wfo=jan, accessed 7/5/2016
[58] http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=perl1, accessed 7/10/2016
[59] http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=perl1, accessed 7/10/2016
[60] https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act, accessed 9/25/17.
[61] https://www.epa.gov/superfund/superfund-cercla-overview, accessed 9/25/17.
[62] https://www.epa.gov/superfund/superfund-amendments-and-reauthorization-act-sara, access 9/25/17.
[63] Environmental Data Resources (EDR) DataMap Environmental Atlas. Port Bienville Railroad, Inquiry Number 4689756.5s; includes EDR Governmental Database Search. August 03, 2016.

- one incident reported in 1992 and closed with No Further Action Required in 1994;
- one incident reported in 1996 and closed with No Further Action Required in 1997;
- one incident reported in 2008 and closed with No Further Action Required in 2009; and
- one incident reported in 2013 which remains open.

4.16.1.2 Unexploded Ordnance

A listing of unexploded ordnance (UXO) site locations was provided by EDR. One UXO listing was noted within the search radius as described below.

The Hancock County Bombing and Gunnery Range was used by the Army, Navy, and Air Force to train aerial bombing crews from 1942 until 1963 and consisted of approximately 30,622 acres within Hancock County. Within the range were three target sectors: two near the current SSC and one near the Stennis International Airport. Approximately 9.8 miles of the proposed Project would traverse the range, but would remain at least one mile from the three target sectors. UXO represents a minimal risk of contamination, but a significant risk of explosion, as bombs and fuses that did not detonate during training exercises could potentially still detonate.

4.17 Aesthetics and Visual Resources

4.17.1 Aesthetics and Visual Quality

Aesthetic and visual effects must be considered when assessing a projects potential impact to surrounding communities as well as the effects of the project to properties protected under Section 106 of the Historic Preservation Act, Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Act.

The Study Area is mainly undeveloped and is largely a combination of pine flatwoods and scrub-shrub wetlands with a scattering of rural residential property and a few businesses. There are two interstate routes, several two-lane paved and dirt roadways along with a cleared pipeline easement. The topography of the Study Area is relatively flat with a steady rise in terrain from about 8 feet in elevation at the southern end of the proposed rail corridor to approximately 43 feet at the tie-in to the existing NS line at the northern terminus of the proposed Project.

Existing views for travelers and/or residents from transportation facilities within the Study Area primarily consist of wooded vistas, with small areas of rural development, including residences. Along I-10, travelers would see minimal development, except the entrance gates to SSC. Along the northern section of Texas Flat Road, travelers would see more development, including residences, businesses and community buildings near Nicholson.

4.18 Transportation

The existing transportation infrastructure in the Study Area includes port and airport facilities, railroads, and a roadway network. Gulf Coast region transportation facilities are also described.

4.18.1 Existing Port and Airport Facilities

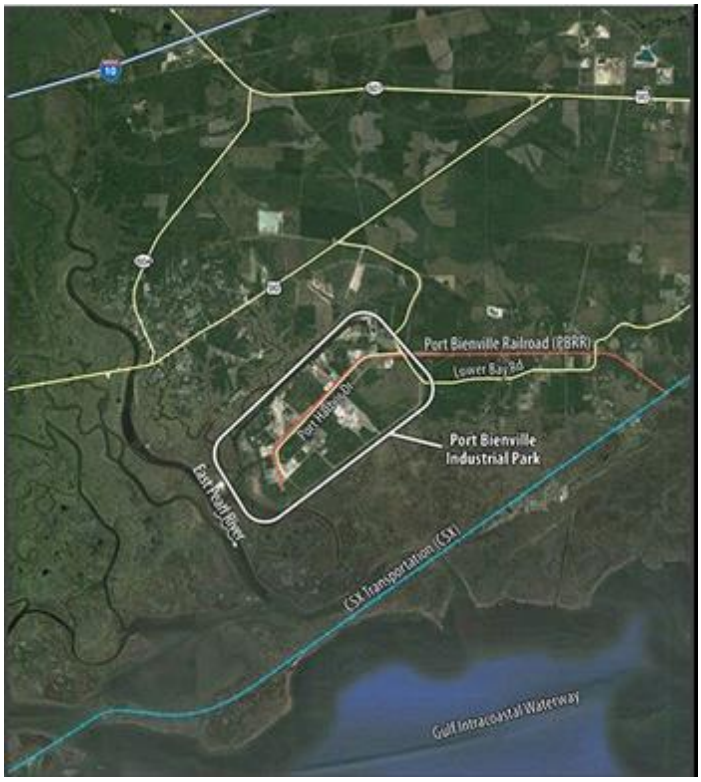
4.18.1.1 Port Bienville/Port Bienville Industrial Park

Port Bienville is owned and operated by the Hancock County Port and Harbor Commission (HCPHC). As described previously, Port Bienville is a multi-modal, shallow draft barge port with a 12-foot channel located off the Gulf Intracoastal Waterway near mile marker 24 on Mulatto Bayou in Hancock County (see **Figure 4.20**). Port Bienville is a container, bulk and break-bulk seaport with trans-load capabilities. Existing port infrastructure within Port Bienville includes 600 feet of dock space, three primary berths, and an additional 300-foot berth and turning basin. The Port is located on the south end of the Study Area, with primary highway access provided by way of I-10, I-59 and U.S. 90.

Port Bienville is also home to the Port Bienville Industrial Park that encompasses approximately 3,600 acres. Currently, 13 tenants are located within the industrial park, with a workforce of approximately 1,200 employees.

Approximately 775 acres of land within the Port Bienville Industrial Park and other sites within Hancock County are allocated to foreign trade zone (FTZ) space. This area is formally designated as Mississippi Coast Foreign Trade Zone #92 (FTZ #92). The creation of an FTZ must be federally approved by the Foreign-Trade Zone Board. Overall, FTZ #92 is comprised of 5,000 acres of land located throughout Hancock, Jackson and Harrison counties. Foreign trade zones are physical areas within the United States that are treated by customs as though they were outside of the U.S. border. FTZs offer many potential benefits for warehousing/distribution and manufacturing operations. FTZs help U.S. companies overcome competitive disadvantages stemming from U.S. trade laws and procedures.

Figure 4.20: Port Bienville Industrial Park and Port Bienville Railroad



Source: MDOT Website, http://mdot.ms.gov/ports/bienville.html

Approximately 1,220 acres of port-owned property on 17 sites is currently available for lease at the Port.[64] In addition to port-owned property, five parcels of land are privately owned within the industrial park.

[64] Hancock County Port and Harbor Commission (HCPHC).“Port Bienville Industrial Park.” http://portairspace.com/advantages/port_bienville_industrial_park (accessed November 21, 2016).

Port Bienville is one of three ports serving Mississippi's Gulf Coast. Two deep draft ports also serve the Gulf Coast including the Port of Gulfport in Gulfport, Mississippi and the Port of Pascagoula in Pascagoula, Mississippi (see **Figure 4.21**).

Figure 4.21: Regional Transportation Infrastructure

Source HCPHC Website, http://portairspace.com/site_selection/maps

Port Bienville Industrial Park – Planned and Future Projects

Major development initiatives have recently been undertaken or are proposed at Port Bienville Industrial Park. These projects, which would benefit from the expansion of regional transportation facilities within the Study Area, are briefly described below.[65]

Jindal Tubular USA LLC, one of the largest manufacturers of large diameter steel pipe, invested $10 million in their plant expansion for a production line to manufacture mortar-lined pipe for drinking water. Since beginning operations in August 2015, Jindal has increased employment at its Port Bienville Industrial Park plant from less than 50 to 200 personnel.

DAK Americas, which is one of the largest plastic-resin manufacturers in the U.S., has announced plans for a new manufacturing plant at their existing site at the industrial park. The plant would include $40 million of direct investment while adding 87 new full-time jobs.

In December 2015, it was announced that the Port Bienville Industrial Park would receive $8 million in RESTORE Act funding (Deepwater Horizon Oil Spill) for the construction of a trans-load dock and ancillary infrastructure improvements including rail line expansion. The project will improve Port users' ability to move product between modes of transportation and will increase Port throughput in support of industry onsite and offsite.

[65] Hancock County Port and Harbor Commission (HCPHC). 2015. Comprehensive Annual Financial Report For Fiscal Year Ended September 30, 2015. Prepared by Finance Department, Janet E. Sacks, Chief Financial Officer.

In 2001, the Multimodal Transportation Improvement Program was established by the Mississippi Legislature which created a special fund, known as the Multimodal Transportation Improvement Fund (MTIF).[66] The MTIF allows the MDOT to appropriate funds for multimodal capital improvement projects at ports, airports, railroads, and public transit systems throughout the state. Annual funding for the program is currently $10 million. MDOT's Multimodal Transportation Improvement Program plays a key role in keeping Mississippi's non-highway transportation infrastructure maintained and in a state of good repair. Funds for the program have also contributed to significant upgrades and improvements to the intermodal system through advancements and expansions that otherwise would not have been completed, thus keeping the state competitive in goods movement nationally and internationally. In 2013, the distribution of multimodal funding for each mode of transportation consisted of: ports (38%), rail (12%), public transit (16%), and airports (34%).[67]

According to the Multimodal Investment Report,[68] ports have experienced an increase in rail infrastructure projects allowing them to better handle and move freight, which in turn makes ports safer, improves the flow of goods, and provides faster service. These benefits have positioned ports to remain more competitive in the goods movement industry. In 2013, Port Bienville was the recipient of a port multimodal grant in the amount of $275,000 for repairs and upgrades to an internal roadway, and for pre-construction survey work for future Port expansion projects. In August 2016, Port Bienville Industrial Park was awarded a $375,500 grant for the construction of bulkhead and dolphin upgrades to support tenant product movements.[69]

4.18.1.2 Stennis International Airport

Stennis International Airport, also owned by the HCPHC, is located on the eastern perimeter of the Study Area in Kiln, Mississippi. The airport is a general aviation airport with a 8,500-foot runway. Stennis recorded a total of 29,010 takeoffs and landings in fiscal year 2015, up from 22,008 the previous year.[70]

The first phase of a Terminal Hangar project opened at the airport in 2014 which included the expansion of an existing tenants operation to accommodate maintenance, repair and overhaul operations, in addition to an increase of rentable tenant space including a café. Apron and parking facilities were also constructed.[71] Other recent landside and airside construction projects at the airport include: expansion of an apron at the northern area, rehabilitation of an existing apron, new taxiway markings and airport perimeter fencing. The Stennis Airport property also includes a business park, Stennis Airpark, which is a 1,800-acre business park. Businesses in Stennis Airpark include: Tyonek Services Facilities, Teledyne Optech CZMIL, Joint Airborne Lidar Bathmetry Technology Center, US Naval Meteorology and Oceanography Command, NOAA, FBO Million Air, Aircraft Rescue Firefighters Mississippi, Koening Stainless, and Lazy Magnolia Brewer.

[66] Mississippi Department of Transportation (MDOT). Multimodal Investment Report.
[67] Mississippi Department of Transportation (MDOT). Mississippi State Rail Plan. June 2011.
[68] Mississippi Department of Transportation (MDOT). Multimodal Investment Report.
[69] Hancock County Port and Harbor Commission (HCPHC). "Stennis Airport, Port Bienville Receive MDOT Grants." August 1, 2016. http://portairspace.com/news/article/stennis-airport-port-bienville-receive-mdot-grants (accessed November 21, 2016)
[70] Hancock County Port and Harbor Commission (HCPHC). Comprehensive Annual Financial Report For Fiscal Year Ended September 30, 2015. Prepared by Finance Department, Janet E. Sacks, Chief Financial Officer.
[71] Ibid

Stennis International Airport - Planned and Future Projects

In 2013, Stennis Airport was awarded an MDOT Airport multimodal grant in the amount of $23,750 for matching funds for the construction of an apron expansion project.[72] In August 2016, the same multimodal grant funding source provided approximately $252,500 to Stennis Airport for a parking/containment area for fuel trucks and ground support equipment.[73]

In December 2015, it was announced that the airport would receive $2 million in RESTORE Act funding (Deepwater Horizon Oil Spill) for Phase II of the Terminal Hangar project to construct a new 24,000 square foot hangar. The new hangar will also accommodate maintenance, repair and overhaul operations.[74]

4.18.2 Existing Roadway Network

4.18.2.1 Study Area Roadway Network

The roadways in the Study Area are comprised of a mix of roadway types ranging from interstate highways to local roadways. The Study Area is bisected by Interstate 10, while a small section of Interstate 59 passes through the northern portion of the Study Area in Pearl River County. I-59 and I-10 are both 4-lane divided facilities and are classified as interstate highways (see **Figure 4.22).**

U.S. Highway 11 (U.S. 11) is located in the northern portion of the Study Area in Nicholson. U.S. 11 is a 2-lane roadway west of I-59 and is classified as a minor arterial. U.S. 11 ends on the west side of I-59 and becomes SR 607 on the east side of I-59. Within Nicholson and extending north to Picayune, U.S. 11 parallels the NS Railroad. North of Picayune, the NS Railroad and U.S. 11 corridors diverge.

U.S. Highway 90 (U.S. 90) is located in the southern portion of the Study Area in Pearlington and extends northeast to SR 607. U.S. 90 is classified as a minor arterial from the Mississippi-Louisiana state line to Lower Bay Road and is classified as a principal arterial for its remaining length within the Study Area.

From I-59 southward to I-10, SR 607 is classified as a major collector. South of I-10, SR 607 is classified as a principal arterial. The portion of SR 607 that traverses through SSC is known as Shuttle Parkway and is not open to the general public. **Table 4.25** summarizes the Study Area roadways and their existing roadway typical sections.

[72] Mississippi Department of Transportation (MDOT). Mississippi State Rail Plan. June 2011.

[73] Hancock County Port and Harbor Commission (HCPHC). "Stennis Airport, Port Bienville Receive MDOT Grants." August 1, 2016. http://portairspace.com/news/article/stennis-airport-port-bienville-receive-mdot-grants (accessed November 21, 2016)

[74] Hancock County Port and Harbor Commission (HCPHC). 2015. Comprehensive Annual Financial Report For Fiscal Year Ended September 30, 2015. Prepared by Finance Department, Janet E. Sacks, Chief Financial Officer.

Figure 4.22: Transportation Network

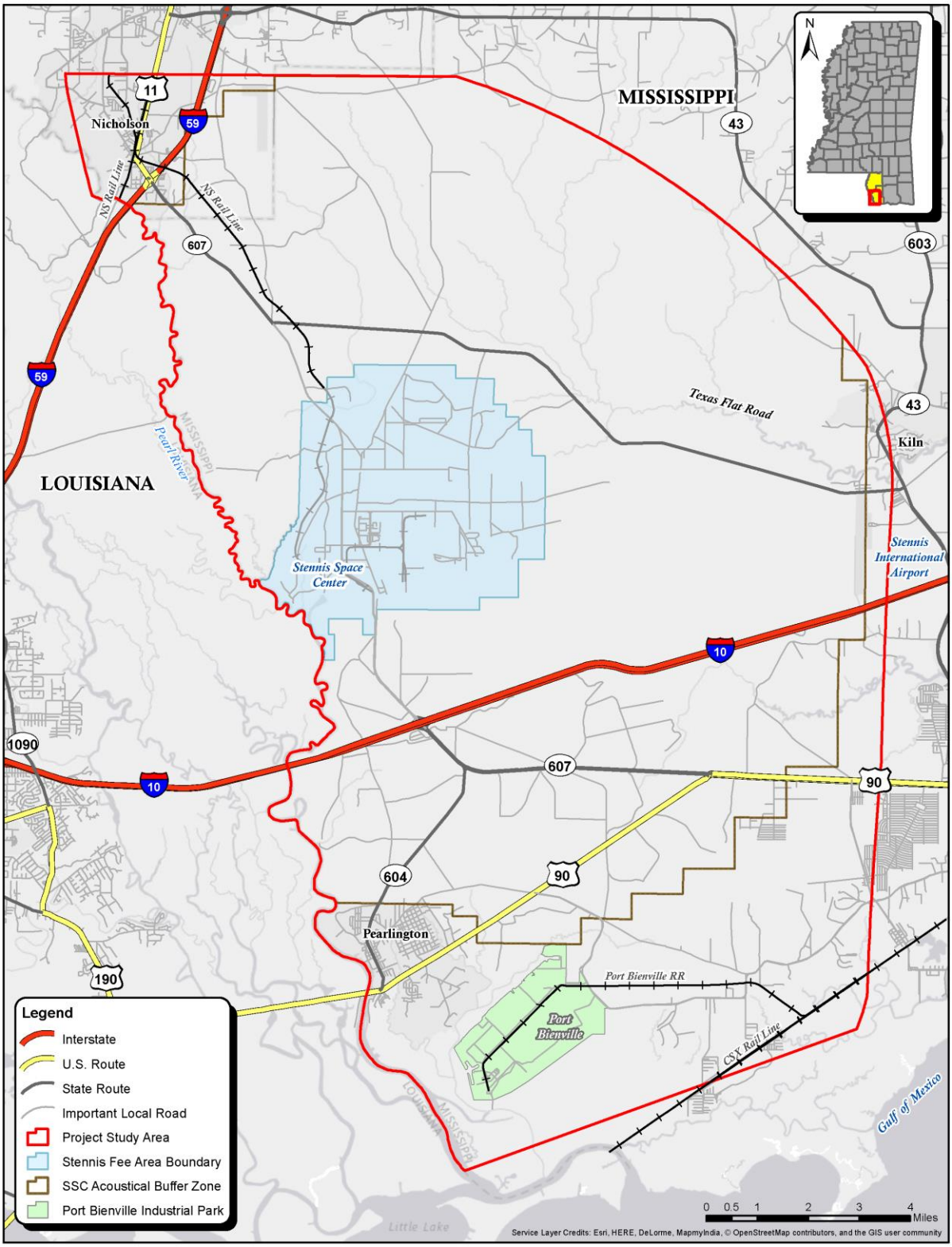


Table 4.25: Existing Roadway Functional Classification

Route	Functional Classification	Limits	Roadway Typical Section
Interstate 59	Interstate Highway	Throughout Pearl River County	4-lane divided with shoulders
Interstate 10	Interstate Highway	Throughout Hancock County	4-lane divided with shoulders
U.S. Highway 11	Minor Arterial	SR 43 to SR 607/I-59	2-lane
SR 607	Major Collector	I-59 to Texas Flat Road	2-lane with narrow shoulders
SR 607 / Shuttle Parkway	Major Collector	Texas Flat Road to I-10	4-lane divided, no shoulders
SR 607	Principal Arterial	I-10 to U.S. 90	4-lane divided with narrow shoulders
U.S. Highway 90	Minor Arterial	LA/MS state line to Lower Bay Road	2-lane with shoulders
U.S. Highway 90	Principal Arterial	Lower Bay Road to SR 607/U.S. 90	2-lane with shoulders
U.S. Highway 90	Principal Arterial	SR 607 to Rifle Range Road	4-lane divided with shoulders
Texas Flat Road	Major Collector	SR 607 to SR 603	2-lane unimproved
Flat Top Road	Rural Minor Collector	SSC to Old Kiln Road	2-lane unimproved
Lower Bay Road	Local Roadway	U.S. 90 to SR 603	2-lane
Old Lower Bay Road	Local Roadway	Lower Bay Road to SR 603	2-lane
Port and Harbor Drive	Local Roadway	Internal Port Road west of Lower Bay Road	2-lane

Sources:
Functional Classification System map, Pearl River County, MS, MDOT Planning Division, 2015 (MDOT 2015b).
Functional Classification System map, Hancock County, MS, MDOT Planning Division, 2014 (MDOT 2014a).
Functional Classification System map, Picayune Urban Area, Pearl River County, MS, MDOT Planning Division, 2013 (MDOT 2013b).

4.18.2.2 Existing Highway-Railroad At-Grade Crossings

The information described below is extracted from FRA's website under "Rail Safety"[75] and "Grade Crossings."[76]

Highway-railroad grade crossings are intersections where a highway crosses a railroad at-grade. To avoid collisions, warning/control devices are required at grade crossings just as intersecting roadways need stop signs or traffic signals. Active Grade Crossings have active warning and control devices such as bells, flashing lights, and gates, in addition to passive warning devices. Passive warning devices include crossbucks (the familiar x-shaped signs that mean yield to the train), yield or stop signs, and pavement markings. Passive Grade Crossings have only passive warning devices. These warning/control devices are specified in the Manual of Uniform Traffic Control Devices (MUTCD).

[75] Federal Railroad Administration (FRA). "Railroad Safety." https://www.fra.dot.gov/Page/P0010 (accessed July 8, 2016)
[76] Federal Railroad Administration (FRA). "Highway-Rail Grade Crossings Overview." https://www.fra.dot.gov/Page/P0156 (accessed July 8, 2016)

Grade crossings may be public or private. Public at-grade crossings are roadways that are under the jurisdiction of, and maintained by, a public authority. Private at-grade crossings are on privately owned roadways, such as on a farm or industrial area, and are intended for use by the owner or by the owner's licensees and invitees. Private at-grade crossings are not intended for public use and are not maintained by a public highway authority. A grade-separated crossing can be described as a location where the rail right of way is physically separated from the highway right of way; i.e., either the rail is elevated over the highway or the rail is depressed under the highway.

Table 4.26 provides a summary of the existing highway-rail grade crossings in the northern portion of the Study Area along the existing NS right of way. Existing at-grade and grade-separated crossing locations are shown.

Table 4.26: Existing Highway-Rail Grade Crossings along NS Rail Alignment

Roadway Crossing Location	NS Alignment Approximate Centerline Station [(1)]	Crossing Type and Disposition		
		At-Grade		Grade-Separated; Public Crossing
		Public	Private	
U.S. Highway 11	Sta 7+91	Existing	-	-
Interstate 59	Sta 38+30	-	-	Existing; Rail over
Asa McQueen Road	Sta 84+93	Existing	-	-
Unknown Roadway	Sta 128+80	Existing	-	-
Unknown Roadway	Sta 155+29	Existing	-	-
Ridge Road	Sta 199+45	Existing	-	-
Texas Flat Road	Sta 229+74	Existing	-	-

[1] *HDR Engineering, Inc. Conceptual Engineering Map Set*

Figure 4.23 and **Figure 4.24** depict the northbound and southbound approaches to the existing at-grade crossing at U.S. Highway 11, respectively, while **Figure 4.25** depicts the existing at-grade crossing at Texas Flat Road. These photographs depict two key locations within the Study Area where existing at-grade crossings occur along the existing NS right of way.

4.18.2.3 Roadway Network – Planned and Future Projects

Future improvements to Study Area roadways are included within MDOT's 5-year Transportation Improvement Program (TIP). The only project included within the TIP that is located within the Study Area is the proposed U.S. 90 bridge replacement over the Pearl River near the Louisiana/Mississippi state line (Project 106663/301000). Initial funding in the amount of $30 million has been identified for the construction of this project, which is programmed to begin in 2020.[77]

[77] Hancock County Port and Harbor Commission (HCPHC). 2016b. "Stennis Airport, Port Bienville Receive MDOT Grants." August 1, 2016. http://portairspace.com/news/article/stennis-airport-port-bienville-receive-mdot-grants (accessed November 21, 2016).

Figure 4.23: U.S. Highway 11 At-Grade Crossing (view looking northbound)

Figure 4.24: U.S. Highway 11 At-Grade Crossing (view looking southbound)

Figure 4.25: Texas Flat Road At-Grade Crossing (view looking westbound)

4.18.3 Existing Rail Network

4.18.3.1 CSX Transportation

CSX Transportation (CSX), a subsidiary of CSX Corporation, is one of seven Class I railroads serving the United States rail and intermodal markets. The CSX rail network encompasses 21,000 route miles of tract in 23 states and the District of Columbia,[78] which are primarily located in the eastern U.S., specifically east of the Mississippi River.

CSX's New Orleans & Mobile (NO&M) Subdivision is located between New Orleans, Louisiana and Mobile, Alabama and is approximately 138.5 miles long. Within Mississippi, the single-track mainline extends 74 miles between the Louisiana border and Alabama border. Within Mississippi, CSX also operates over 20 track miles via trackage rights.[79] Approximately 3.5 miles of CSX's mainline is located within the study area.

Currently, the CSX mainline within Mississippi carries an average of 18 to 19 freight trains daily[80], in addition to serving local in-line industries. This daily train volume is consistent with prior train activity reported within the Statewide Freight Plan. Train speeds along the CSX corridor vary from Class 3 freight train speeds of less than 39 miles per hour (mph) on some short segments, to Class 4 freight train speeds of up to 60 mph.[81] There are 72 public highway-rail at-grade crossings along the CSX mainline; 35 of these crossings do not have Active warning devices.

Existing freight rail service to Port Bienville and the industrial park is provided by CSX. The Port Bienville Railroad connects to CSX's mainline approximately 5 miles east of the Port near Ansley, Mississippi. The Port of Gulfport and the Port of Pascagoula are also served by CSX. In 2011, annual freight flow on the CSX was 16.4 million tons, with an estimated value of $27.6 billion. By 2040, annual freight flow is projected to be 24.1 million tons, with an estimated value of $50.7 billion.[82]

4.18.3.2 Norfolk Southern Railway Company

Norfolk Southern Railway Company (NS) operates 20,000 route miles in 22 states and the District of Columbia,[83] which are primarily located in the eastern U.S. with principal gateways at Chicago, St. Louis, Kansas City, Memphis and New Orleans. Within Mississippi, the NS operates 211 route miles which includes ownership of 209 route miles and trackage rights over two route miles over two principal routes.[84]

The NS mainline route bisects a small portion of the Study Area in Nicholson and generally parallels U.S. Highway 11 northward to Picayune. The NS rail line continues farther north to Hattiesburg and Meridian; generally paralleling I-59.

Currently, the NS mainline carries an average of 22 trains a day through Nicholson, and averages about 115 trains per week.[85] Train speeds along the NS corridor generally allow freight speeds of up to 60 mph. There

[78] CSX. "Company Overview." https://www.csx.com/index.cfm/about-U.S./company-overview/ (accessed November 21, 2016)
[79] Mississippi Department of Transportation (MDOT). Mississippi State Rail Plan. June 2011
[80] Larry Ratcliffe (CSX), phone call with Kevin Keller (HDR), November 16, 2016.
[81] Mississippi Department of Transportation (MDOT). Mississippi Statewide Freight Plan Final Report. February 2015.
[82] Ibid
[83] Norfolk Southern (NS). 2016. "Our Network" http://www.nscorp.com/content/nscorp/en/shipping-options/intermodal/why-norfolk-southern-intermodal/our-network.html (accessed November 21, 2016).
[84] Mississippi Department of Transportation (MDOT). Mississippi State Rail Plan. June 2011
[85] Alan Sisk (NS), email to Kevin Keller (HDR), October 20, 2016.

are 30 public highway-rail at-grade crossings along the NS mainline; 7 of these crossings do not have Active warning devices.[86] Passenger rail service is provided on the NS mainline. Amtrak currently operates the *Cresent*, which is a passenger train that provides daily service between New Orleans and New York (1 train per day in each direction).

In 2011, annual freight flow on the NS was 28.8 million tons, with an estimated value of $36.4 billion. By 2040, annual freight flow is projected to be 41.8 million tons, with an estimated value of $64.5 billion.[87]

Rail service to SSC was previously provided by way of a former rail spur that connects to the NS lead track in Nicholson, just east of U.S. Highway 11. The right of way and track associated with the former rail line is owned by NS (see **Figure 4.26**). The existing rail right of way varies in width but is generally 200 feet wide. Rail service to SSC ceased over 10 years ago; subsequently, maintenance of the existing track has not been undertaken.

Figure 4.26: Existing Norfolk Southern Right of Way and Railroad Track between Nicholson and SSC

4.18.3.3 Port Bienville Railroad

The Port Bienville Railroad is a Class III, short line railroad that provides rail service to several businesses within the Port Bienville Industrial Park and connects these rail users to CSX's east-west mainline along the Gulf Coast. From Port Bienville, the PBRR extends east approximately 5 miles to Ansley, Mississippi and connects to CSX's mainline. PBRR owns and operates a total 9 route miles.[88] Similar to Class I railroads, the single-tract PBRR has the ability to transport 286,000-pound carloads.

The PBRR currently operates 6-day service with 2 trains per day (1 train inbound and 1 train outbound). Each train averages 22 cars per train each way. This daily average is based on the actual number of total cars serviced (49,013 cars) from January 2013 to present. Annually, PBRR handles approximately 6,200 train cars. PBRR train speeds are generally 20 to 30 mph. There are 2 public highway-rail at-grade crossing along the PBRR; each crossing Lower Bay Road with the eastern crossing located at the Port entrance. Active warning devices were recently installed at this grade crossing.

The PBRR maintenance yard is located immediately east of Lower Bay Road, and includes a 3,000-foot siding and six storage tracks of varying length, ranging from approximately 2,000 feet to 3,000 feet. Storage capacity is estimated at 429 cars.[89]

As part of MDOT's Multimodal Transportation Improvement Program, in 2013 Port Bienville Railroad was awarded a Rail multimodal grant in the amount of $260,000 for rail improvements to a dry bulk terminal.

[86] Mississippi Department of Transportation (MDOT). Mississippi Statewide Freight Plan Final Report. February 2015.
[87] Mississippi Department of Transportation (MDOT). Mississippi Statewide Freight Plan Final Report. February 2015.
[88] Mississippi Department of Transportation (MDOT). Mississippi State Rail Plan. June 2011
[89] Ibid

Port Bienville – Planned and Future Projects

In August 2016, PBRR was the recipient of a $398,000 grant for the construction of a 1,270-foot rail spur.[90] Other recent PBRR construction projects include expansion of the rail car wash and adjacent rail line, storm drainage improvements consisting of the replacement of culverts, and the installation of lights and gates at the two at-grade rail crossings on Lower Bay Road.

4.18.3.4 Passenger Rail

Amtrak, also known as the National Railroad Passenger Corporation, currently operates intercity passenger rail service within Mississippi. Daily passenger rail service between New Orleans and Chicago is provided along Kansas City Southern (KCS) track via the *City of New Orleans*. Passenger rail service is also provided between New Orleans and New York via the *Crescent*. The *Crescent* route runs along NS mainline track within the Study Area. Each of these Amtrak routes consists of one train per day in each direction.

Prior to Hurricane Katrina (August 2005), Amtrak operated intercity passenger rail service between New Orleans and Florida via the *Sunset Limited*. The route followed CSX's single-track mainline through Mississippi, including a small portion of the study area. Since then, Amtrak has completed several studies (including ridership projections, revenue forecasts and infrastructure improvements) to explore options to resume passenger rail service.

The restoration of passenger rail service along the Gulf Coast is a key initiative among several states including Louisiana, Mississippi, Alabama, and Florida. On February 18, 2016, representatives from the FRA, Amtrak, state Departments of Transportation, elected officials, and the Southern Rail Commission embarked on a two-day Gulf Coast Passenger Rail Train Trip—the first passenger rail service since 2005 (Southern Rail Commission 2016). Starting at the Union Passenger Terminal in New Orleans and terminating in Jacksonville, Florida, thousands of enthusiastic residents and community groups greeted the train at each of the 14 stations along its journey, further demonstrating support for passenger rail service for both mobility and economic reasons. Indications are that passenger rail service may be viable if CSX's mainline route is double-tracked in the future.

CSX's route through Mississippi also comprises a portion of the Gulf Coast Corridor that was federally designated as a high-speed rail corridor in 1998 and further extended in 2000. Between Houston and Atlanta, total mileage for this designated corridor is 1,025 miles. High-speed (110 miles per hour service) passenger rail service would only be viable if CSX's mainline route is double-tracked in the future.

4.18.3.5 Railroad Network – Planned and Future Projects

Based on the Mississippi State Rail Plan, there are no other known rail project planned within the study area.

4.18.4 Multimodal Corridors

A key element of the Mississippi Statewide Freight Plan was the identification of primary freight corridors in the state. Several multimodal freight corridors comprise the Mississippi Freight Network (MFN). The MFN is intended to define these critical corridors and is comprised of primary multimodal freight corridors, major intermodal facilities (marine ports, river ports, and commercial airports) served by these freight corridors, connecting roadway and rail links serving those intermodal facilities; and the state's major freight

[90] Hancock County Port and Harbor Commission (HCPHC). "Stennis Airport, Port Bienville Receive MDOT Grants." August 1, 2016. http://portairspace.com/news/article/stennis-airport-port-bienville-receive-mdot-grants (accessed November 21, 2016)

generators. Based on these criteria, the MFN identified Tier I and Tier II Corridors. The Tier I Corridors can generally be described as primary/interstate freight corridors with network connectivity to national transportations systems such as interstate highways and Class I railroads. Included among the Tier I Corridors are the I-10/CSX (Gulf Coast) Corridor and the I-59/NS Corridor. Both of these Tier I Corridors are aligned to a major interstate and Class I railroad main line. Each corridor features a combination of intermodal facilities (ports, airport, or rail) that are served by both a highway and rail connector.

4.18.4.1 Multimodal Corridor Network - Planned and Future Projects

Future conditions associated with the Tier I Corridors defined in the Mississippi Statewide Freight Plan were assessed using a comprehensive approach. The comprehensive approach considered a combination of all the intermodal facilities for assessing the corridor needs, as well as corridor infrastructure requirements. Each of the short-range and long-range recommended improvements to the Tier I Corridors would provide a benefit to the proposed Project. Key features associated with each of these multimodal Tier I Corridors include:

- I-10/CSX – Short-Range and Long-Range Recommended Improvements
  - Upgrade all public at-grade crossings to full active crossing warning devices to improve safety (35 out of 72).
  - Widen I-10 along the entire corridor to enhance reliability.
  - Enhance rail access between CSX and the Port of Gulfport to improve operational efficiency.
  - Raise 7 of 48 bridges along I-59 to meet 16-foot vertical clearance requirement.
  - Double track CSX mainline to accommodate passenger rail.

- I-59/NS – Short-Range and Long-Range Recommended Improvements
  - Upgrade all public at-grade crossings to full active crossing warning devices to improve safety (7 out of 30).
  - Construct track improvements along NS rail corridor in Picayune and Laurel to raise operating speed and enhance reliability.
  - Upgrade I-59 to improve safety—21 miles out of 171 miles along I-59 have high crash segments.
  - Raise 1 of 9 bridges along I-10 to meet 16-foot vertical clearance requirement.
  - Double track NS mainline to accommodate high-speed passenger rail.

4.19 Utilities

Overhead and underground utilities in the Study Area were identified using Mississippi Automated Resource Information System (MARIS) and Stennis Space Center GIS data and the National Pipeline Mapping System (NPMS) Public Map Viewer[91] for Hancock and Pearl River Counties.

[91] https://www.npms.phmsa.dot.gov/PublicViewer/, accessed on 8/18/16.

4.19.1 Underground Pipelines

Several underground pipelines are located within the vicinity of the proposed track alignment at the locations shown in **Table 4.27** and on **Figure 4.27**.

Table 4.27: Underground Pipeline Crossings

Type (Commodity)	Owner	Description/Comments
Gas Pipeline[a]/ Gas Transmission Pipeline (Natural Gas)[c]	Gulf South Pipeline Company, LP[c]	The first of three crossings is northwest of Interstate 59 near Sta. 32+00. It then crosses over the track near Sta. A 154+00 and back near Sta. A 159+00.
Natural Gas Pipeline[b]	unknown	Pipeline crosses Texas Flat Road west of Mainline Road
Gas Pipeline[a]	unknown	North-South pipeline crosses east of Mainline Road
Gas Pipeline[a]/ Hazardous Liquid Pipeline (Natural Gas Liquids)[c]	Tri-States NGL Pipeline, LLC[c]	East-West pipeline
Hazardous Liquid Pipeline (Non-HVL Product)[c]	Colonial Pipeline, Co.[c]	North-South pipeline east of Mainline Road
Gas Transmission Pipeline (Calgon 4-inch Natural Gas)[c]	Enmark Energy, Inc.[c]	East-West pipeline along south side of existing Port Bienville tracks.

Sources:
a – MARIS GIS data (msgas layer)
b – Stennis Space Center GIS data (NatGasPipelines layer)
c – NPMS Public Map Viewer
d – HDR Conceptual Rail Alignment Maps

4.19.2 Overhead Transmission Lines

Based on GIS data,[92] high tension transmission lines cross the Study Area. The proposed rail alignment crosses the transmission lines in two locations—south of I-10 and at the intersection with the Port Bienville Railroad.

4.19.3 Wells

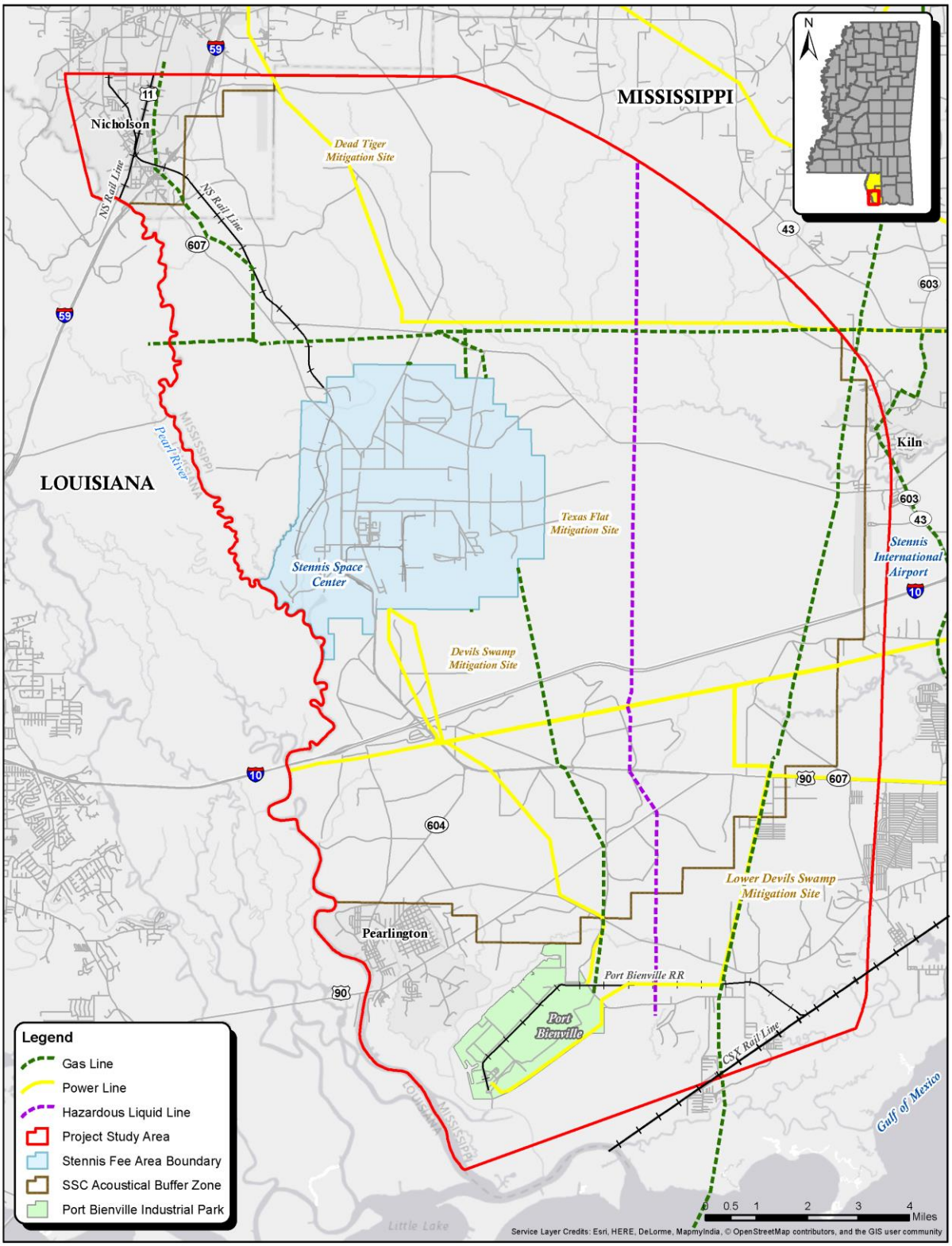
Based on GIS data,[93] numerous water wells and/or oil and gas wells were identified within the Study Area. No water wells are located within 100 feet of the proposed track centerline.

4.19.4 Water and Sewer

Stennis Space Center GIS data was the only readily available data on water and wastewater utility lines. The northern portion of the Study Area in Nicholson, MS is within the jurisdiction of the Nicholson Water and Sewer Association. The portion of the alignment within Hancock County is within the jurisdiction of the Hancock County Water and Sewer District.

[92] Source: MARIS; Layer Name: majr_transm10
[93] Source: MARIS; Layer Names: USGS_Wells09 and OGB_wells2013

Figure 4.27: Pipeline and Transmission Line Crossings



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5.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides a description of the potential beneficial and adverse social, economic, and environmental impacts that could be expected with and without the proposed Project. This analysis considers both the No-Build Alternative and Build Alternative (Alternative C). This chapter also includes discussion on measures proposed to avoid, minimize, and mitigate adverse impacts associated with the proposed Project. If FRA funding is used to construct the Project, FRA would require the future Project Sponsor to comply with the commitments and mitigation measures outlined in this chapter.

For the assessment of some resources, including cultural resources, wetlands, habitat, and threatened and endangered species, a smaller corridor was used to evaluate existing conditions instead of the entire Study Area. This was due to the intensive field work required to survey for these resources, which would be cost prohibitive for the entire 231-square mile Study Area. Throughout this chapter several terms are used to describe these different areas of effect and/or corridors assessed for the proposed Project. These terms are described below:

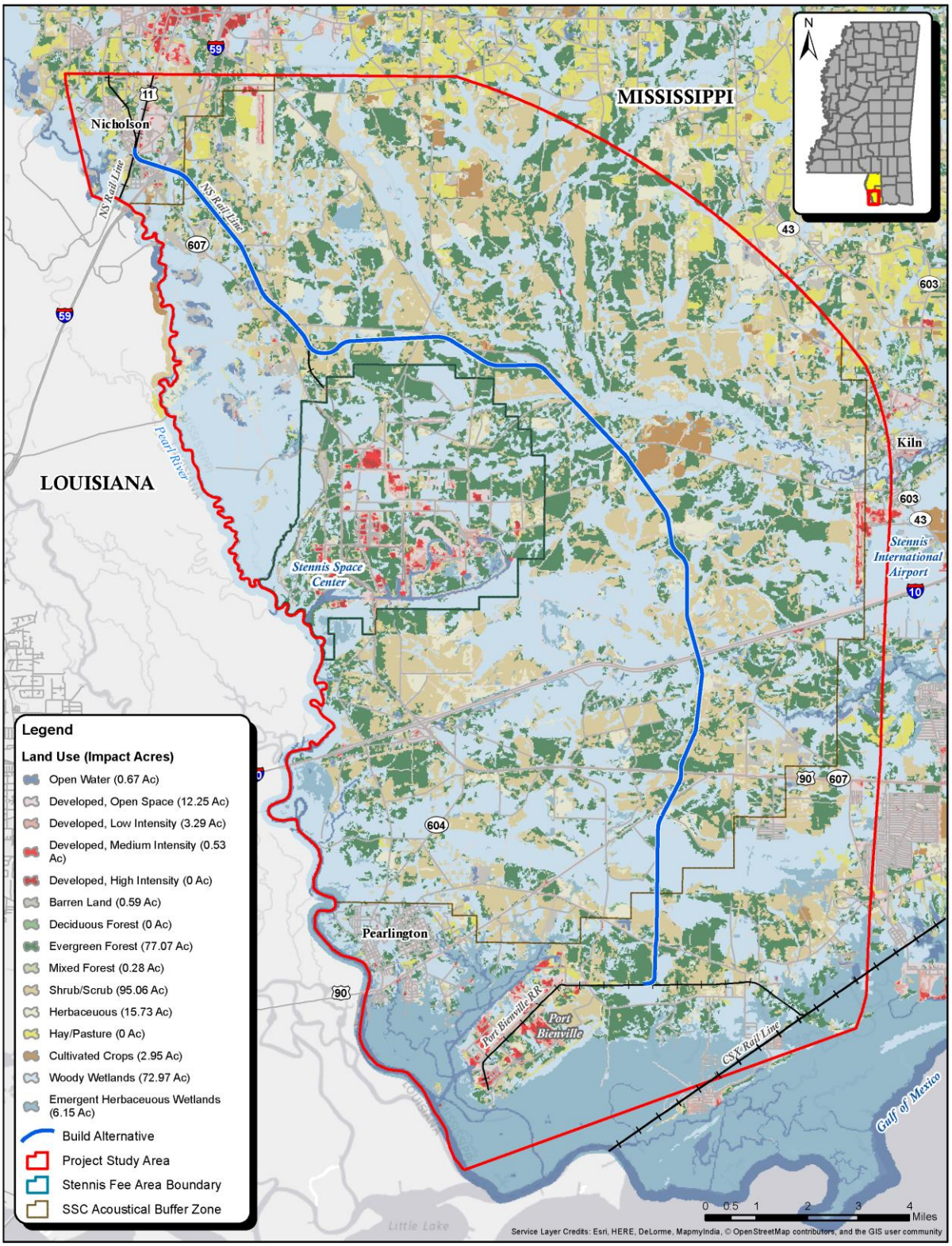
- Study Area – 231 square mile area of Hancock and Pearl River Counties, bounded by the community of Nicholson to the north, Port Bienville Industrial Park to the south, the Pearl River to the west, and Stennis International Airport and the community of Kiln to the east.
- Project Corridor – 200-foot corridor within which the proposed rail line will be constructed.
- Area of Potential Effect (APE) - 200-foot wide buffer along the identified rail alignment that was surveyed for cultural resources.
- Survey Corridor - 200-foot wide buffer along the identified rail alignment that was surveyed in the field for wetlands, habitat, and threatened and endangered species.

5.1 Land Use

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under No-build conditions, there would be no effects, positive or negative, to existing land use designations.

Build Alternative. The proposed alignment begins in the northern section of the Study Area at the NS Switch yard in Nicholson. The Build Alternative follows the existing inactive NS rail line in a southern direction until it enters the SSC acoustical buffer zone. Since this section of the Build Alternative would be located within the existing corridor consisting of inactive track and rail bed, upgrading the rail facility for this section would not result in any changes to existing land use or future development patterns (see **Figure 5.1).**

Figure 5.1: Land Use Impacts



As the alignment continues in a southeastern direction it begins to diverge from the existing NS corridor and onto new right-of-way. The Build Alternative between the existing NS line and 1.5 miles south of U.S. 90 is located completely within the SSC acoustical buffer zone. Habitable building structures are strictly prohibited within the acoustical buffer zone and development rights have been purchased by the federal government, therefore no development can occur within this area. However, transportation facilities are not restricted from being constructed. Because of these development restrictions within the acoustical buffer zone, the construction of the proposed Build Alternative would have no impacts on future land uses within the buffer zone. Right-of-way acquisition for the Build Alternative would directly convert 222 acres of existing undeveloped and uninhabited land uses, the majority of which is currently being used for silviculture operations, to a transportation use. The conversion of these is considered minimal when compared to the overall undeveloped land within the SSC buffer zone (0.20%) and the Study Area (0.17%).

Approximately 1.5 miles south of U.S. 90, the alignment exits the SSC acoustical buffer zone and continues south for 1.7 miles to PBRR. This area currently consists of rural residential, industrial/mining, wetlands and undeveloped land. The Build Alternative would convert approximately 23 acres of existing undeveloped land uses to a transportation use. The direct impacts to existing land use would be considered minimal when compared to the total undeveloped land in the Study Area as a whole (0.017 %). Future land use within this section of the Study Area has the highest potential to change as a result of the Build Alternative, where industrial and other commercial development could occur between the Build Alternative and Port Bienville Industrial Park. These potential land use changes are consistent with future land use designations identified in the Hancock County Comprehensive Plan, where this area is designated for industrial, office park and office retail uses.[94]

5.2 Farmland

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under No-Build conditions, there would be no impacts to area soils or protected farmland.

Build Alternative. The total right-of-way corridor for the Build Alternative would require a total of approximately 287 acres of land. Sixty-five acres of the corridor along the existing NS rail line are currently used for transportation. Approximately 222 acres of new right-of-way within the corridor would be converted to a transportation use.

Under the FPPA guidance, farmlands are defined based on soil types (7 CFR 657.5). The identification of important farmlands is determined from currently published soil survey maps and data produced by the NRCS National Cooperative Soil Survey Program. Based on the soil types identified by the NRCS Web Soil Survey (WSS) online mapping[95], it was determined that 134 acres within the Project corridor meet the requirements for prime and unique farmland, and 1 acre of the Project corridor meets the requirements for statewide and locally important farmland. These 135 acres of relevant soils make up approximately 0.25% of the prime, unique and/or statewide important farmlands within Hancock County.

NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score; the assessment is completed using form NRCS-CPA-106, Farmland Conversion Impact Rating For

[94] The Hancock County Interim Comprehensive Plan November 2, 2008
[95] USDA Natural Resources Conservation Service Web Soil Survey. https://websoilsurvey.nrcs.usda.gov/app/, accessed 12/25/2016.

Corridor Type Projects, which assesses non-soil related criteria such as the potential for impact on the local agricultural economy if the land is converted to non-farm use and compatibility with existing agricultural use.[96] This form determines the amount of land that is currently in non-urban and agricultural uses, based on what is currently being farmed and the agricultural investments within and adjacent to the Project corridor. The only active agricultural activity identified in the Study Area is silviculture. Based on the form, the site assessment score is under 160, the threshold for determining impact to protected farmland. For projects with a score less than 160, no alternative actions (alternative sites, modifications or mitigation) need to be considered for farmlands impacts. Coordination with NRCS was initiated in the form of a written letter, project description and map and NRCS-CPA-106 form to the state soil scientist on October 19, 2016.

5.2.1 Conservation Easements

Because there are no conservation easements located within the Study Area, the implementation of the Build Alternative railroad corridor would have no impact on any of these sites.

5.3 Socioeconomics

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Therefore, industries that may be interested in locating to in the Study Area due to the addition of dual Class I rail service would most likely not find Hancock County a viable option. The potential enhancement of economic opportunities in the Study Area would not occur.

Build Alternative. The Build Alternative would provide a link between the PBRR and the Norfolk Southern line, which would support economic development and growth in Hancock County and the Port Bienville Industrial Park. This would provide dual Class I rail service, at the Park, which would make the area more appealing to industries that benefit from or require this rail service. Potential benefits of this service would be:

- Attracting new businesses that would provide job growth;
- Reducing rail shipping costs;
- Additional transportation options for moving freight; and
- Providing alternative response options in the event of emergency and natural disaster situations.

The *Port Bienville Economic Development Benefits and Opportunities Analysis* completed in Phase 1 estimated between 680 and 700 new direct rail construction jobs would be created with ongoing construction and would generate an additional 150 to 425 jobs from expanding or new businesses related to the rail line development. Subsequent to the rail construction, the economic development benefits study estimated an additional 650 direct manufacturing jobs attracted to the Study Area by the year 2025. In addition to the direct jobs from rail served business expansions or new locations, an additional 1,154 additional indirect jobs would result from the impacts of the direct job growth in the manufacturing section by year 2025 for a total increase in workforce of 2,634. Compared to Study Area baseline employment, the rail connection is forecasted to result in a 33.8 percent increase in direct manufacturing employment and a 3.5 percent increase in overall employment within the Study Area.

[96] https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/, accessed 9/25/17.

In 2013, there were two industrial prospects evaluating sites in Hancock County. Both would require access to dual Class I rail service. Collectively, these prospects would have invested slightly over $650 million in plant and equipment and would have employed approximately 450 people. The introduction of this number of jobs would generate more than half the existing jobs currently in place within the Port Bienville Industrial Park. These types of investments would become more likely if dual Class I rail access was provided by the Build Alternative.

New transportation infrastructure enables businesses to take advantage of additional capacity and modify their logistics and supply chains, improving delivery services to their customers. The proposed Port Bienville rail connector would allow companies in the park to modify supplier networks, which may reduce their costs or enhance the quality of inputs. Access to dual Class 1 rail service can improve transit times, provide alternative response options in the event of natural disasters, increase transportation service levels, and provide access to broader markets and more customers – all of which are critical to a company's ability to successfully compete in an international marketplace.

A 2012 American Chemical Council study showed that captive facilities (facilities having access to a single rail line) had 30 percent higher shipping costs than non-captive facilities (facilities having access to multiple rail lines). With the addition of dual Class 1 rail service, businesses within the Port Bienville Industrial Park would have a more competitive edge.

Currently, businesses at the Port Bienville Industrial Park receive raw materials and other shipments by barge, rail or truck. In order to move freight north, it must then continue by truck. Connection with the dual Class I rail service would provide businesses with options for rail service, which provides opportunities to avoid current delays experienced at Gentilly Yard in New Orleans. An additional connection to the NS line would provide options for moving freight, which could contribute to improved delivery times and reliability, reduced fuel usage from trucks, and allow more freight to move at one time.

In addition, an additional rail line would improve the resilience of economic activities in Hancock County in the event of a natural disaster. In 2005, Hurricane Katrina was devastating to the Mississippi coast. Due to the hurricane, the CSX rail line had to be completely shut down in the area for six months. This required shipments to be rerouted through several states, causing delays and additional costs to businesses in the industrial park. Construction of the Build Alternative would provide businesses with alternate shipping routes, which could potentially reduce the impacts of future natural disasters.

With the benefits of attracting new businesses and increasing workforce expected by the proposed Project, it is likely that increases in employment and income may be experienced in the region.

However, because 76% of the Study Area is within the SSC buffer zone, the demographics of the area, including population, population make-up (race, age, disability) and general housing characteristics are not expected to experience appreciable changes as a result of the Project. Education levels would not be affected by the proposed Project.

5.4 Environmental Justice

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Therefore, impact to minority and low income populations would not occur.

Build Alternative. Under the Build Alternative, possible impacts to minority and low income populations could only occur in either the northern and/or southern section of the Study Area. Habitation and building structures that could be inhabited are strictly prohibited within the buffer zone, which is enforced by SSC. Additionally, the Build Alternative alignment in the northern section near Nicholson uses the existing NS rail line. Since the rail line already exists, impacts would be limited.

The Build alternative would cross five of the eleven block groups (BG) within the Study Area. These are identified as Census Tracts (CT) 304, BG 1 and BG 3; CT 306.02, BG 3; CT 9505.01, BG 1; and CT 9507, BG 4. Of these block groups, only three have higher percentages of low-income populations than their respective counties, CT 306.2, BG 3; CT 9505.01 BG 1, and CT 9507, BG 4 (see **Table 5.1**). As show in **Figure 5.2,** CT 306.2, BG 3 is mainly within the SSC acoustical buffer zone, therefore, there are no residences in the block group impacted by the Build Alternative. CT 9505.01 BG 1 and CT 9507, BG 4 are located near Nicholson.

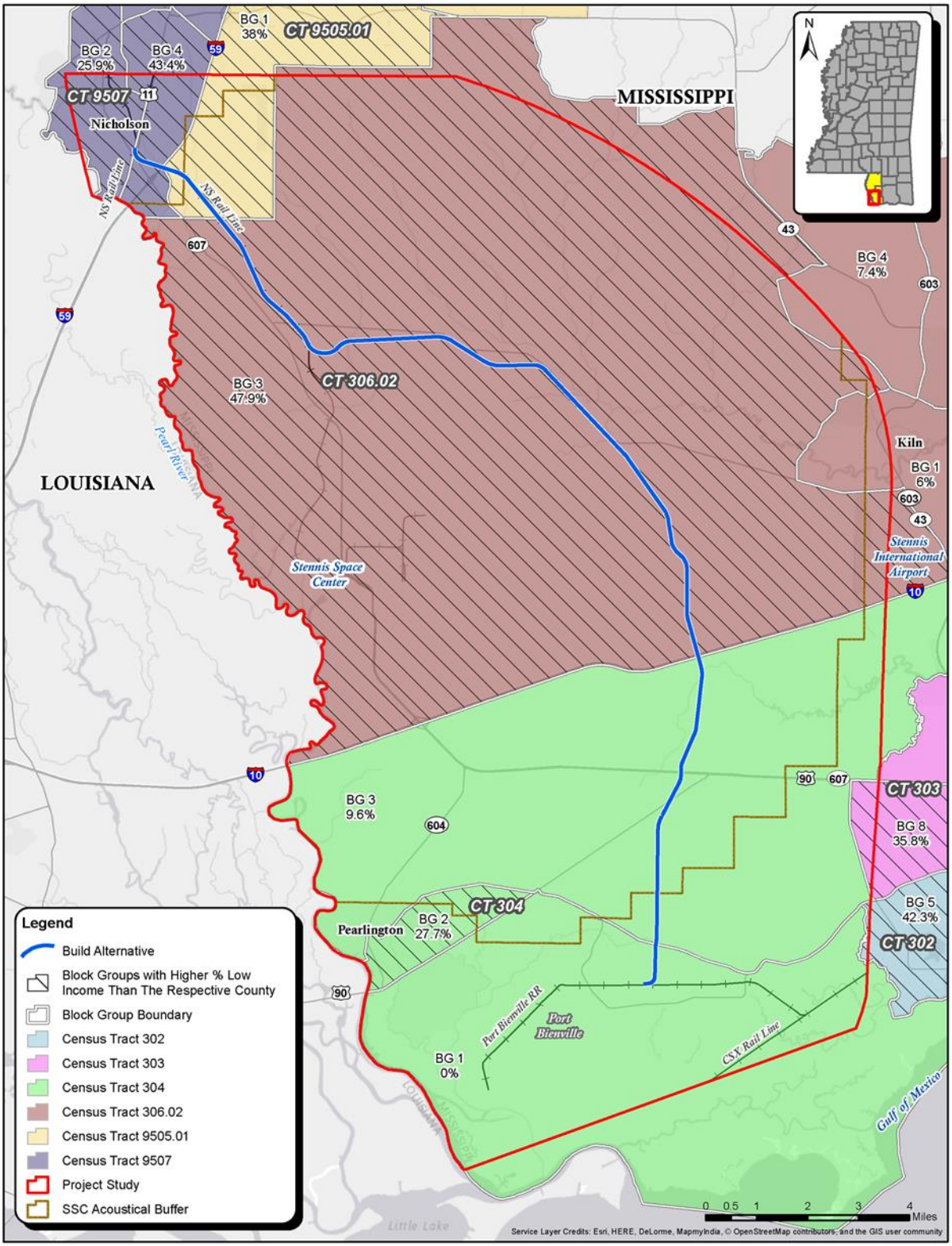
The Build Alternative would not cause any relocations and would not directly impact any residential areas in these block groups.

Table 5.1: Low-Income Data by Block Group – Income in 2013 Below Poverty Level

	Hancock County									Pearl River County			
	Total County	CT 302, BB 5	CT 303, BG 8	CT 304, BG 1	CT 304, BG 2	CT 304, BG 3	CT 306.2, BG 1	CT 306.2, BG 3	CT 306.2, BG 4	Total County	CT 9505.01, BG 1	CT 9507, BG 2	CT9507 BG 4
Total Households	18,891	149	996	260	346	416	581	421	471	20,606	749	1013	837
Households with Incomes below the poverty level	3,798	63	357	0	96	40	35	202	35	4,229	285	263	364
Percentage of Total Household Incomes below the poverty level	20.0%	42.3%	35.8%	0%	27.7%	9.6%	6.0%	47.9%	7.4%	21.0%	38.0%	25.9%	43.4%

Source: U.S. Census Bureau, ACS 2011-2015 5-Year Estimates, Table B17017; Census Tracts in blue are those which the Build Alternative would cross. Those which are underlined have higher percentages than their respective counties.

Figure 5.2: Low-Income Population



As noted previously, the Build Alternative would only cross CT 304, BG 1 and BG3; CT 306.02, BG 3; CT 9505.01, BG 1; and CT 9507, BG 4. Only two of these block groups have higher percentages of minorities than their respective counties. These block groups are CT 9507, BG 4 (31 percent), located in Pearl River County and CT 306.03, BG 3 (33 percent), located in Hancock County see **Table 5.2**. In Nicholson, (BG 4) the rail line is an existing facility and there would be only minimal impacts related to the construction of the Build Alternative. Construction activities in this area would be limited to upgrading the existing rail bed, which would include replacing rail, ties, and surface and lining the track; in addition, the timber trestle over Alligator Branch would be replaced. Block group CT 306.2, BG 3 as stated above, is mainly within the SSC acoustical buffer zone (see **Figure 5.3**).

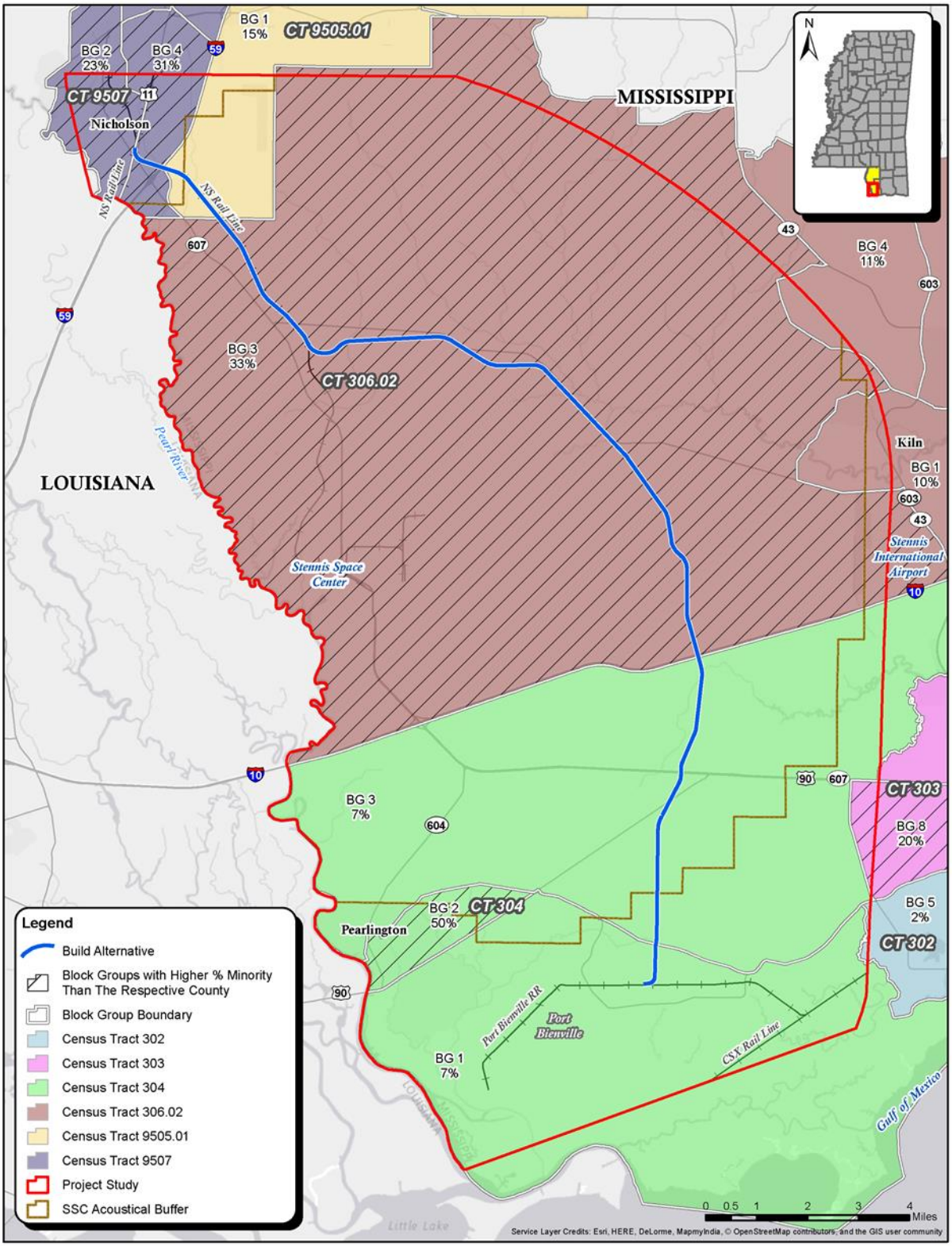
Table 5.2: Minorities Populations by Block Group

	Race	Total Population	White	Minority
HANCOCK COUNTY MISSISSIPPI				
Total County	Number	45,627	39,686	5,941
	% of Total	100%	87%	**13%**
CT 302, BG 5	Number	425	417	8
	% of Total	100%	98%	2%
CT 303, BG 8	Number	2,667	2,124	543
	% of Total	100%	80%	**20%**
CT 304, BG 1	Number	686	637	49
	% of Total	100%	93%	7%
CT 304, BG 2	Number	870	431	439
	% of Total	100%	50%	**50%**
CT 304, BG 3	Number	926	858	68
	% of Total	100%	93%	7%
CT 306.02, BG 1	Number	1,540	1,388	152
	% of Total	100%	90%	10%
CT 306.02, BG 3	Number	810	546	264
	% of Total	100%	67%	**33%**
CT 306.02, BG 4	Number	1,083	959	124
	% of Total	100%	89%	11%
PEARL RIVER COUNTY MISSISSIPPI				
Total County	Number	55,196	46,411	8,785
	% of Total	100%	84%	16%
CT 9505.01, BG 1	Number	2,027	1,732	295
	% of Total	100%	85%	15%
CT 9507, BG 2	Number	2,930	2,268	662
	% of Total	100%	77%	**23%**
CT 9507, BG 4	Number	2,213	1,533	680
	% of Total	100%	69%	**31%**

Source: U.S. Census Bureau, ACS 2011-2015 5-Year Estimates. Census Tracts in blue are those which the Build Alternative would cross. The bold and underlined percentages are higher than the respective counties.

Although the Build Alternative would cross through the block groups, where low-income and/or minority populations were identified, no relocations and no disproportionately high and adverse impacts would occur within minority and/or low-income areas. There would be two residences impacted by noise and vibration and one additional residence impacted by vibration within BG 4, near the northern-most end of the Study Area, at the U.S. 11 at-grade crossing. These impacts occur adjacent to an existing rail line and at-grade crossing. Mitigation for these impacted residences has not yet been determined but would be finalized before the FEIS. For more information on noise and vibration impacts, see **Section 5.9.**

Figure 5.3: Minority Population



As documented in **Section 5.3,** Socioeconomics, the Build Alternative is expected to bring development and employment opportunities to the area; these benefits would be experienced by all communities within the Study Area, including low-income and/or minority communities. Since the impacts (both adverse and beneficial) to minority and low-income households would not be disproportionate, there are no EJ concerns associated with the Build Alternative.

5.5 Communities and Community Facilities

5.5.1 Communities

There are no communities or neighborhoods within the limits of the Build Alternative corridor, although the two neighborhoods (Joe Fleming and Old Lower Bay Road) are adjacent or close to the corridor (approximately 600 and 1600 feet, respectively) (see **Figure 5.4**).

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Therefore, no effects, positive or negative, are expected to communities and neighborhoods.

Build Alternative. In Hancock County, the Build Alternative is approximately 0.3-mile from the closest house in the Old Lower Bay Road Community. Within Pearl River County, the alignment of the Build Alternative is adjacent to the rear of the Joe Fleming Road neighborhood in Nicholson; however, this is along an existing, inactive rail line. Since no new right-of-way would be required, none of the houses within these communities would be relocated as part of the project.

Under the Build Alternative, the community residents could experience delays during construction; periodic delays at the at-grade crossings; and visual or noise impairments from either construction or project implementation.

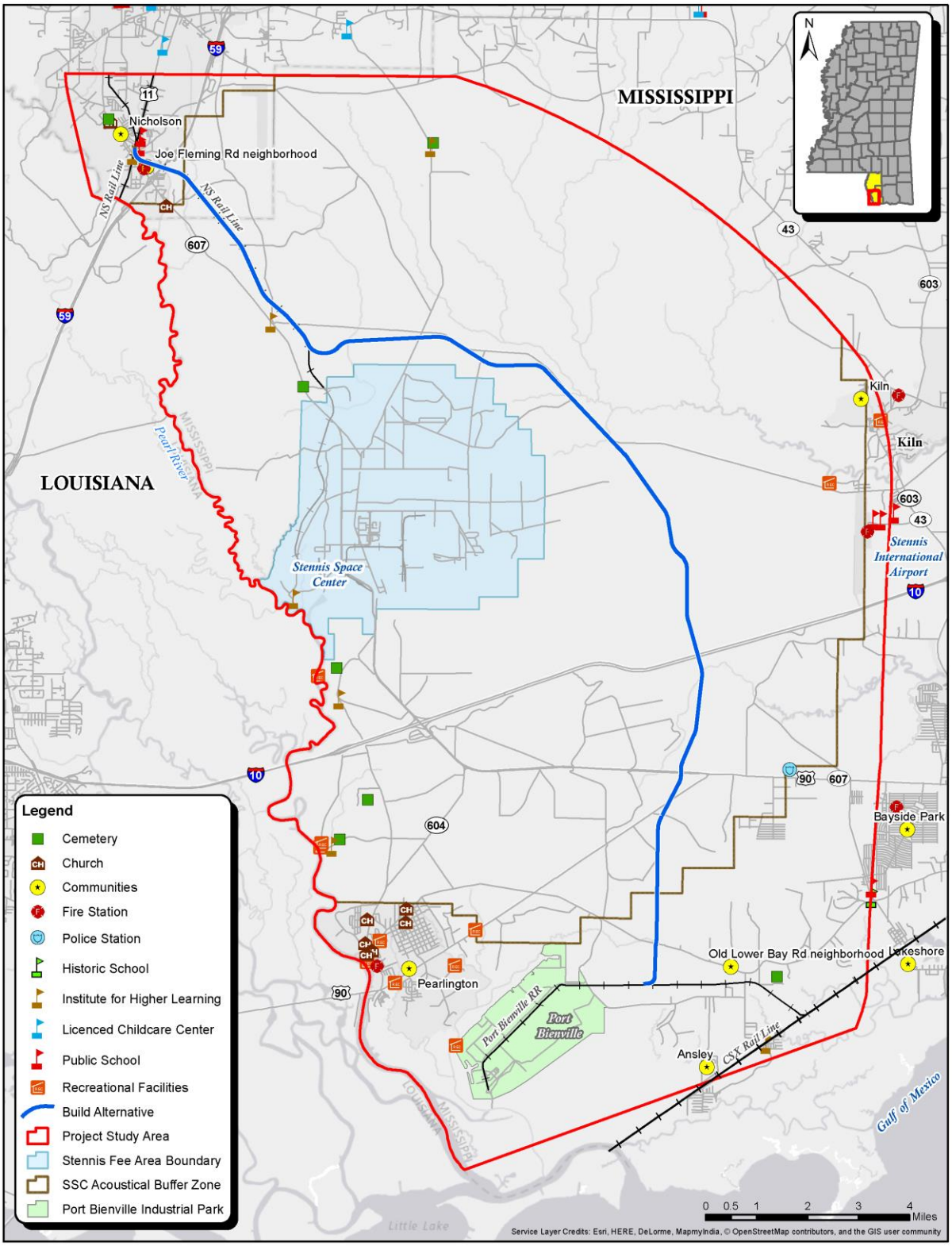
5.5.1.1 Access and Delays

The proposed Project includes numerous existing and proposed crossings. The four grade separated crossings (one existing roadway and three new roadways) should not cause any effects to existing travel patterns since they would bridge existing roads. The proposed at-grade crossings are being added at 13 public roads and nine private local roads.

Much of the roadway network consists of the unpaved, property access roads within the SSC acoustical buffer zone; these roads are not generally used by the public for daily travel. Residents along Old Lower Bay Road are the closest community to a new at-grade crossing and are most likely to experience changes in access or delays.

For detailed information on new road crossings, delays, and safety see **Section 5.18** Transportation Impacts.

Figure 5.4: Communities and Community Facilities



5.5.1.2 Noise Impacts

Under the Train Horn Rule (49 CFR Part 222), locomotive engineers must begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public grade crossings. If a train is traveling faster than 60 mph, engineers would not sound the horn until it is within ¼ mile of the crossing, even if the advance warning is less than 15 seconds. The maximum volume level for the train horn is 110 decibels. The minimum sound level remains 96 decibels. Localities can establish "new quiet zones" to counter the noise issues. Per the "Quiet Zone FRAWeb Report."[97] Nicholson is not currently a designated Quiet Zone.

For detailed information on noise impacts, see **Section 5.9** Noise and Vibration.

The Build Alternative would include minimal effects to the communities related to construction activities and the implementation of new grade crossings, specifically the at-grade crossings which may cause minor delays when trains are crossing.

5.5.2 Parks and Recreation

There are three parks, four specialty recreational facilities and three RV parks within the Study Area, however none are within or directly adjacent to the Build Alternative corridor. Most of these sites are near the towns of Pearlington (5) or Kiln (2). One is located within Port Bienville Industrial Park and others are in remote parts of the Study Area. See **Figure 5.4**.

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under the No-Build Alternative, there would be no impacts to park or recreation facilities in the Study Area. Neither parks nor recreational areas would experience changes in access, delays or visual or noise impairments from either construction or Project implementation.

Build Alternative. Under the Build Alternative, there would be no direct impacts to any parks or recreation sites within the Study Area. Visitors to parks and recreations areas could experience delays during construction. Impacts to accessibility to any parks during construction would be minimal and temporary. Post construction, visitors to parks and recreation areas could experience periodic delays at the proposed at-grade crossings, particularly those visitors using Old Lower Bay Road. However, because train traffic would be limited to one inbound and one outbound train per day, the likelihood of delays would be minimal.

5.5.3 Community Services

5.5.3.1 Schools

A total of four schools and one bus maintenance facility are located within the Study Area. Three of the schools, and the bus facility, are within Hancock County and one school is in Nicholson, Pearl River County. The closest school on the southern end of the project is South Hancock Elementary School, which is approximately 5 miles from the Build Alternative.[98] At the northern end of the project, Nicholson Elementary is located on U.S. 11, approximately 0.20-mile from the location where the existing inactive NS rail line crosses U.S. 11. There is no fence in front of the school along U.S. 11. While Mississippi does participate in the Safe Routes to School program, there are no sidewalks within the vicinity of the school.

[97] Federal Railroad Administration, http://www.fra.dot.gov/Page/P0889, website visited 6.1.16

[98] The school itself is outside the study area; however, due to the campus falling with the study area project affects have been included.

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under the No-Build condition, no effects, positive or negative, are expected to schools and school buses. Neither schools nor school buses would experience changes in access or delays from either construction or Project implementation. Nicholson Elementary would not have increased noise effects due to additional train traffic; however, the rail line is still being used. Train traffic crossing U.S. 11, which is approximately 0.20-mile from the school has the potential to cause noise impacts associated with existing rail operations.

Build Alternative. Under the Build Alternative, the schools and school buses could experience delays during construction; periodic delays at the at-grade crossings; and visual or noise impairments from either construction or project implementation.

Access and Delays

The Hancock County school bus routes located within the Study Area are primarily between Pearlington and South Hancock Elementary School. The Hancock County school bus shop is located within the Study Area, in Kiln. The existing school bus route along Lower Bay Road crosses two existing at-grade rail crossings of the PBRR at the entrance of the Port Bienville Industrial Park and above the intersection of Lower Bay Road and 34th Street north of Ansley. The proposed at-grade crossing at Old Lower Bay Road is the only proposed crossing that would directly affect the school bus route and it would have a minimal effect. While additional freight traffic could cause minor delays, the school system already uses a route that has the potential for train traffic. Alteration of the bus route is not viable based on the location of residences along Old Lower Bay Road and within Pearlington.

School bus routes were requested from both the Bay St. Louis-Waveland and the Pearl River School Districts, but none were received after multiple requests. Only Nicholson Elementary School in the Pearl River School District is within the Study Area. Given its proximity to the U.S. 11 at-grade crossing, it is likely that school buses may encounter delays at this crossing. However, Port Bienville Industrial Park estimates two trains at this crossing per day and therefore, delays are expected to be occasional and minimal.

Safety

The Build Alternative would include minimal effects to schools and school bus routes related to construction activities and the implementation of new grade crossings, specifically the at-grade crossings, which may cause minor delays when trains are crossing. On U.S. 11, pedestrian crossing signs to accommodate Nicholson Elementary School students should be considered, if warranted.

At the northern end of the Project, school bus routes picking up children south of Nicholson and the existing at-grade crossings on U.S. 11, traffic along Jackson Landing Road could also be affected. With Project implementation, the crossing on U.S. 11, which is currently in use for rail car storage, would have additional train traffic; therefore, school bus schedules could be affected, although freight trains do not run on regular daily schedules the way that passenger trains do.

Noise Impairments

Nicholson Elementary would be close enough to experience construction noise during the building of the Project; however, improvements would be limited to replacing and upgrading the current rail, cross-ties, surface, and lining the track for this section of the existing NS rail line. The schools on the southern end are not close enough to experience noise from construction or project implementation, specifically noise

associated with trains crossing at roadways. Nicholson Elementary would be affected with additional trains utilizing the NS rail line through Nicholson, due to additional noise, from the trains themselves and with train horns at the U.S. 11 (see **Section 5.9** for noise and vibration impacts).

5.5.3.2 Churches and Cemeteries

There are 8 churches and 8 cemeteries within the Study Area, all within Hancock County; however, none are within the corridor for the Build Alternative.

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under these conditions, no impacts, positive or negative, are expected to churches or cemeteries.

Build Alternative. Based on the location of the churches and cemeteries, in comparison to the location of the various communities, it is not likely that access would be affected by the proposed Project, in particular at any proposed at-grade crossings on local roads. However, this would be dependent on the routes Study Area residents travel to their respective churches and cemeteries. Unlike with school buses, independent drivers can change their routes as needed if they encounter trains. Also, most people attend churches and church activities that are within their own communities.

There would be no expected impacts, positive or negative, to churches and cemeteries, under the Build Alternative.

5.5.3.3 Public Government Facilities

There are eight public government facilities within the Study Area, including five federal facilities and three county facilities. Four of the five federal facilities are within SSC and one is in Nicholson; Hancock County Public Safety Complex and Hancock County Animal Shelter are located in Bay St. Louis and Kiln, respectively. None of these facilities are located within the corridor of the Build Alternative.

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under the No-Build Alternative, no public government facilities would experience changes in access, delays or visual or noise impairments from either construction or Project implementation.

Build Alternative. Under the Build Alternative, there would be no direct impacts to public facilities or relocations of these facilities. Visitors to public facilities could experience minor changes in accessibility, delays during construction, periodic delays at the new at-grade crossings, and visual or noise impairments from either construction or Project implementation.

5.5.3.4 Public/Private Social and Cultural Facilities

There is one public or private social facility within the Study Area, INFINITY, located within the SSC fee area. There are no such facilities within the limits of the Build Alternative.

No-Build Alternative. Under the No-Build Alternative, there would be no changes to existing conditions or impacts to social or cultural facilities.

Build Alternative. Under the Build Alternative, there would be no direct impacts to social or cultural facilities or relocations of these facilities.

It is not expected that any of the above public/private social and cultural facilities would be affected by the proposed Project since access to these facilities would most likely be along major roads where grade separations are proposed. However, access to this location could be affected if visitors chose to use Old Lower Bay Road due to a new at-grade crossing of the Build Alternative. The facilities are not close enough to experience visual impairments from either construction or Project implementation.

5.5.3.5 Medical and Health Services

There is one medical facility located within the Study Area – the Hancock Medical Center, located within Port Bienville Industrial Park.

No-Build Alternative. Under the No-Build Alternative, construction of the new rail line and/or improvements to existing rail lines in the Study Area would not occur; no other known projects are planned within the Project Corridor. Under the No-Build Alternative, no effects, positive or negative, are expected to medical facilities or emergency services.

Build Alternative. All medical facilities and emergency services are outside of the Build Alternative corridor and would not be directly impacted.

Visitors to the Hancock Medical Center – Family Health Clinic (Medical Services Port) located in the Port Bienville Industrial Complex could experience delays during construction; periodic delays at the at-grade crossings; or noise impairments from either construction or project implementation. Access to this medical facility would not be affected by any of the proposed grade-separated crossings at the major roads. However, due to the location of this facility in the southern section of the Study Area, access could include utilizing Old Lower Bay Road, which has a proposed at-grade crossing. This could cause access issues to the facility as trains can cause delays. However, since there is no emergency department, this would be considered a minimal affect. The facility is not close enough to experience visual impairments from either construction or project implementation, especially due to a curve in the road and tree cover.

Emergency service drivers could experience delays during construction and periodic delays at the at-grade crossings once the project is implemented. However, this would be dependent on the routes they travel to the various locations. Emergency service dispatchers and drivers may need to: be aware of alternate routes in case of trains blocking roadways; confirm they have accurate contact information for railway police; and maintain current maps translating road-rail intersections into railway location language. Up-to-date railroad crossing signals would be beneficial to emergency services and railroad safety coordination.[99] Citizens, ambulances or first responders traveling to hospitals or ambulances could experience moderate effects from the proposed project except in areas where they would have to cross at-grade crossings, such as at Old Lower Bay Road and within the SSC acoustical buffer zone. Any citizens, ambulances or first responders coming from the south or east could potentially have to cross at-grade crossings, which could cause brief delays in reaching their destinations. Although there is an existing rail line in Nicholson, in the northern portion of the Study Area, it is an inactive line; therefore, there is also the potential for moderate effects due to new train traffic to the area and the potential delays this could cause.

Therefore, there would be moderate effects to emergency services under the Build Alternative for further information see **Section 5.18** Transportation Impacts.

[99] Teamsters Canada Rail Conference, http://www.tcrc295.com/TCRC_News_August_19_2010.htm, website visited 6.10.16

5.5.3.6 Emergency Services – Law Enforcement and Emergency Management

Law Enforcement

There is one law enforcement agency, the Hancock County Public Safety Complex, and three fire departments (West Hancock Volunteer FD in Pearlington, SSC Fire Department and Nicholson Volunteer FD) within the Study Area. None of these emergency services is within the limits of the Build alternative

No-Build Alternative. Under the No-Build Alternative, no changes to law enforcement agencies or their services would be impacted.

Build Alternative. Under the Build Alternative, there would be no direct impacts to any law enforcement buildings or facilities. It is not expected that access to the Hancock County Public Safety Complex would not be affected by the proposed project since access would most likely be along major roads where grade separations are proposed. However, employees and visitors to the complex could experience delays during construction and, for those using Old Lower Bay Road, periodic delays at the proposed at-grade crossings. The complex is approximately 2.0 miles from the Build Alternative's crossing of U.S. 90; this would be a grade-separated crossing, which may be visible from a distance due to the flat terrain. Although the crossing may be visible from the complex, this visual intrusion would be minor and would not affect its function. The complex is also far enough away from the Build Alternative that noise impairment is not likely from project construction or implementation.

Emergency Management

There are no emergency management agencies within the Study Area.

No-Build Alternative. Under the No-Build Alternative, there would be no changes to any emergency management agency or their protocols.

Build Alternative. Because there are no emergency management agencies or facilities within the Study Area, there would be no impacts to these facilities. However, depending on how residents travel to the evacuation routes, minimal effects could be experienced at the at-grade crossing at Old Lower Bay Road. Although there are numerous proposed at-grade crossings within the SSC acoustical buffer zone, there are no inhabitants within that area. In the event of an emergency, employees at SSC would exit to SR 607 then travel south to I-10 or north to I-59, both of which are evacuation routes. The Build Alternative would cross both of these routes via grade-separated crossings, therefore, no impacts are expected in accessing these evacuation routes.

Overall, there would be minimal effects to emergency management agencies and their protocols under the Build Alternative.

5.6 Cultural Resources

No-Build Alternative. Under the No-Build Alternative, no archaeological or architectural resources would be impacted.

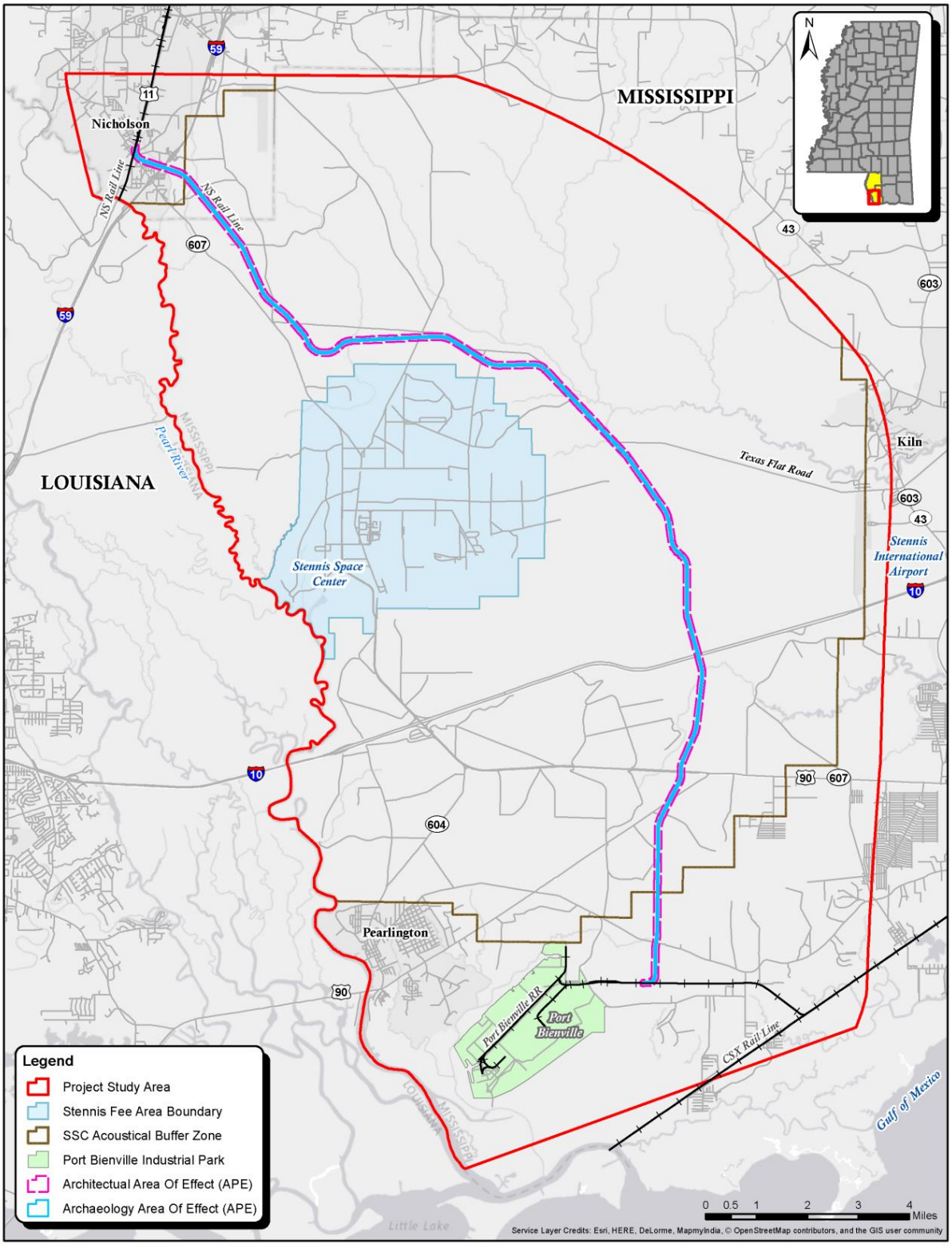
Build Alternative. No previously recorded archaeological sites were identified within the Archaeological APE. A total of 24 linear archaeological sites were identified within the Archaeological APE (**Table 5.3** and **Figure 5.5**). Thirteen of the 24 linear sites have been determined as not eligible for listing on the NRHP. Eleven sites are considered as "unknown" for their eligibility determination. While sites with an NRHP

eligibility determination of "unknown" are present, MDAH/SHPO does agree that the construction of the Project would not have an adverse impact on these sites.

Table 5.3: Archaeological Sites

Site Number	Context	NRHP Recommendation
22Ha171	Historic	Unknown
22Ha181	Historic	Unknown
22Ha766	Historic	Not Eligible
22Ha767	Historic	Unknown
22Ha768	Historic	Not Eligible
22Ha769	Historic	Not Eligible
22Ha770	Historic	Unknown
22Ha771	Historic	Not Eligible
22Ha772	Historic	Unknown
22Ha773	Historic	Not Eligible
22Ha774	Historic	Not Eligible
22Ha775	Historic	Not Eligible
22Ha776	Historic	Not Eligible
22Ha777	Historic	Not Eligible
22Ha778	Historic	Not Eligible
22Ha789	Historic	Not Eligible
22Ha780	Historic	Not Eligible
22Ha781	Historic	Not Eligible
22Ha782	Historic	Unknown
22Ha783 (a – g)	Historic	Unknown
22Pr158	Historic	Unknown
22Pr180	Historic	Unknown
22Pr967	Historic	Unknown
22Pr968	Historic	Unknown

Figure 5.5: Cultural Resources APEs



No previously recorded architectural resources were within the Architectural APE. See **Figure 5.5**. Three newly recorded historic resources were identified during the architectural survey and are associated with NASA Turn (Site 22Ha767) (**Table 5.4**). Resource 1 is an approximately 145-foot-long open-deck timber trestle over Second Alligator Branch. Resource 2 is an approximately 145-foot-long two-span through plate girder bridge over I-59 Alligator Branch. Resource 3 is a prefabricated corrugated metal pipe culvert over Indian Camp Branch.

Table 5.4: Newly Documented Historic Resources

Site Number	Type	Location	NRHP Recommendation
Resource 1 (HS1)	Southern Railroad Bridge over Second Alligator Branch	89° 40' 27.07" W 30° 28' 6.89" N	Not Eligible
Resource 2 (HS2)	Southern Railroad Bridge over I-59 and Alligator Branch	89° 41' 3.09" W 30° 28' 24.59" N	Not Eligible
Resource 3 (HS3)	Southern Railroad Culvert over Indian Camp Branch	89° 39' 56.05" W 30° 27' 34.00" N	Not Eligible

All three were built by Southern Railway for transporting construction materials and other material to the Mississippi Test Operations site, now known as the John C. Stennis Space Center. Individually, none of the three resources rises to the level of historic significance as defined by the National Park Service. Although the resources were built to enable construction of the NRHP-listed Rocket Propulsion Test Complex, they are not associated with the mission of the complex. They provided necessary infrastructure and support for the complex, but were not specifically associated with complex's mission or any historic themes or events. The structures are not historically or architecturally significant. Therefore, the Resources are recommended not eligible for the National Register of Historic Places (NRHP) under Criteria A-D (see **Figure 5.6**). Therefore, construction of the Project would not affect any NRHP eligible architectural sites.

5.7 Federally Funded and Protected Public Facilities

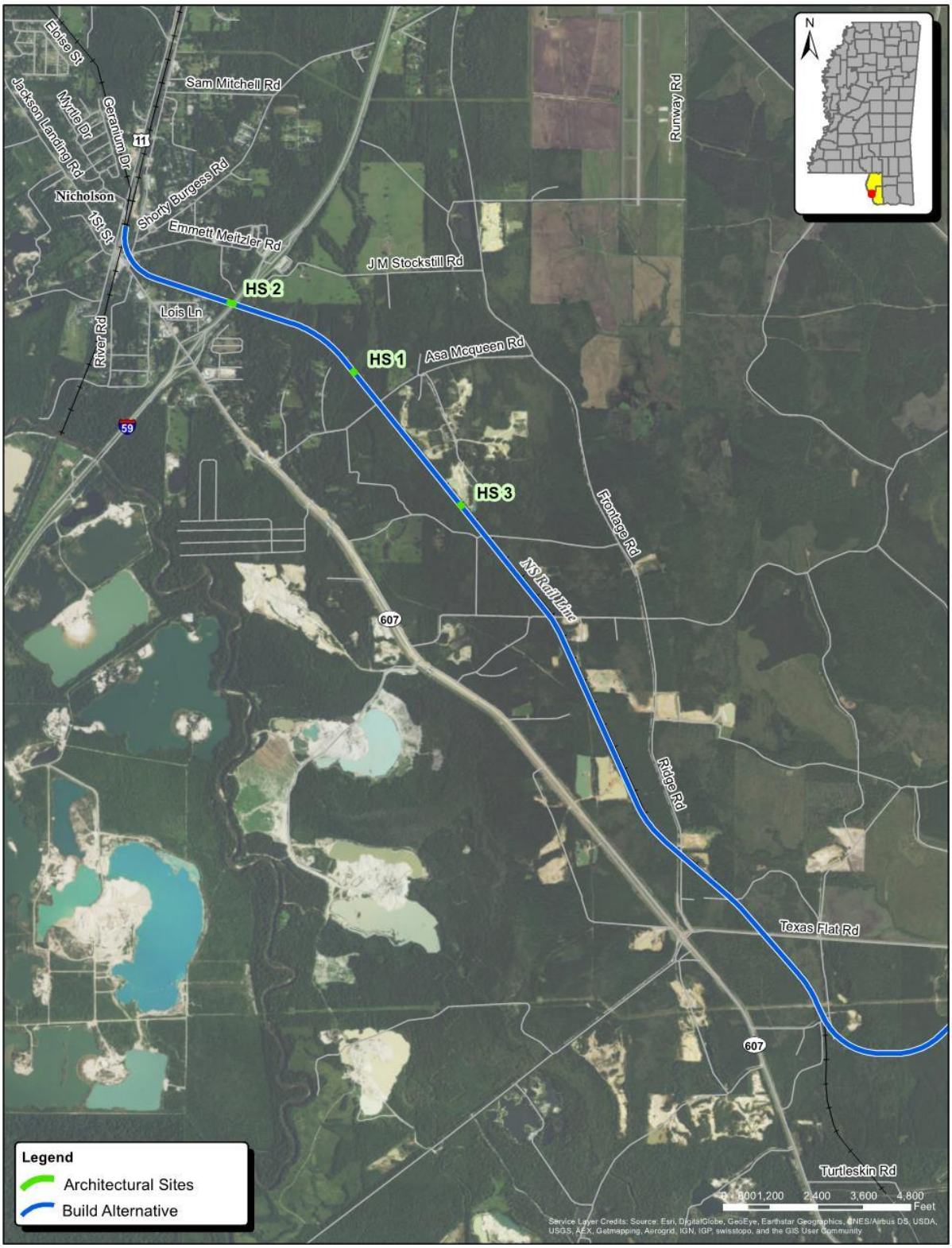
5.7.1 Section 4(f) and 6(f) Properties

There are four publicly owned park properties, McLeod Park, Whites Road Park, Pearlington Boat Launch and Curtis Johnson Boat Launch located within the Study Area.

No-Build Alternative. The No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS mainline and does not include the construction of any new railroad features, it would have no impacts to either Section 4(f) or Section 6(f) properties.

Build Alternative. The Build Alternative would have no impacts on Section 4(f) or Section 6(f) properties. McLeod Park would be located approximately 3.3 miles from the Build Alternative. The second property is Whites Road Park which is located approximately 5.3 miles from the Build Alternative. The third property is the Pearlington Boat Launch, located approximately 5.7 miles from the Build Alternative. The fourth property is Curtis Johnson Boat Launch located approximately 7.4 miles from the Build Alternative. Because of the distance of the project from the Section 4(f) resources, the Project would have no impact on these parks.

Figure 5.6: Newly Recorded Architectural Sites



Additionally, two of these parks, McLeod Park and Whites Road Park are protected under Section 6(f); because of the distance maintained between the Build Alternative and the parks, the Project would have no impact on any Section 6(f) properties.

The Build Alternative would not affect the any Section 4(f)/6(f) protected properties.

5.8 Air Quality

No-Build Alternative. The No-Build Alternative would have no direct effect on air quality since the Project would not be built. It could potentially have impacts on future air quality or future climate change trends since it would not provide improved transportation facilities for the area.

Build Alternative. The Council on Environmental Quality (CEQ) recently issued guidance (Executive Office of the President, CEQ, Memorandum by Christina Goldfuss, CEQ, to Heads of Federal Departments and Agencies, August 1, 2016) recommending that NEPA documents address climate change by evaluating:

1) The effect of the Project in contributing to climate change, and
2) The effect of climate change on the Project.

With respect to the first item, the proposed Project would be expected to decrease global greenhouse gas emissions, primarily in the form of carbon dioxide (CO2), compared to the No-Build Alternative. This prediction is based on an assumption of freight hauling by truck, or by a longer rail route (another carrier) for the No-Build Alternative, compared to hauling it by train on a more direct route. Because trains are substantially more efficient than trucks on a gallon of fuel combusted per gross freight-ton-mile basis, and because CO_2 emissions are directly proportional to fuel use, Project implementation would result in a decrease in greenhouse gas emissions for any freight that switches from truck to rail. For any freight that is diverted from a longer rail line to the proposed line, the shorter haul distance would also result in a decrease in greenhouse gas emissions.

In a report from FRA, rail fuel efficiency varies from 156 to 512 ton-miles per gallon, while truck fuel efficiency ranges from 68 to 133 ton-miles per gallon.[100]

With respect to the second item, the effects of climate change on the Project, the issue of greatest concern would be the potential effect of climate change on sea level rise, and how that could impact the Project infrastructure, given the Project would be located at low elevations, not far from a coastal area. Current average rates of global sea level rise based on satellite measurements are approximately 1 foot per century (http://sealevel.colorado.edu/), and are about 0.5 feet per century based on actual tide gauge data (Houston and Dean, 2011). The tide gauge data indicate no substantial acceleration or deceleration in rate of sea level rise in recent decades (Houston and Dean 2011). Given the project would be built generally from 10 feet to about 40 feet above sea level, and the project infrastructure's expected useful life is likely on the order of a 100 years or less, it is not expected that sea level rise, assuming it continues at the historical rate, would adversely affect the project infrastructure during its expected useful life.

[100] A Final Report Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors (November 1, 2009), Accessed June 8, 2017.

5.9 Noise and Vibration

The majority of the Study Area is within the 125,000-acre SSC acoustical buffer zone, which mitigates noise impacts associated with the testing of various rocket engines at SSC. Habitation and building structures that could be inhabited are strictly prohibited within the buffer zone, which is enforced by SSC. Since no receptors are located within the SSC acoustical buffer zone, the noise and vibration assessment that was conducted applies only to the northern-most portion of the Study Area and the southern-most portion of the Study Area where the track alignment extends and terminates beyond the limits of the SSC buffer zone.

No-Build Alternative. The No-Build Alternative would have no impacts associated with noise and vibrations and noise and vibration would remain at existing levels.

Build Alternative. A general assessment approach for noise and vibration impacts was conducted for the Build Alternative. Noise and vibration contours were overlaid upon digital aerial photographs, and impacted receptors were identified inside the contours. The following are the results from the general assessment.

5.9.1 Estimated Noise Effects

The results of the general assessment approach for noise impacts are shown in **Figure 5.7** with noise contours overlaid upon digital aerial photographs, and impacted receptors identified inside the contours.

Results of the general assessment determined the distance between the proposed rail line and the noise impact contour. This distance is also a function of existing noise levels; therefore, it varies. Noise contours narrow where background noise levels are louder (i.e. near highways, etc.). **Table 5.5** summarizes the range of existing noise levels throughout the entire Study Area, and the range of noise impact contour distances associated with wayside noise.

Table 5.5: Wayside Noise Impact Distances

FTA Noise Category	Existing Sound Level Ldn (dBA)	Distance to Moderate Impact (feet)	Distance to Severe Impact (feet)
2	35	161	70
2	40	77	34
2	45	53	19
2	50	43	17
2	55	32	13
2	60	22	9
2	65	14	6
2	70	8	4
2	75	7	2

Figure 5.7: General Assessment Noise Contours

Locomotive horn noise impact contours were determined using the FRA locomotive horn noise model. **Table 5.6** presents the results of those calculations.

Table 5.6: Locomotive Horn Noise Impact Contour Dimensions

Impact Distances in Feet	U.S. 11 (feet)	Lower Bay Road (feet)
Impact Distance at Crossing	555	1,111
Severe Impact Distance at Crossing	290	703
Impact Distance at 1/2 Zone Length	429	882
Severe Impact Distance at 1/2 Zone Length	217	547
Zone Length	780	780

Results of applying the noise impact distances identified above to digital aerial photos indicate that 14 receptors have potential to experience noise impacts, as shown in **Table 5.7** and **Figure 5.7**. Receptor No. 3 has no noise impact but has a vibration impact as discussed in **Section 5.10.4**.

Table 5.7: Noise Analysis Results

Receptor ID	Type	Land Use Category	Noise Metric (dBA)	Impact Magnitude
1	Residence	Category 2	Outdoor L_{dn}	Severe
2	Residence	Category 2	Outdoor L_{dn}	Severe
3	Residence	Category 2	Outdoor L_{dn}	No impact
4	Residence	Category 2	Outdoor L_{dn}	Moderate
5	Residence	Category 2	Outdoor L_{dn}	Moderate
6	Residence	Category 2	Outdoor L_{dn}	Moderate
7	Residence	Category 2	Outdoor L_{dn}	Moderate
8	Residence	Category 2	Outdoor L_{dn}	Moderate
9	Residence	Category 2	Outdoor L_{dn}	Moderate
10	Residence	Category 2	Outdoor L_{dn}	Moderate
11	Residence	Category 2	Outdoor L_{dn}	Moderate
12	Residence	Category 2	Outdoor L_{dn}	Moderate
13	Residence	Category 2	Outdoor L_{dn}	Moderate
14	Residence	Category 2	Outdoor L_{dn}	Moderate
15	Residence	Category 2	Outdoor L_{dn}	Moderate

Twelve receptors have potential to experience moderate noise impacts and two receptors have potential to experience severe noise impacts. All noise impacts are at the northern-most end of the Study Area, and are from the predicted horn noise at the U.S. 11 at-grade crossing.

Eliminating locomotive horn use at the U.S. 11 at-grade crossing would mitigate all severe noise impacts. However, it may not be cost-effective to implement quiet zones and cease use of locomotive horns at public at-grade crossings in the Study Area as a means to mitigate two severe noise impacts. The use of wayside horns may be explored as a mitigation measures. Other mitigation measures could include receiver-based treatments such as building insulation programs or negotiated settlements. Building insulation programs refers to the acoustical insulation of the building, although sometimes thermal insulation can be utilized for

additional acoustical insulation. Other building insulation measures include air conditioning, improved seals, improved doors and windows, or relocating vents or doors to another side of the building.

Receiver-based noise mitigation measures may be more cost effective for the two severe noise impacts. Where moderate noise impacts are projected to occur, occupants may experience annoyance when trains are nearby. Noise mitigation measures are not recommended for locations where moderate noise impacts are projected to occur. FRA does not require mitigation for moderate noise impacts, because the magnitude of the change in noise levels or overall noise level is modest and not projected to substantially affect sleep or other activities.

5.9.2 Estimated Vibration Effects

Results of the general vibration assessment indicate that vibration impacts are projected to occur at a distance of 169 feet from the rail line. Based on this distance, three receptors have the potential to experience vibration impacts, as shown in **Table 5.8** and **Figure 5.8**. All vibration impacts are at the northern-most end of the Study Area. Two of the receptors with vibration impacts are the same two receptors with severe noise impacts (receptors 1 and 2). There are no ground-borne noise impact thresholds for Category 1 land uses in the Study Area because equipment sensitive to ground-borne vibration is generally not sensitive to ground-borne noise.

Table 5.8: Vibration Impacts

Receptor ID	Type	Land Use Category
1	Residence	Category 2
2	Residence	Category 2
3	Residence	Category 2

Vibration mitigation is very difficult to implement on freight train projects due to the very heavy axle loads. Vibration mitigation measures available for transit train projects are not effective for freight trains. Operational restrictions such as reduced speed may reduce the magnitude of vibration experienced at receptors, but would increase the duration of vibration as well as other effects to noise exposure and road traffic delays. Track and wheel maintenance is considered a viable mitigation option for ground-borne vibration of freight trains; this can include regularly scheduled rail grinding, wheel truing programs, vehicle reconditioning programs, and use of wheel- flat detectors where feasible.

5.9.3 Noise and Vibration Summary

Noise and vibration associated with the proposed Project have the potential to affect residential and commercial properties adjacent to the rail line. Using methods published by the FTA/FRA, Project-related noise and vibration was evaluated to assess potential impacts. Analysis results indicate that Project-related noise and vibration has the potential to exceed impact thresholds, as defined by the FTA/FRA, at multiple receptors within the Study Area. It may not be cost effective to cease use of locomotive horns at public at-grade crossings in the Study Area. Therefore, noise mitigation measures, such as eliminating locomotive horn use at the U.S. 11 at-grade crossing, retrofitting buildings with air conditioning and improved storm doors and windows, or settlements, would be considered where severe noise impacts are projected to occur and would be finalized prior to the Final Environmental Impacts Statement (FEIS). The future Project Sponsor would be responsible for implementation of noise mitigation measures. There are no practical means of mitigating ground-borne vibration impact. See the *Noise and Vibration Report*, January 2017 **Appendix D**.

Figure 5.8: General Assessment Vibration Contours

5.10 Geological Resources

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS rail and does not include the construction of any new railroad features, it would have no impacts to geological resources within the area.

Build Alternative. The alignment is located within the coastal plain deposits of Pearl River and Hancock Counties, Mississippi. The deposits are noted as Holocene and a part of the late Quaternary period, ranging in age between 0.01 Ma to present. Near surface soils range from Coarse Sands and gravels to fine grained clay soils. According to the United States Department of Agriculture *Web Soil Survey*, near surface soils are predominately fine grained soils with low plasticity and low organic content. Soils in the area are noted to have a medium to high risk of corrosion to concrete and a high risk of corrosion to steel, as are common in coastal areas. The northern section of the alignment, from Nicholson to Interstate 10 is noted to be moderately suitable for roadways and structures, whereas the section south of Interstate 10 is noted to be poorly suitable given the wetlands and undisturbed wooded areas. Mean soil permeability in the area is estimated between 0.5 and 2.0 inches per hour, which represents relatively permeable, free-draining soils.

The alignment crosses several creeks and streams as well as small tributaries. Soils near these water features would likely contain more organic material as well as fine-grained soils. These soils have a moderate to high compressibility and are difficult to work with during construction.

Deep coastal deposits are generally deep and relatively compressible. The alignment would generally vary from near grade to heights on the order of 5 feet except at grade crossings where fill height would be greater. Soil impacts on constructability could be handled by preloading (adding additional fill to account for settlement) and deep foundations for bridge structures. Long term settlement is a concern throughout the area but would be investigated during design to limit the degradation of the embankment and railway alignment.

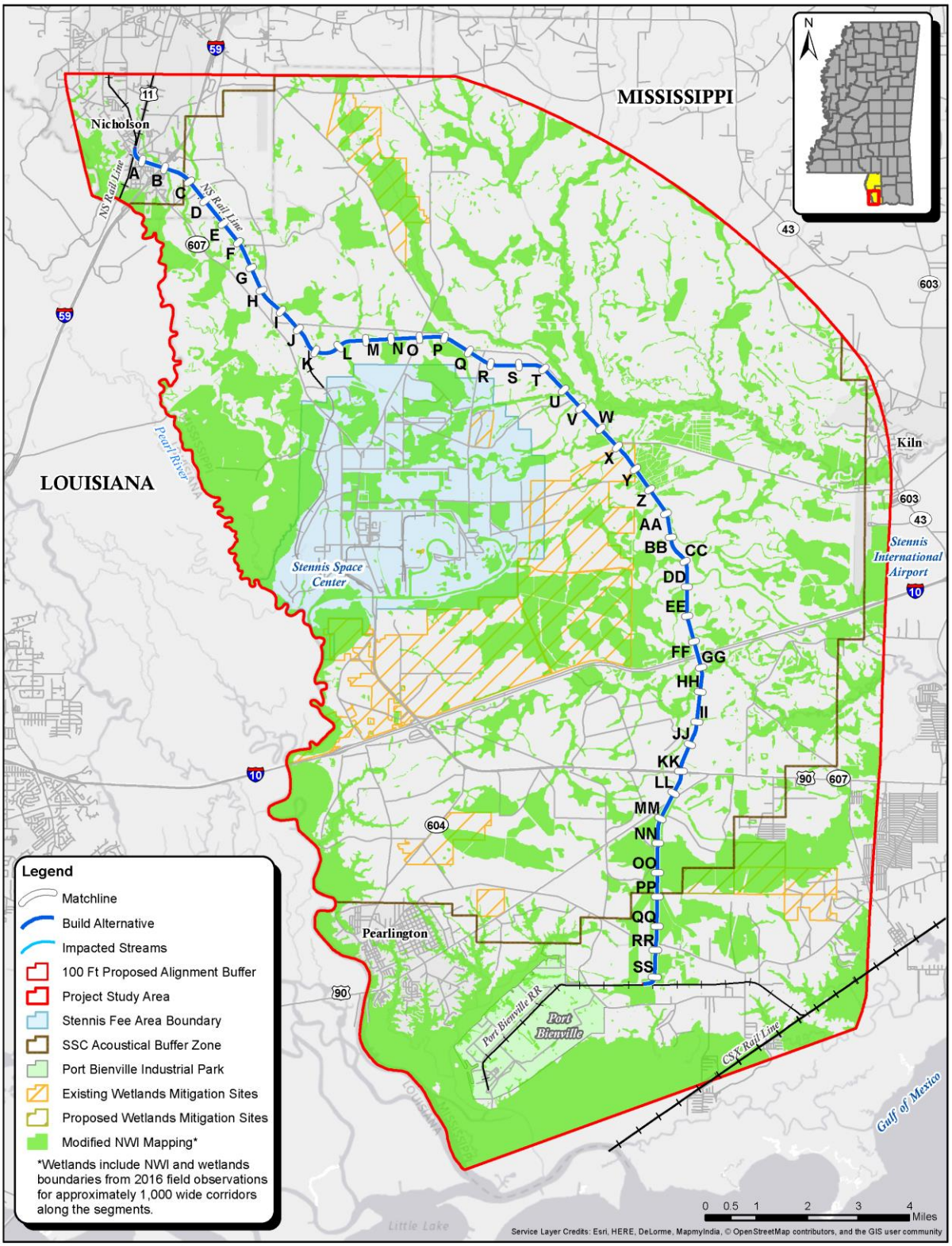
5.11 Wetlands

5.11.1 Impacts to Wetlands, Streams, and Other Water Bodies

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS rail and does not include the construction of any new railroad features, it would have no impacts to wetlands, streams, and other waterbodies.

Build Alternative. The construction of the Build Alternative would impact wetlands, streams, and other waters types located within the construction limits of the proposed project. The proposed right-of-way for the project has been determined to be 100 feet wide. During the design phase, construction limits would be defined; construction limits are estimated to be approximately 75 feet wide, which would further reduce wetland impacts. Impacts discussed in this section are based off a 100 feet wide corridor. Both temporary and permanent impacts would occur in order to construct the proposed Project (see **Figure 5.9**: Wetland Index Map and Wetland Map Book in **Appendix E**).

Figure 5.9: Wetland Index Map



Wetland and stream map book associated with index map is in Appendix E

The section of the rail line from Nicholson to just past Texas Flat Road constructed would involve construction on the existing NS rail alignment. Construction activities for this section of the project would be limited to rail and tie replacement and surface and lining the track. It is anticipated that the timber trestle over Alligator Branch would be replaced. It is anticipated the impacts to wetlands and streams in this area would be considered temporary impacts. The remainder of the proposed project would be on new location requiring permanent impacts to the resources within this area.

In developing the Build Alternative, considerable time was taken to avoid waters of the U.S., including wetlands, during the planning and preliminary design process. Impacts to wetlands and other waters have been minimized by modifying the alignment to the extent practicable. All impacts to waters of the U.S., including wetlands, and mitigation assessments identified within this section are considered preliminary and have been calculated for planning purposes which are subject to USACE regulatory approval.

As shown in **Table 5.9**, approximately 173.59 acres of wetlands and other waters, and approximately 2,482 linear feet of streams would be impacted by the new railroad and associated infrastructure.

Table 5.9: Resources Potentially Impacted by the Proposed Project - Rehabilitation of Existing NS RR and Construction of New Rail

Resource Type	Linear Feet within 100' Right-of-way	Acreage within 100' Right-of-Way	Temporary Impacts within 100' Existing Rail Right-of-way	Temporary Impacts due to Bridging (New Location Section)	Total Temporary Impacts
STREAM IMPACTS					
Intermittent	1,669	_	1669	_	1669
Perennial	741	_	225	284	509
Ephemeral	46	_	46	_	46
Stream Total (LF)	**2,482**	_	**1,940**	**397**	**2,224**
WETLAND IMPACTS					
Emergent (PEM)	-	9.10	0.33	_	0.33
Bottomland Hardwood (PFO)	_	37.08	0.23	_	0.23
Pine Savannah (PFO)	_	108.90	0.09	_	0.09
Scrub-Shrub (PSS)	_	16.50	0.63	_	0.63
Wetland Total (Acres)	_	**171.58**	**1.28**	_	**1.28**
OTHER IMPACTS					
Open water	_	1.83	0.22	_	0.22
Riverine	_	0.18	0.07	0.11	0.18
Other Total (Acres)	_	**2.01**	**0.29**	**0.11**	**0.40**
Total	2,482	**173.59**	**1.57**	**0.11**	

Quantities are based on wetland delineation for the build alternative

The majority of the wetlands observed within the Survey Corridor have been altered by silviculture practices, development, and transmission line and pipeline right-of-way. Although these wetlands are not of the highest quality due to anthropogenic disturbances, they still provide significant filtration and flood mitigation functions.

Impacts from the proposed Project have been evaluated as either temporary or permanent. The type of impact (temporary vs. permanent) varies based on the location along the rail alignment. As described above, the Project from Nicholson to Texas Flat Road would be constructed on the existing rail line. Since the existing rail bed would be used, impacts would be considered as temporary since construction activities would only require the rehabilitation of the existing NS railroad line. Ballast and rail ties would be replaced, and new track constructed. It is anticipated that the timber trestle over Alligator Branch would be replaced; other culvert structures along this section are not anticipated to be replaced or modified but a thorough inspection of these structures would be conducted during design. Other activities could include the movement of equipment, staging and stockpile areas, and other ground disturbance.

Approximately 1,940 linear feet of stream impacts are located along the existing NS rail line, where the existing rail bed would be used. This is approximately 75 percent of the total stream footage within the proposed right-of-way for the Project. These streams could be temporarily impacted during the rehabilitation of the existing rail line but would not be permanently impacted. A total of 1.28 acres (along the existing line) of wetland impacts would also be considered temporary.

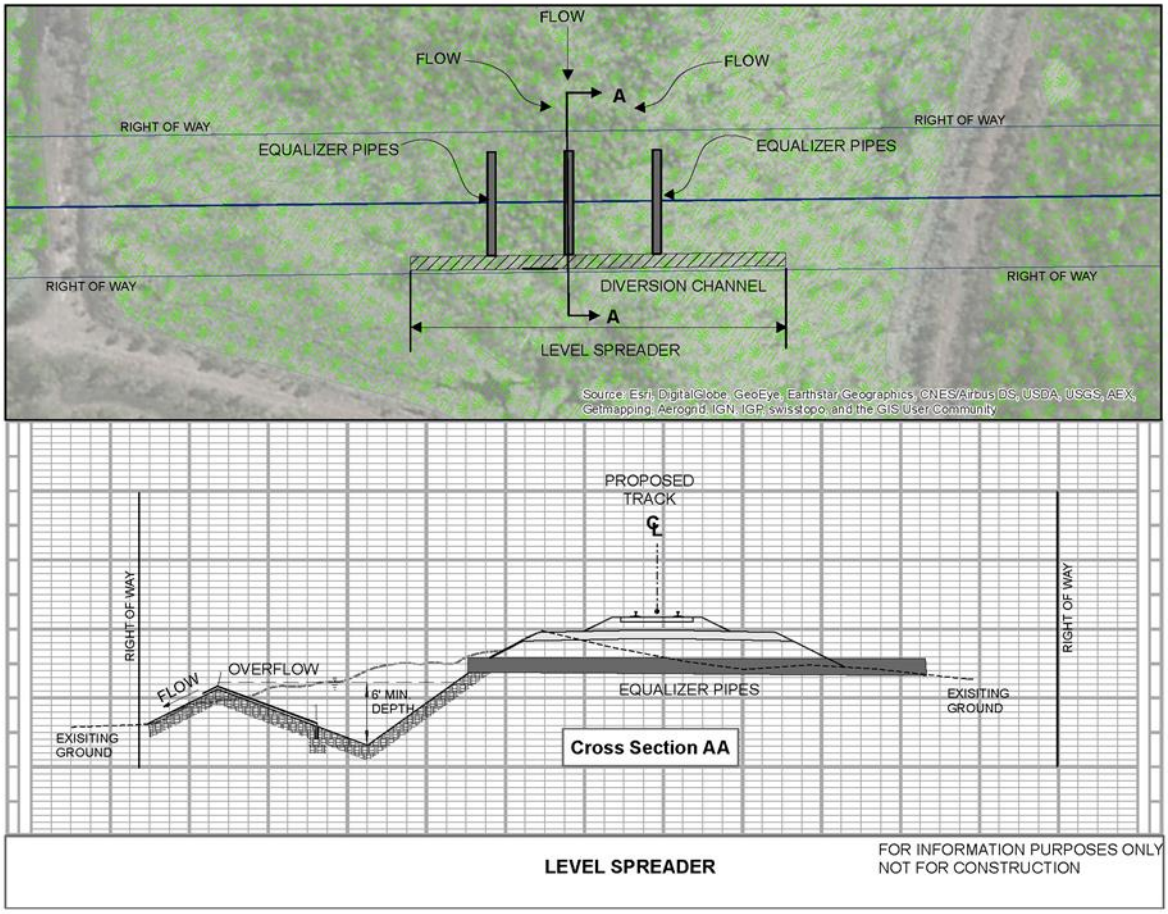
The remainder of the rail line from just past Texas Flat Road to the connection into the existing PBRR at the southern terminus of the Project would be constructed on new location. Impacts to wetlands and streams within the required right-of-way would occur resulting in the permanent conversion of wetlands or aquatic habitat to uplands. Bridge structures are proposed over two named streams (Turtle Skin Creek and Bayou LaCroix) and a culvert on the remaining named stream (Wolf Branch Creek). This would further reduce the remaining permanent stream impacts by approximately 28 linear feet. Additional impacts could occur near road crossing and drainage structures to accommodate for those features.

A detailed hydrology study has not be completed for the proposed Project. However, it appears that the majority of the hydrologic conditions of this area are atributed to sheet flow. During coordination with resource agencies, it was suggested that optimally this type of hydrology should be maintained, which could be accomplished by using stabilizer pipes and leveler spreader as shown in **Figure 5.10**.

The future Project Sponsor would be responsible for implementation of mitigation measures for wetlands/waters of the U.S. Best management practices would be implemented by the contractor to avoid and minimize impacts to wetlands and streams were practicable. Surface matting is an option that would reduce soil disturbance, and silt fencing where construction activities occur adjacent to streams. Permanent impacts or conversion to uplands would be confined to the surface area occupied by the new rail embankment. Any impacts directly adjacent to the new embankment would be considered temporary if restored to pre-construction elevations and with the re-establishment of native vegetation. Post-construction, temporary impact areas would be restored to pre-construction elevation by the contractor, and native vegetation should be able to re-establish quickly. No conversion of wetlands or net loss of habitat is anticipated from the rehabilitation/construction of the existing portion of the Project.

Construction of the proposed Project would require a permit under Section 404 of the Clean Water Act (CWA) to authorize impacts to waters of the U.S., including wetlands. The compensatory mitigation requirements under Section 404 would provide for the replacement of the functions of wetlands and water impacted by the proposed Project and would be provided by the future Project sponsor. Because the proposed Project would not appreciably diminish the availability of functional wetlands and other waters within the proposed right-of-way, there would be no fragmentation of wetland vegetative communities and; therefore, short-term and long-term impacts would be localized and minor.

Figure 5.10: Stabilizer Pipes and Leveler Spreader



5.11.2 Coastal Zone Management

The Study Area includes two coastal zone counties—Pearl River and Hancock Counties—and would need a coastal zone "federal consistency" determination[101]. Federal consistency ensures that federal actions that are reasonably likely to affect any coastal use or resources will be consistent with the enforceable policies of a coastal state's federally approved coastal management program.

Implementation of the Mississippi Coastal Program (MCP) is the primary responsibility of the Office of Coastal Resources, which is part of the Mississippi Department of Marine Resources (MDMR).[102] The MCP was legislatively mandated in Section 57-15-6 of the Mississippi Code of 1972 and approved by the National Oceanic and Atmospheric Administration (NOAA) under the provisions of the Coastal Zone Management Act (CZMA) of 1972.

The Coastal Zone Consistency determination would be coordinated with the MDMR via distribution of the Draft EIS. Final coordination would be completed prior to the signing of the Record of Decision. The MDMR will review the proposed Project based upon the provisions of the MCP and Section 307 of the

[101] https://coast.noaa.gov/czm/consistency/ accessed 9/25/17
[102] www.dmr.ms.gov/index.php/coastal-resources-management, accessed on 8/16/16

CZMA of 1972, as amended, to determine if the activities are consistent to the maximum extent practicable with the MCP.

The Project is expected to receive concurrence from MDMR that it is consistent with the Coastal Zone Management Program for the following reasons:

- The proposed rail line has a coastal-dependent use given its connection to the Port Bienville Industrial Park.
- The proposed rail line helps locate new commercial and industrial development in, or adjacent to, existing developed areas.
- The proposed north/south rail connection would provide an option to move rail equipment, industrial equipment, materials, and other critical components out of harm's way to the NS Railroad in advance of tropical storm surges, thereby improving coastal resiliency and preventing potential hazardous conditions within the coastal zone.

Project impacts to wetlands within the coastal zone are unavoidable given the distribution of wetland areas throughout the Study Area (see **Figure 5.9: Wetland Index Map** and wetland map book in **Appendix E** and *Draft Wetland and Threatened and Endangered Species Report, December 2016* **Appendix C**). Wetlands and stream impacts would be mitigated as part of the 404/401 permitting process.

5.12 Floodplains

5.12.1 Floodplain and Floodway

No-Build Alternative. Since the No-Build Alternative would leave the existing PBRR in its current configuration without a north-south connection to the NS rail line and does not include the construction of any new railroad features, it would not impact floodways or the floodplain.

Build Alternative. Executive Order 11988 requires that any practicable alternatives to locating in the floodplain be identified and evaluated, including alternative sites outside of the floodplain. As shown in **Figure 5.11** there are no alternative routes that would connect the Port Bienville Railroad to the existing NS rail that would avoid the floodplain, so there are no practicable Build Alternatives to locating the Project outside the floodplain.

Approximately 96.74 acres of Project right-of-way (existing and new right-of-way) would be within the 100-year floodplain (Zones A and AE) as shown in **Figure 5.11** and **Table 5.10**. The existing NS right-of-way extends 5.4 miles from Nicholson, Mississippi to south of Texas Flat Road where the proposed rail alignment departs the existing NS spur and new construction begins.

Figure 5.11: Floodplain Impacts

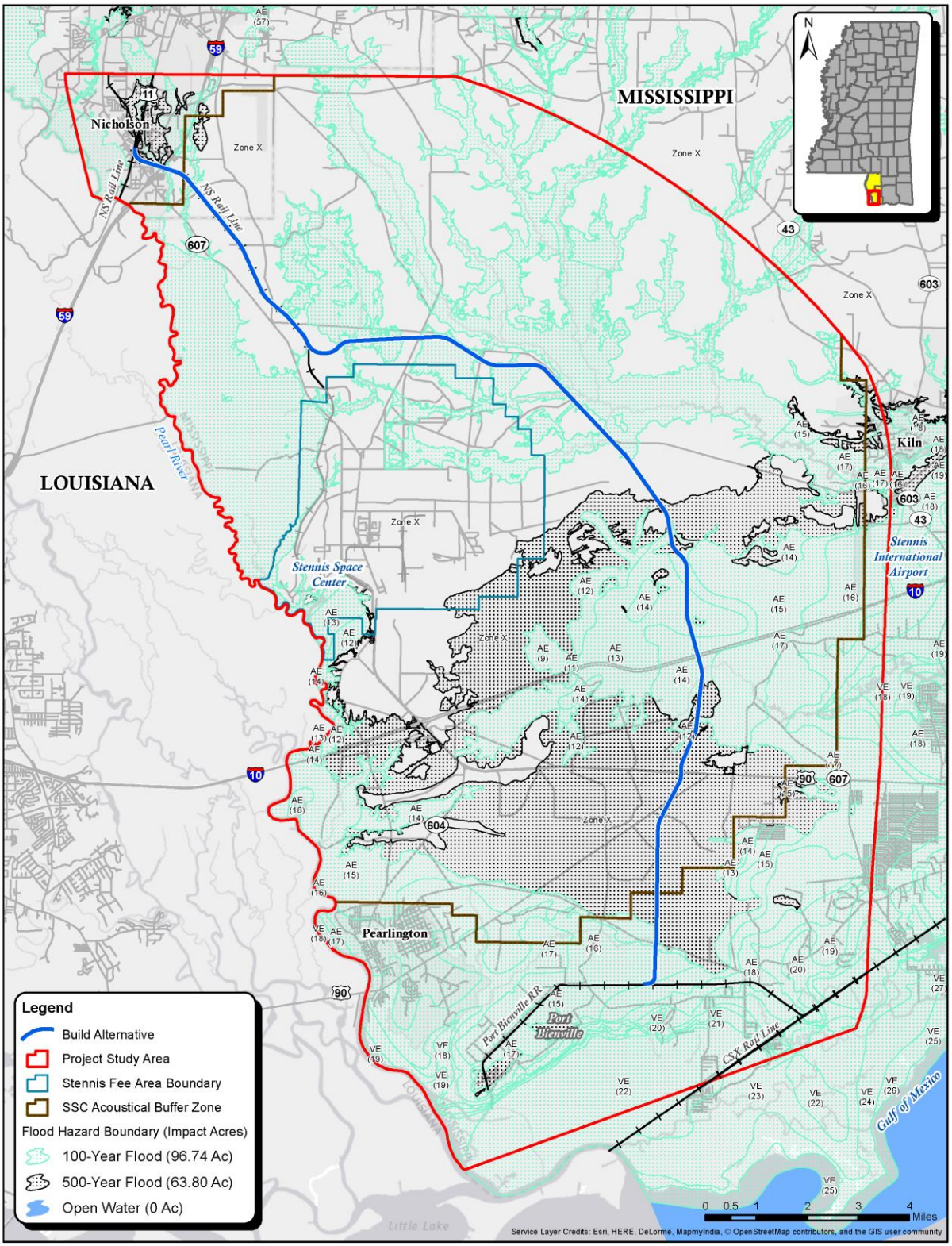


Table 5.10: Floodplain Impacts

Segment	Zones A and AE 100-Year Floodplain (acres)	Zone X 500-Year Floodplain (acres)
Existing NS Rail Right-of-way	0.61	0.27
Proposed New Rail Right-of-way	96.13	63.53
Estimated Floodplain Impacts	**96.74**	**63.8**

Potential impacts to floodplains would include filling, grading, new bridges and culverts, and other activities. The Project would be designed to include features, such as bridges and culverts, so that it would not increase flood heights and could achieve "no-rise certification."

The proposed rail alignment would not cross any regulatory floodways. For streams and other watercourses where FEMA has provided BFEs, but no floodway has been designated, a review of floodplain development must be conducted by the local floodplain management on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available.

Floodplain impacts typically require coordination and approval from FEMA and the local floodplain administrator(s), which includes Hancock and Pearl River Counties. During the permitting process, the Project sponsor would need to contact FEMA and Hancock and Pearl River Counties for permit and review requirements for the Project.

5.13 Water Resources

5.13.1 Natural Ecology Systems

The following sections describe the impacts to hydrology, terrain, vegetation, flora and fauna communities and wetland and other waters based on recent field surveys and the proposed Project right-of-way limits.

5.13.1.1 Surface Water

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS rail line and does not include the construction of any new railroad features, it would have no impacts to surface water. No changes to the overall Study Area water quality would be expected. Impaired water bodies within the Study Area would continue to be impaired unless TMDLs and restoration plans are implemented in the future.

Build Alternative. Impacts to surface water are classified as being either short-term, from construction, or long-term from operation. Short-term construction impacts related to earth moving activities such as grading and clearing, can result in discharge of sediment and chemicals into surface waters. Excessive sediment contamination can lead to aquatic habitat degradation, including a reduction in dissolved oxygen and an increase in turbidity, and increases in nutrients, heavy metals and chemicals. These impacts can be reduced and mitigated through the careful implementation of an erosion and sediment control plan.

MDOT is the largest administrator of construction projects in Mississippi and has had a Storm Water Pollution Prevention Plan (SWPPP) in place since October 1992. This plan was approved by the MDEQ and is routinely used successfully throughout the state on MDOT construction projects.

Long-term effects from surface water typically result from stormwater runoff as it flows or drains away from a project's right-of-way. Stormwater runoff can carry harmful contaminants from rail operations and engine wear and tear. These impacts can be reduced or mitigated by constructing stormwater retention and detention ponds within the right-of-way and by minimizing the use of impervious surfaces. These minimization efforts will be further explored during the design phase. Because railroad projects typically require less right-of-way than other linear transportation projects, there is a greater amount of pervious surface area adjacent to the rail to allow for stormwater soil infiltration before reaching surface waters. Minimal impacts to surface water are anticipated during and following construction.

Hydraulic studies have not been completed at this stage of the Project and final mitigation measures cannot be determined until further project development.

5.13.1.2 Water Quality

The CWA is the primary federal law protecting the quality of the nation's surface waters. It prohibits any discharge of fill or dredged material into waters regulated by the USACE, unless authorized by a permit. To regulate the discharge of dredged or fill material into waters of the United States, including wetlands, Section 404 of the CWA establishes a permit program, managed by the USACE.

A National Pollutant Discharge Elimination System (NPDES) permit for discharges into waters of the U.S. is required under Section 402 of the CWA.

The discharge of stormwater from construction sites must comply with the conditions of an NPDES permit under the CWA. A statewide General Permit for Stormwater Discharges Associated with Construction Activity has been developed for the state of Mississippi. In accordance with the General Permit, the disturbance of more than 1 acre of soil requires the development and implementation of a Storm Water Pollution Prevention Plan that identifies site management activities to be carried out during construction. These activities generally include construction of stormwater best management practices (BMPs), erosion and sedimentation controls, dewatering (nuisance water removal), runoff controls, and construction equipment maintenance.

In accordance with Section 401 of the CWA, any activities that would result in a discharge to waters of the U. S. must obtain a state certification proving the discharge complies with other requirements of the CWA. MDEQ oversees the certification program in Mississippi.

No-Build Alternative. No changes to overall Study Area water quality would be expected. Impaired water bodies within the Study Area would continue to be impaired unless TMDLs and restoration plans are implemented in the future.

Build Alternative. The Build Alternative lies within an area where many streams are already disturbed by agricultural land use. Section 303[d] of the CWA requires each state to provide a list of impaired waters that do not meet or are expected not to meet state water quality standards as defined by that section. Of the three impaired water bodies in the Study Area, the only one within the proposed Project right-of-way is Turtle Skin Creek, which is a tributary of the Pearl River. The proposed rail alignment crosses Turtle Skin Creek south of Texas Flat Road. Due to heavy rainfall in March 2016, the creek was observed outside of its banks and no clear channel could be observed at the time. Based upon aerial imagery on an adjacent pipeline corridor, it is estimated the creek is typically less than 10 feet wide. The proposed rail alignment would be designed to avoid or minimize impacts to Turtle Skin Creek as well as other water bodies and would not hinder any MDEQ restoration plans for Turtle Skin Creek.

No permanent impacts to water quality are anticipated as a result of the Build Alternative. Railroads typically do not contribute much to surface water or groundwater contamination. Localized water quality could be temporarily affected during construction, but use of Best Management Practices (BMPs) would minimize potential water quality impacts. The MDOT would consult with the appropriate federal and state resource and regulatory agencies to identify measures to minimize these impacts.

A Section 401 Permit (Water Quality Certification) would be required from the MDEQ's Environmental Permits Division, Office of Pollution Control prior to construction. Any water quality impacts would be mitigated as part of the 404/401 permit process.

Many stream crossings are currently traversed with a bridge or culvert structure along the existing rail line. Similar structures are proposed along the new rail alignment. New crossings would require a USACE 404 permit.

Construction of the Build Alternative would result in short term impacts to hydrology within the limits of the right-of-way as a result of minor discharge of sediment from disturbance of ground cover, excavation, and grading of the railroad embankment. A comprehensive SWPPP with BMPs to protect water quality (e.g., silt fence, re-vegetation) would likely mitigate these impacts. Additionally, these measures would also likely fulfill the requirements of the Section 401 Certification.

Bridges were considered as much as possible in development of the Build Alternative. Where culverts or drainage pipes are used, they would be designed with their inverts below the normal stream beds. This design would avoid scouring downstream from the structure and provide better aquatic habitat. During construction activities, aquatic organisms may be displaced as a result of construction activities, but these organisms are expected to return once activities cease. Minimal impacts to water quality are anticipated during and following construction.

5.13.1.3 Groundwater

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS mainline and does not include the construction of any new railroad features, it would have no impacts to ground water wells or aquifers.

Build Alternative. The construction of the proposed Project lies within the Coastal Lowlands Aquifer System, Graham Ferry and Pascagoula Aquifers. Within this shallow aquifer system, railroad infrastructure, including bridge bents, may come into contact with the underlying groundwater; however, industry standard construction methods would minimize any potential contamination effects. Bridge construction materials likely to be used, such as steel H-piles or reinforced concrete drilled shafts, are non-reactive with groundwater and contain no additives that would be hazardous or detrimental to groundwater quality. During construction, the ground would be temporarily disturbed causing some localized, temporary groundwater effects. Groundwater dewatering may be required during construction in certain locations, depending on the types of bridge foundations used and the construction means and methods. If dewatering is required, discharge of water would be conducted in accordance with applicable requirements. Long-term effects to groundwater quality as the result of construction of the Project would be negligible.

Based on GIS data,[103] no water wells are located within 100 feet of the proposed track centerline. Therefore, no impacts to water wells are anticipated.

5.13.2 Wild and Scenic Rivers and Scenic Streams

One 21-mile segment of Black Creek from Fairley Bridge Landing upstream to Moody's Landing has been designated as a Wild and Scenic River in the state of Mississippi. The designated segment of Black Creek is located outside of the Study Area, near Wiggins, Mississippi. Therefore, no impact from the Project is anticipated.

The Mississippi Statewide Scenic Stream Stewardship Program has designated 11 stream/river segments as a Scenic Stream in the state of Mississippi. Of the 11 streams designated, only the segment of Wolf River crosses into Pearl River and Hancock Counties. However, this designated segment is located outside of the Study Area. Therefore, no impact to State Scenic Streams is anticipated from the Project.

5.14 Habitat and Wildlife

5.14.1 Vegetation and Floral/Faunal Communities

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS rail and does not include the construction of any new railroad features, it would have no impacts to vegetation and floral/faunal communities.

Build Alternative. The most likely impacts to the terrestrial flora and fauna within the proposed right-of-way would be from construction and clearing activities for the new rail. Construction activities would result in the loss of wildlife habitat within the right-of-way limits, but the right-of-way corridor would be narrow and the total acreage of habitat loss would be relatively small in relation to the surrounding area/landscape. The new rail corridor is not anticipated to create a barrier to wildlife movement. During final design the Project would be evaluated to see if incorporating specific design features would enhance wildlife crossings along the Project.

Effects to wildlife would occur during vegetation removal and disturbance during construction. Grading and construction of the new track would permanently convert wetland habitat within the right-of-way and clearing of pine and hardwood trees would result in loss of habitat for birds, squirrels, and other animals of the area. Since wildlife animals are mobile, they have the capability to avoid areas of construction and travel to other undisturbed areas surrounding the corridor. Plant communities disturbed or removed within the right-of-way would result in minimal loss of habitat. Flow through streams within the Survey Corridor would be maintained during construction, so no impacts to aquatic species are anticipated during or after construction.

Existing vegetation communities provide habitat for resident and migratory wildlife. Construction activities could cause temporary displacement or stress in local wildlife. Potential effects on wildlife would be short-term because construction disturbance would be temporary.

The future Project Sponsor would be responsible for implementation of minimization and mitigation measures for vegetation and wildlife. Mitigation measures and restoration of disturbed areas would reduce

[103] Source: MARIS; Layer Names: USGS_Wells09 and OGB_wells2013

effects to wildlife. BMPs would be used to the extent practicable to further reduce the impact to wildlife and habitat. Vegetation clearing for construction activities would be planned outside of the migratory bird breeding season. In addition, areas disturbed for stockpiling materials or equipment staging yards would be placed in uplands where possible and restored to pre-construction elevations and re-seeded with native species to re-establish the vegetation community. During construction, sediment run-off would be controlled near streams through the use of silt fencing and other methods to reduce turbidity and any potential effects to aquatic species.

5.14.2 Effects on Federally-Listed Species

Several of the federally-listed and candidate species would not occur in or near the Study Area due to lack of habitat. These species that have no known occurrences include the pearl darter (Percina aurora), Atlantic sturgeon (Acipenser oxyrinchus desotoi), smalltooth sawfish (Percina aurora), gopher tortoise (Gopherus polyphemus), ringed map turtle (Graptemys oculifera), Kemp's ridley sea turtle (Lepidochelys kempii), leatherback sea turtle (Dermochelys coriacea), loggerhead sea turtle (Caretta caretta), Hawksbill sea turtle (Eretmochelys imbricate), peregrine falcon (Falco peregrinus), piping plover (Charadrius melodus), and red knot (Calidris canutus ruga). These federally listed species have been dismissed from further discussion since they are not likely to occur within the study area. However, coordination with USFWS is ongoing and final determinations would require their concurrence.

The following seven federally listed species may occur in or near the Study Area and are listed in **Table 5.11**. However, it has been recommended in the *Draft Wetlands and Threatened and Endangered Species Report* that the proposed Project would have no effect on the Alabama (=inflated) heelsplitter (Potamilus inflatus) and the Black pine snake (Pituophis melanoleucus lodingi). Also, it was determined that the proposed Project may effect but is not likely to adversely affect the Louisiana quillwort (Isoetes louisianensis), eastern indigo snake (Drymarchon couperi), black pine snake (Pituophis melanoleucus lodingi), red-cockaded woodpecker (Picoides borealis), wood stork (Mycteria americana), and the Florida panther (Puma concolor coryi). The *Draft Wetland and Threatened and Endangered Species Report* is appended to the DEIS as **Appendix C.**

Table 5.11: Effects on Listed Federal Species with Potential Suitable Habitat in the Survey Corridor

Common Name/ Scientific Name	Federal Status[1]	State Status[1]	Potential Habitat Present?	Anticipated Effects Determination[2]
FEDERAL AND/OR STATE-LISTED SPECIES				
Alabama (=inflated) heelsplitter *Potamilus inflatus*	T	E	Yes	No effect
Louisiana quillwort *Isoetes louisianensis*	E	-	Yes	May affect; not likely to adversely affect
Eastern indigo snake *Drymarchon couperi*	T	E	Yes	May affect; not likely to adversely affect
Black pine snake *Pituophis melanoleucus lodingi*	T	E	Yes	No effect
Red-cockaded woodpecker *Picoides borealis*	E	E	Yes	May affect; not likely to adversely affect
Wood stork *Mycteria americana*	T	E	Yes	May affect; not likely to adversely affect
Florida panther *Concolor coryi*	E	E	Yes	May affect; not likely to adversely affect

[1] *E = Endangered; T = Threatened; C = Candidate species; DL = Delisted; - = not listed*
[2] *Federal species = No effect or May affect; Not likely to adversely affect*

All species descriptions, preferred habitat, and location of known occurrences are summarized from the IPaC database (Federal species) and from a report entitled *Endangered Species of Mississippi*[104].

Alabama Heelsplitter (Threatened). The inflated heelsplitter has an oval, compressed to moderately inflated, thin shell. The valves may gape anteriorly. The umbos are low, and a prominent posterior wing is present that may extend anterior to the beak in young individuals. The shell is brown to black and may have green rays in young individuals.[105]

The preferred habitat of this species is soft, stable substrates in slow to moderate currents. It has been found in sand, mud, silt and sandy gravel, but not in large gravel or armored gravel. It is usually collected on the protected side of bars and may occur in depths over 20 feet. The occurrence of this species in silt may not indicate that the life cycle can be successful in that substrate. Adult mussels may survive limited amounts of silt where juveniles would suffocate. The heelsplitter has been known to use the freshwater drum as a suitable host for its eggs; therefore, it could potentially be found in any river system the drum inhabits.

During field reconnaissance, the largest stream encountered was Bayou LeCroix, an outlet stream of the Bay St. Louis. The segment of Bayou LeCroix located within the Build Alternative Corridor is relatively narrow, but does have slow to moderate currents and likely a silty/clay substrate. No sand bars are present in this segment and the depth of Bayou LeCroix is less than 20 feet. Although freshwater drum species (host) may be present in Bayou LeCroix, the heelsplitter has not been known to occur in this stream system/area. Recently, this species has only been collected at two locations on the Pearl River in Mississippi and in the West Pearl River in Louisiana. It still occurs in the Amite River in Louisiana and parts of the Tombigbee River drainage in Mississippi.[106] It is anticipated that a finding of no effect would be made for the Alabama (=inflated) Heelsplitter.

Louisiana Quillwort. The Louisiana quillwort is a small, semi-aquatic, facultative evergreen plant with spirally-arranged leaves (sporophylls) arising from a globose, two-lobed corm. The pliant, hollow leaves are transversely septate and measure 0.12 inch wide and up to 16.0 inches long. These little plants are valuable indicators of stream health. To date, 8 populations occur in Louisiana, 3 populations in Alabama, and 30 populations in Mississippi. It was not until 1996 that Louisiana quillwort plants were verified in Mississippi. Most Mississippi colonies of quillwort are found in the DeSoto Ranger District of the DeSoto National Forest (Forrest, Perry, Stone, Harrison, and Jackson counties) with a smaller cluster of sites in North-Central Hancock County. One colony is known from Pearl River County.

Louisiana quillworts grow in mineral soil, usually light grey in color, in bottomlands that are periodically washed free of leaves and debris. Overstory trees are typically laurel oak, red maple, tuliptree, and swamp tupelo. Pine trees are only occasionally observed, but they may have been more common, as large old pine stumps are frequently observed around quillwort populations.

The Louisiana quillwort was listed as an endangered species by the USFWS in 1992 before populations were discovered in Mississippi. Although the majority of known Mississippi colonies are found on public land, various land uses, including certain silviculture activities, military training, and some recreational

[104] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

[105] U.S Fisht & Wildlife Service, Environmental Conservation Online System, https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F01O, Accessed 10-06-2017

[106] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

activities, as well as natural alterations arising from impoundment of streams, may contribute to adverse impacts on quillwort habitat. Activities which negatively affect hydrology, water quality, and/or substrate stability could threaten population persistence in its habitat.

Suitable habitat for the quillwort is present within the Survey Corridor; however, the health of the stream segments surveyed were in decline due to silviculture practices, pollution, and debris. Overhead canopy of the streams were primary pine and hardwoods, though not specifically the preferred hardwood canopy species of the quillwort. It is unlikely the quillwort inhabits these streams, and no quillwort was observed during field observations. It is anticipated that a finding of may affect, not likely to adversely affect will be made for the Louisiana Quillwort.

Eastern Indigo Snake. The eastern indigo snake is a non-venomous, black snake. It is the longest snake native to the United States, ranging in size from 60 to 84 inches, and is entirely shiny bluish-black color, including the belly. The chin and sides of the head are usually colored reddish or orange-brown. Juvenile indigo snakes look very similar to adults, but have much more red on their heads. Indigo snakes are sexually dimorphic, with males growing to larger lengths than females.

Eastern indigo snakes are restricted to Florida and southern areas of Georgia, Alabama, and Mississippi. Until relatively recently, all indigo snakes in the U.S. were considered to be the same species, D. corais.

In the southeast, indigo snakes are restricted to areas with dry sand ridges and pine-oak sandhills (uplands), dominated by pines (primarily longleaf) and oaks. Gopher tortoises usually inhabit the areas where the eastern indigo snake is found. These snakes use gopher tortoise burrows as shelter during the winter and during the warmer months for nesting and refuge from intense summer heat. During the active season, indigo snakes may move long distances and often forage along wetland margins.

Indigo snakes are active strictly by day. During the summer they prefer wetland edges where prey is abundant, but move to drier habitats in the winter. Indigo snakes breed in the winter and are more active in cold weather than most other snakes. When cornered, they may flatten their heads, hiss and vibrate their tails, which produces a rattling sound. Despite these intimidating acts, the indigo snake rarely bites. Indigo snakes regularly feed on mammals, birds, frogs and other snakes, including rattlesnakes and cottonmouths. Also, these snakes will occasionally feed on young gopher tortoises.

In the past, periodic growing season fires created excellent upland habitat for the gopher tortoise, the presence of which is important to the Indigo snake in Mississippi. In recent years, fires have been excluded from formerly suitable habitat and burning is primarily performed in the dormant season; this sort of burning does not effectively control proliferation of hardwoods and brush. In parts of its range, this species has been adversely affected by the "gassing" of gopher tortoise burrows, a practice illegal in Mississippi. The last specimen actually collected in Mississippi was taken in 1939, and there have been no verified observations of natural populations of the Indigo snake in Mississippi since the 1950s.[107]

Suitable habitat exists for the eastern indigo snake occurring in the Survey Corridor, particularly along wetland edges and in the summer months. They usually prefer pine oak sandhills usually inhabited by gopher tortoises. The eastern indigo snake uses the gopher tortoises' burrows for shelter during winter. Due to the low probability of gopher tortoises to inhabit the Survey Corridor, the eastern indigo snake may be

[107] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

restricted to the wetland areas where prey is abundant. However, due to lack of observation of the species in Mississippi since the 1950s, it may be extirpated. It is anticipated that a finding of may affect, but is not likely to adversely affect the eastern indigo snake.

Black Pine Snake. The black pine snake is a large dark brown to black snake that prefers to inhabit mature, longleaf pine forests, similar to the gopher tortoise, with sandy soil, an open canopy, moderately fire-suppressed midstory and a thick grassy understory. Studies have shown that the black pine snake is usually found in rotting pine stumps and are located underground two-thirds of the time. It is considered critically imperiled and in decline along with its preferred habitat of longleaf pine forests due to timbering and conversion to agriculture.

Although the black pine snake has been known to occur in 14 counties within southern Mississippi, (excluding Hancock County) the species is now extremely rare over most of the historic range and has been extirpated from Louisiana and Lauderdale County, Mississippi. It is still relatively common within DeSoto National Forest in Mississippi. A recent study commissioned by USFWS found that 31 percent of historical black pine snake population segments have been extirpated and that another 26 percent are in serious jeopardy; the main reason for the decline being habitat destruction and fragmentation. In recent years, fires (controlled burning)has been excluded from some formerly suitable habitats in Mississippi, resulting in a dense understory of hardwoods and shrubs that prevent sunlight from reaching the forest floor, shading out food sources of the black pine snake.

The majority of the Survey Corridor contains saturated (poorly drained) soil conditions and dense canopy. Open areas of the Survey Corridor are primarily pasture or transmission corridors with emergent wetlands. The black pine snake does have the potential to occur in the few upland areas of the Survey Corridor with sandy soil sand stands of long leaf pine and may have a broader range in during the dry season. Literature also states that the black pine snake may be found within stream or river corridors and near pitcher plant bogs, which were present within the Survey Corridor. While suitable habitat is present for the black pine snake, it is anticipated that a finding of may affect, but is not likely to adversely affect will be made for the Black Pine Snake.

Red-Cockaded Woodpecker. About the size of the common cardinal, the red-cockaded woodpecker is approximately 7 inches long, with a wingspan of about 15 inches. Its back is barred with black and white horizontal stripes. The red-cockaded woodpecker's most distinguishing feature is a black cap and nape that encircle large white cheek patches. Rarely visible, except perhaps during the breeding season and periods of territorial defense, the male has a small red streak on each side of its black cap called a cockade, hence its name. Female red-cockaded woodpeckers lack the red cockade. Juvenile males have a red 'patch' in the center of their black crown. This patch disappears during the fall of their first year at which time their 'red-cockades' appear.

The diet of red-cockaded woodpeckers consists mostly of insects in the egg, larvae, and adult stages. These include beetles, ants, roaches, spiders and other insects found in or on pine trees. Fruits and seeds make up a small portion of the overall diet. Large, older trees are preferred for foraging. In general, males forage on the limbs and upper trunk while females forage on the trunk below the crown.

The red-cockaded woodpecker makes its home in mature pine forests (60+ years old). Longleaf pines are most commonly preferred, but other species of southern pine are also acceptable. While other woodpeckers bore out cavities in dead trees where the wood is rotten and soft, the red-cockaded woodpecker is the only one that excavates cavities exclusively in living pine trees. Cavities are excavated in mature pines, generally

over 80 years old. The older pines favored by the red-cockaded woodpecker often suffer from a fungus called red heart disease, which attacks the center of the trunk, causing the inner wood, the heartwood, to become soft. Cavity excavation takes from one to six years.

In Mississippi, the red-cockaded woodpecker mainly occurs in the southern two-thirds of the state. It has not been found in the Delta and only sporadically occurs in northern counties. Although listed and protected in Hancock County, Mississippi, given the coastal region surrounding the Survey Corridor, the current land use and silviculture practices, and lack of mature undisturbed pine stands (longleaf and slash pine) make it unlikely that the red-cockaded woodpecker would nest within the Survey Corridor. While some suitable foraging habitat may be present within the Survey Corridor, this habitat is unlikely to be used by red cockaded woodpecker because of the low probability of suitable nesting habitat occurring within 0.5 miles of the Survey Corridor. Thus, impacts to potential suitable foraging habitat are not expected to impact this species. It is anticipated that a finding of may affect, but is not likely to adversely affect the red-cockaded woodpecker.

Wood Stork. Wood storks are large, long-legged wading birds, about 50 inches tall, with a wingspan of 60 to 65 inches. The plumage is white except for black primaries and secondaries, and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved. Immature birds are dingy gray and have a yellowish bill.

Nesting has been restricted to Florida, Georgia, and South Carolina; however, they may have formerly bred in most of the southeastern United States and Texas. A second distinct, non-endangered population of wood storks breeds from Mexico to northern Argentina.

Wood storks from both populations move northward after breeding, with birds from the southeastern United States population moving as far north as North Carolina on the Atlantic Coast and into Alabama and eastern Mississippi along the Gulf Coast, and storks from Mexico moving up into Texas and Louisiana and as far north as Arkansas and Tennessee along the Mississippi River Valley. Occasional sightings are known from all states along and east of the Mississippi River, and sporadic sightings in some states west of the Mississippi and in Ontario, Canada.

Storks are birds of freshwater and estuarine wetlands, including ponds, bayheads, flooded pastures, oxbow lakes, and ditches. They nest primarily in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels.

The wood stork is listed as an endangered species by USFWS in only Florida, Georgia, Alabama, and South Carolina because at the time of listing, that was the range of the U.S. breeding population. Birds from Mexican and Guatemalan breeding populations can be found in the U.S. as well, but these birds are not considered endangered. It is assumed birds found in Mississippi came from the non-listed population.

In Mississippi, storks are found on the western edge of the state in those areas bordering the Mississippi River. Nesting wood storks have not been confirmed in Mississippi, although a report of possible nesting was made along the Mississippi River north of Vicksburg. Although storks are not known to nest in Mississippi, the forested wetland habitat, freshwater streams, and location of the Study Area may provide suitable stopover and foraging habitat. It is anticipated that a finding of may affect, but is not likely to adversely affect the Wood Stork.

Florida Panther. The Florida panther is tawny, brown on the back and pale gray underneath. It is one of 32 Puma concolor subspecies known by many names – puma, cougar, mountain lion, painter, catamount and panther. Panthers historically ranged across the southeastern United States including Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and parts of Tennessee and South Carolina. Currently, the breeding population of Florida panthers is found only in the southern tip of Florida, south of the Caloosahatchee River. In recent years, young male panthers have traveled north into central and northeast Florida, and one even dispersed to west-central Georgia near the Alabama border. Females do not roam as widely and none has been documented outside of south Florida in decades.

Florida panthers are about 6 to 7 feet long – males are bigger than females. They are carnivores and skilled at hunting white-tailed deer, feral hogs, raccoons, and other medium-sized mammals and reptiles. Florida panthers also stalk birds.

Florida panthers utilize a diversity of warm climate habitats. They live in wetlands, swamps, upland forests, and stands of saw palmetto. Panthers are wide-ranging, secretive, and occur at low densities. They require large, contiguous areas to meet their social, reproductive, and energetic needs. Panther habitat selection is related to prey availability. Dense understory vegetation provides some of the most important feeding, resting, and denning habitat for panthers. The historic range of the Florida panther extended throughout the Gulf Coast from Florida to Louisiana. Florida panthers live alone, unless a pair is mating or a female is raising cubs. Males roam much larger territories than the females. A male can occupy a territory over 200 to 250 square miles in size.

The Florida panther probably once ranged over most of Mississippi. Unconfirmed reports of panthers in Mississippi over the past few years have been concentrated along the Mississippi River and along the lower Pearl River. No records could be located documenting the panther within the vicinity of the Survey Corridor.

The corridor's hardwood forested wetlands and swamp areas provide suitable habitat and food for the Florida panther, although it less frequently occurs in upland pine forests or pine savannahs. The lack of thick understory in most of the Survey Corridor is not suitable for denning. It is anticipated that a finding of may affect, but is not likely to adversely affect the Florida panther.

5.14.3 State-Listed Species

There is no suitable habitat within the Survey Corridor for the following state listed species: Crystal darter (Crystallaria asprella), Frecklebelly madtom (Notorus munitus), southern hognose snake (Heterodon simus), southeastern snowy plover (Charadrius alexandrines tenuirostris), and brown pelican (Pelecanus occidentalis). These state listed species have been dismissed from further discussion since there is low probability or not likely to occur.

There are three state-listed species that could potentially occur within the Study Area which include the Ironcolor shiner (Notropis chalybaeus), Rainbow snake (Farancia erytrogramma), and the Louisiana black bear (Ursus americanus luteolus) see **Table 5.12**.

Table 5.12: Effects on Listed State Species with Potential Suitable Habitat in the Survey Corridor

Common Name/ Scientific Name	Federal Status[1]	State Status[1]	Potential Habitat Present	Potential Impact
OTHER STATE-LISTED SPECIES				
Ironcolor shiner *Notropis chalybaeus*	-	E	Yes	No
Rainbow snake *Farancia erytrogramma*	-	E	Yes	May adversely impact
Black bear *Ursus americanus*	DL	E	Yes	No

[1] *E = Endangered; T = Threatened; C = Candidate species; DL = Delisted; - = not listed*

All state species descriptions, preferred habitat, and location of known occurrences are summarized from a report entitled *Endangered Species of Mississippi*[108] unless otherwise noted.

Ironcolor Shiner. The ironcolor shiner is a small fish with a deep, compressed body that is generally arched and only reaches 2.5 inches in length. It is colorful, with straw yellow above, a dusky stripe along the back and a silvery-white color below. A very prominent black stripe runs along the side, beginning at a black spot at the base of the tail and continuing around the snout, covering both lips and its chin. The inside of the mouth is black. Scales are darkly outlined except just above the black stripe where a gold-orange streak may be present. Breeding males often have an orange-gold body and fins.

The ironcolor shiner is found primarily in lowland streams where stream reaches are characterized by abundant aquatic vegetation, open swamp habitat, and/or areas draining densely canopied woodlands. It has been observed in deep pool areas of creeks and small rivers, as well as in bodies of water where a moderate current exists. They occur in areas with aquatic vegetation, such as bladderwort, pondweed and Elodea. Sand seems to be important for spawning.

In Mississippi, this species of shiner has historically occurred within the coastal area of the state in the Coastal Rivers, Pascagoula and Pearl River drainage systems and may exist in the Survey Corridor, although none were observed during field investigations. Several creeks and streams are found within the Survey Corridor. Each stream had slow to moderate current and silty mud bottoms. The preferred aquatic vegetation was not observed in streams during field reconnaissance. Therefore, the Project is not anticipated to negatively impact this species.

Rainbow Snake.[109] The rainbow snake is a large (up to 66 inches), non-venomous, highly aquatic snake that is seldom seen because of its secretive habits. Rainbow snakes are among the most beautiful snakes in the United States. Adults have three red stripes running down a glossy black back. The belly is red or pink with two or three rows of black spots. Yellowish coloration is often present on the head and sides. They have small dark eyes, smooth shiny scales, and a pointed tail tip. Male rainbow snakes are smaller than females but have relatively longer and thicker tails. Young rainbow snakes resemble adults but generally lack any yellow coloration.

[108] Mississippi Museum of Natural Science. 2014. Endangered Species of Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.

[109] Portions of this species description are from http://srelherp.uga.edu/snakes/farery.htm.

Rainbow snakes are found in the Coastal Plain of the southern United States from southern Virginia to eastern Louisiana. In Mississippi, it has been recorded in Forrest, Jackson, Hancock, Lamar, Pearl River, and Copiah counties. Rainbow snakes are found in a variety of aquatic habitats but are most common in cypress swamps and flowing-water habitats such as blackwater creeks, streams, and rivers, with soils which are sandy enough to allow it to burrow. In coastal areas, rainbow snakes can be found in tidal or even brackish water. Although highly aquatic, rainbow snakes occasionally move overland and are sometimes found far from water.

Rainbow snakes are highly aquatic and spend most of their lives hidden amongst aquatic vegetation and debris. Unlike water snakes, rainbow snakes seldom bask out of the water, preferring to remain burrowed into vegetation or soil, and thus are seldom encountered anywhere in its range, implying that it is a relatively rare species. However, due to its secretive nature, may be much more common than it appears. Rainbow snakes are perhaps most frequently encountered crossing roads adjacent to aquatic habitats, particularly on rainy summer nights. When captured, rainbow snakes do not bite.

The wetlands and other aquatic habitats in the Survey Corridor provide suitable habitat for the rainbow snake, and it has been recorded in Hancock County, Mississippi. It is most likely to be found in the areas where hardwoods, cypress swamp, and emergent vegetation occur, providing the ideal vegetative cover and habitat for both dwelling and foraging. It is anticipated that the project may adversely impact the rainbow snake.

Black Bear. The American black bear is the smallest of the three bears species found in North America, and is found only in North America. Black bears have short, non-retractable claws that give them an excellent tree-climbing ability. American black bears are omnivorous, eating plants, fruits, nuts, insects, honey, salmon, small mammals, and carrion. In northern regions, they eat spawning salmon.

It is estimated that at least 600,000 black bears live in North America. In the United States, the population is estimated to be over 300,000 individuals. According to historical accounts, black bears once lived throughout Mississippi. Today, black bears are primarily found in counties along the Mississippi, Lower Pearl, and Pascagoula watersheds.

Mississippi is home to two subspecies of black bear—the Louisiana black bear (*Ursus americanus luteolus*) and Florida black bear (*Ursus americanus floridanus*) are unique subspecies with small populations. The Louisiana black bear was recently delisted; the Florida black bear is estimated to number 3,000.

Most of the bears in the state of Mississippi are found along the drainages of major rivers such as the Mississippi, Pearl, and Pascagoula, although bears can and have been known to show up just about anywhere. Most of the bears found in the state are believed to be transient males that have wandered across state lines. They are the dispersing products of breeding populations of bears that border the state in Arkansas, Louisiana, and Alabama. Black bears were listed as endangered in Mississippi in 1984. The Louisiana black bear was listed as federally threatened in 1992. However, as noted above, it has recently been delisted. Only small differences in skull size and shape exist between the American black bear in north Mississippi and the Louisiana black bear found in the south. Mississippi Department of Wildlife, Fisheries, and Parks' (MDWFP) biologists currently estimate the Mississippi bear population at less than 150 bears in the entire state.

Suitable habitat occurs in the Survey Corridor, primarily in hardwood forested areas. No sightings of the black bear occurred during field reconnaissance, and there are no documents of it inhabiting the Survey

Corridor. Because bears are mobile animals, they are able to avoid temporary disturbances to their surroundings. No impact on the species from the Project is anticipated.

5.14.4 Threatened and Endangered Species Effects/Impacts Summary

No-Build Alternative. Since the No-Build Alternative would leave the existing Port Bienville Railroad in its current configuration without a north-south connection to the NS mainline and does not include the construction of any new railroad features, it would have no adverse effect/impact on any of the protected species that may be present within the Study Area.

Build Alternative. Due to potential suitable habitat observed within the survey corridor, the Project may affect/impact, but is not likely to adversely affect/impact, the following five federally-listed species: Louisiana quillwort, eastern indigo snake, red-cockaded woodpecker, wood stork, and the Florida panther. There are two state-listed species within the corridor having suitable habitat which are the Louisiana Black Bear and the Rainbow snake. No protected species were observed during field reconnaissance.

Based on the literature review conducted for this EIS, the only documented occurrence of any state or federally listed threatened or endangered species or candidate species within the Study Area is the state-listed rainbow snake. The rainbow snake may be adversely impacted with the conversion of wetland and aquatic habitats to uplands as part of the proposed construction of the rail Project. This construction may reduce the vegetative cover (habitat) and food source of the rainbow snake within the right of way and cause displacement. Potential impacts include being struck by construction equipment and vehicles when trying to escape its burrow/habitat, stress, and exposure to predators from lack of suitable cover. For all species, construction activities could cause temporary displacement or stress. However, these impacts would be temporary and would return to normal levels post-construction. Also, listed species are typically lower in abundance than other species, so the probability of encountering and therefore affecting a listed species within the Project right-of-way is lower than other species of abundant wildlife (raccoons, possums, squirrels, etc.). If any of the above-listed species are found in the Build Alternative right-of-way during construction, work would be halted and additional coordination with USFWS would be required. See *Draft Wetland and Threatened and Endangered Species Report, December 2016* **Appendix C.**

Coordination with USFWS is still ongoing and all determinations are preliminary until USFWS concurrence is received.

5.15 Hazardous Materials

No-Build Alternative. The No-Build Alternative would have no impact on the hazardous materials sites identified within the quarter-mile search radius.

Build Alternative. Despite the fact that the Nicholson Quick Stop has had three Leaking Underground Storage Tank (LUST) cases and a currently open LUST case, this listing would have no impact on the proposed Project. The fueling station is located approximately 1,000 feet from the existing Norfolk Southern (NS) railroad track, which is well outside the existing rail right-of-way and any proposed construction staging areas. No real estate acquisitions are expected in that segment of the proposed rail Project.

Any unexploded ordnance (UXO) within the bombing ranges could potentially impact the Project during construction, but would not impact the Project during operation. In order to reduce the risk that UXO presents, a thorough search using metal detectors of all areas within the proposed right-of-way that fall

within the Hancock County Bombing and Gunnery Range, and where soil would be disturbed or heavy equipment utilized, should be conducted prior to construction. In the event that UXO is discovered, all construction activity should immediately cease; the area should be evacuated; and local authorities should be contacted in order to dispatch a bomb disposal unit to the UXO location. No UXO's were discovered during field investigations.

During construction of the proposed Project, construction waste may consist of hazardous materials and wastes generated during clearing, grubbing, milling and other activities. Hazardous materials may be discovered during demolition of structures and excavation.

Prior to construction, health and safety and contingency plans would be developed. The plans would include procedures to protect construction workers and the public if hazardous materials are encountered during construction. If contaminants are encountered during construction, disposal would occur at facilities and in a manner approved by federal, state and local regulations.

5.15.1 Rail Transport of Hazardous Materials

The following information is excerpted from FRA website, Hazardous Material Transport[110] and CSX website under safety/hazardous materials.[111]

Rail transportation of hazardous materials in the United States is recognized to be the safest method of moving large quantities of chemicals over long distances. Recent statistics show that the rail industry's safety performance, as a whole, is improving. In particular, the vast majority of hazardous materials shipped by rail tank car every year arrive safely and without incident, and railroads generally have an outstanding record in moving shipments of hazardous materials safely.

Freight railroads have established recommended operating practices for the transportation of hazardous materials pursuant to Association of American Railroads (AAR) *Recommended Railroad Operating Practices for Transportation of Hazardous Materials,* Circular No. OT-55-I (CPC-1174, Supplement No. 1) (AAR 2006). Continuous sponsored industry and government improvements in rail equipment, tank car and container design and construction, and inspection and maintenance methods have resulted in reducing derailments, spills, leaks and casualties while the volume of traffic increases (FRA 2016d). Railroads that transport hazardous materials have highly trained experts that manage hazardous material movements and respond to hazardous material incidents. The transport of hazardous materials is regulated by the U.S. Department of Transportation (DOT), the U.S. Department of Homeland Security, the U.S. Transportation Security Administration, the U.S. Environmental Protection Agency (USEPA), and the Occupational Safety and Health Administration (OSHA). These regulations mandate that the transport of hazardous materials be conducted with the highest level of care and security.

Freight railroads are considered "common carriers" under U.S. interstate commerce laws and are legally required to move any freight including hazardous materials, provided that they are contained within a government approved rail car or container. Rail cars that transport hazardous materials must meet strict federal regulations.

[110] Federal Railroad Administration (FRA). 2016d. "Hazardous Materials Transportation." https://www.fra.dot/Page/P0151 (accessed July 8, 2016).

[111] CSX 2016b. "Hazardous Materials." https://www.csx.com/index.cfm/about-us/safety/hazardous-materials1/ (accessed November 22, 2016).

The majority of hazardous materials are chemicals that are essential to the economy of the U.S. and are used to manufacture every day products. Hazardous commodities, by U.S. DOT hazard class, are listed below.

- Class I – Explosives
- Class 2 – Gases
- Class 3 – Flammable Liquids
- Class 4 – Other Flammable Substances
- Class 5 – Oxidizing Substances and Organic Peroxides
- Class 6 – Toxic (Poisonous) and Infectious Substances
- Class 7 – Radioactive Material
- Class 8 – Corrosives
- Class 9 – Miscellaneous Hazardous Materials

5.15.1.1 Emergency Response

USEPA regulations address spill prevention and cleanup. Most USEPA regulations address fixed facilities rather than transport activities. However, USEPA regulations in 40 CFR Part 263, are applicable to transporters of hazardous waste, and specify immediate response actions, discharge cleanup, and other requirements for transporters of hazardous waste. Finally, OSHA regulations in 29 CFR § 1910.120, address hazardous waste operations and emergency response, and specify emergency response and cleanup operations for releases of hazardous substances and substantial threats of such releases.

5.16 Aesthetics and Visual Resources

No-Build Alternative. The No-Build Alternative would not result in any changes within the Study Area and therefore, no aesthetic or visual quality impacts would occur.

Build Alternative. The presence of proposed rail corridor would affect the aesthetics and visual fabric of the Study Area by adding another linear feature to the landscape similar in manor as any road or cleared easement. When a train or service vehicle is not on the tracks, transverse visibility would be less than two and a half miles without landscape or other screens. This is based on the curvature of the earth which causes an approximate eight-degree drop per mile. Most of the residents, workers and visitors to the area would not see the proposed railroad corridor except at roadway crossings. There would be 22 at-grade crossings – 15 of these crossings are private, gated logging road. There would be three new grade-separated crossings created by the Build Alternative and there is one existing grade-separated bridge exists over I-59. The new public roadway crossings are listed in **Table 5.13**. See *Draft Modified Phase 1 Environmental Site Assessment Report* **Appendix F**.

Table 5.13: New Public Roadway Crossings of the Proposed Project

Grade Separated Public Road Crossing	Crossing type
Interstate 10	Grade separated with RR over
LA Route 607	Grade separated with RR over
U.S. Route 90	Grade separated with RR over
At-Grade Public Road Crossing	**Crossing Type**
Old Lower Bay Road	Gates, flashers, pavement markings and grade crossing signs
Unknown Public Road	Gates, flashers, pavement markings and grade crossing signs
Unknown Public Road	Gates, flashers, pavement markings and grade crossing signs
Unknown Public Road	Gates, flashers, pavement markings and grade crossing signs
Catahoula Public Road	Gates, flashers, pavement markings and grade crossing signs
Mainline Road	Gates, flashers, pavement markings and grade crossing signs
Flattop Road	Gates, flashers, pavement markings and grade crossing signs

There would be minimal visual affects at these crossing locations associated with the occasional train traffic anticipated. It should be noted that the three new proposed grade-separated crossings would cause a slightly greater visual impact because the bridges required for this grade separation would be visible for a further distance. However, all of these bridges are located within the SSC buffer zone so there are no inhabitable buildings nearby that would see the bridge. In addition, the bridges would primarily be visible from the transportation facilities that they cross. Therefore, the visual effects are considered minimal.

There are two neighborhoods that could be affected by new crossings and/or the reactivation of existing crossing resulting from the proposed Project.

Old Lower Bay Road Neighborhood – This area consists of approximately 10 houses and at its closest point it is located approximately 0.4 mile from the proposed rail corridor. Although, there are tree-lines on either side of Old Lower Bay Road and a quarry, which has limestone mounds on the southern side of the road, the residents within this neighborhood would be able to see both the railroad corridor and the trains from vantage points on their property; because the rail line would be at ground level and obstructed by trees except for approximately 20 feet as it crosses Old Lower Bay Road, itself; in addition, only two trains are anticipated to use this rail line per day. Therefore, visual effects of the new rail line on this community would be minimal.

Joe Fleming Road Neighborhood – This area consists of approximately 18 houses and five businesses. The neighborhood is located very close to the existing NS rail corridor that would be incorporated into the proposed Project. This rail corridor is currently used for rail car storage and train traffic is an existing visual landscape. Since the track is currently located adjacent to this neighborhood, the visual impairment would not be related to the tracks themselves but the additional train traffic associated with the Build Alternative; the track is expected to see approximately two trains per day. Some of the residences in this neighborhood would be able to see the occasional train from vantage points on their property. This is considered a minimal visual affect for adjacent communities.

There are no Section 4(f) or 6(f) properties located within the visual APE of the proposed Project. Therefore, the proposed Project would not have any visual or aesthetic impacts on any 4(f) or 6(f) properties. The cultural resource survey identified 3 historic properties within the architectural APE, however, none are eligible for the NRHP. As a result, there are no aesthetic or visual quality affects to NRHP properties.

5.17 Transportation

5.17.1 Transportations Impacts

No-Build Alternative. The future and planned expansion projects within the Port Bienville Industrial Park may place a greater demand on the Study Area roadway network (see **Section 4.18.1**). New and expanding manufacturing facilities would require additional employees and services, thus generating additional vehicular traffic and placing a greater demand on the existing roadway network. It should be noted that the Study Area roadways are relatively low-volume facilities for their respective functional classifications, and should be able to accommodate normal traffic growth. No roadway capacity-related improvement projects for Study Area roadways have been identified by MDOT.

As part of the No-Build Alternative, impacts to the existing highway network would remain the same as existing conditions. Existing rail infrastructure along the NS right of way and at intersecting at-grade crossings, which are located in the northern portion of the Study Area, would likely remain in-place however, there would be no trains operating on the existing track, thus eliminating all vehicle and train conflicts associated with highway-rail at-grade crossings.

The No-Build Alternative would have no impacts on other transportation modes such as pedestrians and bicycles. No conflicts between trains and pedestrians and bikes would occur as rail operations would not be implemented.

Build Alternative. The proposed Project is identified as a near-term priority within the Mississippi State Rail Plan (MDOT 2011a). The proposed Project would provide a direct connection between Port Bienville and the NS rail line near I-59 in Nicholson. The proposed rail connection to the NS would also provide access to the Canadian National Railroad further north in Hattiesburg. Overall, the proposed Project would link to both the CSX and NS main lines in Hancock and Pearl River Counties, providing Port Bienville with the access to dual Class I rail service.

The proposed Project would repair and upgrade a 5.33-mile portion of the inactive NS rail line between U.S. Highway 11 and Texas Flat Road. This segment of existing rail previously served SSC. The existing track within this segment consists of 100 pound and 85 pound rail with wood ties.

South of Texas Flat Road, the proposed Project consists of new rail that would be constructed with a proposed 100-foot right-of-way. The new alignment segment is approximately 18.3 miles in length. Approximately 96,624 track feet of rail would be constructed as part of the Project. The proposed track would consist of 136 pound (136#) continuously welded rail with wood ties. Manual and electric turnouts would be installed.

5.17.1.1 Proposed Highway-Rail Grade Crossings

As part of the conceptual engineering that was undertaken for the proposed rail alignment, proposed highway-rail grade crossings along the 24-mile rail corridor are depicted in **Figure 5.12**. Depending on highway functional classification and existing traffic volume, the proposed grade crossings consist of grade-separated crossings and at-grade crossings (both public and private). **Table 5.14** and **Figure 5.12** summarizes the grade crossing locations along the alignment of the Build Alternative, which are further described below.

Figure 5.12: Proposed Grade Crossings along Project Alignment

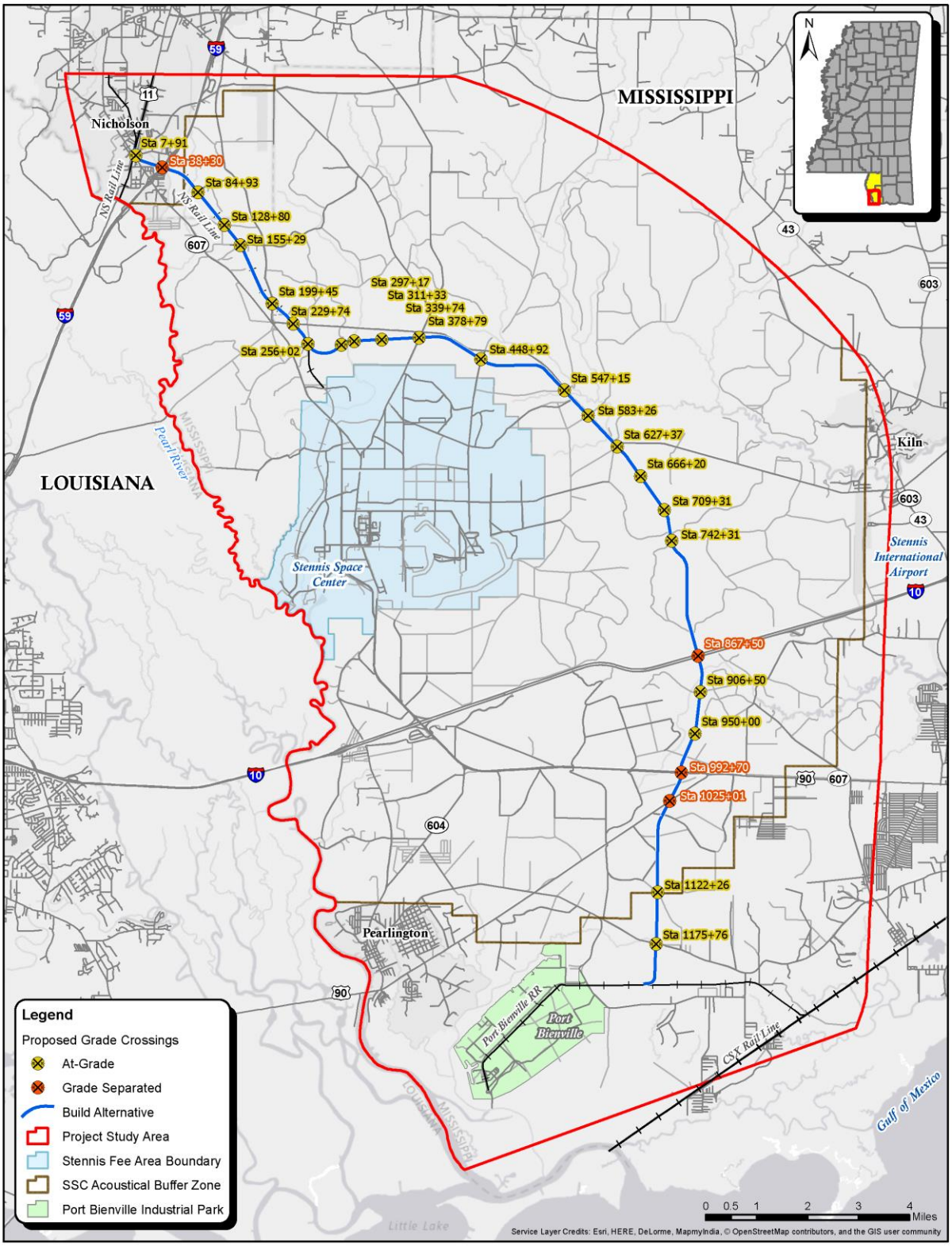


Table 5.14: Proposed Grade Crossings along Project Alignment

Roadway Crossing Location	Alignment Centerline Station (1)	Crossing Type and Disposition		
		At-Grade		Grade-Separated; Public Crossing
		Public	Private	
PROPOSED RAIL ON EXISTING ALIGNMENT WITHIN EXISTING NS RAILROAD RIGHT-OF-WAY				
U.S. Highway 11	Sta 7+91	Existing		
Interstate 59	Sta 38+30			Existing; Rail over
Asa McQueen Road	Sta 84+93	Existing		
Unknown Roadway	Sta 128+80	Existing		
Unknown Roadway	Sta 155+29	Existing		
Ridge Road	Sta 199+45	Existing		
Texas Flat Road	Sta 229+74	Existing		
PROPOSED RAIL ON NEW ALIGNMENT WITHIN REQUIRED RIGHT-OF-WAY				
Unknown Roadway	Sta 256+02	Proposed		
Unknown Roadway	Sta 297+17		Proposed	
Unknown Roadway	Sta 311+33		Proposed	
Unknown Roadway	Sta 339+74		Proposed	
Flat Top Road	Sta 378+79	Proposed		
Mainline Road	Sta 448+92	Proposed		
Unknown Roadway	Sta 547+15	Proposed		
Catahoula Road	Sta 583+26	Proposed		
Unknown Roadway	Sta 627+37	Proposed		
Unknown Roadway	Sta 666+20		Proposed	
Crown Road	Sta 709+31		Proposed	
Unknown Roadway	Sta 742+31		Proposed	
Interstate 10	Sta 867+50			Proposed; Rail over
Utility Access Road	Sta 906+50		Proposed	
Unknown Roadway	Sta 950+00		Proposed	
SR Route 607	Sta 992+70			Proposed; Rail over
U.S. Highway 90	Sta 1025+01			Proposed; Rail over
Unknown Roadway	Sta 1122+26		Proposed	
Old Lower Bay Road	Sta 1175+76	Proposed		
Total No. of Crossings by Type		**13**	**9**	**4**

Note 1: Station locations are based on conceptual rail alignment maps

Grade-Separated Crossings

Four grade-separated crossings would occur along the entire Project corridor. These locations include the existing rail bridge over I-59 in Nicholson and three new grade-separated structures at I-10, SR 607 and U.S. 90. For the new grade-separations, the rail would be elevated over the roadway with a bridge structure, and embankment sections would be constructed on each approach to the bridge. Bridge lengths would be determined based on existing topography, existing cross street right-of-way and proposed vertical geometry.

Public At-Grade Crossings

Thirteen public at-grade crossings would occur along the entire limits of the Project corridor. Six of the public at-grade crossings would be located on the north end of the corridor where the existing rail crosses U.S. 11, Asa McQueen Road, Ridge Road, Texas Flat Road, and two unknown roads. Seven additional

public at-grade crossings would occur at Flat Top Road, Mainline Road, Catahoula Road, Old Lower Bay Road, and three unknown roads.

Private At-Grade Crossings

Along the main line alignment from Texas Flat Road to U.S. 90, there would be approximately nine private at-grade crossings. All of these crossings would occur at existing local access roadways, many of which are unpaved or unimproved asphalt roadways and do not have designated street names. These existing roadways provide access to parcels of land owned by private landholders. In addition, several of the at-grade crossings are located within the SSC acoustical buffer zone.

5.17.1.2 Proposed Road Closures

Due to the close proximity of existing private roadways in relationship to the three proposed grade separations, a few adjacent private roadways would need to be closed to accommodate the embankment sections associated with the bridge approaches. However, no land parcels would lose access due to the proposed Project. Access to existing parcels of land would be maintained and/or consolidated through the construction of parallel access roads. The access roads would be located adjacent to the proposed rail right of way. Existing private roads recommended for closure include:

- one private road closure north of I-10,
- two private road closures immediately north and south of SR 607; and
- one private road closure south of U.S. 90.

5.17.1.3 Proposed Traffic Control Measures at Highway-Rail At-Grade Crossings

In accordance with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD), traffic control for grade crossings includes all signs, signals, markings, other warning devices, and their supports along highways approaching and at grade crossings. The function of this type of traffic control is to promote safety and provide effective operation of rail and highway traffic at grade crossings. Before any new highway-rail grade crossing traffic control system is installed, or before modifications are made to an existing system, approval shall be obtained from the highway agency with the jurisdictional and/or statutory authority, and from the railroad company.[112] MDOT Freight Rail Division and MDOT Traffic Engineering Division would be responsible for approving traffic control measures on state maintain roadways, while Hancock County would be responsible for these approvals on local county roads. The proposed traffic control measures would be coordinated through the Port Bienville Railroad during the design phase of the Project.

Highway-rail grade crossing traffic control measures would be implemented in accordance with the MUTCD standards as part of the Project. Recommended traffic control for highway-rail at-grade crossings would include one grade crossing (crossbuck) sign on each highway approach. The crossbuck sign is a warning to on-coming traffic of a highway-rail at-grade crossing and of a driver's responsibility to yield to rail traffic if a train is approaching a crossing. In addition, a Grade Crossing Advance Warning sign shall be used on each highway in advance of every public highway-rail grade crossing. Several other advance warning signs can be used to alert drivers of highway-rail crossing conditions (see **Figure 5.13**).

[112] Federal Highway Administration (FHWA). 2009. Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways. 2009 Edition. Updated in 2012.

Figure 5.13: Highway-Rail At-Grade Crossing Signage

Recommended Signs	 Grade Crossing sign (R15-1) (Crossbuck)	 Grade Crossing Advance Warning sign (W10-1)		
Optional Traffic Control/Advance Warning Signs	 Diagonal Crossing (W10-12)	 Parallel Crossing (W10-3)	 Stop Sign (if needed)	 Yield Sign (if needed)

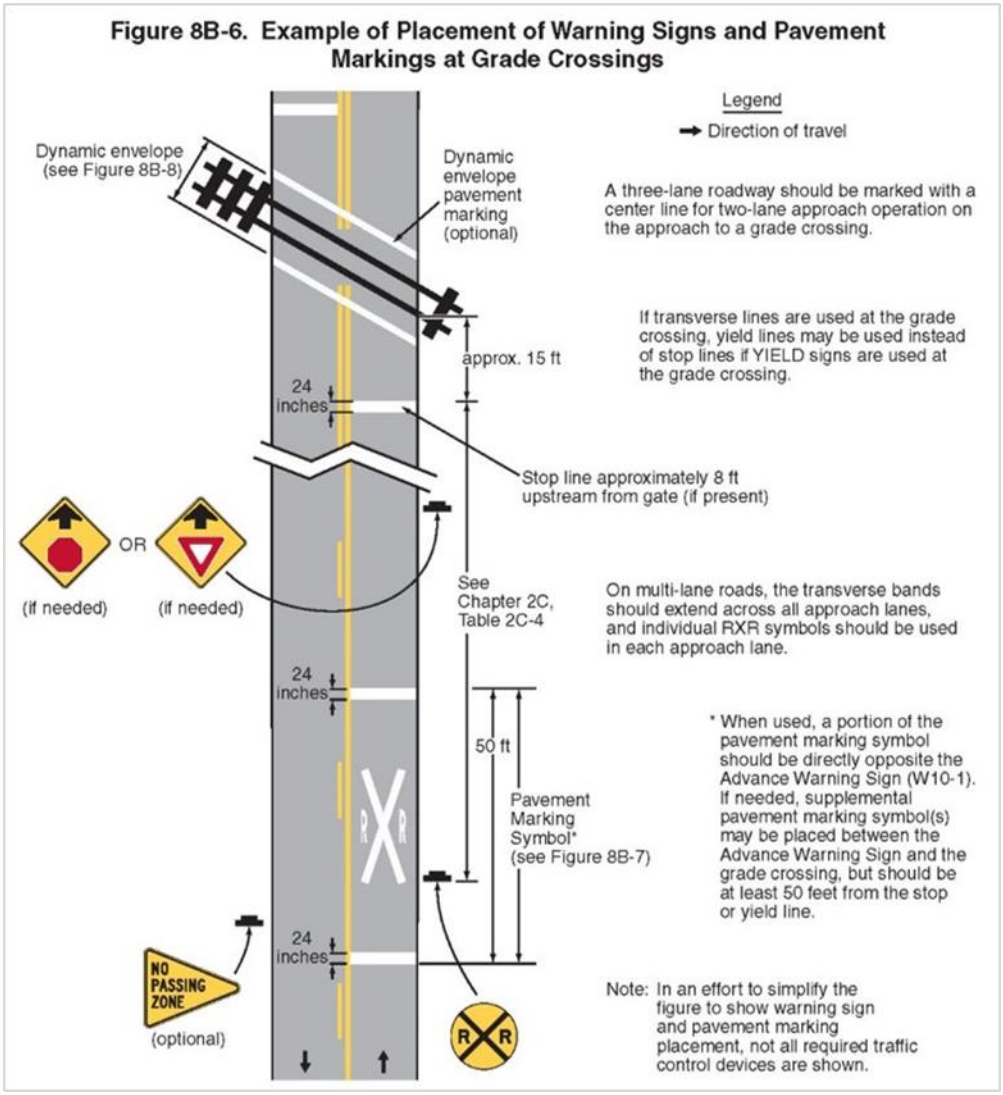
Source: Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways (FHWA 2009).

In addition to MUTCD-compliant grade crossing signage, various on-street pavement markings are recommended for installation at public at-grade crossings. These markings would include stop lines, dynamic envelope pavement markings, and railroad pavement marking symbols. **Figure 5.14** provides an example layout of safety devices for a public highway-rail grade crossing.

Table 5.15 summarizes the proposed traffic control measures that are recommended for installation at each of the 22 at-grade crossings. Advance warning signs, on-street pavement markings, signal gates and flashing lights are proposed at all public at-grade crossings. At the remaining private at-grade crossings, which would consist of very low volume roadways, crossbuck signs are recommended. On U.S. 11, pedestrian crossing signs to accommodate Nicholson Elementary School students should be considered, if warranted. During the design phase of the Project, pedestrian crossings would be evaluated to determine if adequate refuge areas are provided at this crossing location. MDOT Freight Rail Division and MDOT Traffic Engineering Division would be responsible for approving traffic control measures on U.S. 11.

Traffic control and signing and pavement marking plans which illustrate the proposed traffic measures for each of these locations would be developed as part of the Project design. Concurrence and approval from the highway agencies (MDOT, Hancock County and Pearl River County) with the jurisdictional and/or statutory authority for each roadway would be required. See Draft Transportation and Safety Report **Appendix G**.

Figure 5.14: Highway-Rail Crossing Signage and On-street Pavement Marking Example



Source: Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, Page 765 (FHWA 2009).

Table 5.15: Proposed Traffic Control Measures at Highway-Rail Grade Crossings

Roadway Crossing Location	Alignment Centerline Station (1)	Crossing Type (Public/Private)	Proposed At-Grade Crossing Measures
U.S. Highway 11	Sta 7+91	Public	Gates, flashers, pavement markings and grade crossing signs (crossbucks and grade-crossing advance railroad crossing)
Asa McQueen Road	Sta 84+93	Public	
Unknown Roadway	Sta 128+80	Public	
Unknown Roadway	Sta 155+29	Public	
Ridge Road	Sta 199+45	Public	
Texas Flat Road	Sta 229+74	Public	
Unknown Roadway	Sta 256+02	Public	
Unknown Roadway	**Sta 297+17**	**Private**	**Crossbuck signs**
Unknown Roadway	**Sta 311+33**	**Private**	
Unknown Roadway	**Sta 339+74**	**Private**	
Flat Top Road	Sta 378+79	Public	Gates, flashers, pavement markings and grade crossing signs (crossbucks and grade-crossing advance railroad crossing)
Mainline Road	Sta 448+92	Public	
Unknown Roadway	Sta 547+15	Public	
Catahoula Road	Sta 583+26	Public	
Unknown Roadway	Sta 627+37	Public	
Unknown Roadway	**Sta 666+20**	**Private**	**Crossbuck signs**
Crown Road	**Sta 709+31**	**Private**	
Unknown Roadway	**Sta 742+31**	**Private**	
Utility Access Road	**Sta 906+50**	**Private**	
Unknown Roadway	**Sta 950+00**	**Private**	
Unknown Roadway	**Sta 1122+26**	**Private**	
Old Lower Bay Road	Sta 1175+76	Public	Gates, flashers, pavement markings and grade crossing signs (crossbucks and grade-crossing advance railroad crossing)

Note 1: Station locations are based on conceptual rail alignment maps prepared by HDR.

5.17.2 Build Alternative Delay Analysis at Proposed Highway-Rail Public At-Grade Crossings

5.17.2.1 Traffic Delay Analysis Overview

Train crossings interrupt roadway traffic flow for a period of time at highway-rail at-grade crossings. Speed and length of the train are the primary factors that contribute to vehicular delay. A traffic delay analysis was undertaken for the Build Alternative to estimate the projected vehicular delay in 2020 and 2040. To characterize future conditions along the Project corridor, the analysis estimated future traffic delays due to the train movements at four public highway-rail at-grade crossings. The analysis focused on calculating delays to characterize the future effects on vehicular traffic from projected train movements. **Table 5.16** briefly describes the parameters that were used to measure the at-grade crossing roadway operational delay.

Table 5.16: Operational Parameters at Highway-Rail Grade Crossings

Parameter	Description
Blocked Crossing Time per Train (Dc)	The time required for a train to cross the intersecting roadway will be estimated. This time is called the blocked crossing time. This value is used to determine the length of time drivers wait when trains pass through a highway/rail at-grade crossing. Average train speed is a major factor in this calculation. This speed is dependent not only on track conditions and train operating characteristics, but also on intersecting commuter and freight rail traffic.
Average Delay per Delayed Vehicle (Da)	The average delay per delayed vehicle is the average amount of time that a driver would be delayed at a highway/rail at-grade crossing as a result of a single train crossing. It assumes a uniform arrival of vehicles. Vehicles arrive at a constant rate. When the blocked crossing period begins, vehicles begin to queue. When the blocked crossing period ends, queued vehicles begin to depart at the constant vehicle departure rate. The departure rate continues until the departure curve intersects the arrival curve, signifying the dissipation of the queue.
Vehicle Queue Length (Q)	The vehicle queue is the estimated number of vehicles in line at the end of the blocked crossing time of a single train event. The vehicle queue is equal to the number of vehicles that arrive during the blocked crossing time (De). The vehicle queue during the peak hour of roadway traffic is estimated. The peak-hour traffic is assumed to be 10 percent of the ADT volume-a typical assumption used by traffic engineers, and consistent with MDOT count data. The vehicle queue at the end of the blocked crossing time is determined.
Average Delay for All Vehicles (Dv)	The average delay per vehicle is the average amount of time that a vehicle is delayed at that intersection.
Average Number of Vehicles Delayed Per Day (Td)	The average number of vehicles delayed per day equals the number of drivers in a 24-hour period that would be stopped for trains at highway-rail at-grade crossings.
Traffic Level of Service (LOS)	The vehicle delay effects at highway-rail at-grade crossings uses the LOS concept at signalized intersections, as documented in the 2010 Highway Capacity Manual (HCM) (TRB 2010). Use of the HCM procedures for signalized intersections is acceptable for the following reasons: the absence of a similar measure of efficiency for highway-rail at-grade crossings, and similarities between signalized intersection operation and highway-rail at-grade crossing operation.
Total Daily Average Vehicle Traffic Delay	The total average vehicle delay for each crossing over a 24-hour period multiplied by the number of vehicles delayed is used to estimate the total daily average vehicle traffic delay.

5.17.2.2 Traffic Delay Analysis Methodology

The model used for calculation of delay at individual at-grade crossings provides a measure of delay based upon the time spent waiting for trains to clear individual crossings. This analysis provides output within the following general categories.

Maximum Queue Length

The queuing model, which is based upon the *Highway Capacity Manual (HCM) 2000*, developed by the Transportation Research Board of the National Academies (TRB 2000), measures the length of traffic queues created when trains crossing through at-grade intersections stop traffic flow. Measurement of the queue length is in the number of vehicles waiting in both directions at the given time the train crosses.

Total Delay

Delay measurements identify two conditions prevalent along the rail corridors:

- Aggregate Delay, defined as the total delay (in vehicle hours) incurred by all vehicles passing through the rail/road intersection.
- Average Delay, defined as the delay experience (in seconds per vehicle) for each peak hour experienced by vehicles passing through the rail/road intersection.

Level of Service

Level of Service (LOS) represents traffic operational conditions along various types of roadways and intersections. Analysis of level of service depends on the prevailing conditions of traffic operations, generally characterized by the following factors:

- Traffic density or number of vehicles found on the corridor by lane;
- Prevailing speed of operation; and
- Ratio of volume to roadway capacity.

The measure of performance, known as the level of service, appear as a letter grade ranging from A to F. Level of service C (LOS C) or better conditions typically indicates that traffic movements occur close to, or at the posted speed limit. LOS D marks the point in traffic operations where the options to maneuver around slower moving vehicles, or vehicles entering/exiting the roadway is severely restricted. Traffic operations characterized by slower moving vehicles, including incidents of stopped vehicles or vehicles remaining platooned at signals through multiple cycles, reflect LOS E or LOS F conditions. LOS F represents that period during which the roadway is at, or over capacity, with breakdowns in traffic flow.

5.17.2.3 Traffic Delay Analysis Locations

At-grade crossings along the proposed Project were analyzed for delay under future year conditions in 2020 and 2040. The analysis focused on public at-grade crossings that would most likely be impacted by the proposed Project. The overall transportation network and rural nature of the study area were also considered. Along the proposed rail alignment, three future highway-rail grade crossings were evaluated including US Highway 11, Texas Flat Road, and Flat Top Road. The existing at-grade crossing on Lower Bay Road at the Port entrance was also evaluated. The delay analysis on Lower Bay Road consisted of two scenarios: 1) with proposed Project rail traffic from the NS line only and 2) with proposed Project rail traffic from the NS line in combination with PBRR traffic on the existing spur that connects to CSX. Due to the CSX's current common carrier obligation with Port Bienville, it is assumed that the existing and projected rail volumes for Port Bienville Industrial Park Tenants would continue to be served by CSX.

5.17.2.4 Highway Data for Traffic Delay Analysis

Traffic data for the delay analysis was provided by the MDOT and the Gulf Regional Planning Commission. Average daily traffic (ADT) count data represents the total volume of two-way traffic found at key locations in the Study Area. Historical ADT was evaluated to identify changes in overall traffic volumes, which was determined to be a 1 percent annual change. This rate of change allowed for annualized growth of traffic count data between the date of collection and the established baseline year (2020) and future year (2040). **Table 5.17** provides a summary of the ADT for each location evaluated. This data demonstrates the low volume nature of the majority of roads which cross the proposed Project.

Table 5.17: Grade Crossing Projected Average Daily Traffic Volume Data (2020 and 2040)

At-Grade Crossing Location	Existing Volume (year)	2020 Estimated Volume[1]	2040 Estimated Volume[1]
US Highway 11	8,400 (2014)	8,917	10,880
Texas Flat Road	2,064 (2012)	2,235	2,727
Flat Top Road	110 (2011)	-	-
	See Note 1	500	610
Lower Bay Road	1,876 (2012)	2,031	2,479

[1] The 2011 traffic count for Texas Flat Road is located to the north of Flat Top Road. The proposed at grade crossing is located on the south side of Flat Top Road where there is no traffic count data. Based on the existing roadway network, it is assumed that the volume of traffic on Flat Top Road, south of Texas Flat Road, would be higher due to the proximity of access to SSC. Therefore the 2020 volume on Texas Flat Road south of Flat Top Road is estimated at 500 vehicles per day.

5.17.2.5 Rail Data for Traffic Delay Analysis

Estimates of existing and future rail car volumes were developed as part of the delay analysis. The PBRR is currently operating 6-day service with 2 trains per day (1 train inbound and 1 train outbound). Each train averages 22 cars per train each way. This daily average is based on the actual number of total cars serviced (49,013 cars) from January 2013 to present. Annually, PBRR handles approximately 6,200 train cars. These existing trains access Port Bienville by way of the CSX mainline near Ansley, Mississippi.

Based on previous interviews that were conducted with existing companies and information from the Mississippi Development Authority (MDA), future rail car usage on the Port Bienville Railroad could increase significantly given access to dual Class I railroads. The largest projected rail car user, Shale Support Services, is currently trucking fracking sands from Hancock County to its drying facility in Picayune. Additional product lines are planned for this facility in the near future if dual rail access is available, and the Phase II expansion would move 168,000 tons (1,680 rail cars) of material monthly (20,160 rail cars annually) from the Hancock County facility (MDOT 2013c).

Table 5.18 depicts the total projected volume of rail traffic with dual Class I rail service into Port Bienville.

Table 5.18: Projected Rail Car Volumes with Dual Class I Rail Service

Existing and Projected Rail User	Existing and/or Projected Annual Rail Car Volume	Existing and/or Projected Daily Rail Car Volume (one-way only)
Existing Rail Car Volume for Existing Port Bienville Industrial Park Tenants (1)	6,200 rail cars	22 rail cars
Future Additional Rail Car Volume for Existing Port Bienville Industrial Park Tenants (2)	3,530 rail cars	11 rail cars (3)
Projected Rail Car Volumes for Phase II Shale Support Services Facility in Hancock County (2)	20,160 rail cars	65 rail cars (3)
Total Projected Rail Car Volumes for Existing Industries and MDA Industrial Prospect	**29,890 rail cars**	**98 rail cars**

(1) Hancock County Port and Harbor Commission, email correspondence dated June 2, 2016 and August 25, 2016.
(2) Port Bienville Rail Feasibility Study, CDM Smith, September 2013.
(3) Projected Daily Volume Based on 6-day Service Weekly per Year.

As part of the grade crossing analysis, projected rail car volumes were distributed among the Class I railroads as shown in **Table 5.19**. Due to the CSX's current common carrier obligation with Port Bienville, it is assumed that the existing and projected rail volumes for Port Bienville Industrial Park Tenants would continue to be served by CSX. For purposes of the delay analysis, projected one-way rail volumes on the existing PBRR are estimated to be 22 cars in 2020, increasing to 33 cars by 2040.

The remainder of the projected rail traffic would utilize the proposed rail line. Based on the distribution of projected daily rail car volumes, it is estimated that the proposed rail line would move 65 rail cars (one-way only) on a daily basis by 2040. In the interim, the projected one-way rail volume on the proposed rail line is estimated to be 30 cars in 2020.

Table 5.19: Distribution of Projected Daily Rail Car Volumes by Class I Railroad (one-way only)

Existing and Projected Rail User	Total Projected Daily Rail Car Volumes (one-way only) Full Build - 2040	Projected Daily Rail Car Volumes - Existing CSX		Projected Daily Rail Car Volumes - NS/Proposed Project	
		2020	2040	2020	2040
Existing Rail Car Volume for Existing Port Bienville Industrial Park Tenants	22 rail cars	22	22	-	-
Future Projected Additional Rail Car Volume for Existing Port Bienville Industrial Park Tenants	11 rail cars	-	11	-	-
Projected Rail Car Volumes for Phase II Shale Support Services Facility in Hancock County	65 rail cars	-	-	30	65
Total Projected Rail Car Volumes for Existing Industries and Future Industrial Prospects	**136 rail cars**	**22**	**33**	**30**	**65**

Train Lengths (L)

The numbers of existing and projected cars per train is projected to vary from 22 to 65 cars. With each car having an average length of 60 feet including the coupling, plus an 80 foot locomotive, train lengths could range from 1,400 feet to 4,060 feet. Trains over 50 cars would require two locomotives, which is accounted for within the 65 car - 4,060 feet train set.

Train Speed (V)

The average train operating speed provided by the PBRR Railway is 39 miles per hour (mph). For the delay analysis, it was assumed that the average train speed for the proposed Project would be 30 mph at proposed public highway-rail grade crossings. At the Port entrance, a 20 mph speed was assumed for the train to cross Lower Bay Road.

5.17.2.6 Traffic Delay Analysis Results

As part of the proposed Project, the number of trains crossing Lower Bay Road immediately east of the Port entrance is anticipated to increase to 4 trains per day. This includes 2 trains per day (inbound and outbound) on the proposed rail line plus 2 trains per day (inbound and outbound) on the existing PBRR that connects to CSX.

The results of the traffic delay analysis indicate that vehicle operations at each of the crossings evaluated are not projected to experience any level of delay in 2020 and 2040, as indicated by the level of service A.

Blockage of public at-grade intersections is not anticipated and motorist delay is not projected. Queue lengths are anticipated to be minimal, as is total vehicle delay.

5.18 Utility Impacts

No-Build Alternative. No utility relocations or adjustments would be required for the No-Build Alternative.

Build Alternative. As previously described, the uniqueness of the SSC acoustical buffer zone greatly limits the type and number of infrastructure within the Study Area; however, as shown in **Figure 5.15**, several major gas lines, power lines, and hazardous liquid lines cross the proposed right-of-way. Given the rural nature of most of the study area, impacts to other overhead and underground utilities are expected to be minimal. Impacts to both overhead and underground utilities would be assessed during the detailed design phase and any impacts would be resolved prior to or during construction through adjustment, relocation, or modification.

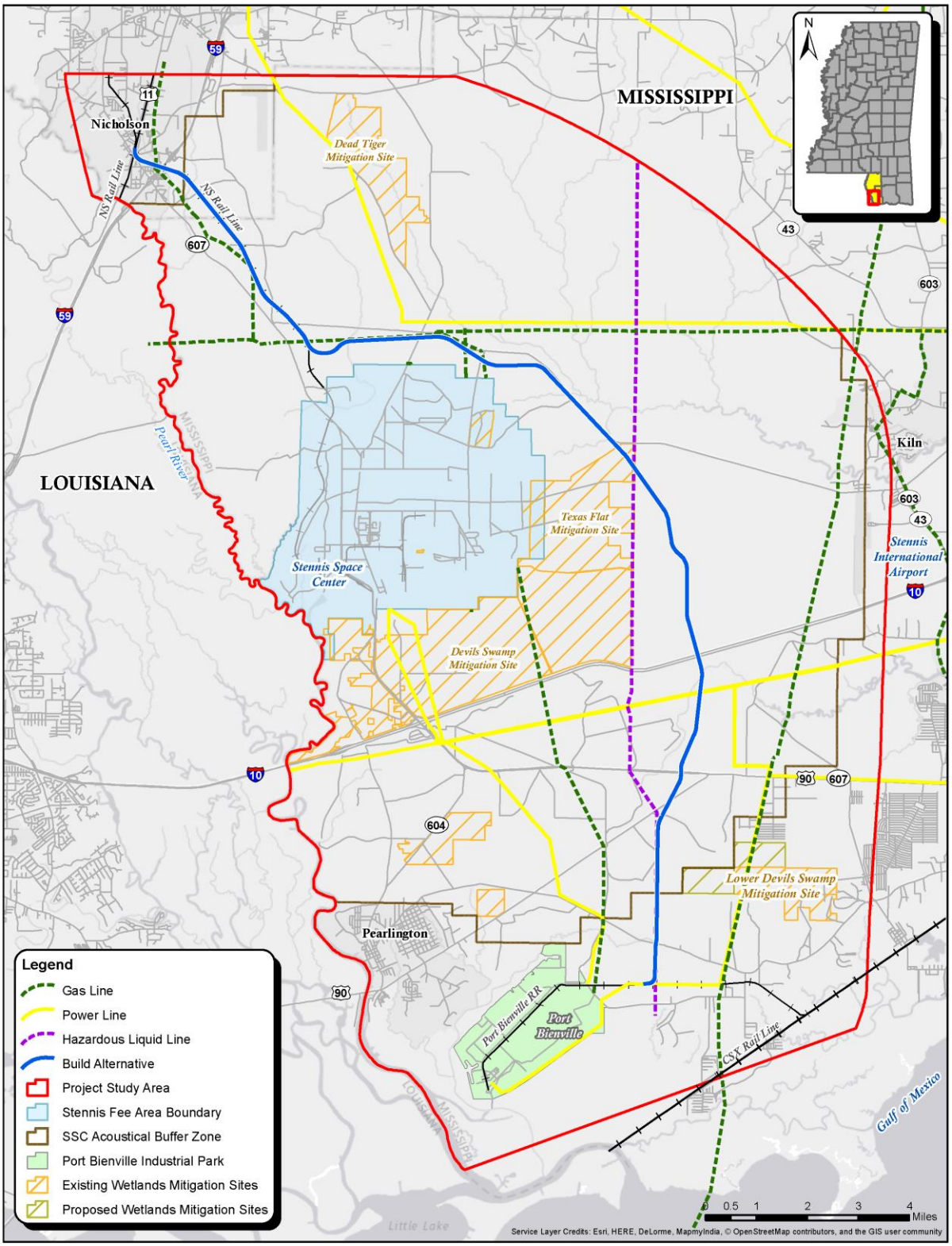
Specific utility information such as pipeline depths, overhead clearances for power lines, and the location of utility poles within the Project right-of-way is unknown at this time. Project design would include utility surveys and subsurface utility investigations to determine the horizontal and vertical location of utility infrastructure. Surveys would be followed by design phase services that would identify potential utility impacts and potential relocations or adjustments.

All modifications, relocations or adjustments would remain subject to coordination with the affected utilities. For pipelines and other underground infrastructure, Mississippi's "One Call" underground utility notification service (Mississippi 811, Inc.)[113] would be contacted by the contractor prior to commencing construction operations. Coordination would be required to ensure that overhead and underground utilities meet American Railway Engineering and Maintenance Association (AREMA) standards within the proposed right-of-way.

During construction and prior to operation of the proposed Project, a rail safety public awareness program would be implemented. Since rail service has not been in operation within the Study Area for over a decade, this type of program would benefit residents and motorists alike.

[113] Mississippi 811, Inc. (http://ms1call.org/) is a non-profit organization providing underground utility notification service under Mississippi Code of 1972, Chapter 13, Sections 77-13-1 through 77-13-23.

Figure 5.15: Gas Line Crossings



5.19 Energy

When importing and exporting goods, the companies within the Port Bienville Industrial Park use a combination of transportation modes available to the park, i.e. truck, rail, and barge. The amount of energy required to haul the same amount of cargo varies by mode. For example, rail transport is more than twice as efficient as truck hauling. Railroads can move 1 ton of cargo 413 miles for the same amount of fuel as it takes a truck to haul 1 ton of cargo 155 miles[114].

Currently, rail freight bound for Port Bienville must travel to the Gentilly Yard in New Orleans, and then be backhauled to Port Bienville. This additional time and distance increases the energy consumption of rail transport. Gentilly Yard is often congested. It is not unusual for rail cars to take at least 7 days to move from Gentilly Yard back to Port Bienville, and transit times as long as 28 days were reported by Port Bienville Industrial Park rail users[115]. This transportation inefficiency leads to increased energy consumption; for example, one Port Bienville Industrial Park business had to hire hundreds of trucks to offload a rail shipment in order to avoid a customer penalty for late delivery.

No-Build Alternative. In the no-build scenario, rail freight bound for Port Bienville would continue to travel to the Gentilly Yard in New Orleans, and then be backhauled to Port Bienville as described above. No other route options would be available to move cargo more efficiently to reduce energy consumption.

Build Alternative. The Build Alternative would reduce the direct consumption of energy as compared to the No-Build Alternative in the following two ways:

1) The Build Alternative would provide dual Class I rail service, which would provide an alternative to the current rail route. In some cases, this alternative route would provide a shorter, more efficient rail route, reducing the distance traveled by rail cars, and therefore reducing the consumption of fuel.

2) In some situations, the Build Alternative would replace truck transport with rail, which is more energy efficient and reduces overall energy consumption. Rail uses less than half the amount of fuel as trucks to move the same amount of freight.

In addition to the direct fuel savings described above, the Build Alternative has some indirect energy conservation benefits. The primary indirect benefit is that the proposed rail line would help locate new commercial and industrial development in, or adjacent to, existing developed areas reducing the potential for new industries to develop in areas that would be more truck dependent. Increasing rail options at the Port Bienville Industrial Park would attract new businesses to the multi-modal transportation hub and encourage the use of barge and rail transportation over less fuel-efficient trucking mode.

SSC does not have rail service at present, although rail was available to Stennis in the past. The proposed alignment for the new rail connector would run east of the Stennis facility, and access to the proposed rail connector could be extended near the north gate. Several SSC businesses interviewed for the Phase 1 study in 2013 indicated interest in shipping by rail[2]. These businesses currently ship large components by truck.

[114] www.marad.dot.gov/wp-content/uploads/pdf/water_works_REV.pdf, accessed on June 21, 2016.

[115] Port Bienville Economic Development Benefits and Opportunities Analysis. Presented to Mississippi Department of Transportation in collaboration with Federal Railroad Administration and Hancock County Port and Harbor Commission. Prepared by CDM Smith in association with HDR. September 19, 2013.

These businesses also noted they were aware of other research contractors that would be more inclined to move facilities to Stennis if rail were available.

The proposed north-south rail connection to the NS railroad also provides an option to move rail equipment, industrial equipment, materials, and other critical components out of harm's way in advance of tropical storm surges, which could reduce potential energy consumption required for clean up after tropical storms and hurricanes.

5.20 Construction Impacts

Construction impacts would be temporary and short-term and would therefore not result in any permanent damage. Construction impacts are related to the same types of topics discussed earlier in this DEIS such as air quality, water quality, noise/vibration, hazardous materials, public safety, wetlands and wildlife. Construction impacts would be controlled, minimized, or mitigated by closely adhering to applicable federal, state and local laws governing safety, health, and sanitation and through conformance with established construction methods. Most of the proposed rail alignment is located away from residential, public, and business structures, so construction impacts, such as noise, to citizens and business operations would be limited.

The following sections outline specific types of construction impacts and provide examples of safeguards, safety devices, protective equipment, and other reasonable actions that can be implemented to protect the safety of the work crew, public, property, and environment in connection with the construction of the Project.

5.20.1 Air Quality

Air quality impacts during construction can be caused by emissions from construction vehicles and equipment; emissions from local vehicles resulting from detours and other traffic delays during construction; and dust from construction sites. Emissions from vehicles and equipment increase greenhouse gases.

Emissions from construction vehicles and equipment would be minimized by properly maintaining and tuning equipment; reducing equipment idling time; planning efficient routes from construction material loading sites to the construction site; and using alternative fuels for construction equipment, when feasible. Emissions from local vehicles resulting from detours and other traffic delays during construction would be minimized by properly planning work zone flow and signage. Dust generated by construction activities would be minimized by:

- applying water suppression to active construction areas several times a day;
- covering trucks carrying loose materials, such as soil and sand, with tarp, or requiring that trucks maintain several feet of freeboard;
- applying non-toxic soil stabilizers or regularly apply water to unpaved access roads, parking areas, and staging areas;
- spraying all paved access roads, parking areas, and staging areas with water daily;

- seeding or applying non-toxic soil stabilizers to inactive construction areas and replanting vegetation as quickly as possible to minimize erosion in disturbed areas;
- enclosing, covering and watering, or applying non-toxic soil stabilizers, to exposed stockpiles of dirt, sand, etc.;
- limiting traffic speeds on unpaved roads; and/or
- using appropriate erosion control measures to reduce silt runoff.

5.20.2 Water Quality

Temporary impacts to surface and groundwater during construction can result from stormwater runoff, erosion and sedimentation, and accidental spills or discharges during construction. Impacts can be minimized by following strict stormwater management rules and regulations, use of Best Management Practices (BMPs), erosion control, and turbidity reduction. To prepare for any accidental spills, a spill prevention and emergency response plan would be developed and implemented.

Prior to construction, a Section 401 Water Quality Certification and National Pollutant Discharge Elimination System (NPDES) water discharge permit would be obtained. As part of the NPDES permit, MDOT would develop Storm Water Pollution Prevention Plans (SWPPP) for the Project. The SWPPP would include mandatory BMPs to minimize potential sediment transport due to construction activities, including obligatory erosion control techniques, stormwater management, and channel dewatering for all stream crossings. Example BMPs include practices that:

- store and dispose of construction materials so they are not discharged into or alongside streams or other water bodies;
- minimize contact between construction materials, equipment, and maintenance supplies with stormwater;
- control the release of contaminants near areas of surface water or groundwater recharge.
- reduce soil erosion including watering for dust control, perimeter silt fences, placement of straw bales, sediment basins, and soil stabilization;
- re-establish vegetative cover at stockpiling and staging sites after construction to reduce runoff and lessen sediment loadings; and
- maintain water quality through filtration, detention, and retention systems, constructed wetlands, biofiltration/bioretention systems, grass buffer strips, ponding areas, organic mulch layers, soil beds, sand beds, or biofilters such as vegetated swales to convey and treat runoff.

5.20.3 Noise and Vibration

Activities that cause noise and vibration during railroad and bridge construction include haul truck and heavy equipment operation, pile driving, and compaction of embankments. The range of noise depends on activity, construction schedule (time of day and duration of activity), and distance from noise receptors. Noise and vibration impacts would be minimized by:

- properly muffling all construction equipment, e.g. using specially quieted equipment with enclosed engines and/or high-performance mufflers;
- avoiding impact pile driving near noise-sensitive areas, where possible, e.g. using sonic or vibratory pile drivers in lieu of impact pile drivers where conditions permit their use;
- locating construction equipment as far as possible from noise-sensitive areas;
- constructing temporary noise barriers, such as walls or piles of excavated material, between construction activities and noise-sensitive areas;
- shutting all motor panels during operation; and
- avoiding nighttime construction near noise-sensitive areas, e.g. operating between the hours of 7:00 a.m. and 6:00 p.m., whenever possible.

5.20.4 Hazardous Materials and Construction Waste

Construction waste consists of materials and wastes generated during clearing, grubbing, milling and other activities. Hazardous materials may be discovered during demolition of structures and excavation.

Prior to construction, health and safety and contingency plans would be developed. The plans would include procedures to protect construction workers and the public if hazardous materials are encountered during construction. If contaminants are encountered during construction, disposal would occur at facilities and in a manner approved by federal, state and local regulations.

Generally, uncontaminated litter and trash would be collected and disposed of at landfill locations. Sanitary waste generated at the site would be removed by approved third party vendors and would be disposed of in a manner approved by state and local regulations.

5.20.5 Public Safety, Traffic, and Access

During construction, all local and through traffic would be adequately and safely accommodated. Overall, the Project would have limited traffic and access impacts on the public given the rural and low-density nature of the Study Area. Traffic and access impacts during construction include temporary lane or road closures and detours. Impacts could be minimized by:

- developing traffic management plans to maintain connectivity and reduce disruption to communities, activities, traffic, and circulation during construction;
- implementing procurement specifications and incentives for construction contractors designed to reduce the duration and disruption of construction, such as placing restrictions on construction vehicle traffic and routes, hours of permitted construction activity, and advance public notification of all closures and expected travel delays; and
- conforming to standard construction practices.

Construction and operational strategies would be developed through coordination between FRA (should additional FRA funding be identified for construction), MDOT, and other interested agencies. Plans for maintenance of traffic would be developed by Project engineers during final design of the Project and in

accordance with the current edition of the Federal Highway Administration's *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*.

5.20.6 Visual Impacts

The Project would have no impacts on visual resources since most of construction would be in rural, undeveloped, industrial, or commercial areas. During construction, the view of construction equipment, construction lighting, and stockpile and/or borrow areas would negatively impact Project site aesthetics in those areas that are accessible to the public. Nighttime construction lighting impacts would be minimized by use of appropriate light and glare screening measures, including the use of downward cast lighting. Areas where vegetation is temporarily removed or disturbed for construction would be re-vegetated as quickly as possible with native vegetation.

5.20.7 Energy Consumption

Temporary increases in energy consumption associated with construction activities include increased fuel use associated with manufacturing, truck traffic, and construction equipment. Energy consumption would be minimized by developing and implementing a construction energy conservation plan; using newer, more energy efficient construction equipment and materials; planning efficient haul routes; and encouraging construction workers to carpool to and from work sites.

5.20.8 Utility Service and Relocations

Prior to, or during construction, utilities in conflict with the Project would be relocated, modified, or protected in place. All modifications, relocations or adjustments would be coordinated with the affected utility owners/providers. Given the rural nature of the Study Area, impacts to public utilities would be limited.

5.20.9 Wildlife and Wetlands Impacts

During construction, ground cover along the rail corridor right-of-way would be temporarily disturbed and nearly all vegetative species would be removed. As a result, most animal species would temporarily relocate away from the area as clearing begins. Use of best management practices would control soil erosion. Areas where vegetation is temporarily removed or disturbed for construction would be re-vegetated as quickly as possible with native vegetation.

5.20.10 Cultural/Archeological Resources Encountered During Construction

Based on the results of the Phase 1 Archaeological and Cultural Historic Reconnaissance survey, there are four cultural resources over 50 years of age in the Project right-of-way (e.g., bridges, culverts, rail and roads) that could be potentially eligible for listing on the National Register of Historical Places (NRHP). However, it has been recommended that no further archaeological work is required. Construction activities for this section of the Project would be rail and tie replacement and surface and lining the track. In addition, the timber trestle over Alligator Branch was recently closed by NS and it is anticipated that this bridge would be replaced. In the event that artifacts or sites are discovered during construction, construction workers would be informed of how to recognize archaeological and cultural resources, and of the policies for handling discoveries of these resources, including deterrence of casual collection of artifacts by construction workers. If unanticipated cultural materials (e.g., large, intact artifacts or animal bones; large soils stains or patterns of soil stains; buried brick or stone structures; clusters of brick or stone) or human skeletal remains are discovered during construction activities, then the appropriate construction engineer

shall be immediately notified and all work in the vicinity of the discovered materials shall cease until an evaluation can be made by the MDOT archaeologist in consultation with the MDAH/SHPO.

5.20.11 Borrow Pits and Spoil Sites

Borrow activities would include providing fill for the development of the proposed rail embankment and grade-separations. Only approved borrow materials would be utilized for the Project. Borrow activities would occur in conformance with federal, state and local regulations. The following measures would be implemented for borrow pits and spoil sites:

- evaluation of borrow sites to incorporate input of federal, state and local agencies as necessary;
- early coordination and consultation to allow for evaluation of potential borrow sites to determine them satisfactory for use from an archaeological standpoint;
- disposal of unnecessary excavated materials in a manner consistent with federal, state and local regulations (including no disposal into wetlands and waterways)

Prior to the start of borrow activities, all required permits would be obtained, including evidence of mitigation or control plans for potential adverse environmental impacts.

5.21 Indirect and Cumulative Impacts

The Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act, 40 CFR Part 1500, defines secondary or indirect effects as follows:

> "[C]aused by an action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." (40 CFR § 1508.8)

Whereas direct effects generally occur within the Project right-of-way, indirect effects often occur outside of the Project right-of-way and can even occur outside of the Study Area. For example, indirect effects may include induced changes to land use resulting in resource impacts, such as induced development in wetlands resulting in habitat fragmentation and/or loss of wetland functionality.

The Council on Environmental Quality defines cumulative impacts as follows:

> "[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from minor but collectively significant actions taking place over a long period of time" (40 CFR § 1508.7).

Cumulative effects include both direct and indirect effects that would result from the Project, as well as the effects from other projects (past, present, and reasonably foreseeable future actions) not related to or caused by the Project. The cumulative effects of an action may be undetectable when viewed in the individual context of direct and indirect effects, but they can add to other impacts and eventually lead to a measurable environmental change.

The cumulative effects analysis considers the magnitude of the cumulative effect on the resource, as well as the general overall condition, stability, or vitality of the resource and the trend of that condition. Laws, regulations, policies, or other factors that may change or sustain the resource trend are considered to determine if more or less stress on the resource is likely in the foreseeable future. Opportunities to mitigate adverse cumulative effects on a stressed resource, or a resource that would continue to be stressed are presented.

The following seven-step evaluation process was used for the cumulative effects analysis (CEA) using an efficient, consistent, and logical method. The results of the CEA are described in sections by resource following the description of the seven steps.

Step 1: Identify Resources to Consider in the CEA

Evaluation of cumulative effects was completed for the resources that were found to be most directly or indirectly affected by the Project. Resources that were not found to be significantly affected by the Project were not considered in the CEA. The resources and environmental effects categories evaluated in this CEA include socioeconomics; noise and vibration; wetlands, streams, and other waters of the U.S.; and floodplains.

Step 2: Define the Geographic and Temporal Study Limits for Each Resource

The study timeframe considered for the CEA is from the 1960s to 2040. The 125,000-acre acoustical SSC acoustical buffer zone was established by NASA in the 1960s to enable testing of large engines for the Apollo Program and has since altered the development patterns of Hancock County. The year 2040 is based on the *2040 Mississippi United Long-Range Transportation Infrastructure Plan* (MULTIPLAN 2040).[116]

Geographic study limits are defined for each resource selected in Step 1 to be evaluated as part of the CEA. The resource study limits are used for characterization of the health condition and trend for each resource and to determine the potential cumulative effects on a resource.

Step 3: Describe the Current Status/Viability and Historical Context for Each Resource

The historical context and health of each resource is described and presented for each of the resources selected in Step 1. This information is important to establish the baseline condition and trend the resource is experiencing to be able to estimate the magnitude of the resource effect. The historical context is first described to provide an explanation of the factors that have caused the current health of the resource.

Step 4: Identify the Direct and Indirect Impacts of the Project

This step identifies the direct and indirect effects that could result from the proposed Project that may contribute to a cumulative effect when added to non-Project related effects.

Step 5: Identify Other Reasonably Foreseeable Effects

A CEA requires consideration of past, present and reasonably foreseeable future actions. This step identifies other non-Project related effects, i.e., other actions that have caused the current health of resources and other reasonably foreseeable future projects that may impact future resource trends.

116 MDOT. 2040 Mississippi United Long-Range Transportation Infrastructure Plan. January 2016.

Step 6: Identify and Assess Cumulative Impacts

This step considers the direct and indirect effects of the Project identified in Step 4 together with the effects of past, present, and reasonably foreseeable future projects identified in Step 5. The magnitude of the cumulative effect is determined by comparing the effect to the health and trend of the affected resource.

Step 7: Assess the Need for Mitigation

Opportunities for mitigation of adverse effects, where applicable, are discussed for each resource. These are not meant to be mitigation measures that the Federal Railroad Administration (FRA), Mississippi Department of Transportation (MDOT), Port Bienville Railroad (PBRR), or other agencies would, or have the authority to implement. Rather, they are intended to disclose steps or actions that could be undertaken by local, state and federal agencies and organizations to minimize the potential cumulative effect on each resource health and trend.

5.21.1 Land Use CEA

5.21.1.1 Study Limits

The study limits for the CEA for this resource is generally Hancock County, and a portion of Pearl River County, near Nicholson, Mississippi.

5.21.1.2 Historical Context and Current Conditions

Since the creation of the SSC acoustical buffer zone, land use within the zone is limited. No development is allowed and only limited land use changes can occur within this area. Areas to the north and south of the SSC acoustical buffer zone are the only areas within the Study Area that have the potential of being impacted.

At the northern end of the proposed PBRR extension is 5.3 miles of existing, Norfolk Southern (NS) railroad right-of-way (formerly connected to SSC) near Nicholson, Mississippi. Land uses within this area consist of industrial, commercial and residential. On the southern end of the Study Area, the proposed Project is located on new location until tying back into the Port Bienville Railroad. This area is identified as commercial/industrial land uses.

5.21.1.3 Direct and Indirect Effects

Direct and indirect land use changes from the proposed Project would be limited to the northern and southern section. Since the northern section ties into the existing rail line, no land use changes are anticipated in this area. The southern portions of the Study Area where development can occur, would include new development opportunities for the commercial and industrial areas. This development is consistent with Hancock County land use plans.

5.21.1.4 Effects of Other Reasonably Foreseeable Future Actions

Future land use changes with the highest potential to occur would be mainly due to potential development at Port Bienville Industrial Park. As described previously the industrial park will receive $8 million for improvement to the infrastructure that include rail expansion.

It is anticipated that planned projects of this nature would generate positive benefits for this area and region. Expansion would require additional opportunities, new jobs, and additional housing.

5.21.1.5 Cumulative Effects

The cumulative effects of the proposed Project and any other future development on the regions land uses are expected to be limited to the southern portion of the Study Area; these changes are anticipated to be beneficial for the area and region and are consistent with the planned uses of the area.

5.21.1.6 Mitigation

Mitigation of cumulative land use impacts is not necessary because the cumulative effects are expected to be limited and potentially beneficial.

5.21.2 Socioeconomic CEA

5.21.2.1 Study Limits

The study area for the CEA for this resource is generally Hancock County, Mississippi. Pearl River County was not included in the assessment because the alignment follows an existing rail line through the county and changes in Pearl River are not expected.

5.21.2.2 Historical Context and Current Health

The SSC was created in the early 1960s, allowing NASA to test rocket engines in Hancock County. To create the 13,800-acre "fee" area owned by the federal government and the surrounding 125,000-acre SSC acoustical buffer zone, five small towns were relocated and every house and building in the SSC acoustical buffer zone and fee area had to be moved or destroyed.[117] Both private companies and public agencies, including the Navy's Meteorology and Oceanography Command, have relocated to the area creating a concentration of research and technology.[118] The Hancock County Port and Harbor Commission began development of the Port Bienville Industrial Park and Port of Bienville in 1967.[119] Several casinos are now located in Hancock County as the result of the state legislature allowing casino gambling on the coast since 1992.[120]

Hancock County has faced transforming conditions in the last decade as it has worked to recover from the effects of Hurricane Katrina and the oil spill in the Gulf of Mexico, and the economic consequences of these disasters. The Port Bienville Industrial Park and SSC played a pivotal role in the recovery of this region, sustaining employment and attracting new investments and jobs that have helped to rebuild and enhance the area's economy. The Hancock County Port and Harbor Commission has identified four major growth sectors for the county: aerospace and aviation; cargo-oriented development; polymers and advanced composite materials; and geospatial technology. In addition to these four target industries, manufacturing and exports continue to represent a significant opportunity for future growth.[121]

Jindal Tubular USA LLC, one of the largest manufacturers of large diameter steel pipe, invested $10 million in their plant expansion for a production line to manufacture mortar-lined pipe for drinking water. Since

[117] http://www.nasa.gov/centers/stennis/pdf/697602main_October_12_Lagniappe.pdf, accessed on September 6, 2016

[118] Gulf Regional Planning Commission. 2013 County Overview: Hancock County.

[119] Port Bienville Economic Development Benefits and Opportunities Analysis. Presented to Mississippi Department of Transportation in collaboration with Federal Railroad Administration and Hancock County Port and Harbor Commission. Prepared by CDM Smith in association with HDR. September 19, 2013.

[120] Gulf Regional Planning Commission. 2013 County Overview: Hancock County.

[121] Port Bienville Economic Development Benefits and Opportunities Analysis. Presented to Mississippi Department of Transportation in collaboration with Federal Railroad Administration and Hancock County Port and Harbor Commission. Prepared by CDM Smith in association with HDR. September 19, 2013.

beginning operations in August 2015, Jindal has increased employment at its Port Bienville Industrial Park plant from less than 50 to 200 personnel.[122]

5.21.2.3 Direct and Indirect Effects

Direct and indirect socioeconomic effects of the Project include the impact on the local and regional economy due to enhanced development opportunities at the Port Bienville Industrial Park. These impacts are generally beneficial, such as increased tax revenue from developed land, increased household income and employment opportunities from new commercial development and increased income from construction of both the rail line itself and potential new development. Long-term employment opportunities could be increased as the growth following improvements in rail transportation. Population growth could follow employment growth and could increase additional demand for housing and services.

However, because 76% of the Study Area is within the SSC acoustical buffer zone, the demographics of the area, including population make-up (race, age, disability) and general housing characteristics are not expected to experience appreciable changes as a result of the Project. Education levels would not be affected by the proposed Project.

5.21.2.4 Effects of Other Reasonably Foreseeable Future Actions

Future development initiatives proposed at Port Bienville Industrial Park and Stennis International Airport are briefly described below.[123]

DAK Americas, which is one of the largest plastic-resin manufacturers in the U.S., has announced plans for a new manufacturing plant at their existing site at the industrial park. The plant would include $40 million of direct investment while adding 87 new full-time jobs.

In December 2015, it was announced that the Port Bienville Industrial Park will receive $8 million in RESTORE Act funding (Deepwater Horizon Oil Spill) for the construction of a trans-load dock and ancillary infrastructure improvements including rail line expansion. The Project would improve Port users' ability to move product between modes of transportation and would increase Port throughput in support of industry onsite and offsite.

It was also announced In December 2015 that the Stennis International Airport will receive $2 million in RESTORE Act funding (Deepwater Horizon Oil Spill) for Phase II of the Terminal Hangar project to construct a new 24,000 square foot hangar. The new hangar will also accommodate maintenance, repair and overhaul operations.

Each of these planned projects would generate positive socioeconomic benefits. New and expanding manufacturing facilities would require additional employees and services, thus generating jobs and income.

5.21.2.5 Cumulative Effects

The cumulative socioeconomic effects of the proposed Project and any other future development are expected to be beneficial due to the potential for economic growth that could provide additional and better paying jobs.

[122] Hancock County Port and Harbor Commission (HCPHC). 2015. Comprehensive Annual Financial Report For Fiscal Year Ended September 30, 2015. Prepared by Finance Department, Janet E. Sacks, Chief Financial Officer.

[123] Hancock County Port and Harbor Commission (HCPHC). 2015. Comprehensive Annual Financial Report For Fiscal Year Ended September 30, 2015. Prepared by Finance Department, Janet E. Sacks, Chief Financial Officer.

5.21.2.6 Mitigation

Mitigation of cumulative socioeconomic effects is not necessary because the cumulative effects are expected to be beneficial.

5.21.3 Environmental Justice

5.21.3.1 Study Limits

The study area for the CEA for this resource is generally Hancock County and the portion of Pearl River County, Mississippi that falls within the Study Area.

5.21.3.2 Historical Context and Current Conditions

Existing communities are located to the north and south of the SSC acoustical buffer zone. Since development is limited within the SSC acoustical buffer zone these are the only areas within the Study Area that have the potential of being impacted.

At the northern section of the Study Area, the proposed Project is located on the former Norfolk Southern (NS) railroad right-of-way near Nicholson, Mississippi. Residential areas exist as the alignment emerges out of the acoustical buffer zone and communities begin developing around the Project as it nears Nicholson. On the southern end of the Study Area, the proposed Project is located on new location until tying back into the Port Bienville Railroad. This area is identified as mainly commercial/industrial area with some single-family homes east of the proposed Project along Old Lower Bay Road.

5.21.3.3 Direct and Indirect Effects

Direct and indirect environmental justice impacts from the proposed Project would be limited to the northern and southern sections. Since the northern section ties into the existing rail line, no impacts to minority or low-income populations are anticipated. Impacts to the southern portion of the Study Area would include development opportunities for the commercial and industrial areas. Increase development would potentially provide job opportunities both short and term employment. These types of impacts are generally beneficial allowing for new opportunities for these communities.

5.21.3.4 Effects of Other Reasonably Foreseeable Future Actions

Future development with the highest potential to occur would be mainly development within Port Bienville Industrial Park. Development within the industrial park would not cause any relocations of EJ households or within the community.

It is anticipated that planned projects of this nature would generate positive benefits for this area and region. Expansion would require additional opportunities, new jobs, and additional housing.

5.21.3.5 Cumulative Effects

The cumulative land use and anticipated economic development that the Project would support are expected to be limited to the southern portion of the Study Area. These effects are likely to be beneficial for the area and region by providing additional jobs, which would be available to environmental justice populations within the area.

5.21.3.6 Mitigation

Mitigation of cumulative environmental justice impacts is not necessary because the cumulative effects are expected to be potentially beneficial to these populations.

5.21.4 Noise and Vibration CEA

5.21.4.1 Study Limits

The study area for the noise and vibration CEA is the area within the vicinity of the proposed rail alignment and Port Bienville Industrial Park. Noise and vibration are localized conditions, and the Study Area has three distinctly different areas from a noise and vibration standpoint—the northern end of the rail alignment in Nicholson, Mississippi near U.S. Highway 11, the central portion of the rail alignment within the SSC acoustical buffer zone, and the southern end of the rail alignment in the vicinity of the Port Bienville Industrial Park.

5.21.4.2 Historical Context and Current Health

At the northern end of the proposed PBRR extension is 5.3 miles of existing, Norfolk Southern (NS) railroad right-of-way (formerly connected to SSC) near Nicholson, Mississippi. Nicholson is located along the existing NS route from New Orleans, Louisiana to Meridian, Mississippi that is used by both freight and Amtrak passenger trains, so residents near Nicholson are accustomed to the sound and vibration of passing trains.

Centrally located within the Study Area is the SSC, a NASA facility. The SSC is surrounded by a 125,000-acre acoustical SSC acoustical buffer zone which makes up the majority of the Study Area. The 125,000-acre acoustical SSC acoustical buffer zone surrounding SSC was established by NASA in the 1960s to enable testing of large engines for the Apollo Program. Following the Apollo Program missions to the moon in the late 1960s and early 1970s, all of the main engines used on 135 space shuttle missions from 1981 to 2011 were tested at SSC.[124] Recently, the center has been testing the engines that will be used to power NASA's new Space Launch System rocket for the journey to Mars.[125] Commercial engines are also tested at the NASA facility. The SSC acoustical buffer zone remains critical to the current and future missions of NASA and the resident agencies at the SSC, and is considered a national asset.[126] Development or the construction of any standing structures is strictly prohibited within the SSC acoustical buffer zone and is enforced by SSC.

On the southern end of the Study Area, existing freight rail service to Port Bienville and the industrial park is provided by CSX Transportation (CSX). The Port Bienville Railroad connects to CSX's mainline approximately 5 miles east of the Port near Ansley, Mississippi. Since this commercial/industrial area has existing freight rail service, employees and residents are accustomed to the sound and vibration of passing trains.

5.21.4.3 Direct and Indirect Effects

All of the Project's direct noise and vibration impacts are projected to occur at the northern-most end of the Study Area near the U.S. 11 crossing. In that area, direct effects of the Build Alternative would include potential noise impacts at 14 receptors. Twelve receptors have potential to experience moderate noise impacts and two receptors have potential to experience severe noise impacts. Three receptors have potential to experience vibration impacts. Two of the receptors with vibration impacts are the same two receptors

[124] www.nasa.gov/press/2013/october/stennis-officials-issue-buffer-zone-reminder/, accessed on September 6, 2016

[125] www.nasa.gov/image-feature/nasa-continues-progress-on-the-journey-to-mars-with-latest-rs-25-rocket-engine-test, accessed on September 6, 2016

[126] www.nasa.gov/press/2013/october/stennis-officials-issue-buffer-zone-reminder/, accessed on September 6, 2016

with severe noise impacts. No development is expected to be induced near Nicholson, Mississippi by the proposed Project, so no indirect noise and vibration impacts are expected in that area.

In the central portion of the Study Area, there are no noise- or vibration-sensitive receptors within the SSC acoustical buffer zone, so the Project would have no direct or indirect noise and vibration impacts in that area.

In the southern portion of the Study Area where the track alignment extends and terminates beyond the limits of the SSC acoustical buffer zone, no noise- and vibration-sensitive receptors were found within the noise and vibration contours, so the Project would have no direct noise and vibration impacts in that area. The analysis of direct noise and vibration impacts includes future commercial development induced by the proposed Project in Port Bienville or at the Port Bienville Industrial Park and the future train volumes needed to serve those facilities. Therefore, development induced by the proposed Project has already been accounted for in the noise and vibration impacts and no additional indirect noise and vibration impacts would be expected to occur.

5.21.4.4 Effects of Other Reasonably Foreseeable Future Actions

By 2040, a 61 percent increase in cargo flow is projected within the state, especially along state-owned highways near ports.[127] New industrial development in the southern portion of the Study Area could create additional noise and vibration from construction, manufacturing, and freight traffic, however, most of Mississippi's population growth is expected to occur in major cities and along the Gulf Coast, not within the Study Area, so potential effects of other non-Project related development within the Study Area is not expected to be significant.

5.21.4.5 Cumulative Effects

The SSC acoustical buffer zone reduces the harmful effects of very loud, and very low-frequency, sound waves produced in the rocket testing area during engine tests. Since the SSC acoustical buffer zone surrounding SSC prevents development of habitable structures within its boundary, it also prevents cumulative effects related to noise and vibration within its boundary.

Adverse cumulative noise and vibration effects in the Study Area outside the SSC acoustical SSC acoustical buffer zone are not anticipated because the areas directly impacted by the Project are different than the areas that could be impacted by unrelated development. With the exception of train events where noise from train horns and vibration from locomotives and rail cars exceed normal thresholds, noise and vibration levels would be consistent with those expected in rural and industrial areas.

5.21.4.6 Mitigation

FRA does not require mitigation for moderate noise impacts, because the magnitude of the change in noise levels or overall noise level is modest and not projected to substantially affect sleep or other activities. Some limited mitigation options will be explored where severe noise impacts are projected to occur such as eliminating locomotive horn use at the U.S. 11 at-grade crossing, retrofitting buildings with air conditioning and improved storm doors and windows, or negotiated settlements. There are limited practical means to mitigate ground-borne vibration impacts due to freight trains other than track and wheel maintenance programs. Mitigation measures for the Project will be finalized in the FEIS.

[127] MDOT. 2040 Mississippi United Long-Range Transportation Infrastructure Plan. January 2016.

5.21.5 Wetlands CEA

5.21.5.1 Study Limits

The study area for the wetlands CEA is the same as the Study Area.

5.21.5.2 Historical Context and Current Health

Wetlands within the Study Area have been altered by silviculture practices, rail lines, interstate highways and other roadways, bridges, transmission line and pipeline right-of-way, and development near SSC, Stennis International Airport, Nicholson, Pearlington, and Port Bienville. Several existing wetland mitigation sites are located within the Study Area, including the Dead Tiger Mitigation Site, Texas Flat Mitigation Site, Devils Swamp Mitigation Site and Lower Devils Swamp Mitigation Site. Expansion of the Lower Devils Swamp Mitigation Site is proposed. Although Study Area wetlands are not of the highest quality due to anthropogenic disturbances, they still provide significant filtration and flood mitigation functions.

Within the Study Area, three water bodies are listed in the final 2014 Section 303(d) List of Impaired Water Bodies[128] and the draft 2016 303(d) report[129]. Those three water bodies—Turtleskin Creek, Dead Tiger Creek and Catahoula Creek—are listed for biological impairment. Total Maximum Daily Loads (TMDLs) have not been set for these streams, and the "TMDL Priority" is listed as "Low" in the draft 2016 303(d) report. Of the three impaired water bodies within the Study Area, Turtleskin Creek is the only stream within the proposed Project right-of-way.

5.21.5.3 Direct and Indirect Effects

Approximately 173 acres of wetlands and 2,482 linear feet of streams have the potential to be directly or indirectly impacted by the proposed Project. Because the proposed Project would not appreciably diminish the availability of functional wetlands and other waters, there would be no fragmentation of wetland vegetative communities and; therefore, short-term and long-term impacts would be localized and minor. Since the proposed Project is only anticipated to enhance opportunities for development at the Port Bienville Industrial Park, and not to induce development in areas outside the Industrial Park, indirect impacts on wetlands as the result of induced development are not anticipated.

Of the nine streams crossed by the Build Alternative, Turtleskin Creek is the only stream designated as impaired. The proposed rail alignment would be designed to avoid or minimize impacts to Turtleskin Creek as well as other water bodies and would not hinder any MDEQ restoration plans for Turtleskin Creek.

5.21.5.4 Effects of Other Reasonably Foreseeable Future Actions

Future projects within the Study Area include the Port Bienville Industrial Park and Stennis International Airport expansion projects previously described in the Socioeconomics CEA section, as well as short-range and long-range rail and roadway network projects, such as widening I-10, double-tracking CSX mainline to accommodate passenger rail, and other infrastructure improvements. Any new development within wetlands would be regulated by federal, state, and local policies and would be subject to Sections 404 and 401 of the CWA, which regulates impacts to waters of the U.S., including wetlands. Significant adverse impacts to waters of the U.S. from other reasonably foreseeable developments are not anticipated.

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[128] Mississippi Department of Environmental Quality, Surface Water Division of the Office of Pollution Control. 2014. *Mississippi 2014 Section 303(d) List of Impaired Water Bodies.* Final July 24, 2014.

[129] Mississippi Department of Environmental Quality, Surface Water Division of the Office of Pollution Control. 2016. *Mississippi 2016 Section 303(d) List of Impaired Water Bodies.* Draft February 8, 2016.

5.21.5.5 Cumulative Effects

Significant adverse cumulative effects to waters of the U.S. are not anticipated. Any new development within wetlands would have to comply with Sections 404 and 401 of the CWA, which regulates the filling of and encroachment on these resources, and would require mitigation to offset impacts. Given the regulatory requirements governing impacts to waters of the U.S., and the mitigation measures discussed in the following section, substantial cumulative effects to these resources are not anticipated.

5.21.5.6 Mitigation

The compensatory mitigation requirements under Section 404 would provide for the replacement of the functions of wetlands and waters impacted by the proposed Project. Because adverse cumulative effects to waters of the U.S. are not anticipated, no other mitigation is proposed.

5.21.6 Floodplains CEA

5.21.6.1 Study Limits

The study area for the floodplains CEA is the same as the Study Area.

5.21.6.2 Historical Context and Current Health

The majority of the Port Bienville Industrial Park and surrounding areas in southern Mississippi are located near the Gulf of Mexico within the 100-year floodplain, which makes them susceptible to flooding. In 2005, Hurricane Katrina heavily damaged Port Bienville and other ports and towns along the Gulf of Mexico. Damage to port structures included warehouses, berths, docks, offices, access roads, and rail lines. The ports also lost equipment and, in the case of the Port Bienville, all business records, including those stored on computers.[130]

5.21.6.3 Direct and Indirect Effects

Approximately 97 acres of the 200-foot Survey Corridor falls within Zones A and AE (1 percent annual chance flood, or "100-year") and 327 acres falls in Zone X (0.2 percent annual chance flood, or "500-year"). Design features to minimize impacts to the floodplain would be made during the design phase. Any enhanced development opportunities resulting from the Project would likely occur near Port Bienville and would be subject to the local ordinances governing development within floodplains. Therefore, no indirect Project impacts on floodplains are expected.

5.21.6.4 Effects of Other Reasonably Foreseeable Future Actions

Future projects within the Study Area include the Port Bienville Industrial Park and Stennis International Airport expansion projects previously described in the Socioeconomics CEA section, as well as short-range and long-range rail and roadway network projects, such as widening I-10, double-tracking the CSX mainline to accommodate passenger rail, and other infrastructure improvements. Those projects and any other development would be subject to the local ordinances governing development within floodplains. The primary constraint to development in floodplains within the central portion of Hancock County is the SSC acoustical buffer zone that prevents development within its borders. Therefore, floodplain impacts within the Study Area are expected to be minimal.

[130] http://www.peer.state.ms/487.html, accessed on September 6, 2016

5.21.6.5 Cumulative Effects

Although new development within the Study Area may impact floodplains, floodplains in the direct vicinity of the proposed rail Project are either not available for development or are not desirable for development. While county and local ordinances do not prohibit development within the floodplain, they limit and regulate development to eliminate or reduce potential damage from future floods. Communities must also regulate development in floodways to ensure that there are no increases in upstream flood elevations. Based on the regulation of development in floodplains and floodways, adverse cumulative effects to floodplains and floodways are not anticipated.

5.21.6.6 Mitigation

Mitigation of cumulative floodplain effects is not necessary because cumulative effects are not anticipated.

5.22 Irreversible and Irretrievable Commitments of Resources

Irreversible and Irretrievable resources are defined as natural, cultural, and human resources that cannot be recovered or reversed due to the impact upon the resource. Irreversible would mean that the impact would be permanent and could never be retrieved. Irretrievable applies to resources that would only be temporarily impacted while being used for another purpose.

The construction of a new rail line on new alignment would require irreversible and irretrievable impacts on various resources. The resources would include wetlands, streams, farmland, cultural resources, land use, construction materials, labor, financial, transportation, fuel, and energy as some examples.

No-Build Alternative. The No-Build Alternative would not require any irreversible and irretrievable impacts on this area. Growth would still be limited by the lack of dependable transportation options and high costs associated with only one rail line to service this area.

Build Alternative. The construction of the Build Alternative would require the conversion of approximately 173 acres of wetland for the proposed rail line. This conversion would be considered not retrievable since its natural state would be lost during the conversion. Other non-retrievable resources would include, funding for the project, labor, construction materials, energy, and petroleum base fuels and products.

The conversion of land use from agriculture to a transportation use would be considered a retrievable resource due to fact that if the rail line was abandoned and removed there would be the potential to convert the area back to an agriculture use.

It is anticipated that the commitment of these resources both irreversible and irretrievable would provide a direct benefit to the economic development for Port Bienville, Hancock and Pearl River Counties, regionally, and statewide. The economic growth and opportunities would provide new jobs and additional growth for this area.

5.23 Relationship Between Short-Term Impacts and Long-Term Benefits

The construction of the proposed rail line would account for the majority of the short-term impacts. These would consist of direct impacts to wetlands, streams, and farmlands. There would also be a short-term impact/benefit to the economy associated with construction activities including increase in jobs, housing, services, and food. There would likely be a higher demand for construction materials and equipment.

The long-term benefits would include potential growth for the counties, region and statewide associated with the availability of dual Class I rail service. Access to dual Class I rail service is a key factor providing economic competitiveness for existing businesses, and a significant factor for many companies considering sites for new or expanded business operations. Since industrial parks providing dual Class I rail services are a scarce resource, the long-term benefit for this Project would be to position Hancock County and Port Bienville Industrial Park for increased development and investment opportunities.

5.24 Summary of Impacts

Impacts would occur in both the Build and No-build scenarios. The primary impacts from the No-Build Alternative would be the failure to meet the purpose and need for this Project and provide conditions to support economic development. Existing conditions would remain the same and the economic benefits associated with the Build Alternative would not be realized. The Build Alternative would impact both the natural and human environment. As summarized in **Table 5.20** the primary impacts would include streams, wetlands, farmlands, floodplains, noise, vibration, pipelines, bridges, at-grade crossings, and construction costs. However, the Build Alternative would also result in potential economic benefits and opportunities to the region such as:

- Lower rail rates for existing businesses, enabling these companies to be more competitive and increase sales and production, creating additional employment and investment in Hancock County;
- Increased job opportunities at companies within Port Bienville Industrial Park in the five-year period following the completion of the proposed PBRR to meet increased customer demand;
- Support additional employment and new investment in plants and equipment from existing businesses and the location of new companies that require or would benefit from access to dual Class 1 rail services;
- Allow businesses in the Port Bienville Industrial Park greater opportunities for increasing exports to some regions.[131]

[131] *Port Bienville Feasibility Study*, September 19, 2013.

Table 5.20: Summary of Impacts and Costs

Impact Category (Units)	No-Build Alternative	Build Alternative
HUMAN ENVIRONMENT		
Cultural Resources (Sites)	N/A	0
Farmland (Acres)	N/A	222
Noise (No. of sensitive receptors)	N/A	2 Severe/12 Moderate
Vibration (No. of sensitive receptors)	N/A	3
Residential Relocations (No.)	0	0
Hazardous Materials (sites)	N/A	1
Business Relocations (No.)	0	0
Environmental Justice Impacted Census Blocks (No.)	N/A	4
NATURAL ENVIRONMENT		
Streams (LF)	N/A	2,482
Wetlands (Acres)	N/A	171.58
Other Waters (Acres)	N/A	2.01
Floodplains (Acres)	N/A	96.74
Threatened and Endangered Species (affect/impact)	N/A	7
ENGINEERING		
Gas Pipelines (Crossings No.)	N/A	8
Railroad Bridges Over Roadways (No.)	N/A	4
Railroad Bridges Over Streams (No.)	N/A	2
SAFETY AND MOBILITY		
At-Grade Crossings (No.)	N/A	22
Construction Costs	N/A	$ 118,151,058

5.25 Required Permits and Coordination

Table 5.21 provides a summary of likely permitting requirements and other work that would likely need to be accomplished during the design phase prior to construction. Additional federal, state, and/or local permitting requirements may be identified during future phases of the Project.

Based on the assessment of Project impacts and/or agency coordination, no permits or approvals would be required related to the following:

- General Conformity Program under the Clean Air Act, 40 CFR Part 93, Subpart B – The Study Area is in attainment area with the National Ambient Air Quality Standards (NAAQS) and has no general conformity determination obligations.
- Section 4(f) of the U.S. Department of Transportation Act of 1966, 49 USC § 303 – No parks, recreational lands, wildlife and waterfowl refuges, or historic sites would be impacted by the Project.
- Section 9 and 10 of the Rivers and Harbors Act of 1899, 33 USC § 401 – The Study Area does not include any navigation projects under USACE Section 9 or 10 authority.
- Section 14 of the Rivers and Harbors Act of 1899, 33 USC § 408 ("Section 408") – The Study Area does not include any federal flood control facilities.
- Magnuson-Stevens Fishery Conservation and Management Act, 16 USC § 1801, et seq., 50 CFR Part 600 – Based on agency coordination, the Study Area does not contain any critical habitat or endangered marine species managed by National Marine Fisheries Service (NMFS).

Table 5.21: Impacts/Actions Requiring Permits and/or Approvals

Impact or Action	Applicable Laws/Regulations	Agency	Sites or Actions Requiring Permits and/or Approvals
Wetlands/ Waters of the U.S.	Section 404 of the Clean Water Act (CWA), 33 USC §1251 et seq.	USACE	Section 404 regulates the discharge of dredged or fill material into waters of the U.S. Impacts that require a Section 404 permit include, but are not limited to, placement of fill into wetlands for rail beds, placement of culverts and pipes within the ordinary high water mark of a stream and alteration of channel morphology. Bridge construction over creeks that does not involve dredging or filling does not require a permit as no improvements take place in waters of the U.S. Some rail bridge piers may need to be placed in stream beds. Potential wetland impacts have been identified within the Project right-of-way.
Water Quality	Section 401 of the CWA, 33 USC §1251 et seq.	MDEQ	Section 401 requires a state certification that a discharge to waters of the U.S. complies with other provisions of the CWA. The USACE 404 permit application prepared also serves as an application for water quality certification. MDEQ will receive notice from USACE that an application has been made. The proposed track alignment crosses one Section 303(d) impaired stream.
Stormwater	Section 402 of the CWA, 33 USC §1251 et seq.	MDEQ	Section 402 requires a National Pollutant Discharge Elimination System (NPDES) permit for discharges into waters of the U.S. Prior to construction, an application for a general permit for construction activities under the NPDES would be prepared. As part of the permit application, a detailed Stormwater Pollution Prevention Plan (SWPPP) would be prepared to control stormwater runoff and erosion at construction sites. The State is in the process of reissuing Mississippi's Large Construction Storm Water General Permit (MSR10), which pertains to land-disturbing activities of 5 acres or more.
Farmland	Farmland Protection Policy Act (FPPA) – Subtitle I of Title XV, Section 1539-1549	USDA/ NRCS	Impacts to farmland (prime), farmland (prime if drained), and farmland (statewide importance) have been identified. NRCS completes a Farmland Conversion Form (CPA-106) for all federal funding projects to assess potential irreversible impacts to farmland.
Threatened/ Endangered Species	Endangered Species Act (ESA) of 1973, 16 USC §1531 et seq., 50 CFR Part 17	USFWS	The Project is not expected to impact any critical habitat. If any impacts were to be identified, mitigation measures would be determined in consultation with USFWS prior to construction.
Coastal Zone	Coastal Zone Management Act of 1972, 16 USC §1451	MDMR Office of Coastal Resources	The MDMR will review the proposed rail Project based upon the provisions of the MCP and Section 307 of the CZMA of 1972, as amended, to determine if the activities are consistent to the maximum extent practicable with the MCP. If so, MDMR will grant consistency certification.
Cultural Resources	Section 106 of the National Historic Preservation Act of 1966, as amended, 16 USC §470 et seq.	MDAH SHPO	Involvement with historic sites and districts is being coordinated with the State Historic Preservation Office (SHPO) and the Mississippi Department of Archives and History (MDAH). A total of four cultural resources were identified as potentially being eligible for listing on the National Register or Historical Places (NRHP).
Floodplain	NFIP; Executive Orders 11988 and 11990 (SOV response dated May 12, 2015).	FEMA/ Local floodplain admin-istrators	Encroachment into floodways would be coordinated with the Federal Emergency Management Agency (FEMA). Bridges, pipes, and box culverts must be designed in accordance with appropriate floodplain impact requirements per FRA, MDOT, FHWA, and local agencies. Prior to construction, community floodplain administrators will be contacted for the review and possible permit requirements.

6.0 AGENCY AND PUBLIC INVOLVEMENT

The public involvement and agency coordination process is a key component of the Project and provides a forum to share Project information with resource and regulatory agencies the individuals who live and work in this area; to listen to ideas and concerns; and to incorporate input received is an important step in the study process.

6.1 Agency Coordination and Public Involvement Plan

The purpose of the Agency Coordination and Public Involvement Plan is to define the process by which the Federal Railroad Administration (FRA) and the Mississippi Department of Transportation (MDOT) would communicate information about this Project to federal, state and local agencies, and to the public. The plan also identifies how input from the public and agencies will be solicited and considered.

The coordination plan:

- Describes the early coordination efforts conducted during Phase 1;
- Identifies potential cooperating and participating agencies to be involved in agency coordination;
- Establishes the timing and form of agency involvement in defining the Project's purpose and need and study area, the range of alternatives to be investigated and methodologies, as well reviewing documents;
- Establishes the timing and form of public involvement in defining the Project's purpose and need and study area and the range of alternatives to be investigated, providing input on issues of concern and environmental features, and commenting on the findings presented; and
- Describes the communication methods that will be implemented to inform stakeholders and the public about the Project.

Appendix H contains the Agency Coordination and Public Involvement Plan.

6.2 Agency Coordination

6.2.1 Phase 1

During the Feasibility Study, two agency meetings were held on August 23, 2012 and December 18, 2012 at MDOT. These meetings provided a Project and study area overview and collected input on the Alignment Alternatives Research Tool (AART) data sets, including the ranking of natural resources and initial alignments.

Representatives from the following agencies attended those meetings:

- MDOT,
- FRA,
- NASA,
- Hancock County Ports and Harbor Commission (HCPHC),

- U.S. Army Corps of Engineers (USACE),
- U.S. Fish and Wildlife Service (USFWS),
- Mississippi Department of Environmental Quality (MDEQ),
- Mississippi Department of Wildlife, Fisheries and Park (MDWFP),
- Environmental Protection Agency (EPA), and
- Mississippi Department of Archives and History (MDAH).

6.2.2 EIS Kick-off Meeting

The initial coordination meeting was held on June 24, 2014 at the MDOT Administration Building at 401 North West Street in Jackson, Mississippi. The meeting was conducted to initiate the Environmental Impact Statement (EIS) for the Project, provide background on the Project, introduce the Project team, and discuss initial Project steps. Two representatives from the FRA and three representatives from MDOT were in attendance.

6.2.3 Notice of Intent

FRA is the lead federal agency for the Port Bienville Railroad Project, in cooperation with MDOT. In accordance with the National Environmental Policy Act (NEPA), a notice of intent (NOI) to prepare an EIS was published in the Federal Register on June 2, 2015. No comments were received in response to the NOI.

6.2.4 Agency Scoping Meeting

Prior to the scoping meetings, scoping letters were mailed to all applicable federal and state agencies and/or officials requesting initial comments on the Project and inviting them to attend the scoping meeting.

The agency scoping meeting was held on August 19, 2015 at MDOT Administration Building in Jackson, Mississippi.

The purpose of these meetings was to introduce the agencies to the Project and to present the findings of the Phase 1 – Feasibility Study.[132] Representatives from the following agencies were in attendance:

- MDOT,
- FRA,
- Federal Highway Administration (FHWA),
- NASA,
- HCPHC,
- USACE,
- USFWS,
- MDEQ,
- Federal Aviation Administration (FAA),
- Natural Resource Conservation Service (NRCS),
- MDWFP, and
- EPA.

[132] Port Bienville Rail Feasibility Study, September 19, 2013

Agency comments suggested simplification of the Purpose and Need and questions about alignments through Stennis Space Center Fee Area. No formal letters were received from agencies during the scoping period. Sign in sheets and meeting notes are found in **Appendix H**.

6.2.5 Cooperating Agencies and Participating Agencies

Following the Agency Scoping Meeting, FRA distributed invitation letters to agencies with regulatory approvals or permits (February 3, 2016) inviting them to become cooperating agencies in the Project development process **(Appendix H, Agency Letters**). Cooperating Agencies are defined as any federal agency other than the lead agency that has discretionary authority over the proposed action, jurisdiction by law, or special expertise with respect to the environmental impacts expected to result from the proposed Project.

The Surface Transportation Board (STB), National Marine Fisheries Service, EPA, and USFWS, have accepted invitations to be cooperating agencies for the Project.

In addition, MDOT sent letters to four additional agencies inviting them to become participating agencies for the Project. Participating agencies are those that may have an interest in the Project and are afforded an opportunity for involvement in the development of the proposed Project. Participating agencies may also provide access to information integral to understanding and assessing the potential impacts and benefits of the Project. Invitations were extended to MDEQ, Mississippi Department of Archives and History (MDAH), MDWFP and Mississippi Department of Marine Resources.

6.2.6 Tribal Coordination

FRA and MDOT have initiated coordination with Native American Tribes. The tribes were sent Project information, maps and GIS data related to the study area.

The following federally recognized Native American tribes were contacted:

- Mississippi Band of Choctaw Indians
- Chickasaw Nation
- Jena Band of Choctaw
- Tunica-Biloxi Indians of Louisiana, Inc.
- Choctaw Nation of Oklahoma
- Quapaw Tribe of Oklahoma
- Alabama-Coushatta Tribe of Texas
- Muscogee Creek Nation

The Muscogee Creek Nation responded that they had no objections to the Project. The Muscogee Creek Nation, Alabama Coushatta Tribe and Jena Band of Choctaw requested the Cultural Resources studies, once completed.

6.2.7 Agency Coordination Meetings

An Agency Coordination Meeting was held on September 7, 2016 to provide an update on the Project and gather input from the agencies on the draft purpose and need for the Project and the alternative segment comparisons. The meeting was held at the MDOT Administration Building at 401 North West Street in Jackson, Mississippi. Representatives from the following agencies were in attendance:

- MDOT,
- FRA,
- USACE,
- EPA,
- MDAH,
- MDEQ, and
- USFWS.

An additional Agency Coordination Meeting was held on September 8, 2016 at the Port Bienville Industrial Park Training Center in Pearlington, Mississippi to provide an additional opportunity and location for agencies to participate in the Project. Representatives from the following agencies were in attendance:

- Mississippi Department of Marine Resources,
- USFWS,
- NASA Stennis Space Center (SSC),
- Gulfport Regional Planning,
- HCPHC,
- MDOT Planning, and
- Mississippi Secretary of State.

Sign-in sheets for both agency coordination meetings and copies of all comments received from the agencies are contained in **Appendix H**.

6.3 Stakeholder Involvement

6.3.1 Hancock County Ports and Harbor Commission – Update to Board Members

On July 25, 2016, the Project team attended an HCPHC board meeting to present the Project to new board members. The team provided Project background, an overview and the status on the EIS.

6.3.2 Public Officials Meeting

A Project update meeting for public officials was held on September 8, 2016 at the Port Bienville Industrial Park Training Center in Pearlington, Mississippi. This meeting provided an overview of the Project and a status of the development process. Seven public officials attended this meeting. No written comments were received.

6.4 Public Involvement

6.4.1 Phase 1

During the Feasibility Study, a public information meeting was held on October 16, 2012 at the Bay St. Louis Public Library in Bay St. Louis, Mississippi. The meeting provided an introduction to the Project and the studies being conducted. Approximately 30 people attended the meeting and four written comments supporting the Project were received.

6.4.2 Public Scoping Meeting

A Public Scoping Meeting was held on August 20, 2015 to gather input from the public on the needs for the Project and the concerns of the community. The meeting was held at the Port Bienville Industrial Park Training Center in Pearlington, Mississippi. The meeting was advertised in newspapers and the MDOT website.

The public meeting was an open-house format. Meeting attendees were asked to sign-in and were given a handout that explained the Project, its history within the community and the environmental review process; the handout is included in **Appendix H**. Display boards with the preliminary segments identified in Phase 1 and a matrix of impacts were set up for public review and discussion. The Phase 1 Feasibility Study was available for review. The Project team was available to answer questions and explain the display boards. Each person was also given a comment sheet to either fill out at the meeting or mail in during the public comment period.

Approximately 16 people attended the meeting and three comments supporting the Project were received during the comment period. Sign-in sheets and copies of all comments received from the public are contained in **Appendix H**.

6.4.3 Public Information Meeting

A public information meeting was held on September 8, 2016 at the Port Bienville Industrial Park Training Center in Pearlington, Mississippi. The meeting was advertised in newspapers and the MDOT website. In addition, property owners adjacent to proposed Project corridors were mailed letters inviting them to the meeting.

The meeting was conducted in an open-house format and citizens attending this meeting were given information about the Project and a comment card. Display boards with the preliminary segments were set up for public review and discussion. Project team members were available to explain the alternatives, answer questions and receive comments. In addition, attendees were encouraged to provide Project team members with any additional information about the Study Area that was not represented on the maps.

Approximately 37 people attended the meeting and seven comment cards were received. Copies of the comment cards and correspondence received are included in **Appendix H**.

- Support for the Project - 4
- Support for the “yellow” alternative on displays (Alternative C/Build Alternative) - 2
- Concerns about property impacts - 2
- Concerns about who will pay for the Project - 3

6.5 Next Steps

Upon signing of the DEIS, FRA will publish availability of the document for review in the Federal Register and a public hearing will be scheduled. A public hearing will provide interested citizens and businesses an opportunity to review the Build Alternative and provide comments on the Project.

All comments received on the Project from the public and agencies will be addressed in the Final EIS and Record of Decision (ROD).

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9.0 GLOSSARY

A

AART:
Alignment Alternatives Research Tool.

ACHP:
Advisory Council on Historic Preservation.

Adjacent Track:
In relation to excepted track and for the purposes of the Track Safety Standards, any track or tracks next to a track that is designated as an excepted track. Any tracks with centerlines that are 30 feet or closer to the excepted track in question are considered as adjacent and speeds on those tracks must not exceed 10 mph.

Advanced Signal:
A fixed signal used in connection with one or more signals to govern the approach of a train or engine to such signal.

Adverse:
Negative or detrimental.

Affected Environment:
The physical, biological, social, and economic setting potentially affected by one or more of the alternatives being considered.

Air Quality:
A measure of the concentrations of pollutants, measured individually, in the air.

Alignment:
The horizontal and vertical general location for the centerline of railroad tracks or a roadway within study corridors.

Alignment Alternatives:
The general location for tracks, structures and systems for the system between logical points within study corridors.

Alternative:
As used in the transportation analysis in this EIS, a variation of a rail corridor segment to mitigate a potential adverse environmental or engineering factor.

AREMA:
American Railway Engineering and Maintenance Association. North American body for determination of railway engineering standards.

At Grade:
A term used to describe roadways and track alignments that are at the same elevation (level) as the facility being crossed.

Attainment:
An air basin is considered to be in *attainment* for a particular pollutant if it meets the federal or state standards set for that pollutant.

A-Weighted Sound Level:
A measure of sound intensity that is weighted to approximate the response of the human ear, so it describes the way sound will affect people in the vicinity of a noise source.

B

Ballast:
Rock, gravel or other granular material placed on a road bed to support cross ties and rails and to aid in holding the desired track geometry.

BFEs:
Base Flood Elevations.

Borrow:
Material, such as sand and gravel, which is extracted from an excavation or pit area that can be used to fill another site.

C

Capital Cost:
The total cost of acquiring an asset or constructing a project.

Carbon Dioxide: (CO_2):
A colorless, odorless gas that occurs naturally in the earth's atmosphere; significant quantities are also emitted into the air by fossil fuel combustion.

Carbon Monoxide (CO):
A colorless, odorless gas that is generated in the urban environment, primarily by the incomplete combustion of fossil fuels in motor vehicles.

CDP:
Census Designated Place.

CEA:
Cumulative effects analysis.

Classes of Track:
A categorization of track based on the maximum allowable operating speed.

Classification:
The act of switching rail cars for sorting, segregating or grouping according to their kind, contents or destination.

Clearance Limits:
The dimensions beyond which the size of, or projections of a shipment may not extend in order to clear such things as switch stands, platforms, tunnels, and low bridges.

Community Cohesion:
The degree to which residents have a sense of belonging to their neighborhood, a commitment to the community, or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time.

Continuous Welded Rail (CWR):
Traditionally, track was laid in lengths of 39' with a joint between each to allow for expansion and contraction due to heat and cold. Joints were points of high maintenance. Continuous Welded Rail typically consists of lengths between 400 and 1,600 feet in length and the joints between them are eliminated by in-place welding using portable equipment. Without joints, expansion and contraction can result in buckling in high temperatures and breaking in cold conditions.

Construction:
Any activity related to building projects, including highways or rail infrastructure (e.g., track, yards, bridges) that directly alters the environment.

Cooperating agency:
Under NEPA, any agency other than the lead agency that has legal jurisdiction over, or technical expertise regarding, environmental impacts associated with a proposed action and has agreed to participate.

Corridor:
A geographic belt or band that follows the general route of a transportation facility (highway, railroad, etc).

Crossbucks:
A term for railway crossing sign with crossed arms.

Crossing (Track):
A structure, used where one track crosses another at grade, and consisting of four connected frogs.

CSXT:
CSX Transportation.

Cultural Resources:
Resources related to the tangible and intangible aspects of cultural systems, living and dead, that are valued by a given culture or contain information about the culture. These include, but are not limited to sites, structures, buildings, districts, and objects associated with or representative of people, cultures, and human activities and events.

Cumulative Impact:
As defined by NEPA, and impact on the environment that results from the incremental impact of the action when added to other past, present, reasonably foreseeable future actions.

Curved Track:
Curved track is measured by degrees, with most main track curves falling between 1 and 5 degrees. The degree of curvature is the angle subtended at the center of a simple curve by a 100-foot chord. Curves require more power from locomotives, and the forces present while a train negotiates a curve increases rail and car wear. Stronger track, ties and additional spikes are used in curves in order to take the added loads.

CZMA:
Coastal Zone Management Act.

D

Dangerous or Hazardous Goods:
Articles or substances, which are capable of posing a significant risk to health, safety or property when transported.

Decibel (dB):
A logarithmic measurement of noise intensity.

Dewatering:
The process of removing water from an area or substance, such as fill material.

E

EDR:
Environmental Data Resources, Inc.

EIS:
Environmental Impact Statement.

EJ:
Environmental Justice.

Endangered Species:
A species that is in danger of extinction throughout all or a significant part of its range, and has a formal listing of the U.S. Fish and Wildlife Service under the Endangered Species Act.

Engine (Eng):
A unit propelled by any form of energy, or a combination of such units operated from a single control, used in train or yard service.

Environment:
Includes water, air and land and all plants and humans and other animals living therein, and the interrelationship existing among these.

Environmental Impact Statement (EIS):
A detailed information document that analyzes a project's potential effects and identifies mitigation measures and reasonable alternatives to reduce the significant effects. This document is part of the NEPA environmental review process.

Environmental Justice:
Identifying and addressing the potential for disproportionately high and adverse effects of programs, policies, and activities on minority populations and low-income populations.

EO:
Executive Order.

Erosion:
Process by which earth materials are worn down by the action of flowing water, ice, or wind.

ESA:
Endangered Species Act.

Ethnicity:
A grouping or category of people based on shared cultural traits, such as ancestral origin, language, custom or social attitude.

F

Farmland of Local Importance:
Farmlands that are important to the local agricultural community, as determined by each county's board of supervisors and local advisory committee.

Farmland of Statewide Importance:
Farmlands similar to prime farmlands but that have been evaluated as less valuable because they have steeper slopes, less ability to retain moisture in the soil, or other characteristics that limit their use. To qualify as farmland of statewide importance, a property must have been used for production of irrigated crops at some time during the previous four years.

Federal Railroad Administration (FRA):
A Federal agency attached to the Department of Transportation. The FRA serves as the principal organization for assistance to the Secretary of Transportation on all matters relating to rail transport and safety.

FEMA:
Federal Emergency Management Agency.

Floodplain:
The lowlands adjoining inland and coastal waters and relatively flat areas and floodprone areas of offshore islands including, at a minimum, that area inundated by a 1% or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0%) floodplain. The critical action floodplain is defined as the 500-year (0.2%) floodplain.

FOIA:
Freedom of Information Act.

FPPA:
Farmland Protection Policy Act.

FRA:
Federal Railroad Administration.

FTA:
Federal Transit Administration.

G

Gauge (of Track):
The distance between the rails, measured at right angles thereto 5/8 inches below the top of the rail. (Standard gauge is 4 feet 8-1/2 inches or 56-1/2inches.)

Geographic Information Systems (GIS):
An information management system designed to store and analyze data referenced by spatial or geographic coordinates.

Grade Crossing:
The intersection of a railroad and a highway at the same elevation (grade); an intersection of two or more highways; an intersection of two railroads.

Grade Separated:
At different elevations; on separate levels.

Ground Vibration:
The rapid linear motion of a compression wave in the ground caused by a single or repeated force or impact to the ground as in the action of a pile driver or a tire hitting a bump or pothole in a road.

Groundwater:
Water contained and transmitted through open spaces in rock and sediment below the ground surface.

H

Habitat:
An environment where plants or animals naturally occur; an ecological setting used by animals for a particular purpose, such as roosting or breeding.

Hazardous Materials:
Cargo that poses a risk to individuals and/or the environment, the movement of which is governed by the Department of Transportation and other regulations. Hazardous Materials (hazmat) include corrosive materials, poisons and explosives among other substances.

HCPHC
Hancock County Port and Harbor Commission.

High Visual Impact:
Impact sustained if features of a project alternative are very obvious, such that they begin to dominate the landscape and detract from the existing landscape characteristics or scenic qualities.

High/Wide Load:
A load that exceeds clearance limits.

Hours of Service:
A government regulation which determines the number of hours covered employees (defined by law and regulations) may work before going off duty for a specified length of time.

I

ICE
Indirect and Cumulative Effects

Impact:
For an EIS, the positive or negative effect of an action (past, present, or future) on the natural environment (land use, air quality, water resources, geological resources, ecological resources, aesthetic and scenic resources) and the human environment (infrastructure, economics, social, and cultural).

In-Situ:
In the original or natural position.

Interchange or Interchange Point:
A place where the line of a railway company connects the line of another railway company and where loaded or empty cars may be stored until delivered or received by that other company.

Interlocking:
A configuration of switches and signals interconnected to direct trains along different routes, the limits of which are governed by interlocking signals. An arrangement of interconnected signals and signal appliances for which interlocking rules are in effect. An arrangement of signal appliances so interconnected that their movements must succeed each other in proper sequence. It may be operated manually or automatically. Interlocking consists for most of them of controlled block signals with dual-control switches that are controlled by the dispatcher.

Interlocking Limits:
The tracks between the extreme or outer opposing interlocking signals of an interlocking.

Interlocking Signals:
The fixed signals of an interlocking, governing trains and engines using the interlocking limits.

Intermodal Traffic:
Traffic, which moves in containers, trailers on flatcars. Traffic, which moves in via two or more different modes of transport.

Invasive Species:
An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

IPaC:
Information Planning and Conservation.

J - K

Joint Facility:
Two or more railways jointly operating on the same segment of tracks, covered by agreement between the affected railroads.

L

Land Use Compatibility Assessment:
An assessment of the compatibility of a proposed project or land use with existing and projected land uses in nearby areas, based on the sensitivity of various land uses to change related to the alternatives and the impact of these changes on the land use.

Lead Agency:
The public agency that has the principal responsibility for carrying out or approving a project or action and is thus responsible for preparing environmental review documents in compliance with NEPA.

L_{eq}:
A measure of the average noise level during a specified period of time.

L_{eq}(h), dBA:
Equivalent or average noise level for the noisiest hour, expressed in A-weighted decibels. See also *A-Weighted Sound Level.*

Level of Service (LOS):
A rating using qualitative measures that characterizes operational conditions within a traffic stream and the perception by motorists and passengers of these conditions.

Limits:
A segment of track that can be controlled by signals or other identifiable means.

Line:
The condition of the track in regard to uniformity in direction over short distances on tangents, or uniformity in variation in direction over short distances on curves.

Line Capacity:
The maximum possible number of trains capable of being operated over a line in one direction. Usually expressed as trains per hour, it will depend on all trains running at the same speed, having equal braking capacity and on how the signaling is arranged.

Locomotive:
A unit propelled by any energy form, or a combination of such units, operated from a single control, as defined in the railroads Operating Rules (an engine).

Low-Income Population:
Poverty guidelines established for 2015, are a simplified version of the poverty threshold. Poverty threshold is what the Census Bureau uses to determine poverty population.

The poverty guideline shows that a household of four with an annual income of $24,250 or less is living in poverty.

Low Visual Impact
Impact sustained if features of a project alternative are consistent with the existing line, form, texture, and color of other elements in the landscape and do no stand out.

LUST
Leaking Underground Storage Tank.

LWCFA
Land and Water Conservation Fund Act.

M

Main Line:
The principal line of a given railroad company's rail network. Main lines consist of either single, double or multiple track lines extending between major stations. Trains are operated by time table, train order, or governed by block signals. A track extending through yards and between stations, upon which trains or engines are authorized and operated by time table or train order, or both, or the use of which is governed by block signals by one or more methods of control. May not be occupied without proper authority or protection.

Main Track:
For the purposes of the Track Safety Standards, a track other than an auxiliary track extending through yards and between stations.

MARIS:
Mississippi Automated Resource Information System.

MCP:
Mississippi Coastal Program.

MDAH:
Mississippi Department of Archives and History.

MDEQ:
Mississippi Department of Environmental Quality.

MDMR:
Mississippi Department of Marine Resources.

MDOT:
Mississippi Department of Transportation.

Medium Visual Impact:
Impacts sustained if features of a project alternative are readily discernable but do not dominate the landscape or detract from existing dominant features.

MEMA:
Mississippi Emergency Management Agency.

MFN:
Mississippi Freight Network.

Mile Post:
Post along a railroad right of way, which indicates the distance, in miles, to or from a given point.

Minority Population:
As defined for the purposes of this EIS - A community, census block, or block group in which the portion of the population of a racial or ethnic minority is greater than county in which it is located.

Mitigation:
Action or measure undertaken to minimize, reduce, eliminate, or rectify the adverse impacts of a project, practice, action or activity.

MNHP:
Mississippi Natural Heritage Program

MOA:
Memorandum of Agreement

MSDEQ:
Mississippi Department of Environmental Quality

MTIF:
Multimodal Transportation Improvement Fund

MUTCD:
Manual on Uniform Traffic Control Devices

N

National Ambient Air Quality Standards (NAAQS):
Federal standards stipulating the allowable ambient concentrations of specific criteria pollutants.

National Environmental Policy Act (NEPA):
Federal legislation requiring federal agencies to consider the environmental impacts of major federal projects or decisions, to share information with the public, to identity and assess reasonable alternatives, and to coordinate efforts with other planning and environmental reviews taking place.

Native Species:
With respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

NEI:
National Emissions Inventory

NEPA:
National Environmental Policy Act

NHPA:
National Historic Preservation Act

NO&M:
Rail subdivision is located between New Orleans and Mobile.

No Action:
Under NEPA, refers to an alternative under which no action would be taken (no infrastructure would be built and no new management or operational practices would be instituted).

No-Build Alternative:
Represents the region's (and state's) transportation system (highway, air, and conventional rail) as it is today and with implementation of programs or projects that are in regional transportation plans and have identified funds for implementation by 2030.

NOI:
Notice of intent

Noise:
Any sound that is undesirable because it interferes with speech and hearing; if intense enough, it can damage hearing.

NPDES:
National Pollutant Discharge Elimination System

NPMS:
National Pipeline Mapping System

NRHP:
National Register of Historic Places

NS:
Norfolk Southern Railway Company

NWI:
National Wetlands Inventory

O

On-track Equipment:
A machine that operates on a railway track and is used in connection with construction or work on, or inspection of, a railway track.

P

PA:
Programmatic Agreement.

PBRR:
Port Bienville Railroad.

Poverty Level:
A federally established income guideline published each year by the U.S. Department of Health and Human Service used to define persons who are economically disadvantaged. For 2008, in the contiguous U.S., this level is set at income less than $21,200 per year for a family of four.

Preferred Alternative:
The alternative identified as preferred by the lead agency.

Prime Farmland:
Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

Purpose and Need:
The reason(s) why a project or action is undertaken, and the need(s) it is intended to meet or fulfill.

Q

Qualitative:
With regard to a variable, a parameter, or data, an expression or description of an aspect in terms of non-numeric qualities or attributes.

Quantitative:
A numeric expression or variable.

R

Rail (Track):
A rolled steel shape, commonly a T-section, designed to be laid end to end in two parallel lines on crossties or other suitable supports to form a track for railway rolling stock. It has three main parts:

1. The head that comes into contact with car wheels.
2. The web, which is the thinner, middle part of the rail; and
3. The base.

Rail Classification Yard
A railroad switching yard where railcars arriving in inbound freight trains are classified and reassembled according to their routing to make up outbound freight trains.

Rail Joints:
Rail joints are plates of metal with holes used to join two pieces of rail end-to-end.

Record of Decision:
A document that provides a concise public record of a decision made by a government agency. Under NEPA, a federal agency must issue a record of decision following the issuance of the final EIS, and explain therein: 1) its decision; 2) the alternatives and reasons for deciding upon them; 3) any significant expected impacts; and 4) a mitigation plan for those impacts.

Resource Study Areas (RSA):
Areas examined for potential environmental impacts as part of the NEPA analysis process. Examples include air quality, hydrology, and biological resources.

Right of Way:
The property owned by a railway company on which tracks have been laid, including the track and land surrounding that track.

RMS:
Root mean square.

ROD:
Record of Decision.

S

Scoping:
A process used under NEPA to determine the scope of issues to be addressed and to identify the significant issues related to the proposed action or project to be addressed in an EIS.

Section 4(f):
Provisions originally enacted as Section 4(f) of the U.S. Department of Transportation Act of 1966 (23 C.F.R. 771.135) and subsequently codified in 49 U.S.C., Subtitle I, Section 303(c). The Section 4(f) provisions address the potential for conflicts between transportation needs and the protection of lands for recreational use and resource conservation by regulating the use of publicly owned parkland, recreation areas, and historic sites. Specifically, they prohibit the Secretary of Transportation from approving any program or project that would require the use of any publicly owned land from a public park, recreation area, wildlife or waterfowl refuge, or land of an historic site of national significance as determined by the officials having jurisdiction over these lands, unless there are no feasible and prudent alternatives to the use of these lands. In addition, a proposed program or project must include all possible planning to minimize harm resulting from the proposed use.

Shoulder of Track:
The outside portion of the track comprised of the ballast. The width of the shoulder is usually expressed as the level top portion of the ballast up to the point where is begins to slope down.

SHPO:
State Historic Preservation Officer

Siding:
A track auxiliary to the main track, for meeting and passing trains, which is so designated in Timetable, General Bulletin Order, or Dispatchers Operations Bulletin.

Signal:
Visual indication passed to the locomotive engineer to advise the speed, direction or route of the train. Some signals are: engine whistle signals, display of headlights, markers, blue signal protection, signals imperfectly displayed, and emergency protection signals.

Single Track:
One main track upon which trains are operated in both directions.

Speed:
Note: speed definitions may vary from one railroad to another and from one country to another. However, for purposes of this document, *speed* has the following meanings:

Limited Speed: A speed not exceeding 45 mph.

Maximum Authorized Speed: The fastest speed that trains are permitted to operate over a track as designated in a railroad timetable or special instruction.

Medium Speed: A speed not exceeding 30 mph.

Reduced Speed: A speed that permits complying with flagging signals and stopping short of train or obstruction.

Restricted Speed: A speed that will permit stopping within half of the range of vision of equipment, also prepared to stop short of a switch not properly lined and in no case exceeding Slow Speed. At restricted speed, the engineer should be on the lookout for broken rails.

Slow Speed: A speed not exceeding 15 mph.

Speed Restriction:
An imposed speed restriction of a train to below the maximum speed for the railroad, division, or subdivision, caused by track, signal, train equipment, or environmental conditions.

Spoil:
Material composed of a variety of rocks and minerals having different chemical and physical characteristics and in varying proportions and sizes.

Spur Track:
Side track that is connected at one end only to a running track. Some form of bumping post or other solid obstruction usually protects the other end.

SSC:
NASA's Stennis Space Center

Stakeholder:
A person or organization with an interest in or affected by FRA actions (representatives from Federal, state, tribal, or local agencies; members of Congress or state legislatures; unions; educational groups; environmental groups; industrial groups, etc.; and members of the general public).

STB:
Surface Transportation Board.

Surface (Track):
The condition of the track as to vertical evenness or smoothness. Track surface may need to be measured while under load, since some setting of the track can occur.

Switch:
A track structure used to divert rolling stock from one track to another.

Switching:
The physical movement of rail cars from one place to another within the limits of a yard, terminal or station.

SWPAs:
Source water protection areas

SWPPP:
Stormwater Pollution Prevention Plan

T

T&E:
Threatened or Endangered

Threatened Species:
A species that is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range.

Tie, Cross:
The transverse member of the track structure to which the rails are spiked or otherwise fastened to provide proper gauge and to cushion, distribute, and transmit the stresses of traffic through the ballast to the roadbed.

Tie, Switch:
The transverse member of the track structure, which is longer than but functions as does the crosstie and in addition supports a crossover or turnout.

TIP:
Transportation Improvement Program

TMDLs:
Total Maximum Daily Loads

Track:
An assembly of rails, ties, and fastenings over which cars, locomotives, and trains are moved.

Body: Each of the parallel tracks of a yard upon which cars are placed or stored.

Classification: One of the body tracks in a classification yard, or a track used for classification purposes.

Departure: Tracks where rail cars are classified and assembled into trains for line- haul movement.

Interchange: A track on which cars are delivered or received, as between railways.

Lead: An extended track connecting either end of a yard with the main track.

Main Track: For the purposes of the Track Safety Standards, a track other than an auxiliary track extending through yards and between stations.

Passing: A track auxiliary to the main track for meeting or passing trains. Same as a Siding. The correct term to use is "Siding" for repairs.

Receiving Track: Tracks where incoming trains are received.

Running: A track reserved for movement through a yard.

Side: A track auxiliary to the main track for purposes other than for meeting and passing trains.

Spur: A stub track diverging from a main or other track.

Storage: One of the body tracks in storage yards or one of the tracks used for storing equipment.

Team: A track on which cars are placed for transfer of freight between cars and highway vehicles.

Train:
An engine or more than one engine coupled, with or without cars, or a track unit(s) so designated by its operating authority, displaying a marker(s).

Turnout:
An arrangement of a switch and a frog with closure rails, by means of which rolling stock may be diverted from one track to another.

U

Unique Farmland:
Land other than prime farmland that is used for the production of specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

USACE:
United States Army Corps of Engineers

USFWS:
United States Fish and Wildlife Service

UXO:
Unexploded ordnance.

V

VFW:
Veterans of Foreign War

Viewshed:
A total field of vision or a vista. In particular, an area with visual boundaries seen from various points within the area.

W

Watershed:
The area that contributes water to a drainage system or stream.

Water Table:
(1)The upper limit of the saturated zone (the portion of the ground wholly saturated with water). (2)The upper surface of a zone of saturation above which the majority of pore spaces and fractures are less than 100% saturated with water most of the time (unsaturated zone) and below which the opposite is true (saturated zone).

Wetland:
An area of ground that is saturated with water either permanently or seasonally. A community composed of hydric soil and hydrophytes.

Wildlife Corridor:
A belt of habitat that is essentially free of physical barriers such as fences, walls, and development and connects two or more larger areas of habitat, allowing wildlife to move between physically separate areas.

Wood Trestle:
A wood structure composed of bents supporting stringers, the whole forming a support for loads applied to the stringers through the deck.

X – Y -Z

Yard:
A system of tracks within defined limits provided for making up trains, storing cars, and other purposes, over which movements not authorized by time table or by train-order may be made, subject to prescribed signals and rules, or special instructions. Under freight yard, the definition is: "A network of tracks set aside for a railway's own working purpose, such as classification, switching and holding rail equipment." It is common to use the words yard and track interchangeable in some instances, but they are basically tracks used for a specific purpose and located within the yard limits.

Yard Limits:
That portion of the main track or main tracks within limits defined by yard limit signs.

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