

### **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 73.6 miles of Holocene alluvial plains and alluvium associated with the Red, Ouachita, and Mississippi Rivers consisting of loam, sand, gravel, silt, and clay; 39.9 miles of Pleistocene terrace uplands consisting of sand, clay, silt, and gravel; 34.1 miles of Miocene (23.8 Ma to 5.3 Ma) upland and terrace deposits consisting of sand, sandstone, clay, gravel,

quartzite, and sandy limestone; 9.2 miles of Oligocene (33.7 Ma to 23.8 Ma) upland and terrace deposits consisting of limestone, sandy limestone, sand, and marl; 58.4 miles of Eocene (54.8 Ma to 33.7 Ma) silt, clay, marl, sand ironstone, lignite, and glauconite; and 24.6 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 pre-construction 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 MP 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**

| <b>Cumulative Length Crossed (miles)</b> | <b>Group/Formation/ Type</b>    | <b>Description</b>  | <b>Age</b>  |
|--|---------------------------------|---|-------------|
| 38.9                                     | Alluvium                        | Loams, sand, gravel, and clay; mapped only in the Mississippi River Alluvial Plain  | Holocene    |
| 16.7                                     | Braided Stream Terraces         | Light gray, tan, and brown fine to coarse sand, some clay, silt, and gravel. Glacial outwash of ancestral Arkansas River.   | Pleistocene |
| 8.4                                      | 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      |
| 11.4                                     | Catahoula - Loess               | Brown silty clay with basal glauconitic, fossiliferous silts that may weather to ironstone locally.   | Eocene      |
| 34.1                                     | 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 |
| 34.7                                     | 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           |
| 9.2                               | 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        |
| 24.6                              | 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 pre- construction 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, LDNR’s SONRIS database, aerial photography, and field survey observations; three mineral resource sites exist within 0.25 mile of the proposed 42-inch 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.

| Milepost<br>(MP) | Parish/<br>County,<br>State | Mineral<br>Resource    | Distance<br>from<br>Construction<br>Work Area<br>(feet) | Direction<br>from<br>Construction<br>Work Area | Evaluation of Impacts   |
|------------------|-----------------------------|------------------------|---|--|---|
| 12.1             | DeSoto, LA                  | Inactive<br>gravel pit | Crossed   | N/A  | No impacts anticipated, the site is inactive  |
| 64.6             | Bienville,<br>LA            | Inactive<br>gravel pit | Crossed   | N/A  | No impacts anticipated, the site is inactive  |
| 68.7             | Jackson,<br>LA              | Active sand<br>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, but 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 HDDs 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 and 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 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 also would be unlikely to encounter bedrock along the 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 soils 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 (94 percent) to moderate (3 percent) erosion potentials (see Appendix C). However, approximately 3 percent of the soils crossed by the proposed Project, located specifically between proposed MP 103.9 and MP 104.0; MP 149.4 and MP 149.5; and in many areas between MP 186.0 and MP 196.2, have a severe erosion potential. The area occurring between MP 103.9 and MP 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 MP 149.5 in Madison Parish, Louisiana, consists of fluvial deposits composed of the Dundee-Sharkey-Tensas soil association. The area occurring between MP 186.0 and MP 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 10.4 miles of the soils that would be crossed by the proposed pipeline route are poorly drained and approximately 9.1 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 28 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 22 percent, or 54 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 MP 185.8, relatively large, contiguous areas occur in Madison Parish Louisiana from MP 149.3 to MP 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 (63 percent), fair (30 percent), poor (4 percent) and very poor (3 percent).

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

### 3.2.4 Sensitive Soils

#### 3.2.4.1 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.

Adherence to the impact avoidance, minimization, and mitigation measures outlined in its Plan and described below should minimize impacts to loess soils. However, based on agency concerns, regarding the unique qualities of loess soils, we recognize that additional measures could further minimize impacts. Gulf South is consulting with the NRCS to determine the need for additional measures that could be implemented and would further protect loess soils during construction and operation of the proposed Project and because that consultation has not yet been completed, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period a plan developed in consultation with the NRCS, regarding the management of loess soils. This plan should indicate any NRCS recommendations to minimize or mitigate impacts to loess soils and state whether or not these recommendations would be adopted and if not, explain why.**

### 3.2.5 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 managing 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;
- confirming revegetation efforts through post-construction monitoring of all disturbed areas.

### **3.2.5.1 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 also 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.

### **3.2.5.2 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 22 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.

### **3.2.5.3 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 would consult with the local soil conservation authorities to determine the appropriate seed mixtures for stabilization and permanent erosion control. We are recommending in Section 3.5 that Gulf South consult with TPWD, LDWF, and the MDWFP regarding seeding mixtures and revegetation.

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.

### **3.2.5.4 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.

### **3.2.5.5 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.

### **3.2.6 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, a favorable growing season, are not saturated for long periods of time, 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, and therefore this information is available directly from the soil survey databases. Approximately 70 percent of the soils that would be affected by the proposed pipeline 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.

Approximately 70 percent of the land that would be encompassed by the proposed pipeline construction right-of-way and additional temporary workspaces contains soils classified as prime farmland soils. 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 Transmission, Texas Eastern Transmission, 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.

### **3.2.7 Conclusion**

Construction of the proposed Project would result in several affects 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 also 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 2006). 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 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 MP 193 and MP 205 through MP 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 1 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 25 wells located within 150 feet of the proposed construction right-of-way and aboveground facility boundaries. The identified wells included two industrial wells, two irrigation wells, four observation wells, seven domestic water supply wells, three rig supply wells, and seven 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.

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.

**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<sup>a</sup>**

| Well Type                | County/Parish | Approximate<br>Milepost | Approximate<br>Well Depth (feet) | Approximate<br>Distance from<br>Centerline (feet) | Approximate<br>Distance<br>from<br>Construction<br>Work Area<br>(feet) |
|--------------------------|---------------|-------------------------|----------------------------------|---|--|
| Private<br>Irrigation    | DeSoto, LA    | 6.6                     | 100                              | 169   | 119  |
| Plugged and<br>abandoned | DeSoto, LA    | 7.4                     | 90                               | 196   | 146  |
| Public<br>Domestic       | DeSoto, LA    | 8.7                     | 60                               | 71  | 21   |
| Private Rig<br>supply    | DeSoto, LA    | 9.0                     | 160                              | 75  | 25   |
| Public<br>Observation    | DeSoto, LA    | 9.2                     | 348                              | 107   | 57   |
| Plugged and<br>abandoned | DeSoto, LA    | 11.2                    | 376                              | 78  | 28   |
| Private<br>Industrial    | DeSoto, LA    | 12.3                    | 410                              | 108   | 58   |

**TABLE 3.3.1-2 (continued)**  
**Wells Located Within 150 Feet of the Proposed East Texas**  
**to Mississippi Expansion Project<sup>a</sup>**

| <b>Well Type</b>      | <b>County/Parish</b> | <b>Approximate Milepost</b> | <b>Approximate Well Depth (feet)</b> | <b>Approximate Distance from Centerline (feet)</b> | <b>Approximate Distance from Construction Work Area (feet)</b> |
|-----------------------|----------------------|-----------------------------|--------------------------------------|--|--|
| Plugged and abandoned | Bienville, LA        | 54.9                        | 336                                  | 35   | 0  |
| Public Observation    | Bienville, LA        | 62.6                        | 482                                  | 77   | 27   |
| Private Industrial    | Bienville, LA        | 63.2                        | 490                                  | 85   | 35   |
| Public Observation    | Bienville, LA        | 63.6                        | 488                                  | 154  | 104  |
| Plugged and abandoned | Bienville, LA        | 63.9                        | 494                                  | 135  | 85   |
| Public Domestic       | Bienville, LA        | 64.5                        | 110                                  | 137  | 87   |
| Public Domestic       | Bienville, LA        | 67.0                        | 320                                  | 43   | 0  |
| Plugged and abandoned | Bienville, LA        | 67.0                        | 270                                  | 152  | 102  |
| Private Rig supply    | Bienville, LA        | 67.0                        | 280                                  | 43   | 0  |
| Plugged and abandoned | Bienville, LA        | 67.7                        | 480                                  | 186  | 136  |
| Plugged and abandoned | Jackson, LA          | 78.2                        | 400                                  | 47   | 0  |
| Public Domestic       | Richland, LA         | 124.4                       | 285                                  | 141  | 91   |
| Private Rig supply    | Richland, LA         | 138.5                       | 200                                  | 197  | 147  |
| Public Observation    | Richland, LA         | 149.1                       | 629                                  | 163  | 113  |
| Private Irrigation    | Madison              | 163.7 <sup>b</sup>          | not available                        | not available                                      | not available  |
| Private Domestic      | Hinds, MS            | 199.4                       | 29.0                                 | 191  | 141  |
| Public Domestic       | Hinds, MS            | 207.2                       | 228.0                                | 132  | 82   |
| Public Domestic       | Hinds, MS            | 226.5                       | 570.0                                | 21   | 0  |

Notes:

<sup>a</sup> 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.

<sup>b</sup> This well would be plugged and abandoned, and a new well would be drilled approximately 100 feet south of the right-of-way.

## 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<br>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 (~800 feet) | 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 the 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 the centerline                        | 770 Kemp Bottom Road, Vicksburg, MS, 39180  |
| 184.8    | Warren, MS    | Entergy                               | RCRA/<br>FINDS/<br>CERC | Less than 0.25 mile (~1,060 feet) north of the 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 the centerline | 4106 Warrenton Road, Vicksburg, MS 39180 |
| 185.3    | Warren, MS    | Corp Headquarters (Former)    | UST          | Less than 0.25 mile (~330 feet) north of the centerline | 4111 Warrenton Road, Vicksburg, MS 39180 |
| 185.3    | Warren, MS    | Vicksburg Terminal            | FINDS        | Less than 0.25 mile (~330 feet) north of the centerline | 4212 Warrenton Road, Vicksburg, MS 39180 |
| 185.3    | Warren, MS    | Jett Elementary School        | LUST/<br>UST | Less than 0.25 mile (~330 feet) north of the 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 is 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 of a brief duration.

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 includes:

- 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
- the 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 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 MP 192.6 and MP 205.3 to MP 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 seven-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 affects 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 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 848 waterbodies would be crossed by construction and operation of the proposed Project. Specifically, the proposed Project would cross 196 perennial streams, 646 intermittent streams, and 6 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 crossings in Texas, all of which are designated for aquatic life. In Louisiana, 590 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 253 waterbodies. All 253 waterbodies have designated uses of fish and wildlife, public water supply, and recreation.

No waterbodies occur at the proposed aboveground facility sites and pipe storage and contractor yards. Additionally, Gulf South indicates that all additional temporary workspaces would be located at least 50 feet away from waterbodies. 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). However, the specific nature of the proposed access road improvements have not been identified, and it is not known whether the construction of new access roads or improvement of existing access roads would affect any waterbodies. Therefore, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, the locations and dimensions of all new or improved access roads that would cross waterbodies, a description of the construction methods that would be used to cross these waterbodies and a description of the measures that would be used to minimize and mitigate impacts to these waterbodies. In addition, Gulf South should submit documentation that the necessary permits and landowner approvals have been obtained.**

### **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 23 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 being 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 Gulf sturgeon inhabits the Pearl River, which is also designated as critical habitat for the species. The Mississippi Museum of Natural Science identified the Big Black River, Baker’s Creek (MP 203.8),

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

| <b>Waterbody</b>       | <b>County/Parish</b> | <b>Length of Crossing (feet)</b> | <b>Major Waterbody</b> | <b>Navigable Waterbody</b> | <b>Proposed Crossing Method</b> |
|------------------------|----------------------|----------------------------------|------------------------|----------------------------|---------------------------------|
| 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                             |
| Red River Tributary    | Red River, LA        | 273                              | X                      |                            | Open-cut                        |
| 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                        |
| Dugdemona 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                        |

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.

Four waterbodies each in Louisiana and Mississippi are listed as impaired waterbodies (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 Crossed by the Proposed East Texas  
to Mississippi Expansion Project**

| <b>Waterbody</b>   | <b>County/Parish</b>   | <b>Pollutant Cause</b>   |
|--------------------|------------------------|--|
| Bayou Pierre       | DeSoto / Red River, LA | Organic enrichment/low dissolved oxygen (DO)                         |
| Red River          | Red River, LA          | Color from an upstream source  |
| Black Lake Bayou   | Bienville, LA          | Organic enrichment/low DO  |
| Bayou Macon        | Richland / Madison, LA | Organic enrichment/low DO/ nutrients                                 |
| Big Black River    | Warren, MS             | Sediment/siltation   |
| Fourteenmile Creek | Hinds, MS              | Nutrients, organic enrichment/low DO, sedimentation/siltation        |
| Bakers Creek       | Hinds, MS              | Biological impairment  |
| Pearl River        | Simpson, MS            | Nutrients, organic enrichment/low DO, pesticides, sediment/siltation |

### 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 23 major waterbody crossings via HDD. The major waterbodies that would be crossed using open-cut methods include an unnamed pond, Red River Tributary, 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).

With the exception of a measure regarding seasonal construction windows that is discussed below, 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-foot-wide) and 48 hours for intermediate waterbody crossings (10- to 100-foot-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 our Wetland and Waterbody Construction and Mitigation Procedures (i.e., June 1 through November 30). The TPWD responded in their correspondence dated December 12, 2006 that the proposed schedule for construction in warmwater streams in Texas was acceptable. However, LDWF and MDWFP have not yet responded. Therefore, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period, copies of approvals or concurrences from the LDWF and the MDWFP indicating that instream construction between May 1 and November 30 is acceptable.**

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 affects 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 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. Following construction, trees and shrubs would also be allowed to reestablish themselves, except for a 10-foot-wide corridor centered over the pipeline.

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 six of the eight 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 and Bakers Creek in Hinds County, Mississippi would be crossed using open-cut methods. Construction-related disturbances and impacts to these waterbodies should be adequately minimized through the implementation of Gulf South's Procedures. Gulf South proposes to cross Black Lake Bayou, Saline Bayou, the Big Black River and the Pearl River using HDDs (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 HDDs 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 HDDs to install the proposed pipeline across 64 waterbodies, including 16 of the 23 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, to account for the potential that the planned geotechnical analyses could indicate that any proposed HDD crossing is not feasible or if HDD methods fail, **we recommend that:**

- **Gulf South should not begin an open-cut crossing of any of the waterbodies proposed to be crossed using HDD until it files an amended crossing plan with the Secretary for review and written approval by the Director of OEP. The amended crossing plan should include site-specific drawings identifying all areas that would be disturbed using the proposed alternate crossing method. Gulf South should file the amended crossing plan concurrent with the appropriate state and federal applications required for implementation of the plan.**

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 would be required to submit permit applications to LDWF for both proposed activities and would have to comply with any conditions of a permit.

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. The Big Black River and the Pearl River would be crossed using HDDs. 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 would be minimized. Furthermore, all work would be conducted in accordance with Gulf South's Procedures, including protective measures regarding withdrawal and discharge of hydrostatic test waters. 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 the end of the Draft EIS comment period, Gulf South should consult 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 recommended that Gulf South cross the Big Black River, Baker's Creek, Fourteenmile Creek, Turkey Creek, Tallahalla Creek, and the Pearl River via HDD in order to avoid potential impacts to rare aquatic species. Gulf South proposes to cross the Big Black River and the Pearl River using HDD methods, and Baker's Creek, 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 and Baker's Creek are approximately 13 feet and 55 feet wide, respectively. In order to ensure that potential impacts to these streams and the habitats for rare species that they provide are adequately minimized, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period a report summarizing consultations with the MDWFP regarding the proposed sensitive waterbody crossings of Baker's Creek, Fourteenmile Creek, Turkey Creek, and Tallahalla Creek.**

### **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 affects 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 impacts would include increased water temperatures, reduced levels of dissolved oxygen, 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**

| <b>Project Component / Facility</b>       | <b>Water Source</b>    | <b>Withdrawal Location (MP)</b> | <b>Approximate Volume (gallons)</b> | <b>Discharge Location (MP)</b> |
|---|------------------------|---------------------------------|-------------------------------------|--------------------------------|
| <b>42-Inch-Diameter Mainline Pipeline</b> |                        |                                 |                                     |                                |
| Construction Spread 1                     | Powell Bayou           | 25.1                            | 9,053,000                           | 25.1                           |
|   | Powell Bayou           | 25.1                            | 761,000                             | 25.1                           |
|   | Red River              | 27.1                            | 9,850,000                           | 27.1                           |
|   | Red River              | 27.1                            | 12,820,000                          | 27.1                           |
| 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                          |
| <b>Horizontal Directional Drill</b>       |                        |                                 |                                     |                                |
| Interstate 49                             | Municipal Supply       | Not Applicable                  | 112,000                             | 14.7                           |
| Bayou Pierre                              | Bayou Pierre           | 22.2                            | 137,000                             | 22.2                           |
| Prairie Bayou/ Cowpen Bayou               | Cowpen Bayou           | 23.5                            | 223,000                             | 23.5                           |
| Ash Bayou                                 | Ash Bayou              | 24.2                            | 112,000                             | 24.2                           |
| Powell Bayou                              | Powell Bayou           | 25.1                            | 112,000                             | 25.1                           |
| Red River                                 | Red River              | 27.1                            | 147,000                             | 27.1                           |
| Loggy Bayou                               | Loggy Bayou            | 29.7                            | 112,000                             | 29.7                           |
| Black Lake Bayou                          | Municipal Water Supply | Not Applicable                  | 147,000                             | 42.5                           |
| Black Lake Bayou                          | Municipal Water Supply | Not Applicable                  | 182,000                             | 43.2                           |
| Saline Bayou                              | Municipal Water Supply | Not Applicable                  | 182,000                             | 57.2                           |
| Dugdemonia River                          | Dugdemonia River       | 71.6                            | 231,000                             | 71.6                           |

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

| <b>Project Component / Facility</b>  | <b>Water Source</b>    | <b>Withdrawal Location (MP)</b> | <b>Approximate Volume (gallons)</b> | <b>Discharge Location (MP)</b> |
|--------------------------------------|------------------------|---------------------------------|-------------------------------------|--------------------------------|
| State Highway 167                    | Municipal Water Supply | Not Applicable                  | 112,000                             | 73.1                           |
| Castor Creek & LA Highway 34         | Castor Creek           | 89.8                            | 252,000                             | 89.8                           |
| Cutoff Bayou                         | Cutoff Bayou           | 109.1                           | 112,000                             | 109.1                          |
| Ouachita River                       | Ouachita River         | 110.8                           | 168,000                             | 110.8                          |
| Bayou Lafourche                      | Bayou Lafourche        | 115.5                           | 119,000                             | 115.5                          |
| Steep Bayou                          | Steep Bayou            | 120.9                           | 112,000                             | 120.9                          |
| Boeuf River                          | Boeuf River            | 122.3                           | 112,000                             | 122.3                          |
| Bee Bayou                            | Bee Bayou              | 130.9                           | 112,000                             | 130.9                          |
| Siphon Creek                         | Siphon Creek           | 140.1                           | 112,000                             | 140.1                          |
| Big Creek                            | Big Creek              | 140.9                           | 126,000                             | 140.9                          |
| Bayou Macon                          | Bayou Macon            | 149.8                           | 154,000                             | 149.8                          |
| Tensas River                         | Tensas River           | 159.9                           | 112,000                             | 159.9                          |
| Despair Lake                         | Despair Lake           | 161.2                           | 112,000                             | 159.9                          |
| Mothiglam Bayou                      | Mothiglam Bayou        | 163.7                           | 112,000                             | 163.7                          |
| Madison Parish Canal                 | Madison Parish Canal   | 166.7                           | 112,000                             | 166.7                          |
| Walnut Bayou                         | Walnut Bayou           | 172.9                           | 112,000                             | 172.9                          |
| Walnut Bayou                         | Walnut Bayou           | 177.5                           | 112,000                             | 177.5                          |
| Mississippi River                    | Mississippi River      | 184.0                           | 364,000                             | 184.0                          |
| Highway 61                           | Municipal Water Supply | Not Applicable                  | 182,000                             | 185.3                          |
| Big Black River                      | Big Black River        | 196.9                           | 252,000                             | 196.9                          |
| Interstate Highway 55                | Municipal Water Supply | Not Applicable                  | 112,000                             | 227.0                          |
| Pearl River                          | Pearl River            | 232.4                           | 112,000                             | 232.4                          |
| <b>Aboveground Facilities</b>        |                        |                                 |                                     |                                |
| 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                          |
| 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                          |
| <b>36-Inch-Diameter Pipeline</b>     |                        |                                 |                                     |                                |
| Pipeline Lateral                     | Municipal Supply       | Not Applicable                  | 900,000                             | H0.0                           |

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 and impacts to them would be avoided. 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 was sole jurisdiction for wetlands permitting for the proposed Project, including the provisions of any required wetland compensatory mitigation.

### **3.4.1 Existing Wetland Resources**

Gulf South conducted field surveys and performed a desktop review of 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, but field verification of Gulf South's wetland delineations have not yet been completed.

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 301 wetlands that would be crossed by the proposed Project are located in Louisiana (approximately 90 percent of the total number), with the remainder occurring in Mississippi (8 percent) and Texas (2 percent). The location, classification, crossing length, and affected acreage for each impacted wetland is listed in Appendix E. 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, and access roads would not affect any wetlands; therefore, these facilities are not considered further in this section.

| <b>TABLE 3.4.1-1<br/>Summary of Wetlands Affected by the Proposed East Texas<br/>to Mississippi Expansion Project</b> |                               |   |  |  |
|---|-------------------------------|---|--|--|
| Wetland Type <sup>a</sup>   | Number of<br>Wetlands Crossed | Permanent<br>Operation Impact<br>(acres) <sup>b</sup> | Temporary<br>Construction<br>Impact (acres) <sup>c</sup> | Estimated Crossing<br>Length (feet) <sup>d</sup> |
| PEM   | 108                           | 5.5   | 21.7   | 14,943   |
| PFO   | 146                           | 19.5  | 80.7   | 41,482   |
| PSS   | 39                            | 1.5   | 11.0   | 6,914  |
| POW   | 8                             | 0.3   | 1.5  | 306  |
| Total <sup>d</sup>  | 301                           | 26.8  | 114.9  | 63,645   |

Notes:

<sup>a</sup> Wetland Type  
PEM = Palustrine emergent  
PFO = Palustrine forested  
PSS = Palustrine scrub-shrub  
POW = Palustrine open-water

<sup>b</sup> Operational impacts for the pipeline facilities were based on a 10-foot-wide, maintained permanent right-of-way.

<sup>c</sup> Wetland impact calculations were based on a 75-foot-wide construction right-of-way.

<sup>d</sup> Totals may differ slightly from data presented in Appendix E due to rounding.

### 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 prinus*), chinquapin oak (*Quercus muhlenburgii*), red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), tupelo (*Nyssa aquatica*), and cypress (*Taxodium distichum*).

### 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 (*Carex* spp.), 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<br>(feet) | Description                                  |
|----------------|--|--|
| 17.3 to 17.4   | 675                                    | Scattered old-growth cypress at Rambin Bayou |
| 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                       |
| 107.7 to 107.9 | 355                                    | Cypress dominated                            |
| 124.3 to 124.4 | 86                                     | Cypress dominated                            |
| 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 Program 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 improve wetland function and wildlife habitat, and to promote long-term conservation through technical and financial assistance. Prior Converted wetlands are wetlands converted to agriculture that are targeted for voluntary restoration.

Gulf South identified 16 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, 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 3.8.5.

### **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 associated with the Sabine River. The proposed Project would not cross the Sabine River. 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.

#### **3.4.2 General Impacts and Mitigation**

As shown in Table 3.4.1-1, construction of the proposed Project would affect 301 wetland areas, resulting in a total of approximately 114.9 acres of wetland disturbance during construction. These impacts would include approximately 80.7 acres of PFO wetlands and an additional 34.2 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 19.5 acres of PFO wetlands and 7.3 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 may be issued by the COE. 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 182 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 section VI.B.1 of our Procedures, which relates to the location of additional temporary workspaces in wetlands. Section VI.B.1 states that all extra work areas, such as staging areas and access roads, should be located at least 50 feet outside of identified wetland boundaries, 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 Table 3.4.2-1.

Based on our review, we determine that the proposed alternative measures to our Procedures (including those that would affect PFO wetlands), as described in Table 3.4.2-1, appear reasonable and are 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 wetland boundary. Although Gulf South provides preliminary site-specific drawings for the proposed additional temporary workspaces in wetlands, the required site-specific written plans have not been submitted. In accordance with its Procedures, Gulf South would be required to file these site-specific construction plans prior to the start of construction.

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. Our Procedures also require that the Director of OEP approve any access road improvements or new access roads in wetlands, but Gulf South indicates that wetlands would not be affected by access roads. 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.

**TABLE 3.4.2-1  
Summary of the Proposed Alternative Measures to Our Procedures  
for the Proposed East Texas to Mississippi Project**

| <b>Affected Wetland/<br/>Facility</b>  | <b>Milepost</b> | <b>Affected Area<br/>(acres)</b> | <b>Wetland Type/<br/>Identifier</b> | <b>Applicable FERC<br/>Procedures<br/>Section</b> | <b>Basis for Requested Variance</b>   |
|--|-----------------|----------------------------------|-------------------------------------|---|---|
| PDP38W                                 | 8.4             | 0.3                              | PEM                                 | VI.B.1.a  | Additional temporary workspace (80-ft x 182-ft) needed in wetland on the east side of Parish Road 350 to safely install the pipeline at the road crossing.              |
| DW68PEM                                | 27.4            | 0.5                              | PEM                                 | VI.B.1.a  | Additional temporary workspace (50-ft x 400-ft) needed in wetland on the south side of pipeline ROW to safely install the pipeline at the Red River HDD crossing.       |
| EW42PFO                                | 34.5            | 0.1                              | PFO                                 | VI.B1.a   | Additional temporary workspace (50 ft x 100 ft) needed in wetland to safely install pipe on east side of Parish Road 350  |
| EW8PEM                                 | 38.0            | 0.2                              | PEM                                 | VI.B1.a   | Additional temporary workspace needed in wetland on the east and west side of Layfield Road (50 ft x 100 ft and 50 ft x 150 ft respectively) to safely install pipeline |
| DW16PFO<br>and<br>DW18PFO              | 40.9            | 0.3                              | PFO                                 | VI.B1.a   | Additional temporary workspace needed in wetlands on east and west side of Parish Road 540 (50 ft x 10 Ft and 50 ft x 150 ft respectively) to safely install pipeline.  |
| DW21PFO<br>and<br>DW23PFO              | 42.0            | 3.2                              | PFO                                 | VI.B1.a   | Additional temporary workspace needed (50 ft x 2,100 ft) in wetland adjacent to Black Lake Bayou for testing and fabrication of pipe extending west from HDD exit.      |
| DW24PFO                                | 42.3            | 0.0                              | PFO                                 | VI.B1.a   | The exit point for the Black Lake Bayou HDD is located within 50 feet of a wetland.   |
| DW31PEM,<br>DW32PFO,<br>and<br>DW35PFO | 43.0            | 2.6                              | PEM and PFO                         | VI.B1.a   | Additional temporary workspace needed (50 ft x 1450 ft) in wetland for fabrication and test pipe for Black Lake Bayou HDD extending east from Black Lake Bayou.         |
| EW74PFO                                | 56.4            | 0.1                              | PFO                                 | VI.B1.a   | Additional temporary workspace needed in wetland on the east side of State Highway 9 (50 ft x 100 ft) to safely install pipeline at the road crossing                   |

**TABLE 3.4.2-1 (continued)  
Summary of the Proposed Alternative Measures to Our Procedures  
for the Proposed East Texas to Mississippi Project**

| <b>Affected Wetland/<br/>Facility</b>  | <b>Milepost</b> | <b>Affected Area<br/>(acres)</b> | <b>Wetland Type/<br/>Identifier</b> | <b>Applicable FERC<br/>Procedures<br/>Section</b> | <b>Basis for Requested Variance</b>   |
|--|-----------------|----------------------------------|-------------------------------------|---|---|
| DW78PFO                                | 57.5            | 0.7                              | PFO                                 | VI.B1.a   | Additional temporary workspace needed for HDD exit site at Saline Bayou. The drill length is too long to span entire wetland.   |
| DW78PFO,<br>DW87PEM,<br>and<br>DW88PFO | 57.5            | 2.3                              | PEM and PFO                         | VI.B1.a   | This additional temporary workspace (85 ft x 1800 ft) is needed in wetland to fabricate and test pipe for Saline Bayou HDD extending east from the HDD exit.  |
| EW59PFO<br>and<br>EW61PFO              | 67.7            | 0.3                              | PFO                                 | VI.B1.a   | Additional temporary workspace needed on East and West side of Parish Road 757 (50 ft x 100 ft and 50 ft x 150 ft respectively) to safely install the pipeline at the road crossing.                        |
| PdP4W                                  | 127.8           | 0.0                              | PFO                                 | VI.B1.a   | Temporary workspace needed within 50 ft of two wetlands near Cane Bayou.  |
| GPOW1                                  | 134.3           | 0.0                              | POW                                 | VI.B1.a   | Additional temporary workspace needed (50 ft x 200 ft) in wetland on east side of Johnson Road to safely install the pipeline at road crossing is located within 50 feet of a wetland.                      |
| QDP7W                                  | 147.7           | 0.0                              | PEM                                 | VI.B1.a   | Temporary workspace needed (50 ft x 100 ft) on east side of Barfield Road to safely install pipeline at road crossing is located within 50 feet of a wetland.   |
| DW137PFO                               | 182.0           | 4.5                              | PFO                                 | VI.B.1.a  | Additional temporary workspace (25-ft x 7,864-ft) needed in wetlands inside the levee and at HDD site on west side of the Mississippi River to safely install the pipeline in this area.                    |
| DW136PFO                               | 183.0           | 5.9                              | PFO                                 | VI.B.1.a  | Additional temporary workspace (50-ft x 3,720-ft + 200-ft x 200-ft + 200-ft x 160-ft) needed in wetlands on west side of the Mississippi River to safely install the HDD crossing of the Mississippi River. |

**TABLE 3.4.2-1 (continued)**  
**Summary of the Proposed Alternative Measures to Our Procedures**  
**for the Proposed East Texas to Mississippi Project**

| <b>Affected Wetland/<br/>Facility</b> | <b>Milepost</b> | <b>Affected Area<br/>(acres)</b> | <b>Wetland Type/<br/>Identifier</b> | <b>Applicable FERC<br/>Procedures<br/>Section</b> | <b>Basis for Requested Variance</b>   |
|---------------------------------------|-----------------|----------------------------------|-------------------------------------|---|---|
| EW601PEM                              | 185.0           | 0.2                              | PEM                                 | VI.B.1.a  | Additional temporary workspace (50-ft x 100-ft) needed in wetlands on east side of State Highway 61 to safely install the pipeline at the State Highway 61 crossing.                        |
| EW801PSS                              | 186.0           | 0.3                              | PSS                                 | VI.B.1.a  | Additional temporary workspace (75-ft x 200-ft) needed in wetlands on south side of Railroad & Kemp Bottom Road to safely install the pipeline at the Railroad & Kemp Bottom Road crossing. |

### 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 HDDs. Gulf South would use HDDs 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 our recommendation regarding 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 trees occur within the proposed Project right-of-way at Rambin Bayou (MP 17.3 and MP 17.4). Gulf South proposes to minimize its construction right-of-way in this area in an effort to minimize impacts to this unique wetland habitat area. Additionally, Gulf South proposes to develop site-specific crossing plans for some, but not all, of the other areas it identified as having mature and large cypress or tupelo trees in forested wetlands as listed in Table 3.4.1-2. We believe that additional measures to further minimize impacts to these areas of mature tupelo and cypress trees in forested wetlands may be appropriate. Therefore, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period site-specific wetland crossing plans developed in consultation with the COE, FWS, LDWF, and the MDWFP for the areas listed in Table 3.4.1-2. These plans should indicate a reduction in the width of the proposed construction right-of-way and any associated extra temporary workspace areas. Each plan should also depict the location of any mature, specimen trees (i.e., greater than 24 inches diameter at breast height)**

**within and adjacent to the proposed construction work areas, and identify how impacts to such trees might be avoided.**

### **Wetlands Reserve Program Lands and Prior Converted Wetlands**

Based on available mapping and coordination with the NRCS, Gulf South indicates that 16 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 program 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 also recommending Gulf South consult further with the NRCS regarding 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 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 for unavoidable impacts to this community by treating affected wetlands as high-quality wetlands. 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 on 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 would complete wetland permitting, including the development of measures for compensatory mitigation for all wetland impacts, in consultation with the COE. Based on the results of the consultations completed to date, Gulf South proposes to compensate for wetland impacts 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. Gulf South and the COE are consulting regarding appropriate mitigation for wetland impacts, and because these consultations are not yet complete, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, its Wetland Mitigation Plan developed in consultation with the COE, FWS, TPWD, LDWF, MDFWP, and other applicable agencies.**

### **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 HDDs, and the implementation of Gulf South's Procedures. Additionally, we are recommending measures that would further minimize or mitigate impacts to mature wetland cypress or tupelo communities, WRP and Prior Converted Wetland areas. Given these measures, 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 types 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.

### **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 53 percent of the 3,425.6 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 (15 percent), and slope hardwood (15 percent). Agricultural areas (30 percent), pasture (12 percent), and open lands (5 percent) account for most of the remaining areas that would be crossed.

Temporary pipe storage and contractor yards that would be used to support construction of the proposed Project would temporarily encumber approximately 484 acres. Of this area needed for pipe

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

| Vegetation Cover Type           | 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 and 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   |

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, meter and regulation facilities, pig launchers and receivers, valves, and other ancillary facilities. Pine plantation and agricultural lands are the dominant existing vegetation cover types 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 167 access roads of varying lengths and construction activity. Gulf South reports that 70 of these access roads would be new roads or existing roads that would require upgrades to support construction-related traffic. Approximately 88 percent of the 102.4 acres encompassing new or modified access roads would be within the open land vegetation category or within industrial/commercial areas where vegetation is maintained or generally lacking. The remainder of the vegetation types 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 and identified easement lands held in the NRCS Conservation Reserve Program (CRP), the Ouachita Wildlife Management Area (WMA), and the Loess Hills Forest.

As described further in Section 3.8, the NRCS-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, 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 type 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 the 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.

| Location              | Begin Milepost | End Milepost | Length<br>(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               |
| <b>Total</b>          |                |              | <b>77.1</b>       |

### 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 pre-construction 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-foot-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 three 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 provide additional justification regarding the need for a 60-foot-wide permanent right-of-way.

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 re-established. General impacts to vegetation communities are described in further detail below.

### **Community Specific Impacts**

The proposed Project would impact approximately 3,447.7 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 types 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 one to two 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 re-growth 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.

**TABLE 3.5.2-1  
Vegetative Communities Affected by the Proposed  
East Texas to Mississippi Expansion Project**

| Vegetation Cover Type           | Pipeline Facilities <sup>a</sup>      |                                     | 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 <sup>b</sup>       | 950.6                                 | 442.8                               | 10.0                                  | 14.0 <sup>c</sup>                   | 6.5                                   | 3.7                                 |
| Pasture <sup>b</sup>            | 362.5                                 | 170.3                               | 0.0                                   | 0.0                                 | 0.0                                   | 0.0                                 |
| Loblolly pine – hardwood forest | 522.9                                 | 222.3                               | 0.0                                   | 0.0                                 | 1.4                                   | 1.4                                 |
| Hardwood slope forest           | 517.3                                 | 202.6                               | 0.0                                   | 1.0 <sup>c</sup>                    | 2.8                                   | 2.8                                 |
| Pine plantation                 | 776.1                                 | 346.9                               | 12.0                                  | 8.0                                 | 2.1                                   | 2.1                                 |
| Open land                       | 126.1                                 | 63.4                                | 0.0                                   | 1.0 <sup>c</sup>                    | 44.9                                  | 1.8                                 |
| <b>Total</b>                    | <b>3,255.5</b>                        | <b>1,448.3</b>                      | <b>22.0</b>                           | <b>24.0</b>                         | <b>57.7</b>                           | <b>11.8</b>                         |

Notes:

<sup>a</sup> 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.

<sup>b</sup> 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.

<sup>c</sup> 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 best management practices identified in its 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 indicates that it has begun discussions with state and federal agencies regarding seeding mixtures, but that these consultations are not yet complete. To ensure that appropriate vegetative restoration practices would be implemented, **we recommend that:**

- **Gulf South should develop its revegetation procedures in consultation with interested federal, state, and local agencies including the FWS, TPWD, LDWF, MDWFP, and other appropriate agencies. Gulf South should also file with the Secretary, prior to the end of the Draft EIS comment period a summary of these consultations.**

Project impacts to vegetative communities would vary depending upon disturbance duration, magnitude, and vegetation cover type. As described above, approximately 53 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 affects 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. 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, we believe that impacts to general vegetative communities would be minimized.

### **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 types 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 89.8 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 each site was forested or not. 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. We are recommending in Section 3.2.4 that Gulf South consult further with NRCS regarding management of loess soils and we believe that the results of that consultation, 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 100-foot-wide construction right-of-way and routine mowing, cutting, and trimming along the proposed 60-foot-wide permanent pipeline right-of-way. 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 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 its Plan, selective routing, and collocation with existing rights-of-way, as well as avoidance of some sensitive vegetative communities through the use of HDD would further minimize potential Project impacts to vegetation in specially designated areas and 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 Species 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. Further, 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, locally prescribed seed mixes 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, an 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 Nuisance Species 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.

**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                       |            |                                     |

## **Upland Forest**

Mixed hardwood/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/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/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.

## **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, reptile and amphibian species, and mammal species. 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 miles of the WMA.

## **FWS Managed Lands**

The proposed Project would cross areas managed by the FWS' Tensas River National Wildlife Refuge (NWR) complex. These areas include one fee-owned property east of Bayou Macon (near MP 150.2) and an FWS easement associated with the Tensas River National Wildlife Refuge located in Madison Parish, Louisiana. The proposed Project would not cross the Tensas River NWR proper due to selective routing in Madison Parish, Louisiana.

## **NRCS Managed Lands**

The proposed Project would cross 16 WRP easements and 16 CRP easements, managed by the NRCS. 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 (FWS 2002). 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 one 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 4,034.0 acres of land would be temporarily disturbed and 1,542.2 acres of land would be permanently affected by the proposed Project. We are recommending in Section 2.0 that Gulf South provide additional justification regarding the need for a 60-foot-wide permanent right-of-way. 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 3,426 acres of land. Of this total amount, approximately 53 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 of 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.

Construction of the proposed Project is expected 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 during 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. Direct mortality and displacement due to construction activities would be relatively short in 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, as 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 80 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 pipe storage and contractor yards would also impact a total of approximately 100 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 only affect 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 HDDs.

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, we are recommending in Section 3.5 that Gulf South consult with regulatory agencies, including state and federal wildlife management agencies, regarding seeding mixes and revegetation.

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; therefore, 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 its avoidance of construction activities. 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.

#### **FWS Managed Lands**

Gulf South proposes to cross the FWS fee-owned property located near MP 150.2 using a HDD which would avoid impacts to this property. In the event of frac-out or HDD failure, Gulf South would implement the measures described in its HDD Contingency Plan to prevent or minimize any impacts. Gulf South is consulting with the FWS regarding the crossing of a FWS easement associated with the Tensas River National Wildlife Refuge in Madison Parish, Louisiana. This area provides potential habitat for the Louisiana black bear and we are recommending in Section 3.7 that Gulf South consult further with the FWS to ensure that black bears are adequately protected. Given the lack of impact to the Tensas River NWR itself, the proposed HDD at the FWS fee-owned property, and the ongoing consultation with FWS, we believe that impacts to FWS managed lands would be adequately minimized.

#### **NRCS 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 consultations with the NRCS regarding the minimization of impacts to WRP and CRP lands. We believe the results of this consultation, 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 NRCS.

## **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, such as white-tailed deer, wild turkey, certain raptors, and foxes that utilize forest edge and open habitats.

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 wading bird 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 colonial wading birds 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, as proposed, 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 its 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 and wildlife habitats.

## **3.6.2 Aquatic Resources**

### **3.6.2.1 Existing Aquatic Resources**

As described in Section 3.3, the proposed Project would cross a total of 848 waterbodies. 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, and 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.

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, 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.

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

| Common Name           | Scientific Name                |
|-----------------------|--------------------------------|
| <b>Fish Species</b>   |                                |
| 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>       |
| <b>Mussel Species</b> |                                |
| 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>      |

Additionally, the Pearl and Big Black Rivers are listed on the NPS's Nationwide Rivers Inventory (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 dissolved oxygen levels, 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 also 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 only be transported over short distances and would likely have a limited impact on aquatic species and their associated habitats. Further, reduced levels of dissolved oxygen, 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 and 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 its Plan, the risk to water quality and aquatic species from contaminated soils and sediments is low.

Additionally, 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 have an impact on 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. LDWF and MDWFP agency approvals have not yet been obtained; therefore, we are recommending in Section 3.3 that Gulf South further consult with the LDWF and MDWFP regarding the timing of construction in waterbodies and file the required approvals with the Secretary. As described above and in accordance with its Procedures, erosion and sediment control best management practices 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 HDDs 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. Ecological Services offices of the FWS 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 endangered and threatened species related database information, and conducted field surveys of the proposed pipeline route and aboveground facility sites from March through August 2006. 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. To comply with Section 7 of the ESA, we request that the FWS consider this Draft EIS as our BA for the proposed Project.

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, but these consultations are not yet 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 (FWS 2006d). 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).

Since the filing of those letters, Gulf South has modified its proposed route and 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.

| <b>TABLE 3.7.1-1<br/>Federally Listed Species Potentially Occurring in the Proposed<br/>East Texas to Mississippi Expansion Project Area</b> |                           |                         |                             |                               |   |
|--|---------------------------|-------------------------|-----------------------------|-------------------------------|---|
| <b>Species</b>   | <b>Federal<br/>Status</b> | <b>Texas<br/>Status</b> | <b>Louisiana<br/>Status</b> | <b>Mississippi<br/>Status</b> | <b>County/Parish<br/>(Portion of Potential<br/>Range Crossed by<br/>the Proposed Project)</b>     |
| <b>Birds</b>   |                           |                         |                             |                               |   |
| Bald eagle ( <i>Haliaeetus leucocephalus</i> )   | T                         | T                       | T                           | T                             | Panola County, TX; DeSoto, Jackson, Ouachita, Richland, Parishes, LA, Warren County, MS;          |
| Interior least tern ( <i>Sterna antillarum athalaso</i> )  | E                         | E                       | E                           | E                             | Madison, Red River Parishes, LA; Warren County, MS  |
| Red-cockaded woodpecker ( <i>Picoides borealis</i> )   | E                         | E                       | E                           | E                             | DeSoto, Bienville, Jackson, Ouachita Parishes, LA   |
| <b>Mammals</b>   |                           |                         |                             |                               |   |
| Louisiana black bear ( <i>Ursus americanus luteolus</i> )  | T                         | T                       | T                           | T                             | Panola County, TX; Madison and Richland Parishes, LA; Copiah, Hinds, Simpson, Warren Counties, MS |
| <b>Reptiles</b>  |                           |                         |                             |                               |   |
| Ringed map turtle ( <i>Graptemys oculifera</i> )   | T                         | --                      | T                           | T                             | Copiah, Hinds, Simpson Counties, MS   |
| <b>Fishes</b>  |                           |                         |                             |                               |   |
| Bayou darter ( <i>Etheostoma rubrum</i> )  | T                         | --                      | --                          | T                             | Copiah, Hinds County, MS  |
| Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> )  | T                         | --                      | T                           | T                             | Simpson, Hinds, Copiah Counties, MS   |
| Pallid sturgeon ( <i>Scaphyrhynchus albus</i> )  | E                         | --                      | E                           | E                             | Madison, Red River Parishes, LA; Warren County, MS  |
| <b>Invertebrates</b>   |                           |                         |                             |                               |   |
| Fat pocketbook pearly mussel ( <i>Potamilus capax</i> )  | E                         | --                      | --                          | E                             | Copiah, Hinds, Simpson, Warren Counties, MS   |
| Inflated heelsplitter ( <i>Potamilus inflatus</i> )  | T                         | --                      | T                           | T                             | Hinds County, MS  |
| <b>Candidate Species</b>   |                           |                         |                             |                               |   |
| Louisiana pine snake ( <i>Pituophis ruthveni</i> )   | C                         | --                      | --                          | --                            | Bienville Parish, LA  |
| Notes:   |                           |                         |                             |                               |   |
| C = Candidate for listing.   |                           |                         |                             |                               |   |
| E = Endangered.  |                           |                         |                             |                               |   |
| T = Threatened.  |                           |                         |                             |                               |   |

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 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 a 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, we are recommending in Section 3.3.2 that Gulf South prepare site-specific, alternative crossing plans, as applicable. 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 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 HDDs to avoid potential affects 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 (RCW), 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 3 to 60 acres in size. 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, or 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 from the wild or by the animal being euthanized, 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 includes forested tracts. The proposed pipeline route in Madison Parish, Louisiana avoids most forested areas and would be primarily located in agricultural areas. Gulf South and the FWS are consulting regarding the proposed pipeline route near the Tensas National Wildlife Refuge 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. The currently proposed route in this area would potentially affect a forested corridor if clearing associated with open-cut construction proceeds as planned.

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 Implementation Plan a description of measures, developed in consultation with the FWS, to 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 a HDD, thereby avoiding impacts to potential habitat. As noted above, in regard to the interior least tern, Gulf South's planned pre-construction 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 the HDD should fail, all provide additional protective measure for this species.

Based on the results of surveys conducted by Gulf South, the proposed crossing methods of the Pearl River and its 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 and 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 in nature, 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 HDDs, avoiding impacts to the habitat and species. As noted above in regard to the interior least tern, Gulf South's planned pre-construction 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 measure for this species.

Based on the avoidance of habitat in the Mississippi and Pearl Rivers by HDDs, 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 HDDs. As noted above in regard to the interior least tern, Gulf South's planned pre-construction 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 measure for this species.

Based on the avoidance of habitat in the Mississippi and Red Rivers by HDDs, 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 HDDs, 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 in regard to the interior least tern, Gulf South's planned pre-construction 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 measure for this species.

Based on the apparent extirpation of the fat pocketbook mussel from rivers affected by the proposed Project, the proposed use of HDDs 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. This species is not abundant within any known habitat within the proposed Project route. 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 in regard to the interior least tern, Gulf South's planned pre-construction 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 measure 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; however, 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.

Given the occurrence of potentially favorable habitat for the Louisiana pine snake along the proposed route, its sensitive status, and the possibility that it may become federally listed in the future, we **recommend that:**

- **Prior to construction, Gulf South should consult further with the FWS regarding the need for additional mitigation measures to protect the Louisiana pine snake and file with the Secretary comments from the FWS addressing this issue. Gulf South should also indicate any additional measures it would adopt to protect 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 also 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 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.

| <b>TABLE 3.7.2-1<br/>State-Listed and Rare Species Potentially Occurring in the Proposed<br/>East Texas to Mississippi Expansion Project Area<sup>a</sup></b> |   |   |   |   |
|---|---|---|---|---|
| <b>Species</b>  | <b>Texas<br/>Status/<br/>Rank<sup>bcd</sup></b> | <b>Louisiana<br/>Status/<br/>Rank<sup>b</sup></b> | <b>Mississippi<br/>Status/<br/>Rank<sup>b</sup></b> | <b>Habitat</b>  |
| <b>Birds</b>  |   |   |   |   |
| Bachman's sparrow<br>( <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<br>Peregrine falcon ( <i>Falco<br/>peregrinus / tundrius</i> )  | E / T   | --  | --  | Mountain ranges, river valleys, and seacoasts. Nest on high cliffs or tall buildings.   |
| Wood stork  | T   | --  | --  | Swamps and marshes.   |
| <b>Fish</b>   |   |   |   |   |
| Crystal Darter<br>( <i>Crystallaria asprella</i> )  | --  | --  | E / S1  | Raceways of larger creeks and rivers with water depths greater than 60 cm and gravel and sand substrates. Moderate to strong currents.  |
| Frecklebelly Madtom<br>( <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<br>( <i>Erimyzon oblongus</i> )  | T   | --  | --  | Creeks and small rivers. River mouths sand and gravel bottom pools, riffles, and lake outlets   |
| Paddlefish<br>( <i>Polyodon spathula</i> )  | T   | --  | S3  | Slow water in medium and large rivers. Channels, oxbows, backwaters, and impoundments.  |
| Pearl Darter<br>( <i>Percina aurora</i> )   | --  | --  | E / S1  | Rapids or riffles over gravel or bedrock substrate in slow to moderate currents.  |
| Sicklefin chub<br>( <i>Macrhybopsis meeki</i> )   | --  | --  | SA  | Large rivers with swift currents and sandy bottoms.   |

**TABLE 3.7.2-1 (continued)**  
**State-Listed and Rare Species Potentially Occurring in the Proposed**  
**East Texas to Mississippi Expansion Project Area<sup>a</sup>**

| Species  | Texas<br>Status/<br>Rank <sup>bcd</sup> | Louisiana<br>Status/<br>Rank <sup>b</sup> | Mississippi<br>Status/<br>Rank <sup>b</sup> | Habitat  |
|--|---|---|---|--|
| <b>Invertebrates</b>   |   |   |   |  |
| Ouachita fencing<br>crawfish<br>( <i>Faxonella creaseri</i> )            | --                                      | S2  | --  | Temporary pools in roadside ditches.   |
| Round Hickorynut<br>( <i>Obovaria subrotunda</i> )                       | --                                      | --  | S2  | Medium and large rivers with sand and gravel<br>substrates   |
| Plain Pocketbook<br>( <i>Lampsilis cardium</i> )                         | --                                      | --  | S3 / S4                                     | Streams with soft, stable substrate and slow or<br>moderate currents   |
| Pyramid pigtoe<br>( <i>Pleurobema rubrum</i> )                           | --                                      | --  | E / S1                                      | Large and medium sized rivers; riffles and<br>shoals, shallow water with coarse-particle<br>substrates, sand bars, or in deep water (>4<br>meters) with mud and sand bottoms.<br>Moderate to swift currents. |
| Rabbitsfoot<br>( <i>Quadrula cylindrica</i> )                            | --                                      | --  | E / S1                                      | Large to medium rivers with moderate to swift<br>currents. Riffle areas with stable bottoms<br>composed of sandy gravel, or gavel and<br>cobble.   |
| Wartyback<br>( <i>Quadrula nodulata</i> )                                | --                                      | --  | S3  | Large to medium rivers with sand or fine gravel<br>substrate.  |
| <b>Mammals</b>   |   |   |   |  |
| Rafinesque's big-eared<br>bat<br>( <i>Corynorhinus<br/>rafinesquii</i> ) | T                                       | --  | --  | Shallow caves or rock shelters, hollow trees,<br>abandoned buildings, girder bridges for<br>nesting and roosting. Mature upland and<br>lowland forest.   |
| Red Wolf<br>( <i>Canis rufus</i> )                                       | E                                       | --  | --  | Brushy and forested areas, apparently now<br>extinct in Texas.   |
| <b>Plants</b>  |   |   |   |  |
| Fire pink<br>( <i>Silene virginica</i> )                                 | --                                      | S2  | --  | Northern Louisiana; hardwood slope forests,<br>mixed pine/hardwood forests, mesic sites.   |
| Helianthus silphioides   | --                                      | S2 / S3                                   | --  | Disturbed upland forests along roads and tall<br>grass prairies.   |
| Northern burmannia<br>( <i>Burmannia biflora</i> )                       | --                                      | S2  | --  | Bayhead swamps, forested wetlands, forested<br>seeps, lower slopes. Very conspicuous during<br>flowering, flowering peaks in October.  |
| Nodding clubmoss<br>( <i>Lycopodiella cernua</i> )                       | --                                      | S2  | --  | Hillside seepage bogs and wetland longleaf<br>pine savannahs, and is known from ditches<br>and pond margins that are wet and acidic.   |
| Smooth Twistflower<br>( <i>Streptanthus<br/>hyacinthoides</i> )          | --                                      | S2  | --  | Northwest Louisiana; deep, xeric, sandy loam<br>soil, found on roadsides and fields which are<br>regularly cleared.  |
| Crested Fringed Orchid<br>( <i>Platanthera cristata</i> )                | --                                      | --  | S3  | Moist meadows and open woods   |
| <b>Reptiles</b>  |   |   |   |  |
| Alligator snapping turtle<br>( <i>Macrochelys temminckii</i> )           | T                                       | --  | --  | Slow, deep water of rivers, sloughs, oxbows,<br>canals, swamps, bayous, ponds, and shallow<br>creeks.  |

**TABLE 3.7.2-1 (continued)**  
**State-Listed and Rare Species Potentially Occurring in the Proposed**  
**East Texas to Mississippi Expansion Project Area<sup>a</sup>**

| Species  | Texas<br>Status/<br>Rank <sup>bcd</sup> | Louisiana<br>Status/<br>Rank <sup>b</sup> | Mississippi<br>Status/<br>Rank <sup>b</sup> | Habitat  |
|--|---|---|---|--|
| Northern scarlet snake<br>( <i>Cemophora coccinea copei</i> )  | T                                       | --  | --  | Well drained soils, scrubby pines or oaks, found under logs or debris                                  |
| Texas Horned Lizard<br>( <i>Phrynosoma cornutum</i> )          | T                                       | --  | --  | Open areas with sparse vegetation in sandy to rocky soils, likes to burrow                             |
| Timber (canebrake)<br>rattlesnake ( <i>Crotalus horridus</i> ) | T                                       | --  | --  | Hardwood forests in river bottoms, swampy areas, floodplains, wet pine flatwoods, and hydric hammocks. |

Notes:

<sup>a</sup> Sources: LDWF 2005, LDFW 2006, MDWFP 2006a, MDWFP 2006b, TPWD 2006, NatureServe 2006, Crandall et al. 2001, Kirkpatrick 1993.

<sup>b</sup> 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.

<sup>c</sup> Texas Parks and Wildlife Division does not designate species rank for rare or sensitive species.

<sup>d</sup> 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.

<sup>e</sup> 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.

<sup>f</sup> 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.

In general terms, impacts to state listed species would be similar to those described above 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.

The impacts described above would largely be avoided or minimized by the implementation of Gulf South's proposed measures and our recommendations. However, to ensure that potential impacts to state listed species are adequately addressed, **we recommend that:**

- **Prior to construction, Gulf South should consult further with the TPWD, LDWF, and the MDWFP regarding the need for additional surveys or mitigation to further minimize or avoid potential impacts to state listed species. Gulf South should file the results of its consultation and indicate whether it would adopt any mitigation measures recommended by the agencies and as applicable, explain why measures were not adopted.**

## **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 current land use types, and evaluate the significance of Project-related impacts to those lands, as well as specially designated areas, transportation corridors, possible visual effects, and 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**

There are 11 general land use types that 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 4,034.0 acres of land. Approximately 86 percent of that acreage would be contained within the pipeline construction right-of-way and construction areas associated with the proposed aboveground facilities. Approximately 20 percent of the total land that would be affected during construction is characterized as pine plantation, 25 percent would be agricultural land, 26 percent would be combined forestland other than pine plantation, and 12 percent would be 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 182 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 92 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 1,542.2 acres. About 30 percent of the land that would be affected during operation is currently classified as agricultural land, 28 percent is either 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.

#### **Pipeline Facilities**

Approximately 3,425.6 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 28 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

**TABLE 3.8.1-1  
Acres Potentially Affected by the Proposed Project**

| Facility or Parish/County  | Agricultural  |              | Pine Plantation |              | Slope Hardwood |              | Loblolly Pine/<br>Hardwood Forest |              | Pasture      |              | Open Land    |             |
|--|---------------|--------------|-----------------|--------------|----------------|--------------|-----------------------------------|--------------|--------------|--------------|--------------|-------------|
|  | Temp          | Perm         | Temp            | Perm         | Temp           | Perm         | Temp                              | Perm         | Temp         | Perm         | Temp         | Perm        |
| <b>42-INCH MAINLINE PIPELINE</b>   |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| <b>Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)</b> |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| DeSoto Parish, LA  | 4.3           | 1.7          | 52.7            | 22.2         | 15.2           | 4.9          | 94.5                              | 36.2         | 71.0         | 28.5         | 23.0         | 14.1        |
| Red River Parish, LA   | 63.0          | 22.0         | 6.3             | 1.9          | 20.4           | 6.2          | 26.8                              | 9.6          | 10.8         | 4.4          | 18.0         | 8.0         |
| Bienville Parish, LA   | 4.1           | 1.5          | 246.2           | 113.7        | 18.8           | 7.5          | 97.9                              | 37.0         | 13.3         | 5.3          | 12.2         | 5.9         |
| Jackson Parish, LA   | 0.0           | 0.0          | 248.1           | 119.2        | 34.6           | 15.3         | 47.9                              | 22.1         | 30.5         | 14.3         | 18.1         | 10.2        |
| Ouachita Parish, LA  | 73.3          | 32.1         | 169.0           | 66.9         | 21.2           | 8.9          | 20.2                              | 7.0          | 0.0          | 0.0          | 0.8          | 0.4         |
| Richland Parish, LA  | 339.7         | 162.3        | 18.8            | 9.2          | 55.8           | 23.1         | 2.1                               | 1.0          | 17.0         | 8.5          | 14.9         | 6.9         |
| Madison Parish, LA   | 413.4         | 200.1        | 0.0             | 0.0          | 35.9           | 14.4         | 3.4                               | 1.2          | 6.3          | 2.7          | 12.1         | 4.8         |
| Warren, MS County, MS  | 0.0           | 0.0          | 0.0             | 0.0          | 190.3          | 63.5         | 13.4                              | 4.3          | 25.2         | 13.1         | 7.0          | 3.1         |
| Hinds County, MS   | 52.8          | 23.1         | 12.4            | 5.7          | 85.8           | 40.4         | 125.2                             | 63.3         | 165.3        | 83.7         | 13.3         | 5.7         |
| Copiah County, MS  | 0.0           | 0.0          | 0.0             | 0.0          | 8.1            | 4.2          | 11.8                              | 6.4          | 15.6         | 8.4          | 0.0          | 0.0         |
| Simpson County, MS   | 0.0           | 0.0          | 18.2            | 6.3          | 31.2           | 14.2         | 51.6                              | 20.8         | 7.5          | 1.4          | 0.4          | 0.2         |
| <b>Subtotal Aboveground Facilities</b>   | <b>950.6</b>  | <b>442.8</b> | <b>771.7</b>    | <b>345.1</b> | <b>517.3</b>   | <b>202.6</b> | <b>494.8</b>                      | <b>208.9</b> | <b>362.5</b> | <b>170.3</b> | <b>119.8</b> | <b>59.3</b> |
| <b>Aboveground Facilities</b>  |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| 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         |
| Tallahulah 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          | 0.0            | 0.0          | 0.0                               | 0.0          | 0.0          | 0.0          | 1.5          | 1.0         |
| Columbia Gulf M&R Station  | 8.0           | 4.0          | 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          | 1.5             | 1.0          | 0.0            | 0.0          | 0.0                               | 0.0          | 0.0          | 0.0          | 0.0          | 0.0         |
| <b>Subtotal Aboveground Facilities</b>   | <b>18.0</b>   | <b>14.0</b>  | <b>9.5</b>      | <b>7.0</b>   | <b>1.5</b>     | <b>1.0</b>   | <b>0.0</b>                        | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>   | <b>1.5</b>   | <b>1.0</b>  |
| <b>Extra Work Areas</b>  |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| Pipe Storage and Contractor Yards  | 50.0          | 0.0          | 0.0             | 0.0          | 0.0            | 0.0          | 0.0                               | 0.0          | 50.0         | 0.0          | 0.0          | 0.0         |
| Access Roads   | 6.5           | 3.7          | 2.1             | 2.1          | 2.8            | 2.8          | 1.4                               | 1.4          | 0.0          | 0.0          | 44.9         | 1.8         |
| <b>Subtotal Extra Work Areas</b>   | <b>56.5</b>   | <b>3.7</b>   | <b>2.1</b>      | <b>2.1</b>   | <b>2.8</b>     | <b>2.8</b>   | <b>1.4</b>                        | <b>1.4</b>   | <b>50.0</b>  | <b>0.0</b>   | <b>44.9</b>  | <b>1.8</b>  |
| <b>Subtotal 42-inch Mainline Pipeline</b>  | <b>1025.1</b> | <b>460.5</b> | <b>783.3</b>    | <b>354.2</b> | <b>521.6</b>   | <b>206.4</b> | <b>496.2</b>                      | <b>210.3</b> | <b>412.5</b> | <b>170.3</b> | <b>166.2</b> | <b>62.1</b> |
| <b>36-INCH SUPPLY LATERAL PIPELINE</b>   |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| <b>Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace)</b> |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| 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         |
| <b>Subtotal Pipeline Facilities</b>  | <b>0.0</b>    | <b>0.0</b>   | <b>4.4</b>      | <b>1.8</b>   | <b>0.0</b>     | <b>0.0</b>   | <b>28.1</b>                       | <b>13.4</b>  | <b>0.0</b>   | <b>0.0</b>   | <b>6.3</b>   | <b>4.1</b>  |
| <b>Aboveground Facilities</b>  |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| Enbridge M&R Station   | 0.0           | 0.0          | 2.0             | 1.0          | 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             | 1.0          | 0.0            | 0.0          | 0.0                               | 0.0          | 0.0          | 0.0          | 0.0          | 0.0         |
| <b>Subtotal Aboveground Facilities</b>   | <b>0.0</b>    | <b>0.0</b>   | <b>4.0</b>      | <b>2.0</b>   | <b>0.0</b>     | <b>0.0</b>   | <b>0.0</b>                        | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>  |
| <b>Extra Work Areas</b>  |               |              |                 |              |                |              |                                   |              |              |              |              |             |
| 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         |
| <b>Subtotal Extra Work Areas</b>   | <b>0.0</b>    | <b>0.0</b>   | <b>0.0</b>      | <b>0.0</b>   | <b>0.0</b>     | <b>0.0</b>   | <b>0.0</b>                        | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>   | <b>0.0</b>  |
| <b>Subtotal 36-inch Supply Lateral</b>   | <b>0.0</b>    | <b>0.0</b>   | <b>8.4</b>      | <b>3.8</b>   | <b>0.0</b>     | <b>0.0</b>   | <b>28.1</b>                       | <b>13.4</b>  | <b>0.0</b>   | <b>0.0</b>   | <b>6.3</b>   | <b>4.1</b>  |
| <b>TOTAL PROJECT</b>   | <b>1025.1</b> | <b>460.5</b> | <b>791.7</b>    | <b>358.0</b> | <b>521.6</b>   | <b>206.4</b> | <b>524.3</b>                      | <b>223.7</b> | <b>412.5</b> | <b>170.3</b> | <b>172.5</b> | <b>66.2</b> |

**TABLE 3.8.1-1 (continued)**  
**Acres Potentially Affected by the Proposed Project**

| Facility or Parish/County   | Open Water  |            | Residential |            | Industrial/<br>Commercial |             | Wetlands     |             | Other      |            | TOTAL         |               |
|---|-------------|------------|-------------|------------|---------------------------|-------------|--------------|-------------|------------|------------|---------------|---------------|
|   | Temp.       | Perm.      | Temp.       | Perm.      | Temp.                     | Perm.       | Temp.        | Perm.       | Temp.      | Perm.      | Temp.         | Perm.         |
| <b>42-INCH MAINLINE PIPELINE</b>  |             |            |             |            |                           |             |              |             |            |            |               |               |
| Pipeline Facilities (includes pipeline right-of-way and additional temporary workspace) |             |            |             |            |                           |             |              |             |            |            |               |               |
| DeSoto Parish, LA   | 0.1         | 0.0        | 0.2         | 0.0        | 2.3                       | 1.5         | 1.2          | 0.4         | 2.9        | 1.1        | 267.4         | 110.6         |
| Red River Parish, LA  | 0.5         | 0.2        | 0.2         | 0.2        | 0.8                       | 0.5         | 4.2          | 1.1         | 0.0        | 0.0        | 151.0         | 54.2          |
| Bienville Parish, LA  | 0.0         | 0.0        | 0.0         | 0.0        | 7.1                       | 3.8         | 22.2         | 5.4         | 0.0        | 0.0        | 421.8         | 180.1         |
| Jackson Parish, LA  | 0.2         | 0.1        | 0.2         | 0.1        | 7.1                       | 3.8         | 6.8          | 1.4         | 0.1        | 0.1        | 393.6         | 186.6         |
| Ouachita Parish, LA   | 0.0         | 0.0        | 0.0         | 0.0        | 3.6                       | 1.3         | 7.6          | 5.0         | 0.0        | 0.0        | 295.8         | 121.6         |
| Richland Parish, LA   | 0.0         | 0.0        | 0.6         | 0.1        | 3.7                       | 2.6         | 20.8         | 4.4         | 0.0        | 0.0        | 473.3         | 218.1         |
| Madison Parish, LA  | 2.1         | 1.4        | 0.0         | 0.0        | 3.1                       | 0.7         | 36.6         | 4.9         | 0.0        | 0.0        | 512.9         | 230.2         |
| Warren, MS County, MS   | 7.8         | 4.3        | 0.0         | 0.0        | 2.0                       | 0.9         | 1.6          | 0.3         | 0.0        | 0.0        | 247.3         | 89.4          |
| Hinds County, MS  | 0.6         | 0.3        | 0.0         | 0.0        | 5.3                       | 3.2         | 11.4         | 3.4         | 0.0        | 0.0        | 472.1         | 228.8         |
| Copiah County, MS   | 0.0         | 0.0        | 0.0         | 0.0        | 0.1                       | 0.0         | 0.0          | 0.0         | 0.0        | 0.0        | 35.6          | 19.0          |
| Simpson County, MS  | 0.0         | 0.0        | 2.3         | 1.3        | 1.5                       | 0.5         | 0.4          | 0.1         | 0.0        | 0.0        | 113.1         | 44.8          |
| Subtotal Aboveground Facilities   | <b>11.3</b> | <b>6.3</b> | <b>3.5</b>  | <b>1.7</b> | <b>36.6</b>               | <b>18.8</b> | <b>112.8</b> | <b>26.4</b> | <b>3.0</b> | <b>1.2</b> | <b>3383.9</b> | <b>1483.5</b> |
| 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         | 0.0          | 0.0         | 0.0        | 0.0        | 0.0           | 1.0           |
| 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        | 0.0           | 4.0           |
| 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        | 0.0           | 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        | 0.0           | 1.0           |
| Subtotal Aboveground Facilities   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>                | <b>0.0</b>  | <b>0.0</b>   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b> | <b>18.0</b>   | <b>23.0</b>   |
| Extra Work Areas  |             |            |             |            |                           |             |              |             |            |            |               |               |
| Pipe Storage and Contractor Yards   | 0.0         | 0.0        | 0.0         | 0.0        | 374.0                     | 0.0         | 0.0          | 0.0         | 0.0        | 0.0        | 474.0         | 0.0           |
| Access Roads  | 0.0         | 0.0        | 0.0         | 0.0        | 44.7                      | 2.1         | 0.0          | 0.0         | 0.0        | 0.0        | 102.4         | 13.9          |
| Subtotal Extra Work Areas   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>418.7</b>              | <b>2.1</b>  | <b>0.0</b>   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b> | <b>576.4</b>  | <b>13.9</b>   |
| Subtotal 42-inch Mainline Pipeline  | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>374.0</b>              | <b>0.0</b>  | <b>0.0</b>   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b> | <b>474.0</b>  | <b>0.0</b>    |
| <b>36-INCH SUPPLY LATERAL PIPELINE</b>  |             |            |             |            |                           |             |              |             |            |            |               |               |
| 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          | 0.4         | 0.0        | 0.0        | 41.7          | 19.8          |
| Subtotal Pipeline Facilities  | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>0.7</b>                | <b>0.1</b>  | <b>2.1</b>   | <b>0.4</b>  | <b>0.0</b> | <b>0.0</b> | <b>41.7</b>   | <b>19.8</b>   |
| 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        | 2.0           | 1.0           |
| 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           | 1.0           |
| Subtotal Aboveground Facilities   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>                | <b>0.0</b>  | <b>0.0</b>   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b> | <b>4.0</b>    | <b>2.0</b>    |
| Extra Work Areas  |             |            |             |            |                           |             |              |             |            |            |               |               |
| Pipe Storage and Contractor Yards   | 0.0         | 0.0        | 0.0         | 0.0        | 10.0                      | 0.0         | 0.0          | 0.0         | 0.0        | 0.0        | 10.0          | 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   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>10.0</b>               | <b>0.0</b>  | <b>0.0</b>   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b> | <b>10.0</b>   | <b>0.0</b>    |
| Subtotal 36-inch Supply Lateral   | <b>0.0</b>  | <b>0.0</b> | <b>0.0</b>  | <b>0.0</b> | <b>10.7</b>               | <b>0.1</b>  | <b>2.1</b>   | <b>0.4</b>  | <b>0.0</b> | <b>0.0</b> | <b>55.7</b>   | <b>21.8</b>   |
| <b>TOTAL PROJECT</b>  | <b>11.3</b> | <b>6.3</b> | <b>3.5</b>  | <b>1.7</b> | <b>466.0</b>              | <b>21.0</b> | <b>114.9</b> | <b>26.8</b> | <b>3.0</b> | <b>1.2</b> | <b>4034.0</b> | <b>1542.2</b> |

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 1,503.3 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 either 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 provide additional justification regarding the need for a 60-foot-wide permanent right-of-way.

### **Aboveground Facilities**

In addition to lands affected by construction of the proposed pipeline, construction of the proposed aboveground facilities would affect approximately 22 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 four of the M/R stations would not result in land requirements beyond those already accounted for by construction of the proposed pipeline. However, because the footprint of these M/R stations would extend beyond the proposed pipeline's permanent right-of-way, the amount of permanent impacts would exceed the temporary impacts associated with construction. The two M/R stations located in Panola County, Texas would affect two acres of pine plantation land use types each. Construction and operation of MLV and pig launcher/receiver facilities would not result in land requirements beyond those already noted for the permanent pipeline right-of-way. In total, aboveground facilities would affect approximately 25 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 167 access roads of varying lengths and construction, of which 148 would be for temporary use, while 19 would be for permanent use (Appendix F-2). Of the 167 access roads, 97 would be unmodified existing roads, and 70 (comprising approximately 37.7 miles of road) would be new or upgraded roads. Access road improvements would temporarily affect 102.4 acres of land during construction and 13.9 acres of land permanently during operation. Approximately 45 percent of the permanently affected land would be pine plantation and upland forest, 40 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 20 pipe storage and contractor yards during construction, temporarily affecting approximately 484.0 acres of land (Table 3.8.1-1). These facilities are further described in Section 2.2.3.2. Approximately 80 percent of the area that would be used for pipe storage and contractor yards consists of commercial or industrial uses, with an additional 10 percent consisting of agricultural and pasture land uses, respectively.

### **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 were 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 from an agricultural use to an industrial use). General impacts associated with Project construction and operation to land use type 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, pre-construction 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 all 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 re-growth 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 2007 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 mitigating 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, MP 40.6, MP 170.8, and MP 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 3.5 acres of land classified as residential would be contained within the construction right-of-way or additional temporary workspaces, and 1.7 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 miles 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. Gulf South has not indicated whether any special construction procedures, such as deep pipeline installation, might be required in the vicinity of the Delhi Municipal Airport. Therefore, **we recommend that:**

- **Prior to construction, Gulf South should consult further with Delhi Municipal Airport officials and the FAA to monitor whether the runway extension would be planned and funded prior to construction of the proposed Project. If such plans are confirmed, then Gulf South should file documentation of associated consultations with airport officials and the FAA and provide a site-specific construction plan that addresses any concerns identified by those entities with the Secretary.**

We believe the consultation and construction plans as required by the above recommendation stated 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 is consulting with the Red River, Ouachita River, and Mississippi River Levee Districts, the Louisiana Levee Board, Louisiana Department of Transportation and Development, and the COE. These agencies would review Gulf South's levee crossing plans and would issue permits authorizing the crossings of these levees before construction could occur. We would like the opportunity to review the levee crossing requirements for our own records. Therefore, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary site-specific levee crossing plans developed in consultation with the Red River, Ouachita River, and Mississippi River Levee Districts, Louisiana Levee Board, Louisiana Department of Transportation and Development, and the COE.**

We believe that by consulting with the appropriate agencies that permitting requirements would ensure 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 (TETLP) 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 orphan hazardous waste sites would be located in the proposed Project area, but whose exact locations are not known. 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 Plan for the Unanticipated Discovery of Contaminated Environmental Media 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 use, and/or hunting activities. By mandate, any revenues not used by local school districts can only be invested in federally secured investments.

The Mississippi Secretary of State’s Office, as the designated supervisory trustee for these areas, 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 MP 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 HDDs, we believe that impacts to Sixteenth Section lands have been adequately minimized.

| <b>Mileposts</b> |            | <b>Landowner</b>                 | <b>Routing and Crossing Information</b>   |
|------------------|------------|----------------------------------|---|
| <b>Begin</b>     | <b>End</b> |                                  |   |
| 185.7            | 186.7      | Warren County School System      | 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 MP 197.4 would be crossed by horizontal directional drill with no surface impacts. From MP 197.4 to MP 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 through 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 HDDs 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 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 Rivers.

## **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 a HDD would significantly 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 (FWS 2006). 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.

The proposed Project would also cross two FWS properties associated with the Tensas River National Wildlife Refuge (NWR complex). FWS manages one of these tracts as a fee-owned property that is located on the east side of Bayou Macon (MP 150.2). The other tract is enrolled in a conservation easement program and is located west of the Tensas River NWR. Impacts to the fee-owned parcel would be avoided through the use of HDD. Gulf South is currently exploring alignment alternatives in consultation with FWS regarding possible avoidance of the Tensas River NWR easement tract. Given the avoidance of the FWS managed fee-owned property by use of a HDD, and ongoing consultations to mitigate or avoid impacts to the identified easement; we believe that impacts to FWS managed lands would be effectively minimized or avoided.

## **NRCS Managed Lands**

The CRP, WRP, and Prior Converted Wetlands program are voluntary programs administered by the NRCS. The CRP 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 erodable soils or otherwise sensitive croplands from production for a period of 10 to 15 years. The WRP offers landowners the opportunity to protect, restore, and enhance wetlands located on their property (NRCS 2006a). The program attempts to improve 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 16 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 89.8 and 143.3 acres for CRP and WRP sites, respectively. Gulf South indicates that some of the WRP and Prior Converted Wetland easements that they examined in the field did not exhibit wetland characteristics as defined by the COE. The proposed Project would cross 4 Prior Converted wetlands, three located in Red River Parish, Louisiana (MP 24.2, MP 25.4, and MP 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.

| <b>TABLE 3.8.4-2<br/>Conservation Reserve Program Lands Crossed by the Proposed<br/>East Texas to Mississippi Expansion Project</b> |                |                      |                              |                          |
|---|----------------|----------------------|------------------------------|--------------------------|
| <b>Enter MP</b>   | <b>Exit MP</b> | <b>Parish/County</b> | <b>Acreeage<br/>Impacted</b> | <b>Land Type</b>         |
| 23.1  | 24.2           | Red River Parish, LA | 6.1                          | Agriculture              |
| 31.5  | 31.9           | Red River Parish, LA | 6.0                          | Forested                 |
| 151.6   | 151.7          | Madison Parish, LA   | 2.6                          | Agriculture              |
| 158.2   | 158.9          | Madison Parish, LA   | 23.4                         | Agriculture              |
| 193.3   | 193.4          | Warren County, MS    | 1.0                          | Pasture                  |
| 198.2   | 199.1          | Hinds County, MS     | 12.7                         | Forested                 |
| 201.8   | 202.0          | Hinds County, MS     | 2.4                          | Pasture                  |
| 205.0   | 205.4          | Hinds County, MS     | 5.0                          | Pine plantation          |
| 206.7   | 208.0          | Hinds County, MS     | 17.7                         | Forested/pine plantation |
| 215.3   | 215.5          | Hinds County, MS     | 2.6                          | Forested                 |
| 216.5   | 216.7          | Hinds County, MS     | 1.4                          | Forested                 |
| 216.8   | 216.8          | Hinds County, MS     | 0.4                          | Forested                 |
| 216.9   | 216.9          | Hinds County, MS     | 1.0                          | Forested                 |
| 217.0   | 217.1          | Hinds County, MS     | 2.2                          | Forested                 |
| 217.2   | 217.2          | Hinds County, MS     | 0.2                          | Forested                 |
| 226.3   | 226.7          | Hinds County, MS     | 5.1                          | Pine plantation          |
| <b>Total</b>  |                |                      | <b>89.8</b>                  |                          |

The proposed pipeline route is collocated with other existing rights-of-way in many places where NRCS 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. We are recommending in Section 2.0 that Gulf South provide additional justification regarding the need for a 60-foot-wide permanent right-of-way. 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 rendering avoidance impractical. Further, Gulf South proposes a route in Madison Parish that avoids the Tensas River NWR.

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

| Enter<br>MP  | Exit<br>MP | Parish/ County       | Acreage<br>Impacted | Land Type            |
|--------------|------------|----------------------|---------------------|----------------------|
| 30.2         | 30.5       | Red River Parish, LA | 4.6                 | Forested             |
| 112.9        | 113.2      | Ouachita Parish, LA  | 3.3                 | Agriculture          |
| 131.0        | 131.8      | Richland Parish, LA  | 1.1                 | Agriculture          |
| 152.1        | 153.3      | Madison Parish, LA   | 12.8                | Agriculture          |
| 153.3        | 155.1      | Madison Parish, LA   | 27.3                | Agriculture          |
| 155.2        | 156.9      | Madison Parish, LA   | 23.6                | Agriculture          |
| 156.9        | 157.3      | Madison Parish, LA   | 5.7                 | Agriculture          |
| 157.3        | 158.2      | Madison Parish, LA   | 11.6                | Agriculture          |
| 163.7        | 164.0      | Madison Parish, LA   | 3.8                 | Agriculture/forested |
| 166.8        | 168.0      | Madison Parish, LA   | 7.1                 | Agriculture          |
| 171.8        | 172.1      | Madison Parish, LA   | 4.4                 | Agriculture          |
| 174.5        | 174.6      | Madison Parish, LA   | 1.4                 | Agriculture/forested |
| 174.7        | 174.9      | Madison Parish, LA   | 3.1                 | Agriculture/forested |
| 175.1        | 175.8      | Madison Parish, LA   | 9.6                 | Agriculture/forested |
| 175.8        | 177.1      | Madison Parish, LA   | 17.2                | Agriculture/forested |
| 178.1        | 178.6      | Madison Parish, LA   | 7.7                 | Agriculture/forested |
| <b>Total</b> |            |                      | <b>144.3</b>        |                      |

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 NRCS 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. As part of the right-of-way procurement process, Gulf South would negotiate with the affected landowners to obtain an easement agreement for the construction and permanent pipeline rights-of-way. Compensation for any losses or limitations associated with CRP lands would be addressed during those easement negotiations.

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 re-growth or permanent in the maintained right-of-way.

Gulf South continues to consult with NRCS regarding the crossing of NRCS managed lands, as well as considerations for routing, construction methods, revegetation, and other impact minimization measures. Based on our consultations with NRCS, we believe a series of impact minimization or mitigation measures may be appropriate in easements managed by NRCS including reduced right-of way widths and implementation of the elements of Gulf South's Procedures as appropriate, regardless of whether the sites meet COE-wetland delineation requirements. Gulf South would be required to obtain

Subordinate-Use Permits authorizing the crossing of any lands managed by NRCS. Since consultations with the NRCS are not complete, **we recommend that:**

- **Gulf South should file with the Secretary prior to the end of the Draft EIS comment period, a plan, developed in consultation with the NRCS, for the crossing of Prior Converted wetlands, WRP, and CRP lands. This plan should indicate any avoidance, minimization, and mitigation measures identified by the NRCS, state whether or not these measures would be adopted, and as applicable, explain why measures were not adopted.**

Based on the characteristics of NRCS managed lands, Gulf South's proposed construction measures, and our above recommendation, we believe that impacts to NRCS 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 be anticipated 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 HDDs often associated with the crossing of adjacent waterbody features, which 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 our 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.

**TABLE 3.8.5-1  
Major Highway Road Crossings for the Proposed  
East Texas to Mississippi Expansion Project<sup>a</sup>**

| <b>Facility/Road Name</b>              | <b>Parish/County</b>    | <b>Milepost</b> |
|--|-------------------------|-----------------|
| 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,<br>LA | 26.0            |
| State Highway 515                      | Red River Parish,<br>LA | 28.4            |
| U.S. Highway 71                        | Red River Parish,<br>LA | 30.7            |
| State Highway 783                      | Red River Parish,<br>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            |
| 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           |

| <b>TABLE 3.8.5-1 (continued)</b>   |                      |                 |
|--|----------------------|-----------------|
| <b>Major Highway Road Crossings for the Proposed East Texas to Mississippi Expansion Project<sup>a</sup></b> |                      |                 |
| <b>Facility/Road Name</b>  | <b>Parish/County</b> | <b>Milepost</b> |
| 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:   |                      |                 |
| <sup>a</sup> All major roads would be crossed using subsurface boring 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 primarily 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 therefore should 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 six 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. No existing residences or businesses would be within view of the Tallulah Compressor Station.

Overall, we believe 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.

#### **Mainline Valve, Side Valve, and M/R Sites**

MLV sites would consist of a 50-foot 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 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 Gulf South (MP 238.6) and Enterprise (MP H3.3) M/R Stations also would include a pig launcher and receiver, respectively. Sizes of the proposed M/R stations would vary from 1.0 to 4.0 acres.

The Texas Gas (MP 112.4), 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.

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 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 240.0 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 were 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. Census Bureau 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.

**TABLE 3.9.2-1  
Existing Population and Demographics Conditions in the  
Region of Influence for the Proposed Project<sup>a</sup>**

| County/Parish       | 2004<br>Population | Population<br>Change<br>since 1990<br>(%) | Population<br>Density | White,<br>non<br>Hispanic<br>(%) | Black or<br>African<br>American<br>(%) | Hispanic<br>(%) | Asian<br>(%) | Native<br>American<br>(%) |
|---------------------|--------------------|---|-----------------------|----------------------------------|--|-----------------|--------------|---------------------------|
| <b>Texas</b>        | <b>20,490,022</b>  | <b>22.8</b>                               | <b>79.6</b>           | <b>52.4</b>                      | <b>11.5</b>                            | <b>32.0</b>     | <b>2.7</b>   | <b>0.6</b>                |
| Panola County       | 22,756             | 3.3                                       | 28.4                  | 77.5                             | 17.7                                   | 3.5             | 0.2          | 0.4                       |
| <b>Louisiana</b>    | <b>4,515,770</b>   | <b>5.9</b>                                | <b>102.6</b>          | <b>62.5</b>                      | <b>32.5</b>                            | <b>2.4</b>      | <b>1.2</b>   | <b>0.6</b>                |
| DeSoto Parish       | 25,494             | -0.7                                      | 29.1                  | 55.3                             | 42.2                                   | 1.6             | 0.1          | 0.5                       |
| Red River<br>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<br>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                       |
| <b>Mississippi</b>  | <b>2,844,658</b>   | <b>2.7</b>                                | <b>60.6</b>           | <b>59.9</b>                      | <b>36.8</b>                            | <b>1.7</b>      | <b>0.7</b>   | <b>0.5</b>                |
| 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<br>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                       |

Notes:  
<sup>a</sup> Source: U.S. Census Bureau 2006a.

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 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).

| County/Parish       | Per Capita<br>Income<br>(\$) | 1999<br>Population<br>below<br>Poverty<br>Level<br>(%) | Civilian<br>Labor<br>Force | Unemployment<br>Rate<br>(%) <sup>b</sup> | Major Industry                                      |
|---------------------|------------------------------|--|----------------------------|--|---|
| <b>Texas</b>        | <b>\$19,617</b>              | <b>15.4</b>  | <b>9,830,559</b>           | <b>5.3</b>                               | <b>Educational, health, and<br/>social services</b> |
| Panola County       | \$15,439                     | 14.1   | 9,692                      | 4.9                                      | Educational, health, and<br>social services         |
| <b>Louisiana</b>    | <b>\$16,912</b>              | <b>19.6</b>  | <b>1,997,995</b>           | <b>7.1</b>                               | <b>Educational, health, and<br/>social services</b> |
| DeSoto Parish       | \$13,606                     | 25.1   | 10,563                     | 6.8                                      | Educational, health, and<br>social services         |
| Red River<br>Parish | \$12,119                     | 29.9   | 3,563                      | 8.9                                      | Educational, health, and<br>social services         |
| Bienville Parish    | \$12,471                     | 26.1   | 5,939                      | 7.3                                      | Educational, health, and<br>social services         |
| Jackson Parish      | \$15,354                     | 19.8   | 6,504                      | 6.0                                      | Manufacturing                                       |
| Ouachita<br>Parish  | \$17,084                     | 20.7   | 69,818                     | 6.1                                      | Educational, health, and<br>social services         |
| Richland<br>Parish  | \$12,479                     | 27.9   | 8,258                      | 7.8                                      | Educational, health, and<br>social services         |
| Madison Parish      | \$10,114                     | 28.5   | 4,883                      | 9.7                                      | Educational, health, and<br>social services         |
| <b>Mississippi</b>  | <b>\$15,853</b>              | <b>19.9</b>  | <b>1,267,092</b>           | <b>7.9</b>                               | <b>Educational, health, and<br/>social services</b> |

**TABLE 3.9.3-1 (continued)**  
**Existing Income and Employment Conditions within the**  
**Region of Influence for the Proposed Project<sup>a</sup>**

| <b>County/Parish</b> | <b>Per Capita Income (\$)</b> | <b>1999 Population below Poverty Level (%)</b> | <b>Civilian Labor Force</b> | <b>Unemployment Rate (%)<sup>b</sup></b> | <b>Major Industry</b>                    |
|----------------------|-------------------------------|--|-----------------------------|--|--|
| 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:  
<sup>a</sup> Source: U.S. Census Bureau 2006a.  
<sup>b</sup> 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.

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 moderate 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.

| <b>TABLE 3.9.4-1<br/>Temporary Housing Units Available within the<br/>Region of Influence for the Proposed Project</b> |  |  |  |                    |
|--|--|--|--|--------------------|
| <b>County/Parish</b>   | <b>Vacant Rental<br/>Units<sup>a</sup></b> | <b>Units for Seasonal,<br/>Recreational, or<br/>Occasional Use<sup>a</sup></b> | <b>Number of<br/>Hotel/Motel<br/>Rooms</b> | <b>Total Units</b> |
| <b>Texas</b>   | <b>294,240</b>                             | <b>151,919</b>   | <b>N/A</b>                                 | <b>446,159</b>     |
| Panola County  | 227  | 414  | 125 <sup>b</sup>                           | 766                |
| <b>Louisiana</b>   | <b>54,185</b>                              | <b>30,333</b>  | <b>N/A</b>                                 | <b>84,518</b>      |
| DeSoto Parish  | 231  | 327  | 129 <sup>c</sup>                           | 687                |
| Red River Parish   | 67   | 59   | 58 <sup>c</sup>                            | 184                |
| Bienville Parish   | 128  | 693  | 90 <sup>c</sup>                            | 911                |
| Jackson Parish   | 195  | 491  | 24 <sup>d</sup>                            | 710                |
| Ouachita Parish  | 1,969                                      | 395  | 1,215 <sup>e,f</sup>                       | 3,579              |
| Richland Parish  | 159  | 246  | 160 <sup>f</sup>                           | 565                |
| Madison Parish   | 104  | 167  | 34 <sup>e</sup>                            | 305                |
| <b>Mississippi</b>   | <b>29,486</b>                              | <b>21,845</b>  | <b>N/A</b>                                 | <b>51,331</b>      |
| 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                |
| <b>Total</b>   | <b>8,485</b>                               | <b>4,033</b>   | <b>9,339</b>                               | <b>21,857</b>      |

Notes:

<sup>a</sup> Source: U.S. Census Bureau 2006b.

<sup>b</sup> Source: Texas Economic Development 2006.

<sup>c</sup> Source: The Coordinating & Development Corporation 2006.

<sup>d</sup> Source: Jonesboro Budget Inn 2005.

<sup>e</sup> Source: ePodunk 2006.

<sup>f</sup> Source: Hotel-Rates.com 2006.

<sup>g</sup> Source: Mississippi Hotel Guides 2006.

### 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 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 four percent, or Mississippi’s seven 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.

| <b>TABLE 3.9.6-1<br/>County Revenue and Estimated Annual Taxes<br/>for the Proposed Project</b> |                                  |                                   |                       |
|---|----------------------------------|-----------------------------------|-----------------------|
| <b>County/Parish</b>  | <b>Total Revenue<sup>a</sup></b> | <b>Estimated Annual<br/>Taxes</b> | <b>Percent Change</b> |
| <b>Texas</b>  |                                  |                                   |                       |
| Panola County   | \$64,292,000                     | \$518,053                         | 0.8                   |
| <b>Louisiana</b>  |                                  |                                   |                       |
| 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                   |
| <b>Mississippi</b>  |                                  |                                   |                       |
| Warren County   | \$108,653,000                    | \$553,382                         | 0.4                   |

| <b>TABLE 3.9.6-1 (continued)</b>  |                                  |                               |                       |
|---|----------------------------------|-------------------------------|-----------------------|
| <b>County Revenue and Estimated Annual Taxes for the Proposed Project</b> |                                  |                               |                       |
| <b>County/Parish</b>  | <b>Total Revenue<sup>a</sup></b> | <b>Estimated Annual Taxes</b> | <b>Percent Change</b> |
| 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                   |
| <b>Total</b>  | <b>\$1,346,768,000</b>           | <b>\$9,942,000</b>            | <b>2.0</b>            |

Notes:  
<sup>a</sup> Source: U.S. Census Bureau 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).

| <b>TABLE 3.9.7-1</b>   |                  |                             |                          |                        |                                       |
|--|------------------|-----------------------------|--------------------------|------------------------|---------------------------------------|
| <b>Existing Educational, Medical, Police, and Fire Full-time Equivalents within the Region of Influence for the Proposed Project<sup>a</sup></b> |                  |                             |                          |                        |                                       |
| <b>County/Parish</b>   | <b>Education</b> | <b>Health and Hospitals</b> | <b>Police Protection</b> | <b>Fire Protection</b> | <b>Total Health, Fire, and Police</b> |
| <b>Texas</b>   | <b>539,530</b>   | <b>62,160</b>               | <b>52,718</b>            | <b>18,680</b>          | <b>133,558</b>                        |
| Panola County  | 780              | 140                         | 44                       | 3                      | 187                                   |
| <b>Louisiana</b>   | <b>101,050</b>   | <b>13,675</b>               | <b>11,791</b>            | <b>4,280</b>           | <b>29,746</b>                         |
| 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                                   |
| <b>Mississippi</b>   | <b>69,336</b>    | <b>17,855</b>               | <b>7,094</b>             | <b>3,164</b>           | <b>28,113</b>                         |
| 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                                   |
| <b>Total</b>   | <b>17,631</b>    | <b>1,092</b>                | <b>2,163</b>             | <b>1,009</b>           | <b>11,915</b>                         |

Notes:  
<sup>a</sup> Source: U.S. Census Bureau 2005.

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.

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 460.5 acres of agricultural land and 358.0 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 a cultural resources survey from March through December 2006 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 240.0-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 portion between MP 167.5 and MP 167.6 in Louisiana. These field surveys were scheduled to be completed in January 2007.

##### **3.10.1.1 Texas**

The survey within the Texas portion of the proposed Project identified no cultural resources within the proposed Project area, and we are not recommending any additional work. The cultural resources survey report dated July 28, 2006 was submitted to the Texas SHPO, which concurred with the consultant's recommendations. We also concur.

##### **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.

Five 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 September 1, 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 proposes to file an addendum survey report addressing additional route modifications in January 2007. A response from the Louisiana SHPO regarding these surveys is pending.

### **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 and 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 September 1, 2006, and requested concurrence with their findings. An addendum survey report addressing route modifications was submitted on November 15, 2006. Gulf South proposes to file an addendum survey report that included route variations and associated access roads in January 2007. A response from the Mississippi SHPO is pending.

### **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.

### **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

Gulf South has not received comments on the survey reports from the Louisiana and Mississippi SHPOs. The NPS has also not yet completed its review of the impacts of the proposed Project to the Natchez Trace Parkway. 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, the 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, the 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, the 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, a 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 (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter with an aerodynamic diameter less than 10 microns (PM<sub>10</sub>), particulate matter with an aerodynamic diameter less than 2.5 microns (PM<sub>2.5</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), 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 (AQCR) 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 “unclassifiable”. The counties and parishes in which the proposed Project would be located are designated at “attainment” or “unclassifiable” for all criteria pollutants.

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

| <b>Pollutant</b>                                     | <b>Time Frame</b>    | <b>Primary</b>                     | <b>Secondary</b>                   |
|--|----------------------|------------------------------------|------------------------------------|
| Particulate matter less than 10 microns in diameter  | Annual <sup>a</sup>  | 50 µg/m <sup>3</sup>               | 50 µg/m <sup>3</sup>               |
|  | 24-hour <sup>b</sup> | 150 µg/m <sup>3</sup>              | 150 µg/m <sup>3</sup>              |
| Particulate matter less than 2.5 microns in diameter | Annual <sup>c</sup>  | 15 µg/m <sup>3</sup>               | 15 µg/m <sup>3</sup>               |
|  | 24-hour <sup>d</sup> | 65 µg/m <sup>3</sup>               | 65 µg/m <sup>3</sup>               |
| Sulfur dioxide                                       | Annual               | 0.030 ppm (80 µg/m <sup>3</sup> )  | N/A                                |
|  | 24-hour <sup>b</sup> | 0.014 ppm (365 µg/m <sup>3</sup> ) | N/A                                |
|  | 3-hour <sup>b</sup>  | N/A                                | 0.5 ppm (1,300 µg/m <sup>3</sup> ) |
| Carbon monoxide                                      | 8-hour <sup>b</sup>  | 9 ppm (10,000 µg/m <sup>3</sup> )  | None                               |
|  | 1-hour <sup>b</sup>  | 35 ppm (40,000 µg/m <sup>3</sup> ) | None                               |
| Nitrogen dioxide                                     | Annual               | 0.053 ppm (100 µg/m <sup>3</sup> ) | 0.053 ppm                          |
| Ozone  | 8-hour <sup>e</sup>  | 0.08 ppm (157 µg/m <sup>3</sup> )  | 0.08 ppm                           |
| Lead   | Quarterly            | 1.5 µg/m <sup>3</sup>              | 1.5 µg/m <sup>3</sup>              |

Notes:

µg = Microgram(s).  
m<sup>3</sup> = Cubic meter(s).  
NA = Not applicable.  
ppm = Part(s) per million.

<sup>a</sup> To attain this standard, the 3-year average of the weighted annual mean particulate matter less than 10 microns in diameter concentration at each monitor within an area must not exceed 50 µg/m<sup>3</sup>.

<sup>b</sup> Not to be exceeded more than once per year.

<sup>c</sup> 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/m<sup>3</sup>.

<sup>d</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m<sup>3</sup>.

<sup>e</sup> 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.

### 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);
- 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 (NSR) 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 Prevention of Significant Deterioration (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 also can 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 Table 3.11.1-2 and the discussion under “Operations Emissions”). Therefore, PSD permitting is not applicable to the proposed Project.

### *Air Quality Control Regions*

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.

**TABLE 3.11.1-2  
Existing and Proposed Emissions for the Carthage Junction Compressor Station**

| <b>Emission Source</b>                | <b>NO<sub>x</sub><br/>(TPY)</b> | <b>CO<br/>(TPY)</b> | <b>VOC<br/>(TPY)</b> | <b>PM<sub>10</sub><br/>(TPY)</b> | <b>PM<sub>2.5</sub><br/>(TPY)</b> | <b>SO<sub>2</sub><br/>(TPY)</b> | <b>HAPs<br/>(TPY)</b> |
|---------------------------------------|---------------------------------|---------------------|----------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------------|
| <b>New Sources</b>                    |                                 |                     |                      |                                  |                                   |                                 |                       |
| 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                  |
| <b>Existing sources</b>               |                                 |                     |                      |                                  |                                   |                                 |                       |
| 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                  |
| <b>Total New and Existing Sources</b> | <b>246.07</b>                   | <b>277.58</b>       | <b>110.39</b>        | <b>13.69</b>                     | <b>13.32</b>                      | <b>5.01</b>                     | <b>14.50</b>          |

New Source Performance Standards

The New Source Performance Standards (NSPS), codified at 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 m<sup>3</sup> (19,813 gallons) and 151 m<sup>3</sup> (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 m<sup>3</sup> 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.

On February 18, 2005, EPA proposed a new NSPS for stationary combustion turbines (Subpart KKKK). Stationary combustion turbines of 1 MW and larger installed after February 18, 2005, would be covered by the proposed NSPS. The proposed standard imposes 1.0 pound NO<sub>x</sub> per MW-hour and 0.58 pound SO<sub>2</sub> per MW-hour emission limits on turbine operations. The proposed Project would comply with any applicable standards of the rule, once finalized.

No other NSPSs are applicable to the proposed Project.

#### National Emission Standards for Hazardous Air Pollutants

The National Emissions Standards for Hazardous Air Pollutants (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 hazardous air pollutants (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<sub>x</sub>), SO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and VOC. Emissions of NO<sub>x</sub> 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.

**TABLE 3.11.1-3  
Proposed Emissions for the Vixen Compressor Station**

| <b>Emission Source</b>       | <b>NO<sub>x</sub><br/>(TPY)</b> | <b>CO<br/>(TPY)</b> | <b>VOC<br/>(TPY)</b> | <b>PM<sub>10</sub><br/>(TPY)</b> | <b>PM<sub>2.5</sub><br/>(TPY)</b> | <b>SO<sub>2</sub><br/>(TPY)</b> | <b>HAPs<br/>(TPY)</b> |
|------------------------------|---------------------------------|---------------------|----------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------------|
| 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**

| <b>Emission Source</b>         | <b>NO<sub>x</sub><br/>(TPY)</b> | <b>CO<br/>(TPY)</b> | <b>VOC<br/>(TPY)</b> | <b>PM<sub>10</sub><br/>(TPY)</b> | <b>PM<sub>2.5</sub><br/>(TPY)</b> | <b>SO<sub>2</sub><br/>(TPY)</b> | <b>HAPs<br/>(TPY)</b> |
|--------------------------------|---------------------------------|---------------------|----------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------------|
| 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                  |

### 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 and 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 Texas Commission on Environmental Quality (TCEQ) manages air

quality issues in Texas, the Louisiana Department of Environmental Quality (LDEQ) manages air quality issues in Louisiana, and the Mississippi Department of Environmental Quality (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, and backfilling, and during 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 metering and regulation stations.

Construction would be expected to cause a minor and temporary reduction in 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 NO<sub>2</sub>, CO, VOCs, PM<sub>10</sub>, small amounts of SO<sub>2</sub>, 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.

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. 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<sub>x</sub> 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<sub>x</sub> 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 off line. 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 NO<sub>2</sub> 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 µg/m<sup>3</sup>. Background NO<sub>2</sub> concentration at the air quality monitor was approximately 10 µg/m<sup>3</sup>; when added to station emissions, this resulted in a total offsite NO<sub>2</sub> concentration of 14.4 µg/m<sup>3</sup>. This is well below the NAAQS of 100 µg/m<sup>3</sup> for NO<sub>2</sub>. In May 2006, Gulf South also submitted applications to LDEQ for minor source construction permits, to authorize construction of the 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 are lower than emissions from the Carthage Junction Compressor Station, NO<sub>2</sub> 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; and 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<sub>eq</sub>) and day-night sound level (L<sub>dn</sub>). The L<sub>eq</sub> is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L<sub>dn</sub> is the L<sub>eq</sub> 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. EPA has determined that an  $L_{dn}$  of 55 dBA protects the public from indoor and outdoor activity 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 (NSA #3) northeast 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 water bodies 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 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. Also, 9 locations showed an increase of 9 dBA or greater above the ambient noise level (6 of which were also above 55 dBA).

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 below. 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 a 16-foot-high insulated plywood sound wall 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. All HDD sound levels would be below

| TABLE 3.11.2-1<br>Locations with Predicted HDD Operation Noise Impacts Greater Than 55 dBA |                       |  |   |  |
|--|-----------------------|--|---|--|
| HDD Site   | HDD Location          | Calculated L <sub>dn</sub> due to HDD Activity (dBA) | Calculated L <sub>dn</sub> 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  |                       |  |   |  |

55-dBA at all locations in following this plan. 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.

Of the 9 locations with projected increases above 9 dBA, 4 are still currently projected above a 9-dBA increase (HDD # 18 entry point, HDD # 18 exit point, HDD #28 entry point, and HDD # 33 entry point). To ensure that noise levels from HDD operations would not be significant, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary, for review and written approval by the Director of OEP, a revised Noise Mitigation and Compliance Plan for HDD Operations. This plan should include mitigation for HDD #18 entry point, HDD #18 exit point, HDD #28 entry point, and HDD #33 entry point to reduce the overall increase above the ambient to below 9 dBA.**

### 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/<br>NSA   | Distance/<br>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 recip. unit (dBA) | Estimated $L_{dn}$ for new and existing equipment (dBA) <sup>a</sup> | Total Estimated (Station noise plus survey levels) $L_{dn}$ (dBA) <sup>b</sup> | Potential Noise Increase from all new units (dB) <sup>c</sup> |
|--|---|--|--|--|--|--|---|
| NSA #1/<br>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   |   |  |  |  |  |  |   |
| <sup>a</sup> Estimated Project $L_{dn}$ sound levels are from operation of existing and expansion station equipment, with noise control measures installed as recommended. |   |  |  |  |  |  |   |
| <sup>b</sup> Estimated total $L_{dn} = 10 \log (10^{(Ambient L_{dn}/10)} + 10^{(Predicted L_{dn}/10)})$  |   |  |  |  |  |  |   |
| <sup>c</sup> 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 higher existing ambient noise level at. 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 (ft) | Calculated Ambient L <sub>dn</sub> (dBA) | Estimated Project L <sub>dn</sub> (dBA) <sup>a</sup> | Total Estimated L <sub>dn</sub> (dBA) <sup>b</sup> | Potential Noise Increase (dBA) <sup>c</sup> |
|--------------------------|---|--|--|--|---|
| 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<sub>dn</sub> = Day-night sound level
- NSA = Noise-sensitive area

<sup>a</sup> Estimated L<sub>dn</sub> sound levels from the proposed Vixen Compressor Station, with noise control measures installed as recommended.

<sup>b</sup> Estimated total L<sub>dn</sub> = 10 log (10<sup>(Ambient L<sub>dn</sub> / 10)</sup> + 10<sup>(Predicted L<sub>dn</sub> / 10)</sup>)

<sup>c</sup> Estimated increase of the ambient L<sub>dn</sub> 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<sub>dn</sub> 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<sub>dn</sub> 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 metering stations. Principal noise sources would include gas flow through valves and metering 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 meter station is located 1,280 feet from the Columbia Gulf Meter/Regulator 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

| TABLE 3.11.2-4<br>Predicted Noise Level Contribution of the Tallulah Compressor Station at Nearby NSAs   |   |  |  |  |   |
|--|---|--|--|--|---|
| Measurement Location/NSA   | Distance/Direction of NSA to Compressor Building (feet) | Calculated Ambient L <sub>dn</sub> (dBA) | Estimated Project L <sub>dn</sub> (dBA) <sup>a</sup> | Total Estimated L <sub>dn</sub> (dBA) <sup>b</sup> | Potential Noise Increase (dBA) <sup>c</sup> |
| 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 <sub>dn</sub> = Day-night sound level  |   |  |  |  |   |
| NSA = Noise-sensitive area   |   |  |  |  |   |
| <sup>a</sup> Estimated L <sub>dn</sub> sound levels from the proposed Vixen Compressor Station with noise control measures installed as recommended. |   |  |  |  |   |
| <sup>b</sup> Estimated total L <sub>dn</sub> =10 log (10 <sup>(Ambient L<sub>dn</sub> /10)</sup> + 10 <sup>(Predicted L<sub>dn</sub> /10)</sup> )    |   |  |  |  |   |
| <sup>c</sup> Estimated increase of the ambient L <sub>dn</sub> sound levels due to operation of the proposed Vixen Compressor Station.               |   |  |  |  |   |

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<sub>dn</sub> to 55 dBA or less.

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 blow down 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 no later than 60 days after placing the authorized units at the Carthage Junction Compressor Station into service noise surveys. If the noise attributable to the operation of the authorized units exceeds an Ldn 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 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 Ldn 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 MP 38.7 (3,209 feet);
- MP 72.7 to MP 74.0 (6,687 feet);
- MP 185.0 to MP 185.6 (3,227 feet);
- MP 187.8 to MP 188.6 (4,298 feet);
- MP 219.8 to MP 221.6 (9,259); and
- and MP 228.4 to MP 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 radius<sup>1</sup> is greater than 660 feet and 20 or more buildings are intended for human occupancy within the potential impact circle<sup>2</sup>; or
- any area in Class 1 or 2 where the potential impact circle includes an identified site<sup>3</sup>.

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.

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<sup>1</sup> 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.

<sup>2</sup> The potential impact circle is a circle of radius equal to the potential impact radius.

<sup>3</sup> 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.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under 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;
- 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.<sup>4</sup>

| <b>TABLE 3.12.2-1<br/>Natural Gas Service Incidents by Cause<sup>a</sup></b> |   |                          |
|--|---|--------------------------|
| <b>Cause</b>   | <b>Incidents per 1,000 Miles of Pipeline (Percent Distribution)</b> |                          |
|  | <b>1970 through 1984</b>  | <b>1986 through 2005</b> |
| 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)              |
| <b>Total</b>   | <b>1.30</b>   | <b>0.26</b>              |

Notes:  
<sup>a</sup> 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.

<sup>4</sup> 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.

| <b>TABLE 3.12.2-2<br/>Outside Forces Incidents by Cause<br/>(1970 through 1984)<sup>a</sup></b> |                |
|---|----------------|
| <b>Cause</b>  | <b>Percent</b> |
| 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            |
| Notes:  |                |
| <sup>a</sup> Source: Jones et al. 1986.   |                |

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.

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.

| <b>TABLE 3.12.2-3<br/>External Corrosion by Level of Control (1970 through June 1984)<sup>a</sup></b> |   |
|---|---|
| <b>Corrosion Control</b>  | <b>Incidents per 1,000 Miles per Year</b> |
| None – bare pipe  | 0.42                                      |
| Cathodic protection only  | 0.97                                      |
| Coated only   | 0.40                                      |
| Coated and cathodic protection  | 0.11                                      |
| Notes:  |   |
| <sup>a</sup> 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; and 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.

| <b>TABLE 3.12.3-1<br/>Annual Average Fatalities for Natural Gas<br/>Transmission and Gathering Systems<sup>a</sup></b>   |           |               |                  |
|--|-----------|---------------|------------------|
| Year   | Employees | Non-employees | Total            |
| 1970 – June 1984   | 2.4       | 2.6           | 5.0              |
| 1984 – 2005 <sup>b</sup>   | --        | --            | 3.6              |
| 1984 – 2005 <sup>b</sup>   | --        | --            | 2.8 <sup>c</sup> |
| Notes:   |           |               |                  |
| <sup>a</sup> Sources: Jones et al. 1986, DOT OPS 2006.   |           |               |                  |
| <sup>b</sup> Employee/non-employee breakdown not available after June 1984.  |           |               |                  |
| <sup>c</sup> 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 582 years. This would represent a slight increase in risk to the nearby public.

| <b>TABLE 3.12.3-2<br/>Nationwide Accidental Deaths<sup>a</sup></b>   |                   |
|--|-------------------|
| <b>Type of Accident</b>  | <b>Fatalities</b> |
| 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<br>(1984 to 1993 average)   | 181               |
| All liquid and gas pipelines <sup>b</sup><br>(1978 to 1987 average)  | 27                |
| Gas transmission and gathering lines <sup>c</sup><br>(non-employees only, 1970 to 1984 average)  | 2.6               |
| <b>Notes:</b>  |                   |
| <sup>a</sup> 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 <sup>th</sup> Edition." |                   |
| <sup>b</sup> Source: DOT, "Annual Report on Pipeline Safety – Calendar Year 1987."   |                   |
| <sup>c</sup> Source: Jones et al. 1986.  |                   |

### 3.12.4 Additional Security and Safety Issues

#### 3.12.4.1 Terrorism

During the scoping 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. 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 243.3 miles of proposed pipeline, 38.4 miles would be collocated with HVAC power lines, and 6 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. To address the Project and HVAC power line collocation collateral risk, Gulf South states that it has contracted a study to assess Project collateral risk. In addition to completing the collateral risk study, Gulf South evaluated and adopted an alternative route to the north of the originally proposed alignment (see Section 4.0). The 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, and the further assessment of the specific risks associated with HVAC power lines and Project collocation, 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 commonalities 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).

| <b>TABLE 3.13-1<br/>Existing or Proposed Projects That Would Cumulatively Impact<br/>Resources in the East Texas to Mississippi Expansion Project Area</b> |  |  |  |
|--|--|--|--|
| <b>Project</b>   | <b>Description</b>   | <b>Anticipated<br/>Construction<br/>Date</b> | <b>Counties/Parishes<br/>within Project Area</b>   |
| <b>Natural Gas Pipeline Projects</b>   |  |  |  |
| 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<br>DeSoto, Red River, Bienville, Jackson, Ouachita, Richland, and Madison Parishes, Louisiana<br>Warren, Hinds, Copiah, Simpson, and Walthall Counties, Mississippi |
| Carthage to Perryville   | Construct and operate a 172-mile-long, 42-inch-diameter natural gas pipeline   | 2006–2007                                    | Panola County, Texas<br>Caddo, DeSoto, Red River, Bienville, Jackson, Ouachita, and Richland Parishes, Louisiana   |
| Southeast Supply Header  | Construct and operate a 270-mile-long, 36-inch-diameter natural gas pipeline   | 2007–2008                                    | Richland and Madison Parishes, Louisiana<br>Warren, Copiah, and Simpson Counties, Mississippi  |
| Regency Pipeline   | Construct and operate an 80-mile, 30-inch-diameter intrastate natural gas pipeline and a 40-mile, 24-inch-diameter natural gas pipeline loop | Completed in 2005                            | Bienville, Jackson, and Richland Parishes, Louisiana   |
| <b>Unrelated Projects</b>  |  |  |  |
| Trans-Texas Corridor 69  | Construct and operate an intermodal transportation corridor from Texarkana, Texas, to Mexico   | N/A  | Panola County, Texas   |

**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 |
|---|--|--|---------------------------------------|
| <b>Unrelated Projects</b>                       |  |  |                                       |
| Interstate 69                                   | Construct and operate a highway between U.S. Highway 71 and Interstate Highway 20 as part of the Interstate 65 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 65                                 | 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             |
| Notes:  |  |  |                                       |
| N/A = not available                             |  |  |                                       |

The identified projects consist of one existing and two 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**

The FERC is currently considering a proposal for one other natural gas pipeline project that would also traverse northern Louisiana and Mississippi, the Southeast Supply Header (SESH). The FERC recently issued a Certificate for CEGT’s Carthage to Perryville Project, which is also located in

northern Louisiana. In addition, Regency Intrastate Gas, LLC (Regency) recently completed construction on an expansion of its existing intrastate pipeline facilities in the Project area.

### **Southeast Supply Header**

Duke Energy Gas Transmission (DEGT) and CEGT have proposed construction of a new 36-inch-diameter natural gas pipeline system that would extend approximately 270 miles southeast from Delhi, Louisiana to near Coden, Alabama. In addition to the 270 miles of pipeline construction, the SESH Project would add three new compressor stations. 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. The project is in the pre-filing stage and is being evaluated by the FERC, but 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. The FERC (1989) concluded that the general impact of building more than one pipeline would be primarily additive, and the cumulative impact may be calculated by adding together the impact of each individual project. Based on the project scope, geographic location, and preliminary information, 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 can be viewed on the FERC website under Docket No. CP07-44-000.

### **CEGT Carthage to Perryville Project**

CEGT has started construction of 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 Project route for approximately 99 miles. The FERC issued CEGT its Certificate on October 2, 2006. Construction of the Carthage to Perryville Project would likely be completed by the first quarter 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 advises further consideration. As noted above, 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.

### **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, and the separation between the two routes ranges 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 42.0 acres of wetlands and resulted in permanent conversion of approximately 13.5 acres of forested wetlands to emergent and scrub-shrub wetlands.

### **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 October 2006, construction of the U.S. Highway 171 project was approximately

61 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 October 2006, construction of the U.S. Highway 167 widening was approximately 33 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 October 2006, construction of the U.S. Highway 165 widening was approximately 39 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 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 301 wetland areas, resulting in disturbance of a total of approximately 114.9 acres of wetlands, including approximately 80.7 acres of forested wetland impacts. In Section 3.4.3, we are recommending the development of 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 the area of the proposed Project. Further, discharges to wetlands and other surface waters associated with construction and operation would require review, approval, and mitigation (if necessary) under the TCEQ, LDEQ, and MDEQ stormwater discharge programs.

Construction of the proposed Project would result in 848 individual waterbody crossings. Gulf South proposes to use 33 separate HDDs to accomplish pipeline installation across 64 waterbodies, including 16 major waterbody crossings, 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 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 1,045.9 acres of upland forest (slope hardwood and loblolly pine-hardwood forest) and 791.7 acres of pine plantation. Impacts to forested land and other native vegetative communities from the SESH, CEGT, and Regency 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 182 miles, or about 76 percent of the proposed route. Additionally, approximately 36 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 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 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 4,034.0 acres of land during construction. Approximately 46 percent of that land would be upland forest (including pine plantations), 25 percent would be agricultural, 4 percent would be open land, and 3 percent would be wetland. Residential land, commercial/industrial land, and open water would also be affected. While most of these impacts would be temporary, construction of the proposed Project would result in some permanent land use changes, including conversion of approximately 788.1 acres of forested uplands including pine plantations, 460.5 acres of agriculture, 66.2 acres of open land, and 26.8 acres of wetlands to maintained utility right-of-way.

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. Acreages impacted for land use types have not yet been determined for the proposed SESH Project. 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.

### **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 SESH Project, 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 affect 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 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 SESH Project 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 would overlap in time. 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 two 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, only a small cumulative effect is anticipated when the impacts of the proposed Project are added to past, present, or reasonably foreseeable future projects in the area.