

3.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the proposed Project would vary in duration and significance based on construction method and affected resource. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to preconstruction conditions almost immediately afterward. Short-term impacts could continue for approximately 3 years following construction. Impacts were considered long-term if the resources would require more than 3 years to recover. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to preconstruction conditions during the life of the proposed Project, such as with the construction of a compressor station. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment.

In this section, we discuss the affected environment, construction and operational impacts, and propose mitigation measures for each resource. We evaluated these measures as well as proposed mitigation measures to determine whether or not additional steps would be necessary to further reduce impacts. Additional measures that we have identified appear as bulleted, boldface paragraphs in the text of the EIS. We recommend that these measures be included as specific conditions to the Certificate that may be issued to Gulf South for the proposed Project.

Conclusions in this EIS are based on our analysis of environmental impacts and the following assumptions:

- Gulf South would comply with all applicable laws and regulations;
- the proposed facilities would be constructed as described in Section 2.0 of this EIS; and
- Gulf South would implement the mitigation measures identified in its application and supplemental filings to the FERC.

3.1 GEOLOGY

3.1.1 Geological Setting

The geologic history of eastern Texas, northern Louisiana, and southwestern Mississippi is dominated by alluvial, deltaic, and shallow marine sedimentary deposits. The proposed Project would be located in a geological feature known as the Mississippi Embayment. The Embayment began in the Precambrian (543 mega annum [Ma] and earlier) as a rift zone that left a depression in the crust. The depression acted to accumulate sediment eroding from the interior of the continent. The weight of accumulated sediments further depressed the crust, creating more accommodation space. As sea levels fluctuated, the ocean advanced into and retreated out of the Embayment, leaving alternating deposits of marine sediments and limestone, evaporites, delta sediments, and alluvial sediments. As more sediment was deposited, buried sediment lithified into rock and tilted to the south. At the end of the Last Glacial Maximum, during the Pleistocene (1.8 Ma to 10 kilo annum [ka]), outwash from melting glaciers deposited a huge volume of sediment in the Mississippi Embayment. More recently, in the Holocene (10 ka to Present), rivers have begun incising into the Pleistocene sediments, creating the modern topography.

The proposed pipeline would cross approximately 77.6 miles of Holocene alluvial plains and alluvium associated with the Red, Ouachita, and Mississippi Rivers consisting of loam, sand, gravel, silt, and clay; 40.1 miles of Pleistocene terrace uplands consisting of sand, clay, silt, and gravel; 35.2 miles of Miocene (23.8 Ma to 5.3 Ma) upland and terrace deposits consisting of sand, sandstone, clay, gravel,

quartzite, and sandy limestone; 9.3 miles of Oligocene (33.7 Ma to 23.8 Ma) upland and terrace deposits consisting of limestone, sandy limestone, sand, and marl; 58.5 miles of Eocene (54.8 Ma to 33.7 Ma) silt, clay, marl, sand ironstone, lignite, and glauconite; and 22.4 miles of Paleocene (65 Ma to 54.8 Ma) and Eocene associated with the Wilcox Group consisting of sand, silt, lignite, limestone, and glauconite (Table 3.1.1-1).

3.1.1.1 Topography

Topography along the proposed pipeline route would range from flat to moderately hilly terrain. The elevation of the proposed pipeline route would vary from 200 to 260 feet above mean sea level (AMSL) in east Texas, 300 to 400 feet AMSL in western Louisiana upland areas, approximately 75 feet AMSL in the Mississippi River Alluvial Plain in Madison Parish, Louisiana, and 450 feet AMSL in Simpson County, Mississippi. The topography varies from mostly level floodplains, to gently sloping stream terraces, with rolling hills and some gently sloping to moderately steep uplands.

Some areas of moderately rugged topography would be encountered along the proposed Project route, particularly in Ouachita Parish, Louisiana and Warren, Hinds, and Simpson Counties, Mississippi. As described in Section 2.3.2, Gulf South would use special “two-tone” construction techniques in these areas as listed in Table 2.3.2-2 to effectively work along these steeper slopes and all areas disturbed during pipeline construction would be finish-graded and restored as closely as possible to preconstruction contours during cleanup and restoration. Some of this steeper topography in Warren County, Mississippi is associated with thick deposits of loess soil found between MP 185.9 and 196.4, which are capable of supporting near vertical slopes when dry. Topography in this area often varies by 100 feet or more over relatively short distances. Loess soils are discussed in more detail in Section 3.2.

3.1.1.2 Bedrock

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) defines shallow bedrock as bedrock occurring in the upper 60-inches of the soil profile. A review of soil survey databases for the Project area indicate that shallow bedrock would not likely to be encountered along the proposed pipeline route. Additionally, Gulf South indicates that based on review of topographic maps, soil conditions, and geologic formations crossed, it would be unlikely that bedrock would be encountered within 5 to 7 feet below ground surface. Since no shallow bedrock has been identified and the shallow bedrock that could be encountered would consist of loosely consolidated, weathered sandstone and shale that should be easily workable with standard construction equipment and techniques; it is unlikely that bedrock blasting would be needed for the proposed Project. Should blasting become necessary, Gulf South would notify the FERC before blasting and would conduct all blasting and disposal of bedrock material in accordance with its Plan and Procedures and in compliance with applicable federal, state, and local laws, permits, and authorizations. Gulf South would use the minimum charge explosives necessary to excavate the trench and place mats over the blast area to keep rock from becoming airborne. Additionally, Gulf South would implement all appropriate safety precautions to prevent injury to workers, livestock and property, including safeguards such as flags, barricades, and warning signals.

**TABLE 3.1.1-1
Geologic Units Underlying the Proposed East Texas to Mississippi Expansion Project**

Cumulative Length Crossed (miles)	Group/Formation/ Type	Description	Age
40.9	Alluvium	Loams, sand, gravel, and clay; mapped only in the Mississippi River Alluvial Plain	Holocene
16.8	Braided Stream Terraces	Light gray, tan, and brown fine to coarse sand, some clay, silt, and gravel. Glacial outwash of ancestral Arkansas River.	Pleistocene
8.5	Braided Stream Terraces - Loess	Tan to reddish brown massive silt with some clay and minor amounts of very fine sand. Stippled map units are those overlain by 1 to 9 meters of loess.	Pleistocene
3.0	Cane River Formation	Brown silty clay with basal glauconitic, fossiliferous silts that may weather to ironstone locally.	Eocene
11.5	Catahoula - Loess	Brown silty clay with basal glauconitic, fossiliferous silts that may weather to ironstone locally.	Eocene
35.2	Catahoula-Loess	Irregularly bedded gray sand and sandstone; mottled red and gray, green and chocolate-colored clay; some quartzite and some gravel; the Paynes Hammock sand; sandy limestone, cross-bedded fine green sand, and thin-bedded sand and clay, is mapped with the underlying Chickasawhay limestone in eastern Mississippi.	Miocene
22.2	Cockfield Formation	Brown lignitic clays, silts, and sands; some sideritic glauconite may weather to brown ironstone in lower part.	Eocene
4.4	Cook Mountain Formation	Greenish gray sideritic, glauconitic clay in upper part may weather to brown ironstone; yellow to brown clays and fossiliferous marl in lower part may weather to black soil. Ironstone concretions near base.	Eocene
1.1	Deweyville Terrace	Gray mixed with brown-to-red clay and silty clay; some sand and gravel locally. Topographically higher than Holocene alluvium and lower than Prairie terraces. Found along streams of intermediate size.	Pleistocene
2.3	High Terraces	Tan to orange clay, silt, and sand with a large amount of basal gravel. Surfaces are highly dissected and less continuous than lower terraces. Composed of terraces formerly designated as Willana, Citronelle, and the highest Bentley.	Pleistocene
2.9	Intermediate Terraces	Light gray to orange-brown clay, sandy clay, and silt; much sand and gravel locally. Surfaces show more dissection and are topographically higher than the Prairie. Composed of terraces formerly designated as Montgomery, Irene, and most of the Bentley.	Pleistocene
36.7	Natural Levees	Gray and brown silt, silty clay, some very fine sand, reddish brown along the Red River. Shown only on past and present courses of major streams.	Holocene
8.5	Prairie Terraces	Light gray to light brown clay, sandy clay, silt, sand, and some gravel. Surfaces generally show little dissection and are topographically higher than the Deweyville. Three levels are recognized: two along alluvial valleys, the lower coalescing with its broad coastwise expression; the third, still lower found intermittently gulfward.	Pleistocene

TABLE 3.1.1-1 (continued)
Geologic Units Underlying the Proposed East Texas to Mississippi Expansion Project

Cumulative Length Crossed (miles)	Group/Formation/Type	Description	Age
17.4	Sparta Formation	White to light gray massive sands with interbedded clays; some thin interbeds of lignite or lignitic sands and shales.	Eocene
9.3	Vicksburg/Chickasawhay - Loess	Chickasawhay limestone, sandy limestone and sand, and overlying Paynes Hammock sand of Miocene age, present only in eastern Mississippi; Vicksburg Group, predominantly limestone and marl but contains some bentonite and near the top, chocolate-colored clay and some sand.	Oligocene
22.4	Wilcox Group	Gray to brown lignitic sands and silty to sandy lignitic clays, many seams of lignite, some limestone and glauconite. Includes small Carrizo Sand (Claiborne Group) outcrops.	Paleocene/ Eocene

Source: Gulf South

3.1.1.3 Impacts to the Geologic Setting

The primary effect of pipeline construction on geological resources would consist of disturbances to topographical features found along the construction right-of-way. These disturbances to topography would be most apparent in relatively steeper areas, such as the areas discussed above in Warren County, Mississippi. However, since all topographic features disturbed by pipeline construction would be finish-graded and restored as closely as possible to preconstruction contours during cleanup and restoration, and aboveground facilities have been sited in areas without any significant topography, we believe that construction and operation of the proposed Project would not result in significant alterations or negative impacts to the topography or overall geologic setting occurring within the proposed Project area.

3.1.2 Mineral Resources

Oil, gas, coal, salt, sulfur, sand, gravel and clay are all actively extracted in Texas, Louisiana, and Mississippi. Panola County, Texas produces construction sand and gravel. Louisiana produces salt, sand, gravel, crushed stone, lignite, sulfur, lime, gypsum, and common clay. Mississippi produces bentonite, fuller’s earth, ball clays and kaolin, lignite, sandstone, and limestone. Oil and natural gas extraction is common in Texas, Louisiana, and Mississippi and is an important economic resource in those areas. Gulf South has identified a total of 124 gas and oil wells within 0.25 mile of the proposed pipeline route. All of these wells were located in either eastern Texas or Louisiana.

According to Gulf South, which used USGS topographic maps, Louisiana Department of Natural Resources’ (LDNR) SONRIS database, aerial photography, and field survey observations, three mineral resource sites exist within 0.25 mile of the proposed 42-inch-diameter mainline pipeline (Table 3.1.2-1) in Louisiana. Two of these sites are inactive and the third, an active sand pit in Jackson Parish, Louisiana, would be avoided because it is located approximately 600 feet south of the proposed pipeline. Given that there are few mineral resources located in the immediate vicinity of the proposed Project, and that known sites are inactive or would be avoided, we believe that no significant impacts to mineral resources would occur.

**TABLE 3.1.2-1
Mineral Resources within 0.25 Mile of the Proposed East Texas
to Mississippi Expansion Project**

Milepost (MP)	Parish/ County, State	Mineral Resource	Distance from Construction Work Area (feet)	Direction from Construction Work Area	Evaluation of Impacts
12.1	DeSoto, LA	Inactive gravel pit	Crossed	Not available	No impacts anticipated, the site is inactive
64.6	Bienville, LA	Inactive gravel pit	Crossed	Not available	No impacts anticipated, the site is inactive
68.7	Jackson, LA	Active sand pit	600	South	The proposed pipeline would be adjacent to existing utility and pipeline corridors, which would prevent the further development of mineral resources. No further impact is anticipated.

In addition to the identified mineral sites, Gulf South indicates that construction and operation of the proposed Project could possibly affect 10 exploitable oil and natural gas wells, but that potential impacts to these wells would be addressed through easement negotiations with landowners. An active oil and gas lease would be crossed by the proposed Project at MP 20.9 in DeSoto Parish, Louisiana. The nearest well would be located approximately 150 feet away from the proposed pipeline and an existing right-of-way prevents expansion of activity at this site, so impacts from the proposed Project are not anticipated. Excavation of the pipeline trench would typically extend to a depth of approximately 7 feet below the ground surface, and none of the proposed HDD crossings would exceed a depth greater than 100 feet below the ground surface.

Because there would be little to no overlap regarding the depth of oil and gas operations and construction activity, affected oil and gas well operators would be compensated, if necessary, and new drilling operations would be conducted outside of the permanent right-of-way, we believe that construction and operation of the proposed Project would not impact existing and/or future mineral sites or oil and gas field development.

3.1.3 Paleontological Resources

Paleontological resources are the fossilized remains of prehistoric plants and animals, as well as the impressions left in rock or other materials of the forms and activities of such organisms. Eocene deposits underlying the western portion of the proposed Project route associated with the Cane River and Cook Mountain formations (which are described in Table 3.1.1-1) and Holocene deposits underlying the eastern portion of the proposed Project route associated with the Mississippi River Alluvial Plain are the only formations likely to contain fossilized remains. The proposed pipeline route would cross potentially fossil-bearing units associated with the fossiliferous silts of the Cane River Formation (MP 43.8 to 46.0, MP 46.7 to 46.8, MP 46.9 to 47.3, and MP 47.4 to 47.7) and the fossiliferous marl of the Cook Mountain Formation (MP 69.3 to 70.2, MP 71.0 to 74.3, MP 75.8 to 76.0, and the MLV facility at MP 70.0). The proposed pipeline route would also cross sand and gravel bars within the floodplain of the Mississippi, which potentially contain fossils. Though the possibility of encountering fossilized remains exists, no paleontological resources have been identified within the proposed Project area.

Due to the limited exposure of fossil-bearing rock units crossed by the proposed Project and the general instability of Paleocene and Eocene fossils at shallow depth, we believe it is unlikely that trenching and excavation activities associated with construction of the proposed Project would adversely impact paleontological resources. However, if paleontological resources were discovered during the course of pipeline construction, Gulf South would follow the measures identified in its Plan for the Unanticipated Discovery of Historical Properties, Human Remains or Potential Paleontological Evidence during Construction.

Based on the low probability of encountering these resources and Gulf South's adherence to its plans as necessary, we believe that construction and operation of the proposed Project would not significantly affect paleontological resources.

3.1.4 Geologic Hazards

Geologic hazards are defined by the American Geological Institute (Bates and Jackson 1984) as "geologic conditions or phenomena that present a risk or are a potential danger to life and property, either naturally occurring or man-made." Geologic hazards potentially occurring in the vicinity of the proposed Project area include seismicity and faults, soil liquefaction, slope failures/landslides, and ground subsidence. Geologic hazards such as volcanism are not relevant to the proposed Project area and are excluded from further consideration.

3.1.4.1 Seismicity and Faults

The USGS defines seismicity as “the geographic and historical distribution of earthquakes” (USGS 2006a). Faults are fractures in rock that are evidence of geologic movement. Hazards associated with seismicity and faulting include ground shaking, surface rupture of faults, and offset along normal, reverse, or strike-slip faults. Faulting is especially hazardous to linear, rigid structures, such as pipelines, in which the ground is not moving the same distance or direction.

Gulf-parallel, normal faults border the Gulf of Mexico and run through Texas, Louisiana, Mississippi, and Alabama. These faults were created by a wedge of sediments thickening until they collapsed under their own weight. These faults are shallow at depth and are not attached to the crust. Because the stress field of the underlying crust is not known, seismic potential is difficult to determine. However, historically recorded seismicity in the area traversed by the proposed Project has not been significant.

Earthquakes are caused by stress building up along a fault until a critical limit is reached and the stress is released through sudden movement along the fault. This release of stress causes seismic energy to radiate from the fault causing the ground to shake. Gulf South indicates that there is no evidence of active faulting in the last 10,000 years in the proposed Project area and indicates that the proposed Project would be located in a region of low seismic risk.

Based on the historical record and absence of fault activity over the last 10,000 years, we believe that the potential for seismicity and faulting does not represent a significant risk to the stability or safety of the proposed Project.

3.1.4.2 Soil Liquefaction

Soil liquefaction is a condition that occurs when loose, cohesionless, saturated soil (usually well-sorted sand) is subjected to vibration or shock waves. During liquefaction, pore water inhibits grain-to-grain contact, and the strength of the soil is greatly reduced such that the soil may act like a viscous liquid with the ability to move and flow. Soil liquefaction can lead to landslides and earthflows, movement or failure of foundations and footings, and mobility of buried objects.

Soils along the proposed pipeline route are poorly drained to very poorly drained in some locations as discussed in Section 3.2. Saturated soil conditions increase the risk of liquefaction. However, because soil liquefaction risk is closely related to seismic risk, which was previously described as low within the proposed Project area; we believe that the potential for soil liquefaction is similarly low. Further, the pipeline and associated facilities would be designed and constructed in accordance with the standards specified in 49 CFR Part 192, *Minimum Federal Safety Standards for the Transportation of Natural and Other Gas by Pipeline*, which should adequately address the low potential for soil liquefaction. Given the low seismic risk in the area and the methods that would be used to construct the proposed pipeline and associated facilities, we believe that soil liquefaction does not represent a significant risk to the stability or safety of the proposed Project.

3.1.4.3 Slope Failures/Landslides

Several factors contribute to slope failures and subsequent landslides including the degree of slope or tilt of geologic materials, the composition of the materials, the amount of man-made disturbance of the materials, proximity to seismic activity, and the amount of rainfall exposure. Generally, flat areas were selected for the location of the proposed compressor and meter station sites; therefore, slope failure is not expected at aboveground facility locations. However, slope failures and landslides represent a

potential hazard along portions of the proposed Project route that would traverse areas of side slopes and rolling terrain. Factors that would increase the potential for slope failures along slopes and rolling terrain include cutting along slopes, the weight of construction equipment, and unusually high precipitation.

Past incidences of “high” landslide activity (greater than 15 percent of area involved in landslide processes) are located in areas between proposed MP 174.1 and 182.3 in Louisiana and between proposed MP 189.4 and 202.0 in Mississippi. Although the area in Louisiana exhibits past landslide activity, the area has eroded and is now mainly flat terrain with an overall low landslide potential. The location of high landslide activity in Mississippi coincides with upland terraces and loess deposits at elevations above the alluvial plain.

Areas where susceptibility to future landslides was rated as high are located between proposed MP 162.5 and 174.2 in Louisiana and between proposed MP 182.3 and 185.9 in Mississippi. Areas where susceptibility to future landslides was rated as moderate are located in Hinds, Copiah, and Simpson Counties, Mississippi between proposed MP 201.9 and 238.2.

Construction of the pipeline would be accomplished in accordance with Gulf South’s Plan, which includes measures to control runoff and erosion that would minimize the potential for slope failures. In addition, pre- and post-construction inspections would identify areas of risk, and continued monitoring along slopes would likely identify any significant landslide hazards before they develop. Gulf South would also implement specialized two-tone construction techniques as described in Section 2.3.2 to provide for safe working conditions in steeper areas potentially susceptible to slope failures. Based on the characteristics of the proposed Project area and Gulf South’s adherence to its identified construction and monitoring measures, we believe that potential impacts from slope failures and landslides would be prevented or effectively minimized.

3.1.4.4 Ground Subsidence

Ground subsidence is a lowering of the land-surface elevation that results from changes that take place underground. Common causes of land subsidence include dissolution of limestone in areas of karst terrain; collapse of underground mines; and pumping of water, oil, and gas from underground reservoirs. Gulf South identified two areas of karst terrain located along the proposed Project between MP 184.2 and 184.4 in Warren County, Mississippi and MP 195.1 and 204.1 in Warren and Hinds Counties, Mississippi. These locations are located within either Vicksburg or Chickasawhay Limestone. These areas are not identified as occurring in areas where dissolution of limestone will occur and therefore likely would not contribute to an increased potential for ground subsidence. Gulf South has not identified any underground mines along the proposed pipeline route.

As described in Section 3.1.2, the proposed Project would traverse areas in eastern Texas, western Louisiana, and Mississippi where oil and natural gas extraction is common. Extraction of oil and gas from sources underlying the proposed Project facilities has the potential to cause ground subsidence (USGS 2006b, USGS 2006c). Further, unconsolidated sediments, which are abundant in the Mississippi Embayment, are susceptible to compaction and subsidence.

Ground subsidence can affect pipelines and aboveground facilities by causing a loss of support that would result in bending or rupture of pipelines and weaken the foundations of aboveground facilities. However, the proposed Project facilities would be designed and constructed to meet or exceed the federal safety standards set forth in 49 CFR Part 192, which should ensure integrity of the Project facilities and minimize the potential for any pipe failures due to ground subsidence. Additionally, Gulf South would conduct regular patrols of the pipeline right-of-way during operations to identify conditions, including any areas of ground subsidence that might affect the safety or operation of the pipeline. We believe that

use of the appropriate construction methods, as well as post-construction monitoring, would minimize the potential for any risk to the proposed Project posed by ground subsidence.

3.1.5 Conclusion Regarding Impacts to Geologic Resources

The proposed Project would be unlikely to affect paleontological resources and would be unlikely to encounter bedrock along the proposed pipeline route. However, Gulf South has plans in place to address these issues should the need arise. Potential impacts to mineral sites and oil and gas-producing areas would be largely avoided due to routing and through negotiations with affected parties, as applicable. The largest potential for effects would be related to alteration of topography, especially in steep or moderately rugged terrain. These potential effects would be effectively mitigated through use of special construction techniques and restoration of contours. Geologic hazards, such as seismic activity and liquefaction would not likely cause a significant threat to construction or operation of the proposed facilities. The potential for other hazards, such as slope failure and subsidence, would be minimized through the use of special construction techniques, restoration, and post-construction monitoring. Given the resources, level of impacts, and impact avoidance, minimization, and mitigation measures described above, we believe that the proposed Project would not have a significant impact on geological resources nor would there be more than a negligible risk to the proposed pipeline from geologic hazards.

3.2 SOILS

3.2.1 Existing Soils

Numerous soil types and soil associations would be crossed by the proposed Project. These soil associations, along with a description of their major characteristics, are listed in Appendix C (Table C-1). Soils found at the location of the proposed aboveground facilities and their descriptions are listed in Appendix C (Table C-2).

3.2.2 Major Soil Characteristics

The characteristics of the various soil associations crossed by the proposed pipeline and located at the proposed aboveground facilities are identified in Appendix C and are discussed below.

3.2.2.1 Erosion Potential

Soils crossed by the proposed Project have severe, moderate and low erosion potentials. Specifically, a majority of the soils traversed by the proposed Project have low (85 percent) to moderate (10 percent) erosion potentials (see Appendix C). However, approximately 4 percent of the soils crossed by the proposed Project, located specifically between proposed MP 103.9 and 104.0; MP 149.4 and 149.5; and in many areas between MP 186.0 and 196.2, have a severe erosion potential. The area occurring between MP 103.9 and 104.0 is located in Ouachita Parish, Louisiana and consists of terrace escarpments composed of the Ruston-Lucy-Alaga soil association. The soils found in the area between MP 149.4 and 149.5 in Madison Parish, Louisiana, consist of fluvial deposits composed of the Dundee-Sharkey-Tensas soil association. The area occurring between MP 186.0 and 196.2 is located in Warren County, Mississippi and consists of loess bluffs composed of the Memphis-Natchez-Collins soil association.

3.2.2.2 Drainage Class

The drainage class of a soil is the range of its relative wetness under natural conditions. Soils with good drainage lose water and have low wetness, while soils with poor drainage retain water and have

high wetness. Differences in drainage classes are typically attributed to grain size and sorting. Well-sorted or coarse-grained soils have more pore space and are typically better drained. Poorly sorted or fine-grained soils have less pore space and are typically poorly drained. The NRCS recognizes seven classes of drainage: very poorly drained, poorly drained, somewhat poorly drained, moderately well drained, well drained, somewhat excessively drained, and excessively drained.

No soils classified as very poorly drained would be crossed by the proposed pipeline. Approximately 55.0 miles of the soils that would be crossed by the proposed pipeline route are poorly drained and approximately 20.9 miles that would be crossed are somewhat poorly drained. These areas are scattered along most of the length of the proposed pipeline route.

3.2.2.3 Presence of Hydric Soils

Hydric soils are defined as “soils that are formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions” (NRCS 2006d). Soils that formed under hydric conditions in their unaltered state are still considered hydric when artificially drained or altered for such purposes as agricultural use. Hydric soils are typically poorly drained, and the presence of hydric soils is one of the criteria used for defining wetlands (NRCS 2006d). Hydric soils may also be prone to compaction and rutting. About 32 percent of the soils that would be crossed by the proposed pipeline are classified as hydric (see Appendix C), with large amounts of hydric soils occurring along the proposed route in Richland and Madison Parishes, Louisiana. However, much of the land crossed by the proposed pipeline would be agricultural land or would be associated with floodplains that are now protected by levees. Consequently, some of the hydric soils crossed by the proposed pipeline route likely have been altered from their undisturbed state.

3.2.2.4 Compaction Potential

The compaction of soils results from the decreasing of pore space and water-retention capacity. Susceptibility of soils to compaction varies based on moisture content, composition, grain size, and density of the soil. Poorly drained and fine-grained silt and clay soils are the most likely soils to experience compaction.

Severe compaction potential typically affects soils with clay loam or finer textures and somewhat poor to very poor drainage characteristics. Approximately 20 percent, or 48 miles, of the soil associations that would be traversed by the proposed pipeline are classified as having severe compaction potential (see Appendix C, Table C-1). Although areas susceptible to severe compaction potential are scattered along much of the proposed 42-inch-diameter pipeline route from MP 21.9 to 185.8, relatively large, contiguous areas occur in Madison Parish Louisiana from MP 149.3 to 183.2. Additionally, about 64 percent of the proposed 36-inch-diameter pipeline route in Panola County, Texas is subject to severe compaction potential.

3.2.2.5 Revegetation Potential

Revegetation potential is a rating of the ability of a soil to support revegetation efforts following construction-related disturbance. Gulf South evaluated the potential for revegetation of each soil association that would be affected by construction of the proposed pipeline by averaging the vegetation suitability for grain and seed crops, grasses and legumes, wild herbaceous plants, hardwood trees, and coniferous plants. Taking these factors into account, Gulf South identified four general classes of revegetation potential: good, fair, poor, and very poor. The revegetation potential of soils that would be affected by the proposed Project were classified as good (39 percent), fair (54 percent), poor (6 percent) and very poor (1 percent).

Approximately 8.8 miles of the soils that would be crossed by the 42-inch mainline pipeline between MP 96.2 and 193.6 and 0.9 mile of the soils that would be crossed by the 36-inch supply lateral pipeline between MP H1.5 and H3.0 were defined as having poor or very poor revegetation potential.

3.2.3 Sensitive Soils

3.2.3.1 Loess Soils

Loess soils are composed of fine, tightly packed, wind-blown sediments, which have been described as unique because of their ability to maintain near vertical slopes, their occurrence in large deposits and their high susceptibility to erosion. A deposit of loess soils (loess bluffs) occurs in Warren County, Mississippi between proposed MP 185.9 and 196.4.

The loess soils found in Warren County, Mississippi are particularly sensitive due primarily to their severe erosion potential, but also because of associated or other soil limitations, characteristics, or designations occurring in the area including the presence of hydric soils, poor revegetation potential, moderately steep topography, compaction potential, and prime farmland. The majority of the construction area containing loess soils would be crossed using two-tone construction techniques as described in Section 2.3.2.5. In order to minimize impacts to loess soils, Gulf South developed in consultation with the NRCS a Loess Soil Management Plan (LSMP) that would specifically guide the construction through and restoration of loess soils. Specifically, the LSMP includes the following measures:

- Retention of a geotechnical engineer, experienced with construction and restoration in areas containing loess soils, to approve construction plans in advance and to monitor construction activities;
- Excavation of the trench to as near a vertical slope as possible, along with use of a berm or other obstacle to prevent water from entering the open trench;
- Use of both cool and warm season species for re-seeding, including wheat, rye, bahia, and Bermuda grasses; use of unhulled bahia and bermuda grass seeds that would minimize seed decay prior to germination;
- Mulching of seeded areas at levels meeting or exceeding rates recommended by NRCS; and
- Monthly inspections of the restored areas for the first six months following restoration, and then inspections every two months for the following year; problems such as poorly revegetated areas, evidence of erosion, or loss of mulch would be immediately addressed.

We believe that the implementation and adherence to the impact avoidance, minimization and mitigation measures described in Gulf South's LSMP and its Plan as described below would effectively minimize impacts to loess soils.

3.2.4 General Impacts and Mitigation

Construction activities associated with the proposed Project, such as clearing, grading, trenching, backfilling, and restoration would affect the characteristics of each identified soil type and soil association as described below. Impacts to hydric soils are addressed along with wetlands in Section 3.4.

With appropriate stabilization and revegetation, long-term or permanent impacts to soils would not occur during operation of the proposed Project except for loss of function under constructed impermeable structures such as buildings associated with compressor stations and M/R stations.

To minimize and mitigate impacts to soils as well as other resources, Gulf South developed its Plan which includes the following soils-related measures:

- the deployment of at least one EI for each construction spread; the EI would have peer status with the other inspectors and would have the authority to stop activities that violate the environmental conditions of the FERC Certificate or other authorizations and order corrective action(s);
- limiting Project-related ground disturbance to the construction right-of-way, additional temporary workspaces, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the Certificate;
- minimizing the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area in actively cultivated or rotated croplands and pastures, residential areas, hayfields, wetlands and other areas at the landowner's or land management agency's request;
- installing temporary erosion controls immediately after the initial disturbance of soil. Erosion controls would be properly maintained throughout construction and repaired within 24 hours, if found ineffective. Mulch, which can consist of straw, hay, or erosion control fabric, would be used to stabilize the soil surface;
- installing sediment barriers (such as silt fences and/or staked hay or straw bales, or sand bags) at the base of slopes adjacent to road crossings, to prevent siltation into waterbodies or wetlands crossed by or near the construction work area. These barriers would remain in place until revegetation is successful;
- testing topsoil and subsoil for compaction at regular intervals in areas disturbed by construction activities. If either the subsoil or topsoil is severely compacted, a paraplow or other deep tillage device would be used to break up the soils. In areas where the topsoil was segregated, the subsoil also would be plowed before replacing the segregated topsoil;
- revegetating or stabilizing areas disturbed by Project-related activities in accordance with written recommendations from local soil conservation authorities or the request of the landowner or land management agency; and
- confirming revegetation efforts through post-construction monitoring of all disturbed areas.

3.2.4.1 Erosion

Although the majority of soils that would be crossed by the proposed Project have a low erosion potential, the construction of the proposed Project would disturb soils and result in increased erosion. Additionally, erosion and the potential for erosion would significantly increase in areas of side slopes and rolling terrain found in Ouachita Parish, Louisiana and Warren, Hinds, and Simpson Counties, Mississippi. Soil erosion would impact a soils ability to maintain its structure and support vegetation which would affect several other resources including wildlife and land use.

To minimize the impacts of soil erosion, Gulf South would implement several erosion control (e.g., slope breakers, silt fencing, and mulch) measures described in its Plan, which would control runoff and reduce the duration of soil disturbance.

In addition to adhering to its Plan, Gulf South would develop and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would incorporate the requirements for minimizing and mitigating upland erosion and revegetation described in its Plan, and would further detail the erosion

control structural best management practices, inspection procedures, and reporting protocols to be implemented during construction of the proposed Project.

3.2.4.2 Compaction Potential

Compaction damages the structure of a soil and restricts the transport of air and water to plant roots. As a result, soil productivity and plant growth rates may be reduced. In general, about 20 percent of the soils that would be crossed by the proposed pipeline are considered prone to compaction due to the prevalence of hydric soils and poor drainage. Use of the construction right-of-way, additional temporary workspaces, and access roads by heavy construction equipment would result in soil compaction. The degree of compaction would depend on the composition, grain size, density, and moisture content of the soils at the time of construction.

As described in Gulf South's Plan and Procedures, measures such as restricting vehicular traffic, reducing loads, employing lower ground-pressure equipment, and rescheduling certain activities may be used when soil moisture is high to avoid and minimize compaction and rutting.

3.2.4.3 Revegetation Potential

Because the majority of soils that would be disturbed during construction have fair to good revegetation potential, restoring vegetation in accordance with its Plan should not be of significant concern across most of the proposed pipeline route. However, about 7 percent of the soils that would be disturbed during construction are characterized as having poor or very poor revegetation potential. Revegetation is necessary for stabilization and restoration of the soils in the construction right-of-way, additional temporary workspaces, and areas adjacent to access roads. Revegetation potential may be inhibited by soil erosion; loss of soil productivity through soil compaction; damage to soil structure; loss of soil fertility; damage to drainage systems; and unsuitable seed selection, methods, or planting conditions.

To avoid or minimize these conditions, and as described above and in Section 2.3.1, Gulf South would return the construction right-of-way and extra work areas to preconstruction contours to the extent feasible, control erosion by implementing the procedures in its Plan; segregate and de-compact soils and spread topsoil on the right-of-way during final cleanup, repair any damaged drainage systems, place soil nutrients and lime in upland areas, and seed all disturbed areas. Further, Gulf South has consulted with NRCS and various agencies regarding the appropriate seed mixtures for stabilization and permanent erosion control. We are recommending in Section 3.5 that Gulf South consult further with TPWD regarding seeding mixtures and revegetation in Panola County, Texas.

Gulf South would be responsible for successful revegetation of all disturbed areas, and it would follow its Plan to ensure that all mitigation is sufficient. Gulf South would conduct at least 2 years of post-construction monitoring of all work areas to verify successful revegetation or determine the need for additional restoration. In accordance with its Plan, revegetation would be considered successful if the density and cover of non-nuisance vegetation were similar in density and cover to adjacent undisturbed lands. If vegetation cover and density were not similar or if there were excessive noxious weeds after two full growing seasons, a professional agronomist would determine the need for additional restoration measurements. In agricultural areas, revegetation would be considered successful if crop yields in areas affected by construction were similar to that in adjacent, undisturbed areas.

3.2.4.4 Accidental Releases or Discovery of Contaminants

The accidental release of equipment-related fuels and/or fluids or other hazardous materials, as well as the discovery of contaminated soils during construction could result in additional impacts to soils. To minimize these impacts, Gulf South would implement its general Spill Prevention, Control, and Countermeasures (SPCC) Plan to prevent and contain, if necessary, accidental spills of any material that may contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained and cleaned up in an appropriate manner. This SPCC Plan has been prepared by Gulf South in compliance with Title 40 CFR, Part 112, which describes the management of hazardous materials, such as fuels, lubricants, and coolants, that would be used during construction.

If contaminated soils were encountered during construction, Gulf South would implement procedures to identify and properly manage the contamination. Gulf South prepared its *Plan for the Unanticipated Discovery of Contaminated Environmental Media* which identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations.

3.2.4.5 Drainage Systems and Drainage Patterns

Heavy equipment traffic and trenching along the construction right-of-way, as well as the removal of vegetation, could damage existing drainage systems or affect existing drainage patterns, thereby affecting farm management by causing wet, unworkable soil conditions. Future crop production would likely be reduced if such damage were not corrected. Gulf South indicates that no known drainage structures would be crossed by the proposed Project. However, Gulf South would continue to work with property owners to identify locations of existing drainage structures that could be damaged during construction. If active drainage tiles, culverts, or other drainage facilities were damaged during construction, Gulf South would replace or repair them to a condition that is equal to or better than their preconstruction condition. Additionally, Gulf South would be responsible for ensuring that all areas affected by construction activities were finish-graded and restored as closely as possible to preconstruction contours. Although damage to drainage structures and patterns would result in short-term impacts, the corrective procedures to be implemented by Gulf South would avoid or minimize any long-term impacts.

3.2.5 Prime Farmland

The NRCS defines prime farmland as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses” (NRCS 2006e). Soils classified as prime farmland have few or no rocks, a dependable water supply, and a favorable growing season; they are not saturated for long periods, typically do not flood during the growing season, and are permeable to air and water. Prime farmland is an important resource because it provides the highest crop yield per unit of energy expended. The NRCS determines the prime farmland status of all soil associations that have been surveyed; therefore, this information is available directly from the soil survey databases. Approximately 65 percent of the soils that would be affected by the proposed pipeline and additional temporary workspaces are classified as prime farmland. Designated prime farmland is scattered along virtually the entire proposed route, but over 30 miles of prime farmland would be crossed in each of three parishes/counties: Richland and Madison Parishes, Louisiana, and Hinds County, Mississippi.

Gulf South would implement the measures included in its Plan to minimize and mitigate any impacts to prime farmland soils. Virtually all impacts to prime farmland soils resulting from construction and operation of the proposed pipeline would be temporary because the proposed pipeline would be

buried, and disturbed areas within the construction and permanent rights-of-way would largely revert to their preconstruction uses following restoration. However, the footprint of aboveground facilities would permanently affect some prime farmlands. Operation of the Tallulah Compressor Station would affect about 10 acres of prime farmland. In addition, designated prime farmland located at the Columbia Gulf, Texas Eastern, Enbridge, and Enterprise M/R Stations, as well as at various valves and other minor facilities, would be lost as these areas would be converted to an industrial/commercial land use.

Farmland Conversion Impact Rating documentation would not be required for the proposed Project since it would not be completed by or with assistance from a federal agency, as specified by the Farmland Protection Policy Act. Given the prevalence of prime farmland soils within the affected counties and parishes, the permanent impacts to prime farmland soils associated with construction and operation of the proposed Project aboveground facilities would be less than significant.

3.2.6 Conclusion

Construction of the proposed Project would result in several effects to soils. However, Gulf South would be required to control erosion, test and mitigate for compacted soils, protect topsoil, repair any damaged drainage systems, and revegetate disturbed areas. Further, Gulf South would implement its SPCC Plan and manage contaminated soils should they be encountered. Although a small amount of prime farmland would be permanently affected at the proposed aboveground facilities, these impacts would be minor overall and potential impacts to prime farmland along the proposed pipeline route would be minor and temporary. Given the impact minimization and mitigation measures described above, we believe that soils would not be significantly affected by construction and operation of the proposed Project.

3.3 WATER RESOURCES

3.3.1 Groundwater

3.3.1.1 Existing Groundwater Resources

Along the proposed Project route, groundwater is a significant source of drinking water in selected areas and is used for irrigation, aquaculture, and industrial purposes. Although depth to groundwater is variable along the proposed pipeline route, groundwater is often found at or near the ground surface and the proposed Project would encounter groundwater during construction activities.

Major aquifers underlying the proposed Project include the Carrizo-Wilcox, Red River Alluvial, Sparta, Cockfield, Mississippi River Alluvial, and the Coastal Lowlands aquifers. Although all of these aquifers are utilized, the aquifers contributing major drinking water supplies in the proposed Project area are the Sparta and Coastal Lowlands Aquifers, and to a much smaller extent, the Carrizo-Wilcox, Cockfield, and Mississippi River Alluvial Aquifers (Southern Regional Water Program 2006a). Additional information on these aquifers as well as sole-source aquifers, wellhead protection areas, wells, springs, and contaminated groundwater is presented below.

Carrizo-Wilcox Aquifer

The portion of the proposed Project route traversing Panola County in Texas and DeSoto, Red River, Caddo, and Bienville Parishes in Louisiana is underlain by the Carrizo-Wilcox Aquifer. Well yields typically are restricted in this aquifer due to relatively thin water-bearing sand beds. The maximum depths to groundwater range from 200 feet above mean sea level (AMSL) to 1,100 feet below mean sea level (BMSL). The aquifer is considered to be of good quality, and approximately 14.6 million gallons

per day (mgd) of water are withdrawn for public supply, rural, domestic, and general irrigation uses (LDEQ 2003, Sargent 2002).

Red River Alluvial Aquifer

The portion of the proposed Project route traversing DeSoto and Red River Parishes in Louisiana is underlain by the Red River Alluvial Aquifer. The Red River Aquifer is hydraulically related to the Red River and its major tributaries. Groundwater for this aquifer is typically encountered within 30 to 40 feet of the ground surface. Approximately 7.5 mgd are withdrawn from this aquifer (Sargent 2002) for irrigation and aquaculture uses. Water from this aquifer is not used as a drinking water supply source due to poor quality in relation to taste, odor, and appearance.

Sparta Aquifer

The portion of the proposed Project route traversing Bienville, Ouachita, and Jackson Parishes in Louisiana is underlain by the Sparta Aquifer. This aquifer receives inflow from the Carrizo-Wilcox and Cockfield Aquifers, as well as from overlying terrace and alluvial deposits. The maximum depths to groundwater range from 200 feet AMSL to 1,700 feet BMSL. This aquifer is considered to be of fair to good quality, and approximately 68.3 mgd are withdrawn for public water supply and industrial uses (LDEQ 2003, Sargent 2002).

Cockfield Aquifer

The portion of the proposed Project route traversing Jackson, Ouachita, and Richland Parishes in Louisiana is underlain by the Cockfield Aquifer. This aquifer is recharged by direct infiltration, movement through alluvial and terrace deposits, and by upward movement from the Sparta Aquifer. The maximum depths to groundwater range from 200 feet AMSL to 2,150 feet BMSL. This aquifer is considered to be of fair quality and approximately 7.4 mgd are withdrawn for public water supply use (LDEQ 2003, Sargent 2002).

Mississippi River Alluvial Aquifer

The portion of the proposed Project route traversing Ouachita, Richland, and Madison Parishes in Louisiana is underlain by the Mississippi River Alluvial Aquifer. The Mississippi River Alluvial Aquifer is hydraulically related to the Mississippi River and its major tributaries; it is recharged by infiltration of rainfall through the overlying silt and clay layers, lateral and upward movement of water from adjacent and underlying aquifers, and overbank stream flooding. Groundwater typically is encountered within 30 to 40 feet of the ground surface. The quality of water from this aquifer is considered relatively poor due to the presence of arsenic and poor taste and odor qualities, but approximately 353.6 mgd are withdrawn for irrigation and industrial uses (LDEQ 2003, Sargent 2002).

Coastal Lowlands Aquifer

The portion of the proposed Project route traversing Warren, Hinds, Copiah, and Simpson Counties in Mississippi, in addition to Gulf South's existing McComb Compressor Station in Walthall County, Mississippi, is underlain by the Coastal Lowlands Aquifer. This aquifer system merges with the Mississippi River Alluvial Aquifer near the proposed Project area in Copiah and Simpson Counties; however, the Vicksburg-Jackson geologic confining unit separates the two aquifer systems. The Coastal Lowlands Aquifer system is a gulfward-thickening, heterogeneous, unconsolidated wedge of discontinuous beds of sand, silt and clay (USGS 2006d). The Coastal Lowlands Aquifer system is hydraulically related to the Mississippi, Pearl and Red Rivers, and is recharged by precipitation. The

aquifer is divided into five permeable zones and its yield is utilized for agricultural, public supply, commercial, and industrial uses. The majority of groundwater withdrawals from the Coastal Lowlands Aquifer occur in Louisiana near New Orleans, Baton Rouge, and the southwestern portion of the State.

Sole-source Aquifers

Sole-source or principal-source aquifers are defined by the EPA as those that supply a minimum of 50 percent of the drinking water used in the area overlying the aquifer. The areas served by these aquifers may not have readily available alternate water sources. The Southern Hills Aquifer in Mississippi is the only sole-source aquifer located in the proposed Project (EPA 2006) area. This aquifer is part of the larger Coastal Lowlands Aquifer and is comprised of a collection of smaller aquifers such as the Chicot equivalent, Evangeline equivalent, Jasper equivalent, and Catahoula equivalent. The Southern Hills Aquifer extends from north-central Mississippi to coastal areas of Mississippi and Louisiana and intersects the proposed Project right-of-way between in the general area between MP 183 through 193 and MP 205 through 233. The Southern Hills regional aquifer system is the primary source of public and domestic water supplies in 10 parishes of southeastern Louisiana and areas of southwestern Mississippi, serving over 1,000,000 persons.

Aquifer Protection Programs

Texas, Louisiana and Mississippi have state or regional aquifer protection programs in place. The State of Texas has instituted Groundwater Conservation Districts; Louisiana has designated “areas of ground water concern” based upon water quantity levels, and the State of Mississippi participates in the Mississippi, Arkansas, and Tennessee Regional Aquifer Study (MATRAS) to develop groundwater rules, regulations, and/or conservation programs for their respective states. The proposed Project would not cross any aquifers protected by either the Texas or Mississippi programs; however, the proposed Project would cross one aquifer in Louisiana, the Sparta aquifer (described above) which has “areas of groundwater concern.” Specifically, the State of Louisiana has designated the Jonesboro-Hodge area as an area of groundwater concern. However, proposed activities in this area would involve relatively shallow trenching and construction disturbance that would not contact the deeper aquifer.

Wellhead Protection Areas

Gulf South consulted with Texas Commission on Environmental Quality (TCEQ), Louisiana Department of Environmental Quality (LDEQ), and MDEQ regarding the location of wellhead protection areas, which are designated to protect the drinking water supplies obtained from municipal or community wells. The TCEQ did not identify any wellhead protection areas, the LDEQ identified 12 wellhead protection areas, and the MDEQ identified one wellhead protection area located within the proposed pipeline construction right-of-way. The locations of the wellhead protection areas crossed by the proposed Project are listed in Table 3.3.1-1.

Wells and Springs

Based on consultation with the TCEQ, Louisiana Department of Transportation (LDOT), and MDEQ, Gulf South has identified 24 wells located within 150 feet of the proposed construction right-of-way and aboveground facility boundaries. The identified wells included two industrial wells, four irrigation wells, five observation wells, four domestic water supply wells, four public domestic water supply wells, one rig supply well, and four wells that have been plugged and abandoned. These wells and their location relative to the proposed Project are listed in Table 3.3.1-2.

**TABLE 3.3.1-1
Drinking Water Wellhead Protection Areas Crossed by the Proposed
East Texas to Mississippi Expansion Project**

Identifier	County/Parish	Begin Milepost	End Milepost
LA1081009	Bienville, LA	39.9	41.0
LA1013006	Bienville, LA	43.3	45.2
LA1049001	Jackson, LA	70.5	72.4
LA1049012	Jackson, LA	71.5	73.7
LA1049017	Jackson, LA	72.0	73.7
LA1049008	Jackson, LA	72.1	73.5
LA1049006	Jackson, LA	72.4	73.7
LA1049026	Jackson, LA	82.0	83.7
LA1049024	Jackson, LA	87.6	87.2
LA1049004	Jackson, LA	88.5	90.8
LA1073047	Ouachita, LA	101.7	103.6
LA1021004	Ouachita, LA	110.2	112.4
MS61004003	Simpson, MS	235.2	236.1

**TABLE 3.3.1-2
Wells Located within 150 Feet of the Proposed East Texas
to Mississippi Expansion Project^a**

Well Type	County/Parish	Approximate Milepost	Approximate Well Depth (feet)	Approximate Distance from Centerline (feet)	Approximate Distance from Construction Work Area (feet)
Domestic	DeSoto, LA	1.9	110	185	135
Domestic	DeSoto, LA	6.6	320	169	119
Plugged and abandoned	DeSoto, LA	7.4	270	160	70
Domestic	DeSoto, LA	11.2	285	161	110
Public domestic	Red River, LA	26.8	25	271	61
Public domestic	Red River, LA	26.8	25	272	62
Plugged and abandoned	Red River, LA	26.8	25	270	60

TABLE 3.3.1-2 (continued)
Wells Located within 150 Feet of the Proposed East Texas
to Mississippi Expansion Project^a

Well Type	County/Parish	Approximate Milepost	Approximate Well Depth (feet)	Approximate Distance from Centerline (feet)	Approximate Distance from Construction Work Area (feet)
Rig supply	Bienville, LA	54.9	160	10	0
Public observation	Bienville, LA	62.6	348	100	50
Plugged and abandoned	Bienville, LA	63.2	376	110	55
Industrial	Bienville, LA	63.6	410	183	130
Plugged and abandoned	Bienville, LA	63.9	410	200	144
Observation	Bienville, LA	64.5	336	200	135
Observation	Bienville, LA	67.0	482	26	0
Observation	Bienville, LA	67.0	488	26	0
Industrial	Bienville, LA	67.0	490	82	48
Observation	Jackson, LA	78.2	629	70	17
Irrigation	Richland, LA	120.3	100	540	130
Private irrigation	Richland, LA	124.2	70	141	91
Private irrigation	Richland, LA	149.1	100	5	0
Irrigation	Richland, LA	150.5	629	20	0
Private domestic	Hinds, MS	199.4	29.0	191	141
Public domestic	Hinds, MS	207.2	228.0	132	82
Public domestic	Hinds, MS	226.7	570.0	21	0

Notes:
^a Actual well locations may vary by as much as 100 feet due to the level of accuracy associated with well coordinate data. Gulf South would confirm the actual location of the wells prior to construction.

Because the locations of wells listed in the agencies' databases are not exact, Gulf South would confirm their actual location in the field prior to construction. Based on agency consultations and field surveys conducted by Gulf South, no springs have been identified within 150 feet of the proposed construction right-of-way and aboveground facility boundaries.

Contaminated Groundwater

Based on agency consultations and a review of databases, Gulf South has identified 18 sites with potential contaminated groundwater within a 0.25-mile radius of the proposed Project facilities. These

sites are identified and described in Table 3.3.1-3. Many of these sites are associated with underground storage tanks or have been subject to previous regulatory action.

**TABLE 3.3.1-3
Potentially Contaminated Groundwater Sites Located within 0.25 Mile
of the Proposed East Texas to Mississippi
Expansion Project Centerline**

Milepost	County/Parish	Name	Type	Distance/ Direction	Location
38.6	Bienville, LA	Madden Contracting Co. Inc.	Mines	Less than 0.25 mile (~360 feet) north of centerline	Address unknown. On centerline just north of Layfield Road
70.0	Bienville, LA	Brewton Chipmill, Inc.	FINDS	Less than 0.25 mile (~300 feet) south of centerline	Brewton Chipmill, Inc., 420 Arcadia Highway Jonesboro, LA 71251 State Highway 147, near Jackson Parish
111.2	Ouachita, LA	K.K. Anderson	UST	Less than 0.25 mile (~925 feet) from centerline	810 Mansfield Road, Monroe, LA 71202
111.7	Ouachita, LA	Ke-Ro Mini Mart	UST	Less than 0.25 mile (~330 feet) from centerline	5200 Hwy 165 South, Monroe, LA 71202. East of River near Hwy 165
125.1	Richland, LA	Bend of the River	UST	Less than 0.25 mile (~800 feet) from centerline on State Highway 135	Hwy 15 Alto, LA 71216
143.6	Richland, LA	Stratus Corp	FINDS	Less than 0.25 mile (~800 feet) from centerline	Near intersection of Cooper Road and Cook Rd
181.4	Madison, MS	Interstate Stations # 7	UST	Less than 0.25 mile (~925 feet) north of centerline	I-20 Delta exit, Delta, LA 71233
184.8	Warren, MS	Baxter Wilson Steam Electric Station	UST	Less than 0.25 mile (~1,060 feet) north of centerline	Highway 61 South, Vicksburg, MS 39810
184.8	Warren, MS	Mississippi State Highway Department	UST	Less than 0.25 mile (~1,060 feet) north of centerline	Highway 80, Vicksburg, MS 39180
184.8	Warren, MS	Baxter Wilson Steam Electric Station	ERNS	Less than 0.25 mile (~1,060 feet) north of the centerline	770 Kemp Bottom Road, Vicksburg, MS 39180
184.8	Warren, MS	Warren Power LLC Warren 184.2 Peaking	FINDS	Less than 0.25 mile (~1,060 feet) north of centerline	770 Kemp Bottom Road, Vicksburg, MS 39180
184.8	Warren, MS	Entergy	RCRA/ FINDS/ CERC	Less than 0.25 mile (~1,060 feet) north of centerline	770 Kemp Bottom Road, Vicksburg, MS 39180

TABLE 3.3.1-3 (continued)
Potential Contaminated Groundwater Sites Located within 0.25 Mile
of the Proposed East Texas to Mississippi
Expansion Project Centerline

Milepost	County/Parish	Name	Type	Distance/ Direction	Location
185.3	Warren, MS	Mid Continent Marine Terminal	FINDS	Less than 0.25 mile (~330 feet) north of centerline	4106 Warrenton Road, Vicksburg, MS 39180
185.3	Warren, MS	Corp Headquarters (Former)	UST	Less than 0.25 mile (~330 feet) north of centerline	4111 Warrenton Road, Vicksburg, MS 39180
185.3	Warren, MS	Vicksburg Terminal	FINDS	Less than 0.25 mile (~330 feet) north of centerline	4212 Warrenton Road, Vicksburg, MS 39180
185.3	Warren, MS	Jett Elementary School	LUST/ UST	Less than 0.25 mile (~330 feet) north of centerline	4212 Warrenton Road, Vicksburg, MS 39180
186.8	Warren, MS	Dana Road Elementary	FINDS	0.25 mile (~330 feet) north of centerline	1247 Dana Road, Vicksburg, MS 39180
186.8	Warren, MS	Vicksburg Intermediate	FINDS	0.25 mile (~330 feet) north of centerline	1245 Dana Road, Vicksburg, MS 39180

Notes:

- FINDS = Facility Index System (permit compliance)
- ERNS = Emergency Response Notification System
- LUST = Leaking Underground Storage Tank
- NPDES = National Pollution Discharge Elimination System
- RCRA = Resource Conservation and Recovery Act
- SHWS = Inactive Hazardous Sites Inventory
- UST = Underground Storage Tank

3.3.1.2 General Impacts and Mitigation

In general, the potential for temporary and permanent impacts to groundwater resulting from construction and operation of the proposed Project depends upon whether the proposed Project facilities would cause localized changes to existing groundwater flow paths. Most aquifers underlying the proposed Project area would not be impacted due to their depth and the generally shallow nature of trenching and disturbance. The proposed Project generally would not affect changes in the overall quantity of groundwater, which is determined by the quantity of recharge to the aquifer, except to the extent that clearing of vegetation reduces evapotranspiration (movement of water from soil to air through vegetation) and pipeline trenching increases the potential for infiltration of rainfall in specific locations. In porous soils, an open trench could provide a more direct pathway for infiltration compared to undisturbed land. Increased infiltration and reduced evapotranspiration could result in increased recharge to groundwater, thus increasing groundwater storage. However, given the localized nature of the pipeline trench relative to the surrounding area, such increased recharge would likely not be significant and may even be offset given the increased potential for runoff from cleared areas. Soil compaction could also increase runoff and affect groundwater recharge.

Backfill placed within the pipeline trench would typically be somewhat more permeable than the surrounding soil and rock units; consequently, the trench would act as a preferential pathway for groundwater flow in areas where it intersects the water table. Thus, the pipeline trench would potentially

alter the existing groundwater flow patterns within shallow saturated zones. However, this alteration would not be significant overall.

Permanent impacts to groundwater recharge could also occur from development of impervious surfaces and structures at the proposed aboveground facility sites. However, these impacts would likely be minor considering the relatively small area of the aboveground facility structures relative to the total potential recharge area.

Excavation of the pipeline trench could also alter the quantity and quality of groundwater that flows to specific points of discharge, such as a well or spring, by altering groundwater flow paths. Altered groundwater flow paths, in turn, could result in changes to the quality of groundwater at specific locations. Temporary impacts to groundwater flow paths would most likely be in the shallow aquifers, such as the Red River Alluvial and Mississippi River Alluvial Aquifers, but would not likely be permanent after construction and restoration. All wells except one identified as being located within 0.25 mile of the proposed Project are screened deeper than 60 feet and many are much deeper. Given the depths of these wells, impacts resulting from the proposed construction activity would be unlikely.

Dewatering of the pipeline trench during construction would be necessary where shallow groundwater is encountered. Dewatering would temporarily depress groundwater levels in the immediate vicinity of the trench. However, because trenching typically proceeds at a relatively rapid rate, the depression of the water table around the trench would be expected to recover rapidly once the trench is backfilled. Therefore, dewatering would temporarily affect flow patterns in nearby springs and shallow wells if present, but such impacts would likely be minor and brief.

Accidental spills and leaks of hazardous materials could impact groundwater resources through introduction of contaminants, especially in highly permeable areas near wells. Gulf South would implement the spill prevention and control measures included in its Procedures to minimize these impacts. Additionally, Gulf South developed a Project-specific SPCC Plan, which describes management of the hazardous materials, such as fuels, lubricants, and coolants, that would be used during construction. Given the adoption of the measures in its Procedures and Gulf South's implementation of an SPCC Plan, the risk of accidental spills or other introductions of hazardous materials to groundwater would be effectively minimized.

Gulf South indicates that it does not anticipate encountering any contaminated groundwater plumes during construction or operation of the proposed Project. If contaminated groundwater was encountered, construction activities could cause it to be dispersed to other groundwater resources, surface water resources, or adjacent land. In the event that hazardous materials were discovered during construction of the proposed Project, Gulf South would stop work, notify the appropriate state and federal agencies, and proceed in accordance with all applicable laws and regulations. Additionally, Gulf South would follow the procedures outlined in its *Plan for the Unanticipated Discovery of Contaminated Environmental Media* to ensure that any hazardous materials encountered during construction are properly identified, tested, and disposed of in accordance with the appropriate state and federal regulations. We have reviewed this plan and find it acceptable.

In order to minimize potential impacts to groundwater, Gulf South would implement the measures identified in its Plan, which include:

- testing and, as applicable, mitigation for compacted soils (see Section 3.2 for additional discussion);

- install trench breakers at specified intervals to reduce the potential for the trench to act as a preferential groundwater flow path. Trench breakers would reduce the ability of the trench to convey groundwater, and no long-term impacts to the water table or groundwater migration patterns would be anticipated as a result of the proposed Project;
- measures to reduce the impacts resulting from trench dewatering including discharging the pumped water to well vegetated areas or properly constructed temporary retention structures that would promote infiltration and minimize or eliminate runoff; and
- installation of trench plugs to prevent parallel flow in the trenches.

Based on the anticipated impacts to groundwater, Gulf South's stated construction methods, and the implementation of its Plan, we believe that construction and operation of the proposed Project would not change regional flow paths, groundwater recharge or discharge conditions, or groundwater quality. These features are largely determined by larger-scale geologic features that form the hydrogeologic setting and deeper aquifers are overlain by other aquifers with separating layers would not be directly affected because their upper margin would be located well below the depth of the pipeline trench. We also believe that construction and operation of the proposed Project would not significantly affect groundwater through accidental spills or unanticipated contact with contaminated sites, given Gulf South's adherence to its Plan and Project-specific SPCC Plan.

3.3.1.3 Site-specific Impacts and Mitigation

The route of the proposed Project would cross the Southern Hills Aquifer, a designated sole-source aquifer, for approximately 37.3 miles between MP 183.1 to 192.6 and MP 205.3 to 233.1. However, the relatively deep aquifer system would not be directly affected by trenching and construction activities because its upper margin would be located well below the 7-foot depth of the pipeline trench. Additionally, potential impacts to this aquifer or other groundwater sources are expected to be minimal due to the limited area used for pipeline construction and implementation of mitigation protocols in concert with Gulf South's SPCC Plan, Plan and Procedures. No other regional or state-protected aquifers, including the Jonesboro-Hodge designated area within the Sparta aquifer in Louisiana, would be disturbed or affected by the proposed Project given their absence from the proposed Project area or their depth relative to construction activity.

Wellhead protection areas were identified in multiple areas within and along the proposed pipeline route, as identified in Table 3.3.1-1. These areas would potentially be affected by the general impacts described above, thereby possibly impacting public water supplies through impaired quality, decreased yield, or other disruptions of service. However, potential impacts to wellhead protection areas would likely be avoided or minimized by the measures described above to prevent impacts to groundwater resources.

In order to mitigate for potential effects to wells, at the request of the landowner Gulf South would test the wells of landowners located in close proximity to construction of the proposed Project. The scope of the requested pre- or post-construction monitoring would be negotiated on an individual basis with the landowners. Several private wells, including wells used for domestic supply, are located within 150 feet of the proposed route (see Table 3.3.1-2) and would be subject to potential impacts. To ensure that these resources are adequately protected, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, a final well monitoring and mitigation plan that describes standard testing procedures, and the measures that would be taken should a well be impacted such that it is no longer operable or that it becomes impaired. Gulf**

South should also file a report with the Secretary, within 30 days of placing its pipeline facilities in service, identifying all private or domestic water wells or systems damaged by construction and describing how they were repaired. The report should include a discussion of any complaints concerning well yield or quality and how each problem was resolved.

3.3.1.4 Conclusion Regarding Groundwater Resources

Aquifers typically would not be impacted by the proposed Project given their depth and the relatively shallow nature of construction activity. Impacts to more shallow aquifers and groundwater resources would be adequately avoided or minimized through Gulf South's implementation of its Plan and Procedures, Project-specific plans, and our recommendation. Given these measures, we believe that construction and operation of the proposed Project would not significantly affect groundwater resources.

3.3.2 Surface Water Resources

3.3.2.1 Existing Surface Water Resources

Waterbody Crossings

Approximately 885 waterbodies would be crossed by construction and operation of the proposed pipeline and an additional four waterbodies would be crossed by access roads. Specifically, the proposed Project would cross 200 perennial streams, 682 intermittent streams, and 7 ponds. A table identifying these waterbodies, as well as their widths, locations along the proposed Project route, state waterbody classifications, and proposed crossing methods, is included as Appendix D of this EIS.

As identified in Appendix D, each affected surface waterbody has been assigned a designated use, which characterizes the best intended uses of that waterbody. Designated uses for waterbodies in Texas include aquatic life, recreation, general, fish consumption, public water supply, and oyster waters. Designated uses for waterbodies in Louisiana include primary contact recreation (swimming), secondary contact recreation (boating), fish and wildlife propagation, drinking water supply, oyster propagation, agriculture, and outstanding natural resource waters. The designated uses for waterbodies in Mississippi include fish and wildlife, public water supply, recreation, public water supply and recreation, shellfish harvesting, recreation and shellfish harvesting, and ephemeral (suitable for secondary contact recreation, fish and wildlife, and recreation).

Construction and operation of the proposed Project would require the crossing of five waterbodies in Texas, all of which are designated for aquatic life. In Louisiana, 627 waterbodies would be crossed, all of which have designated uses of primary contact recreation, secondary contact recreation, and fish and wildlife propagation. In addition to this basic suite of designated uses, several waterbodies have additional classifications. These include:

- Bayou Pierre located near MP 22.2 (agriculture);
- Red River near MP 27.0 (agriculture);
- Loggy Bayou located near MP 29.7 (agriculture);
- Black Lake Bayou located near MP 42.4 (agriculture and outstanding natural resource waters); and
- Saline Bayou located near MP 57.1 (agriculture and outstanding natural resource waters).

In Mississippi, the construction and operation of the proposed Project would require the crossing of 257 waterbodies. All 257 waterbodies have designated uses of fish and wildlife, public water supply, and recreation.

No waterbodies occur at the proposed aboveground facility sites or pipe storage and contractor yards, but several additional temporary workspaces would be located within 50 feet of waterbodies (Appendix E-2). Construction of the proposed pipeline would require the temporary use of new and/or improved access roads (see Section 3.8 for additional discussion of access road requirements). Gulf South proposes to use a temporary bridge to cross Cowpen Bayou (MP 23.6) to access an HDD workspace area. Gulf South also proposes to install culverts across waterbodies at MPs 112.2, 185.5, and 219.7 in order to construct access roads. Potential impacts to these waterbodies would be minimized with implementation of Gulf South's Procedures and mitigation would be provided as part of the COE permit for the proposed Project.

Major and Navigable Waters

The major waterbodies (greater than 100-foot-wide) and navigable waterbodies as defined by 33 CFR Part 329 that would be crossed by the proposed Project are listed in Table 3.3.2-1. The proposed Project would cross 22 major waterbodies and 15 navigable waterbodies.

Sensitive Waterbodies

Sensitive waterbodies include those streams designated as one or more of the following: having special status by federal or state resource agencies, providing habitats for threatened and endangered species, having potable water intakes within 3 miles downstream of the proposed pipeline crossing, or not attaining specified water quality uses. No state or locally designated surface water protection areas or surface water intakes located within 3 miles downstream of the proposed Project waterbody crossings would be affected by the proposed Project.

Two streams, Black Lake Bayou (MP 42.3) and Saline Bayou (MP 57.0), have been designated as Louisiana Natural and Scenic Rivers, pursuant to the Louisiana Scenic Rivers Act. These streams are recognized as having unique and diverse characteristics, and are protected through management by LDWF (LDWF 2006c).

The Big Black River (MP 196.7) and the Pearl River (MP 232.2) in Mississippi are designated by the National Park Service (NPS) as being listed on the Nationwide Rivers Inventory (NRI). Streams included in the NRI are considered to possess "outstandingly remarkable natural or cultural values judged to be of more than local or regional significance" (NPS 2006a). The NPS (2006b) described the designated Big Black River as an unaltered stream in a bottomland hardwood setting and the Pearl River as a scenic example of a large Gulf Coast river with adjacent swampland.

The federally endangered pallid sturgeon inhabits the Mississippi River and Red River. The federally threatened Gulf sturgeon inhabits the Pearl River, which is also designated as critical habitat for the species. The MDWFP and Mississippi Museum of Natural Science identified the Big Black River, Baker's Creek (MP 203.8), Turkey Creek (MP 208.0), Fourteenmile Creek (MP 211.4), Tallahalla Creek (217.2), and the Pearl River as waterbodies containing rare aquatic species. Additional discussion of endangered, threatened, and special-status species and their habitats is provided in Section 3.7.

**TABLE 3.3.2-1
Major and Navigable Waterbodies That Would Be Crossed by the
Proposed East Texas to Mississippi Expansion Project**

Waterbody	County/Parish	Length of Crossing (feet)	Major Waterbody	Navigable Waterbody	Proposed Crossing Method
Unnamed pond	DeSoto, LA	114	X		Open-cut
Bayou Pierre	DeSoto, LA	88		X	HDD
Cowpen Bayou	Red River, LA	111	X		HDD
Ash Bayou	Red River, LA	150	X		HDD
Red River	Red River, LA	716	X	X	HDD
Loggy Bayou	Red River, LA	200	X	X	HDD
Grand Bayou Tributary	Bienville, LA	115	X		Open-cut
Black Lake Bayou	Bienville, LA	103	X	X	HDD
Saline Bayou	Bienville, LA	58		X	HDD
Coulee Creek	Jackson, LA	112	X		Open-cut
Coulee Creek	Jackson, LA	123	X		Open-cut
Dugdemonia River	Jackson, LA	54		X	HDD
Castor Creek	Jackson, LA	34		X	HDD
Castor Creek Tributary	Jackson, LA	108	X		Open-cut
Ouachita River	Ouachita, LA	746	X	X	HDD
Bayou Lafourche	Richland, LA	262	X	X	HDD
Boeuf River	Richland, LA	140	X	X	HDD
Bayou Macon	Richland, LA	163	X	X	HDD
Tensas River	Madison, LA	90		X	HDD
Despair Lake	Madison, LA	181	X		HDD
Mothiglam Bayou	Madison, LA	169	X		HDD
Walnut Bayou	Madison, LA	336	X		HDD
Walnut Bayou	Madison, LA	197	X		HDD
Mississippi River	Madison, LA	4,182	X	X	HDD
Big Black River	Warren, MS	193	X	X	HDD
Pearl River	Simpson, MS	238	X	X	HDD
Hoggs Bayou	Panola, TX	137	X		Open-cut

The proposed Project would cross six waterbodies in Louisiana and four waterbodies in Mississippi that are listed as impaired waterbodies by each state's respective 303(d) lists (Table 3.3.2-2). No impaired waterbodies in Texas were found along the Project route. The location of these waterbodies and causes of impairment are listed in Table 3.3.2-2. Contaminated sediments are not known to occur along the proposed Project route.

**TABLE 3.3.2-2
Impaired Waterbodies ¹ Crossed by the Proposed East Texas
to Mississippi Expansion Project**

Waterbody	County/Parish	Pollutant Cause
Bayou Pierre	DeSoto / Red River, LA	Organic enrichment/low dissolved oxygen (DO)
Red River	Red River, LA	Color from an upstream source, sulfates
Black Lake Bayou	Bienville, LA	Low DO
Boeuf River	Richland, LA	Mercury
Big Creek ²	Richland, LA	Fecal coliform bacteria
Bayou Macon	Richland / Madison, LA	Low DO/ nutrients
Big Black River	Warren, MS	Sediment/siltation, nutrients, organic enrichment, low DO, and pesticides
Fourteenmile Creek	Hinds, MS	Nutrients, organic enrichment/low DO, pesticides, and sedimentation/siltation
Bakers Creek	Hinds, MS	Biological impairment, pathogens, nutrients, organic enrichment, and low DO
Pearl River	Simpson, MS	Nutrients, organic enrichment/low DO, pesticides, sediment/siltation

Notes:
¹ List of impaired waterbodies is based on the 2004 EPA-approved 303(d) lists for Texas, Louisiana, and Mississippi.
² Unspecified tributaries to Big Creek are also listed as impaired due to fecal coliform bacteria.

3.3.2.2 General Impacts and Mitigation

Waterbody crossings as identified in Appendix D would be accomplished using either open-cut or HDD methods, as described below and in Section 2.3.2. As proposed, approximately 92 percent of all waterbody crossings would be accomplished using open-cut methods. Gulf South proposes to cross 16 of the 22 major waterbody crossings via HDD. The major waterbodies that would be crossed using open-cut methods include an unnamed pond, Grand Bayou Tributary, Coulee Creek (two crossings), Castor Creek Tributary, and Hoggs Bayou. Gulf South proposes to cross all navigable waterbodies via HDD (see Table 3.3.2-1).

Gulf South's proposed Procedures would minimize impacts associated with waterbody crossings. These measures include, but are not limited to:

- requirement to obtain all necessary permits from the COE and state agencies prior to construction, and notify applicable state agencies at least 48 hours before commencing with instream trenching;
- use of EIs during construction;
- route the proposed pipeline as close to perpendicular to the axis of the waterbody as practicable and minimize the number of individual crossings where waterbodies meander or have multiple channels;
- limit the use of equipment within the waterbody to that necessary to construct the crossing, and utilize equipment bridges for passage of other construction equipment;

- placement of spoil at least 10 feet away from the water's edge, with installation of sediment barriers to prevent the flow of spoil or silt-laden water to the waterbody;
- completion of all instream construction activity, including stabilization and re-contouring of banks, within 24 hours for minor waterbody crossings (less than 10-feet-wide) and 48 hours for intermediate waterbody crossings (10- to 100-feet-wide);
- use of temporary erosion and sediment control measures such as sediment barriers and trench plugs; and
- restoration activities, including restoration of preconstruction bank contours, installation of slope breakers, and revegetation of disturbed riparian areas.

Gulf South indicates that it would construct the proposed Project during the period of May 1 through September 1, 2007, pending the Commission's approval of the Project. However, this proposed schedule for construction would result in construction partially outside the time window for warmwater fisheries specified in Gulf South's Procedures (i.e., June 1 through November 30). The TPWD indicated in their correspondence dated December 12, 2006 that Gulf South's proposed schedule for construction in warmwater streams in Texas was acceptable. Additionally, in correspondence dated February 6, 2007 and February 21, 2007, the MDWFP and the LDWF, respectively, granted authorization for Gulf South to perform construction activities outside the specified window.

General impacts to waterbodies, including sensitive waterbodies, potentially resulting from pipeline construction, accidental spills, and construction of aboveground facilities are discussed in more detail below.

Pipeline Construction

Construction of the proposed pipeline through waterbodies using open-cut methods would result in several temporary effects to water quality and instream habitat. The clearing and grading of stream banks, instream trenching, trench dewatering, and backfilling of the instream trench would affect water quality and instream habitat by increasing turbidity, sedimentation, water temperature, modifying aquatic habitat and decreasing dissolved oxygen (DO) levels. The use of heavy equipment or other vehicles in and near surface waterbodies could also introduce chemical contaminants, such as fuels and lubricants, into surface waters or may result in accidental spills during construction.

The extent of the potential impacts resulting from increased sedimentation and turbidity would depend on the amount of material disturbed, the sediment grain size, stream velocity, and channel stability. These factors would determine the amount of suspended sediment and the downstream distance that the suspended sediment is transported. In general, where the streambed consists of fine materials such as sand and silt, as is likely along the proposed Project route, the increase in turbidity and suspended sediments would be relatively greater when compared to locations where the streambed consists of coarser materials such as gravel and cobble. However, stream gradients tend to be relatively low in the area of the proposed Project; thus, stream velocities would also tend to be low, indicating that suspended sediments within these streams typically would be transported over short distances.

Increased turbidity can reduce light penetration into the water and thereby reduce photosynthetic activity and levels of DO in the water column. Organic materials suspended in the water can further reduce DO by increasing the biochemical oxygen demand (BOD). Resuspension of sediments can also introduce contaminants, metals, and nutrients bound to the sediments into the water column. However, because there are no known contaminated sediments located along the proposed Project route, adverse impacts resulting from resuspension of contaminants would be unlikely. If contaminated soils were

encountered during construction, Gulf South would implement procedures in its Contaminated Media Plan to identify and properly manage the contamination.

Removal of vegetation from riparian areas would cause an increase in surface runoff and erosion from the pipeline corridor. However, as specified in Gulf South's Procedures, the use of temporary and permanent sediment controls (e.g., silt fence and slope breakers) would minimize this impact by directing surface runoff to well vegetated areas along the sides of the construction right-of-way. Removal of riparian vegetation and the loss of associated shading at waterbody crossings would result in elevated water temperatures, but potential impacts would not be expected to be significant because of the limited amount of streambank canopy that would be cleared.

Gulf South's Procedures include measures regarding spill prevention, containment, and minimization near waterbodies. These measures include the overall structuring of operations to reduce the risk of accidental spills, proper training of employees, regular inspection of all equipment, preparation to contain and recover spilled materials, and storage of hazardous materials and refueling of equipment at least 100 feet from any waterbody or in an upland area at least 100 feet from any wetland. These measures were identified as part of Gulf South's SPCC Plan, which describes the management of hazardous materials, such as fuels, lubricants, and coolants, that would be used during construction.

Aboveground Facilities

Construction of the proposed aboveground facilities would not directly affect any waterbodies. To minimize indirect impacts to waterbodies, Gulf South would implement the erosion control measures described in its Plan. These measures include using erosion controls (e.g., slope breakers, silt fencing, and mulch) during construction to control runoff, reducing the time of soil disturbance, and reestablishing contours and vegetative cover as soon as practicable (see Section 3.2.3).

Conclusion Regarding General Impacts to Surface Water

The proposed Project would impact surface waters along the pipeline route through increased sedimentation and turbidity caused by instream trenching, bank disturbance, and runoff from cleared areas. However, these impacts would be minimized and mitigated through implementation of Gulf South's Procedures, which include measures for sediment and erosion control and require rapid crossings of minor and intermediate streams. Most major waterbodies would be crossed via HDD, thereby avoiding impacts with successful completion of the procedure. Frac-out or other problems associated with an unsuccessful HDD would be addressed by Gulf South's HDD Contingency Plan. The potential for impacts to water quality resulting from accidental spills would be minimized by implementation of Gulf South's SPCC Plan and its Procedures. Given the measures described above to avoid and minimize impacts, we believe that construction and operation of the proposed Project would not significantly affect surface waters.

3.3.2.3 Site-specific Impacts and Mitigation

Sensitive Waterbodies

Gulf South proposes to cross 9 of the 10 impaired waterbodies identified in Table 3.3.2-2 using HDD methods. Use of the HDD method to cross these waterbodies would significantly minimize potential impacts to these resources; however, should the HDD fail or a frac-out occur, Gulf South would implement its HDD Contingency Plan as discussed below. Fourteenmile Creek in Hinds County, Mississippi would be crossed using open-cut methods. Construction-related disturbances and impacts to this waterbody should be adequately minimized through the implementation of Gulf South's Procedures.

Gulf South proposes to cross Black Lake Bayou and Saline Bayou (Louisiana Natural and Scenic Rivers), as well as the Big Black River and the Pearl River (NRI streams) using HDD methods (Table 2.3.2-1).

Construction-related disturbances and impacts to these waterbodies would be avoided with a successful HDD. There are no state or locally designated surface water protection areas or surface water intakes located within 3 miles downstream of the proposed Project waterbody crossings; therefore, these resources would not be affected by the proposed Project.

Given the use of HDD methods to cross most sensitive waterbodies, Gulf South's HDD Contingency Plan, and the implementation of its Procedures, we believe that impacts to sensitive waterbodies would not be significant.

Horizontal Directional Drill Crossings

Gulf South proposes to use HDD crossings to install the proposed pipeline across 65 waterbodies, including 16 of the 22 major waterbodies and all navigable streams, both Louisiana Natural and Scenic Rivers-designated streams, both NRI-designated streams, and all streams containing potential habitat for listed threatened or endangered species (Table 2.3.2-1). As described in Section 2.3.2, HDD is a trenchless crossing method that avoids direct impacts to sensitive resources, such as waterbodies, by directionally drilling beneath them. A successful HDD results in little or no impact to the waterbody being crossed.

The feasibility of each proposed HDD would be evaluated based on site-specific geotechnical data collected at each of the proposed HDD sites. The results of these geotechnical analyses would be provided to us for our review prior to construction. In the event of HDD failure, Gulf South could attempt to re-drill the crossing using a different location or profile, change the drilling procedures, or employ alternate crossing methods such as open-cut. We do not believe that the HDD methods are likely to fail; however, if the planned geotechnical analyses indicated that any proposed HDD crossing is not feasible or if HDD methods fail, Gulf South would be required to obtain approval from the FERC's Director of OEP before they could begin an open-cut crossing of any waterbody proposed to be crossed using HDD.

The use of a HDD, with the exception of a potential frac-out, would not result in any impacts to waterbodies. A frac-out, which is an inadvertent release of drilling fluids into a waterbody, would result in increased turbidity and sedimentation. Increased turbidity and sedimentation would result in decreased water and habitat quality. However, Gulf South's HDD Contingency Plan which describes the procedures that would be implemented to monitor for, contain, and clean up any potential releases of drilling fluid during HDD operations and would reduce the impacts of a frac-out.

The crossing of Black Lake Bayou and Saline Bayou, as well as the proposed withdrawal of hydrostatic test water from each of these sources, would require approval from LDWF. Gulf South has submitted Louisiana Natural and Scenic Rivers permit applications to LDWF for both proposed activities and would have to obtain these permits before construction at these sites could begin. Additionally, Gulf South would be required to comply with any conditions included in the LDWF's permit, if authorized.

The proposed Project would cross the NRI-listed Big Black River and Pearl River and would also require the withdrawal of hydrostatic test water from both waterbodies. Gulf South has initiated consultation with the NPS regarding the proposed Project. Although this consultation has not been concluded, the NPS indicated that potential visual effects and erosion control were their most significant concerns and that HDD would be an appropriate crossing method. The Big Black River and the Pearl River would be crossed using HDD methods. In the event of a frac-out, Gulf South would implement its

HDD Contingency Plan to avoid or minimize impacts. The proposed crossing location for the Big Black River is adjacent to an existing maintained electrical transmission line right-of-way, and the HDD entry and exit points would be located 150 feet and 750 feet away from the stream's edge, respectively. The HDD entry and exit points at the proposed Pearl River crossing location would be located at least 300 feet away from the stream's edge. Given the previously disturbed nature of the area at the proposed crossing of the Big Black River and the distance between the proposed HDD work areas and both streams' edges, impacts to riparian areas and visual resources would be minimized. Furthermore, all work would be conducted in accordance with Gulf South's Plan and Procedures, including protective measures regarding erosion and sedimentation control and withdrawal and discharge of hydrostatic test waters. Gulf South indicated that the NPS had no significant concerns over the potential temporary effects caused by withdrawal of hydrostatic test water. However, because Gulf South has not yet completed consultations with the NPS regarding potential Project-related effects to designated NRI-listed streams, **we recommend that:**

- **Prior to construction, Gulf South should complete consultation with the NPS regarding its proposed HDD crossings of, and hydrostatic test water withdrawals from, the NRI-listed Big Black and Pearl Rivers, and file copies of those consultations with the Secretary. If applicable, Gulf South should also file plans to address any additional mitigation measures recommended by the NPS.**

As noted above, the MDWFP identified the Big Black River, Baker's Creek, Fourteenmile Creek, Turkey Creek, Tallahalla Creek, and the Pearl River as waterbodies potentially containing rare aquatic species, and originally recommended that Gulf South cross these streams via HDD in order to avoid potential impacts to these species. Gulf South initially proposed to cross the Big Black River and the Pearl River using HDD methods, and after additional agency consultation following issuance of the Draft EIS, Gulf South proposed to also cross Baker's Creek via HDD. Gulf South would cross Fourteenmile Creek, Turkey Creek, Tallahalla Creek using open-cut methods. At the point of the proposed crossing, Gulf South indicates that Fourteenmile Creek is a small perennial stream approximately 3 feet-wide and that Turkey Creek is an intermittent stream approximately 10 feet-wide. Tallahalla Creek is approximately 13 feet wide. Based on additional consultations with Gulf South, MDWFP indicated that the proposed crossings of Fourteenmile Creek, Turkey Creek, Tallahalla Creek using open-cut methods were acceptable and we agree with the MDWFP's conclusion.

Hydrostatic Testing

Gulf South would withdraw water from streams or obtain it from municipal sources as described in Table 3.3.2-3. Withdrawal of large amounts of water for hydrostatic testing of pipeline segments could result in several effects to waterbodies. Specifically, water supply, recreation, and aquatic habitat could be affected by hydrostatic test water withdrawals that could reduce the quantity of water in the subject streams. Other potential impacts could include increased water temperatures, reduced levels of DO, and entrainment of aquatic organisms.

Discharge of hydrostatic test water would contribute to a change in water quality of receiving waters if the source water quality is different than the receiving water, especially during low flow or drought conditions when there is less water available in the receiving stream for dilution. Gulf South would avoid or adequately minimize potential impacts to waterbodies resulting from hydrostatic testing by implementing its Procedures, which include, but are not limited to, the following measures:

- obtain and comply with all applicable water withdrawal permits and special-status stream permits;

- address the operation and fueling of any pumps located within 100 feet of waterbodies or wetlands in the proposed Project-specific SPCC Plan;
- maintain adequate flow rates in all source waterbodies to protect aquatic life and to provide for all downstream uses;
- screen all hydrostatic test water withdrawal intakes to prevent entrainment of fish and aquatic organisms; and
- regulate the discharge of hydrostatic test waters using energy dissipation devices to prevent erosion, scour, turbidity, or excessive streamflow.

**TABLE 3.3.2-3
Summary of Hydrostatic Test Water Requirements for the
Proposed East Texas to Mississippi Expansion Project**

Project Component / Facility	Water Source	Withdrawal Location (MP)	Approximate Volume (gallons)	Discharge Location (MP)
42-inch-Diameter Mainline Pipeline				
Construction Spread 1	Powell Bayou	25.1	9,053,000	25.1
	Powell Bayou	25.1	761,000	25.1
	Loggy Bayou	29.7	9,850,000	29.7
	Loggy Bayou	29.7	12,820,000	29.7
Construction Spread 2	Ouachita River	110.8	17,562,000	110.8
	Ouachita River	110.8	1,702,000	110.8
	Bayou Lafourche	115.5	1,702,000	115.5
	Bayou Lafourche	115.5	1,702,000	115.5
Construction Spread 3	Boeuf River	122.3	690,000	122.3
	Boeuf River	122.3	6,700,000	122.3
	Big Creek	140.9	6,700,000	140.9
	Big Creek	140.9	6,844,000	140.9
	Tensas River	159.9	6,844,000	159.9
	Tensas River	159.9	6,301,000	159.9
Construction Spread 4	Mississippi River	183.7	2,463,000	183.7
	Mississippi River	183.7	4,639,000	183.7
	Big Black River	196.9	4,639,000	196.9
	Big Black River	196.9	12,855,000	196.9
	Pearl River	232.4	12,855,000	232.4
	Pearl River	232.4	2,209,000	232.4
Horizontal Directional Drill				
Interstate 49	Municipal supply	Not applicable	666,000	14.7
Bayou Pierre	Bayou Pierre	22.2	744,000	22.2
Prairie Bayou/ Cowpen Bayou	Cowpen Bayou	23.5	1,206,000	23.5
Ash Bayou	Ash Bayou	24.2	672,000	24.2
Powell Bayou	Powell Bayou	25.1	684,000	25.1
Red River	Red River	27.1	732,000	27.1
Loggy Bayou	Loggy Bayou	29.7	744,000	29.7

TABLE 3.3.2-3 (continued)
Summary of Hydrostatic Test Water Requirements for the
Proposed East Texas to Mississippi Expansion Project

Project Component / Facility	Water Source	Withdrawal Location (MP)	Approximate Volume (gallons)	Discharge Location (MP)
Black Lake Bayou	Municipal water supply	Not applicable	822,000	42.7
Black Lake Bayou	Municipal water supply	Not applicable	1,086,000	42.9
Saline Bayou	Municipal water supply	Not applicable	1,146,000	57.0
Dugdemona River	Dugdemona River	71.6	1,362,000	71.6
State Highway 167	Municipal water supply	Not applicable	642,000	73.1
Castor Creek & LA Highway 34	Castor Creek	89.8	1,512,000	89.8
Cutoff Bayou	Cutoff Bayou	109.1	654,000	109.1
Ouachita River	Ouachita River	110.8	930,000	110.8
Bayou Lafourche	Bayou Lafourche	115.5	702,000	115.5
Steep Bayou	Steep Bayou	120.9	642,000	120.9
Boeuf River	Boeuf River	122.3	654,000	122.3
Bee Bayou	Bee Bayou	130.9	642,000	130.9
Siphon Creek	Siphon Creek	140.1	642,000	140.1
Big Creek	Big Creek	140.9	762,000	140.9
Bayou Macon	Bayou Macon	149.8	1,206,000	149.4
Tensas River	Tensas River	159.9	666,000	159.9
Despair Lake	Despair Lake	161.2	642,000	159.9
Mothiglam Bayou	Mothiglam Bayou	163.7	648,000	163.7
Madison Parish Canal	Madison Parish Canal	166.7	642,000	166.7
Walnut Bayou	Walnut Bayou	172.9	642,000	172.9
Walnut Bayou	Walnut Bayou	177.5	642,000	177.5
Mississippi River	Mississippi River	184.0	1,806,000	183.7
Highway 61	Municipal water supply	Not Applicable	904,000	185.3
Big Black River	Big Black River	196.9	1,083,000	196.9
Baker's Creek	Baker's Creek	203.9	642,000	203.9
Interstate Highway 55	Municipal water supply	Not Applicable	501,000	227.0
Pearl River	Pearl River	232.4	517,000	232.4
Aboveground Facilities				
Carthage Junction Compressor Station	Industrial supply	Not applicable	33,500	0.00
Hall Summit Launcher and Receiver	Municipal supply	Not applicable	6,000	38.4
Vixen Compressor Station	Municipal supply	Not applicable	33,500	99.4
Texas Gas Trans. M/R	Municipal supply	Not applicable	6,000	112.4

TABLE 3.3.2-3 (continued)
Summary of Hydrostatic Test Water Requirements for the
Proposed East Texas to Mississippi Expansion Project

Project Component / Facility	Water Source	Withdrawal Location (MP)	Approximate Volume (gallons)	Discharge Location (MP)
Columbia Gulf M/R	Municipal supply	Not applicable	6,000	149.1
Tallulah Compressor Station	Municipal supply	Not applicable	33,500	167.6
Texas Eastern M/R	Municipal supply	Not applicable	6,000	219.7
Gulf South M/R	Municipal supply	Not applicable	6,000	238.6
36-inch-Diameter Pipeline				
Pipeline Lateral	Municipal supply	Not applicable	900,000	H0.0
Enbridge M/R	Municipal supply	Not applicable	6,000	H2.7
Enterprise M/R	Municipal supply	Not applicable	6,000	H3.3

Additionally, Gulf South indicates that biocides, chemical de-watering agents, and other potentially toxic hydrostatic test water additives would not be used during hydrostatic testing. Gulf South would obtain appropriate NPDES discharge permits prior to conducting hydrostatic testing; would sample all test water according to the permit to determine its suitability; and would implement treatment measures, if needed, prior to discharge.

Given Gulf South's proposed measures and Procedures, and our requirement to address any additional mitigation measures that may result from continuing agency consultations, we believe that impacts to waterbodies resulting from hydrostatic testing would be adequately minimized.

3.3.3 Conclusion Regarding Surface Water Resources

The proposed Project would cross numerous waterbodies, but potential impacts to these waterbodies would be minimized or mitigated through the implementation of Gulf South's Procedures. Most minor and intermediate streams would be crossed using open-cut methods, but they would be crossed in less than 48 hours and restored and stabilized rapidly. Most major or sensitive waterbodies and all designated Natural and Scenic, NRI, and navigable rivers, would be crossed by HDD, avoiding impacts to these waterbodies. In the event of HDD frac-out, Gulf South would implement its HDD Contingency Plan. Given the measures described above and our recommendations, we believe that construction and operation of the proposed Project would not significantly affect surface water resources.

3.4 WETLANDS

Wetlands are areas that are inundated or saturated with surface water or groundwater 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. Wetlands generally include swamps, marshes, bogs, and similar areas (Environmental Laboratory 1987). Wetlands perform a number of valuable functions including flood flow attenuation, peak storm water flow filtration and attenuation, sediment and nutrient retention, groundwater recharge and discharge, wildlife habitat, recreational opportunities, and erosion control.

Section 404 of the CWA of 1972 established standards to minimize impacts to wetlands under the regulatory jurisdiction of the COE. These standards require the avoidance of impacts to wetlands where possible and minimization of disturbance where impacts are unavoidable, to the degree practical. Any unavoidable crossings would be subject to review and approval by the Vicksburg District of the COE, who has primary jurisdiction for wetlands permitting for the proposed Project along with the Fort Worth District of the COE. The COE would determine the provisions of any required wetland compensatory mitigation.

3.4.1 Existing Wetland Resources

Gulf South conducted field surveys and reviewed available data to determine wetland presence within the proposed Project area. Gulf South field investigators delineated wetland boundaries using *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and *U.S. Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats in the United States* (Cowardin et al. 1979) methods. The COE is responsible for approving wetland delineations, and Gulf South's jurisdictional determinations for the proposed Project have been approved by the COE.

Using the Cowardin et al. (1979) wetland classification system, field investigators identified four wetland types within the proposed Project area:

- palustrine forested (PFO);
- palustrine scrub-shrub (PSS);
- palustrine emergent (PEM); and
- palustrine open-water (POW).

The majority of the 309 wetlands that would be crossed by the proposed Project are located in Louisiana (approximately 88 percent of the total number), with the remainder occurring in Mississippi (10 percent) and Texas (2 percent). The location, classification, crossing length, and affected acreage for each impacted wetland is listed in Appendix E-1. A summary of the wetland types affected by the proposed Project is provided in Table 3.4.1-1. Aboveground facilities, pipe storage and contractor yards would not affect any wetlands; therefore, these facilities are not considered further in this section.

Palustrine Forested Wetlands

PFO wetlands are dominated by woody vegetation that is at least 20-feet-tall (Cowardin et al. 1979). These wetlands provide a diverse assemblage of vegetation and an abundance of food and water for wildlife. These areas often contain extensive bottomland hardwoods. Common tree species in the PFO wetlands observed within the proposed Project right-of-way include willow oak (*Quercus phellos*), water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), nuttall oak (*Quercus nuttallii*), swamp chestnut oak (*Quercus michauxii*), chinquapin oak (*Quercus muhlenbergii*), red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), water tupelo (*Nyssa aquatica*), and cypress (*Taxodium distichum*).

TABLE 3.4.1-1
Summary of Wetlands Affected by the Proposed East Texas
to Mississippi Expansion Project

Wetland Type ^a	Number of Wetlands Crossed	Permanent Operation Impact, 10-foot-wide Corridor (acres) ^b	Permanent Operation Impact, 30-foot-wide Corridor (acres) ^c	Temporary Construction Impact ^d (acres)	Estimated Crossing Length (feet) ^e
PEM	108	3.2	9.3	25.5	19,396
PFO	152	10.5	31.0	84.2	43,531
PSS	41	1.3	4.3	11.3	6,900
POW	8	0.2	0.4	1.4	306
Total ^d	309	15.2	45.0	122.4	70,133

Notes:

^a Wetland Type

- PEM= Palustrine emergent
- PFO = Palustrine forested
- PSS = Palustrine scrub-shrub
- POW = Palustrine open-water

^b Operational impacts for the pipeline facilities were based on a 10-foot-wide, mowed permanent right-of-way.

^c Operational impacts for the pipeline facilities were based on a 30-foot-wide permanent right-of-way that includes a 10-foot-wide mowed corridor and an additional width of 20 feet where selective removal of trees greater than 15 feet tall is allowed.

^d Temporary Wetland impact calculations were based on a 75-foot-wide construction right-of-way.

^e Totals may differ slightly from data presented in Appendix E-1 due to rounding.

Palustrine Scrub-shrub Wetlands

PSS wetlands include all wetlands dominated by woody vegetation less than 20 feet tall (Cowardin et al. 1979). PSS wetlands are typically not as structurally diverse as forested wetlands due to the lack of trees comprising the canopy. As in the PFO wetlands, PSS wetlands supply an abundance of food and cover resources for mammals and birds. Common shrub species in the PSS wetlands observed within the proposed Project right-of-way include wax myrtle (*Myrica cerifera*), button bush (*Cephalanthus occidentalis*), along with saplings of sweet gum and red maple.

Palustrine Emergent Wetlands

PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et al. 1979). Wildlife species use these areas for nesting and feeding, and during migratory periods. Common herbaceous plants in the PEM wetlands traversed by the proposed Project right-of-way include narrow leaf cattail (*Typha angustifolia*), duck potato (*Sagittaria lancifolia*), lizard tail (*Saururus cernuus*), sedges (including the genera *Carex*, *Cyperus*, *Eleocharis*, *Scirpus*, and *Rynchospora*), and spike rush (*Eleocharis* spp.).

Palustrine Open-Water Wetlands

POW wetlands rarely occur along the proposed Project route. These wetlands are often shallow beaver or manmade ponds, but typically do not contain emergent wetland vegetation.

3.4.1.1 High-quality, Sensitive, or Special-status Wetlands

Several areas of higher quality forested wetlands occur along the proposed Project. These areas include forested wetlands associated with Black Lake Bayou (MP 42.3), Saline Bayou (MP 57.0), Dugdemona River (MP 71.5), and Castor Creek (MP 89.7). Additionally, wetlands with significant tupelo and cypress trees occur along the proposed route and may comprise a component of relatively higher quality forested wetlands, especially when the specimen trees are mature and large; these areas are identified in Table 3.4.1-2.

Milepost	Approximate Distance Crossed (feet)	Description
17.5 to 17.6	78	Cypress, red maple
17.8 to 17.9	714	Cypress, red maple, water oak
42.2 to 42.3	112	Cypress, willow oak
51.1 to 51.2	219	Cypress, willow oak
66.0 to 66.2	205	Cypress, cedar elm
89.6 to 89.7	205	Cypress, water hickory
232.8 to 233.2	328	Cypress and tupelo

Wetlands Reserve Program Lands and Prior Converted Wetlands

Gulf South identified lands in the NRCS Wetland Reserve Program (WRP) and the associated Prior Converted Wetlands along the proposed route. The NRCS administers the WRP, which is a voluntary program that offers landowners the opportunity to protect, restore, and enhance wetlands located on their property (NRCS 2006f). The private owner retains title to the lands in the WRP, but the NRCS controls a protective easement over the properties. The program attempts to restore wetland function and wildlife habitat, and to promote long-term conservation through technical and financial assistance. Prior Converted (cropland and farmed wet pasture) wetlands are wetlands converted to agriculture that are targeted for voluntary restoration.

Gulf South identified 17 WRP lands and 4 Prior Converted Wetlands managed by the NRCS that are proposed to be crossed by the Project. Based on available mapping and coordination with the NRCS, Gulf South indicates that WRP lands would be crossed by the proposed pipeline route in Red River, Ouachita, Richland, and Madison Parishes in Louisiana. Prior Converted Wetlands would be crossed in Red River and Madison Parishes, Louisiana. The location, size, and characteristics of these WRP lands and Prior Converted Wetlands are discussed in more detail in Section 3.8.4.

Sabine River Water Oak-Willow Oak Community

The TPWD indicated that the proposed Project would cross a portion of a Water Oak-Willow Oak Series Community in Panola County, Texas that is associated with the Sabine River. The proposed Project would not cross the Sabine River. In general, this bottomland hardwood community contains ecologically diverse plant species and provides habitat for a variety of wildlife. The proposed route in this area would be collocated with an existing right-of-way. Based on consultation with TPWD, Gulf South further evaluated the quality of the affected Water Oak-Willow Oak Series Community and

assessed potential impacts. The results of the evaluation indicated that Water Oak-Willow Oak Series Community would be crossed at MPs H1.3 and H1.9, but that these areas did not contain mature, high-quality forest.

3.4.2 General Impacts and Mitigation

As shown in Table 3.4.1-1, construction of the proposed Project would affect 309 wetland areas, resulting in a total of approximately 122.4 acres of wetland disturbance during construction. These impacts would include approximately 84.2 acres of PFO wetlands and an additional 38.2 acres of PSS, POW, and PEM wetlands.

In the short term, construction activities would diminish the recreational and aesthetic value of wetlands through clearing, trenching, spoil placement, vehicle traffic, and related construction disturbances. Wetland functions such as erosion control, buffering and flood flow attenuation, and sediment and nutrient retention would also be affected by construction. These effects typically would be greatest during and immediately following construction. Clearing of wetland vegetation would result in both short- and long-term loss of wetland wildlife habitat and some wetland functions, with the duration of the impact varying by habitat type.

Excavation of the pipeline trench during open-cut construction, installation of the pipe, and backfill of the trench would affect the rate and direction of water movement within wetlands. In addition, excavation activities could alter perched water tables by disturbing impermeable soil layers. This would adversely affect wetland hydrology and revegetation by creating soil conditions that might not support wetland communities and hydric vegetation at preconstruction levels. Failure to properly segregate soils during construction would result in mixed soil layers, which would alter biological components of the wetland and affect the reestablishment of native wetland vegetation. Temporary stockpiling of soil and the movement of heavy machinery across wetlands would also lead to inadvertent compaction and furrowing of soils, which would alter natural hydrologic patterns, inhibit seed germination, and increase seedling mortality. Altered surface drainage patterns, storm water runoff, runoff from the trench, accidental spills, and discharge of hydrostatic test water would also negatively affect water quality by increasing the potential for siltation and turbidity resulting from construction activities.

Impacts to PSS wetlands would be mostly short term, as regeneration likely would occur within 2 to 4 years. PEM and POW wetlands, which can regenerate more rapidly, typically would be affected only temporarily as they may become reestablished in one or two growing seasons. Due to the relatively long period required for PFO wetlands to regenerate, up to 30 years or more, impacts to these wetland types would be long term. Operation of the proposed Project would permanently affect approximately 31.0 acres of PFO wetlands and 14.0 acres of PSS, POW, and PEM wetlands.

During operation of the proposed Project, Gulf South's Procedures allow for annual maintenance of a 10-foot-wide strip centered over the pipeline. Additionally, trees that are within 15 feet of the pipeline and greater than 15 feet in height may be cut and removed. These activities would not affect PEM wetlands, as these herbaceous areas typically would not be maintained or mowed. However, mowing, clearing, and tree removal would affect PSS and PFO wetlands along the permanent right-of-way. Functions associated with these wetland types would be altered as forested or scrub-shrub wetlands within the maintained portion of the permanent pipeline right-of-way would be permanently converted to an herbaceous state. However, the overall acreage of wetlands would not be significantly reduced.

3.4.2.1 General Wetland Construction and Mitigation Procedures

The COE requires that all appropriate and practicable actions be taken to avoid or minimize wetland impacts, pursuant to its Section 404(b)(1) guidelines, which restrict discharges of dredged or fill material where a less environmentally damaging and practicable alternative exists. All wetland crossings would be subject to review by the COE to ensure that wetland impacts are fully identified and that appropriate wetland restoration and mitigation measures are identified. Gulf South would also comply with all conditions of the Section 404 permit authorizations that were issued by the COE on March 14, 2007. Additional discussion of compensatory mitigation requirements is provided in Section 3.4.4.

Gulf South avoids or minimizes impacts to wetlands through reductions in the nominal construction right-of-way width in wetlands to 75 feet, selective routing, and the use of its Procedures. Gulf South's proposed route would be collocated with or would parallel existing pipeline or utility rights-of-way for approximately 181 miles or 76 percent of the proposed route, thereby reducing impacts to previously undisturbed wetlands. Additionally, Gulf South avoids wetlands in the vicinity of the Dugdemona River.

Section 2.3.2 describes the specialized pipeline construction procedures that Gulf South would implement to minimize impacts to wetlands. Within the construction right-of-way, Gulf South would leave existing root systems intact where possible; would install erosion control devices to minimize sediment flow into the wetland; and could use special seed mixes during restoration, as may be recommended by local agencies.

Gulf South would use the minimum construction equipment necessary within wetlands for clearing, trench excavation, pipe fabrication and installation, trench backfilling, and restoration activities. If standing water or saturated soil conditions were present, or if construction equipment caused ruts or mixing of the topsoil and subsoil, construction equipment operating in wetland areas would be further limited to the use of low-ground-pressure equipment or normal equipment operating from timber riprap or prefabricated equipment mats. Gulf South would also minimize impacts to wetlands by implementing the measures identified in its Procedures. These measures include, but are not limited to:

- clear marking of wetland boundaries and buffers in the field until construction is complete;
- limitation of tree stump removal and grading to the area directly over the pipeline, unless it was determined that safety-related construction constraints required grading or removal of tree stumps from under the working side of the construction right-of-way;
- stripping of topsoil from the area directly over the trench line to a maximum depth of 12 inches in unsaturated soils;
- minimization of the amount of time that topsoil is segregated and the trench is open;
- use of sediment barriers to prevent sediment flow into a wetland;
- de-watering of trenches in a way that does not cause sedimentation in a wetland;
- use of trench breakers to ensure maintenance of the original wetland hydrology;
- prohibition of the storage of hazardous materials and re-fueling within 100 feet of a wetland; and
- restoration of preconstruction contours, vegetative restoration, and monitoring.

3.4.2.2 Alternative Measures to Our Procedures

Gulf South proposes alternative measures from those described in sections V.B.2.a and VI.B.1.a of our Procedures. Sections V.B.2.a and VI.B.1.a. states that all extra work areas, such as staging areas and access roads, should be located at least 50 feet outside of identified waterbody and wetland boundaries, respectively, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. The locations and basis for each identified alternative measure are identified in Appendix E-2.

Based on our review, we determine that the proposed alternative measures to our Procedures (including those that would affect PFO wetlands), as described in Appendix E-2, appear reasonable and adequately justified. Our Procedures require that Gulf South file a site-specific construction plan for each additional temporary workspace that would not be located at least 50 feet outside of a waterbody or wetland boundary. Although Gulf South provided draft site-specific drawings for the proposed additional temporary workspaces in or near waterbodies and wetlands, the required site-specific explanations of the conditions that will not permit a 50-foot setback have not been submitted. In accordance with its Procedures, Gulf South would be required to file these site-specific explanations and receive approval regarding its site-specific construction plans before construction could begin.

Gulf South would be required to implement the other wetland protective measures included in our Procedures in the areas relevant to the proposed alternative measures. Gulf South's Procedures also require that the Director of OEP approve any access road improvements or new access roads in wetlands, including the one proposed alternative measure, which involves the construction of an access road through a wetland to a MLV at MP 112.4 (as listed in Appendix E). Gulf South would complete all wetland permitting and compensatory mitigation consultations with the COE before commencing construction at any additional temporary workspaces or any access roads located within wetlands, as discussed above.

3.4.3 Site-specific Wetland Impacts and Mitigation

Although impacts to forested wetlands would be considerable, Gulf South attempts to minimize these impacts through avoidance, selective routing, and the use of HDD methods. Gulf South would use HDD methods to cross wetlands associated with Black Lake Bayou, Saline Bayou, Castor Creek, Boeuf River (MP 122.1), Bee Bayou (MP 130.8), Big Creek (MP 140.9), the Big Black River (MP 196.7) and the Dugdemona River.

Based on Gulf South's proposed wetlands crossing methods, measures described in its Procedures, and the development of site-specific wetland crossing plans (see Section 3.4.3.1), we believe that impacts to PFO wetlands would be sufficiently minimized.

3.4.3.1 High-quality, Sensitive, or Special-status Wetlands

Gulf South indicates that old-growth cypress and/or tupelo trees occur within the proposed Project right-of-way at or adjacent to seven wetland locations as listed in Table 3.4.1-2. As recommended in the Draft EIS, Gulf South re-surveyed these areas for trees larger than 24 inches diameter at breast height (dbh) and developed site-specific crossing plans including measures to minimize impacts to these mature trees. Selective routing and positioning of additional temporary workspaces would result in avoidance of at least 40 mature trees located immediately adjacent to the proposed construction areas. No mature trees were found within the areas that would be impacted by construction in three locations (MPs 17.3, 107.7, and 124.3) and mature trees in a fourth area (MP 89.6) would be completely avoided via use of a HDD.

Gulf South proposes to use a tree buffer zone in the outer 10 feet of the spoil side of the pipeline construction right-of-way in order to minimize impacts to mature trees, where feasible. Mature trees in this buffer zone would not be cut, rather they would be avoided and spoil would be placed around them. Trees in this buffer zone would be marked and Gulf South would avoid or minimize impacts to the trees, their bark, and associated soils. Utilization of this tree buffer zone would preserve one mature tree at MP 17.8 and seven mature trees near MP 232.8. Construction would impact 17 other mature trees located within the construction right-of-way at MP 17.8 and 232.8, along with all 20 of the mature trees located within the construction right-of-way at the other four locations (MPs 17.5, 42.2, 51.1, and 66.0), which can not be avoided and would be cut.

Given Gulf South's avoidance of mature trees where possible during routing, and utilization of a buffer zone to protect a portion of the mature trees located within or adjacent to these wetlands, we believe that impacts have been adequately minimized and that effects to these resources would not be significant.

Wetlands Reserve Program Lands and Prior Converted Wetlands

Based on available mapping and coordination with the NRCS, Gulf South indicates that 17 WRP lands and four Prior Converted Wetlands would be crossed by the proposed pipeline route in Red River, Ouachita, and Madison Parishes in Louisiana. Based on consultations with the NRCS, Gulf South would be required to obtain Compatible Use Permits and subordination agreements from the NRCS authorizing the crossing of any WRP lands or Prior Converted Wetlands. It is the position of the NRCS that all WRP lands are wetlands, although Gulf South indicates that not all lands enrolled in the WRP and Prior Converted Wetlands would be classified as wetlands using COE wetland delineation methods. Further consideration of potential Project-related effects to WRP lands and Prior Converted Wetlands is provided in our analysis of impacts to special interest areas, which is included in Section 3.8. In that section, we are recommending Gulf South consult further prior to construction with the NRCS in order to finalize plans that include measures to minimize or mitigate impacts to these areas.

Sabine River Water Oak-Willow Oak Community

Potential impacts to the Water Oak-Willow Oak Series Community would total less than one acre and would be confined to areas that did not contain mature, high-quality forest. Potential impacts to this area would be minimized through selective routing in this area, including collocation with existing right-of-way to prevent clearing of undisturbed areas and habitat fragmentation. Gulf South's implementation of its Procedures, as described above, would also minimize impacts to this area. Further, Gulf South proposes to mitigate unavoidable impacts to this community by treating affected wetlands as high-quality wetlands and by providing wetland mitigation in accordance with that designation. Given the selective routing, collocation with existing right-of-way, implementation of Gulf South's Procedures, and mitigation for unavoidable impacts, we believe that impacts to the Water Oak-Willow Oak Series Community would be adequately minimized and mitigated.

3.4.4 Wetland Restoration and Compensatory Mitigation

For temporary and short-term wetland impacts, Gulf South would restore wetlands in accordance with its Procedures. The requirements for wetland restoration measures identified in Gulf South's Procedures include:

- consultation with appropriate land management or state agencies to develop a Project-specific restoration plan that includes measures for reestablishing herbaceous and woody species;

- prohibition of the use of herbicides or pesticides within 100 feet of a wetland, except as allowed by the appropriate agencies; and
- monitoring of the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is considered successful.

Revegetation would be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, a remedial revegetation plan would be developed and implemented in consultation with a professional wetland ecologist. The remedial revegetation plan would serve as a guide to actively revegetate the wetland with native wetland herbaceous and woody plant species. Revegetation efforts would be continued until revegetation is successful.

As noted above, Gulf South has completed wetland permitting, including the development of draft measures for compensatory mitigation for all wetland impacts, in consultation with the COE. Based on the results of the consultations, Gulf South proposes to compensate for wetland impacts in Texas through purchase of wetland mitigation bank credits. Mitigation banking is an approved alternative to on-site mitigation and often provides for greater likelihood of success in replacement of wetland function and long-term management of restored wetland areas. In Louisiana and Mississippi, appropriate wetland mitigation bank credits were unavailable and Gulf South, in consultation with the COE, proposes to provide mitigation on two private properties that are not associated with wetland mitigation banks. The mitigation involves restoration of bottomland hardwood wetland habitat to areas that were previously used for agriculture or as pasture. Both properties have previously been approved by the COE to provide mitigation for wetland impacts resulting from other projects. The two properties include the Pintail Brake Mitigation Property in Madison Parish, Louisiana and the Whitten/Culpepper tract in Leake County, Mississippi. Monitoring, and as necessary replanting, would ensure that the reforestation is successful. The properties would be placed in a mitigation covenant per COE guidelines. In order to ensure that the appropriate agencies are allowed adequate input on the draft plan for wetland mitigation, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, its final Wetland Mitigation Plan.**

3.4.5 Conclusion Regarding Impacts to Wetlands

The proposed Project would impact a number of wetlands, including forested wetlands that would be affected over the long-term or permanently. However, wetland impacts would be minimized by the collocation of the proposed pipeline with existing rights-of-way, the use of HDD methods, and the implementation of Gulf South's Procedures. Additionally, Gulf South has proposed measures to minimize impacts to mature wetland cypress or tupelo communities and we are recommending that Gulf South complete consultation regarding measures to minimize or mitigate impacts to, WRPs and Prior Converted Wetland areas. Given these measures, along with Gulf South's wetland mitigation plan, we believe that impacts to wetlands would be adequately minimized and mitigated.

3.5 VEGETATION

3.5.1 Existing Vegetation Resources

Construction and operation of the proposed Project would affect six upland vegetative communities: agricultural areas, pasture, loblolly pine-hardwood forest, hardwood slope forest, pine

plantation, and open lands. The vegetative communities crossed by the proposed Project and representative species are described and listed in Table 3.5-1. Riparian forested areas associated with waterways are included in the respective forest vegetation community listed above. In addition to the upland vegetation communities listed above, the proposed Project would cross forested, scrub-shrub, and emergent wetlands. Wetland vegetation resources, impacts, restoration, and mitigation are discussed in detail in Section 3.4. Additionally, potential impacts of the proposed Project on agricultural areas are discussed in more detail in Sections 3.2 and 3.8.

**TABLE 3.5-1
Upland Vegetation Communities Occurring along the Proposed
East Texas to Mississippi Expansion Project**

Vegetation Community	General Description	Common Species
Agricultural	Areas under active farming, including field crops	Cotton (<i>Gossypium</i> spp.), soybeans (<i>Glycine</i> spp.), corn (<i>Zea</i> spp.), wheat (<i>Triticum</i> spp.), rice (<i>Oryza sativa</i>); orchards, and vineyards
Pasture	Areas used for livestock grazing or hay production	Primarily bermuda grass (<i>Cynodon dactylon</i>) and crabgrasses (<i>Digitaria</i> spp.), with lesser amounts of broomsedge species (<i>Andropogon</i> spp.), bluegrass species (<i>Poa</i> spp.), and bahiagrass (<i>Paspalum notatum</i>)
Loblolly pine - hardwood forest	Loblolly pine typically comprises up to 20 percent of the canopy, with the remainder in hardwoods depending on slope, soil type, and moisture conditions	In drier areas - Southern red oak (<i>Quercus falcate</i>), red maple (<i>Acer rubrum</i>), cherrybark oak (<i>Quercus pagoda</i>), mockernut hickory (<i>Carya tomentosa</i>), winged elm (<i>Ulmus alata</i> , and white oak (<i>Quercus alba</i>); in wetter locations, laurel oak (<i>Quercus laurifolia</i>), southern magnolia (<i>Magnolia grandifolia</i>), and water oak (<i>Quercus nigra</i>)
Hardwood slope forest	Typically found in stream floodplains and within the loblolly pine-hardwood forest communities	Similar species as found in the loblolly pine - hardwood forest; also white oak (<i>Quercus michauxii</i>), nuttall oak (<i>Quercus nuttallii</i>), willow oak (<i>Quercus phellos</i>), American elm (<i>Ulmus americana</i>), American beech (<i>Fagus grandifolia</i>), pecan (<i>Carya illinoensis</i>), and yellow poplar (<i>Liriodendron tulipifera</i>)
Pine plantation	Pine plantation includes varying age stands of loblolly pine that are planted, managed, and periodically cut for timber production	Loblolly pine as a canopy species, with an understory of sweet gum (<i>Liquidambar styraciflua</i>), McCartney rose (<i>Rosa bracteata</i>), blackberry (<i>Rubus</i> spp.), green briar (<i>Smilax</i> spp.), Carolina jasmine (<i>Gelsemium sempervirens</i>), yaupon holly (<i>Ilex vomitoria</i>), and wax myrtle (<i>Myrica cerifera</i>)
Open lands	Scrub/shrub areas, low lying vegetation with saplings, and other areas such as maintained rights-of-way	Greenbriar, dewberries (<i>Rubus</i> spp.), peppervine (<i>Ampelopsis arborea</i>), and yaupon holly

Pipeline Facilities

Relatively large areas of pine plantation, agricultural land, loblolly pine-hardwood forest, and slope hardwood forest would be crossed by construction of the proposed pipeline and associated additional temporary workspaces. Approximately 52 percent of the 3,393.5 acres that would be contained within the pipeline construction right-of-way and additional temporary workspaces consists of forested areas including pine plantation (23 percent), loblolly pine-hardwood forest (16 percent), and slope hardwood (14 percent). Agricultural areas (28 percent), pasture (11 percent), and open lands (4 percent) account for most of the remaining areas that would be crossed.

Temporary storage and contractor yards that would be used to support construction of the proposed Project would temporarily encumber approximately 230 acres. Of this area needed for storage facilities and contractor yards, approximately 79 percent would occur at existing commercial/industrial areas, where vegetation is typically lacking. The remaining area encompassed by the pipe storage and contractor yards consists of pasture and agricultural lands.

Aboveground Facilities

The proposed aboveground facilities include modifications to three existing compressor stations, as well as the construction of two new compressor stations, M/R facilities, pig launchers and receivers, valves, and other ancillary facilities. Pine plantation and agricultural areas are the dominant existing vegetation communities at the proposed Vixen Compressor Station and Tallulah Compressor Station, respectively. Modifications to the Carthage Junction, Hall Summit, and McComb Compressor Stations would not occur outside of the existing fenced facilities that already have industrial/commercial uses, and would not impact vegetative communities. All pig launchers and receivers, MLVs, and side valve facilities would be contained within the proposed permanent pipeline right-of-way and would not result in impacts to vegetation beyond that required for the proposed pipeline corridor.

Access Roads

Gulf South indicates that construction of the proposed pipeline and aboveground facilities would require the use of 179 access roads of varying lengths and construction activity. Gulf South reports that 74 of these access roads would be new roads or existing roads that would require upgrades to support construction-related traffic. Approximately 86 percent of the 103.8 acres encompassing new or modified access roads would be within the open land vegetation community or within industrial/commercial areas where vegetation is maintained or generally lacking. The remainder of the vegetation communities affected by access roads would be comprised of agriculture (6 percent) and forested areas (6 percent).

3.5.1.1 Vegetative Communities of Special Concern or Value

Gulf South reviewed maps and other available information, conducted field surveys, and consulted with resources agencies to identify several areas containing vegetation of special concern or value. Gulf South also identified easement lands held in the Farm Service Agency (FSA) Conservation Reserve Program (CRP), the Ouachita Wildlife Management Area (WMA), and the Loess Hills Forest.

As described further in Section 3.8, the FSA-administered CRP is a voluntary program that allows owners of agricultural tracts to conserve environmentally sensitive lands with financial assistance from the federal government (USDA 2006). Through the planting of native grasses, trees, and other cover, these easements are designed to reduce soil erosion and sedimentation, improve water quality, and establish and improve aquatic and wildlife habitat. Vegetation found in these easements performs a critical role in providing these ecological values.

The proposed Project would also cross approximately 1,000 feet of the LDWF's Ouachita WMA which is managed for hunting and has been the focus of extensive efforts to restore hardwood forests to provide additional wildlife habitat (LDWF 2006c). Additional information regarding the Ouachita WMA can be found in Sections 3.6 and 3.8.

The Loess Hills forest sub-type is a division of the hardwood slope forest community that is located along the proposed route from MP 185.9 to 196.4. The plant communities found in this area are similar to those found in the hardwood slope forest, but may include increased species diversity and higher tree stand quality due to the higher fertility of the soil. As described in Section 3.2, the loess soil type present in this forested area is highly erodible in the absence of a stabilizing vegetative cover.

3.5.1.2 Extensive Forested Tracts

Based on a review of aerial photographs and field surveys conducted by Gulf South, several areas of large, relatively non-fragmented forested tracts that would be crossed by the proposed pipeline were identified. The location of these tracts and the length of the associated crossings are identified in Table 3.5.1-2. Although these areas are relatively non-fragmented, Gulf South indicates that many of these tracts are disturbed by periodic harvest and/or thinning.

TABLE 3.5.1-2 Extensive Forested Tracts Crossed by the Proposed East Texas to Mississippi Expansion Project			
County/Parish	Begin Milepost	End Milepost	Length (miles)
DeSoto, LA	12.2	18.0	5.8
DeSoto, LA	18.2	19.9	1.7
DeSoto, LA	20.2	21.5	1.3
Red River, LA	29.7	33.9	4.2
Bienville, LA	36.1	37.6	1.5
Bienville, LA	38.6	40.0	1.4
Bienville, LA	41.9	44.4	2.5
Bienville, LA	45.3	46.4	1.1
Bienville, LA	46.9	52.8	5.9
Bienville, LA	57.0	65.1	8.1
Bienville, LA	65.9	67.7	1.8
Jackson, LA	68.7	72.2	3.5
Jackson, LA	73.6	75.5	1.9
Jackson, LA	78.2	87.1	8.9
Jackson, Ouachita, LA	91.9	100.5	8.6
Warren, MS	185.4	195.1	9.7
Hinds, MS	196.8	198.2	1.4
Copiah, Simpson, MS	232.0	238.2	6.2
Panola, TX	H0.2	H1.8	1.6
Total			77.1

3.5.2 General Impacts and Mitigation

General Impacts

The primary impacts of the proposed Project on the identified vegetative communities would arise from the removal of vegetation along the proposed pipeline route and at aboveground facility sites during construction and routine maintenance. Cutting or removal of vegetation for Project construction could lead to increased soil erosion, associated sedimentation and turbidity in streams and wetlands, an increase in invasive or exotic plant species, and a reduction in wildlife habitat. Clearing and construction activities along the proposed pipeline right-of-way and associated facilities could also result in soil compaction. Additionally, heavy machinery could damage riparian vegetation associated with waterbodies, whether the equipment is moving or parked for extended periods, thereby potentially reducing water quality in adjacent streams. All areas disturbed during construction, but not needed permanently as part of the pipeline or aboveground facilities or permanent access roads would be allowed to revert to preconstruction vegetative conditions.

In those areas where a HDD would be used to cross special features such as waterbodies, wetlands, roads, Gulf South proposes to use hand-laid electric-grid guide wires to assist guidance of the drill bit along the proposed route. A small pathway approximately 2- to 3-feet-wide may be cut, using hand tools in heavily vegetated areas, in order to position these guide wires. This activity would result in minimal disturbance to vegetation along the path of the HDD and no large trees would be cut as part of this process.

The proposed 60-foot wide permanent right-of-way would be mowed or otherwise maintained every 3 years and a 10-foot-wide corridor over the pipeline centerline would be maintained annually in an herbaceous state. We are recommending in Section 2.0 that Gulf South's permanent right-of-way should be limited to a width of 50 feet in cases where eminent domain authority would be exercised.

Periodic maintenance of the permanent pipeline right-of-way would prevent the regrowth of forested vegetative communities and would result in regular disturbance of vegetation. Construction of the aboveground facility sites would result in permanent conversion of some vegetated areas to a non-vegetated industrial/commercial use, either as standing structures or associated facilities such as parking and storage areas.

The severity of the impacts described above would depend on the type of vegetation impacted, the size of the area cleared, and the time required for vegetation to become reestablished. General impacts to vegetation communities are described in further detail below.

Community-specific Impacts

The proposed Project would impact approximately 3,304.9 acres of upland vegetation during construction. Vegetated areas would be primarily impacted by the proposed pipeline and extra work areas. The anticipated impacts to vegetation communities associated with specific Project components are listed and enumerated in Table 3.5.2-1. Relatively large amounts of agricultural and forested land, along with lesser amounts of pasture and open land would be affected by construction and operation of the proposed pipeline. Smaller impacts would result from construction of the aboveground facilities, modification of access roads, and use of pipe storage and contractor yards.

Most impacts to agricultural and open lands would be short term, as these areas typically would return to their herbaceous or shrub status within 1 to 2 years following construction, cleanup, and restoration. Areas planted with field crops are typically disturbed by periodic agricultural practices and

would be replanted in the next growing season. It is also anticipated that pastures and other shrubby or herbaceous areas would revegetate within one or two growing seasons, given the abundant rainfall and long growing season in Texas, Louisiana, and Mississippi.

Impacts to pine plantations and upland forests within the temporary construction right-of-way would be long term, as regrowth to preconstruction condition would take 30 years or more. Impacts to forested areas, including pine plantations, mixed hardwood-loblolly pine forests, and sloped hardwood forests, resulting from construction and operation of the proposed Project would include a change in vegetative strata, appearance, conversion of community type, and loss of habitat.

Vegetation Community	Pipeline Facilities ^a		Aboveground Facilities		Access Roads	
	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)
Agricultural ^b	962.8	458.0	15.0	15.0 ^c	6.5	3.3
Pasture ^b	374.2	176.8	0.0	0.0	0.9	0.0
Loblolly pine – hardwood forest	526.6	235.7	0.0	0.0	1.4	1.4
Hardwood slope forest	462.3	192.8	2.5	1.5 ^c	2.4	2.4
Pine plantation	764.2	346.9	15.2	8.7 ^c	2.6	2.1
Open land	121.7	66.1	2.8	2.8 ^c	43.8	1.8
Total	3,211.8	1,476.1	35.5	28.0	57.6	11.0

Notes:

^a Acreages reflect a nominal 100-foot-wide construction right-of-way and a 60-foot-wide permanent easement that would be maintained in upland areas following construction, and additional temporary workspaces. However, we are recommending that Gulf South's permanent right-of-way be limited to a width of 50 feet in cases where eminent domain authority would be exercised.

^b An additional 50 acres of pasture lands and 50 acres of agricultural lands would be affected by pipe storage and contractor yards during construction, but none would be affected during operation.

^c The footprint of certain aboveground facilities extends beyond the permanent pipeline right-of-way, but construction impacts may be wholly contained within the pipeline construction right-of-way and are counted there.

Maintenance of the permanent right-of-way would have a much greater impact on the area's forest vegetation than on agricultural areas, pasture, and open lands. Pine plantation and upland forest would also be permanently impacted by operation and maintenance of the permanent pipeline right-of-way. These impacts would represent a marked, permanent change from forested vegetation to herbaceous or shrubby vegetation. Although agricultural and open lands would also occur within the permanent pipeline right-of-way, the vegetative strata in those areas would not be significantly changed compared to preconstruction conditions.

Mitigation

To minimize Project-related effects to vegetative communities, Gulf South would implement measures in its Plan, which include baseline mitigation measures for minimizing erosion and enhancing revegetation in upland areas. Implementation of its Plan would aid vegetative restoration and prevent or minimize sedimentation and turbidity in streams and wetlands. Some of the restoration and BMPs identified in Gulf South's Plan include the following:

- use of at least one EI per construction spread, who would ensure compliance with the Plan, Procedures, and other required conditions;
- segregation of topsoil;
- installation of temporary erosion control measures, such as slope breakers, sediment barriers, and mulch;
- commencement of cleanup immediately after backfilling and completion of restoration within 20 days;
- installation of permanent erosion control devices, such as trench breakers, and slope breakers;
- testing and mitigation for soil compaction;
- revegetation in accordance with the recommendations of the local soil conservation authority, other land management agencies, or the affected landowner;
- provision of barriers to control off-road vehicle activities; and
- post-construction monitoring and maintenance of revegetated areas.

Further, its Plan requires that all upland areas disturbed by construction be fertilized, limed, and seeded in accordance with the prescribed schedule and seed mixes specified by local soil conservation authorities or land management agencies. Gulf South consulted with state and federal agencies regarding seeding mixtures, and developed a revegetation plan based on the results of this coordination. The FWS, LDWF, and MDWFP deferred to the recommendations of the NRCS regarding re-seeding, which included use of both warm season cover (bahia and bermuda grasses) and cool season species (rye and wheat). To promote spring germination of warm season grass seeds that may be broadcast in the fall season, unhulled warm season grass seeds would be used to minimize seed decay. Should construction and re-seeding continue past the Fall of 2007, Gulf South indicated that it would initiate additional consultations with the NRCS. Additionally, Gulf South would modify its general revegetation plan to address site-specific agency issues, such as coordination with the FWS regarding the area near the Tensas River National Wildlife Refuge (NWR) in Madison Parish, Louisiana.

The TPWD filed comments on the Draft EIS including several recommendations for reseeding that were not reflected in Gulf South's plan for revegetation. These recommendations included a preference for re-seeding using native species, allowing individual landowners to choose among native or non-native species during reseeding, and a preference for Bermuda grass over bahia grass should non-native species be selected. In order to ensure that TPWD's input regarding revegetation is fully considered, **we recommend that:**

- **Prior to construction, Gulf South should finalize its revegetation procedures based on comments provided by the TPWD, and file these procedures with the Secretary for review and approval by the Director of OEP.**

Project impacts to vegetative communities would vary depending upon disturbance duration, magnitude, and vegetation community. As described above, approximately 52 percent of the disturbed vegetation would be forested. Due to the nature of forest regrowth, the clearing of these areas may result in long-term to permanent effects in these areas. These long-term and permanent impacts to forested areas would be minimized by the measures described above. Additionally, Gulf South avoids forested areas to the extent possible through selective routing and minimizes impacts to vegetation through extensive collocation with existing rights-of-way. Impacts to agricultural, open-land, or pasture lands would be minimal and limited primarily to the construction phase. We believe that impacts to general vegetative communities would be minimized based on Gulf South's proposed measures to avoid and minimize impacts to forested areas, the relatively minor impacts to agricultural areas, pastures, and open lands, and the implementation of Gulf South's Plan.

3.5.2.1 Impacts to Vegetation Communities of Special Concern or Value

Most of the general construction impacts described above are applicable to specially designated vegetation communities or conservation programs depending on the vegetation present. These specially designated areas include CRP lands, which may be grassed or forested, and forested WMA lands, the Loess Hills Forest type, and large forested tracts.

Approximately 91.1 acres of CRP lands containing protected vegetative covers such as hardwood and pine forests and native grasses would be affected by the Project. Impacts and mitigation for vegetation in CRP lands would be similar to those described above, depending on whether or not each site was forested. Impacts to CRP lands are discussed in more detail in Section 3.8.

Gulf South avoids impacts to the Ouachita WMA by using a HDD to cross the WMA and the adjacent Bayou LaFourche. As discussed in Section 3.3, in the event of a frac-out or HDD failure, Gulf South would implement its HDD Contingency Plan. Impacts to the Ouachita WMA are also further described in Section 3.8.

The Loess Hills Forest type would be affected by the proposed route from MP 185.9 to 196.4. Construction and operation of the Project would have a similar impact on the Loess Hills Forest community as those described above for upland forests. Upland tree species would be permanently cleared from the maintained right-of-way and reestablishment in the temporary right-of-way would take up to 30 or more years. Due to the vegetation in this area's higher species diversity, quality, and erosion control properties, removal of vegetation in this location may cause localized increases in erosion and a localized decrease in vegetation species diversity. Gulf South has developed a plan regarding management of loess soils based on consultation with NRCS and we believe that specific plan, as well as implementation of its Plan, would minimize impacts to the Loess Hills Forest type.

The large forested tracts present along the proposed route would be affected by clearing of the nominal 100-foot-wide construction right-of-way and routine mowing, cutting, and trimming along the proposed 60-foot-wide permanent pipeline right-of-way. We are recommending in Section 2.0 that Gulf South's permanent right-of-way should be limited to a width of 50 feet in cases where eminent domain authority would be exercised. Cleared forested areas located outside of the permanent right-of-way would be allowed to revegetate; but effects to those areas would be long-term, as vegetative strata would be altered for up to 30 years or more until mature trees replace the early herbaceous, shrub, and sapling succession strata. Forested areas within the proposed 60-foot-wide permanent pipeline right-of-way would be permanently impacted and replaced by herbaceous and shrubby areas. Although these areas are relatively non-fragmented, many of these tracts contain some roads or other corridors and are subject periodic tree harvest or thinning, thereby reducing their overall quality. Through selective routing and

collocation with other rights-of-way, Gulf South minimizes impacts related to fragmentation and disturbance of large forested areas.

Due to the diverse nature of the vegetative communities associated with specially designated lands within the proposed Project area, impacts to vegetative communities of special concern would range from temporary to long-term or permanent. Adherence to the mitigation measures as described in Section 3.5.2 would minimize any impacts to specially designated lands that contain sensitive or specially protected vegetative communities. In addition to the implementation of Gulf South's Plan, selective routing, and collocation with existing rights-of-way, and avoidance of some sensitive vegetative communities through the use of HDD would further minimize potential Project impacts to vegetation in specially designated areas. Consequently, we believe that impacts would be minor overall.

3.5.3 Exotic or Invasive Plant Communities

Invasive species can out-compete and displace native plant species, thereby negatively altering the appearance, composition, and habitat value of affected areas. Several exotic and invasive plant species have been observed along the proposed pipeline, including Chinese tallow tree (*Sapium sebiferum*), Japanese honeysuckle (*Lonicera japonica*), and Chinese privet (*Ligustrum sinense*). Chinese tallow tree is a deciduous tree reaching up to 60 feet in height that is fast growing, can thrive in both wet and dry sites, can displace native vegetation, and is able to successfully invade undisturbed forests (Invasive. Org 2006). Japanese honeysuckle is an evergreen, woody vine that can climb up to 80 feet and invades all forested habitats, particularly areas along forested margins and rights-of-way (Invasive. Org 2003a). Chinese privet is a large, evergreen shrub that forms dense thickets primarily in bottom-land forests, often gaining access to these habitats via open fields, fence lines, or rights-of-way (Invasive. Org 2003b). All three species are spread through seed dispersal by wildlife. Japanese honeysuckle and Chinese privet also spread through rooting vine nodes and root sprouts, respectively.

The FWS and NRCS have also identified purple loosestrife (*Lythrum salicaria*) and cogon grass (*Imperata cylindrica*) as invasive species of potential concern in the general vicinity of the proposed Project. Purple loosestrife is a perennial herb that invades both disturbed and undisturbed wetlands, where it can out-compete native plant species (NPS 2006c). This species produces seeds for dispersal and also spreads via underground stems. Cogon grass is a perennial grass that spreads through wind-blown seeds and forms dense infestations by branching underground rhizomes, a thick system of mat-forming roots that sprout. Cogon grass competes with hardwood species for light, water, and nutrients and can grow so extensively that it decreases growth and increases mortality of young trees (Matlack 2002). Cogon grass can also spur fires that are more frequent and intense than would otherwise occur (NPS 2006d).

In order to minimize the impacts of exotic and invasive species, Gulf South would implement its Plan, which includes measures to reduce erosion such as topsoil stripping and specific vegetation restoration measures. Further, as described above, use of seed mixes developed in consultation with the NRCS and other agencies and post-construction monitoring measures would be implemented to further minimize the spread of exotics to and within the Project area.

Gulf South indicates that it would continue to coordinate with federal and state resource agencies to identify appropriate control measures for invasive and exotic plant species. Because those consultations are not yet complete, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, a final Exotic and Invasive Species Control Plan developed in consultation with the FWS, TPWD, LDWF, and the MDWFP. This plan**

should identify the specific measures that Gulf South would implement during construction and operation to control exotic and invasive plant species. Following approval, Gulf South should also submit copies of the Exotic and Invasive Species Control Plan to the above-listed agencies.

The temporary removal of vegetation may result in increased opportunities for invasive and exotic species to establish themselves in Project rights-of-way and additional temporary workspaces. Adherence to its Plan in conjunction with consultations with local and state agencies would minimize the potential for the introduction or establishment of nuisance and exotic species within the Project area.

3.6 WILDLIFE AND AQUATIC RESOURCES

3.6.1 Wildlife

3.6.1.1 Existing Wildlife Resources

A variety of wildlife species and habitat types would be encountered and crossed by the proposed Project. Habitats are found along the proposed route in upland forests, agricultural fields, pasture, open lands, wetlands, and open waters. Sections 3.4 and 3.5 further describe the vegetative components of these habitats. Wildlife species commonly associated with these habitats are listed in Table 3.6.1-1. In addition to the wildlife species discussed below, Section 3.7 describes federal and state-listed threatened and endangered species occurring in the Project area.

Upland Forest

Mixed hardwood-loblolly pine forest, pine plantation, and slope hardwood upland forest provide wildlife species with a variety of foraging, rearing, nesting, and cover habitat(s). The canopy of mixed hardwood-loblolly pine forest is typically composed up of a significant hardwood component with at least 20 percent of the stand comprised of loblolly pine. Hardwoods present vary depending on soil type, moisture regime, and slope. Although hardwood-loblolly pine forests may also have an understory of small shrub species and herbaceous growth, the understory would naturally trend toward hardwood dominance without periodic fire suppression. Slope hardwood forests are found on the slopes of small stream floodplains. Both of these upland forest habitat types offer significant cover and forage for a variety of wildlife species.

Wildlife use of pine plantation habitat varies according to wildlife species life stage, season, and forest successional stage. Pine plantation areas have an average rotation time of 20 to 30 years, allowing regular change in the successional vegetation species and habitat types. All successional stages provide some form of forage, cover, and nesting habitat for various bird, mammal, and reptile species. Early and intermediate successional stages are most used by wildlife. However, even after the canopy has closed, openings, edge habitat, and areas periodically subjected to prescribed fire can provide relatively good habitat and forage capable of sustaining a diverse wildlife assemblage.

Agricultural Fields

Row crops and other agricultural areas provide a small amount of cover and foraging opportunities for birds, deer, and small mammal species, especially for those species tolerant of periodic disturbance.

**TABLE 3.6.1-1
Common Wildlife Species That Occur along the Proposed East Texas to Mississippi Expansion Project**

Common Name	Scientific Name	Upland Forest			Wetlands			Open Land, Agriculture, and Pasture
		Mixed Loblolly/ Hardwood Forests	Slope Hardwood Forest	Pine Plantation	Forested (PFO) AND Scrub-Shrub Wetlands	Emergent Wetlands (PEM)	Open Water	
Pine warbler	<i>Dendroica pinus</i>	X	X	X				
Brown-headed nuthatch	<i>Sitta pusilla</i>	X	X	X				
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	X			X			
Wild turkey	<i>Meleagris gallopavo</i>	X	X	X				X
Mourning dove	<i>Zenaida macroura</i>	X	X					
Northern bobwhite	<i>Colinus virginianus</i>	X		X				X
Wood duck	<i>Aix sponsa</i>				X	X		
Louisiana waterthrush	<i>Seiurus motacilla</i>				X			
Green heron	<i>Butorides virescens</i>				X	X	X	
Red-tailed hawk	<i>Buteo jamaicensis</i>	X	X	X				X
Mississippi kite	<i>Ictinia mississippiensis</i>	X	X		X	X		X
Red-winged blackbird	<i>Agelaius phoeniceus</i>				X	X		X
White-tailed Deer	<i>Odocoileus virginianus</i>	X	X	X	X	X		
Cottontail rabbit	<i>Sylvilagus spp.</i>	X	X					
White-footed mouse	<i>Peromyscus leucopus</i>	X	X	X				
Hispid cotton rat	<i>Sigmodon hispidus</i>	X	X	X				
Opossum	<i>Didelphidae</i>	X	X	X				
Raccoon	<i>Procyon spp.</i>	X	X	X	X	X		
Gray squirrel	<i>Sciurus carolinensis</i>	X	X					
Nine-banded armadillo	<i>Dasypus novemcinctus</i>	X	X	X				X
River otter	<i>Lutra canadensis</i>				X	X	X	
Nutria	<i>Myocastor coypus</i>				X	X	X	
Three-toed box turtle	<i>Terrapene carolina triunguis</i>	X	X					X
Western cottonmouth	<i>Agkistrodon piscivorus leucostoma</i>				X	X	X	
Bullfrog	<i>Rana catesbeiana</i>				X	X	X	
Southern leopard frog	<i>Rana sphenoccephala</i>				X	X		
Green tree frog	<i>Hyla cinerea</i>				X	X		

Pasture

Pastures are areas that are primarily used for livestock grazing or for hay production. These areas are dominated by Bermuda grass and crabgrasses that provide grazing opportunities for wildlife such as white-tailed deer, but typically foraging opportunities are somewhat low overall. Pastures do not provide significant cover habitat for most wildlife species.

Open Lands

Open lands include maintained utility rights-of-way, upland shrub areas, and other non-agricultural herbaceous areas. Open land habitat can be important to a variety of species, particularly birds and small mammals by providing edge areas and feeding and rearing habitats.

Forested Wetlands

Forested wetlands are dominated by woody vegetation that is at least 20-feet-tall. Section 3.4 provides a more detailed description of the vegetation communities present in wetland habitats. The diverse vegetation assemblages comprising forested wetlands provide an abundance of cover, foraging and nesting habitat for a variety of wildlife species, especially those that are dependant upon these resources, such as migrating birds, reptiles, amphibians, and mammals. During winter flooding periods, this habitat also provides migratory waterfowl wintering habitat.

Scrub-Shrub Wetlands

Like their upland scrub-shrub counterpart, scrub-shrub wetlands consist of saplings and low-lying vegetation; however, due to their lack of a developed tree canopy, scrub-shrub wetlands are typically not as structurally diverse as forested wetlands. As in forested wetlands, scrub-shrub wetlands provide an abundance of cover, foraging and nesting habitat for a variety of wildlife species including mammals, birds, and reptiles.

Emergent Wetlands

Emergent wetlands are characterized by the presence of erect, herbaceous plants that are used by a variety of wildlife species for cover and as foraging and nesting habitat. Vegetation in emergent wetlands associated with the proposed Project include various herbaceous species, which are described in Section 3.4. Additionally, migratory birds may use emergent wetland habitats as resting sites.

Open Water

Open water habitats, including some wetlands, are characterized by a lack of emergent vegetation within water depths that would normally be suitable for wetland plant growth. Within the proposed Project area, these open water habitats are generally found in larger stream and river crossings, shallow man-made impoundments, and beaver ponds. Like the other wet habitat types, open water habitats provide food and water sources, in addition to habitat for species such as wading birds, waterfowl, beavers, otters, snakes, and other wildlife species dependent upon an aquatic environment.

3.6.1.2 Sensitive or Managed Wildlife Habitats

The proposed Project would cross the Ouachita WMA, FWS-managed lands associated with the Tensas River NWR, WRP and CRP lands, and large forested tracts.

Wildlife Management Areas

The proposed Project would cross approximately 1,000 feet of the southeastern portion of the Ouachita WMA near MP 115. The Ouachita WMA is a 9,641-acre area located in Ouachita Parish, Louisiana, managed by the LDWF primarily for hunting and fishing. In addition to hunting, opportunities exist for camping, fishing, trapping, and wildlife viewing in the WMA. The WMA contains a series of waterfowl management impoundments totaling approximately 1,700 acres, as well as three reservoirs managed for recreational fishing. The impoundments are heavily utilized by waterfowl and non-game birds. Several areas within the WMA have been the focus of hardwood forest habitat restoration efforts. Game species found within the WMA include deer, squirrel, rabbit, snipe, dove, waterfowl, raccoon, mink, nutria, muskrat, opossum, beaver, coyote, and bobcat for trapping; and largemouth bass, crappie, and bluegill for fishing (LDWF 2005a.). The Bayou Pierre WMA is also located within the vicinity of the proposed Project; however, no Project facilities would cross or be located within 0.25 mile of the WMA.

USDA-managed Lands

The proposed Project would cross 17 WRP easements and 16 CRP easements, managed by the USDA. These programs are voluntary and promote the conservation and enhancement of various wetland and upland habitats including forested areas, although CRP easements may also include herbaceous open lands. WRP and CRP lands are described in further detail in Sections 3.4 and 3.8.

Large Forested Tracts

Several large forested tracts used primarily for silviculture would be crossed by the proposed Project. These tracts are discussed in Section 3.5, with the tract locations and crossing mileposts shown in Table 3.5.1-2. Due to their use for timber production, the quality of many of these tracts as undisturbed forest habitat has been reduced. These large forested areas are often crossed by existing roads, rights-of-way, and railroads, but typically are not fragmented by any other open land use type. Some forest interior species, such as many songbirds, exclusively use or nest in relatively large forested areas to avoid disturbed areas and edge habitats. In addition to providing protected nesting habitat, these large forested tracts also comprise contiguous forest habitat corridors for migration, feeding, and escape cover for a number of wildlife species.

3.6.1.3 Unique and Sensitive Wildlife Species

Unique or sensitive wildlife species, such as colonial nesting waterbirds and migratory waterbirds, may be found within the vicinity of the proposed Project.

Colonial Nesting Waterbirds and Migratory Birds

“Colonial nesting waterbirds” is a collective term used to refer to a variety of bird species that obtain all or most of their food from aquatic and wetland environments and gather in large colonies, or rookeries, during their respective nesting seasons. Colonial nesting waterbirds concentrate in these rookeries on sandbars and islands within or along the riparian zones of major waterways, including the Mississippi and Red Rivers. Based on consultations with FWS, LDWF, TDWF, and the Mississippi Museum of Natural Science, the proposed Project would be located in an area where colonial nesting waterbirds, including herons, egrets, night-herons, ibises, spoonbills, anhingas, cormorants, terns, gulls, skimmers, and pelicans, would be present.

Additionally, LDWF indicated that colonial nesting waterbirds are known to occur in the proposed Project's vicinity and that any active or inactive nests identified within 1,312 feet of a proposed Project work area would require coordination with that agency.

Gulf South conducted field surveys from March through December 2006 to determine the presence of any colonial waterbird rookeries, or areas of concentrated nesting of birds that obtain all or most of their food from aquatic and wetland environments. During the survey, one rookery was encountered approximately 1 mile east of the Pearl River in Simpson County, Mississippi, adjacent to the proposed pipeline right-of-way at MP 233.3. The location contained four yellow-crowned night heron nests within a forested wetland dominated by bald cypress trees.

The Migratory Bird Treaty Act regulates the taking of or impacts to migratory birds, including their nests. Numerous migratory bird species, including waterfowl, would potentially occur within the vicinity of proposed Project facilities. Migratory birds would occur as transients within the proposed Project area throughout most of the year.

3.6.1.4 General Impacts and Mitigation

Construction and operation of the proposed Project would result in several temporary and long-term impacts to wildlife species and their habitats including loss of habitat, habitat fragmentation, edge effects, and species displacement. As discussed in Sections 3.5 and 3.8, a total of 3,763.4 acres of land would be temporarily disturbed and 1,564.3 acres of land would be permanently affected by the proposed Project. We are recommending in Section 2.0 that Gulf South's permanent right-of-way should be limited to a width of 50 feet in cases where eminent domain authority would be exercised. Impacts to wildlife habitats are also described in Sections 3.4 and 3.5.

Pipeline Facilities

Pipeline construction would result in temporary and long-term impacts to wildlife and their habitats. As described previously, construction of the proposed pipeline would require the clearing of vegetation within the construction right-of-way, temporarily reducing the quality of cover, nesting, and foraging habitat for wildlife. Additionally, impacts to wildlife habitat due to construction would be more long-term, primarily depending upon the recovery rates of the vegetation comprising the habitat, particularly for forested areas.

As stated in Section 3.8, the construction of pipeline facilities would temporarily require the disturbance of approximately 3,393.5 acres of land. Of this total amount, approximately 52 percent would consist of pine plantation and forest with the remainder consisting mostly of agricultural areas, pasture, or open lands. The loss and reduction in the quality of wildlife habitat would result in the temporary displacement and avoidance by wildlife.

The temporary displacement of wildlife would result in increased stress and the potential for injury and/or mortality to wildlife. Wildlife avoiding construction activities would also experience temporary increase in stress, injury, and the potential for mortality. However, Gulf South has proposed a "no take" policy for wildlife species during construction.

Construction of the proposed Project is proposed to occur between May 1 and September 1, 2007. Hunting seasons for common species such as deer, waterfowl, wild turkey, and small game are generally between the fall and spring seasons and may be affected by construction.

Effects to wildlife using forest habitats would be more severe than those to wildlife inhabiting other habitat types, as vegetative strata in forested areas would undergo a more measurable change. Impacts to upland forest, pine plantation, and forested wetland habitats resulting from proposed construction activities would be long-term; however, they would also be localized. Disturbed areas located outside the permanent right-of-way would be allowed to revert to their preconstruction cover type, but this process would take 30 years or more in some forested habitats, also representing a long-term impact. Non-forested habitats (including agricultural areas, pastures, open lands, scrub-shrub, emergent wetlands, and open water) would be affected by Project construction, but due to the relatively short time required for regrowth of non-forested vegetation, these habitats would recover more quickly from construction-related disturbances.

Operation and maintenance of the permanent pipeline right-of-way would result in effects similar to those described for Project construction. Habitat impacted by vegetation maintenance along the permanent pipeline right-of-way would be maintained as herbaceous or scrub-shrub habitat. This maintenance would represent a conversion of habitat and would be most significant in previously forested upland and wetland habitats. Forest interior species would avoid cleared areas and edge habitats, which could potentially impact migratory patterns. However, those species that depend upon a forest-open land interface for feeding opportunities may actually benefit from edge-effects associated with right-of-way maintenance.

Project impacts to wildlife communities and habitat would vary depending upon disturbance duration, magnitude, and vegetation cover type. The potential for direct mortality and displacement due to construction activities would last for a relatively short duration. Due to the nature of vegetation regrowth, the clearing of forested areas may result in long-term to permanent alterations to wildlife habitat. Any impacts to wildlife habitat associated with agricultural, open land, or pasture lands would be minimal and limited primarily to the construction phase or within one growing season. Despite the potential long-term impacts associated with Project construction and operation, avoidance and mitigation measures described below would ensure that wildlife habitat impacts would be minimized.

Aboveground Facilities, Access Roads, and Pipe Storage and Contractor Yards

As described in Section 3.5 and Table 3.5.2-1, the construction of aboveground facilities and access roads would impact a total of approximately 93 acres of wildlife habitat. The construction of aboveground facilities would impact approximately equal portions of agricultural and pine plantation habitats and the construction of new or modified access roads would primarily impact agricultural or open land habitats. Additionally, the use of storage and contractor yards would impact a total of approximately 15 acres of agricultural and open land habitats.

All areas disturbed by construction of the aboveground facilities not containing infrastructure, such as buildings and other enclosures, would be finish-graded and seeded or covered with gravel, as appropriate. As a result of this conversion, wildlife habitats would be lost or diminished in value. Lands permanently converted due to operation of aboveground facilities would affect only a small percentage of the land area and wildlife habitat affected by the proposed Project. Generally, wildlife occurring in these areas would be permanently displaced, which could result in increased stress, injury, and/or mortality. Construction and operation of structures, parking lots, and roads at the aboveground facility sites would result in the loss and permanent conversion of some existing wildlife habitat into potentially non-vegetated industrial/commercial uses.

Construction impacts to agricultural areas and open land habitats would be short-term, as they would be restored within one to three years after construction.

Due to the small quantity of land required for aboveground facilities and the generally low value of habitats present in these areas, the loss of habitat and disturbance to wildlife species would be localized and minor. Any direct impacts to wildlife species or to their habitat, as described above, would be minimized through the implementation of avoidance and mitigation measures described below.

Impact Minimization and Mitigation Measures

Gulf South would minimize impacts to wildlife and wildlife habitats through selective routing, collocation with existing rights-of-way, and other measures described in its Plan and Procedures.

The proposed Project would avoid high-value wildlife habitats, including forested areas, to the extent practical. Collocation with existing utility rights-of-way would minimize impacts to previously undisturbed wildlife habitats and would substantially reduce the amount of wildlife habitat clearing required as compared to construction in greenfield areas. As described in Section 3.5, non-forested areas would generally be restored within one growing season for herbaceous habitats and within three years after construction for scrub-shrub habitats found in open lands. Gulf South would further reduce impacts to aquatic and riparian habitats used by terrestrial wildlife by crossing 64 streams using HDD methods.

Due to the rapid pace of pipeline installation and the vegetation restoration measures included in Gulf South's Plan and Procedures, we believe that impacts to wildlife species would be minimal. Measures included in Gulf South's Plan and Procedures are described in detail in Sections 3.4 and 3.5. Additionally, Gulf South consulted with the NRCS, FWS, and wildlife management agencies to develop a reseeding plan appropriate for Louisiana and Mississippi, and we are recommending in Section 3.5 that Gulf South consult further with TPWD regarding seeding mixes and revegetation for Panola County, Texas.

Right-of-way maintenance would affect a relatively small percentage of the forested habitat relative to the total amount of forested land areas in the general vicinity of the proposed Project. Operational maintenance of the right-of-way would be relatively infrequent and performed in accordance with Gulf South's Plan and Procedures. Due to these measures, we believe that due to these measures, the anticipated impacts to wildlife resulting from operation of the proposed Project would not be significant.

3.6.1.5 Sensitive or Managed Wildlife Habitats and Species Effects and Mitigation

Wildlife Management Areas

Gulf South proposes to cross the Ouachita WMA using a HDD. The use of a HDD would avoid surface impacts to the WMA; therefore construction and operation of the proposed Project would not significantly affect the Ouachita WMA. In the event of a frac-out or HDD failure, Gulf South would implement the measures described in its HDD Contingency Plan to prevent or minimize any impacts.

Although no significant impacts to WMAs would be expected from construction and operation of the proposed Project, construction activities within the vicinity of WMAs would result in the displacement of wildlife and avoidance of construction activities by wildlife. This displacement and avoidance may lead to an increased use of the WMAs resulting in a temporary increase in competition for habitat and resources. While the proposed Project may cause temporary increases in wildlife populations and noise levels within the WMAs, direct impacts would be avoided by use of the HDD. Therefore, we believe that construction and operation of the proposed Project would not significantly affect WMAs.

USDA-managed Lands

Many of the WRP and CRP easements that would be crossed by the proposed Project are forested. Construction across these lands would result in the long-term or permanent removal of trees which would result in impacts to wildlife and wildlife habitat similar to those discussed above. We are recommending in Section 3.8 that Gulf South complete ongoing consultations with the NRCS and develop an approved plan regarding the crossing of WRP lands. We also are recommending that Gulf South consult with the FSA regarding revegetation at affected CRP lands. We believe the results of these consultations, which would include discussions of routing, right-of-way width, construction methods, restoration, and mitigation, would adequately minimize impacts to wildlife habitats managed by the USDA.

Extensive Forested Tracts

As discussed above and in Section 3.5, approximately 77.1 miles of the proposed pipeline route would traverse large areas of relatively unfragmented forested areas. As indicated above, many of these forested tracts are subject to periodic harvesting and/or thinning, thereby reducing their wildlife habitat value.

Construction and operation of the proposed Project in large forested tracts would result in several temporary and long-term impacts to wildlife species and habitats. These impacts would include loss of forest interior habitat and displacement of wildlife; increased stress and mortality, leading to reduced reproduction and recruitment; increased rates of predation, parasitism, or inter-specific competition; increased destruction of habitat of understory species by browsing species; inhibition of migration, dispersal, foraging, and other movements of forest interior species that are hesitant to cross openings; and increased expansion of non-native or invasive plant or animal species.

Although fragmentation can cause long-term and adverse effects to wildlife that use large forested tracts, the proposed Project would be collocated for approximately 76 percent of its length in order to minimize the effects of fragmentation. The prevention of excessive fragmentation would also minimize increased species competition, loss of higher quality habitat access, and increased edge effects. Additionally, construction of the proposed Project actually would benefit many wildlife species that utilize forest edge and open habitats, such as white-tailed deer, wild turkey, certain raptors, and foxes.

Given the measures to avoid and minimize impacts to large forested areas, and current disturbances in large forested tracts as a result of commercial timber operations, we believe that impacts to wildlife from disturbance of these areas would be relatively minor.

Colonial Nesting Waterbirds and Migratory Birds

Colonial nesting waterbirds could be impacted by construction if their habitats or nests were damaged or disturbed during construction. In its comments on the proposed Project, the FWS recommended that any construction activity within 1,000 feet of a colonial nesting waterbird rookery should be restricted to the non-nesting period (i.e., September 1 through February 15) to minimize disturbance to colonial nesting waterbirds. Should construction be required during the nesting season, FWS recommended that a qualified biologist inspect the proposed Project work area for the presence of potentially undocumented nesting colonies and that on-site contractors be informed of the need to identify and avoid colonial nesting waterbirds and their nests.

Gulf South proposes to construct the proposed Project between May and September 2007, pending Commission approval, when the identified rookery or other rookeries may be active. As

recommended by the FWS, Gulf South proposes that a qualified biologist would survey the appropriate habitats prior to construction. Should active rookeries be discovered, Gulf South would then consult with the appropriate agencies to determine the methods and procedures to avoid or minimize disruption of these habitats. While construction could result in a disturbance to colonial nesting waterbird nesting habitat, we believe that resulting impacts would be adequately minimized by Gulf South's proposed measures. Additionally, the completion of any surveys and further consultations associated with construction activities near suitable habitat and active nesting sites would further minimize any impacts. Operation of the proposed Project would not significantly affect nesting activities of colonial nesting waterbirds nesting activities.

Migratory birds could also be impacted by construction if their habitats or nests were damaged or disturbed during construction. As discussed above, the proposed Project would be constructed between May and September, pending Commission approval, which would avoid the normal migratory period for most of these species, including migratory waterfowl. Most neotropical migrants that nest farther north likely would have already left the vicinity of the proposed Project by the start of construction. The proposed Project could disrupt nesting activity of locally nesting neotropical migrants, such as red-eyed vireo (*Vireo olivaceus*), Swainson's warbler (*Limnothlypis swainsonii*), and summer tanager (*Piranga rubra*), but these potential impacts would be relatively minor and short-term. Additionally, Gulf South would not conduct routine vegetative maintenance of the full pipeline right-of-way more frequently than once every 3 years, except along a corridor not exceeding 10 feet in width centered on the pipeline, which would be maintained annually in an herbaceous state to facilitate periodic corrosion and leak detection surveys. Furthermore, Gulf South would not conduct routine vegetative maintenance clearing between April 15 and August 1 of any year, which would minimize the potential for Project-related disturbance of migratory bird nesting periods. The potential exists for Project-related construction activities to affect migratory bird species in the proposed Project area, but the anticipated construction schedule and implementation of Gulf South's Plan would adequately minimize population-level impacts if they did occur.

3.6.1.6 Conclusion Regarding Impacts to Wildlife Habitats and Species

The proposed Project would affect wildlife and wildlife habitats along the proposed route. Impacts would be temporary, long-term and permanent. Specifically, wildlife would be displaced, injured, or killed by construction activities, but these impacts would be minor on a population level. Based on the characteristics of identified wildlife and wildlife habitats, anticipated impacts to them, and measures proposed by Gulf South to avoid or minimize these impacts, we believe that construction and operation of the proposed Project would not significantly impact wildlife or wildlife habitats.

3.6.2 Aquatic Resources

3.6.2.1 Existing Aquatic Resources

As described in Section 3.3, the proposed pipeline would cross a total of 885 waterbodies and an additional four waterbodies would be crossed by access roads. These waterbodies support numerous aquatic species, including fishes and mussels. Each waterbody that would be crossed is classified as having fish and wildlife propagation uses and provides aquatic habitat, food, resting, reproductive opportunity, and/or travel corridors to aquatic species. Table 3.6.2-1 lists warmwater fish and mussel species commonly found in waterbodies affected by the proposed Project.

**TABLE 3.6.2-1
Fish and Mussel Species Occurring in the Proposed
East Texas to Mississippi Expansion Project Area**

Common Name	Scientific Name
Fish Species	
Alligator gar	<i>Atractosteus spatula</i>
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>
Black crappie	<i>Poxomis nigromaculatus</i>
Blue catfish	<i>Ictalurus furcatus</i>
Bluegill sunfish	<i>Lepomis macrochirus</i>
Channel catfish	<i>Ictalurus punctatus</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Largemouth bass	<i>Micropterus salmoides</i>
Long-eared sunfish	<i>Lepomis megalotis</i>
Longnose gar	<i>Lepisosteus osseus</i>
Paddlefish	<i>Polydon spathula</i>
Red-eared sunfish	<i>Lepomis microlophus</i>
Shortnose gar	<i>Lepisosteus platostomus</i>
Smallmouth buffalo	<i>Ictiobus bubalus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
White bass	<i>Morone chrysops</i>
White crappie	<i>Poxomis annularis</i>
Mussel Species	
Round pearlshell	<i>Glebula rotundata</i>
Bankclimber	<i>Plectomerus dombeyanus</i>
Bleufer	<i>Potamilus pupuratus</i>
Mapleleaf	<i>Quadrula quadrula</i>
Southern mapleleaf	<i>Quadrula apiculata</i>
Texas liliput	<i>Toxolasma texasensis</i>
Tapered pondhorn	<i>Unio merus declivus</i>
Three ridge	<i>Amlema plicata</i>
Flat floater	<i>Anodonta suborbiculata</i>
Pondmussel	<i>Ligumia subrostrata</i>
Giant floater	<i>Pygandon grandis</i>
Pondhorn	<i>Unio merus tetralasmus</i>
Paper pondshell	<i>Utterbackia imbecillis</i>
Louisiana fatmucket	<i>Lampsilis hydriana</i>

No essential fish habitat (EFH), as managed by the National Marine Fisheries Service, is located within the proposed Project area. The Pearl River provides critical habitat for the Gulf sturgeon, a federally threatened anadromous fish. The Gulf sturgeon is addressed in Section 3.7. There are no known significant spawning or rearing areas for recreationally or commercially important fish species, that would be crossed or in the vicinity of the proposed Project.

Fisheries of Special Concern

Fisheries of special concern would include areas containing exceptional recreational or commercial fisheries, specially designated streams or rivers, and waterbodies supporting threatened or endangered aquatic species. The proposed Project would cross seven waterbodies containing fisheries of special concern. These include the Red River (MP 27.0), Black Lake Bayou (MP 42.4), Saline Bayou (MP 57.1), and the Ouachita River (MP 110.7) in Louisiana; the Mississippi River (MP 183.8) on the border of Louisiana and Mississippi; and the Big Black River (MP 196.7) and Pearl River (MP 232.2) in Mississippi. The Ouachita and Mississippi Rivers also support valuable commercial fisheries, including catfish and buffalo. The Red River (pallid sturgeon) and the Pearl River (Gulf sturgeon, inflated heelsplitter) are potential habitats for federally protected species, which are addressed in Section 3.7.

Additionally, the Pearl and Big Black Rivers are listed on the NPS's NRI and the Black Lake Bayou and Saline Bayou are listed by LDWF as Natural and Scenic Rivers. These rivers are listed not only for their scenic and recreational value, but also for their fish and wildlife habitat. Additional information for these waterbodies is provided in Section 3.3.

General Impacts and Mitigation

Gulf South's proposed waterbody crossing methods are identified in Appendix D of this EIS. Waterbody crossings would be accomplished using either the open-cut or the HDD method, as described in detail Sections 2.3.2 and 3.3.2. The use of the open-cut crossing method would result in several temporary impacts to aquatic resources including plankton, aquatic vegetation, amphibians, fish, and aquatic invertebrates including mussels. With the exception of potential impacts from a frac-out, the use of the HDD crossing method would result in the avoidance of impacts to aquatic resources. Additionally, the withdrawal of hydrostatic test water from the source waterbodies listed in Table 3.3.2-3 to facilitate the HDD crossing method and testing of pipeline integrity could result in the entrainment of fish and other aquatic organisms and a disruption of stream flow.

Impacts to water quality and aquatic habitats associated with construction of the proposed Project are generally described in Section 3.3. Some of these impacts include physical disturbance, interruptions to fish passage, sedimentation, turbidity, altered water temperatures and DO, and the introduction of contaminants.

Pipeline construction using open-cut methods would result in sedimentation and turbidity in surface waters and aquatic habitats, as described in Section 3.3. Benthic macroinvertebrates, which typically provide a key food source for fishes, may be buried under accumulated sediments along with fish spawning sites. In addition to altering fish habitat and food sources, sedimentation can affect mussel species by eliminating habitat or causing direct mortality through burial by sediments. Stream gradients tend to be relatively low in much of the proposed Project area; thus, stream velocities would also tend to be low. Under these conditions, suspended sediments within these streams would be transported only over short distances and would likely have a limited impact on aquatic species and their associated habitats. Further, reduced levels of DO, arising from increased turbidity can result in stress, displacement, and mortality to aquatic life including fishes and mussels, particularly during periods of low flows or high water temperatures.

As described in Sections 2.3.2 and 3.3, the use of a HDD would significantly minimize impacts to waterbodies and aquatic species. However, HDD methods are not without risk. A frac-out would cause increased turbidity and sedimentation and would result in impacts to aquatic habitats similar to those described above.

Overhanging vegetation in riparian and adjacent wetland areas, undercut banks, logs and other streamside features provide cover for fish. These types of cover and instream habitats would be disturbed by clearing and open-cut trenching during construction, resulting in decreased shading, increased water temperatures, and displacement of fish from disturbed areas. However, streamside clearing would be localized and would occur immediately adjacent to the construction right-of-way. Overall, these impacts would be relatively minor, as they would affect a relatively small length of a much longer linear stream feature.

Introduction of pollutants into waterbodies and aquatic habitats would occur through disturbance of contaminated soils or sediments, accidental spills, and inadvertent releases of drilling fluids during HDD and open-cut operations. Pollutants would affect fishes and other aquatic life through acute or chronic toxicity; and sub-lethal effects would affect reproduction, growth, and recruitment. Filter feeding species, such as mussels, would be particularly vulnerable to the introduction of pollutants or the disturbance of contaminated sediments. Disturbance and resuspension of contaminated soils and sediments would result in adverse impacts to water quality and instream habitat. However, there are no known contaminated sediments along the proposed Project route. Further, implementation of Gulf South's Plan and Procedures as described in Section 3.2 would be used to control erosion and would limit the flow of any contaminated sediments into waterways. Given the lack of contaminated sediments and pollutants near the proposed Project area and sediment erosion control measures included in Gulf South's Plan, the risk to water quality and aquatic species from contaminated soils and sediments is low.

Pollutants can also be introduced during discharge of hydrostatic test waters. However, Gulf South states that biocides and other potentially toxic hydrostatic test water additives would not be used during hydrostatic testing for the proposed Project.

Overall, the impacts to aquatic habitats and species resulting from construction of the proposed Project would be minor, localized, and short-term. Many of the warmwater species that occur in the waterbodies crossed by the proposed Project route are accustomed to occasionally turbid conditions and are therefore resilient to such periodic impacts. Removal of riparian vegetation would impact in-stream conditions, but would be localized and relatively minor over the length of the waterbody. The introduction of contaminants to aquatic habitats is relatively unlikely due to implementation of Gulf South's SPCC Plan and its Procedures. Operation of the proposed Project would not significantly affect aquatic species and habitats.

Minimization and Mitigation Measures

Gulf South indicates that it would construct the proposed Project during the period of May 1 through September 1, 2007, pending the Commission's approval of the Project. The proposed schedule for construction is partially outside the standard period for construction in waterbodies containing warmwater fisheries (i.e., June 1 through November 30). Gulf South's proposed Procedures require site-specific, written approval by the appropriate state agencies before construction can occur in waterbodies outside the specified window. The TPWD, LDWF, and MDWFP have approved Gulf South's proposed schedule for construction in relation to waterbody crossings. As described above and in accordance with its Procedures, erosion and sediment control BMPs would be implemented at all waterbody crossings during construction to reduce impacts to affected waterbodies.

Gulf South's proposed SPCC Plan describes the management of hazardous materials such as fuels that would be used during construction, in order to prevent spills or to minimize their impacts and to prevent contamination of surface water. Gulf South developed a HDD Contingency Plan that describes the procedures that would be implemented to monitor for, contain, and clean up any potential releases of drilling fluid during HDD operations. Given the measures described in its Procedures and SPCC Plan,

the risk of accidental spills or other introductions of hazardous materials to waterbodies and their effects on aquatic life would be effectively minimized.

Entrainment of fish eggs and larvae associated with hydrostatic testing would be minimized by the implementation of Gulf South's Procedures. These measures include screening to limit entrainment of fishes and maintenance of adequate flow rates to protect aquatic life during withdrawals for hydrostatic testing. Although it is possible that fish eggs and larvae would be entrained through the screens, such impacts would most likely be minor overall.

3.6.2.2 Conclusion Regarding Impacts to Aquatic Habitats and Species

The proposed Project would result in minor, largely temporary impacts to aquatic habitats and species; however, the measures proposed by Gulf South, including the use of HDD methods to cross many streams would significantly limit impacts to aquatic species and habitat. Given these measures and the temporary and localized nature of impacts, we believe that the proposed Project would result in only minor impacts to aquatic habitat and species.

3.7 THREATENED, ENDANGERED, AND SPECIAL-STATUS SPECIES

3.7.1 Federally Listed Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) requires each federal agency to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat for any federally listed species. The FERC, as lead agency in the review of the proposed Project, is required to consult with the FWS to determine whether federally listed species or their designated critical habitat may occur in the Project area, and to determine the proposed action's potential effects on these species and critical habitats. For actions involving major construction activities with the potential to affect listed species or designated critical habitats, the FERC must report its findings to FWS in a Biological Assessment (BA).

To assist the FERC in meeting our Section 7 requirements, Gulf South as a non-federal representative, conducted informal consultation with FWS. FWS field offices located in Arlington, Texas, Lafayette, Louisiana, and Jackson, Mississippi are responsible for ESA review and clearances for the proposed Project. In addition, Gulf South contacted state fish and wildlife agencies with expertise regarding sensitive species, reviewed database information related to endangered and threatened species, and conducted field surveys of the proposed pipeline route and aboveground facility sites from March 2006 into early 2007. No threatened or endangered species were observed during the field studies of the proposed pipeline route survey corridor. We have reviewed the information submitted by Gulf South, performed our own research, and consulted directly with the FWS. Our analysis of the potential for Project-related effects to federally listed species and their designated critical habitats is provided in this EIS. Based on Gulf South's consultation with the FWS (FWS 2006a, FWS 2006b, FWS 2006c, FWS 2006d, FWS 2006e) and our review of existing records, 11 federally listed endangered, threatened, or candidate species could occur within the vicinity of the proposed Project. These species and their management status are listed in Table 3.7.1-1.

Gulf South initiated consultations with the FWS regarding impacts to federally listed species, and these consultations are now largely complete. The FWS Lafayette, Louisiana office concurred with Gulf South's determination that the proposed Project would affect, but would be not likely to adversely affect the listed species (except for the Louisiana black bear) in correspondence dated November 9, 2006

TABLE 3.7.1-1
Federally Listed Species Potentially Occurring in the Proposed
East Texas to Mississippi Expansion Project Area

Species	Federal Status	Texas Status	Louisiana Status	Mississippi Status	County/Parish (Portion of Potential Range Crossed by the Proposed Project)
Birds					
Bald eagle (<i>Haliaeetus leucocephalus</i>)	T	T	T	T	Panola County, TX; DeSoto, Jackson, Ouachita, and Richland, Parishes, LA; Warren County, MS
Interior least tern (<i>Sterna antillarum athalaso</i> s)	E	E	E	E	Madison and Red River Parishes, LA; Warren County, MS
Red-cockaded woodpecker (<i>Picoides borealis</i>)	E	E	E	E	DeSoto, Bienville, Jackson, and Ouachita Parishes, LA
Mammals					
Louisiana black bear (<i>Ursus americanus luteolus</i>)	T	T	T	T	Panola County, TX; Madison and Richland Parishes, LA; Copiah, Hinds, Simpson, and Warren Counties, MS
Reptiles					
Ringed map turtle (<i>Graptemys oculifera</i>)	T	--	T	T	Copiah, Hinds, and Simpson Counties, MS
Fishes					
Bayou darter (<i>Etheostoma rubrum</i>)	T	--	--	T	Copiah and Hinds County, MS
Gulf sturgeon (<i>Acipenser oxyrinchus desotoi</i>)	T	--	T	T	Simpson, Hinds, and Copiah Counties, MS
Pallid sturgeon (<i>Scaphyrhynchus albus</i>)	E	--	E	E	Madison and Red River Parishes, LA; Warren County, MS
Invertebrates					
Fat pocketbook pearly mussel (<i>Potamilus capax</i>)	E	--	--	E	Copiah, Hinds, Simpson, and Warren Counties, MS
Inflated heelsplitter (<i>Potamilus inflatus</i>)	T	--	T	T	Hinds County, MS
Candidate Species					
Louisiana pine snake (<i>Pituophis ruthveni</i>)	C	--	--	--	Bienville Parish, LA
Notes:					
C = Candidate for listing					
E = Endangered					
T = Threatened					

(FWS 2006d). Subsequently, Gulf South received notification from FWS that the proposed Project would be not likely to adversely affect the Louisiana black bear in correspondence dated February 26, 2007. On March 22, 2007, the FWS stated that no further ESA consultation with the Lafayette, Louisiana Field

Office will be required. The FWS Jackson, Mississippi office also concurred with a determination that the proposed Project would affect, but would be not likely to adversely affect the listed species under its purview in correspondence dated November 16, 2006 (FWS 2006e). The FWS Arlington, Texas office indicated in its letter dated July 17, 2006 that given Gulf South's determination that the proposed Project would not affect listed species in Texas, no further consultation with the FWS would be necessary. We concur with these findings. Since the filing of those letters, Gulf South has modified its proposed route and identified new access roads and additional temporary workspaces. Gulf South has compiled additional information on species occurrence and habitat based on new surveys that were not reviewed previously by the FWS; therefore, to ensure that the entire proposed Project area is properly reviewed for the presence or absence of federally listed species and their habitats, **we recommend that:**

- **Gulf South should not begin construction activities until:**
 - a. **the staff completes Section 7 consultations with the FWS; and**
 - b. **Gulf South has received written notification from the Director of OEP that construction or use of mitigation may begin.**

The preferred habitats, potential for occurrence within the Project vicinity, and our assessment of potential Project effects to federally listed threatened or endangered species are discussed further below.

3.7.1.1 Bald Eagle

The bald eagle, a federally listed threatened species, is a large carnivorous bird whose range covers virtually all of North America. Its preferred habitat consists of areas near waterbodies, such as coasts, bays, lakes, rivers, and forested wetlands. Bald eagles are opportunistic feeders and will both hunt and scavenge. Primary food sources are fish, waterfowl, and seabirds, though bald eagles are also known to feed on carcasses of large animals (NatureServe 2006). Mixed conifer and hardwood forests and woodlands with large, accessible trees are used for roosting and nesting. Threats to the bald eagle include loss of habitat, human disturbance, environmental contamination (particularly dichloro-diphenyl-trichloroethane) affecting food supply, and illegal shooting (NatureServe 2006). Consistent disturbance caused by human activity will provoke bald eagles to abandon otherwise suitable habitat.

Bald eagles build substantial nests in the tops of large trees, typically in riparian areas near rivers, lakes, marshes, and wetland areas. Once the eagles establish a suitable breeding territory, they will return to the same area year after year, often using several nests within the territory during different years.

Bald eagles nest in the winter and are known to occasionally nest near suitable waterbodies in the vicinity of the proposed Project from October to mid-May. The FWS (2006a) has identified large numbers of nests in southern portions of Louisiana, but indicated that bald eagles also winter and infrequently nest in northern Louisiana and western Mississippi. They are also known to winter along the lakes and major waterways in northern and central Louisiana. Bald eagles are also found in Panola County, Texas as winter residents and spring and fall migrants (TPWD 2006b).

Field surveys of the proposed Project route conducted by Gulf South identified very little suitable bald eagle habitat. Although several large waterbodies that may potentially be used as foraging habitat would be crossed by the proposed Project, disturbance to foraging activities would be avoided via HDD. Additionally, no bald eagles or bald eagle nests were observed during Gulf South's field surveys and construction-related disturbance of nesting activity is not anticipated. The FWS (2006d) indicated that consultation should be reinitiated if bald eagles were observed along the proposed route prior to or during construction. To ensure that the necessary measures to protect the bald eagle would be implemented, **we recommend that:**

- **Gulf South should file with the Secretary as part of the final Implementation Plan a description of measures, developed in consultation with the FWS, to train construction workers regarding awareness of bald eagles and nesting activity. Gulf South should immediately notify the FERC staff and the FWS if bald eagles or their nests are observed within 1,500 feet of the proposed Project's facilities prior to or during construction.**

Based on the results of field surveys conducted by Gulf South, the absence of bald eagle sightings, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the bald eagle.

3.7.1.2 Interior Least Tern

The interior least tern, a federally listed endangered species, is a small migratory shorebird that is found throughout much of the United States. Breeding, nesting, and rearing occur on non-vegetated portions of sandbars and islands in various rivers, including the Mississippi and Red River systems. On the lower Mississippi River, the population of this species is concentrated within approximately 500 miles between Cairo, Illinois and Vicksburg, Mississippi. Few birds have been observed in Louisiana along the Mississippi River in recent surveys; however, several nesting colonies recently have been found along the Red River in northwestern Louisiana. Major threats to this species include habitat loss and human disturbance of nesting colonies (FWS 2006a).

Gulf South avoids suitable habitat for the interior least tern, such as sandbars found along the western bank of the Mississippi River, by using an HDD. Suitable habitat was not found at either of the proposed Red River or Mississippi River HDD entry or exit points. The LDWF states that their database had a 1996 record of an interior least tern present within one mile of the proposed Project (LDWF 2006); however, no interior least terns were observed by Gulf South during its field surveys.

The nesting season for interior least terns extends from May 15 through August 31. Gulf South proposes to construct the proposed Project during this general timeframe, but potential impacts to nesting habitats would be avoided by positioning the HDD entry and exit points away from non-vegetated sandbars and islands. In the event of a frac-out, Gulf South's HDD Contingency Plan would be implemented to minimize potential impacts.

Should the proposed HDD crossing fail or geotechnical investigations indicate that the proposed HDD is not feasible, Gulf South would be required to obtain approval from the FERC before implementing any alternative crossing plans. A site-specific plan would be developed and approved prior to initiating any instream construction activities at the Red River, and it is anticipated that the required agency consultations would identify any appropriate measures to avoid and minimize potential adverse effects to the interior least tern.

The FWS recommended that the absence of nesting activity for this species should be confirmed in suitable habitats located along the Red River in areas affected by construction if such activity occurred during the nesting season. To ensure that the FWS concern is addressed and that necessary measures to protect the interior least tern would be implemented during construction, **we recommend that:**

- **Gulf South should file with the Secretary as part of the final Implementation Plan a description of measures, developed in consultation with the FWS, to train construction workers in the identification of interior least terns and their nesting habitat in the vicinity of the Red and Mississippi River crossings. Gulf South should immediately notify the FERC staff and the FWS if interior least terns are observed within 650 feet of**

proposed waterbody crossings in the Red and Mississippi River basins prior to or during construction.

Based on the results of field surveys performed by Gulf South, the use of HDD crossings to avoid potential effects to habitat, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the interior least tern.

3.7.1.3 Red-cockaded Woodpecker

The red-cockaded woodpecker, a federally listed endangered species, excavates cavities in mature (greater than 60 years old) pine trees found in open, park-like stands with little or no understory or midstory (FWS 2006a). Generally, red-cockaded woodpeckers are intolerant of dense hardwood midstories resulting from fire suppression. An aggregate of suitable cavity trees is called a cluster and may include one to 20 or more cavity trees on tracts from 3 to 60 acres. Foraging habitat is defined as pine and pine-hardwood stands (i.e., 50 percent or more of the dominant trees are pine trees) over 30 years old that are located contiguous to and within 0.5 mile of the cluster (FWS 2006a).

Field surveys conducted by Gulf South determined that most of the pine forests traversed by the proposed pipeline route contain pine trees too small or young to be used as cavity trees by red-cockaded woodpeckers; when larger and older pine trees were observed, the dense understory and midstory indicated that the area was not suitable as habitat. However, Gulf South encountered 15 areas containing large pines that were determined to be potentially suitable habitat for red-cockaded woodpecker foraging. All of these areas were examined for the presence of red-cockaded woodpeckers, including observations for specimens, bark scaling, and cavities, as well as listening for vocalizations. No signs of red-cockaded woodpeckers were recorded. Based on consultation with the FWS and the evaluation of aerial photography and understory composition and density, Gulf South determined that nine of these sites were unsuitable habitat. The remaining six sites could not be adequately assessed with existing data and were evaluated through direct contact with the landowners to assess the age of the pine stands. The results of this assessment indicate that none of the remaining pine stands were older than 30 years and that the areas were unsuitable as red-cockaded woodpecker habitat. Therefore, construction-related impacts to cavity trees and foraging habitat are not anticipated.

Based on the surveys conducted by Gulf South and the lack of suitable habitat, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the red-cockaded woodpecker.

3.7.1.4 Louisiana Black Bear

The Louisiana black bear, a federally listed threatened species, is one of 16 recognized subspecies of the American black bear. Louisiana black bear populations are listed in Panola County, Texas, Richland and Madison Parishes, Louisiana; and in Copiah, Hinds, Simpson, and Warren Counties, Mississippi. Although individuals are known to occur in Mississippi, whether any breeding populations occur outside of Louisiana is unknown (FWS 2006f). Black bear habitat is primarily associated with forested wetlands; however, bears may utilize a variety of habitat types including marsh, spoil banks, and upland forests. In upland forests, black bears utilize soft and hard forage for food, thick vegetation for escape cover, vegetated corridors for dispersal and movement, large trees for den sites, and isolated areas for refuge from human disturbance. The primary threats to this species are from the continued loss of bottomland hardwoods and fragmentation of the remaining forested tracts as well as human conflicts where they may be intentionally and illegally shot or killed in automobile collisions (FWS 2006a). The FWS also noted that bears may become habituated to human food sources, especially garbage, when activities encroach on their habitat (FWS 2006a). Such habituation can cause nuisance behavior by black

bears, which can be very difficult to control and may require removal of the animal or euthanasia, thereby impacting the recovery of this species.

Louisiana black bears den from December through April, preferably in bald cypress and water-tupelo trees with visible cavities that have a diameter at breast height of 36 inches or greater and are located along rivers, lakes, streams, bayous, sloughs, or other waterbodies. Where suitable den trees are unavailable, black bears will often den in shallow burrows or depressions within areas of dense cover (FWS 2006a). The FWS has extended legal protection to “actual” and “candidate” den trees. Actual den trees include any tree used by a denning bear during winter and early spring; candidate den trees are those with visible cavities, having the appropriate diameter, and located along a waterbody.

No black bears or actual den trees were observed during field surveys conducted by Gulf South; however, an area of candidate den trees was noted in a cypress-tupelo swamp located east of the Pearl River in Simpson County, Mississippi. The area contained eight tupelo candidate trees with visible hollows at the bases and with diameters at breast height of up to 60 inches. Construction of the proposed Project would take place between May and September, outside the denning period for the black bears.

The proposed route would also cross an area in Madison Parish, Louisiana proposed by the FWS as critical habitat for the Louisiana black bear, although the critical habitat designation has not been approved. The primary constituent elements of the proposed critical habitat in this area include forested tracts. The proposed pipeline route in Madison Parish, Louisiana avoids most forested areas and would be primarily located in agricultural areas. Gulf South has consulted with the FWS regarding the proposed pipeline route near the Tensas River NWR in Madison Parish, Louisiana. The FWS has expended considerable effort in establishing and maintaining forested corridors to allow bear movement and to promote habitat connectivity. Based on consultations with the FWS, Gulf South has agreed to modify its proposed route and avoid two areas managed by the FWS’ Tensas River NWR complex including one U.S. Government fee-owned property managed by the FWS located east of Bayou Macon and an FWS easement associated with the Tensas River NWR. The proposed Project would not cross the Tensas River NWR proper due to selective routing in Madison Parish, Louisiana.

In addition, Gulf South has developed a series of measures in consultation with the FWS to minimize potential impacts and to maintain bear habitat connectivity on a WRP tract located near MP 155. The area is located in a corridor between the northern and southern portions of the Tensas River NWR. Measures to be used in this area during construction and restoration include:

- allowing stumps and roots to remain in place in cleared areas, thereby promoting re-sprouting;
- replanting of trees in disturbed areas outside of the 30-foot-wide permanent right-of-way;
- replanting of shrubs within the 30-foot-wide permanent right-of-way, except for a 10-foot-wide corridor centered over the pipeline that would be planted in native grasses or small shrubs;
- restoration of preconstruction surface contours; and
- limitation of construction to the non-denning season of May through September.

Following construction, Gulf South proposes to allow the section of permanent right-of-way approximately 5,160 feet long that would be located between the northern and southern portions of the Tensas River NWR to remain “virtually un-maintained”. The shrub or other species used to revegetate this area have not yet been determined. During operations, Gulf South would mow and maintain only a

small all-terrain vehicle path approximately 6-feet-wide located over the pipeline to facilitate pipeline inspections. Gulf South also would monitor this area to ascertain the success of revegetation efforts.

Gulf South proposes to re-examine the areas containing candidate den trees prior to construction as well as implement any other agency recommended measures for the protection of the Louisiana black bears. To ensure that all necessary measures to protect the Louisiana black bear would be implemented for the proposed Project, **we recommend that:**

- **Gulf South should file with the Secretary as part of the final Implementation Plan a description of measures, developed in consultation with the FWS, to revegetate the bear management corridor located near the Tensas River NWR, and in accordance with FWS recommendations train construction workers regarding the elimination of activities that may serve as attractants to the Louisiana black bear, and to protect candidate denning trees.**

Based on the results of surveys conducted by Gulf South, the anticipated proposed Project construction timeframe, our recommendation, and Gulf South's commitment to implement agency-recommended measures to mitigate potential impacts, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the Louisiana black bear.

3.7.1.5 Ringed Map Turtle

The ringed map turtle, a federally listed threatened species, occurs in the main channel of the Pearl River from near its mouth upstream to Neshoba County in Mississippi. The ringed map turtle's habitat is typically riverine, with a moderate current and numerous basking logs for adequate sunning. Nesting habitat for this species consists of large, sand and gravel bars adjacent to rivers and streams. The decline of this species is attributed primarily to habitat alteration due to channel modification for flood control, navigation, and impoundment, as well as water quality degradation from sedimentation and pollution.

No ringed map turtles were observed by Gulf South during its field surveys, either along the Pearl River or at any other location. Gulf South notes the presence of suitable habitat, including basking logs, for the ringed map turtle at the proposed crossing point of the Pearl River; however, crossing at this location would be accomplished by an HDD, thereby avoiding impacts to potential habitat. Gulf South's planned preconstruction geotechnical investigations, HDD Contingency Plan, and commitment not to use toxic drilling additives, as well as our recommendation regarding review and approval of alternate methods in the unlikely event that the HDD should fail, would provide additional protective measures for this species.

Based on the results of surveys conducted by Gulf South, the proposed crossing methods of the Pearl River and Gulf South's HDD Contingency Plan, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the ringed map turtle.

3.7.1.6 Bayou Darter

The bayou darter, a federally listed threatened species, is a small fish endemic to Bayou Pierre and the lower reaches of its tributaries: White Oak Creek, Foster Creek, and Turkey Creek, which are located in Claiborne, Copiah, and Hinds Counties, Mississippi. The best habitat for the bayou darter occurs in shallow, meandering sections of Bayou Pierre downstream of headcut areas where stable gravel riffles or sandstone exposures are present and moderate to swift flows occur. Major threats to the Bayou

darter are habitat alteration from floodplain and channel modification, petroleum exploration, transportation, farming, and silviculture (FWS 2006h).

The proposed Project would not cross Bayou Pierre, White Oak Creek, or Foster Creek in Mississippi. A different, but identically named Bayou Pierre, located in DeSoto Parish, Louisiana, would be crossed by the proposed Project, but the species does not occur there. The proposed Project would cross Turkey Creek and some of its tributaries in Hinds County, Mississippi, but these streams are small and intermittent, and do not contain the appropriate habitat to support the occurrence of the bayou darter.

Based on the lack of suitable habitat for the bayou darter, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the bayou darter.

3.7.1.7 Gulf Sturgeon

The Gulf sturgeon, a federally listed threatened species, is an anadromous fish that inhabits the Gulf of Mexico and its drainages, primarily from the Mississippi River east to the Suwannee River. This species may also occur sporadically as far west as Texas and in marine waters in Florida. Adult Gulf sturgeon tend to congregate in the deeper waters of rivers with moderate currents and sand and rocky bottoms (FWS 2006i). Spawning adults move upstream in the spring to spawn over coarse substrates such as bedrock, cobble, and gravel in water up to 26 feet deep. Spawning in the upstream reaches of rivers is typically followed by downstream migrations. Juveniles (less than 2 years of age) are not known to migrate out of rivers and estuaries. The species is threatened by habitat destruction and degradation, and by construction of dams that have prevented access to historical migration routes and spawning areas (FWS 2006i).

The historical range of the Gulf sturgeon included the Mississippi and Pearl Rivers, which would be crossed by the proposed Project route, as well as some larger tributaries. Additionally, the entire Pearl River downstream of Ross Barnett Dam is currently designated as critical habitat for the Gulf sturgeon, including the area of the proposed Project crossing at the border of Copiah and Simpson Counties. Primary constituent elements of the critical habitat include abundant food items, riverine spawning sites, holding areas, flows, water quality, sediment quality, and unobstructed migratory pathways. Both the Mississippi and Pearl Rivers would be crossed by HDD methods, avoiding impacts to the habitat and species. Gulf South's planned preconstruction geotechnical investigations, HDD Contingency Plan, commitment not to use toxic drilling additives, as well as our recommendation regarding review and approval of alternate methods in the unlikely event that an HDD should fail, would provide additional protective measures for this species.

Based on the avoidance of habitat in the Mississippi and Pearl Rivers by HDD methods, the HDD Contingency Plan, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the Gulf sturgeon.

3.7.1.8 Pallid Sturgeon

The pallid sturgeon, a federally listed endangered species, is a large, freshwater fish that lives in large, free flowing, turbid rivers with low to medium gradients. This species could occur in the Mississippi River and the Red River. Spawning is thought to occur in Louisiana, but detailed habitat requirements are not known. Threats to this species include habitat loss through river channelization and placement of dams (FWS 2006i).

The potential occurrence of the pallid sturgeon within the proposed Project area is limited to large rivers such as the Red River and Mississippi Rivers, both of which would be crossed by HDD methods.

As noted above, Gulf South's planned preconstruction geotechnical investigations, HDD Contingency Plan, commitment not to use toxic drilling additives, as well as our recommendation regarding review and approval of alternate methods in the unlikely event that an HDD should fail, all provide additional protective measures for this species.

Based on the avoidance of habitat in the Mississippi and Red Rivers by HDD crossings, the HDD Contingency Plan, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the pallid sturgeon.

3.7.1.9 Fat Pocketbook Mussel

The fat pocketbook mussel, a federally listed endangered species, is a large freshwater mussel that is typically found in larger river systems. This species was once widely distributed in the Mississippi River drainage system, but it currently exists only in an approximate 200-mile stretch of the St. Francis River system in Arkansas, the lower Wabash River in Indiana, the mouth of the Cumberland River in Kentucky, and the Mississippi River in Missouri (NatureServe 2006). The species is listed in Mississippi due to the re-introduction of the species in the upper Mississippi River in 1989, although a study in 1992 found that recruitment at the introduction sites was unsuccessful (Koch 1993). The fat pocketbook mussel is apparently extirpated from the rivers that would be crossed by the proposed Project.

Gulf South proposes to cross the larger rivers in Mississippi (Mississippi, Big Black, and Pearl Rivers) via HDD, thereby avoiding impacts to this species' potential habitat. Gulf South further evaluated potential mussel habitat adjacent to the Mississippi River in August 2006. Side channels in these areas would not be crossed by HDD methods, rather they would be crossed using open-cut methods. Gulf South examined these areas with representatives of the FWS and LDWF and concluded that they were not suitable habitat for the fat pocketbook mussel and that potential impacts to this species would be avoided. As noted above, Gulf South's planned preconstruction geotechnical investigations, HDD Contingency Plan, commitment not to use toxic drilling additives, as well as our recommendation regarding review and approval of alternate methods in the unlikely event that an HDD should fail, would provide additional protective measures for this species.

Based on the apparent extirpation of the fat pocketbook mussel from rivers affected by the proposed Project, the proposed use of HDD methods to cross large rivers, the HDD Contingency Plan, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the fat pocketbook mussel.

3.7.1.10 Inflated Heelsplitter

The inflated heelsplitter, also known as the Alabama heelsplitter, a federally listed threatened species, is a large freshwater mussel known to occur in the Amite River in Louisiana and five sites in the Tombigbee and Black Warrior Rivers in Alabama (Stern 1976, Hartfield 1988). The species was historically present in the Pearl River, but has not been observed there in almost 100 years and is believed to be extirpated. The preferred habitat of this species is soft, stable substrate in slow to moderate currents (Stern 1976), but it has been found in sand, mud, silt and sandy gravel (Hartfield 1988).

Although the current range of this species is apparently outside of the proposed Project area, the Pearl River would be crossed via HDD. As noted above, Gulf South's planned preconstruction geotechnical investigations, HDD Contingency Plan, and commitment not to use toxic drilling additives, as well as our recommendation regarding review and approval of alternate methods in the unlikely event that an HDD should fail, would provide additional protective measures for this species.

Based on the apparent absence of this species from rivers crossed by the proposed Project, the proposed HDD crossing method for the Pearl River, the HDD Contingency Plan, and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the inflated heelsplitter.

3.7.1.11 Louisiana Pine Snake

At this time, the Louisiana pine snake is not federally listed as endangered or threatened and the FWS does not require consultation regarding impacts to this species. Because it is a candidate species, the FWS encourages avoidance of activities that may negatively impact the species due to its sensitive status and in the event that it becomes listed in the future.

The Louisiana pine snake was historically found in portions of west-central Louisiana and extreme east-central Texas (FWS 2006a). Habitat for the Louisiana pine snake consists of longleaf pine savannah with sandy, well-drained soils and substantial herbaceous ground cover (Reichling 1990, Rudolph and Burgdorf 1997). Pocket gophers are an essential component of suitable Louisiana pine snake habitat because they create burrow systems where the snakes are most frequently found and they also serve as a major source of food for the species (Rudolph and Conner 1996). Movement patterns of pine snakes typically involve migration from one pocket gopher burrow system to another (FWS 2006a). The greatest threats to the species are habitat destruction and degradation due to logging, grazing, short-rotation silviculture, and fire-suppression (FWS 2006a).

Gulf South's field surveys focused on potential habitat existing along the proposed pipeline route, including the presence of pocket gopher burrows. This habitat type was encountered near MP 60.3 to 60.7 in Bienville Parish, Louisiana, although no Louisiana pine snakes were observed. The area contained large pine trees, a sparse understory, and grassy areas containing pocket gopher mounds. Gulf South notes that an adjacent area containing pocket gopher mounds was observed at MP 59.7 to 60.3, but that the trees in this area apparently had been recently clear cut.

Gulf South has consulted with the FWS regarding the Louisiana pine snake and has developed a draft training module for construction workers to inform them regarding this species. Gulf South has also proposed a "no take" policy for all wildlife species during construction. However, given the occurrence of potentially favorable habitat for the Louisiana pine snake along the proposed route, its sensitive status, the draft nature of Gulf South's plans, and the possibility that it may become federally listed in the future, we **recommend that:**

- **Prior to construction, Gulf South should file with the Secretary its final plan for avoiding or minimizing impacts to the Louisiana pine snake.**

Based on the lack of observation of this species along the proposed route during field surveys and our recommendation, we determine that construction and operation of the proposed Project may affect, but is not likely to adversely affect the Louisiana pine snake.

3.7.2 Special-status Species

3.7.2.1 State-listed and Rare Species

In addition to federally listed species, other special status species may occur within the vicinity of the proposed Project facilities. Special-status species include state-listed endangered, threatened, and species of concern identified through consultations with the TPWD, LDWF, and MDWFP.

Based on our research and consultation with the TPWD, LDWF and MDWFP, we have determined that 27 state-listed or rare species in addition to those discussed above as federally listed could occur within the vicinity of the proposed Project. These species, their status, and preferred habitat are presented in Table 3.7.2-1.

In general terms, impacts to state listed species would be similar to those described for federally listed species. Birds could be affected by the loss of nesting or foraging habitat during clearing for the proposed Project and they could also be disturbed by human activity. Fish and aquatic invertebrates could be affected by open-cut construction methods through the alteration of stream habitats, along with associated increases of turbidity and sediment load. Although larger streams and rivers would typically be crossed by HDD methods that would avoid the impacts associated with open-cut crossings, frac-outs could occur resulting in turbidity and the deposition of drilling mud. Terrestrial wildlife, such as mammals and reptiles, could be subject to mortality or displacement during clearing and could lose habitats along the right-of-way.

TABLE 3.7.2-1 State-listed and Rare Species Potentially Occurring in the Proposed East Texas to Mississippi Expansion Project Area^a				
Species	Texas Status/ Rank^{b, c, d}	Louisiana Status/ Rank^b	Mississippi Status/ Rank^b	Habitat
Birds				
Bachman's sparrow (<i>Aimophila aestivalis</i>)	T	S3	--	Fire-maintained mature to old pine woodland. Well-developed grass and herb groundcover with limited shrub and hardwood midstory. Able to colonize recent clearcuts, but such habitat is suitable only for a short time. Dry open pine with an undercover of grasses and shrubs, hillsides with patchy brushy areas, overgrown fields with thickets and brambles, grassy orchards, and large clear-cuts.
Peregrine falcon/Arctic Peregrine falcon (<i>Falco peregrinus / tundrius</i>)	E / T	--	--	Mountain ranges, river valleys, and seacoasts. Nest on high cliffs or tall buildings.
Wood stork (<i>Mycteria americana</i>)	T	--	--	Swamps and marshes.
Fish				
Crystal darter (<i>Crystallaria asprella</i>)	--	--	E / S1	Raceways of larger creeks and rivers with water depths greater than 60 centimeters and gravel and sand substrates. Moderate to strong currents.
Frecklebelly madtom (<i>Noturus munitus</i>)	--	--	E / S2	Firm, stable gravel or rubble riffles with swift currents in main river channels and larger tributaries. Often associated with instream cover.
Creek chubsucker (<i>Erimyzon oblongus</i>)	T	--	--	Creeks and small rivers. River mouths sand and gravel bottom pools, riffles, and lake outlets
Paddlefish (<i>Polyodon spathula</i>)	T	--	S3	Slow water in medium and large rivers. Channels, oxbows, backwaters, and impoundments.

TABLE 3.7.2-1 (continued)
State-listed and Rare Species Potentially Occurring in the Proposed
East Texas to Mississippi Expansion Project Area^a

Species	Texas Status/ Rank ^{bcd}	Louisiana Status/ Rank ^b	Mississippi Status/ Rank ^b	Habitat
Fish (continued)				
Pearl darter (<i>Percina aurora</i>)	--	--	E / S1	Rapids or riffles over gravel or bedrock substrate in slow to moderate currents.
Sicklefin chub (<i>Macrhybopsis meeki</i>)	--	--	SA	Large rivers with swift currents and sandy bottoms.
Invertebrates				
Ouachita fencing crawfish (<i>Faxonella creaseri</i>)	--	S2	--	Temporary pools in roadside ditches.
Round hickorynut (<i>Obovaria subrotunda</i>)	--	--	S2	Medium and large rivers with sand and gravel substrates
Plain pocketbook (<i>Lampsilis cardium</i>)	--	--	S3 / S4	Streams with soft, stable substrate and slow or moderate currents
Pyramid pigtoe (<i>Pleurobema rubrum</i>)	--	--	E / S1	Large and medium sized rivers; riffles and shoals, shallow water with coarse-particle substrates, sand bars, or in deep water (>4 meters) with mud and sand bottoms. Moderate to swift currents.
Rabbitsfoot (<i>Quadrula cylindrica</i>)	--	--	E / S1	Large to medium rivers with moderate to swift currents. Riffle areas with stable bottoms composed of sandy gravel, or gavel and cobble.
Wartyback (<i>Quadrula nodulata</i>)	--	--	S3	Large to medium rivers with sand or fine gravel substrate.
Mammals				
Rafinesque's big-eared bat (<i>Corynorhinus rafinesquii</i>)	T	--	--	Shallow caves or rock shelters, hollow trees, abandoned buildings, and girder bridges for nesting and roosting. Mature upland and lowland forest.
Red wolf (<i>Canis rufus</i>)	E	--	--	Brushy and forested areas, apparently now extinct in Texas.
Plants				
Fire pink (<i>Silene virginica</i>)	--	S2	--	Northern Louisiana; hardwood slope forests, mixed pine/hardwood forests, mesic sites.
Helianthus silphoides	--	S2 / S3	--	Disturbed upland forests along roads and tall grass prairies.
Northern burmannia (<i>Burmannia biflora</i>)	--	S2	--	Bayhead swamps, forested wetlands, forested seeps, and lower slopes. Very conspicuous during flowering, flowering peaks in October.
Nodding clubmoss (<i>Lycopodiella cernua</i>)	--	S2	--	Hillside seepage bogs and wetland longleaf pine savannahs, and is known from ditches and pond margins that are wet and acidic.

**TABLE 3.7.2-1 (continued)
State-listed and Rare Species Potentially Occurring in the Proposed
East Texas to Mississippi Expansion Project Area^a**

Species	Texas Status/ Rank ^{bcd}	Louisiana Status/ Rank ^b	Mississippi Status/ Rank ^b	Habitat
Plants (continued)				
Smooth twistflower (<i>Streptanthus hyacinthoides</i>)	--	S2	--	Northwest Louisiana; deep, xeric, sandy loam soil, found on roadsides and fields that are regularly cleared.
Crested fringed orchid (<i>Platanthera cristata</i>)	--	--	S3	Moist meadows and open woods
Reptiles				
Alligator snapping turtle (<i>Macrochelys temminckii</i>)	T	--	--	Slow, deep water of rivers, sloughs, oxbows, canals, swamps, bayous, ponds, and shallow creeks.
Northern scarlet snake (<i>Cemophora coccinea copei</i>)	T	--	--	Well drained soils, scrubby pines or oaks, found under logs or debris
Texas horned lizard (<i>Phrynosoma cornutum</i>)	T	--	--	Open areas with sparse vegetation in sandy to rocky soils, likes to burrow
Timber (canebrake) rattlesnake (<i>Crotalus horridus</i>)	T	--	--	Hardwood forests in river bottoms, swampy areas, floodplains, wet pine flatwoods, and hydric hammocks.
Notes:				
^a Sources: LDWF 2005, LDFW 2006, MDWFP 2006a, MDWFP 2006b, TPWD 2006, NatureServe 2006, Crandall et al. 2001, Kirkpatrick 1993.				
^b C = Candidate for listing, E = Endangered, T = Threatened, R = Rare, -- = Not Listed, S1 = Critically imperiled in state, S2 = Imperiled in state, S3 = Rare or uncommon in state, S4 = Apparently secure in the state, S5 = Demonstrably secure in state, SC = Species of concern, SH = Historically occurred, SA = Accidental occurrence in state.				
^c Texas Parks and Wildlife Division does not designate species rank for rare or sensitive species.				
^d Species are listed as rare or imperiled in Texas, but Texas Parks and Wildlife Division have yet to identify species potentially affected by the proposed Project.				
^e Species is listed as rare or imperiled in Louisiana, but the Louisiana Department of Wildlife and Fisheries did not identify the species as potentially affected by the proposed Project in its letter dated April 27, 2006.				
^f Species is listed as rare or imperiled in Mississippi, but the Mississippi Department of Wildlife, Fisheries, and Parks did not identify the species as potentially affected by the proposed Project in its letter dated September 11, 2006.				

The impacts described above would largely be avoided or minimized by the implementation of Gulf South's proposed measures and our recommendations. Based on our recommendation in the Draft EIS, Gulf South consulted further with the TPWD, LDWF, and MDWFP regarding state-listed and rare species. These agencies indicated that additional surveys or mitigation regarding potential impacts to state-listed species would not be required. Gulf South has also proposed to train construction personnel regarding special-status species and not to disturb such species during construction. Based on our consultations with TPWD, LDWF, and the MDWFP, we believe that construction and operations of the proposed Project would not significantly affect state listed threatened, endangered or species of special concern.

3.8 LAND USE, RECREATION AND SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

3.8.1 General Land Use Types

In this section, we further quantify the land requirements for construction and operation of the proposed Project, describe the current land use types, and evaluate the significance of Project-related impacts to those lands. We also address specially designated areas, transportation corridors, possible visual effects, and the potential to contact hazardous waste sites. The proposed crossing for the specially designated Natchez Trace Parkway is discussed and evaluated in Appendix H.

3.8.1.1 Land Types

Eleven general land use types would be affected by the proposed Project: agricultural, pine plantation, slope hardwood forest, loblolly pine-hardwood forest, pasture, open land, open water, residential, industrial/commercial, wetlands, and other. Table 3.8.1-1 identifies the amount of acreage by general land use type that would be affected by construction and operation of the proposed Project.

Construction of the proposed Project would affect approximately 3,763.4 acres of land. Approximately 91 percent of that acreage would be contained within the pipeline construction right-of-way and construction areas associated with the proposed aboveground facilities. Approximately 21 percent of the total land that would be affected during construction is characterized as pine plantation, 27 percent is agricultural land, 26 percent is combined forestland other than pine plantation, and 8 percent is commercial/industrial land. The remaining land use types reported in Table 3.8.1-1 each represent less than 10 percent of the proposed construction acreage. Following construction, lands temporarily used for pipe storage and contractor yards, additional temporary workspace, and most construction access roads would be allowed to revert to their original use and land use type.

As described in Section 2.0, the proposed Project would be collocated with existing pipeline and utility rights-of-way for approximately 181 miles (approximately 76 percent) of its length. Gulf South's proposed construction right-of-way would typically overlap with 20 feet of its own existing permanent right-of-way for approximately 50 miles and would abut the proposed CenterPoint Project's permanent right-of-way for approximately 91 miles. The proposed pipeline also would be collocated with other natural gas pipelines and electrical transmission lines for approximately 40 miles.

During operation of the proposed Project, the permanent pipeline right-of-way, additional temporary workspaces, aboveground facilities, pipe storage and contractor yards, and permanent access roads would affect approximately 1,564.3 acres. About 30 percent of the land that would be affected during operation is currently classified as agricultural land, 28 percent is slope hardwood or loblolly pine-hardwood forest, 23 percent is pine plantation, and 11 percent is pasture. The remaining land use types each represent less than 10 percent of the acreage required during operation. We are recommending in Section 2.0 that Gulf South's permanent right-of-way should be limited to a width of 50 feet in cases where eminent domain authority would be exercised.

Pipeline Facilities

Approximately 3,393.5 acres of land would be impacted by construction of the proposed pipeline and associated additional temporary workspaces. As shown in Table 3.8.1-1, approximately 29 percent of the land that would be affected during construction of the proposed pipeline is currently classified as agricultural land, 30 percent as either slope hardwood or loblolly pine-hardwood forest, 23 percent as pine plantation, and 11 percent as pasture. The remaining land use types each represent less than 10 percent of

the acreage required during construction. Following construction of the proposed pipeline, additional temporary workspaces would be allowed to revert to their original land use.

Operation of the proposed pipeline would permanently affect approximately 1,521.9 acres of land. Similar to the construction right-of-way requirements, approximately 29 percent of the land that would be affected during operation is currently classified as agricultural land, 28 percent is slope hardwood or loblolly pine-hardwood forest, 23 percent is pine plantation, and 11 percent is pasture. The remaining land use types each represent less than 10 percent of the acreage required during operation. We are recommending in Section 2.0 that Gulf South's permanent right-of-way should be limited to a width of 50 feet in cases where eminent domain authority would be exercised.

Aboveground Facilities

In addition to lands affected by construction of the proposed pipeline, construction of the proposed aboveground facilities would affect approximately 36 acres of land. Specifically, construction activities at the compressor stations would impact approximately 10 acres of agricultural lands and approximately 8 acres of pine plantation. Construction of the six M/R stations would extend beyond the proposed pipeline's permanent right-of-way, and would affect 17.2 acres during construction and 11.5 acres during operation. Each of the two M/R stations located in Panola County, Texas would affect approximately two acres of pine plantation land use types. Construction and operation of pig launcher/receiver facilities would result in land requirements of approximately 0.8 acre during construction. In total, aboveground facilities would affect approximately 28.3 acres of land during operation.

Access Roads

As described in Section 2.2.3.3, construction of the proposed pipeline right-of-way would require use of existing public and private roadways, to gain access during construction and operation of the proposed Project. Gulf South indicates that only the newly constructed or upgraded access roads associated with the aboveground facilities described above would be permanently maintained during operations. The remaining access roads would be allowed to revert to their preconstruction uses. Construction of the proposed pipeline would require the use of 179 access roads of varying lengths and construction, of which 157 would be for temporary use, while 22 would be for permanent use (Appendix F-2). Of the 179 access roads, 105 would be unmodified existing roads and 74 (comprising approximately 38.1 miles of road) would be new or upgraded roads. Access road improvements would temporarily affect 103.8 acres of land during construction and permanently affect 14.1 acres of land during operation. Approximately 42 percent of the permanently affected land would be pine plantation and upland forest, 36 percent would be agricultural land or open space, and the remaining areas would be comprised of industrial/commercial uses.

Pipe Storage and Contractor Yards

Gulf South proposes to use 11 storage and staging yards during construction, temporarily affecting approximately 230 acres of land (Table 3.8.1-1). These facilities are further described in Section 2.2.3.2. Approximately 85 percent of the area that would be used for pipe storage and contractor yards consists of commercial or industrial uses, with an additional seven and nine percent consisting of agricultural and pasture land uses, respectively.

TABLE 3.8.1-1
Acres Potentially Affected by the Proposed East Texas to Mississippi Expansion Project

Facility or Parish/County	Agricultural		Pine Plantation		Slope Hardwood		Loblolly Pine/ Hardwood Forest		Pasture		Open Land	
	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
42-INCH MAINLINE PIPELINE												
Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)												
DeSoto Parish, LA	4.3	1.8	44.9	16.3	15.9	6.6	90.9	37.2	73.9	32.1	29.4	18.3
Red River Parish, LA	64.5	23.8	6.2	2.1	21.1	7.0	26.3	10.1	10.7	4.7	18.0	8.5
Bienville Parish, LA	4.1	1.6	245.5	116.3	20.3	9.1	99.4	41.5	13.4	5.6	12.2	6.5
Jackson Parish, LA	0.0	0.0	246.2	121.7	34.9	18.1	46.5	22.6	31.0	15.3	18.1	10.3
Ouachita Parish, LA	73.9	32.5	168.5	67.7	17.0	7.8	20.4	8.4	0.0	0.0	1.4	0.6
Richland Parish, LA	349.0	167.3	18.7	9.4	52.3	26.5	2.1	1.0	14.9	7.8	14.4	7.3
Madison Parish, LA	416.2	207.4	0.0	0.0	7.2	4.8	1.3	0.5	7.6	3.7	4.2	2.7
Warren, MS County, MS	3.8	0.7	0.0	0.0	172.2	57.4	27.2	11.1	24.3	12.4	4.2	2.2
Hinds County, MS	46.9	22.9	12.1	5.6	83.1	39.9	123.4	63.8	169.3	84.0	12.8	5.5
Copiah County, MS	0.0	0.0	0.0	0.0	4.7	1.6	11.5	5.9	22.1	9.8	0.0	0.0
Simpson County, MS	0.0	0.0	17.8	6.1	33.6	13.9	49.5	20.2	7.1	1.3	0.8	0.1
Subtotal Aboveground Facilities	962.8	458.0	759.8	345.1	462.3	192.8	498.5	222.2	374.2	176.8	115.5	62.0
Aboveground Facilities												
Carthage Junction Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vixen Compressor Station	0.0	0.0	8.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tallah Compressor Station	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
McComb Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Texas Gas M&R Station	0.0	0.0	0.0	0.0	1.0	0.5	0.0	0.0	0.0	0.0	2.8	2.8
Columbia Gulf M&R Station	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Texas Eastern M&R Station	0.0	0.0	0.0	0.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Gulf South M&R Station	0.0	0.0	3.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hall Summit Pig Launcher/Receiver	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Aboveground Facilities	15.0	15.0	11.7	6.9	2.5	1.5	0.0	0.0	0.0	0.0	2.8	2.8
Extra Work Areas												
Pipe Storage and Contractor Yards	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0
Access Roads	6.5	3.3	2.6	2.1	2.4	2.4	1.4	1.4	0.9	0.0	43.8	1.8
Subtotal Extra Work Areas	21.5	3.3	2.6	2.1	2.4	2.4	1.4	1.4	20.9	0.0	43.8	1.8
Subtotal 42-inch Mainline Pipeline	999.3	476.3	774.1	354.1	467.2	196.7	499.9	223.6	395.1	176.8	162.1	66.6
36-INCH SUPPLY LATERAL PIPELINE												
Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)												
Panola County, TX	0.0	0.0	4.4	1.8	0.0	0.0	28.1	13.4	0.0	0.0	6.3	4.1
Subtotal Pipeline Facilities	0.0	0.0	4.4	1.8	0.0	0.0	28.1	13.4	0.0	0.0	6.3	4.1
Aboveground Facilities												
Enbridge M&R Station	0.0	0.0	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Enterprise M&R Station	0.0	0.0	2.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Aboveground Facilities	0.0	0.0	3.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Extra Work Areas												
Pipe Storage and Contractor Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Access Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Extra Work Areas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal 36-inch Supply Lateral	0.0	0.0	7.9	3.6	0.0	0.0	28.1	13.4	0.0	0.0	6.3	4.1
TOTAL PROJECT	999.3	476.3	782.0	357.7	467.2	196.7	528.0	237.1	395.1	176.8	168.3	70.7

TABLE 3.8.1-1 (continued)
Acres Potentially Affected by the Proposed East Texas to Mississippi Expansion Project

Facility or Parish/County	Open Water		Residential		Industrial/ Commercial		Wetlands		Other		TOTAL	
	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.	Temp.	Perm.
42-INCH MAINLINE PIPELINE												
Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)												
DeSoto Parish, LA	0.1	0.0	0.8	0.2	3.3	2.1	1.1	0.2	2.8	1.2	267.4	116.1
Red River Parish, LA	0.1	0.0	0.2	0.2	1.5	0.7	4.1	0.8	0.0	0.0	152.7	57.8
Bienville Parish, LA	0.0	0.0	0.0	0.0	7.4	4.0	22.3	3.4	0.0	0.0	424.7	188.1
Jackson Parish, LA	0.3	0.2	0.2	0.1	7.0	3.8	7.6	0.8	0.1	0.1	391.8	193.0
Ouachita Parish, LA	0.0	0.0	0.0	0.0	3.6	1.3	7.8	1.0	0.0	0.0	292.5	119.3
Richland Parish, LA	0.0	0.0	0.8	0.2	4.0	2.7	25.2	3.2	0.9	0.7	482.2	226.2
Madison Parish, LA	3.2	2.3	0.0	0.0	4.3	0.7	38.0	3.9	0.0	0.0	482.0	225.9
Warren, MS County, MS	7.3	4.0	0.0	0.0	1.9	1.1	1.9	0.2	0.0	0.0	242.6	89.1
Hinds County, MS	0.5	0.3	0.0	0.0	5.2	3.1	11.5	1.0	0.0	0.0	464.7	226.1
Copiah County, MS	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	38.3	17.4
Simpson County, MS	0.0	0.0	2.2	1.3	1.6	0.5	0.4	0.1	0.0	0.0	113.0	43.4
Subtotal Aboveground Facilities	11.4	6.8	4.2	1.9	39.7	20.1	119.7	14.7	3.9	2.1	3351.9	1502.4
Aboveground Facilities												
Carthage Junction Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vixen Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	6.0
Tallulah Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0
McComb Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Texas Gas M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	4.0	3.3
Columbia Gulf M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	4.5
Texas Eastern M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
Gulf South M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.9
Hall Summit Pig Launcher/Receiver	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.8	0.8
Subtotal Aboveground Facilities	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.0	0.0	0.0	32.5	26.5
Extra Work Areas												
Pipe Storage and Contractor Yards	0.0	0.0	0.0	0.0	115	0.0	0.0	0.0	0.0	0.0	150.0	0.0
Access Roads	0.0	0.0	0.0	0.0	45.8	2.7	0.4	0.4	0.0	0.0	103.8	14.1
Subtotal Extra Work Areas	0.0	0.0	0.0	0.0	160.8	2.7	0.4	0.4	0.0	0.0	253.8	14.1
Subtotal 42-inch Mainline Pipeline	11.4	6.8	4.2	1.9	200.8	23.1	120.3	15.1	3.9	2.1	3638.2	1543.0
36-INCH SUPPLY LATERAL PIPELINE												
Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)												
Panola County, TX	0.0	0.0	0.0	0.0	0.7	0.1	2.1	0.1	0.0	0.0	41.7	19.6
Subtotal Pipeline Facilities	0.0	0.0	0.0	0.0	0.7	0.1	2.1	0.1	0.0	0.0	41.7	19.6
Aboveground Facilities												
Enbridge M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.6
Enterprise M&R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.2
Subtotal Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	1.8
Extra Work Areas												
Pipe Storage and Contractor Yards	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0
Access Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Extra Work Areas	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0
Subtotal 36-inch Supply Lateral	0.0	0.0	0.0	0.0	80.7	0.1	2.1	0.1	0.0	0.0	125.2	21.4
TOTAL PROJECT	11.4	6.8	4.2	1.9	281.5	23.2	122.4	15.2	3.9	2.1	3763.4	1564.3

3.8.2 Land Ownership and Easement Requirements

Prior to initiating construction, Gulf South would secure an easement to convey both temporary (for construction) and permanent (for operation) rights-of-way. The easement acquisition process is designed to provide fair compensation to the landowners for the right to use the property for pipeline construction and operation. During the easement acquisition process, Gulf South would compensate landowners for loss of value to specific parcels. The easement agreement between the company and landowner typically specifies compensation for loss of use during construction, loss of nonrenewable or other resources, damage to property during construction, and allowable uses of the permanent right-of-way after construction. During negotiations, Gulf South and affected landowners would address the following:

- allowable uses within the right-of-way;
- mechanisms required to allow the pipeline to be traversed by heavy equipment such as log skidders; and
- minor route adjustments to accommodate landowner needs (provided that the route adjustments do not affect environmentally sensitive areas or other non-consenting landowners).

If an easement cannot be negotiated with a landowner and the proposed Project has been certificated by the FERC, Gulf South could use the right of eminent domain granted to it under Section 7(h) of the NGA and the procedure set forth under the Federal Rules of Civil Procedure (Rule 71A) to obtain the right-of-way and additional temporary workspaces. Although Gulf South would compensate the landowner for the right-of-way and for any damages incurred during construction, a court would determine the level of compensation if a Certificate was issued. In either case, the landowner would be compensated for the use of the land. Eminent domain would not apply to lands under federal ownership.

3.8.3 General Impacts and Mitigation

An area's current use and dominant vegetative community typically determine an area's land use type. Thus, Project impacts that alter land use types do so by either removing defining vegetative communities (such as forested vegetation) or by changing the use of the land (such as converting land from an agricultural use to an industrial use). General impacts to land use type associated with Project construction and operation can be a function of the alteration of one or both of these attributes. The magnitude of land use type conversion depends upon multiple factors including the pre-existing vegetation community recovery time, post-construction restoration methods, preconstruction land use, and allowed post-construction land use. Section 2.3 provides a detailed discussion of the proposed construction methods and post-construction restoration actions for the proposed Project that would dictate the rate of land use type conversion and recovery.

Construction

Following construction, areas outside of the permanent pipeline right-of-way and aboveground facilities would be graded, seeded, or otherwise restored and would be allowed to revert to approximate existing conditions, except where individual landowner agreements negotiated during the easement acquisition process dictate other acceptable restoration measures. As a result, land use type impacts to these areas impacted only by construction would be temporary. Because non-woody vegetation would be expected to return to preconstruction conditions within one to two growing seasons, impacts to lands

currently classified as agricultural, pasture, commercial/industrial, or open land located outside the permanent pipeline right-of-way would be short term and minor.

Forested areas cleared within the construction right-of-way and extra work areas not located within the permanent right-of-way would be allowed to revert to preconstruction conditions and in some cases trees may be replanted. Re-growth of mature trees would take many years, with the duration of recovery dependent on the types and ages of trees removed. As a result, impacts to areas classified as forest and pine plantation lands that are located outside the permanent right-of-way would be long-term.

Sections 2.0 and 4.0 discuss Gulf South's measures to avoid and minimize effects to sensitive land use types through route selection, collocation, and the minimization of construction rights-of-way. Additional discussion of measures that would be implemented to minimize or mitigate impacts to wetlands and vegetation are provided in Sections 3.4 and 3.5, respectively. Despite these minimization measures, proposed Project construction would still result in some long-term impacts in forested areas due to variations in vegetative regrowth rates. Due to the prevalence of these land use types in the affected counties, we believe such impacts would not be significant.

Operation

Permanent land use type changes would occur to those lands contained within the permanent pipeline right-of-way where reversion to the preconstruction land use type would not be compatible with operation of the proposed Project facilities. Land uses not allowed in the permanent pipeline right-of-way would include aboveground construction; below-ground construction; and the growth, planting, or cultivation of trees. Forested and pine plantation land use types therefore would be precluded from the permanent pipeline right-of-way. Allowable land uses generally permitted within the permanent right-of-way would include agriculture, including the use of farming equipment and cultivation of row crops, and pastureland. Permanent changes to land use types would also be associated with the proposed aboveground facilities and those access roads maintained during operations, as acreage required for these facilities would be converted to a commercial/industrial land use type for the life of the proposed Project.

Permanent maintenance of rights-of-way relative to converted land uses and aboveground facilities would have a permanent, lasting affect for at least the life of the Project. Overall, despite the permanent conversion of some land use types in the permanent rights-of-way and at aboveground facilities, we believe the overall Project impact would not be significant given the limited acreage involved.

3.8.3.1 Land Use Type-Specific Impacts and Mitigation

Land use types including open land, open water, industrial/commercial lands, and other lands would not be converted by construction or operation of the proposed Project. Wetlands would be affected by the proposed Project, and these impacts are discussed in detail in Section 3.4. Other land use types, including agriculture, forested areas, pastures, and residential lands would be subject to impacts or conversion of land use and are discussed in more detail below.

Agricultural, Timber, and Pasture Lands

Construction of the proposed Project could affect the productivity of agricultural, timber, and pasture lands within the construction and permanent pipeline rights-of-way. During the pre-filing and scoping periods, we received comments expressing concern for potential proposed Project-related effects to farming, as well as pasture and timber lands. Gulf South proposes to accomplish pipeline construction between May and September 2007, which encompasses the typical growing season. Thus, proposed

Project-related crop losses would occur. As applicable, Gulf South would work with landowners prior to construction to establish compensation agreements for crop damages and for loss of growing time. In accordance with its Plan, Gulf South would implement construction procedures in agricultural areas to minimize potential impacts and restore the right-of-way to approximate preconstruction conditions (see Sections 2.3 and 3.2). Gulf South's Plan requires it to conduct follow up inspections of the disturbed areas after the first and second growing seasons to determine if revegetation was successful. In agricultural areas, revegetation would be considered successful if crop yields are similar to adjacent undisturbed portions of the same field (see Section 3.2).

Gulf South would implement its construction and monitoring procedures in agricultural lands, including pastureland, to minimize adverse effects and ensure proper restoration. However, pastureland disturbed by construction could take several years to return to preconstruction levels of production. In addition, construction through pastureland could temporarily affect some livestock operations, and some landowners could incur additional costs for supplemental livestock feed. Compensation for such losses would be accomplished through the easement negotiation process. To ensure the safety of livestock during construction, Gulf South would either construct temporary fencing to keep livestock away from construction areas or develop a grazing deferment plan to minimize impacts to pastureland during construction and restoration activities in accordance with its Plan.

As discussed above, impacts to forested lands and pine plantation would range from long-term in areas outside the permanent pipeline right-of-way to permanent for areas within the permanent pipeline right-of-way. As such, timber production within the construction and permanent rights-of-way would be temporarily reduced or permanently precluded, respectively. Gulf South would negotiate with affected landowners to obtain an easement agreement that eliminates timber production within the permanent pipeline right-of-way. Compensation for any losses or limitations on future timber production values within the construction and permanent pipeline rights-of-way would be addressed during those easement negotiations. Prescribed burns are often used in the vicinity of the proposed Project to manage planted pines, and pipeline rights-of-way may in some cases serve as fire breaks. Gulf South has committed to coordinating with landowners to mitigate any potential impact to prescribed burning activity caused by the proposed Project.

Appropriate landowner settlements, special construction measures, restoration, and post-construction monitoring would ensure that landowners are able to resume pre-Project activities in construction easements or that such impacts would be mitigated. Further, settlement negotiations would ensure that property owners are fairly compensated for any loss of revenue associated with the construction or operation of the Project.

Existing Residences and Planned Developments

The proposed pipeline would traverse primarily rural, unincorporated areas, thereby avoiding most residences. Four residential structures (at MP 35.3, 40.6, 170.8, and 188.3) would be located within 50 feet of proposed construction work areas. The residential structure at MP 35.3 is within the construction right-of-way; however, it is abandoned and not considered habitable, and would be demolished prior to construction. Approximately 4.2 acres of land classified as residential would be contained within the construction right-of-way or additional temporary workspaces, and 1.9 of those acres would be retained for the permanent right-of-way. During the planning stages for the proposed Project, Gulf South consulted with county and parish planning agencies and reviewed development plans to identify currently filed proposals for residential or commercial developments within 0.25 mile of the proposed construction right-of-way or associated aboveground facilities. No such developments were identified.

General Construction and Operational Impacts to Residences

The general impacts of construction and operation of the proposed Project on residences would result from construction-related disturbances, limitation of land use type within the permanent pipeline right-of-way, and alteration of future development patterns. Specifically, potential construction-related disturbances include inconvenience caused by increased congestion and the noise and dust generated by construction; locally increased traffic; effects on landscaping (including alteration and loss of plantings), wells, and septic systems; and removal of objects such as sheds and trailers from the construction right-of-way. Uses and structures that would be precluded from the permanent pipeline right-of-way include construction of aboveground structures not associated with the proposed Project, construction of septic system leach fields, and planting or cultivation of trees or orchards.

To minimize disruptions to residential areas near construction work areas, Gulf South would attempt to coordinate construction work schedules with affected landowners prior to starting construction. To further minimize impacts to residential areas within the vicinity of construction work areas, Gulf South would implement the following measures on an as-needed basis:

- maintain access to all residences except for brief periods essential to pipe-laying activities;
- where necessary, install temporary safety fencing to control access and minimize the hazards associated with an open trench;
- notify affected landowners in advance of any scheduled disruption of household utilities and limit the duration of any interruption to the smallest time possible;
- repair any damages to residential property that result from construction activities or provide compensation at fair market value; and
- restore all areas disturbed by construction work areas to “as before or better” conditions.

In general, Gulf South sought to avoid residences because construction activities could inconvenience residents, remove or damage shade trees, disrupt landscaping and gardens, and potentially damage structures. For example, operation of large construction equipment in the immediate vicinity of homes can create dust, noise, and/or muddy conditions. Precautions also must be taken to protect pets and small children. As described in Section 2.5, EIs would be responsible for monitoring and ensuring compliance with all environmental mitigation measures required by the FERC Certificate, if granted, including those residential mitigation measures identified above. Additionally, we are interested in ensuring that landowner issues are resolved in an effective and timely manner. Therefore, Gulf South would be required to develop and implement an environmental complaint resolution procedure that provides landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way (see Section 5.2).

We received comments during the pre-filing and scoping periods indicating that the proposed Project route could interfere with plans for construction of homes or other structures. In Section 4.4, we evaluate several route variations that were identified in response to specific landowner requests. During the easement negotiation process, minor reroutes to the proposed Project’s pipeline alignment also could be made in accordance with landowner needs and requirements if they do not impact significant environmental resources or other landowners. Prior to construction, Gulf South would consult with the owners of all structures located within the construction work area, as part of the easement negotiation process, to develop a route or mitigation plan that would minimize impacts to those structures. If a minor reroute could not fully avoid the structures, Gulf South would relocate or replace the structures, or

otherwise compensate the affected landowner per the terms of the agreement negotiated during the easement acquisition process.

3.8.4 Special Interest Areas Impacts and Mitigation

Delhi Municipal Airport

The proposed pipeline route would be located approximately 1,070 feet north of the Delhi Municipal Airport runway (MP 148.2) in Richland Parish, Louisiana. The proposed pipeline would parallel existing natural gas pipelines through this area. The airport has plans for a 2,000-foot runway expansion in the future. Gulf South is consulting with the Federal Aviation Administration (FAA), the airport, and the City of Delhi to determine if the proposed Project would interfere with aircraft operations, the runway safety area, or the runway object-free area. Should the Delhi Municipal Airport runway be extended at some time in the future, Gulf South would work with airport authorities and the FAA to ensure that the proposed Project would comply with all applicable safety regulations. Based on consultation with the City of Delhi following publication of the Draft EIS, Gulf South indicated that future expansion of the Delhi Airport, if approved, would occur at least one year after completion of the East Texas to Mississippi Expansion Project. Furthermore, at the request of City of Delhi officials, Gulf South has agreed to bury the proposed pipeline at an increased depth, with at least seven feet of cover, in order to accommodate possible future grading requirements at the airport.

We believe that the consultations and construction plans described above would prevent adverse impacts to the Delhi Municipal Airport.

Levee Crossings

The proposed Project would cross levees associated with the Red River (MP 27.0), Ouachita River (MP 110.7), and Mississippi River (MP 183.8) in Red River, Ouachita, and Madison Parishes, Louisiana and in Warren County, Mississippi, respectively. These levees provide flood control and augment Louisiana and Mississippi's system of waterborne recreation and transportation.

To determine applicable levee crossing requirements, Gulf South has consulted with the Red River Levee and Drainage District, Fifth Louisiana Levee District, Tensas Basin Levee District, Bossier Levee District, Louisiana Department of Transportation and Development, and the COE. These agencies have reviewed and approved Gulf South's levee crossing plans.

We believe that by Gulf South completing this consultation with the appropriate agencies and by complying with the permitting requirements, that the proposed Project would not negatively impact any levees along the proposed route.

Hazardous Waste Sites

Gulf South used Environmental Data Resources database reviews to identify any known hazardous waste sites within one mile of the proposed Project right-of-way, and identified 37 sites. Seventeen of these sites are located within 0.25 mile of the proposed route. Three Resource Conservation and Recovery Act (RCRA) sites were identified near the proposed Project. The Texas Eastern Transmission Corporation Castor site is located at MP 42.2, approximately 0.4 mile north of the proposed pipeline. This facility is considered a large-quantity waste generator, producing more than 1,000 kg of hazardous or 1 kg of acutely hazardous waste per month. Entergy's Baxter Wilson plant is located near MP 184, approximately 0.7 mile west of the proposed pipeline. This facility is considered a small-quantity waste generator, producing between 100 and 1,000 kg of hazardous waste per month. Vicksburg

Marine is located at MP 185.3, approximately 0.4 mile south of the proposed pipeline. This facility is considered a small-quantity waste generator, producing between 100 and 1,000 kg of hazardous waste per month. The Vicksburg Marine site is identified in the RCRA database; however, MDEQ has no record of contamination there.

In addition to the 37 known hazardous waste site locations, 18 other hazardous waste sites would be located in the proposed Project area for which exact locations are not known (i.e., orphan sites). Eight of these 18 sites are RCRA sites; however, they are believed to be at least one mile from the proposed pipeline. Furthermore, hazardous waste sites typically are associated with existing buildings, which the proposed route has avoided.

In the event that a hazardous waste site is discovered during construction of the proposed Project, Gulf South indicates that it would stop work; notify the appropriate state and federal agencies; and proceed in accordance with local, state, and federal regulations. Gulf South has developed a Contaminated Media Plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations.

Recreational Areas

Recreational areas along the route of the proposed Project consist of natural areas used for hunting, fishing, wildlife viewing, hiking, boating and canoeing, and other outdoor activities. These areas include NRI streams, designated Natural and Scenic streams, WMAs, and national wildlife refuges. These areas are discussed in detail below.

3.8.4.1 Specially Managed Lands Impacts and Mitigation

Specially managed lands are areas administered by federal, state, county, or local agencies; lands of historic or cultural significance; designated environmentally sensitive areas; national or state scenic rivers; and designated scenic areas or roads. This section quantifies potential land use type conversions and recreational impacts at the special interest areas that would be traversed by the proposed Project route.

Sixteenth Section Lands

The Mississippi Secretary of State and the Vicksburg Warren School District informed the FERC about the proposed Project's potential effects on Sixteenth Section Lands in Mississippi. Title for Sixteenth Section Lands is held by the State of Mississippi in trust to support public education (Mississippi Secretary of State 2006). Sixteenth Section Lands provide income to local school districts through the use or lease of lands for silviculture, agriculture, residential, commercial, and industrial uses, and/or hunting activities.

The Mississippi Secretary of State's Office, as the designated supervisory trustee for these Lands, indicated a desire to minimize pipeline crossings of Sixteenth Section Properties to the extent practical. Impacts to these properties from pipeline crossings would result in a loss of land use flexibility, preventing certain future property uses within permanent easements. Unlike properties held by private individuals or companies, any settlement received through easement settlements for Sixteenth Section Lands would be required to be invested in federally secured investments, thereby potentially limiting or decreasing future revenue generation from these lands. The State requested that if it were deemed that these properties could not be avoided, that crossings occur near parcel boundaries to prevent land use fragmentation on these lands.

The proposed Project would cross four Sixteenth Section Lands in Warren and Hinds County, Mississippi (Table 3.8.4-1). Due to these tracts' extensive size and the Project's collocation with existing power lines crossing the properties, avoidance of Sixteenth Section Lands would not be feasible. Deviation from the proposed Project alignment through these parcels would result in the clearing of new corridors, resulting in increased wildlife habitat and vegetation fragmentation. Additionally, Gulf South indicates that it had reached agreement or closed easement agreements with both of the property owners and proposes to cross a portion of one of the properties (MP 196.8 to 197.7) using HDD, thereby avoiding impacts to the ground surface. Gulf South would implement its HDD Contingency Plan in the event of frac-out or HDD failure. Given Gulf South's agreements with landowners, our examination of route alternatives, and attempts to minimize impacts through use of HDD methods, we believe that impacts to Sixteenth Section Lands have been adequately minimized.

Mileposts		Landowner	Routing and Crossing Information
Begin	End		
185.7	186.7	Warren County Board of Education	Gulf South's proposed pipeline would be adjacent to the Entergy power line easement through this property. Any alternative route would not be collocated. The only alternatives to the proposed crossing would involve non-collocated routes that would create a new cleared corridor through the property.
190.7	191.7	Warren County Board of Education	Gulf South's proposed pipeline would be adjacent to the Entergy power line easement through this property. Any alternative route would not be collocated. The only alternatives to the proposed crossing would involve non-collocated routes that would create a new cleared corridor through the property.
196.8	197.7	Hinds County Board of Education	Property from MP 196.8 to 197.4 would be crossed by horizontal directional drill with no surface impacts. From MP 197.4 to 197.7, Gulf South's pipeline would be adjacent to the south side of Entergy's power line easement. The only alternatives to the proposed crossing would involve non-collocated routes that would create a new cleared corridor through the property.
202.7	203.8	Hinds County Board of Education	Gulf South's proposed pipeline would be adjacent to the Entergy power line easement through this property. Any alternative route would not be collocated. The power line traverses the southern portion of the property and a route alternative to the north would cut through the center of the property. A route alternative to the south would impact residential land southwest of this property.

Nationwide Rivers Inventory

Streams included in the NRI are considered to possess "outstandingly remarkable natural or cultural values judged to be of more than local or regional significance" (NPS 2006f). The proposed Project would cross the Big Black River at about MP 196.7 in Warren and Hinds Counties in Mississippi, and the Pearl River at about MP 232.2 in Copiah and Simpson Counties in Mississippi.

The NRI-listed reach of the Big Black River extends from its confluence with the Mississippi River upstream approximately 234 miles. The Big Black River is an unaltered stream in bottomland hardwood habitat that has been recognized for outstanding scenery, recreation, fish, wildlife, history, and cultural values.

The NRI-listed reach of the Pearl River extends from the Gulf of Mexico upstream approximately 152 miles. The Pearl River has been recognized for outstanding scenery, recreation, and wildlife values. Habitat types found along the river include swampland, marsh, and cypress tupelo forest, which provide habitat to a variety of wildlife species.

As described in Sections 2.0 and 3.3, Gulf South would use HDD installation techniques to avoid and minimize impacts to the NRI-designated waterbodies and adjacent riparian areas. As proposed, additional temporary workspaces associated with the Big Black River and Pearl River HDD crossings would result in some impacts to forested areas near these rivers. However, we believe these impacts would be relatively minor as the additional temporary workspaces would be located at least 150 feet from the edge of these streams. We also included a recommendation in Section 3.3 for Gulf South to complete consultations with the NPS regarding these crossings and withdrawal of hydrostatic test waters, and to file plans for additional mitigation measures, if needed. Gulf South's Procedures also include measures to prevent or minimize impacts resulting from the withdrawal or discharge of hydrostatic test waters.

Given the avoidance and minimization measures that would be implemented by Gulf South, as well as the recommended consultation with the NPS, we believe that construction of the proposed Project would not result in a significant impact to the NRI-listed Big Black and Pearl Rivers.

Louisiana Natural and Scenic Rivers

Two streams that would be crossed by the proposed Project, Black Lake Bayou (MP 42.3) and Saline Bayou (MP 57.0), have been designated as Louisiana Natural and Scenic Rivers, pursuant to the Louisiana Scenic Rivers Act. These streams are recognized as having unique and diverse characteristics, and are protected through management by LDWF (LDWF 2006b). Black Lake Bayou offers hiking, boating, fishing, and wildlife viewing opportunities (Recreation.gov 2006). Saline Bayou offers canoeing, floating, and fishing opportunities (NPS 2006g).

As described in Section 3.3, Gulf South would use HDD installation techniques, in accordance with its Procedures, to further avoid and minimize direct impacts at each of these crossings. The proposed crossing of Black Lake Bayou and Saline Bayou, as well as the proposed discharge of hydrostatic test water from each of these sources, would also require approval from LDWF. Gulf South is consulting with LDWF for both of the proposed waterbody crossings, has submitted permit applications, and would be required to complete all agency consultations and receive all approvals and permits prior to the start of construction.

Given the avoidance and minimization measures that would be implemented by Gulf South, as well as those additional mitigation measures that may result from LDWF approval and permitting, we believe that construction of the proposed Project would not result in a significant impact to any designated Louisiana Natural and Scenic River.

Wildlife Management Areas

As described in Section 3.6, the Ouachita WMA is located in Ouachita Parish, Louisiana, and consists of a 9,641-acre site managed by the LDWF. The proposed pipeline route would cross the Ouachita WMA for a distance of approximately 1,000 feet, just west of Bayou Lafourche (MP 115.4).

Impacts to forested lands along all of that distance would be avoided, as the crossing of the Ouachita WMA would be combined with the HDD crossing of Bayou Lafourche. The use of a successful HDD would prevent impacts to the Ouachita WMA and in the event of HDD frac-out or drill failure, Gulf South would implement its HDD Contingency Plan to minimize any potential impacts.

The proposed Project also would pass within 0.25 mile of the Bayou Pierre WMA (approximate MP 22.0 to 23.0) in DeSoto and Red River Parishes, Louisiana. This 2,212-acre WMA, also owned by the LDWF, is bisected by Bayou Pierre and provides waterfowl and upland hunting opportunities. No lands within the Bayou Pierre WMA would be contained within the proposed construction right-of-way, and no impacts to land use would be anticipated during operation of the proposed Project.

We believe that construction and operation of the proposed Project would not result in significant impacts to either the Ouachita or Bayou Pierre WMA. In addition, use of WMA lands and access roads would require prior approval by LDWF. We believe that construction and operation of the proposed Project would not result in significant impacts to the Bayou Pierre WMA; and that use of an HDD would minimize impacts to the Ouachita WMA.

FWS-managed Lands and Easements

The FWS works with private landowners that voluntarily restore wetlands or other valuable wildlife habitats on their property by providing financial assistance from the federal government. One such area is located along the proposed pipeline route near MP 123.2, just east of the Boeuf River in Richland Parish, Louisiana. However, Gulf South has adopted a minor route variation (as described in Section 4.0) that would route the proposed pipeline to the north of the FWS easement. This adopted route variation eliminates any impacts to this particular FWS easement. As discussed in Section 3.7, Gulf South has agreed to modify its proposed route and avoid two areas managed by the FWS' Tensas River NWR complex based on consultations with the FWS. These areas include one U.S. Government fee-owned property managed by the FWS east of Bayou Macon (near MP 150.2) and an FWS easement associated with the Tensas River NWR (near MP 154.0) located in Madison Parish, Louisiana. The proposed Project would not cross the Tensas River NWR proper due to selective routing in Madison Parish, Louisiana.

USDA-managed Lands

The CRP, WRP, and Prior Converted Wetlands are voluntary programs managed by the USDA. The CRP, administered by the FSA, allows owners of agricultural land to conserve those lands through planting of native grasses, trees, and other cover, with financial assistance from the federal government (NRCS 2006a). Typically, these easements retire croplands with erodible soils or otherwise sensitive croplands from production for a period of 10 to 15 years. The WRP and Prior Converted Wetlands are administered by the NRCS. The WRP offers landowners the opportunity to protect, restore, and enhance wetlands located on their property (NRCS 2006a). The program attempts to restore wetland function and wildlife habitat, and to promote long-term conservation through technical and financial assistance. Prior Converted Wetlands are former wetlands converted for agricultural use that are targeted for voluntary restoration under direction of the NRCS and its WRP. After restoration, Prior Converted Wetlands are placed in a permanent, protective easement in exchange for compensation and cost-share assistance.

Gulf South indicates that 16 CRP lands and 17 WRP lands would be crossed by the proposed pipeline route in Red River, Ouachita, Richland, and Madison Parishes, Louisiana; and in Warren and Hinds Counties, Mississippi. Locations of CRP and WRP lands and other information for these sites are summarized in Tables 3.8.4-2 and 3.8.4-3, respectively. The area impacted by the proposed Project would be 91.1 and 132.1 acres for CRP and WRP sites, respectively. The proposed Project would cross

four Prior Converted Wetlands, three located in Red River Parish, Louisiana (MP 24.2, 25.4, and 27.6) and one located in Madison Parish, Louisiana (MP 153.2). Construction of the proposed Project would affect approximately 42.2 acres of Prior Converted Wetlands.

TABLE 3.8.4-2 Conservation Reserve Program Lands Crossed by the Proposed East Texas to Mississippi Expansion Project			
Enter MP	Exit MP	Parish/County	Acreage Impacted
23.1	24.2	Red River Parish, LA	6.1
31.5	31.9	Red River Parish, LA	4.2
151.6	151.7	Madison Parish, LA	2.6
158.2	158.9	Madison Parish, LA	25.1
184.9	184.9	Warren County, MS	0.7
193.3	193.4	Hinds County, MS	1.3
198.2	199.1	Hinds County, MS	12.6
201.8	202.0	Hinds County, MS	2.4
206.7	208.0	Hinds County, MS	18.4
215.3	215.5	Hinds County, MS	2.5
216.5	216.7	Hinds County, MS	1.4
216.8	216.8	Hinds County, MS	0.4
216.9	216.9	Hinds County, MS	1.1
217.0	217.1	Hinds County, MS	2.2
217.2	217.2	Hinds County, MS	0.2
226.3	226.7	Hinds County, MS	4.9
Total			91.1

The proposed pipeline route is collocated with other existing rights-of-way in many places where USDA-managed lands would be crossed. Collocation tends to reduce environmental impacts overall, by reducing the need for clearing of entirely new corridors in greenfield areas. Most of the WRP sites that would be crossed by the proposed Project are located in Madison Parish, Louisiana, which has a high density of these sites thus rendering avoidance impractical. Further, Gulf South proposes a route in Madison Parish that avoids the Tensas River NWR.

As a result of the disturbance caused by the construction of the proposed Project as well as operations, landowners may no longer be eligible to participate in the CRP or to receive the payments that they currently obtain from the FSA due to modified land use or modified vegetation type or strata. Since lands included in the construction or permanent pipeline rights-of-way would potentially be no longer eligible for inclusion in the CRP program, affected landowners could experience an associated financial loss. Gulf South has settled easement agreements with all affected landowners that have tracts enrolled in the CRP. As part of the right-of-way procurement process, Gulf South would have negotiated with the affected landowners to address compensation for any losses or limitations associated with CRP lands.

**TABLE 3.8.4-3
Wetland Reserve Program Lands Crossed by the Proposed
East Texas to Mississippi Expansion Project**

Enter MP	Exit MP	Parish/ County	Acreage Impacted	Impact Avoidance / Minimization Measures
30.2	30.5	Red River Parish, LA	4.3	- collocate with Gulf South's existing pipeline - minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
112.9	113.2	Ouachita Parish, LA	3.2	- collocate with existing pipeline - minimize construction area - restore per NRCS guidance - minimize maintained area
131.0	131.8	Richland Parish, LA	0.0	- avoid impact via HDD
152.1	153.3	Madison Parish, LA	12.7	- minimize construction area - move staging area - restore per NRCS guidance - minimize maintained area - segregate topsoil
153.3	155.1	Madison Parish, LA	10.7	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
154.4	155.2	Madison Parish, LA	5.1	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
155.2	156.9	Madison Parish, LA	23.6	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
156.9	157.3	Madison Parish, LA	5.5	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
157.3	158.2	Madison Parish, LA	11.9	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
163.7	164.0	Madison Parish, LA	2.7	- move HDD exit point to avoid WRP - minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil

**TABLE 3.8.4-3 (continued)
Wetland Reserve Program Lands Crossed by the Proposed
East Texas to Mississippi Expansion Project**

Enter MP	Exit MP	Parish/ County	Acreage Impacted	Impact Avoidance / Minimization Measures
166.8	168.0	Madison Parish, LA	8.9	- modify route to avoid large trees - minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
171.8	172.1	Madison Parish, LA	4.9	- re-route per NRCS guidance to minimize impact - restore per NRCS guidance - minimize maintained area - segregate topsoil
174.5	174.6	Madison Parish, LA	1.2	- re-route closer to existing powerline to minimize impact to large trees - restore per NRCS guidance - minimize maintained area - segregate topsoil
174.7	174.9	Madison Parish, LA	3.1	- re-route closer to existing powerline to minimize impact to large trees - restore per NRCS guidance - minimize maintained area - segregate topsoil
175.1	175.8	Madison Parish, LA	9.2	- re-route closer to existing powerline to minimize impact to large trees - restore per NRCS guidance - minimize maintained area - segregate topsoil
175.8	177.1	Madison Parish, LA	17.5	- cross existing powerline farther east as requested by NRCS - minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
178.1	178.6	Madison Parish, LA	7.6	- minimize construction area - restore per NRCS guidance - minimize maintained area - segregate topsoil
Total			132.1	

Native grasses, trees, and other vegetative cover within CRP lands would be altered by construction and operation of the proposed Project. Gulf South indicated that it would utilize its

revegetation plan as discussed in Section 3.5, as well as its Plan and Procedures, to restore and revegetate impacted CRP lands. Gulf South has not completed consultations with the FSA regarding restoration of these areas. To ensure that impacts are adequately mitigated, **we recommend that:**

- **Prior to construction, Gulf South should consult with the FSA to determine appropriate seed mixes and/or revegetation efforts that should be implemented on CRP lands to minimize and mitigate construction and operations impacts. Gulf South should also retain and have available for inspection any records of consultation(s) with the FSA indicating specific measures agreed upon by Gulf South and the FSA that would be implemented on CRP lands.**

Construction of the Project would temporarily disturb hydric soils and affect wetland and non-wetland vegetation within the WRP easements and Prior Converted Wetland sites. Construction and operation of the proposed Project would affect forested and wetland areas in a similar manner as described above and in Sections 3.4 and 3.5. The greatest and longest-lasting impacts would be to forested areas, which would be long-term to allow for regrowth or permanent in the maintained right-of-way.

Gulf South continues to consult with NRCS regarding the crossing of WRP lands and Prior Converted Wetlands, as well as considerations for routing, construction methods, revegetation, and other impact minimization measures. Based on the results of these ongoing consultations with NRCS, Gulf South developed a series of impact minimization or mitigation measures for WRP lands. In general, impact minimization measures proposed by Gulf South include reduction of the construction footprint, restoration of contours and revegetation per NRCS guidance, minimization of the permanently maintained right-of-way, and topsoil segregation (Table 3.8.4-3). Specific impact avoidance or minimization measures proposed by Gulf South (Table 3.8.4-3) includes the movement of HDD workspace to entirely avoid and minimize impacts at two WRP sites (MPs 149.7 and 163.7, respectively), use of HDD to avoid surface impacts (MP 131.0), adjustment of the location of a staging area (MP 152.1), and modification of the proposed route, primarily to avoid large trees (MPs 166.8, 171.8, 174.5, 174.7, 175.1, and 175.8). Additionally, Gulf South developed other special construction and operational measures in consultation with NRCS to minimize impacts to the WRP site located near the Tensas River NWR that are associated with habitat for the Louisiana black bear (see Section 3.7.1.4). We believe that these impact avoidance, minimization, and mitigation measures are appropriate. However, consultations between Gulf South and NRCS have not been finalized and Warranty Easement Deed Subordination Agreements have not yet been completed. Since consultations with the NRCS are not complete, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, its final site-specific plans for WRP crossings.**

Based on the characteristics of USDA-managed lands, Gulf South's proposed construction measures, additional measures to avoid and minimize impacts to WRP lands, and our above recommendations, we believe that impacts to USDA-managed lands would be adequately minimized.

3.8.5 Transportation

Construction of the proposed Project would result in temporary and minor traffic delays related to road closures and lane blockages. The proposed Project area is predominately comprised of low-density, rural areas. As such, existing transportation infrastructure in the area traversed by the proposed Project route includes mostly rural roads and highways. In addition, Gulf South reports that the majority of construction-related traffic would occur in the early morning and late evening, outside the normal times of

expected peak traffic. As such, we believe that congestion-related delays would not occur in association with construction of the proposed Project.

The proposed pipeline route would cross approximately 42 major U.S. or state and interstate highways (Table 3.8.5-1), including Interstate 49 and Interstate 55, as well as numerous railroads and lightly traveled paved and unimproved, unpaved rural roads. As described in Section 2.3, all railroads, major highways, and interstates would be crossed using subsurface boring techniques to avoid road and lane closures. Most major road crossings would be bored; however crossings at Interstate 49 (MP 14.7), U.S. Highway 167 (MP 73.0), State Highway 34 (MP 90.0), State Highway 602 (MP 172.9 and 177.6), U.S. Highway 61 (MP 185.3), and Interstate 55/Highway 51 (MP 227.1) would be accomplished via HDD methods. Often associated with the crossing of adjacent waterbody features, HDD crossings also would avoid closure of those roadways. Pipeline crossings of more lightly traveled paved and unimproved, unpaved rural roads typically would be accomplished via open-cut installation, which could require temporary lane blockages and closures and implementation of detours, where feasible. In the absence of a reasonable detour, construction across the roadway would be staged to allow at least one lane of traffic to remain open except for the limited periods required for installing the pipeline. Efforts also would be made to schedule lane closures outside of peak traffic periods.

Construction across all roadway features would be accomplished in accordance with Gulf South's Plan and the requirements of all applicable crossing permits and approvals. Therefore, any effects to local transportation patterns or infrastructure would be temporary and minor. As periodic maintenance and inspection activities along the proposed pipeline route would involve only infrequent light vehicle movement, we believe that no impacts to transportation would be expected during operation of the proposed Project.

Facility/Road Name	Parish/County	Milepost
US Highway 171	DeSoto Parish, LA	4.5
State Highway 175	DeSoto Parish, LA	12.2
Interstate 49	DeSoto Parish, LA	14.7
State Highway 1	Red River Parish, LA	26.0
State Highway 515	Red River Parish, LA	28.4
U.S. Highway 71	Red River Parish, LA	30.7
State Highway 783	Red River Parish, LA	35.9
U.S. Highway 371 / State Highway 7	Bienville Parish, LA	38.5
State Highway 4	Bienville Parish, LA	41.9
State Highway 792	Bienville Parish, LA	44.6
State Highway 507 / Kepler Road	Bienville Parish, LA	45.7
State Highway 9	Bienville Parish, LA	56.4
State Highway 155	Bienville Parish, LA	62.6
State Highway 147 / Arcadia Hwy	Jackson Parish, LA	70.2
U.S. Highway 167	Jackson Parish, LA	73.0
State Highway 542 / Beech Springs Road	Jackson Parish, LA	76.5

TABLE 3.8.5-1 (continued)
Major Highway Road Crossings for the Proposed
East Texas to Mississippi Expansion Project^a

Facility/Road Name	Parish/County	Milepost
State Highway 811 / Gladway Road	Jackson Parish, LA	78.2
State Highway 146	Jackson Parish, LA	87.8
State Highway 34	Jackson Parish, LA	90.0
State Highway 548	Jackson Parish, LA	90.8
State Highway 548	Jackson Parish, LA	96.1
State Highway 557	Ouachita Parish, LA	101.5
State Highway 846	Ouachita Parish, LA	102.7
State Highway 165	Ouachita Parish, LA	111.4
State Highway 133	Richland Parish, LA	120.5
State Highway 135	Richland Parish, LA	124.9
State Highway 15	Richland Parish, LA	128.8
State Highway 137	Richland Parish, LA	130.2
State Highway 584 / Burke Road	Richland Parish, LA	137.1
State Highway 2263 / Mengel Road	Richland Parish, LA	138.0
State Highway 609	Richland Parish, LA	142.5
State Highway 17	Richland Parish, LA	149.0
State Highway 577	Madison Parish, LA	153.3
Highway 603	Madison Parish, LA	166.1
US Highway 65	Madison Parish, LA	166.8
State Highway 602	Madison Parish, LA	172.9
State Highway 602	Madison Parish, LA	177.6
US Highway 61	Warren County, MS	185.3
State Highway 27	Warren County, MS	193.6
Highway 18	Hinds County, MS	213.4
Interstate 55 / State Highway 51	Hinds County, MS	227.1
Highway 473	Hinds County, MS	230.3
Notes:		
^a All major roads would be crossed using subsurface boring or drilling techniques.		

3.8.6 Visual Resources

Visual resources refer to the composite of basic terrain, geologic features, hydrologic features, vegetative patterns, and anthropogenic features that influence the visual appeal of an area for residents or visitors. The proposed Project could alter existing visual resources in three ways: (1) construction activity and equipment may temporarily alter viewsapes, (2) construction and right-of-way maintenance would alter existing vegetation patterns, and (3) aboveground facilities would represent permanent alterations to the viewscape. The significance of these visual impacts primarily would depend on the quality of the current viewshed, the degree of alteration of that view, the number of potential viewers, and the perspective of the viewer.

3.8.6.1 Current Viewshed

Most of the proposed Project would extend through rural areas that consist of pine plantations, forested lands, pastures, and agricultural lands with scattered residences. Most areas along the route do not provide long-range unobstructed views, in part because of the topography and in part because much of the land adjacent to the proposed route is forested. However, public viewpoints are present along some of the roadways in the Project area.

3.8.6.2 General Impacts and Mitigation

Pipeline Facilities

During construction, there would be temporary impacts to visual quality for viewers in the vicinity of the construction right-of-way due to the presence of construction equipment, work crews, and construction activities. This temporary alteration to the views likely would be perceived by some as detrimental while others may derive enjoyment from viewing construction activity. In either case, pipeline construction would represent a short-term, localized alteration to visual resources of the Project area.

After completion of construction, the temporary right-of-way would be restored to approximately preconstruction contours and would be allowed to revert to preconstruction uses and land use type. About 42 percent of the proposed pipeline route would traverse agricultural, pasture, and open lands. Pipeline installation in these areas would not result in a significant change to visual resources, as existing vegetative patterns would not be affected during operation of the proposed Project. However, affected forested areas outside the permanent pipeline right-of-way could take many years to recover, and forested land within the permanent right-of-way would be maintained in a condition free of woody vegetation for the life of the Project. To reduce visual impacts related to the permanent pipeline corridor, Gulf South's proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation. In these areas where the proposed pipeline would be collocated with existing rights-of-way, the visual impacts of the proposed Project would be minor because widening of the existing corridor would not significantly alter existing visual resources. The long-term visual impacts resulting from views of the corridor in existing forested areas where the proposed route would not be collocated with existing rights-of-way generally would be limited to a relatively small number of individuals, or brief observations afforded in areas where the corridor intersects roadways. As a result, we believe the visual impact of the permanent pipeline corridor would be minor.

Gulf South avoids crossing state and federally managed lands to the extent possible and also has avoided most scenic vistas. As described above, however, the proposed Project route would cross two NRI-listed rivers and two Louisiana State Natural and Scenic Rivers, all of which have been noted for their visual character, as well as the Ouachita WMA. The crossing of all of these resources would be accomplished via HDD, and the crossings of the two Natural and Scenic Rivers would be located in proximity to an existing, open utility right-of-way crossing. Therefore, construction and operation of the proposed Project would not result in creation or expansion of an existing corridor, and we believe long-term visual impacts to these features would be minimal.

Aboveground Facilities

The proposed Project would include installation of additional compression at one compressor station and construction and operation of two new compressor stations, six M/R stations, 11 MLVs, nine side valves, and five pig launcher/receiver facilities. Most of the aboveground facilities would either be

constructed in areas where existing viewsheds contain similar features or where views would be occluded by existing vegetation or topography. Given the limited visibility of these sites, screening provided by existing vegetation or landscaping, and frequent collocation with existing utility rights-of-way or industrial facilities, the aboveground facilities as a group would represent a minor visual alteration that would persist for the life of the Project. The potential site-specific visual impacts of each aboveground facility are described below.

Compressor Stations

The proposed compressor station sites would typically contain several buildings, including those housing compressor units and other associated equipment. Aboveground features outside the buildings themselves would include piping and pig launcher/receiver facilities. Portions of these sites may be paved, covered with gravel, or landscaped, depending on facility operations and maintenance requirements. A chain-link fence would surround the perimeter of each compressor station site.

The existing Carthage Junction Compressor Station is located at MP H0.0 of the 36-inch-pipeline supply lateral in Panola County, Texas. Additional compression would be added within this existing compressor station. Thus, any visual impacts from new aboveground facilities would be consistent with the existing visual setting.

The McComb Compressor Station is located in Walthall County, Mississippi, approximately 48 miles south of the terminus of the proposed pipeline. Approximately 350 feet of new 26-inch-diameter yard and station piping would be installed within the yard of this existing station. Given the existing industrial setting of this area, no new visual impacts would occur at this station. Similarly, new pig launching and receiving facilities would be installed within the yard of the existing Hall Summit Compressor Station, but no visual impacts are anticipated.

The proposed Vixen Compressor Station would be located at MP 99.4 in Ouachita Parish, Louisiana in an area dominated by managed pine plantation. Gulf South would purchase approximately 20 acres in this area, but would disturb only about 8 acres, and would permanently maintain only about 6 acres. The undisturbed 12 acres would remain as pine forest, and 2 acres would be allowed to revert to natural conditions. The proposed site is completely surrounded by planted pine trees, which would visually screen the compressor station. No existing residences or businesses would be within view of the Vixen Compressor Station.

The Tallulah Compressor Station would be located at MP 167.6 in Madison Parish, Louisiana. Gulf South proposes to purchase approximately 25 acres in this location. The proposed compressor station site would consist of approximately 10 acres of agricultural land, all of which would be permanently impacted. Although the Tallulah Compressor Station would be located in an agricultural field, it would be visually screened on the east, south, and west sides by existing forested vegetation. The proposed compressor station may be visible to one residence and one non-residential structure, both located approximately 3,700 feet to the northeast of the Tallulah Compressor Station. However, given the distance between the proposed Tallulah Compressor Station and the structures, adverse visual impacts would be unlikely.

Overall, we believe that the change in visual quality in the vicinity of the compressor stations would affect few viewers and would result in a minor long-term impact.

MLV, Side Valve, and M/R Sites

MLV sites would consist of a 50- by 50-foot area surrounded by a chain-link fence within the confines of the permanent pipeline right-of-way. Aboveground elements of each MLV site would include 12-inch-diameter piping, with valving extending aboveground for blowoffs and bypass.

Based on review of aerial alignment sheets and information provided by Gulf South, it is likely that a MLV would be visible from nearby residences in one location (MP 129.8). The MLV at MP 129.8 would be located in an agricultural field currently lacking existing vegetation. This facility would be visible to a residence located approximately 500 feet to the south of this proposed facility. To reduce the potential for visual impacts to residences, Gulf South proposes to add a vegetative buffer at the proposed MLV at MP 129.8. The other proposed MLVs and side valves appear to be either located adjacent to other aboveground facilities or would not be generally visible to nearby residents or the public due to existing vegetation or other visual screens. Each of the visible MLVs would appear as a small fenced area within a cleared right-of-way corridor unless the valve is located in an open field. Although this would result in a long-term effect on visual quality, the significance of the impact would vary with the viewer. Our intent is to screen these facilities from nearby residents when needed, particularly for those who may not own the land that the aboveground facility is placed on. Since one residence is located within sight of one of the above-mentioned facilities and a detailed screening plan has not been provided, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, a final site screening plan for the proposed MLV at MP 129.8.**

M/R stations would be constructed adjacent to the cleared pipeline right-of-way at each of the proposed Project receipt and interconnect points to meter the flow and adjust the pressure of natural gas received from or delivered to those systems. Each M/R station would include meter and regulator equipment, flow pressure control equipment, and a customer facility housed within a fenced perimeter. The Enterprise (MP H3.3) M/R Stations also would include a pig launcher. Sizes of the proposed M/R stations would vary from 1.0 to 4.0 acres.

The Columbia Gulf (149.4), Texas Eastern (MP 219.7), Gulf South (MP 238.6), Enterprise (MP H3.3), and Enbridge (MP H2.7) M/R Stations would be constructed in areas lacking nearby residences. Additionally, these stations would be constructed wholly or partially within, and largely screened by, pine plantation or forested land, further limiting the visual impact of these facilities. The location of the Texas Gas (MP 112.3) M/R Station was modified after publication of the Draft EIS and would be located approximately 600 feet southeast of an existing residence near the edge of a forested area. Gulf South has proposed to retain existing trees to provide a visual buffer and to add vegetative buffers where needed to mitigate potential visual intrusion. Given these measures, we believe any potential visual impacts resulting from the modified location of the Texas Gas M/R Station would be adequately minimized.

With the placement of a vegetative screen around the MLV located at MP 129.8, combined with the lack of proximate residences to other above ground facilities, we believe that the proposed Project would not result any significant impact on local viewsheds.

3.8.7 Conclusion Regarding Impacts to Land Use, Recreation and Special Interest Areas, and Visual Resources

The proposed Project would affect multiple land use types, with long-term or permanent impacts to forested areas. However, these impacts would not be significant overall given the amount of forested lands in the vicinity of the proposed Project. Additionally, most of the impacts to other land use types would not result in a permanent conversion of use. Several special interest areas and specially managed lands would also be affected by the proposed Project, but based on Gulf South's proposed measures and plans, ongoing consultations with managing authorities, and our recommendations, we believe that potential impacts would be adequately minimized. Visual resources would generally not be affected by the proposed Project, and we have included a recommendation that would minimize impacts in one location.

3.9 SOCIOECONOMICS

3.9.1 Region of Influence

The proposed Project would consist of approximately 240.3 miles of 42-inch-diameter interstate natural gas pipeline, 3.3 miles of 36-inch-diameter pipe supply laterals, compression upgrades at an existing compressor station, two new compressor stations, and associated ancillary facilities, as described in Section 2.1. The proposed pipelines and associated facilities would be located in one county in Texas (Panola), seven parishes in Louisiana (DeSoto, Red River, Bienville, Jackson, Ouachita, Richland, and Madison), and five counties in Mississippi (Warren, Hinds, Copiah, Simpson, and Walthall). For the purposes of our socioeconomic analysis, we define these counties and parishes as the proposed Project's region of influence.

If the proposed Project was constructed, several potential socioeconomic effects could manifest themselves within the region of influence. Construction-related effects could include alteration of population levels or local demographics, increased demand for housing or public services, and increased employment opportunities. In addition, construction would result in increased government revenue associated with sales and payroll taxes. Potential socioeconomic impacts associated with operation of the proposed Project would include employment opportunities, ongoing local expenditures by the operating company, an increased tax base, and an increase in the demand for provision of public services.

3.9.2 Population

Table 3.9.2-1 reports populations and selected demographic characteristics in the states, counties, and parishes that would be traversed by the proposed Project. Based on census data for the year 2000 (U.S. Bureau of the Census 2006a), the total population in these counties and parishes is 642,244. Populations in the area were relatively stable between 1990 and 2000; only Simpson County and Madison Parish had more than a 5.6-percent change in population over the 10-year period.

Population densities in the region of influence range from a low of 19.4 persons per square mile in Bienville Parish to a high of 285.9 persons per square mile in Hinds County. These densities are consistent with rural areas and with averages reported for their respective states.

The number of residents within the region of influence would increase temporarily during construction. Construction is scheduled for between May and September 2007; the peak construction workforce would be 2,800 workers, of which about 98 percent (2,744) would be non-local. Assuming that 0.8 family members (FERC 2003) would accompany each non-local worker, total

**TABLE 3.9.2-1
Existing Population and Demographics Conditions within the
Region of Influence for the Proposed East Texas to Mississippi Expansion Project^a**

County/Parish	2004 Population	Population Change since 1990 (%)	Population Density	White, Non Hispanic (%)	Black or African American (%)	Hispanic (%)	Asian (%)	Native American (%)
Texas	20,490,022	22.8	79.6	52.4	11.5	32.0	2.7	0.6
Panola County	22,756	3.3	28.4	77.5	17.7	3.5	0.2	0.4
Louisiana	4,515,770	5.9	102.6	62.5	32.5	2.4	1.2	0.6
DeSoto Parish	25,494	-0.7	29.1	55.3	42.2	1.6	0.1	0.5
Red River Parish	9,622	1.0	24.7	57.6	40.9	1.0	0.1	0.3
Bienville Parish	15,752	-3.0	19.4	54.6	43.8	0.9	0.2	0.3
Jackson Parish	15,397	-2.9	27.0	70.7	27.9	0.6	0.2	0.3
Ouachita Parish	147,250	3.6	241.2	63.8	33.6	1.2	0.6	0.2
Richland Parish	20,981	1.7	37.6	60.4	38.0	1.1	0.2	0.1
Madison Parish	12,996	10.2	22.0	37.1	60.3	2.1	0.2	0.2
Mississippi	2,844,658	2.7	60.6	59.9	36.8	1.7	0.7	0.5
Warren County	49,644	-1.0	80.2	52.2	45.1	1.2	0.8	0.2
Hinds County	250,800	-1.4	285.9	33.7	64.3	0.9	0.6	0.1
Copiah County	28,757	4.2	36.9	47.9	50.2	1.3	0.2	0.1
Simpson County	27,639	15.4	46.8	63.3	34.8	1.4	0.1	0.1
Walthall County	15,156	5.6	37.5	54.1	44.5	1.3	0.3	0.2

Note:
^a Source: U.S. Bureau of the Census 2006a.

construction-related immigration would be approximately 4,939 persons. This population impact would be significant if all non-local workers, accompanied by 0.8 family members, were contained in one county or parish. However, the Applicant indicates that construction of the pipeline would entail the simultaneous activity of four individual construction spreads over the proposed Project route. Additional work crews also would be employed for specialty installation procedures, such as HDD crossings. As such, these workers would be distributed along the length of proposed Project route and throughout the region of influence, thereby minimizing the potential population level and demographic effects experienced by any individual county or parish.

As described above, construction-related immigration would be spread across the length of the proposed pipeline. Based on the miles of pipeline in each county, population impacts associated with non-local workers and their families are expected to range from 3.2 to 0.1 percent, on average. This would represent a minor, temporary population increase that would be confined to the period of Project construction. The FERC does not believe that the demographic profile of the workforce would significantly differ from that observed within the region of influence. As such, changes to local demographics would not be anticipated.

During operation, the Applicant estimates that the proposed Project would employ approximately 12 full-time workers. This would represent a negligible, long-term population and demographic alteration.

3.9.3 Economy and Employment

The civilian labor force within the region of influence includes about 291,519 individuals. The major employment sector is educational, health, and social services. On average, the counties and parishes within the region of influence report unemployment rates similar to rates prevailing in their respective states. However, 10 of the 13 counties and parishes report income somewhat below the state average (Table 3.9.3-1).

TABLE 3.9.3-1
Existing Income and Employment Conditions within the
Region of Influence for the Proposed East Texas to Mississippi Expansion Project^a

County/Parish	Per Capita Income (\$)	1999 Population below Poverty Level (%)	Civilian Labor Force	Unemployment Rate (%) ^b	Major Industry
Texas	\$19,617	15.4	9,830,559	5.3	Educational, health, and social services
Panola County	\$15,439	14.1	9,692	4.9	Educational, health, and social services
Louisiana	\$16,912	19.6	1,997,995	7.1	Educational, health, and social services
DeSoto Parish	\$13,606	25.1	10,563	6.8	Educational, health, and social services
Red River Parish	\$12,119	29.9	3,563	8.9	Educational, health, and social services
Bienville Parish	\$12,471	26.1	5,939	7.3	Educational, health, and social services
Jackson Parish	\$15,354	19.8	6,504	6.0	Manufacturing
Ouachita Parish	\$17,084	20.7	69,818	6.1	Educational, health, and social services
Richland Parish	\$12,479	27.9	8,258	7.8	Educational, health, and social services
Madison Parish	\$10,114	28.5	4,883	9.7	Educational, health, and social services
Mississippi	\$15,853	19.9	1,267,092	7.9	Educational, health, and social services
Warren County	\$17,527	18.7	23,641	7.6	Educational, health, and social services
Hinds County	\$17,785	19.9	118,908	6.9	Educational, health, and social services
Copiah County	\$12,408	25.1	12,149	8.4	Educational, health, and social services
Simpson County	\$13,444	21.6	11,324	6.5	Educational, health, and social services
Walthall County	\$12,563	27.8	6,277	9.8	Manufacturing

Notes:

^a Source: U.S. Census Bureau 2006a.

^b Annual average of 2005 Local Area Unemployment Statistics (Bureau of Labor Statistics 2006).

Construction of the proposed Project would result in hiring approximately 56 local workers. Additional jobs also would be created from secondary activity associated with construction of the proposed Project, as purchases made by non-local workers on food, clothing, lodging, gasoline, and entertainment would have a temporary, stimulatory effect on the local economy. These jobs would represent a temporary, minor increase in employment opportunities within the region of influence.

During operation, the proposed Project would create 12 full-time positions. This would represent a minor, permanent increase in employment opportunities.

3.9.4 Housing

Table 3.9.4-1 reports selected housing statistics for the region of influence. Within this region, there are approximately 8,485 vacant rental units and an additional 4,033 units used for seasonal, recreational, or occasional use. Approximately 9,339 hotel or motel rooms supplement this potential housing stock.

County/Parish	Vacant Rental Units ^a	Units for Seasonal, Recreational, or Occasional Use ^a	Number of Hotel/Motel Rooms	Total Units
Texas	294,240	151,919	N/A	446,159
Panola County	227	414	125 ^b	766
Louisiana	54,185	30,333	N/A	84,518
DeSoto Parish	231	327	129 ^c	687
Red River Parish	67	59	58 ^c	184
Bienville Parish	128	693	90 ^c	911
Jackson Parish	195	491	24 ^d	710
Ouachita Parish	1,969	395	1,215 ^{e,f}	3,579
Richland Parish	159	246	160 ^f	565
Madison Parish	104	167	34 ^e	305
Mississippi	29,486	21,845	N/A	51,331
Warren County	822	199	1,672	2,693
Hinds County	4,154	421	5,597	10,172
Copiah County	191	176	145	512
Simpson County	161	202	60	423
Walthall County	77	243	30	350
Total	8,485	4,033	9,339	21,857

Notes:

^a Source: U.S. Bureau of the Census 2006b.

^b Source: Texas Economic Development 2006.

^c Source: The Coordinating & Development Corporation 2006.

^d Source: Jonesboro Budget Inn 2006.

^e Source: ePodunk 2006.

^f Source: Hotel-Rates.com 2006.

^g Source: Mississippi Hotel Guides 2006.

At its peak, construction of the proposed Project would require about 2,744 non-local workers, as described in Section 3.9.2. If each worker required his or her own housing unit, the non-local work force would occupy about 3 percent of the temporary housing within the region of influence. Thus, the temporary housing appears capable of meeting the temporary and moderately increased housing demand that would result from construction of the proposed Project. The housing demands of the 12 individuals employed during operation of the proposed Project would represent a negligible increase in housing demand.

3.9.5 Property Values

The FERC frequently receives comments regarding Project impacts on property values. These concerns generally center on four topics: devaluation of property if encumbered by a pipeline easement, identification of the party responsible for property taxes within a pipeline easement, the potential for Project effects on landowner insurance premiums, and the potential for reduced property values associated with lost timber and agricultural production.

The impact that a natural gas project may have on the value of any land parcel depends on many factors. These include the size of the parcel, the parcel's current value and land use, and the value of other nearby properties. Subjective valuation is generally not considered in appraisals. This is not to say that the proposed Project would not affect resale values. Potential purchasers may make a decision based on intended future use and, if the presence of the proposed Project would make that use infeasible, it is possible that a potential purchaser may not acquire the parcel. However, each potential purchaser has differing criteria and means.

Landowners are responsible for all property taxes levied against parcels, and this responsibility would be independent of the existence of any Project-related pipeline easement. However, if a landowner felt that the proposed Project, should it be constructed, reduced the value of their property, he or she could appeal the assessment and subsequent property taxation to the local property taxation agency. If the parcel were re-appraised, the landowner would then be responsible for property taxes based on an appraisal that directly incorporated the easement.

As described in Section 3.8, construction and operation of the proposed Project would result in a temporary loss of timber and agricultural productivity and a permanent conversion of some lands currently used for forestry operations to a maintained utility right-of-way. During easement negotiations, compensation for any loss of current or future agricultural and timber production would be considered.

3.9.6 Government Revenue

During construction, a portion of the estimated \$130-million Project construction payroll would be spent locally for the purchase of housing, food, gasoline, and entertainment. The exact amount would be dependent on the proportion of the workforce that was local, the behavior of individual workers, and the duration of their stay. The majority of those construction-related expenditures would be subject to Texas' state sales tax of 6.25 percent, Louisiana's state sales tax of 4 percent, or Mississippi's 7 percent rate. This increase in sales tax revenues would represent a minor, short-term increase in government revenues.

Table 3.9.6-1 contains the Applicant's estimate of the annual taxes that would be payable to each county and parish traversed by the proposed Project. On average, operations-related taxes would represent approximately 2.0 percent of each individual county's total revenues. Thus, operation of the proposed Project would provide a permanent, minor increase in government revenues.

**TABLE 3.9.6-1
County Revenue and Estimated Annual Taxes
for the Proposed East Texas to Mississippi Expansion Project**

County/Parish	Total Revenue^a	Estimated Annual Taxes	Percent Change
Texas			
Panola County	\$64,292,000	\$518,053	0.8
Louisiana			
DeSoto Parish	\$61,044,000	\$907,604	1.5
Red River Parish	\$16,467,000	\$618,821	3.8
Bienville Parish	\$30,496,000	\$1,361,406	4.5
Jackson Parish	\$22,833,000	\$1,155,132	5.1
Ouachita Parish	\$296,142,000	\$660,075	0.2
Richland Parish	\$55,064,000	\$1,526,424	2.8
Madison Parish	\$21,135,000	\$1,361,406	6.4
Mississippi			
Warren County	\$108,653,000	\$553,382	0.4
Hinds County	\$553,902,000	\$899,247	0.2
Copiah County	\$50,163,000	\$276,691	0.2
Simpson County	\$39,764,000	\$103,759	0.5
Walthall County	\$26,813,000	\$2,001	0.1
Total	\$1,346,768,000	\$9,942,000	2.0
Note:			
^a Source: U.S. Bureau of the Census 2006c.			

3.9.7 Public Services

Table 3.9.7-1 summarizes the number of full-time equivalent educational, medical, police, and fire protection employees in the counties and parishes traversed by the proposed Project. These employees serve a population of approximately 642,244 people (Table 3.9.1-1).

Construction of the proposed Project would temporarily increase demand for medical, police, and fire protection services. The Applicant has consulted with the counties and parishes in the region of influence and believes that sufficient public services exist to meet Project-related needs. Further, the Applicant would work with local law enforcement and emergency response agencies to coordinate effective emergency response for the proposed Project during construction and operation (see Section 3.12.1).

We note that construction of the proposed Project would occur during a portion of the school year, and a significant influx of students would place considerable strain on the region's approximately 17,931 education workers. However, due to the nature of the proposed construction and its relatively short duration (4 to 6 months), non-local workers are not expected to be accompanied by substantive numbers of children. Thus, any impact would be minor and temporary.

**TABLE 3.9.7-1
Existing Educational, Medical, Police, and Fire Full-time Equivalents
within the Region of Influence for the Proposed East Texas to Mississippi Expansion Project^a**

County/Parish	Education	Health and Hospitals	Police Protection	Fire Protection	Total Health, Fire, and Police
Texas	539,530	62,160	52,718	18,680	133,558
Panola County	780	140	44	3	187
Louisiana	101,050	13,675	11,791	4,280	29,746
DeSoto Parish	673	0	47	9	56
Red River Parish	338	0	43	0	43
Bienville Parish	430	0	38	0	38
Jackson Parish	421	178	41	5	224
Ouachita Parish	3,657	24	442	374	840
Richland Parish	600	403	21	4	428
Madison Parish	386	0	1	0	387
Mississippi	69,336	17,855	7,094	3,164	28,113
Warren County	1,122	1	165	150	316
Hinds County	7,412	0	1,194	446	1,640
Copiah County	791	141	58	15	214
Simpson County	655	53	51	0	104
Walthall County	366	152	18	3	539
Total	17,631	1,092	2,163	1,009	11,915

Note:
^a Source: U.S. Bureau of the Census 2005.

During operation, workers filling the 12 full-time positions and their associated family members would represent a minor, permanent increase in the demand for provision of public services. However, this increased demand would be offset by the Project-related increase in government revenues associated with operation.

3.9.8 Impacts on Specific Economic Sectors

Below, we consider the potential for the proposed Project to result in significant effects to the agriculture and forestry economic sectors. These sectors are defined to include activities associated with harvested crops, timber production, livestock pasturing, and dairy production. This analysis focuses on the effects of potential land use changes (i.e., incorporation of agricultural lands into the construction or permanent rights-of-way) on regional economic sectors. Additional discussion of the potential for site-specific effects to agricultural or forestry lands that would be crossed by the proposed pipeline route is in Sections 3.2 and 3.8.

Approximately 57 percent of Texas is described as rangeland. Texas cover types also include cropland (16 percent), pastureland (10 percent), and forested land (6 percent). Approximately 47 percent of Louisiana is described as forested land, 21 percent is cropland, 9 percent is pastureland; and less than 1 percent is rangeland. Mississippi is 55 percent forested land, 18 percent cropland, 12 percent pastureland, and less than 1 percent rangeland (NRCS 2006g). Cropland in the region of influence is primarily concentrated between the Ouachita and Mississippi Rivers (Ouachita and Richland Parishes)

and along the Red River (Red River Parish). Rangeland is dispersed relatively evenly throughout the region of influence, with forested land generally abundant west of the Ouachita River.

As described in Section 3.8, construction and operation of the proposed Project would permanently affect approximately 476.3 acres of agricultural land and 357.7 acres of lands currently utilized for commercial forestry practices, as these areas would be contained within the permanent pipeline right-of-way. As discussed throughout this EIS, agricultural operations within the vast majority of permanent pipeline right-of-way would not be precluded during operations. As affected agricultural lands would largely return to their preconstruction condition and use, no significant effect to that economic sector would be anticipated in association with construction and operation of the proposed Project. Commercial forestry practices would be permanently precluded within the permanent pipeline right-of-way. However, given the magnitude of the land potentially affected relative to the total amount of land dedicated to sector production, no quantifiable impacts to the forestry economic sector would be expected.

3.10 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to take into account the effect of its undertakings (including the issuance of Certificates) on any properties listed in, or eligible for listing in, the NRHP and to provide the ACHP an opportunity to comment on the undertaking. Gulf South, as a non-federal party, is assisting the FERC in meeting its obligation under Section 106 of the NHPA by conducting the field surveys and evaluations required by ACHP regulations in 36 CFR 800.

3.10.1 Results of Cultural Resources Survey

Gulf South conducted cultural resources surveys from March 2006 through March 2007 for the proposed pipeline, compressor station sites, associated aboveground ancillary facilities, and access roads for the proposed Project within Texas, Louisiana, and Mississippi. The survey of the proposed pipeline was conducted within a 200-foot-wide survey corridor centered on the proposed pipeline route. The proposed Project includes a 3.3-mile section located in Panola County, Texas, as well as a 240.3-mile proposed pipeline route, extending from Keatchie, Louisiana to Harrisville, Mississippi. Gulf South has completed cultural resources surveys for all of the proposed Project area except for the specific areas described for each state below.

3.10.1.1 Texas

The survey within the Texas portion of the proposed Project associated with the pipeline identified no cultural resources within the proposed Project area. The cultural resources survey report dated July 28, 2006 was submitted to the Texas SHPO, who concurred with the consultant's recommendations. We also concur. Gulf South has not yet completed surveys for all access roads or for the Enterprise and Enbridge M/R Stations in Panola County, Texas. Gulf South anticipates that cultural resources surveys would be completed and reports would be submitted to the FERC and the Texas SHPO by Spring 2007.

3.10.1.2 Louisiana

The survey within the Louisiana portion of the proposed Project identified five previously unrecorded prehistoric sites. One of those sites is potentially eligible for listing in the NRHP, but would not be affected by the proposed Project. The remaining four prehistoric sites are not considered eligible for listing in the NRHP, and we are not recommending any additional work. There are six previously recorded prehistoric sites in the Louisiana portion of the proposed Project. One of those sites is

potentially eligible for listing in the NRHP, but would not be affected by the proposed Project. The remaining five previously recorded prehistoric sites are not eligible for listing in the NRHP, and we are not recommending any additional work.

Gulf South identified 15 previously unrecorded historic sites in the Louisiana portion of the proposed Project. None of the sites are eligible for listing in the NRHP, and we are not recommending any additional work. Gulf South identified five previously recorded historic sites located in or near the Louisiana portion of the proposed Project, including two historic material scatters and three historic structures. The two historic material scatters are not eligible for listing in the NRHP, and we are not recommending any additional work. The three historic structures were determined to be located outside the proposed Project corridor, would be screened by vegetation and terrain, and no visual effects would occur.

Six historic cemeteries are located near the proposed Project route in Louisiana. However, each of these cemeteries would be entirely avoided by the proposed pipeline route, and no effect to any of these resources is anticipated in association with construction of the proposed Project.

On November 13, 2006, Gulf South submitted the cultural resources survey report to the Louisiana Department of Culture, Recreation & Tourism, Divisions of Archaeology and Historic Preservation, which functions as the State Historic Preservation Office in Louisiana, and requested concurrence with these findings. An addendum survey report addressing route modifications was submitted on November 15, 2006. Gulf South has filed several addenda survey reports between December 2006 and March 2007 addressing new route modifications and access roads. One standing structure was identified in these surveys, which is not eligible for listing in the NRHP. A response from the Louisiana SHPO, concurring with Gulf South consultant's findings and recommendations was received on March 14, 2007. We have not yet received comments from the Louisiana SHPO for a March 2007 cultural resources survey report associated with proposed modified routes in Red River, Bienville, Jackson, Ouachita, Richland, and Madison Parishes. Additionally, Gulf South has not yet completed surveys for access roads, contractor yards, and an additional temporary workspace associated with the Bayou Pierre HDD. It is anticipated that these surveys would be completed and surveys submitted to the FERC and the Louisiana SHPO by Spring 2007.

3.10.1.3 Mississippi

The survey within the Mississippi portion of the proposed Project identified two previously unrecorded prehistoric sites. The sites are not considered eligible for listing in the NRHP, and we are not recommending any additional work. There are two previously recorded prehistoric sites in the Mississippi portion of the proposed Project. One of the sites is potentially eligible for listing in the NRHP, but would not be affected by the proposed Project.

Gulf South identified four previously unrecorded historic sites in the Mississippi portion of the proposed Project. Three of these sites are not eligible for listing in the NRHP, and we are not recommending any additional work. The other site is a historic structure that is potentially eligible for listing in the NRHP but would not be affected by the proposed Project. No previously recorded historic sites are located in the Mississippi portion of the proposed Project.

Two historic cemeteries are located near the proposed Project in Mississippi. However, both of these cemeteries would be avoided by the proposed pipeline route, and no effect to either of these resources is anticipated in association with construction of the proposed Project.

Gulf South submitted the cultural resources survey report to the Mississippi Department of Archives and History on November 10, 2006, and requested concurrence with their findings. An addendum survey report addressing route modifications was submitted on November 20, 2006. Gulf South has filed several addenda survey reports between December 2006 and March 2007 addressing new route modifications and access roads. Three isolated artifacts were identified by the surveys, none of which are eligible for listing in the NRHP. A response from the Mississippi SHPO, concurring with several of Gulf South consultant's submittals, was received on January 16, 2007. However, we have not yet received comments from the Mississippi SHPO for a March 2007 cultural resources survey report associated with proposed modified routes in Claiborne, Hinds, Rankin, and Simpson Counties. Additionally, Gulf South has not yet completed surveys for access roads, contractor yards, and an additional temporary workspace associated with the Baker's Creek HDD. It is anticipated that these surveys would be completed and reports submitted to the FERC and the Mississippi SHPO by Spring 2007.

3.10.1.4 Natchez Trace Parkway

The Natchez Trace Parkway is a 444-mile-long road in Mississippi, Alabama, and Tennessee that commemorates the historic Natchez Trace. The Parkway, which is managed by the NPS, is also a National Scenic Byway and All-American Road. As such, the NPS must issue a right-of-way permit before Gulf South can cross the Parkway. The National Scenic Byway and All-American Road designations are given to roads that exhibit significant archeological, cultural, historic, natural, recreational, and scenic qualities. The Parkway connects Natchez, Mississippi, and Nashville, Tennessee and has been used for centuries by Native Americans, traders, and early settlers. A detailed discussion of potential impacts to the Natchez Trace Parkway is presented in Appendix H.

Gulf South submitted a cultural resources survey report to the FERC, the National Park Service, and the Mississippi Department of Archives and History regarding the Natchez Trace Parkway crossing. The National Park Service responded on February 5, 2007 and stated that the report met the reporting requirements of the National Park Service. The Mississippi Department of Archives and History responded on February 21, 2007 and concurred with the consultants' findings.

3.10.2 Unanticipated Discoveries Plan

Gulf South filed an Unanticipated Discoveries Plan that outlines the procedures that would be followed in the event that unanticipated cultural resources or human remains were encountered during construction of the proposed Project. The Unanticipated Discoveries Plan has also been filed with the Texas, Louisiana, and Mississippi SHPOs. Copies of the plan would be kept onsite during construction, and construction management and environmental inspectors would be trained on its contents.

3.10.3 Native American Consultation

Gulf South contacted six Native American groups regarding the proposed Project. The groups contacted include the Alabama-Coushatta Tribe of Texas, the Caddo Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, and the Tunica-Biloxi Indian Tribe. Consultation letters were sent to representatives of each of these tribes in March and July 2006, requesting comments on the proposed Project and identification of any cultural or religious sites significant to the tribe. Response letters were received from the Caddo Nation, requesting Project documentation relating to cultural resources. Gulf South submitted a copy of the cultural resources report to Robert Cast, of the Caddo Nation of Oklahoma, on October 6, 2006.

3.10.4 General Impacts and Mitigation

Consultation with the Texas, Louisiana, and Mississippi SHPOs for all of the proposed Project's components is not yet complete. To ensure that required cultural resources studies and consultation are completed for all proposed Project components and that the FERC's responsibilities under Section 106 of the NHPA are met, **we recommend that:**

- **Gulf South should defer implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; and use of all staging, storage, or temporary work areas and new or to-be-improved access roads until:**
 - a. **Gulf South files with the Secretary cultural resources survey and evaluation reports; any necessary treatment plans; and the Texas, Louisiana, and Mississippi SHPO comments on the reports and plans; and**
 - b. **The Director of OEP reviews and approves all cultural resources survey reports and plans, and notifies Gulf South in writing that treatment plans/procedures may be implemented and/or construction may proceed.**

All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: “CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE.”

3.11 AIR QUALITY AND NOISE

3.11.1 Air Quality

Air quality would be affected by construction and operation of the proposed Project. Though air emissions would be generated by operation of equipment during construction of the pipeline and aboveground facilities proposed by Gulf South, most air emissions associated with the proposed Project would result from the long-term operation of the proposed and modified compressor stations.

Gulf South proposes to construct the Vixen Compressor Station near Luna in Ouachita Parish, Louisiana; to construct the Tallulah Compressor Station near Tallulah in Madison Parish, Louisiana; and to expand the existing Carthage Junction Compressor Station near Carthage in Panola County, Texas.

At the Vixen Compressor Station, Gulf South proposes to install two Solar Mars 100 gas turbines rated at 15,000 horsepower (hp) each, one natural gas burning auxiliary generator engine rated at 810 hp, an 8,800-gallon condensate tank, truck loading equipment, and a piping blowdown stack.

At the Tallulah Compressor Station, Gulf South proposes to install two Solar Mars 100 gas turbines rated at 15,000 hp each, one Solar Taurus 70 gas turbine rated at 10,311 hp, one natural gas burning auxiliary generator engine rated at 810 hp, an 8,800-gallon condensate tank, truck loading equipment, and a piping blowdown stack.

At the Carthage Junction Compressor Station, Gulf South proposes to add two Solar Mars 100 gas turbines rated at 15,000 hp each, one Solar Taurus 70 gas turbine rated at 10,311 hp, one natural gas burning emergency generator engine rated at 810 hp, an 1.25-million btu/hour fuel gas heater, and piping components.

3.11.1.1 Existing Air Quality

The proposed Project would be constructed in portions of Panola County in Texas; DeSoto, Red River, Bienville, Jackson, Ouachita, Richland, and Madison Parishes in Louisiana; and Warren, Hinds, Copiah, Walthall, and Simpson Counties in Mississippi. These counties and parishes are characterized by a temperate climate. Rainfall at Shreveport, Louisiana, located near the western end of the proposed pipeline route, averages 51.30 inches annually (Weather.com 2006a). May is the wettest month in Shreveport, averaging 5.25 inches of precipitation; and August is the driest month, averaging 2.71 inches. The warmest month is July, with an average high temperature of 93° Fahrenheit (F) and an average low temperature of 73° F. January is the coldest month, with an average high temperature of 56° F and an average low temperature of 36° F. Rainfall at Vicksburg, Mississippi, located near the eastern end of the proposed pipeline route, averages 57.99 inches annually (Weather.com 2006b). March is the wettest month in Vicksburg, averaging 6.40 inches of precipitation; and August is the driest month, averaging 3.12 inches. The warmest month is July, with an average high temperature of 92° F and an average low temperature of 71° F. January is the coldest month, with an average high temperature of 59° F and an average low temperature of 35° F.

The Clean Air Act (CAA) designates six pollutants as criteria pollutants for which the National Ambient Air Quality Standards (NAAQS) are promulgated. The NAAQS for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter with an aerodynamic diameter less than 10 microns (PM₁₀), particulate matter with an aerodynamic diameter less than 2.5 microns (PM_{2.5}), carbon monoxide (CO), ozone (O₃), and lead were set to protect human health (primary standards) and human welfare (secondary standards). State air quality standards cannot be less stringent than the NAAQS. Texas, Louisiana, and Mississippi have adopted the NAAQS, as defined in 40 CFR 50; these standards are summarized in Table 3.11.1-1.

Air Quality Control Regions and Attainment Status

Air quality control regions (AQCRs) are areas established for air quality planning purposes in which implementation plans describe how ambient air quality standards will be achieved and maintained. AQCRs were established by the EPA and local agencies, in accordance with Section 107 of the CAA, as a means to implement the CAA and comply with the NAAQS through state implementation plans. The AQCRs are intra- and interstate regions such as large metropolitan areas where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated based on compliance with the NAAQS. AQCR designations fall under three categories as follows: “attainment” (areas in compliance with the NAAQS); “nonattainment” (areas not in compliance with the NAAQS); or “unclassified”, which refers to areas with insufficient data to make a determination. The counties and parishes in which the proposed Project would be located are designated as “attainment” or “unclassifiable” for all criteria pollutants.

3.11.1.2 Regulatory Requirements

Federal Regulations

The CAA, 42 USC 7401 et seq. amended in 1977 and 1990, and 40 CFR Parts 50 through 99 are the basic federal statutes governing air pollution. The provisions of the CAA that are potentially relevant to the proposed Project include the following:

- New Source Review (NSR)/Prevention of Significant Deterioration (PSD);
- New Source Performance Standards (NSPS);

**TABLE 3.11.1-1
National Ambient Air Quality Standards**

Pollutant	Time Frame	Primary	Secondary
Particulate matter less than 10 microns in diameter	24-hour ^a	150 µg/m ³	150 µg/m ³
Particulate matter less than 2.5 microns in diameter	Annual ^b	15 µg/m ³	15 µg/m ³
	24-hour ^c	35 µg/m ³	35 µg/m ³
Sulfur dioxide	Annual	0.030 ppm (80 µg/m ³)	N/A
	24-hour ^a	0.014 ppm (365 µg/m ³)	N/A
	3-hour ^a	N/A	0.5 ppm (1,300 µg/m ³)
Carbon monoxide	8-hour ^a	9 ppm (10,000 µg/m ³)	None
	1-hour ^a	35 ppm (40,000 µg/m ³)	None
Nitrogen dioxide	Annual	0.053 ppm (100 µg/m ³)	0.053 ppm
Ozone	8-hour ^d	0.08 ppm (157 µg/m ³)	0.08 ppm
Lead	Quarterly	1.5 µg/m ³	1.5 µg/m ³

Notes:

µg = Microgram(s)
m³ = Cubic meter(s)
NA = Not applicable
ppm = Part(s) per million

^a Not to be exceeded more than once per year.
^b To attain this standard, the 3-year average of the weighted annual mean particulate matter less than 2.5 microns in diameter concentrations from single or multiple community-oriented monitors, must not exceed 15.0 µg/m³.
^c The PM_{2.5} standard was revised from 65 µg/m³ to 35 µg/m³ in December 2006.
^d To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations, measured at each monitor within an area over each year, must not exceed 0.08 ppm.

- National Emission Standards for Hazardous Air Pollutants (NESHAP);
- Title V operating permits; and
- General Conformity.

New Source Review/ Prevention of Significant Deterioration

New Source Review refers to the preconstruction permitting programs under Parts C and D of the CAA that must be satisfied before construction can begin on new major sources or major modifications to existing major sources located in attainment or unclassified areas. This review may include a PSD review. This review process is intended to keep new air emission sources from causing existing air quality to deteriorate beyond acceptable levels codified in the federal regulations. For sources located in non-attainment areas the Nonattainment New Source Review (NNSR) program is implemented for the pollutants for which the area is classified as nonattainment. The proposed Project would be located in attainment areas. Consequently, NNSR is not applicable to the proposed Project.

The PSD review regulations apply to proposed new major sources or major modifications to existing major sources located in an attainment area. The PSD regulations (40 CFR 52.21) define a “major source” as any source type belonging to a list of named source categories that emit or have the potential to emit 100 tons per year (tpy) or more of any regulated pollutant. A major source under PSD

can also be defined as any source not on the list of named source categories with the potential to emit such pollutants in amounts equal to or greater than 250 tpy. Modifications to existing major sources have lower emission thresholds, called “significant emission increases”; amounts over these thresholds trigger PSD review. The proposed Project would not include facilities or operations included on the list of named source categories to which the 100-tpy trigger applies. Also, the proposed Project does not include any existing major sources under the PSD program; therefore the existing Carthage Junction Compressor Station and the proposed new Vixen and Tallulah Compressor Stations are all subject to the 250-tpy threshold.

The PSD review evaluates existing ambient air quality and the potential impacts of the proposed source on ambient air quality (noting in particular whether the source would contribute to any violation of the NAAQS), and reviews the best available control technology (BACT) in order to minimize emissions. The PSD regulations contain restrictions on the degree of ambient air quality deterioration that would be allowed. These increments for criteria pollutants are based on the PSD review classification of the area.

None of the new facilities or additions to existing facilities would exceed emissions of 250 tpy of any criteria pollutant (see Tables 3.11.1-2 through 3.11.1-4 and the discussion under “Operations Emissions”). Therefore, PSD permitting is not applicable to the proposed Project.

Air Quality Control Regions and PSD

AQCRs are categorized as Class I, Class II, or Class III. Class I areas are designated specifically as pristine natural areas or areas of natural significance and have the lowest increment of permissible deterioration, which essentially precludes development near these areas. Class III designations, intended for heavily industrialized zones, can be made only on request and must meet all requirements outlined in 40 CFR 51.166. The remainder of the United States is classified as Class II. Class II areas are designed to allow moderate, controlled growth. The proposed Project would be located in a Class II area. The nearest Class I area is the Caney Creek Wilderness located southeast of Mena, Arkansas, about 153 miles north of the western portion of the proposed Project. The Breton National Wildlife Refuge located in the Gulf of Mexico east of New Orleans, Louisiana and south of Biloxi, Mississippi, is also a Class I area and is located about 154 miles south of the eastern portion of the proposed Project. There are no Class I areas located within 62 miles of any of the proposed compressor station locations.

New Source Performance Standards

The NSPS, codified in 40 CFR 60 and incorporated by reference in 30 Texas Administrative Code (TAC) Rule 101.20, Louisiana Administrative Code (LAC) 33.III.3303, and the Mississippi Commission on Environmental Quality (MCEQ) regulations APC-S-1 Section 6.3, establish requirements for new, modified, or reconstructed units in specific source categories. NSPS requirements include emission limits, monitoring, reporting, and record keeping. The following NSPS requirements were identified as potentially applicable to the specified sources at the compressor stations.

Subpart Kb of 40 CFR 60, Standards of Performance for Volatile Organic Liquid Storage Vessels, lists affected emission sources as storage vessels containing volatile organic liquids. Regulatory applicability is dependent on the construction date, size, and vapor pressure of the storage vessel and its contents. Subpart Kb applies to new tanks, unless otherwise exempted, that have a storage capacity between 75 m³ (19,813 gallons) and 151 m³ (39,890 gallons) and contain volatile organic compounds (VOCs) with a maximum true vapor pressure greater than or equal to 15.0 kilopascals (kPa). Subpart Kb also applies to tanks that have a storage capacity greater than or equal to 151 m³ and contain VOCs with a maximum true vapor pressure greater than or equal to 3.5 kPa. Each proposed compressor station would

be equipped with an 8,800 gallon (210 barrel) condensate tank, which is below the regulated capacity. Therefore, the proposed Project would not be subject to NSPS Subpart Kb standards.

TABLE 3.11.1-2 Existing and Proposed Emissions for the Carthage Junction Compressor Station							
Emission Source	NO_x (tpy)	CO (tpy)	VOC (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	HAPs (tpy)
New sources							
Turbine Engine #5 (Mars 100)	44.02	53.60	15.35	3.55	3.55	1.83	1.72
Turbine Engine #6 (Mars 100)	44.02	53.60	15.35	3.55	3.55	1.83	1.72
Turbine Engine #7 (Taurus 70)	29.12	35.45	10.15	2.29	2.29	1.18	1.11
Emergency generator #2	0.89	0.71	0.14	0.01	0.01	0.00	0.07
Fuel gas heater	0.55	0.46	0.03	0.04	0.04	0.00	0.01
Piping components (fugitives)	0.00	0.00	1.74	0.00	0.00	0.00	0.01
Subtotal new sources:	118.60	143.82	42.76	9.44	9.44	4.84	4.64
Existing sources							
Reciprocating Engine #1 (Superior 12)	28.97	30.90	11.59	0.65	0.65	0.04	1.67
Reciprocating Engine #2 (Superior 12)	28.97	30.90	11.59	0.65	0.65	0.04	1.67
Reciprocating Engine #3 (Superior 12)	28.97	30.90	11.59	0.65	0.65	0.04	1.67
Reciprocating Engine #4 (Superior 16)	38.38	40.94	15.35	0.86	0.86	0.05	4.03
Emergency Generator #1	2.18	0.12	0.02	0.01	0.01	0.00	0.01
Storage Tank 1A	0.00	0.00	3.39	0.00	0.00	0.00	0.25
Truck loading of condensate	0.00	0.00	0.61	0.00	0.00	0.00	0.09
Piping components	0.00	0.00	3.49	0.00	0.00	0.00	0.01
Unpaved roads	0.00	0.00	0.00	0.43	0.06	0.00	0.00
Engine blowdown stack	0.00	0.00	3.67	0.00	0.00	0.00	0.19
Area releases	0.00	0.00	5.33	0.00	0.00	0.00	0.27
Miscellaneous insignificant sources	0.00	0.00	1.00	1.00	1.00	0.00	0.00
Subtotal existing sources:	127.47	133.76	67.63	4.25	3.88	0.17	9.86
Total new and existing sources	246.07	277.58	110.39	13.69	13.32	5.01	14.50

TABLE 3.11.1-3 Proposed Emissions for the Vixen Compressor Station							
Emission Source	NO_x (tpy)	CO (tpy)	VOC (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	HAPs (tpy)
Turbine Engine #1 (Mars 100)	26.41	26.80	15.35	2.94	2.94	1.52	1.43
Turbine Engine #2 (Mars 100)	26.41	26.80	15.35	2.94	2.94	1.52	1.43
Emergency generator #1	0.89	0.71	0.14	0.01	0.01	0.00	0.10
Storage tank 1A	0.00	0.00	5.32	0.00	0.00	0.00	0.93
Truck loading of condensate	0.00	0.00	1.14	0.00	0.00	0.00	0.17
Piping components	0.00	0.00	3.28	0.00	0.00	0.00	0.01
Unpaved roads	0.00	0.00	0.00	0.44	0.06	0.00	0.00
Engine blowdown stack	0.00	0.00	6.29	0.00	0.00	0.00	0.32
Area releases	0.00	0.00	5.33	0.00	0.00	0.00	0.27
Subtotal new sources:	53.71	54.31	52.20	6.34	5.90	3.04	4.66

TABLE 3.11.1-4 Proposed Emissions for the Tallulah Compressor Station							
Emission Source	NO_x (tpy)	CO (tpy)	VOC (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	HAPs (tpy)
Turbine Engine #1 (Mars 100)	26.41	26.80	15.35	2.94	2.94	1.52	1.43
Turbine Engine #2 (Mars 100)	26.41	26.80	15.35	2.94	2.94	1.52	1.43
Turbine Engine # 3 (Taurus 70)	17.47	17.73	10.15	1.94	1.94	1.00	0.94
Emergency generator #1	0.89	0.71	0.14	0.01	0.01	0.00	0.10
Storage tank 1A	0.00	0.00	5.32	0.00	0.00	0.00	0.93
Truck loading of condensate	0.00	0.00	1.14	0.00	0.00	0.00	0.17
Piping components	0.00	0.00	3.28	0.00	0.00	0.00	0.01
Unpaved roads	0.00	0.00	0.00	0.44	0.00	0.00	0.00
Engine blowdown stack	0.00	0.00	6.29	0.00	0.00	0.00	0.32
Area releases	0.00	0.00	5.33	0.00	0.00	0.00	0.27
Subtotal new sources:	71.18	72.04	62.35	8.28	7.84	4.04	5.60

On February 18, 2005, EPA proposed a new NSPS for stationary combustion turbines (Subpart KKKK) which received final approval on October 2, 2006. Stationary combustion turbines of 1 megawatt (MW) and larger installed after February 18, 2005, are covered by the proposed NSPS. Each of the compressor stations would have at least one turbine greater than 1 MW. The proposed standard imposes 1.0 pound NO_x per MW-hour and 0.58 pound SO₂ per MW-hour emission limits on turbine operations. The proposed Project would comply with all applicable standards of the rule.

No other NSPSs are applicable to the proposed Project.

National Emission Standards for Hazardous Air Pollutants

The NESHAP, codified in 40 CFR Parts 61 and 63, regulates hazardous air pollutant (HAP) emissions. Part 61 was promulgated prior to the 1990 Clean Air Act Amendments (CAAA) and regulates

only eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride).

The 1990 CAAA established a list of 189 HAPs, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology (MACT) standards, regulates HAP emissions from major sources of HAP emissions and specific source categories that emit HAPs. Part 63 defines a major source of HAPs as any source that has the potential to emit 10-tpy of any single HAP or 25 tpy of HAPs in aggregate. MACT standards are intended to reduce emissions of air toxics or HAPs through installation of control equipment rather than enforcement of risk-based emission limits. The total of HAP emissions from all equipment at Carthage Junction Station is 14.50 tpy (as shown in Table 3.11.1-2), and total emissions of formaldehyde (the HAP emitted in the greatest amount) are 4.14 tpy. The proposed Vixen and Tallulah Compressor Stations each would emit less than 10 tpy of total HAPs, as shown in Tables 3.11.1-3 and 3.11.1-4. Potential HAP emissions resulting from the proposed Project would be well below the 10/25 tpy thresholds; therefore, MACT is not applicable.

Title V Permitting

The Title V permit program, as described in 40 CFR 70, requires sources of air emissions with criteria pollutant emissions that reach or exceed major source levels to obtain federal operating permits. These permits list all applicable air regulations and include a compliance demonstration for each applicable requirement. The major source threshold level in attainment areas is 100 tpy of nitrogen oxides (NO_x), SO₂, CO, PM₁₀, PM_{2.5}, and VOC. Emissions of NO_x and CO at the Carthage Junction Compressor Station would exceed the 100-tpy criteria pollutant threshold, as shown in Table 3.11.1-2. Therefore, the Carthage Junction Compressor Station would require a Title V permit. None of the criteria pollutants would be emitted at the 100-tpy level at the Vixen Compressor Station or at the Tallulah Compressor Station; therefore, Title V permits would not be required for those facilities.

General Conformity

40 CFR parts 51 and 93 define the requirements for determining conformity for federal actions to state or federal implementation plans. A conformity analysis is required for each criteria pollutant where the total of direct and indirect emissions in a nonattainment or maintenance area caused by a federal action would equal or exceed any of the rates specified in the applicable implementation plan. The proposed Project would not be located in a nonattainment area; therefore, the general conformity requirements do not apply to the proposed Project.

State Regulations

In addition to the federal regulations described above, Texas, Louisiana, and Mississippi have state air quality regulations. The TCEQ manages air quality issues in Texas, the LDEQ manages air quality issues in Louisiana, and the MDEQ manages air quality issues in Mississippi. Subject to EPA approval, these agencies manage the statewide air permitting, compliance, and enforcement programs. The Carthage Junction Compressor Station would be authorized under TCEQ's Standard Permit for Oil and Gas Operations at 30TAC116.620, and the Vixen Compressor Station and Tallulah Compressor Station would be authorized under LDEQ minor source permits.

3.11.1.3 General Impacts and Mitigation

Construction Emissions

Construction of the pipeline and access roads would generate air emissions during grading, trenching, backfilling, and operation of construction vehicles along unpaved areas. The proposed Project would use existing roads to the extent possible. Some roads used for access would be improved during construction by widening or adding drain pipes, gravel, or grading; and some new roads and road extensions would be constructed. The roads would remain after construction to provide access to the pipeline for maintenance purposes. These activities could generate dust and particulate emissions from earth-moving activities and construction equipment engine exhaust.

Construction of the compressor stations would be performed with mobile equipment similar to that typically used for pipeline and road construction. In addition to the compressor stations, Gulf South would construct other aboveground facilities consisting of M/R stations.

Construction would be expected to cause a minor and temporary impact to local ambient air quality as a result of fugitive dust and combustion emissions generated by construction equipment. Criteria pollutant emissions during operation of the fossil-fueled construction equipment would occur from combustion products resulting from the use of gasoline and diesel fuels, primarily NO₂, CO, VOCs, PM₁₀, small amounts of SO₂, and small amounts of HAPs (e.g., formaldehyde, benzene, toluene, and xylene) produced by the construction equipment engines. Impacts from construction equipment would be temporary and would be expected to result in an insignificant impact on air quality.

The TCEQ regulates the emissions of particulate matter arising from unpaved streets, access roads, construction activities, and similar facilities through 30TAC111.141. The rule applies only to certain areas in El Paso and Harris Counties and is therefore not applicable to the proposed Project. LDEQ regulates these types of fugitive dust emissions through LAC33.III.1305, which requires application of water or dust-retardant chemicals, or paving of roadways. The MDEQ does not have a specific regulation for fugitive dust from roadways. Gulf South indicates that if fugitive dust becomes a problem it would use proven construction practices such as water sprays to control fugitive dust. Water sprays have provided sufficient control to ensure protection of air quality during construction of projects similar to the proposed Project.

Operations Emissions

Emissions from the turbines at all locations would be controlled with Solar's SoLoNOx technology and the exclusive use of natural gas. SoLoNOx technology involves two-stage rich/lean combustors that essentially are air-staged, premixed combustors in which the primary zone is operated fuel rich and the secondary zone is operated fuel lean. The rich mixture decreases the amount of oxygen available for NO_x generation. Before entering the secondary zone, the exhaust of the primary zone is quenched (to extinguish the flame) by large amounts of air, and a lean mixture is created. The lean mixture is pre-ignited, and the combustion is completed in the secondary zone. NO_x formation in the second stage is minimized through combustion in a fuel-lean, lower temperature environment.

Each compressor station would include an emergency shut down (ESD) system, pursuant to DOT requirements. Activation of the ESD system would vent the piping (expel the natural gas) to the atmosphere in case of an emergency. The ESD would be used only in the event of an emergency. Compressor unit blowdowns would occur as needed to relieve pressure when a unit is taken offline. Natural gas blowdowns are not part of routine operation.

Tables 3.11.1-2 through 3.11.1-4 list the anticipated emissions of criteria pollutants and HAPs from the operation of each compressor station. Gulf South submitted a Standard Permit application to TCEQ in May 2006 to authorize modification of the Carthage Junction Compressor Station in Panola. Facilities authorized by a TCEQ Standard Permit are considered to have minimal impacts and do not require air dispersion modeling as part of the Permit-by-Rule claim process.

Gulf South prepared a SCREEN3 analysis of NO₂ emissions for the Carthage Junction Compressor Station, which is the station expected to have the greatest emissions. The analysis included both new and existing emission sources. The offsite concentration due to contributions from onsite sources was predicted to be 4.4 micrograms per cubic meter (µg/m³). Background NO₂ concentrations at the air quality monitor were approximately 10 µg/m³. When added to station emissions, this resulted in a total offsite NO₂ concentration of 14.4 µg/m³. This is well below the NAAQS of 100 µg/m³ for NO₂. In May 2006, Gulf South also submitted applications to LDEQ for minor source construction permits for the proposed Vixen and Tallulah Compressor Stations. LDEQ does not require air dispersion modeling to evaluate minor source air permit applications. Because emissions from the Vixen and Tallulah Compressor Stations would be lower than emissions from the Carthage Junction Compressor Station, NO₂ concentrations would be expected to be similar to or less than the SCREEN3 modeled results for the Carthage Junction Compressor Station.

Operation of the aboveground meter stations and block valves would not result in substantial air emissions under normal operating conditions. Typically, only minor emissions of natural gas, called “fugitive emissions,” occur from small connections at meter station and valve sites; because such emissions are very small, they are not regulated by permit or source-specific requirements.

Use of the access roads for maintenance would generate occasional, minor, and short-term increases in dust similar to that generated on other unpaved roads in the area. Use of these roads by maintenance and operation personnel would have a negligible effect on air quality.

Construction of the proposed Project would be expected to result in temporary minor impacts to air quality. Operation of the proposed Project would be expected to result in long-term minor impacts to air quality.

3.11.2 Noise Quality

Noise quality can be affected both during construction and operation of pipeline projects. The magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures used by federal agencies to relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, as averaged over a 24-hour period. The L_{dn} is the L_{eq} with 10 decibels on the A-weighted scale (dBA) added to nighttime sound levels between the hours of 10 p.m. and 7 a.m. to account for people’s greater sensitivity to sound during nighttime hours. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear’s threshold of perception for noise change is considered to be 3 dBA.

3.11.2.1 Regulatory Requirements

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The

EPA has determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity noise interference. We have adopted this criterion and use it to evaluate the potential noise impact from operation of the compressor facilities.

Texas, Mississippi, and Louisiana do not regulate noise at the state level. Similarly, none of the counties crossed by the proposed Project in Texas and Mississippi have existing regulations governing noise from construction or industrial activities. Bienville Parish in Louisiana limits noise from continuous sources in residential areas to 55 dBA, in commercial areas to 60 dBA, and in industrial areas to 80 dBA. Red River Parish and Madison Parish in Louisiana have general prohibitions on nuisance noise.

3.11.2.2 Existing Noise Levels

Impacts are determined at receptors known as noise-sensitive areas (NSAs). NSAs include residences, schools and daycare facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically known for their solitude and tranquility such as wilderness areas. The following NSAs and background noise levels have been evaluated at each compressor station.

The Carthage Junction Compressor Station is located 4 miles east of Carthage in Panola County, Texas. The land surrounding the site consists primarily of forest. The nearest NSA (NSA #1) is a group of residences about 5,000 feet northwest of the proposed compressor station. On May 11, 2006, Gulf South conducted an ambient sound-level survey at NSA #1. Noise sources during the sound-level survey included traffic on local roads, insects, and birds. Measured noise at NSA #1 ranged from 41.9 to 44.1 dBA, with a calculated L_{dn} of 49.3 dBA.

The Vixen Compressor Station would be located in Ouachita Parish, Louisiana, southwest of the town of Luna. The land surrounding the site consists of forest with scattered residences located along Cypress School Road. The nearest NSAs are residences 1,500 feet south (NSA #1), 2,700 feet northwest (NSA #2), and 3,000 feet southeast (NSA #3) of the proposed station. On May 10, 2006, Gulf South conducted an ambient sound-level survey at the NSAs. Noise sources during the sound-level survey included traffic on local roads, insects, birds, and wind. Measured noise at NSA #1 ranged from 41.5 to 42.2 dBA, with a calculated L_{dn} of 48.3 dBA. At NSA #2, measured noise ranged from 41.9 to 45.3 dBA, with a calculated L_{dn} of 49.4 dBA. At NSA #3, measured noise ranged from 39.0 to 39.7 dBA, with a calculated L_{dn} of 45.7 dBA.

The Tallulah Compressor Station would be located in Madison Parish, Louisiana, south of Tallulah. The land surrounding the site consists of forest, cleared area, and marsh with scattered residences located along nearby roadways. The nearest NSAs are residences 2,600 feet south-southwest (NSA #1), 3,500 feet west (NSA #2), and 3,700 feet northeast (NSA #3) of the proposed station. On May 9, 2006, Gulf South conducted an ambient sound-level survey at the NSAs. Noise sources during the sound-level survey included traffic on local roads, insects, birds, wind, and the sound of operations from a nearby plant. Measured noise at NSA #1 ranged from 40.8 to 45.9 dBA, with a calculated L_{dn} of 47.1 dBA. At NSA #2 measured noise ranged from 53.6 to 62.0 dBA, with a calculated L_{dn} of 57.5 dBA. At NSA #3 measured noise ranged from 41.4 to 43.0 dBA, with a calculated L_{dn} of 46.8 dBA.

3.11.2.3 General Impacts and Mitigation

Construction Noise

Construction of the proposed Project is expected to be typical of other pipeline projects in terms of schedule, equipment used, and types of activities. Construction would increase sound levels in the

vicinity of proposed Project activities; and the sound levels would vary during the construction period, depending on the construction phase. Pipeline construction generally would proceed at rates ranging from several hundred feet to 1 mile per day. However, due to the assembly-line method of construction, construction activities in any one area could last from several weeks to several months on an intermittent basis. Construction and modifications at the compressor stations would be concentrated in the vicinity of the construction activity. Construction equipment would be operated on an as-needed basis during those periods and would be maintained to manufacturers' specifications to minimize noise impacts.

Nighttime noise levels would normally be unaffected because most pipeline construction would take place only during daylight hours. The possible exceptions would be at the HDD sites (e.g., at the crossings of waterbodies and highways). At HDD locations, drilling equipment may operate on a 24-hour-per-day basis. In addition to the EPA's 55 dBA standard, noise level changes are categorized as follows: a 3 dBA increase is considered noticeable, a 6 dBA increase is considered clearly noticeable, and a 9 dBA increase is considered significantly noticeable. An acoustical assessment was prepared for all of the planned HDD sites with NSAs within 1 mile of HDD locations to show existing sound levels at each site location and the project levels from HDD activity. Predicted noise impacts on NSAs indicate that sound levels could exceed 55 dBA at 14 of the 66 evaluated HDD entry and exit sites due to HDD operations. Predicted sound levels ranged from 56.7 to 68.7 dBA at these 14 sites, as shown in Table 3.11.2-1.

To ensure that NSAs are not exposed to excessive noise during nighttime drilling operations, Gulf South developed a comprehensive plan for HDD operations that have the potential to exceed 55 dBA, as listed in Table 3.11.2-1. The comprehensive plan demonstrates whether noise due to nighttime drilling operations would be below 55 dBA L_{dn} at the nearest NSA and specifies all noise mitigation equipment necessary to reduce noise levels to less than 55 dBA L_{dn} . In addition, the plan details how Gulf South would ensure compliance and confirm that where surveys indicate that noise attributable to nighttime drilling would exceed 55 dBA L_{dn} Gulf South would offer temporary housing or equivalent monetary compensation to occupants of affected NSAs until L_{dn} levels at the NSAs are reduced to 55 dBA L_{dn} or less.

In the plan, Gulf South proposes to construct temporary noise barriers, consisting of 16-foot-high insulated plywood sound walls at these sites, and to install hospital-grade mufflers on any diesel engines that do not move while they are operating. The temporary sound barrier is predicted to reduce noise to less than 55 dBA at the nearest NSA at all sites except the HDD #12 entry point at State Highway 167 and at the HDD #23 entry point at the Tensas River. Predicted sound levels at those two sites, with the barrier in place, would be 60.1 and 55.4 dBA, respectively. At these two locations Gulf South proposes to use additional noise mitigation measures including equipment relocation and/or a secondary partial barrier around the hydraulic power unit. These additional measures are projected to reduce sound levels to 50.9 dBA and 52.8 dBA, respectively. After implementation of the plan, all HDD sound levels would be below 55 dBA at all locations. These are calculated impacts; actual impacts may vary due to numerous factors, including operation of mobile equipment that would not be within the protection of the sound barrier.

Four HDD locations were previously determined to contribute projected noise level increases above 9 dBA (HDD #18 entry, HDD #18 exit, HDD #28 entry, and HDD #33 entry). Gulf South filed a revised Noise Mitigation and Compliance Plan for HDD Operations in their March 21, 2007 Draft Implementation Plan. The revised plan includes additional mitigation at these four sites and reduces the impact at each location to below 55 dBA and a less than 9 dBA increase above the ambient. In following this plan, there would be no significant noise impacts with respect to HDD operations.

TABLE 3.11.2-1 Locations with Predicted HDD Operation Noise Impacts Greater Than 55 dBA				
HDD Site	HDD Location	Calculated L _{dn} due to HDD Activity (dBA)	Calculated L _{dn} due to HDD Activity with Temporary Sound Barrier (dBA)	
#8 entry	Black Lake Bayou West	60.3	54.2	
#12 entry	State Highway 167	68.7	60.1	
#12 exit	State Highway 167	61.3	53.4	
#13 entry	Castor Creek	59.2	52.1	
#17 entry	Steep Bayou	58.2	51.1	
#18 entry	Boeuf River	59.1	50.7	
#21 exit	Big Creek	57.4	50.6	
#22 entry	Macon Bayou	56.7	48.7	
#23 entry	Tensas River	63.6	55.4	
#27 entry	Walnut Bayou West	63.2	54.7	
#27 exit	Walnut Bayou West	58.5	50.6	
#30 entry	Highway 61	58.1	49.8	
#30 exit	Highway 61	58.5	50.6	
#32 entry	Interstate 55	58.1	49.8	
Note:				
HDD = Horizontal directional drilling				

In response to agency input, Gulf South now proposes to use an HDD at Baker's Creek (MP 203). This modification to the proposed construction method at this location was made subsequent to the completion of acoustical assessments for other planned HDD sites with NSAs located within one mile. In order to ensure the proposed HDD at Baker's Creek does not exceed 55 dbA at the nearest NSA, we recommend that:

- Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, a noise analysis for the proposed HDD site at Baker's Creek. This analysis should identify any NSAs within one-half mile of the proposed entry and exit sites. If NSAs exist within one mile, Gulf South should identify existing background noise levels and estimated drilling noise contributions at the nearest NSAs along with any measures it would implement to control noise from the HDD.**

Operational Noise

During operation of the proposed Project, potential noise impacts would be limited to the vicinity of the new compressor stations. We received comments from affected landowners during the pre-filing process expressing concern about noise generated during operation of the proposed compressor stations. Principal noise sources would include the air inlet, exhaust, and casing of the turbines. Secondary noise sources would include yard piping and valves. Noise from the relief valves, blowdown stacks, and emergency electrical generation equipment would be infrequent.

All compressor stations would include design measures to minimize sound generation. Silencers or mufflers would be installed on the turbine exhausts, and silencers would be installed on the turbine air intakes. The walls and roof of each compressor building would be comprised of acoustical panels consisting of a 22-gauge metal outer skin and 4 inches of fiberglass insulation with a 26-gauge perforated metal liner. The building ventilation system vents would be equipped with acoustical louvers or duct silencers.

The expected L_{dn} at NSA #1 near the Carthage Junction Compressor Station would be 45.5 dBA due to sound generated by the existing and new equipment at the station. When combined with the existing ambient noise level, the L_{dn} would be about 50.8 dBA at NSA #1, as shown in Table 3.11.2-2. Outside the scope of the proposed Project and authorized under a separate docket is the installation of a reciprocating compressor unit that has not yet been installed but would be installed prior to the construction detailed in the proposed Project. Table 3.11.2-2 also includes the estimated noise level for the separate unit. The table also indicates the sound contributions from the existing operation of the station and from the new equipment for the proposed Project alone and then combined with the separate unit. Predicted noise at NSA #1 is below the FERC specification of 55 dBA. Noise from blowdown events was estimated at 60 dBA at a distance of 300 feet from the blowdown vent. Blowdown noise at the NSA was estimated at 30 dBA. As a result, there would not be a significant impact on the noise environment near the Carthage Junction Compressor Station.

Measurement Location/ NSA	Distance/ Direction of NSA to Compressor Building (feet)	Calculated L_{dn} for Existing Equipment (dBA)	Estimated L_{dn} for New Project Equipment (dBA)	Estimated L_{dn} for New Reciprocating Unit (dBA)	Estimated L_{dn} for New and Existing Equipment (dBA) ^a	Total Estimated (Station Noise Plus Survey Levels) L_{dn} (dBA) ^b	Potential Noise Increase from All New Units (dBA) ^c
NSA #1/ residence	5,000 / NW	49.3	39.5	41.3	45.5	50.8	1.5
Notes:							
dBA = A-weighted decibel scale							
L_{dn} = Day-night sound level							
NSA = Noise-sensitive area							
^a Estimated Project L_{dn} sound levels are from operation of existing and expansion station equipment, with noise control measures installed as recommended.							
^b Estimated total $L_{dn} = 10 \log (10^{(Ambient L_{dn} / 10)} + 10^{(Predicted L_{dn} / 10)})$							
^c Estimated increase in the ambient L_{dn} sound levels due to operation of the existing and expansion station equipment.							

Table 3.11.2-3 shows the existing and projected noise levels for the Vixen Compressor Station. The expected L_{dn} at NSA #1 would be 51.0 dBA due to sound generated by the new station. When combined with the existing ambient noise level, the L_{dn} would be about 52.9 dBA at NSA #1. Expected noise at NSA #2 would be 44.3 dBA due to sound generated by the new station and 50.6 dBA when combined with the existing ambient noise level. Expected noise at NSA #3 would be 43.0 dBA due to sound generated by the new station. When combined with the higher existing ambient noise level at NSA #3, the L_{dn} would be about 47.6 dBA. Predicted noise at the NSAs is below the FERC specification of 55 dBA. Noise from blowdown events was estimated at 60 dBA, at a distance of 300 feet from the blowdown vent. Blowdown noise at NSA #1 was estimated at 45 dBA and would be less at NSAs #2 and #3. Consequently, there would not be a significant impact on the noise environment near the Vixen Compressor Station.

Measurement Location/NSA	Distance/Direction of NSA to Compressor Building (feet)	Calculated Ambient L _{dn} (dBA)	Estimated Project L _{dn} (dBA) ^a	Total Estimated L _{dn} (dBA) ^b	Potential Noise Increase (dBA) ^c
NSA #1 / residence	1,500 / S	48.3	51.0	52.9	4.6
NSA #2 / residence	2,700 / WNW	49.4	44.3	50.6	1.2
NSA #3 / residence	3,000 / SE	45.7	43.0	47.6	1.9

Notes:

dBA = A-weighted decibel scale
L_{dn} = Day-night sound level
NSA = Noise-sensitive area

^a Estimated L_{dn} sound levels from the proposed Vixen Compressor Station, with noise control measures installed as recommended.

^b Estimated total L_{dn} = 10 log (10^(Ambient L_{dn} / 10) + 10^(Predicted L_{dn} / 10))

^c Estimated increase of the ambient L_{dn} sound levels due to operation of the proposed Vixen Compressor Station.

Table 3.11.2-4 shows the existing and projected noise levels for the Tallulah Compressor Station. The expected L_{dn} at NSA #1 would be 50.0 dBA due to sound generated by the new station and 51.8 dBA when combined with the existing ambient noise level. Expected noise at NSA #2 would be 45.3 dBA due to sound generated by the new station. When combined with the higher existing ambient noise level at NSA #2, the L_{dn} would be about 57.8 dBA. Expected noise at NSA #3 would be 44.6 dBA due to sound generated by the new station and 48.8 dBA when combined with the higher existing ambient noise level. Predicted noise levels at NSAs #1 and #3 would be below the FERC specification of 55 dBA. The existing ambient noise level at NSA #2 exceeds 55 dBA due to non-Project related sources. The calculated increase in noise level due to the proposed Project is 0.3 dBA. Noise differences of less than 3 dBA are considered undetectable by humans. The noise contribution due to the station is less than 55 dBA. Noise from blowdown events was estimated at 60 dBA at a distance of 300 feet from the blowdown vent. Blowdown noise at the NSA #1 was estimated at 40 dBA and would be less at NSAs #2 and #3. Consequently, there would not be a significant impact on the noise environment near the Tallulah Compressor Station.

During operation of the proposed Project, the potential noise impacts from the pipeline would be limited to the vicinity of the new valve and M/R stations. Principal noise sources would include gas flow through valves and M/R equipment. Such gas flow noise is typically not noticeable more than a short distance from the equipment. The nearest NSA to a surface valve and M/R station is located 1,280 feet from the Columbia Gulf M/R Station at MP 148.7. Gas flow noise is expected to be undetectable at the NSA. Underground sections of the pipeline are not a significant source of noise.

Minor short-term noise impacts are expected during the proposed Project construction, provided that equipment is maintained to the manufacturers' specifications to minimize noise. This assessment assumes that temporary noise barriers would be installed at the HDD sites listed in Table 3.11.2-1, that hospital-grade mufflers would be installed on engines that do not move while operating at HDD sites listed in Table 3.11.2-1, and that temporary housing would be offered to residents of NSAs if noise mitigation measures do not reduce the L_{dn} to 55 dBA or less.

Measurement Location/NSA	Distance/Direction of NSA to Compressor Building (feet)	Calculated Ambient L _{dn} (dBA)	Estimated Project L _{dn} (dBA) ^a	Total Estimated L _{dn} (dBA) ^b	Potential Noise Increase (dBA) ^c
NSA #1 / residence	2,600 / SSW	47.1	50.0	51.8	4.7
NSA #2 / residence	3,500 / W	57.5	45.3	57.8	0.3
NSA #3 / residence	3,700 / NE	46.8	44.6	48.8	2.0

Notes:

dBA = A-weighted decibel scale
L_{dn} = Day-night sound level
NSA = Noise-sensitive area

^a Estimated L_{dn} sound levels from the proposed Vixen Compressor Station with noise control measures installed as recommended.

^b Estimated total L_{dn}=10 log (10^(Ambient L_{dn} /10) + 10^(Predicted L_{dn} /10))

^c Estimated increase of the ambient L_{dn} sound levels due to operation of the proposed Vixen Compressor Station.

Minor long-term noise impacts are expected from compressor station operation during the life of the proposed Project and would not result in a significant effect on the noise environment. These minor impacts would result from the normal operation of compressor station equipment, as well as from blowdown events.

To ensure that noise levels from operation of the Project facilities do not adversely impact surrounding areas, **we recommend that:**

- **Gulf South should file with the Secretary no later than 60 days after placing the authorized units at the Carthage Junction Compressor Station into service compressor station noise surveys. If the noise attributable to the operation of the authorized units exceeds an L_{dn} of 55 dBA at any nearby NSAs, Gulf South should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Gulf South should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**
- **Gulf South should file with the Secretary no later than 60 days after placing the Vixen and Tallulah Compressor Stations into service compressor station noise surveys. If the noise attributable to the operation of the Vixen or Tallulah Compressor Stations at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Gulf South should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Gulf South should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

3.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an ignition temperature of 1,000 °F and is flammable at concentrations between 5 and 15 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

3.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under Title 49, USC Chapter 601. The Pipeline and Hazardous Materials Safety Administration's (PHMSA's) Office of Pipeline Safety (OPS) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act (NGPSA) provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement action. The majority of the states have either 5(a) certifications or 5(b) agreements, while nine states act as interstate agents.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993, between DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an Applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the NGPSA. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to a pipeline under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines whether proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the proposed Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

- | | |
|---------|--|
| Class 1 | Location with 10 or fewer buildings intended for human occupancy. |
| Class 2 | Location with more than 10 but less than 46 buildings intended for human occupancy. |
| Class 3 | Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period. |
| Class 4 | Location where buildings with four or more stories aboveground are prevalent. |

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the proposed Project have been developed based on the relationship of the proposed pipeline centerline to other nearby structures and manmade features. Gulf South reports that six segments of the proposed pipeline would be designated as Class 2. The Class 2 areas include:

- MP 38.1 to 38.7 (3,209 feet);
- MP 72.7 to 74.0 (6,687 feet);
- MP 185.0 to 185.6 (3,227 feet);
- MP 187.8 to 188.6 (4,298 feet);
- MP 219.8 to 221.6 (9,259); and
- and MP 228.4 to 228.7 (1,801 feet).

The remaining 237.7 miles of the proposed pipeline would be designated as Class 1.

If a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, Gulf South would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the DOT code of regulations for the new class location.

In 2002, Congress passed an act to strengthen the Nation's pipeline safety laws. The Pipeline Safety Improvement Act of 2002 (HR 3609) was passed by Congress on November 15, 2002, and signed into law by the President in December 2002. No later than December 17, 2004, gas transmission

operators were required to develop and follow a written integrity management program that contains all the elements described in §192.911 and addresses the risks on each covered transmission pipeline segment. Specifically, the law establishes an integrity management program, which applies to all high consequence areas (HCAs). The DOT (68 FR 69778, 69 FR 18228, and 69 FR 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in §192.903 of the DOT regulations.

OPS published a series of rules from August 6, 2002, to May 26, 2004, (69 FR 29903) that defines HCAs where a gas pipeline accident would cause considerable harm to people and their property, and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate in 49 USC 60109 for OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius¹ is greater than 660 feet and 20 or more buildings are intended for human occupancy within the potential impact circle²; or
- any area in Class 1 or 2 where the potential impact circle includes an identified site³.

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at § 192.911. The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. Gulf South reports that one HCA would be present along the proposed route at MP 186.1 to 186.8 (3,951 feet). The pipeline integrity management rule for HCAs requires inspection of the entire pipeline every 7 years to determine the presence of HCAs.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under Part 192.615, each pipeline operator must also establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;

¹ The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in psi multiplied by the pipeline diameter in inches.

² The potential impact circle is a circle of radius equal to the potential impact radius.

³ An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency shutdown of the system and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Gulf South would provide the appropriate training to local emergency service personnel before the pipeline is placed in service. No additional specialized local fire protection equipment would be required to handle pipeline emergencies.

Gulf South would also operate a gas control center in Houston, Texas to monitor facility pressure, flows, and deliveries. If pressures fall outside of a predetermined range, an alarm notifies safety personnel and appropriate Gulf South responders would be dispatched to investigate the pressure alarm.

3.12.2 Pipeline Accident Data

Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the DOT of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization;
- required taking any segment of transmission line out of service;
- resulted in gas ignition;
- caused estimated damage to the property of the operator, or others, or both, of a total of \$5,000 or more;
- required immediate repair on a transmission line;
- occurred while testing with gas or another medium; or
- in the judgment of the operator was significant, even though it did not meet the above criteria.

The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must only report incidents that involve property damage of more than \$50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 3.12.2-1 presents a summary of incident data for the 1970 to 1984 period, as well as more recent incident data for 1986 through 2005, recognizing the difference in reporting requirements. The 14.5-year period from

1970 through June 1984, which provides a larger universe of data and more basic report information than subsequent years, has been subject to detailed analysis, as discussed in the following sections.⁴

TABLE 3.12.2-1 Natural Gas Service Incidents by Cause^a		
Cause	Incidents per 1,000 Miles of Pipeline (Percent Distribution)	
	1970 through 1984	1986 through 2005
Outside forces	0.70 (53.8)	0.10 (38.5)
Corrosion	0.22 (16.9)	0.06 (23.1)
Construction or material defect	0.27 (20.8)	0.04 (15.4)
Other	0.11 (8.5)	0.06 (23.1)
Total	1.30	0.26

Note:
^a Sources: Jones et al. 1986, DOT OPS 2006.

During the 14.5-year period, 5,862 service incidents were reported over the more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, have remained fairly constant over this period, with no clear upward or downward trend in annual totals. In addition, 2,013 test failures were reported. Correction of test failures removed defects from the pipeline before operation (Jones et al. 1986).

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 3.12.2-2 provides a percentage distribution of the causal factors as well as the annual frequency of each factor per 1,000 miles of pipeline in service (Jones et al. 1986). Data presented for the period extending from mid-1986 through 2003 were gathered from the DOT's OPS.

The dominant incident cause is outside forces, constituting 53.8 percent of all service incidents. Outside forces incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 3.12.2-2 shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. The 1986 through 2005 data show that the portion of incidents caused by outside forces has decreased to 38.5 percent.

The pipelines included in the data set in Table 3.12.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

⁴ Jones, D. J., G. S. Kramer, D. N. Gideon, and R. J. Eiber. 1986. An Analysis of Reportable Incidents for Natural Gas Transportation and Gathering Lines 1970 through June 1984. (NG-18 Report No. 158.) Pipeline Research Committee of the American Gas Association.

TABLE 3.12.2-2 Outside Forces Incidents by Cause (1970 through 1984)^a	
Cause	Percent
Equipment operated by outside party	67.1
Equipment operated by or for operator	7.3
Earth movement	13.3
Weather	10.8
Other	1.5
Note:	
^a Source: Jones et al. 1986.	

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller-diameter pipelines, which have a greater rate of outside forces incidents. Small-diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Table 3.12.2-3 clearly demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. The data show that bare, cathodically protected pipe actually has a higher corrosion rate than unprotected pipe. This anomaly reflects the retrofitting of cathodic protection to actively corroding spots on pipes.

TABLE 3.12.2-3 External Corrosion by Level of Control (1970 through June 1984)^a	
Corrosion Control	Incidents per 1,000 Miles per Year
None – bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11
Note:	
^a Source: Jones et al. 1986.	

3.12.3 Impact on Public Safety

The service incident data summarized in Table 3.12.2-1 include pipeline failures of all magnitudes, with widely varying consequences. Approximately two-thirds of the incidents were classified as leaks; the remaining one-third classified as ruptures, implying a more serious failure.

Table 3.12.3-1 presents the average annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 2005. Fatalities between 1970 and June 1984 have been separated into employees and non-employees, to better identify a fatality rate experienced by the general public. Of the total 5.0 nationwide average, fatalities among the public averaged 2.6 per year over this period. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and non-employees. However, the data show that the total annual average for the period 1984 through 2005 decreased to 3.6 fatalities per year. Subtracting two major offshore incidents in 1989, which do not reflect the risk to the onshore public, yields a total annual rate of 2.8 fatalities per year for this period.

Year	Employees	Non-employees	Total
1970 – June 1984	2.4	2.6	5.0
1984 – 2005 ^b	--	--	3.6
1984 – 2005 ^b	--	--	2.8 ^c

Notes:

^a Sources: Jones et al. 1986, DOT OPS 2006.

^b Employee/non-employee breakdown not available after June 1984.

^c Without 18 offshore fatalities occurring in 1989 (11 resulting from a fishing vessel striking an offshore pipeline and 7 from an explosion on an offshore production platform).

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in Table 3.12.3-2 in order to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Nevertheless, the average 2.6 public fatalities per year is relatively small, considering the more than 300,000 miles of transmission and gathering lines in service nationwide. Furthermore, the fatality rate is approximately two orders of magnitude (100 times) lower than the fatalities from natural hazards such as lightning, tornadoes, floods, and earthquakes.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 300,000 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 per year per 1,000 miles of pipeline. Using this rate, the proposed Project might result in a public fatality every 400 years. This would represent a slight increase in risk to the nearby public.

TABLE 3.12.3-2 Nationwide Accidental Deaths^a	
Type of Accident	Fatalities
All accidents	90,523
Motor vehicle	43,649
Falls	14,985
Drowning	3,488
Poisoning	9,510
Fires and burns	3,791
Suffocation by ingested object	3,206
Tornado, flood, earthquake (1984 to 1993 average)	181
All liquid and gas pipelines ^b (1978 to 1987 average)	27
Gas transmission and gathering lines ^c (non-employees only, 1970 to 1984 average)	2.6
Notes:	
^a Source: All data, unless otherwise noted, reflect 1996 statistics from the U.S. Department of Commerce, Bureau of the Census, "Statistical Abstract of the United States, 118 th Edition."	
^b Source: DOT, "Annual Report on Pipeline Safety – Calendar Year 1987."	
^c Source: Jones et al. 1986.	

3.12.4 Additional Security and Safety Issues

3.12.4.1 Terrorism

During the scoping and Draft EIS comment period, we received comments regarding the susceptibility of the proposed Project to terrorist attack. Due to the various motivations and abilities of terrorist organizations in conjunction with the extensive natural gas infrastructure within the United States, the likelihood of future acts of terrorism occurring at the Project site is unpredictable. The FERC has taken measures to limit the distribution of information to the public regarding facility design to minimize the risk of sabotage. Facility design and location information is removed from the FERC's website to ensure that sensitive information filed under Critical Energy Infrastructure Information is not readily available. Further, the Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies, is working to improve pipeline security practices, strengthen communications within the industry, and extend public outreach in an ongoing effort to secure pipeline infrastructure.

Despite the ongoing potential for terrorist acts along any of the nation's natural gas infrastructure, the continuing need for the construction of these facilities is not eliminated. Given the continued need for natural gas conveyance and the unpredictable nature of terrorist attacks, FERC, DOT, and the Office of Homeland Security's efforts to continually improve pipeline safety would minimize the risk of terrorist sabotage of the Project to the maximum extent practical, while still meeting the nation's natural gas needs.

3.12.4.2 Electric Transmission Lines and Facilities

We have also received comments expressing concerns regarding the safety of the portions of the proposed Project proximate to high voltage alternating current (HVAC) power lines. Of the 243.6 miles of proposed pipeline, 38.4 miles would be collocated with HVAC power lines, and six aboveground facilities would be located within 1,004 feet of HVAC power lines. Further, concerns were expressed about the potential of pipeline failure impacting power delivery via HVAC power lines to the Baxter Wilson Steam Electric Plant and the offsite switch yard that supplies power to the Grand Gulf Nuclear Power Station. Gulf South evaluated and adopted an alternative route to the north of the originally proposed alignment (see Section 4.0), so that the proposed Project is now located greater than 2,400 feet from the Baxter Wilson Plant and Grand Gulf Station switch yard. Due to this adopted route variation, these facilities are now located beyond the pipeline's potential impact radius.

Due to the generally low risk of pipeline failure, as described in Section 3.12.1, combined with the avoidance of electrical infrastructure that has the potential to disrupt nuclear or steam power generation, we believe that the proposed Project would present a minimal increase in the potential for pipeline failure within areas containing HVAC power lines.

3.13 CUMULATIVE IMPACTS

In accordance with NEPA and FERC policy, we considered the cumulative impacts of the proposed Project and other projects in the general Project area. Cumulative impacts represent the incremental effects of the proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a given period of time. The direct and indirect impacts of the proposed Project are discussed in other sections of this EIS.

The purpose of this cumulative impact analysis is to identify and describe cumulative impacts that would potentially result from implementation of the proposed Project. This cumulative impact analysis generally follows the methodology set forth in relevant guidance (CEQ 1997b, EPA 1999). Under these guidelines, inclusion of other projects within the analysis is based on identifying commonalties of impacts from other projects to potential impacts that would result from the proposed Project. An action must meet the following three criteria to be included in the cumulative impacts analysis:

- impact a resource area potentially affected by the proposed Project;
- cause this impact within all, or part of, the proposed Project area; and
- cause this impact within all, or part of, the timespan for the potential impact from the proposed Project.

For the purposes of this cumulative impact analysis, we considered the Project area to be the counties and parishes traversed by the proposed Project.

The actions considered in the cumulative impact analysis may vary from the proposed Project in nature, magnitude, and duration. These actions are included based on the likelihood of completion, and only projects with either ongoing impacts or that are "reasonably foreseeable" future actions were evaluated. Existing or reasonably foreseeable actions that would be expected to affect similar resources during similar time periods as the proposed Project were considered further. The anticipated cumulative impacts of the proposed Project and these other actions are discussed below, as well as any pertinent mitigation actions. The anticipated cumulative impacts were based on NEPA documentation, agency and public input, and best professional judgment.

We identified three types of past, present, and reasonably foreseeable future projects that would potentially result in a cumulative impact when considered with the proposed Project. These are: (1) other natural gas pipeline projects; (2) facilities that would be associated with construction of the proposed Project but that are not under the FERC's jurisdiction; and (3) unrelated projects that are either in place, are under construction in the vicinity of the proposed Project, or are proposed (Table 3.13-1).

**TABLE 3.13-1
Existing or Proposed Projects That Would Cumulatively Impact
Resources in the East Texas to Mississippi Expansion Project Area**

Project	Description	Anticipated Construction Date	Counties/Parishes Affected within East Texas to Mississippi Expansion Project Area
Natural Gas Pipeline Projects			
East Texas to Mississippi Expansion	Construct and operate a 240-mile-long, 42-inch-diameter; and a 3-mile-long, 36-inch-diameter natural gas pipeline	2007	Panola County, Texas DeSoto, Red River, Bienville, Jackson, Ouachita, Richland, and Madison Parishes, Louisiana Warren, Hinds, Copiah, Simpson, and Walthall Counties, Mississippi
Regency Pipeline	Construct and operate an 80-mile long, 30-inch-diameter intrastate natural gas pipeline and a 40-mile long, 24-inch-diameter natural gas pipeline loop	Completed in 2005	Bienville, Jackson, and Richland Parishes, Louisiana
Carthage to Perryville	Construct and operate a 172-mile-long, 42-inch-diameter natural gas pipeline	2006–2007	Panola County, Texas DeSoto, Red River, Bienville, Jackson, Ouachita, and Richland Parishes, Louisiana
Southeast Expansion	Construct and operate a 111-mile-long, 42-inch-diameter natural gas pipeline	2007–2008	Richland Parish, Louisiana, Simpson County, Mississippi
Southeast Supply Header	Construct and operate a 269-mile-long, 36 and 42-inch-diameter natural gas pipeline	2007–2008	Richland and Madison Parishes, Louisiana Warren, Copiah, and Simpson Counties, Mississippi
Gulf Crossing Project	Construct and operate a 351-mile-long, 42-inch-diameter natural gas pipeline	2008	Richland and Madison Parishes, Louisiana Hinds, Copiah, and Simpson Counties, Mississippi

TABLE 3.13-1 (continued)
Existing or Proposed Projects That Would Cumulatively Impact
Resources in the East Texas to Mississippi Expansion Project Area

Project	Description	Anticipated Construction Date	Counties/Parishes within Project Area
Natural Gas Pipeline Projects (continued)			
Midcontinent Express Project	Construct and operate a 494-mile-long, 30, 36, and 42-inch-diameter natural gas pipeline	2008 - 2009	Ouachita, Richland, and Madison Parishes, Louisiana Warren, Hinds, and Simpson Counties, Mississippi
Unrelated Projects			
Trans-Texas Corridor 69	Construct and operate an intermodal transportation corridor from Texarkana, Texas, to Mexico	N/A	Panola County, Texas
Interstate 69	Construct and operate a highway between U.S. Highway 71 and Interstate Highway 20 as part of the Interstate 69 corridor that will link Indianapolis, Indiana to the lower Rio Grande Valley in Texas	N/A	DeSoto Parish, Louisiana
U.S. Highway 171	Widen to four lanes sections of U.S. Highway 171 from Shreveport to Lake Charles, Louisiana	2007–2010; work in proposed Project area completed	DeSoto Parish, Louisiana
U.S. Highway 167	Widen to four lanes sections of U.S. Highway 167 from Alexandria, Louisiana to the Arkansas state line	2007–2010	Jackson Parish, Louisiana
U.S. Highway 165	Widen to four lanes sections of U.S. Highway 165 from Jennings, Louisiana to the Arkansas state line	2007–2010; work in proposed Project area completed	Ouachita Parish, Louisiana
Clinton/Raymond Road Interchange	Interchange reconstruction, new bridge on Interstate 20, a new loop in the southwest quadrant, and widen U.S. Highway 80 to five lanes between Raymond Road to Springridge Road	October 2007	Hinds County, Mississippi
Stack Project (Interstate 20 / U.S. Highway 49)	Reconstruction of interchange, including additional lanes to both U.S. Highway 49 south and frontage roads.	December 2006	Hinds County, Mississippi
Note: N/A = Not available			

In addition to the proposed East Texas to Mississippi Expansion Project, the identified projects consist of one completed project, one project recently certificated and under construction, four proposed natural gas transmission pipelines, and seven transportation improvement projects. We identified these projects through scoping and independent research, as well as information provided by Gulf South. While we did not specifically contact each county/parish, community, or other entity regarding new projects or plans for expansion, we did request information on other projects in the NOI. We have identified the tentative construction schedules of these projects, as available; but the actual construction schedules would depend on factors such as economic conditions, the availability of funds, and political considerations.

The potential impacts associated with these projects that are most likely to be cumulatively significant are related to wetlands and waterbodies, vegetation and wildlife (including federally and state-listed endangered and threatened species), land use, air quality, and noise.

3.13.1 Other Natural Gas Pipeline Projects

Regency Intrastate Gas, LLC (Regency) recently completed construction on an expansion of its existing intrastate pipeline facilities in the Project area. As an intrastate pipeline, the Regency Project was not jurisdictional to the FERC. The FERC recently issued a Certificate for CEGT's Carthage to Perryville Project, which is also located in northern Louisiana and is currently in the final phase of construction. In addition, the FERC is currently considering a proposal for four other natural gas pipeline projects that would also traverse northern Louisiana and Mississippi, the Southeast Expansion Project, Southeast Supply Header Project (SESH), the Gulf Crossing Project, and the Midcontinent Express Project. Interstate natural gas pipeline projects occurring in the counties and parishes affected by the proposed East Texas to Mississippi Expansion project are depicted in Figure 3.13-1. Environmental resources that would be affected by recent and proposed interstate natural gas pipeline projects are quantified in Table 3.13-2.

Regency Intrastate Pipeline

Regency owns and operates a 280-mile-long, 30-inch-diameter intrastate pipeline system from Caddo Parish, Louisiana to Ruston, Louisiana. The Regency pipeline is interconnected at its western end with a 10-mile-long, 20-inch-diameter interstate gas pipeline that extends from Harrison County, Texas, to Caddo Parish, Louisiana (Regency 2006). In December 2005, Regency completed construction of the Regency Intrastate Enhancement Project. This expansion project included installation of 40 miles of 24-inch-diameter pipeline loop adjacent to the existing pipeline between Haughton, Louisiana and eastern Bienville Parish; construction of 80 miles of new 30-inch-diameter mainline pipeline between Bienville Parish and Winnsboro, Louisiana; and addition of approximately 10,000 hp of new compression at an existing compressor station in eastern Bienville Parish.

The Regency pipeline runs parallel to and generally north of portions of the proposed Project and the certificated Carthage to Perryville Project route, with the separation between the two routes ranging from about 10 to 25 miles. However, the recently constructed portion of the Regency pipeline in Jackson Parish, Louisiana is close to the proposed Project route and would intersect it near Chatham, Louisiana. Because it is an intrastate pipeline, the FERC did not have jurisdictional authority over planning or construction of the Regency Intrastate Enhancement Project, and we therefore have only limited information on the design and environmental impacts associated with that project. Construction of the Regency Intrastate Enhancement Project temporarily impacted a total of 42 acres of wetlands and resulted in permanent conversion of approximately 14 acres of forested wetlands to emergent and scrub-shrub wetlands.

CEGT Carthage to Perryville Project

CEGT is completing construction of the Carthage to Perryville Project, a new 42-inch-diameter natural gas pipeline system that would extend from Carthage in Panola County, Texas to near Delhi in Richland Parish, Louisiana. The project would consist of 172 miles of pipeline and two compressor stations that would total 41,240 hp. The pipeline would connect multiple receiving points in east Texas with CenterPoint's Perryville Hub and four new interstate pipeline interconnections. The CEGT Project would parallel the proposed East Texas to Mississippi Expansion Project route for approximately

Non-Internet Public

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED EAST TEXAS TO MISSISSIPPI EXPANSION PROJECT
Docket No. CP06-446-000

Page 3-135

Figure 3.13-1

Approximate Location of Interstate Natural Gas Pipeline Projects in
Counties/Parishes Affected by the Proposed East Texas to Mississippi
Expansion Project

Public access for the above information is available only
through the Public Reference Room, or by e-mail at
public.referenceroom@ferc.gov.

**TABLE 3.13-2
Environmental Resources That Would Be Affected During Construction and
Operation of Recent and Proposed Interstate Natural Gas Pipeline Projects in the Vicinity of the
Proposed East Texas to Mississippi Expansion Project**

Project	Total Length/Length of Collocation (miles)	Total Land Disturbance (acres)	Proposed Permanent Right-of-way Width (feet)	Total Open-Cut Waterbody Crossings (number)	Total Wetlands Disturbed During Construction (number / acres)	Total Forested Wetlands Disturbed (acres)	Total Forested Land Cleared (acres)	Federally Listed Endangered, Threatened, or Candidate Species (number)	Total Residences Within 50 Feet (number)	Total Potential National Register of Historic Places Sites (number)
East Texas to Mississippi Expansion Project	244 /181	3,763 (1,564 permanently)	60	170 perennial 647 intermittent	309 wetlands / 122 acres	84 acres	1,777 acres	11	4	1
Carthage to Perryville Project	172 /40	2,498 (1,248 permanently)	60	104 perennial 136 intermittent	154 wetlands / 128 acres	87 acres	1,425 acres	6	0	2
Southeast Supply Header Project	269 /0	3,417 (1,631 permanently)	50	177 perennial 448 intermittent	246 wetlands / 239 acres	249 acres	2,171 acres	19	6	6
Southeast Expansion Project	111 /73	1,954 (825 permanently)	60	92 perennial 159 intermittent	129 wetlands / 89 acres	48 acres	1,329 acres	9	18	9
Gulf Crossing Project	366 /273	5,619 (2,745 permanently)	60	73 perennial 433 intermittent	92 wetlands / 335 acres	at least 154 acres	1,930 acres	16	0	8
Midcontinent Express Project	494 /330	Not available	50	Not available	Not available	Not available	Not available	Not available	Not available	Not available

97 miles. The FERC issued CEGT its Certificate on October 2, 2006. Construction of the Carthage to Perryville Project would likely be completed by the second quarter of 2007.

The Carthage to Perryville Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Texas and Louisiana. Its similarity and proximity to the proposed Project merits further consideration. The FERC (1989) considers that the general impacts of building multiple pipelines would be primarily additive. Based on the project scope, geographic location, and preliminary information, we anticipate that the Carthage to Perryville Project would result in environmental impacts similar to those of the proposed Project. Detailed information regarding the environmental impacts that would be associated with construction and operation of the CEGT Project are included in the EIS (FERC 2006) prepared by the FERC and can be viewed on the FERC website under Docket No. CP06-85-000.

Southeast Expansion Project

Gulf South has proposed construction of a new 42-inch-diameter natural gas pipeline system that would extend approximately 111 miles from Simpson County, Mississippi to Choctaw County, Alabama. Approximately 29 miles of 42-inch-diameter pipeline would be located in one county that would also be affected by the East Texas to Mississippi Expansion Project, Simpson County, Mississippi. The proposed Southeast Expansion Project would affect approximately 344 acres during construction and 207 acres during operation in Simpson County, Mississippi. In addition to the 111 miles of pipeline construction, the proposed Southeast Expansion Project would add three new compressor stations. Two of the new compressor stations would be located in the area affected by the proposed East Texas to Mississippi Expansion Project, the Delhi Compressor Station (10 acres disturbed during construction) in Richland Parish, Louisiana and the Harrisville Compressor Station (11 acres disturbed during construction), in Simpson County, Mississippi. Both of these proposed compressor stations would permanently affect 5 acres of land during operation. The pipeline would connect onshore gas supplies from Texas and Louisiana to the markets in Florida and the northeastern United States, as well as interconnect with interstate systems in Louisiana, Mississippi, and Alabama.

A draft EIS was issued for the proposed Southeast Expansion Project on April 20, 2007, is still being evaluated by the FERC staff and has not yet been approved. While it is not certain if or when this action will occur, its similarity and proximity to the proposed Project merits further consideration. Within the two county region also affected by the proposed East Texas to Mississippi Expansion Project, the proposed Southeast Expansion Project would cross numerous waterbodies and forested lands, and would impact approximately 16 acres of wetlands during construction. Approximately 4 acres of forested wetlands would be permanently converted to herbaceous or scrub-shrub wetlands in this region. Based on the project scope, geographic location, and information that we have available, we anticipate that the Southeast Expansion Project would result in environmental impacts similar to those of the proposed Project. Detailed information regarding the environmental impacts that would be associated with construction and operation of the Southeast Expansion Project, including the draft EIS, can be viewed on the FERC website under Docket No. CP07-32-000.

Southeast Supply Header Project

Duke Energy Gas Transmission (DEGT) and CEGT have proposed construction of a new 36-inch-diameter and 42-inch-diameter natural gas pipeline system that would extend approximately 269 miles southeast from Delhi, Louisiana to near Coden, Alabama. Approximately 94 miles of 42-inch-diameter pipeline would be located in five parishes and counties that would also be affected by the East Texas to Mississippi Expansion Project including Richland and Madison Parishes, Louisiana and Hinds, Copiah, and Simpson Counties, Mississippi. Given proposed 125-foot-wide and 50-foot-wide

construction and permanent rights-of-way, respectively, the proposed SESH pipeline would affect approximately 1,424 acres during construction and 570 acres during operation in the five parish/county region also affected by the proposed East Texas to Mississippi Expansion Project. In addition to the 269 miles of pipeline construction, the SESH Project would add three new compressor stations. One of the new compressor stations would be located in Richland Parish, Louisiana. The pipeline would connect onshore gas supplies from Texas and Louisiana to the markets in the southeast, as well as interconnect with interstate systems in Mississippi and Alabama.

The SESH Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Louisiana and Mississippi. A draft EIS was issued on April 27, 2007, is still being evaluated by the FERC, and has not yet been approved. While it is not certain if or when this action will occur, its similarity and proximity to the proposed Project merits further consideration. Within the five parish/county region also affected by the proposed East Texas to Mississippi Expansion Project, the proposed SESH Project would cross numerous waterbodies and forested lands, and would impact approximately 46 acres of wetlands during construction. Approximately 13 acres of forested wetlands would be permanently converted to herbaceous or scrub-shrub wetlands in this region. Based on the project scope, geographic location, and information that we have available, we anticipate that the SESH Project would result in environmental impacts similar to those of the proposed Project. Detailed information regarding the environmental impacts that would be associated with construction and operation of the SESH Project, including the draft EIS, can be viewed on the FERC website under Docket No. CP07-44-000.

Gulf Crossing Project

Gulf Crossing Pipeline Company, LLC (Gulf Crossing) is a subsidiary of Boardwalk Pipeline Partners, LP, along with Gulf South Pipeline Company. Gulf Crossing has proposed construction of a new 42-inch-diameter natural gas pipeline system that would extend approximately 351 miles from Grayson County, Texas to the area that would be affected by the proposed East Texas to Mississippi Expansion Project, including Ouachita, Richland and Madison Parishes, Louisiana with looping also proposed for Hinds, Copiah, and Simpson, Counties, Mississippi. Loop B of the proposed Gulf Crossing project would be collocated with the proposed East Texas to Mississippi Project for approximately 11 miles. In addition to the 351 miles of pipeline construction, the proposed Gulf Crossing Project would add four new compressor stations, although no new compressor stations would be located in the six parish/county region also affected by the proposed East Texas to Mississippi Expansion Project. The pipeline would connect onshore gas supplies from Texas and Oklahoma to the markets in the southeast, as well as interconnect with interstate systems in Texas, Oklahoma, and Louisiana.

The proposed Gulf Crossing Project is in the pre-filing stage and is being evaluated by the FERC, but an application has not yet been filed. While it is not certain if or when this action will occur, its similarity and proximity to the proposed Project merits further consideration. The Gulf Crossing Project would involve construction and operation of approximately 65 miles of pipeline and would affect approximately 750 and 478 acres during construction and operation, respectively, in the six parish/county region also affected by the proposed East Texas to Mississippi Expansion Project. Approximately 85 acres of wetlands, including at least 5.2 acres of forested wetlands, 97 waterbodies, and 124 acres of forest would be affected by the proposed Gulf Crossing Project in the six parish/county region also affected by the proposed East Texas to Mississippi Expansion Project. As noted above, the general cumulative impact of constructing multiple pipelines would be primarily additive. Based on the project scope, geographic location, and preliminary information, we anticipate that the Gulf Crossing Project would result in environmental impacts similar to those of the proposed Project. More detailed information regarding the environmental impacts that would be associated with construction and

operation of the Gulf Crossing Project, once it is available, can be viewed on the FERC website under Docket No. PF07-1-000.

Midcontinent Express Project

Midcontinent Express Pipeline Company, LLC (Midcontinent Express) has proposed construction of a new 30-inch-diameter, 36-inch-diameter, and 42-inch-diameter natural gas pipeline system that would extend approximately 494 miles from Bryan County, Oklahoma to Choctaw County, Alabama. The proposed Midcontinent Express Project would extend through the region that would be affected by the proposed East Texas to Mississippi Expansion Project, including Ouachita, Richland, and Madison Parishes, Louisiana and Warren, Hinds, and Simpson Counties, Mississippi for a distance of approximately 120 miles. Based on preliminary information, the proposed Midcontinent Express Project would be located near or collocated with the East Texas to Mississippi Project for approximately 68 miles. In addition to the 494 miles of pipeline construction, the proposed Gulf Crossing Project would add four new compressor stations, with one new compressor station proposed for Warren County, Mississippi. The pipeline would connect onshore gas supplies from Texas, Oklahoma, and Arkansas to the markets in the southeast, as well as interconnect with a variety of interstate natural gas transmission systems.

The Midcontinent Express Project is in the pre-filing stage and is being evaluated by the FERC, but an application has not yet been filed. While it is not certain if or when this action will occur, its similarity and proximity to the proposed Project merits further consideration. The Midcontinent Express Project would involve construction and operation of approximately 120 miles of pipeline and would affect approximately 1,818 acres during construction in the six parish/county region affected by the proposed East Texas to Mississippi Expansion Project. Detailed information for waterbodies, wetlands, forested areas, and other resources is not yet available for the Midcontinent Express Project. As noted above, the general impact of constructing multiple pipelines would be primarily additive. Based on the project scope, geographic location, and preliminary information, we anticipate that the Midcontinent Express Project would result in environmental impacts similar to those of the proposed Project. More detailed information regarding the environmental impacts that would be associated with construction and operation of the Midcontinent Express Project, once it becomes available, can be viewed on the FERC website under Docket No. PF07-4-000.

3.13.2 Unrelated Projects

Trans-Texas Corridor 69

A consortium of Texas state transportation planning agencies, including the Texas Department of Transportation (TxDOT) and the Texas Turnpike Authority have proposed the Trans-Texas Corridor (TTC) Project. The TTC Project would consist of a system of new and existing highways that would provide dedicated travel lanes for cars and heavy trucks, incorporate light and heavy rail and other transit modes, and provide infrastructure for pipelines and other linear utilities. Elements of the TTC would be evaluated, designed, and constructed over the next 50 years (TTC 2006).

One major component of the Project, TTC 69, would extend from Texarkana, Texas to Mexico. One section of TTC 69 would be constructed in Panola County, Texas, in the general vicinity of the proposed Project route. An initial environmental study of TTC 69 will result in selection of a preferred 4-mile-wide corridor. That study is currently being conducted by TxDOT and is expected to be completed in 2007. If a preferred corridor is selected, potential route and design alternatives would be evaluated through an EIS conducted by the Federal Highway Administration (FHWA) and the Federal Transit Authority.

Interstate Highway 69

The Louisiana Department of Transportation and Development (LDOT), in cooperation with the FHWA, is conducting an environmental and location study to construct a section of the proposed Interstate Highway 69 in Bossier, Caddo, and DeSoto Parishes, Louisiana. If approved, this project would provide a divided, four-lane, limited access highway on a new location between US Highway 171 near the Town of Stonewall in DeSoto Parish and Interstate Highway 20 near the Town of Haughton in Bossier Parish, a distance of approximately 35 miles. The proposed highway is part of the Interstate 69 Corridor that will link Indianapolis, Indiana to the lower Rio Grande Valley in Texas (LDOT 2006).

U.S. Highway 171 Widening

As part of its Transportation Infrastructure Model for Economic Development (TIMED), a \$40-billion, 10-year program to improve 536 miles of state highways, LDOT is adding a fourth travel lane to approximately 121 miles of U.S. Highway 171 between Shreveport and Lake Charles, Louisiana (LDOT 2006). As of April 2007, construction of the U.S. Highway 171 project was approximately 71 percent complete. Construction is scheduled to begin on the remaining portions by mid-2007, with completion of construction slated for 2010. The proposed Project route would intersect U.S. Highway 171 near MP 4.5 in DeSoto Parish, but construction on this portion of U.S. Highway 171 has already been completed.

U.S. Highway 167 Widening

Under another component of the TIMED program, U.S. Highway 167 is being widened to four lanes along a 112-mile stretch between the Arkansas state line and Alexandria, Louisiana (LDOT 2006). As of April 2007, construction of the U.S. Highway 167 widening was approximately 40 percent complete. The proposed Project route would intersect U.S. Highway 167 near MP 73.1 in Jackson Parish, and this portion of U.S. Highway 167 is expected to be under construction between 2007 and 2010.

U.S. Highway 165 Widening

LDOT also has plans to expand a 173-mile portion of U.S. Highway 165 to four lanes between the Arkansas state line and Jennings, Louisiana (LDOT 2006). As of April 2007, construction of the U.S. Highway 165 widening was approximately 48 percent complete. The TIMED Project schedule indicates that all construction work on U.S. Highway 165 will start no later than mid-2007 and be completed by 2010. The proposed Project route would intersect U.S. Highway 165 near MP 111.4 in Ouachita Parish, but this portion of U.S. Highway 165 has already been constructed. Sections of U.S. Highway 165 located just north and south of the proposed pipeline route in Ouachita Parish would be under construction between 2007 and 2010.

Clinton/Raymond Road Interchange

The Mississippi Department of Transportation's (MDOT's) Clinton/Raymond Road Interchange project is currently underway. The scheduled completion date is October 2007. The project includes complete reconstruction of the interchange, including a new bridge on Interstate 20 over Clinton/Raymond Road, a new loop in the southwest quadrant to improve access to the interstate for traffic southbound on Clinton/Raymond Road going eastbound on Interstate 20, improving U.S. Highway 80 to five lanes from Clinton/ Raymond Road to Springridge Road, and installation of signals at all interstate ramps and at the Clinton/ Raymond Road and U.S. Highway 80 intersections (MDOT 2006).

Stack Project (Interstate 20/U.S. Highway 49)

MDOT's Phase III of the Stack Project is scheduled to be complete in December 2006. This phase includes reconstruction of the Interstate 20/U.S. Highway 49 interchange, including adding lanes to both U.S. Highway 49 south and frontage roads on U.S. Highway 49. Phase IV of the Stack Project is scheduled to be let for construction bids in October 2007. This phase will include replacing the pavement on Interstate 20/Interstate 55 from Gallatin Street to the Pearl River. It also includes a new roadway from Gallatin Street to State Street (MDOT 2006).

3.13.3 Potential Cumulative Impacts of the Proposed Action

Impacts to wetlands, waterbodies, vegetation, wildlife (including federally and state-listed endangered and threatened species), land use, and air quality and noise could contribute to larger cumulative impacts.

The FERC has no authority over permitting, licensing, funding, construction, or operation of the projects listed above in Section 3.13.2. Federal, state, and local agencies must review these projects for compliance with requirements for construction of facilities at sites or places where a governmental license or permit may be required. Expansion or construction of intrastate pipelines and highways would require state or federal permits and approvals to ensure compliance with Section 7 of the ESA; Sections 401, 402, and 404 of the CWA; and the CAA. Issuance of the necessary permits and approvals would reduce or avoid significant impacts from these facilities to wetlands and waterbodies, vegetation and wildlife (including threatened and endangered species), land use, and air quality and noise.

3.13.3.1 Wetlands and Waterbodies

Construction and operation of the proposed Project would result in both short-term and long-term impacts to waterbodies and wetlands. The short-term impacts such as soil or sediment disturbance would dissipate over a period of weeks, while longer-term impacts, such as regrowth of forested wetlands within the temporary construction rights-of-way, would persist for months or years. The primary impacts to wetlands and waterbodies during operation of the proposed pipeline would be associated with routine right-of-way maintenance. All maintenance activities would comply with applicable federal regulations and Gulf South's Plan (see Section 3.2) and Procedures (see Sections 3.3 and 3.4), but would continue throughout the life of the proposed Project.

If approved and constructed, the proposed Project and other reasonably foreseeable future projects would impact wetlands and would include permanent loss or conversion of some existing wetlands (see Table 3.4.1-1). Elements of these projects with the potential to affect wetlands and waterbodies would be subject to review and approval under Section 404 of the CWA, as administered by the COE, as well as state and local wetland regulations (see Section 1.3). Any permanent or long-term impacts to wetlands and waterbodies would require appropriate mitigation. Construction of the proposed Project would affect 309 wetland areas, resulting in disturbance of a total of approximately 122.4 acres of wetlands, including approximately 84.2 acres of forested wetland impacts. Based on our recommendation in the Draft EIS, Gulf South developed site-specific wetland crossing plans in select areas to further minimize forested wetland effects. Gulf South indicates that compensatory mitigation for wetland impacts associated with the proposed Project would be provided through the purchase of wetland mitigation bank credits in Texas and through restoration of bottomland hardwood wetlands located on private property in Louisiana and Mississippi as approved by the COE.

Construction of the proposed Project would result in 889 individual waterbody crossings. Gulf South proposes to use 34 separate HDD crossings to accomplish pipeline installation across

65 waterbodies, including 16 major waterbodies, two Louisiana Natural and Scenic Rivers (Black Lake Bayou and Saline Bayou), and two NRI-listed streams (Big Black River and Pearl River). The use of HDD would avoid direct impacts to waterbodies and minimize impacts to riparian vegetation at those crossings. Although impacts to surface waters could occur during the HDD installation process, either through an inadvertent release of drilling fluids (frac-out) or through accidental fuel and chemical spills, the likelihood and potential damage associated with such events would be greatly reduced by the implementation of Gulf South's HDD Contingency Plan and SPCC Plan.

Because most of the projects listed in Table 3.13-1 are located within the same major watersheds that would be crossed by the proposed Project pipeline, and because some of these projects would likely involve direct and indirect waterbody impacts, the proposed Project and other reasonably foreseeable future projects would result in some cumulative impacts to waterbodies. However, because the proposed Project would not involve construction of permanent diversions or dams, impacts to surface water quality would be temporary. These temporary impacts would include runoff from construction areas, temporary and localized increases in turbidity and sedimentation associated with in-water construction, and withdrawal and discharge of surface waters for hydrostatic testing of pipeline segments. As described in Section 3.3, these effects would be relatively minor and would be further minimized by implementation of Gulf South's Plan and Procedures and our recommendations; therefore, we believe that cumulative impacts to wetlands and waterbodies would be relatively minor.

3.13.3.2 Vegetation and Wildlife

Construction of the proposed Project and other reasonably foreseeable future projects would cause a cumulative impact on native vegetation and associated wildlife. These cumulative impacts would be most significant if the projects were constructed at or near the same time and within close proximity of one another. Either circumstance would increase the impacts and would lengthen the recovery time for affected vegetative communities. The proposed Project, if approved, would impact native vegetative communities during construction, including approximately 995.2 acres of upland forest (slope hardwood and loblolly pine-hardwood forest) and 781.5 acres of pine plantation. Impacts to forested land and other native vegetative communities from the Regency, CEGT, Southeast Expansion, SESH, Gulf Crossing, and Midcontinent Express Projects would likely result in a cumulative effect on vegetation and wildlife when considered in conjunction with proposed Project. The proposed roadway improvement projects listed in Table 3.13-1 are not likely to significantly impact forests or other native plant communities, as these projects would largely be sited within existing disturbed roadway rights-of-way.

Cumulative impacts within a region, such as lost acreage of forestland, are additive. Furthermore, many wildlife species depend on mature contiguous tracts of forest to sustain their migratory and reproduction cycles. These species include dozens of migratory songbirds and terrestrial mammals that are not migratory but that require large tracts of forest to support their home ranges. The impacts of fragmentation can be immediate and significant because population levels for many such species are currently low and on the decline.

The extent and duration of cumulative wildlife habitat impacts associated with construction of the proposed Project and other future projects would be minimized by using existing, maintained rights-of-way and other disturbed areas as much as possible. Gulf South's proposed route would be collocated with or parallel to existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation. The proposed pipeline route would parallel existing utility rights-of-way for approximately 181 miles, or about 76 percent of the proposed route. Additionally, approximately 39 percent of the proposed pipeline route's length would traverse agriculture and pasturelands that would typically experience rapid revegetation. Furthermore, Gulf South would implement the mitigation

measures outlined in its Plan and Procedures to encourage the regrowth of native vegetation and discourage the spread of exotic or noxious plant species.

Eleven federally listed or candidate species and a number of state-listed threatened, endangered, and/or special-status species would be potentially impacted by construction activities associated with the proposed Project. As described in Section 3.7, with implementation of our recommendations for mitigation to avoid and minimize impacts, we believe that the proposed Project would not significantly affect federally listed species. However, if other reasonably foreseeable future projects were to impact the same habitats as the proposed Project route, cumulative impacts to these listed species would occur. Impacts to such species would likely be reduced or eliminated through conservation and mitigation measures identified during the permitting processes because protection of threatened, endangered and other special-status species is part of the federal and state permitting processes. Consequently, we believe that cumulative impacts to vegetation and wildlife resources would be relatively minor.

3.13.3.3 Land Use

Construction of the proposed Project and other reasonably foreseeable future projects would result in temporary and permanent changes in land use within the Project area. The proposed Project would encumber a total of approximately 3,763.4 acres of land during construction. Approximately 47 percent of that land would be upland forest (including pine plantations), 27 percent would be agricultural, 5 percent would be open land, and 3 percent would be wetland. Residential land, commercial/industrial land, and open water would also be affected. While many of these impacts would be temporary, construction of the proposed Project would result in some permanent land use changes, including conversion to maintained utility right-of-way of approximately 791.4 acres of forested uplands including pine plantations, 476.3 acres of agriculture, 70.7 acres of open land, and 45.0 acres of forested wetlands.

Land use impacts associated with the Carthage to Perryville Project include approximately 2,500 acres during construction and approximately 775 acres of permanent impacts to forested lands. The Southeast Expansion and SESH Projects would impact approximately 1,329 and 2,171 acres of forested lands, respectively, in total during construction. Specific data for the region also affected by the proposed East Texas to Mississippi Expansion Project is not available at this time. Acreages impacted for land use types have not yet been determined for the proposed Gulf Crossing and Midcontinent Express Projects. The construction and operational impacts of the Regency Intrastate Expansion also are not available at this time. Land use impacts associated with the pipeline projects would likely cause a cumulative effect when considered in conjunction with the proposed Project. Because these projects were constructed or are proposed to be constructed largely within or adjacent to existing maintained rights-of-way, the impact of land use changes would be reduced. Unlike roadway projects such as TTC 69, which would permanently convert thousands of acres of land to paved impervious surface, much of the land affected during construction of the proposed Project and the other pipeline projects would be restored and allowed to revert to preconstruction uses and conditions once pipeline installation was complete. Because non-woody vegetation would be expected to return to preconstruction conditions over the short term, impacts to acreage classified as agriculture, pastures, or open land would be short term and minor. Long-term impacts to cleared forestland located outside of permanently maintained rights-of-way would take many years to return to preconstruction conditions, with recovery time dependent on the types and ages of the trees removed. However, given the prevalence of these land uses and cover types within the affected counties and parishes, we believe that cumulative impacts to land use would be relatively minor.

The FERC considers a variety of factors when evaluating potential pipeline routes proposed by applicants. One of these factors, but not necessarily the predominant factor, is collocation with existing utility corridors. Selection of a route that is collocated with an existing and maintained right-of-way may

have several advantages over a route in an undisturbed "greenfield" area. Some of these advantages include reduction in fragmentation of forested habitats, an expansion of an existing land use (i.e., maintained right-of-way) instead of introduction an entirely new one, less impacts to wildlife species found primarily in undisturbed habitats, and less visual impacts. However, we recognize that collocation with existing utility corridors may in some cases also have negative consequences to particular tracts such as small privately held properties or managed sites such as Sixteenth Section Lands and WRPs. Existing rights-of-way may appear attractive for routing of new projects and new rights-of-way may attract future projects. Although collocation may tend to reduce cumulative impacts overall, the cumulative impacts of two or more rights-of-way at individual properties or managed sites may be magnified. We have attempted to minimize the potential cumulative impacts for the proposed Project to the extent possible through our coordination with affected agencies and parties, our recommendation of impact avoidance, minimization, and mitigation measures, and our review of alternatives.

3.13.3.4 Air Quality

Air quality would be affected by construction and operation of the proposed Project and other reasonably foreseeable future projects. Construction of these projects would temporarily impact air quality by generating emissions from operation of fossil-fueled construction equipment and fugitive dust from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. However, the majority of impacts to air quality would occur during operation of these projects. The proposed Project, the proposed Southeast Expansion, SESH, Gulf Crossing, and Midcontinent Express Projects, the certificated Carthage to Perryville Project pipeline, and the existing Regency pipeline all would contribute to ongoing air emissions associated with operation of compressor stations. The proposed or planned roadway improvements might also contribute increased levels of air emissions as a result of increased vehicular traffic.

Because construction-related air emissions would be temporary and localized, they would be unlikely to contribute significantly to cumulative air quality impacts. Air emissions from operations of the proposed Project and the other projects listed in Table 3.13-1 would be additive because they would be discharged into a shared air basin. However, all counties and parishes in which the proposed Project would be constructed are in attainment for all NAAQS criteria pollutants. Furthermore, each of the projects listed in Table 3.13-1 would be required to meet all applicable federal and state air quality standards. For these reasons, we believe that cumulative impacts to air quality would be relatively minor.

3.13.3.5 Noise

Potential noise impacts associated with the proposed Project and those projects listed in Table 3.13-1 would occur during construction and operation. Because of the linear nature of these projects, construction-related noise impacts would tend to be of short duration in a given area. Furthermore, because most construction activities would be limited to daylight hours, construction-related noise impacts would not occur at night for the most part. The proposed Project would cause potential impacts at NSAs near HDD sites, but we are recommending measures to mitigate this temporary effect including development of an updated HDD Noise Plan. Potential noise-related impacts during operation of the proposed Project and the other pipeline projects listed in Table 3.13-1 would primarily be limited to the vicinity of the associated compressor stations. As described in Section 3.11, the estimated noise that would be generated by the existing Carthage Junction Compressor Station and the proposed Vixen and Tallulah Compressor Stations likely would meet acceptable levels at the nearest NSA, but we are recommending monitoring to ensure that no impacts occur.

Noise emissions from compressor station operations may be additive with noise-generating elements of other reasonably foreseeable future projects if they are located near a common NSA.

However, no other compressor station, roadway improvement, or other noise-generating source for the identified projects would be located within 1 mile of any of the proposed compressor stations, therefore, we believe that cumulative impacts resulting from additional noise would be negligible.

3.13.4 Conclusions

If the proposed Project and the Southeast Expansion, SESH, Gulf Crossing, and Midcontinent Express Projects are certificated, along with the recently certificated Carthage to Perryville Project, the projects would be constructed within the same general area, and the effects of these actions could overlap in time. Additionally, the project scopes, construction methods, and overall impacts would be similar. Though the unrelated projects identified in our cumulative impact analysis are different from the proposed Project, they would affect similar resources. Although each of these unrelated projects would result in temporary and minor effects during construction, each project would be designed to avoid or minimize impacts to wetlands, waterbodies, protected and special-status species, and other sensitive resources. Additionally, significant unavoidable impacts to sensitive resources resulting from these projects would be mitigated. Mitigation generally leads to avoidance or minimization of cumulative impacts. We therefore consider that the potential cumulative impacts of the five proposed pipeline projects under our review, as well as the recently certificated Carthage to Perryville Project, have been or would be minimized.

We believe that impacts associated with the proposed Project would be relatively minor, and we are recommending additional measures to further reduce the environmental impacts associated with the proposed Project. The environmental impacts associated with the proposed Project would be minimized by careful project routing, utilization of HDD techniques to avoid and minimize impacts to some sensitive resources, and implementation of appropriate mitigation measures. Consequently, a small, but insignificant cumulative effect is anticipated when the impacts of the proposed Project are added to past, present, or reasonably foreseeable future projects in the area.