

3.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the proposed Project would vary in duration and significance. 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 pre-construction conditions almost immediately afterward. Short-term impacts would continue for approximately three years following construction. Impacts were considered long-term if the resources would require more than three years to recover. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to pre-construction conditions during the life of the proposed Project, such as with 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 are recommending 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.
- 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

All proposed Project facilities, with the exception of the Delhi Compressor Station and the CenterPoint M/R Station, are located in the East Gulf Coastal Plain. The East Gulf Coastal Plain consists of flat to rolling topography broken by streams and river bottoms. The Delhi Compressor Station and CenterPoint M/R Station are located in the West Gulf Coastal Plain. The West Gulf Coastal Plain consists of low, rolling, slightly hilly terrain. The specific geologic formations traversed by the proposed Project are presented in Table 3.1.1-1.

The surface of Louisiana on which the Delhi Compressor Station and CenterPoint M/R Station are located is underlain by geologically young sedimentary deposits in or near rivers and deltas, including Holocene sediment deposited by the Red and Mississippi Rivers, which is present at the compressor station and meter station sites. Most surface exposures in Louisiana consist of Quaternary sediment. Holocene sediment deposited by the Mississippi, Ouachita, and Red Rivers, as well as other rivers and coastal marsh deposits, make up approximately 55 percent of the surface of Louisiana. The proposed pipeline would cross approximately 10.3 miles of Pliocene fluvial channel and marine deposits consisting of sands, clays, and silt loams; 70.8 miles of Miocene alluvial channel and alluvial plain deposits consisting of sandy silt, silt, clay, limestone, and dolomitic limestone; and 29.7 miles of Eocene marine and deltaic deposits consisting of clay, sand, sandstone, and shale (Table 3.1.1-1).

Within Mississippi, the proposed Project would lie within two sections of the East Gulf Coastal Plain Physiographic province: the Central Blacklands and Pine Hills Physiographic Districts. The Citronelle, Catahoula, Vicksburg Group-Forest Hill, Jackson, and Claiborne Formations (Mississippi Mineral Resources Institute [MMRI], 1976) underlie this area. Some rolling hills and other areas of ridges and valleys characterize the Central Blacklands Physiographic District with surface sediments consisting of sandy and silty loams. The Pine Hills District is characterized by rolling hills and steep-sided ridges and valleys with surface sediments consisting of clays and sands (Stewart, 2003).

Within Alabama, the proposed Project is located in the East Gulf Coastal Plain, south of the Fall Line that curves from the northwestern corner of Alabama to the Georgia border in east-central Alabama. The Fall Line is an important physical feature and separates the Coastal Plain from other regions to the north. Streams north of the Fall Line are generally swift with rocky bottoms, while streams south of this feature tend to be sluggish with muddy or sandy bottoms. The proposed Project extends into Alabama from Mississippi at the physiographic division known as the Timber Belt, which extends from the Gulf of Mexico northward for approximately 150 miles and is on the outer belt of the Coastal Plain. The area of Alabama where the proposed Project would cross, beginning at MP 104.4 and ending at MP 110.8, is underlain by the Gosport Sand and Lisbon Formation, Tallahatta Formation, Hatchetigbee Formation, alluvial, coastal, and low terrace deposits, and Tuscaloosa sands geologic formations as shown on the Geologic Map of Alabama (Geological Survey of Alabama [GSA], 2006).

The elevation along the proposed Project undulates throughout the proposed Project area from eastern Simpson County, Mississippi, to Choctaw County, Alabama. The topography consists of rolling hills with slight to moderate slopes to the west, level to nearly level floodplains, level to gently sloping stream terraces, and gently sloping to steep uplands on the eastern portion of the proposed Project. However, slopes along the proposed Project range from 1 percent to as much as 30 percent. The topography along the proposed Project is mainly rolling hills with an area from approximately MP 85.0 to MP 90.0 exhibiting the most level terrain. The elevations along the proposed Project in Mississippi and Alabama range from approximately 200 to 400 feet above mean sea level (msl), whereas the elevation throughout Richland Parish, Louisiana, where the proposed Delhi Compressor Station and CenterPoint M/R Station would be located, ranges from 60 to 70 feet msl.

Some areas of moderately rugged topography would be encountered along the proposed Project route. As described in Section 2.3.2.5, Gulf South would use special two-tone construction techniques in these areas as listed in Table 2.3.2.5-1 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.

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 be encountered along the proposed pipeline route. Additionally, Gulf South indicated 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 most likely 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 Gulf South's plans and Procedures and in compliance with applicable federal, state, and local laws, permits, and authorizations.

**TABLE 3.1.1-1
Geologic Formations Underlying the Proposed Southeast Expansion Project**

Cumulative Length Crossed (miles)	Geologic Formation	Description	Geologic Epoch
53.8	Catahoula-Alluvial Channel	Sandy silt, silt, and clay, interbedded with fine-grained sandstone layers, mica, and smectite. The silt and clay commonly display blocky to conchoidal rock fracture.	Miocene
0.7	Citronelle-Fluvial Channel	Yellow and red sands and clays, locally gray weathering, with much gravel near landward margin.	Pliocene
17.0	Vicksburg/ Chickasawhay-Alluvial Plain	Highly porous limestone and dolomitic limestone, interbedded with porous to compact dolomitic limestone.	Miocene
9.6	Forest Hill/Red Bluff Clay Shallow Marine/Marine	Soils are mainly deep, highly weathered silt loams with clays at varying depth. Broad ridges may have a loess cap, with occasional fragipans, sandstones, and dolomites occupying most ridges and upper side slopes, while lower side slopes, especially near major streams, are in upper Gasconade dolomite materials.	Pliocene
7.9	Jackson Group-Marine	Composed of calcitic clay and less prominent sand and marl beds, divided into Yazoo clay member, and Moodys calcitic marl member below.	Eocene
10.5	Cockfield-Deltaic	Massively bedded, very coarse to very fine grained, moderately sorted quartz sand. Colors range from moderate reddish-brown to white.	Eocene
4.4	Cook Mountain-Marine	Clay and sandstone; slightly silty and lignitic, minor glauconite, brown to brownish-gray, weathers brownish-gray to yellowish-gray; very fine grained, calcareous, glauconitic, gray to yellowish-brown; marine fossils.	Eocene
0.5	Kosciusko-Marine	Heterogeneous highly lenticular non-marine sections of sand and shale are dominant facies. Highly cross-bedded sands colored red, brown, yellow, purple, pink, violet, gray, and white.	Eocene
6.4	Kosciusko Cuestas-Marine	Heterogeneous highly lenticular non-marine sections of sand and shale are dominant facies. Highly cross-bedded sands colored red, brown, yellow, purple, pink, violet, gray, and white.	Eocene
**	Alluvium-Alluvial Plain	Gray to brownish silt, silty clay, some very fine sand, reddish-brown along the Red River. Shown only on past and present course of major streams.	Holocene

** Geologic Formation at the Delhi Compressor Station
Source: United States Geological Survey (USGS), 2006c

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.

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 steep areas, such as the areas discussed above in areas where Gulf South plans to use two-tone construction. 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 topographic relief, 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

Subsurface mineral resources in the proposed Project area include oil, gas, coal, clay, lime, sand, and gravel. These resources are discussed below.

In Louisiana, Mississippi, and Alabama, petroleum and natural gas deposits are the main mineral resources. Petroleum resources are most common in the southern halves of Mississippi and Alabama. Louisiana ranks as one of the top energy producers in the nation. Gulf South consulted the Louisiana Department of Natural Resources (LDNR) Strategic Natural Resources Information System (SONRIS) (LDNR, 2006) database to identify active oil and gas areas along the proposed pipeline route. The proposed Delhi Compressor Station and CenterPoint M/R Station in Richland Parish are located near existing oil and gas fields; however, the wells within these fields are greater than 0.25 mile from these proposed facilities.

Gulf South used the Mississippi Automated Resource Information System Technical Center database to identify oil and gas resources in the Project area. Gulf South determined that none of the proposed Project's aboveground facilities are located within 0.25 mile of active, producing gas/condensate wells or producing oil wells in Mississippi. However, Gulf South did determine that the pipeline occurs within 0.25 mile of active producing gas/condensate wells and producing oil wells in Mississippi. Gulf South determined that the proposed pipeline crosses within 0.25 mile of three active producing natural gas wells, 14 producing oil wells, seven enhanced oil recovery injection wells, four saltwater disposal wells, and one sand and gravel mining operation (see Table 3.1.2-1). Of the active wells in Mississippi, six occur at least 1,000 feet from the proposed pipeline centerline, six occur 1,000 to 750 feet from the proposed pipeline centerline, six occur 750 to 500 feet from the proposed pipeline centerline, seven are 500 to 250 feet from the proposed pipeline centerline, two are 250 to 100 feet from the proposed pipeline centerline, and one is within 100 feet of the proposed pipeline centerline. The sand and gravel operation occurs approximately 240 feet from the proposed pipeline centerline. The one producing oil well that is within 100 feet would actually be 80 feet from the proposed Project near MP 69.6. Gulf South has indicated that they would work with the owner of this well to avoid disturbance to well operations.

Gulf South found no sources of information to show any active, producing gas/condensate wells or producing oil wells within the area of the Project in Alabama. In addition, no areas with active wells were observed in Alabama during field surveys conducted by Gulf South.

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, by new

drilling operations that would be conducted outside of the permanent right-of-way, and Gulf South would prohibit future oil and gas exploration within 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.

Louisiana's leading non-petroleum minerals are salt and sulfur, lime, gypsum, crushed stone, and construction sand (Louisiana Geological Survey [LGS], 2006); however, Richland Parish where the proposed Delhi Compressor Station and CenterPoint M/R Station are located does not significantly contribute to these resources. The principal mineral resources for Mississippi include clay, lime, sand, gravel, and lignite. Lignite deposits occur at depths greater than 250 feet and are not economically recoverable at the present time in the area of the proposed Project. Currently, there are no underground or lignite surface mines in the area of the aboveground facilities and pipeline for the proposed Project (USGS, 1998).

In Mississippi, agricultural lime, bentonite, common clay, and crushed stone are surface mined in Smith County; crushed stone, common clay, and construction sand and gravel are mined in Jasper County; and sulfur (a by-product of natural gas production) and construction sand and gravel are mined in Clarke County. Eleven mineral fields with multiple active leases were identified within 0.25 mile of the proposed Project in Mississippi. However, surface mining operations within the state are generally on a small scale (USGS, 2004).

Gulf South has determined that five surface mining operations are located within 0.25 mile of the proposed Project's centerline of the pipeline. Of the five, one is not active based on aerial photography in September 2006. Active mineral leases were identified by reviewing Oil and Gas Production maps of Mississippi and Alabama State Oil and Gas Board (ASOGB) maps, and by performing field survey observations (MMRI, 2005; ASOGB, 2005).

The four remaining mining operations are owned and operated by the same company and are noted to be extensions of one original sand and gravel pit. The northernmost extent of that surface mine occurs over 200 feet south of the centerline of the pipeline, approximately 165 feet south of the construction right-of-way at MP 75.4. This mining operation is not anticipated to be impacted by the proposed Project due to the distance that the mine occurs from the temporary construction right-of-way. Gulf South is currently corresponding with the surface mine operators concerning potential expansion of mining operations; however, with the noted southern expansion of the surface mine, it is unlikely that the mine would extend in a northerly direction.

In Alabama, limestone, dolomite, marble, granite, sandstone, and quartzite are components of an important industry. However, no current data for active mineral field locations was available for Alabama. During field surveys conducted by Gulf South, no surface mines were identified within 0.25 mile of the proposed Project in Alabama. Given that there are few mineral resources located in the immediate vicinity of the proposed Project, and that known sites are inactive or would be avoided, we believe that no significant impacts to mineral resources would occur.

Table 3.1.2-1 presents the active mineral resources located within 0.25 mile of the proposed Project.

**TABLE 3.1.2-1
Active Mineral Resources Within 0.25 Mile of the Proposed Southeast Expansion Pipeline**

Milepost (MP)	County, State	Mineral Resource	Distance from the Proposed Centerline (feet)	Direction from the Proposed Centerline	Evaluation of Impacts from Construction and Operation
22.6	Simpson, MS	Oil – Production	259	South	None
22.7	Simpson, MS	Saltwater Disposal – Injection	417	South	None
22.7	Simpson, MS	Enhanced Oil Recovery Injection (on standby)	962	South	None
22.8	Simpson, MS	Oil – Production	1,206	North	None
22.9	Simpson, MS	Oil – Production	540	North	None
23.1	Simpson, MS	Enhanced Oil Recovery Injection (on standby)	1,277	South	None
23.4	Simpson, MS	Oil – Production	491	South	None
23.4	Simpson, MS	Enhanced Oil Recovery – Injection	911	North	None
58.1	Jasper, MS	Enhanced Oil Recovery – Injection	660	North	None
58.4	Jasper, MS	Oil – Production	247	North	None
58.8	Jasper, MS	Oil – Production	469	South	None
59.2	Jasper, MS	Oil – Production	503	South	None
69.4	Jasper, MS	Saltwater Disposal – Injection	1,181	North	None
69.5	Jasper, MS	Enhanced Oil Recovery – Injection	1,130	North	None
69.6	Jasper, MS	Oil – Production	80	South	Area would be flagged and barricaded. Necessary precautions would be taken to minimize impacts.
69.7	Jasper, MS	Oil – Production	502	South	None
69.7	Jasper, MS	Oil – Production	174	North	None
69.8	Jasper, MS	Enhanced Oil Recovery – Injection	885	South	None
69.8	Jasper, MS	Natural Gas – Production	841	North	None
69.9	Jasper, MS	Oil – Production	393	South	None
70.0	Jasper, MS	Oil – Production	1,044	South	None
70.0	Jasper, MS	Enhanced Oil Recovery – Injection	445	South	None
70.0	Jasper, MS	Natural Gas – Production	885	South	None
70.0	Jasper, MS	Natural Gas – Production	560	South	None
70.1	Jasper, MS	Oil – Production	591	South	None
75.4*	Jasper, MS	Sand and Gravel	240	South	None
84.0	Clarke, MS	Saltwater Disposal – Injection	774	North	None

Milepost (MP)	County, State	Mineral Resource	Distance from the Proposed Centerline (feet)	Direction from the Proposed Centerline	Evaluation of Impacts from Construction and Operation
96.3	Clarke, MS	Saltwater Disposal – Injection	448	North	None
96.5	Clarke, MS	Oil – Production	1,244	South	None

* Five surface mining operations owned by one entity, one is not active and the four remaining mining operations are noted to be extensions of one original sand and gravel pit.
Source: MMRI, 2005; ASOGB, 2005.

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 as indirect evidence of the forms and activities of such organisms.

The proposed Delhi Compressor Station and CenterPoint M/R station site in Richland Parish, Louisiana, is located on Holocene age alluvial deposits. Though the possibility of encountering fossilized remains exists, no paleontological resources have been identified within the proposed Project area.

From a geological context, surface exposures in Mississippi and Alabama are very young, which affects the number and diversity of fossils. The oldest surface sediments are Cenozoic in age. The majority of sediments are Tertiary and Quaternary in age, which is older, lesser-used nomenclature for periods within the Cenozoic age; in addition, many sediments are less than 10,000 years old. Large portions of surface sediments were formed as parts of rivers, deltas, or swamps. These environments are less conducive to the preservation of fossils than marine environments. Thus, marine fossils are relatively uncommon in surface exposures.

No paleontological resources have been identified within the proposed Project area. Because of the limited exposure of fossil-bearing rock units crossed by the proposed Project, possible fossil-bearing formations within the proposed Project area are not likely to occur. However, if paleontological resources are discovered during the course of pipeline construction, Gulf South would follow its *Plan for the Unanticipated Discoveries of Historic 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 faulting, soil liquefaction, slope failures/landslides, and ground subsidence, which are discussed below. Hazards such as volcanism are not relevant to the proposed Project area and are excluded from consideration here.

3.1.4.1 Seismicity and Faults

The USGS defines seismicity as "the geographic and historical distribution of earthquakes" (USGS 2006a). Louisiana, Mississippi, and Alabama lie within the geologic tectonic province known as the Gulf Coast Basin where thick sedimentary rocks overlies basement rock structures. Typical geologic structures of this province are generally characterized by southerly dipping and thickening sedimentary strata disrupted by salt domes and regional systems of relatively shallow, listric growth faults. These fault systems trend for considerable distances roughly paralleling the Gulf Coast. The growth faults are thought to have formed during periods of accelerated basin subsidence. Active movement is thought to have occurred during periods of rapid localized sediment deposition (Miocene and Oligocene epochs). Five earthquake epicenters have been recorded in Mississippi (USGS, 2006a) and 215 epicenters have been recorded in Alabama (GSA, 2006). The epicenters of these earthquakes occurred more frequently in the northern parts of Mississippi and Alabama and none were located 15 miles or less from the proposed Project area (NA.gov, 2006). Although it is difficult to quantify the probability of ground failure, it appears to be low in the proposed Project area.

Hazards associated with seismicity and faulting include ground shaking, surface rupture of faults, and offset along normal, reverse, or strike-slip faults. Earthquakes are caused by active faults. Gulf South indicates that there are no active faults in the proposed Project area.

Faulting can be especially hazardous to linear, rigid structures, such as pipelines, in which the ground is not moving the same distance or in the same direction. However, well-maintained pipelines constructed using modern arc-welding techniques have performed well in seismically active areas of the United States. Only large, abrupt ground displacements have caused serious impacts to those facilities. Based on the historical record and absence of active faults in areas near the proposed Project's corridor, 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 flow. Soil liquefaction can lead to landslides and earthflows, movement or failure of foundations and footings, and mobility of buried objects.

Few soils along the proposed pipeline route are well-drained to poorly-drained, as discussed in Section 3.2. Thus, there is little added risk for soil liquefaction from saturated soil conditions. Because soil liquefaction risk is closely related to seismic risk, which was previously described as low within the proposed Project area, the potential for soil liquefaction is similarly low. Furthermore, 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 M/R 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.

The proposed Project is located in recorded areas of moderate susceptibility/low landslide incidence in Simpson, Smith, and Jasper Counties, Mississippi. Portions of the pipeline would encounter recorded areas of high susceptibility/moderate incidence in Smith (from approximately MP 36.0 to MP 42.4), Jasper (from approximately MP 53.7 to MP 73.5), and Clarke Counties (from approximately MP 75.7 to MP 84.8), in Mississippi. Choctaw County, Alabama is reportedly in a low incidence area.

Construction of the pipeline would be accomplished in accordance with Gulf South's plans, which includes measures to control runoff and erosion that would minimize the potential for slope failures (see Section 2.3). 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 to provide for safe working conditions in areas potentially susceptible to slope failures (see Section 2.3.2.5). 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.

Three areas of karst topography were identified along the proposed Project in Smith, Jasper, and Clarke Counties, Mississippi. These flat-lying carbonate rock areas may produce solution sinkholes, collapse sinkholes, and cover-collapse sinkholes (NA.gov, 2006). These areas, which occur from MPs 36.0 to 42.4, MPs 53.7 to 73.5, and MPs 75.7 to 84.8, are further classified as fissures, tubes, and caves that are generally less than 1,000 feet long and 50 feet or less in vertical extent, and occur in gently dipping to flat-lying beds of carbonate rock beneath an overburden of non-carbonate material about 10 feet to 200 feet in thickness. However, review of USGS topographic quadrangle maps in this area did not identify any active karst features such as sinkholes or springs at the land surface. Karst topography along the proposed Project was not present in Louisiana, Alabama, or Simpson County, Mississippi.

As described in Section 3.1.2, the proposed Project would traverse areas in Louisiana, Mississippi, and Alabama 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).

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, *Minimum Federal Safety Standards for the Transportation of Natural and Other Gas by Pipeline*, 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. Adherence to these standards and procedures would minimize the potential for any risk to the proposed Project posed by ground subsidence.

3.1.5 Conclusions Regarding Impacts to Geologic Resources

The proposed Project is unlikely to affect paleontological resources, and is also 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

We analyzed data for soils traversed by the proposed Project using the USDA NRCS (formerly the Soil Conservation Service) Soil Survey Geographic (SSURGO) (NRCS, 2006a) databases for Richland Parish, Louisiana, Simpson, Smith, Jasper, and Clarke Counties, Mississippi, and Choctaw County, Alabama. These soil associations, along with a description of their major characteristics, are listed in Appendix C (Table C-1). Soils found at the location of the proposed aboveground facilities and their descriptions are listed in Appendix C (Table C-2).

The proposed Project would be located in four Major Land Resource Areas (MLRA), including the Southern Mississippi River Alluvium (MLRA 131), the Southern Mississippi Valley Loess (MLRA 134), the Southern Coastal Plain (MLRA 133), and the Alabama and Mississippi Blackland Prairie (MLRA 135) (NRCS, 2006b). The Southern Mississippi River Alluvium MLRA is dominated by Alfisol, Vertisol, Inceptisol, and Entisol soils characterized as very deep, dominantly poorly-drained and somewhat poorly-drained, and dominantly loamy or clayey. The Southern Mississippi Valley Loess MLRA is dominated by Alfisol, Entisol, Inceptisol, and Ultisol soils characterized as very deep or deep, medium textured, having a thermic soil temperature regime, having an udic soil moisture regime, and having mixed mineralogy. The Southern Coastal Plain MLRA is dominated by Ultisol, Entisol, and Inceptisol soils characterized as very deep, somewhat excessively-drained to poorly-drained, and loamy. The Alabama and Mississippi Blackland Prairie MLRA is dominated by Inceptisol and Vertisol soils characterized as shallow to very deep, generally well-drained to somewhat poorly-drained, and loamy or clayey.

3.2.2 Major Soil Characteristics

Several soil characteristics have the potential to affect, or be affected by, construction and operation of the proposed Project, including the following: erosion hazard, drainage class, presence of hydric soils, compaction potential, presence of shallow bedrock, revegetation potential, and prime

farmland designation. The characteristics of the various soil units crossed by the proposed pipeline are compiled in Appendix C (Table C-1), and discussed further below.

3.2.2.1 Erosion Potential

Erosion is defined as the wearing away of the land surface by water, wind, ice, or other geologic events (NRCS, 2006a). Erosion potential is defined based on land capability subclass as severe, moderate, and low. The potential for soil erosion varies along the proposed pipeline route, with about 26 percent of the soils classified as having a low erosion potential, 31 percent as having a moderate erosion potential, and about 43 percent of the soils as having a severe erosion potential. Of the soils affected by the proposed aboveground facilities, approximately 1 percent have a low erosion potential, 33 percent have a moderate erosion potential, and 66 percent have a severe erosion potential (see Appendix C). Severe erosion potential soils would generally be confined to areas of side slope and rolling terrain.

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 properties are typically attributed to grain size and sorting. Well-sorted or coarse-grained soils have more pore space and thus are better drained. Poorly-sorted or fine-grained soils have less pore space and water drains poorly. The NRCS recognizes seven natural soil drainage classes: excessively-drained, somewhat excessively-drained, well-drained, moderately well-drained, somewhat poorly-drained, poorly-drained, and very poorly-drained (NRCS, 2006a).

There are very few, very poorly-drained soils (0.08 mile) crossed by the proposed pipeline. There are approximately 6.68 miles of poorly-drained soils that exist between MP 15.4 to MP 103.0. Approximately 13.75 miles of somewhat poorly-drained soils exist between MP 1.6 to MP 95.9. The Southern Natural M/R Station and MLV No. 4 are located in areas of somewhat poorly-drained soils (Appendix C).

3.2.2.3 Presence of Hydric Soils

Hydric soil is defined by the USDA as soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation (NRCS, 2006c). 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, 2006c). Hydric soils may be prone to compaction and rutting. Approximately 88 percent of the soils that would be crossed by the proposed pipeline and 72 percent of the soils that would be affected by the aboveground facilities are classified as hydric (see Appendix C). Given that most of the soils along the Project would be in managed timber plantations, most hydric soils are likely to be relatively undisturbed.

3.2.2.4 Compaction Potential

Soil structure, including strength and drainage abilities, is altered when soils are compacted. 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. Consequently, soil compaction is of particular concern in agricultural areas where crop yields could be adversely affected. However, given that most soils crossed would be in uplands with topography unsuitable for the development of fine-grained silt and clay soils, no soils crossed by the proposed Project are listed as having severe compaction issues.

3.2.2.5 Revegetation Potential

Revegetation potential is the rating of the ability of a soil to support vegetation efforts following construction-related disturbance. Gulf South evaluated the potential for revegetation of each soil type that would be affected by construction of the proposed pipeline by assessing such factors as soil texture, drainage properties, wetness, and slope. Taking these factors into account, three general classes were defined for revegetation potential including good, fair, and poor (Appendix C). Gulf South determined that the soils crossed by the pipeline are rated as having good (47.6 miles) and fair (63.2 miles) revegetation potential. Of the soils that would be affected by the proposed aboveground facilities, 56 percent have good revegetation potential and 44 percent have fair revegetation potential. None of the soils that would be traversed have a poor revegetation potential.

3.2.2.6 Prime Farmland Designation

Prime farmland soils are defined by the USDA as those that are best suited for food, feed, forage, fiber, and oilseed crops. These soils have properties that favor the economic production of sustained high yields of crops (NRCS, 2006d). Prime farmland is represented by many soil associations and series and does not need to be actively cultivated to be classified as prime farmland. Any undeveloped land with high crop production potential can be included in this classification. Prime farmland is an important resource because it provides the highest crop yield per unit of energy expended. Approximately 58 percent of the soils that would be affected by the proposed pipeline, and 58 percent of the soils that would be affected by the proposed aboveground facilities, are classified as prime farmland (Appendix C).

3.2.3 General Impacts and Mitigation

Construction activities associated with the proposed Project, such as clearing, grading, trenching, backfilling, and restoration could temporarily and/or permanently affect one or several soil characteristics. Generally, the most significant effects to soils resulting from construction activities include increased erosion and compaction potential, reduced soil productivity and revegetation potential, and altered drainage abilities.

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 plans, which include 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, ATWSs, pipe storage and contractor 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. All turf, ornamental shrubs, and specialized landscaping would be restored in accordance with the landowner's request or the landowner would be compensated.
- Confirming revegetation efforts through post-construction monitoring of all disturbed areas.

3.2.3.1 Erosion

Soil susceptibility to erosion varies along the proposed pipeline route and is a function of variables such as soil type, topography, vegetation, and climate. The majority of soils that would be crossed by the proposed pipeline and affected by the proposed aboveground facilities have severe erosion potential. Soil erosion could occur during construction. Vegetation clearing, grading, topsoil segregation, open trenching, and backfilling destabilize the soil material and make it susceptible to water and wind erosion. In general, the potential for soil erosion along the construction right-of-way would be more pronounced in areas of side slopes and rolling terrain. Soils are most susceptible to erosion after vegetation is removed and before reestablishment of a vegetative cover after the pipeline is installed. Soil erosion also would result from off-road vehicle traffic on the right-of-way following construction. 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 measures (e.g., slope breakers, silt fencing, and mulch) described in its plans, which would control runoff and reduce the duration of soil disturbance. In addition to adhering to its plans, Gulf South would also develop and implement its SWPPP. The SWPPP would incorporate the requirements for minimizing and mitigating upland erosion and revegetation described in its plans, 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.

3.2.3.2 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. None of the soils that would be crossed by the proposed pipeline or affected by the aboveground facilities are considered prone to compaction due to the lack of hydric soils or poor drainage. Use of the construction right-of-way, ATWSs, 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 plans and Procedures, measures such as restricting vehicular traffic, reducing loads, employing lower ground-pressure equipment, protecting topsoil in spoil piles separate from subsoil spoil piles, and rescheduling certain activities may be used when soil moisture is high to avoid and minimize compaction and rutting.

3.2.3.3 Revegetation Potential

Because all of the soils that would be disturbed during construction have fair to good revegetation potential, restoring vegetation in accordance with Gulf South's plans should not be of significant concern across most of the proposed pipeline route. Revegetation is necessary for stabilization and restoration of the soils in the construction right-of-way, ATWSs, 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, Gulf South would return the construction right-of-way, ATWSs, and pipe storage and contractor yards to pre-construction contours to the extent feasible; control erosion by implementing the procedures in its plans; 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. Furthermore, 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 the LDWF, the ADCNR, and the MNHP regarding seeding mixtures and revegetation.

Gulf South would be responsible for successful revegetation of all disturbed areas, and it would follow its plans to ensure that all mitigation is sufficient. Gulf South would conduct at least two years of post-construction monitoring of all work areas to verify successful revegetation or determine the need for additional restoration. In accordance with its plans, 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 measures. In agricultural areas, revegetation would be considered successful if crop yields in areas affected by construction were similar to those in adjacent, undisturbed areas.

Gulf South would take measures to control unauthorized vehicle access to the proposed pipeline right-of-way during operation. In forested lands, these measures may include signs, fences with locking gates, slash and timber barriers, or planting appropriate trees or shrubs to block access to the

right-of-way. Gulf South would coordinate with affected landowners regarding the installation of access barriers on their property.

3.2.3.4 Mixing of Topsoil and Subsoil

Unless the landowner or a land management agency approves otherwise, Gulf South would prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or the trench. This segregation of topsoil would occur in active croplands and pastures, residential areas, hayfields, and other areas as requested by landowners or land management agencies. A maximum of 12 inches of topsoil would be stripped, if available, and the entire topsoil layer would be segregated in areas with less than 12 inches of topsoil available. Topsoil would not be used to pad the proposed pipeline.

3.2.3.5 Rocks

Introduction of rock to surface soil layers would not be of concern across the proposed pipeline route as it is unlikely that shallow bedrock would be crossed by the proposed pipeline route. However, if shallow bedrock is encountered, trenching and mixing of the excavated materials in these areas could bring large rocks to the surface, which would adversely impact soil productivity and agricultural practices. In accordance with its plans, Gulf South would remove excess rock from at least the top 12 inches of soil in all rotated and permanent cropland, hayfields, pastures, residential areas, and other areas at the landowner's request. Following construction and restoration, the size, density, and distribution of rock in all construction work areas would be similar to that in adjacent areas not affected by construction. Thus, no significant impacts are anticipated as a result of pipeline construction through areas of shallow bedrock.

3.2.3.6 Drainage Systems and Drainage Patterns

Heavy equipment traffic and trenching along the construction right-of-way 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 lowered if such damages were not corrected. Gulf South would be responsible for ensuring that all areas affected by construction activities were finish-graded and restored as closely as possible to pre-construction contours. Gulf South indicated 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 pre-construction condition. 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.

3.2.3.7 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, 2006d). 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 58 percent of the soils that would be affected by

the proposed pipeline are classified as prime farmland; however, most of this is currently classified as either upland forest or pine plantation.

Gulf South would implement the measures included in its plans 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 Delhi Compressor Station would affect about 69.5 acres of prime farmland. In addition, designated prime farmland located at the CenterPoint and Southern Natural 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.

3.2.4 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. Furthermore, 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 AND FISHERIES

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. Groundwater is also used for agricultural, industrial, and municipal uses. Although depth to groundwater is variable along the proposed pipeline route, groundwater is often found near the ground surface, and the proposed Project is likely to encounter groundwater during construction activities.

Major aquifers underlying the proposed Project include the Mississippi River Alluvial Aquifer System, the Coastal Lowlands Aquifer System, and the Mississippi Embayment Aquifer System (United States Department of the Interior [USDI], 2006). Although all of the listed aquifers are used, aquifers contributing major drinking water supplies underlain by the proposed Project include the Coastal Lowlands Aquifer, and to a much smaller extent, the Mississippi Embayment Aquifer. Additional information on the aquifers that occur along the proposed Project route, as well as sole-source aquifers, wellhead protection areas, wells, springs, and contaminated groundwater, is presented below.

Mississippi River Alluvial Aquifer

The proposed Delhi Compressor Station would be underlain by the Mississippi River Alluvial Aquifer in Richland Parish, Louisiana. The Mississippi River Alluvial Aquifer is hydraulically connected with the Mississippi River and its major tributaries and is recharged by direct infiltration of rainfall through the overlying silt and clay layers. Groundwater is typically encountered within 30 to 40 feet of the ground surface. Approximately 353.6 million gallons per day (mgd) are withdrawn from this aquifer for irrigation and industrial uses (LDEQ, 2003). The quality of water from this aquifer is considered relatively poor due to the presence of arsenic and poor taste and odor qualities.

Coastal Lowlands Aquifer

In Simpson, Smith, and Jasper Counties, Mississippi, proposed pipeline facilities would be underlain by the Coastal Lowlands Aquifer. Primary recharge of this aquifer occurs from direct infiltration of rainfall in the stream and upland outcrop areas. Water also moves between overlying alluvial and terrace aquifers according to hydraulic head differences. Groundwater in this aquifer occurs at maximum depths ranging from 200 feet above msl to 2,000 feet below msl. Approximately 1 billion gallons per day of water are withdrawn from this aquifer for agricultural, industrial, and municipal uses (USGS, 2005).

Mississippi Embayment Aquifer

In Jasper and Clarke Counties, Mississippi, and Choctaw County, Alabama, proposed pipeline facilities would be underlain by the Mississippi Embayment Aquifer. This aquifer is recharged by infiltration of rainfall in river valleys, lateral and upward movement of water from adjacent and underlying aquifers, and overbank stream flooding. The amount of recharge from rainfall depends on the thickness and permeability of the silt and clay layers. Approximately 433 mgd are withdrawn from this aquifer for agricultural, industrial, and municipal uses (USGS, 2005).

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. No sole-source aquifers would be crossed or otherwise impacted by the proposed Project (USEPA, 2006).

Wellhead Protection Areas

Wellhead protection areas have been established by the LDEQ, MDEQ, and ADEM to protect public drinking water supplies. Based on a search of LDEQ, MDEQ, and ADEM databases, no designated wellhead protection areas would be crossed or are located in the vicinity of the proposed Project.

Wells and Springs

Based on consultation with the Louisiana Department of Transportation and Development (LDTD), Public Works and Water Resources Division's Water Well Registration File (LDTD, 2007), MDEQ, ADEM, database searches, and field observations, two private wells have been identified on the Delhi Compressor Station land parcel in Louisiana and five private wells and four public wells have been identified within 150 feet of the construction right-of-way in Mississippi. No wells were located within 150 feet of the construction right-of-way in Alabama. These wells and their locations relative to the

proposed Project are listed in Table 3.3.1.1-1. Because the locations of wells listed in agency databases are not exact, prior to construction Gulf South would confirm that no wells are located within the construction right-of-way. Based on agency consultations and field surveys, no springs have been identified within 150 feet of the proposed construction right-of-way and aboveground facility boundaries.

**TABLE 3.3.1.1-1
Wells Located Within 150 Feet of the Proposed Southeast Expansion Project**

Well Type	County¹/ Parish²	Approximate MP³/Associated Facility	Approximate Well Depth (feet)	Approximate Distance from Pipeline Centerline (feet)	Distance from Construction Right-of-Way (feet)
42-inch Mainline Pipeline					
Private	Simpson, MS	14.0	247	166.4	126.4
Public	Simpson, MS	16.1	290	68.4	48.4
Public	Smith, MS	39.0	69	90.6	30.6
Public	Smith, MS	44.6	251	235.5	105.5
Public	Smith, MS	44.8	714	232.0	101.8
Private	Jasper, MS	52.9	65	202.7	47.7
Private	Jasper, MS	65.9	430	229.0	128.9
Private	Jasper, MS	68.9	416	52.7	6.7
Private	Clarke, MS	91.2	416	137.7	7.5
Aboveground Facilities					
Private	Richland, LA	Delhi Compressor Station	100	Within facility boundaries	Within facility boundaries
Private	Richland, LA	Delhi Compressor Station	101	Within facility boundaries	Within facility boundaries
¹ MS = Mississippi ² LA = Louisiana ³ MP = Milepost					

Contaminated Groundwater

Based on agency consultations with the MDEQ, a review of public databases maintained by the LDEQ, MDEQ, and ADEM, and a review of a private database (Banks Information Solutions, Inc., 2006a and 2006b), which maintains state and federal records, Gulf South has identified 15 sites containing potentially contaminated groundwater within a 1-mile radius of the proposed Project facilities. These sites are described in Table 3.3.1.1-2.

**TABLE 3.3.1.1-2
Potential Contaminated Groundwater Sites Within 1 Mile of the
Proposed Southeast Expansion Project Centerline**

MP¹	Parish/ County/State²	Name	Type³	Distance/Direction	Physical Location
45.1	Smith, MS	Shell Tallahala Creek Field	UST	0.68 mile south of the centerline (3,585 feet)	RT 2 Box 72-C Bay Springs, MS 39422
49.5	Jasper, MS	Mississippi Highway Department	UST	0.16 mile north of the centerline (847 feet)	RT 4 Box 338 Carthage, MS
51.1	Jasper, MS	MDOT Meridian Area Headquarters	UST	0.99 mile north of the centerline (5,241 feet)	5409 1st Street Meridian, MS
51.1	Jasper, MS	MDOT Maintenance Area Headquarters	UST	0.90 mile north of the centerline (4,772 feet)	U.S. Highway 11 Purvis, MS
52.0	Jasper, MS	Georgia Pacific Chip N Saw	CERCLA	0.39 mile north of the centerline (2,033 feet)	Data not listed
57.2 ⁴	Jefferson, MS	MDOT	UST	0.94 mile south of the centerline (4,959 feet)	Highway 28 East Fayette, MS
66.9	Jasper, MS	Dixon S. Service Center	UST	0.14 mile north of the centerline (727 feet)	Highway 528 Heidelberg, MS 39439
68.9 ⁴	Holmes, MS	MDOT Durant Headquarters	UST	0.22 mile south of the centerline (1,144 feet)	Highway 51 South West, MS
68.9 ⁴	Hinds, MS	MDOT Jackson Project Headquarters	UST	0.60 mile south of the centerline (3,163 feet)	2802 Kingswood Ave. Jackson, MS
69.0	Jasper, MS	Country Cash	UST	0.62 mile south of the centerline (3,276 feet)	Highway 528 Heidelberg, MS 39439
69.0	Jasper, MS	Heidelberg Exxon	UST	0.42 mile south of the centerline (2,206 feet)	2507 North Pine Ave. Heidelberg, MS 39439
69.0	Jasper, MS	Heidelberg Warehouse	UST	0.53 mile north of the centerline (2,815 feet)	Highway 528 Heidelberg, MS 39439
69.5	Jasper, MS	Reagan Equipment Co.	UST	0.81 mile south of the centerline (4,268 feet)	P.O. Box 285 Heidelberg, MS 39439
70.8	Jasper, MS	MDOT Holly Springs Headquarters	UST	0.86 mile north of the centerline (4,551 feet)	State Highway 7 Holly Springs, MS
95.3 ⁴	Jackson, MS	UHAUL 17868	UST	0.03 mile north of the centerline (156 feet)	2903 Shortcut Road Pascagoula, MS

Notes:

1 MP = Milepost

2 MS = Mississippi

3 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

UST = Underground Storage Tanks, Leaking Underground Storage Tanks

4 Site listed as being within 1 mile of pipeline based on inaccurate data from the MDEQ Mississippi Automated Resource Information System. Per conversation with the MDEQ, Gulf South determined the site is not within 1 mile of the Project area; the true site location is listed in the "Physical Location" column.

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 would depend primarily on any localized changes to existing groundwater flow paths. The proposed Project would not affect changes in the overall quantity of groundwater, which is determined by the quantity of recharge to the aquifer, except to the minimal

extent resulting from impervious surfaces at the proposed aboveground facility sites and to the extent that clearing of vegetation reduces evapotranspiration. Increased surface runoff resulting from clearing of the construction right-of-way and reduced evapotranspiration would result in increased recharge to groundwater, thus increasing groundwater storage.

Excavation and subsequent backfilling of the pipeline trench could also alter the quantity and quality of groundwater and groundwater flow paths. Additionally, if soils along the proposed Project route became compacted due to construction and operation of heavy machinery, infiltration and recharge of aquifers along the trench or right-of-way could also be adversely impacted. Altered groundwater flow paths in turn could result in changes to the quality of groundwater at specific locations, such as the shallow Mississippi River Alluvial Aquifer. However, most wells located along the pipeline receive water from deeper formations whose flow paths would not be affected by the trench.

Excavation of the pipeline trench may expose relatively shallow aquifers, such as the Mississippi Alluvial Aquifer, but only to a depth of 6 to 8 feet in most upland and wetland areas. 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 is 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 the introduction of contaminants, especially in highly permeable areas near water withdrawal wells. Gulf South's Procedures include spill prevention and control measures. Additionally, Gulf South has developed a SPCC Plan, which describes management of the hazardous materials, such as fuels, lubricants, and coolants, that would be used during construction. Given the measures described in Gulf South's Procedures and its implementation of an SPCC Plan, we believe the risk of accidental spills or other introductions of hazardous materials to groundwater would be effectively minimized.

Gulf South indicated that it did not anticipate encountering any contaminated groundwater plumes during construction or operation of the proposed Project. 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.

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

- Testing and, as applicable, mitigating for compacted soils (see Section 3.2 for additional discussion).
- Installing 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. No long-term impacts to the water table or groundwater migration patterns would be anticipated as a result of the proposed Project.

- Implementing measures to reduce 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.
- Installing trench plugs to prevent parallel flow in the trenches.

Based on the anticipated impacts to groundwater, Gulf South's stated construction methods, and the measures described in its plans, we believe that construction and operation of the proposed Project would not change regional flow paths, discharge conditions, or groundwater quality because these are determined by larger-scale geologic features that form the hydrogeologic setting, and that aquifers such as the Coastal Lowlands Aquifer and the Mississippi Embayment Aquifer that are typically deeper or that 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.

In order to protect and mitigate potential effects to water withdrawal wells, Gulf South would test the wells of landowners listed in Table 3.3.1.1-1 at the request of the landowner. The scope of any requested pre- or post-construction testing or monitoring would be negotiated on an individual basis with the landowners. However, we recommend that Gulf South offer, and conduct with permission from landowners, individual well testing that evaluates basic parameters such as well yield and water quality. To ensure that water withdrawal well testing and monitoring is performed in a manner that would adequately protect private and public water well resources, **we recommend that:**

- **Gulf South should conduct, with the well-owner's permission, pre- and post-construction well monitoring of well yield and water quality for wells identified in Table 3.3.1.1-1. 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 offer this plan to the landowners before construction. 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.**

3.3.1.3 Site-Specific Impacts and Mitigation

Sole-source and principal-source aquifers do not occur in the vicinity of the proposed Project and would therefore not be affected by the proposed construction and operational activities. Additionally, no springs or public wells were identified along the proposed Project route through resource agency consultations or environmental field surveys conducted by Gulf South.

No wellhead protection areas were identified along the proposed pipeline route. Blasting is not anticipated in association with construction of the proposed Project; therefore, impacts to wells and other sensitive resources from blasting are not anticipated. Should the need for blasting arise, Gulf South would follow local and/or state requirements and use accepted safe construction blasting techniques and safeguards.

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 plans 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

The proposed Project would traverse 308 waterbodies during construction and operation. Specifically, the proposed Project would cross 103 perennial streams, 196 intermittent streams, and 9 ponds. In Mississippi, 292 waterbodies would be crossed, all of which have designated uses of fish and wildlife and recreation. In Alabama, 16 waterbodies would be crossed, all of which have been designated for fish and wildlife use. 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 by the respective state management agency responsible for its management which characterizes the best intended uses of that waterbody. Designated uses for waterbodies in Mississippi include fish and wildlife, and recreation (MDEQ, 2004a). Designated waterbody uses in Alabama include outstanding Alabama water, swimming, and fish and wildlife (ADEM, 2006). Designated waterbody uses in Louisiana include fish and wildlife propagation, primary contact recreation, and secondary contact recreation (EPS, 2007).

In Mississippi, 292 waterbodies would be crossed, all of which have designated uses of fish and wildlife and recreation. In Alabama, 16 waterbodies would be crossed, all of which have been designated for fish and wildlife use. In Louisiana, one waterbody, designated for fish and wildlife, as well as primary and secondary contact recreation, may be potentially impacted

Construction and operation of the Delhi, Harrisville, and Destin Compressor Stations may affect four waterbodies (see Appendix D). Since Gulf South has not indicated what measures would be taken to avoid impacts to these waterbodies; **we recommend that:**

- **Prior to construction, Gulf South should file along with its site-specific construction plans for the Delhi, Harrisville, and Destin Compressor Stations a description of the measures that it would take to avoid impacts to waterbodies affected by these facilities.**

Major and Navigable Waters

The major waterbodies (greater than 100 feet wide) and navigable waterbodies, as defined by 33 CFR Part 329, that would be crossed by the proposed Project are listed in Table 3.3.2.1-1.

Sensitive Waterbodies

Sensitive waterbodies include those 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 streams within the proposed Project are designated as National Wild or Scenic Rivers (NPS, 2004). Based on consultations with the LDEQ, MDEQ, and the ADEM, no

potable surface water intakes are located within 3 miles downstream of any proposed waterbody crossings in Louisiana, Mississippi, and Alabama.

Waterbody	County, State¹	Begin MP²	End MP	Major Waterbody	Navigable Waterbody	Proposed Crossing Method
Pond	Simpson, MS	1.3	1.4	X		In work space only
Leaf River	Smith, MS	44.1	44.2	X	X	HDD
West Tallahala River	Smith, MS	45.3	45.3	X		HDD
Pond	Clarke, MS	87.7	87.8	X		HDD
Chickasawhay River	Clarke, MS	89.3	89.4	X	X	HDD
Bucatunna Creek	Clarke, MS	100.4	100.5		X	HDD
Okatuppa Creek	Choctaw, AL	107.3	107.4		X	HDD

1 MS = Mississippi
AL = Alabama
2 MP = Milepost
N/A = Not Applicable

The Strong River (MP 18.0) and the Chickasawhay River (MP 89.4) are designated by the National Park Service (NPS) as being listed on the NRI. Waterbodies 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, 2006). Gulf South proposes to cross these rivers using HDD to avoid/minimize impacts. In response to our recommendation in the Draft EIS, Gulf South initiated consultation with the NPS (April 30, 2007) regarding impacts and mitigation measures for use of the HDD method, and with the MDWFP (May 22, 2007) regarding its plans/mitigation for withdrawing water from these waterbodies for hydrostatic testing purposes. Gulf South also submitted detailed crossing plans, construction measures, and hydrostatic test water withdrawal plans to the NPS and the MDWFP.

Information for use of the HDD method included a description of the streamside vegetation impacts necessary for laying of the HDD guide wires and the drilling operations and use of bentonite as a drilling mud. In the event of a frac-out, Gulf South would implement its HDD Contingency Plan to avoid or minimize impacts. The proposed HDD entry and exit points for the Strong River would be located approximately 2,150 feet and 750 feet away from the stream edge, respectively. The proposed HDD entry and exit points at the Chickasawhay River crossing location would be located approximately 480 feet and 2,150 feet from the stream edge, respectively. Given the distance between the proposed HDD work areas and both streams' edges, impacts to riparian areas and visual resources would be minimized. Information for withdrawing hydrostatic test water included the quantity of and manner in which hydrostatic test water would be withdrawn and discharged and is discussed in Section 3.3.2.3.

The NPS indicated in a July 2, 2007, conversation with FERC staff that the HDD method being proposed would be acceptable and that these rivers were listed for their values for scenery,

recreation, and fish and wildlife. Furthermore, the NPS considers Gulf South's Procedures sufficient to minimize and mitigate vegetation disturbance along these streams. However, because Gulf South has not yet completed consultations with the NPS regarding potential Project-related effects to designated NRI-listed streams, **we recommend that:**

- **Prior to construction, Gulf South should complete consultation with the NPS regarding its proposed HDD crossings of, and hydrostatic test water withdrawals from, the NRI-listed Strong and Chickasawhay 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.**

The proposed Project would cross seven waterbodies that contain threatened or endangered species or critical habitat. Dabbs Creek, Leaf River, West Tallahala River, Chickasawhay River, Bucatunna Creek, and Strong River are designated as critical habitat for the Gulf sturgeon (*Acipenser oxyrinchus desotoi*). These rivers would be crossed using HDD methods to avoid/minimize potential impacts to the Gulf Sturgeon. The Little Creek is designated as critical habitat for the Natchez Stonefly (*Alloperla natchez*), which would be crossed using the open-cut method. Gulf South consulted with the Mississippi Museum of Natural Science (MMNS) and determined that habitat for this non-listed imperiled species is not likely to be present at this crossing. Additional discussion of endangered, threatened, and special status species and their habitats is provided in Section 3.7.

Waterbodies that do not meet state water quality standards or do not support their designated uses are classified as impaired. Three impaired streams would be crossed by the proposed Project in Mississippi (Table 3.3.2.1-2) (MDEQ, 2004b). These include Tallahala Creek, Campbell Creek, and Dabbs Creek. The proposed Project would not cross any impaired waterbodies in Louisiana or Alabama (LDEQ, 2002; ADEM, 2006). Contaminated sediments are not known to occur along the proposed Project route.

Waterbody	County, State¹	Impaired Use	Scenic River	Pollutant Cause	Proposed Crossing Method
Dabbs Creek	Simpson, MS	Aquatic Life Support	No	Biological Impairment	HDD
Campbell Creek	Simpson, MS	Aquatic Life Support	No	Biological Impairment	HDD
Tallahala Creek	Jasper, MS	Aquatic Life Support	No	Biological Impairment	HDD

Sources: ADEM, 2006; LDEQ, 2002; MDEQ, 2004b
¹ MS = Mississippi

3.3.2.2 General Impacts and Mitigation

Waterbody crossings would be conducted using either open-cut or HDD methods, as described below and in Section 2.3.2.

As proposed, 224 minor and intermediate waterbody crossings would be conducted using open-cut methods. Twenty-three minor and intermediate waterbody crossings would be conducted using HDDs in tandem with the crossing of larger waterbodies and other significant features. The remaining minor and intermediate waterbodies exist within the culverted waterbody crossings where no proposed changes or impacts to these features are anticipated.

In addition to the 23 minor and intermediate waterbodies, Gulf South proposes to cross all major and navigable waterbody crossings via HDDs, as indicated in Table 3.3.2.1-1.

Waterbody	County, State ¹	Begin MP ²	End MP
Dabbs Creek	Simpson, MS	12.4	12.4
Unnamed	Simpson, MS	12.6	12.6
Campbell Creek	Simpson, MS	16.1	16.2
Strong River	Simpson, MS	18.0	18.0
Oakohay Creek	Smith, MS	34.1	34.1
Beaver Creek	Smith, MS	34.6	34.6
Leaf River	Smith, MS	44.1	44.2
Unnamed	Smith, MS	44.2	44.3
Tributary to West Tallahala River	Smith, MS	45.3	45.3
West Tallahala River	Smith, MS	45.3	45.3
Tallahoma Creek	Smith, MS	55.8	55.9
Tallahoma Creek	Jasper, MS	55.9	55.9
Tallahala Creek	Jasper, MS	62.5	62.6
Unnamed	Jasper, MS	69.3	69.3
Unnamed	Jasper, MS	69.4	69.4
Unnamed	Jasper, MS	69.6	69.6
Unnamed Pond	Clarke, MS	82.6	82.6
Unnamed Pond	Clarke, MS	82.6	82.7
Shubuta Creek	Clarke, MS	82.7	82.7
Unnamed Pond	Clarke, MS	87.8	87.8
Unnamed	Clarke, MS	87.8	87.8
Unnamed	Clarke, MS	87.9	87.9
Unnamed	Clarke, MS	87.9	87.9

Waterbody	County, State¹	Begin MP²	End MP
Unnamed	Clarke, MS	87.9	87.9
Chickasawhay River	Clarke, MS	89.3	89.4
Unnamed	Clarke, MS	94.9	94.9
Unnamed	Clarke, MS	100.4	100.4
Buctunna Creek	Clarke, MS	100.4	100.5
Okatuppa Creek	Choctaw, AL	107.3	107.4

Gulf South has developed Procedures which are designed to minimize impacts associated with waterbody crossings. These measures include, but are not limited to:

- The 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 instream trenching.
- Using EIs during construction.
- Routing 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.
- Limiting the use of equipment within the waterbody to that necessary to construct the crossing and using equipment bridges for passage of other construction equipment.
- Placing spoil at least 10 feet from the water's edge, with installation of sediment barriers to prevent the flow of spoil or silt-laden water to the waterbody.
- Completing all instream construction activity, including stabilization and recontouring of banks, within 24 hours for minor waterbody crossings and 48 hours for intermediate waterbody crossings.
- Using temporary erosion and sediment control measures such as sediment barriers and trench plugs.
- Restoring activities, including restoration of pre-construction bank contours, installation of slope breakers, and revegetation of disturbed riparian areas.

Gulf South indicated that it would construct the proposed Project during the period of September 1 through December 31, 2007, pending the Commission's approval of the proposed Project. In the Draft EIS, we recommended that Gulf South should file with the Secretary copies of approvals or concurrences from the MDWFP and the ADCNR indicating that instream construction between December 1 and May 31 is acceptable. On May 30, 2007, Gulf South received approval from the MDWFP to construct the proposed pipeline through waterbodies at any time of the year provided such

activities are performed as outlined in project construction documents. To date, approval from the ADCNR regarding instream construction between December 1 and May 31 is pending, therefore, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary copies of approvals or concurrences from the ADCNR indicating that instream construction between December 1 and May 31 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 effects to water quality and instream habitat. The clearing and grading of stream banks, instream trenching, trench dewatering, and backfilling of the instream trench would affect water quality and instream habitat by increasing turbidity, sedimentation, water temperature, modifying aquatic habitat and decreasing dissolved oxygen (DO) levels. The use of heavy equipment or other vehicles in and near surface waterbodies could also introduce chemical contaminants, such as fuels and lubricants, into surface waters or could 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 also would tend to be low, indicating that suspended sediments within these streams would be transported only 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 also can 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 effects resulting from resuspension of contaminants would be unlikely.

If contaminated soils were encountered during construction, Gulf South would implement procedures to identify and properly manage the contamination as described in its *Plan for the Unanticipated Discovery of Contaminated Media*.

The removal of vegetation from riparian areas would result in an increase in surface runoff and erosion from the pipeline corridor. However, as specified by its 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. However, potential impacts on water temperature are not expected to be significant in most cases because of the limited amount of streambank canopy that would be cleared relative to the

existing riparian vegetation. Following construction, trees and shrubs would also be allowed to reestablish themselves on waterbody banks, except for a 10-foot-wide corridor centered over the pipeline.

We have identified numerous ponds located adjacent to or immediately downstream of the proposed pipeline construction right-of-way that would be susceptible to siltation if special attention is not given to the use of erosion and sedimentation controls during pipeline construction and restoration of the right-of-way. Therefore, **we recommend that:**

- **Gulf South should prevent sediment and heavily silt-laden water from entering ponds adjacent to areas disturbed by construction activities. Gulf South should conduct the open-cut crossing of the waterbodies feeding these ponds (at the following mileposts: 6.8, 12.5, 15.0, 25.0, 40.9, 41.6, 51.2, 53.4, 59.5, 60.0, 63.5, 65.1, 75.1, 77.1, 86.9, 87.1, 98.6, and 110.0) in a manner that prevents sediment and heavily silt-laden water from entering the ponds.**

Construction Spills

Gulf South has developed several measures regarding spill prevention, containment, and impact minimization in and near waterbodies. These measures include, but are not limited to:

- Structuring overall operations to reduce the risk of accidental spills or exposure of fuels or other hazardous materials into the environment.
- Properly training employees on handling fuels and other hazardous materials, including:
 - Regular inspection of all equipment to ensure it is in good operating order.
 - 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.
 - General prohibition of concrete coating activities within 100 feet of a waterbody or wetland.
 - Provisions to have the necessary tools, equipment, and supplies on hand to contain and recover spilled materials at the job site.
 - Prompt reporting of any spills to the appropriate agencies.

In those instances where refueling must be conducted within 100 feet of a waterbody, fueling locations must be preapproved by the EI. Gulf South would store adequate amounts of absorbent pads and keep containment barriers with each construction crew. 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 affect one intermittent waterbody and would potentially affect two perennial and two intermittent waterbodies. An intermittent stream located on the Delhi Compressor Station site would be rerouted, therefore directly affected. An intermittent stream on the Harrisville Compressor Station site and another on the Southern Natural M&R Station site would not be crossed. Likewise, two perennial streams on the Destin Compressor Station site would not be crossed. To minimize potential indirect effect to waterbodies at these sites, Gulf South would implement the erosion control measures described in its plans. 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).

3.3.2.3 Site-Specific Impacts and Mitigation

Sensitive Waterbodies

Gulf South proposes to cross the three impaired waterbodies identified in Table 3.3.2.1-2 using HDD methods. Use of the HDD method to cross these waterbodies would significantly minimize potential impacts to these resources; however, should the HDD method fail or a frac-out occur, Gulf South would implement its HDD Plan as discussed below.

Gulf South indicated that there are no state or locally designated surface water protection areas within Alabama. Additionally, there are no surface water intakes located within 3 miles downstream of the proposed Project waterbody crossings, and no effects to these areas are anticipated. There are no known contaminated sediments in waterbodies that would be crossed by the proposed Project. Therefore, no impacts to such specially-designated areas are anticipated. There are no designated National Wild and Scenic Rivers crossed by the proposed Project. Potential impacts to the Strong River and Chickasawhay River, NRI-listed streams, would be avoided through the use of the HDD method and any additional measures noted in consultation with the NPS.

Horizontal Directional Drill Crossings

Gulf South proposes to use HDDs to install the proposed pipeline across 29 waterbodies, including the major waterbodies and all navigable streams, two NRI-designated streams, and streams containing potential habitat for listed threatened or endangered species (with the exception of Little Creek) as detailed in Appendix D. As described in Section 2.3, HDD is a trenchless crossing method that may be used to avoid direct impacts to sensitive resources, such as waterbodies, by directionally drilling beneath them. A successful HDD would result 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, following its HDD Plan, 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 an 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.**

Hydrostatic Testing

The withdrawal of large amounts of water for hydrostatic testing of pipeline segments could result in several effects to waterbodies. Specifically, water supply, recreation, and aquatic habitat could be affected by hydrostatic test water withdrawals.

The 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. Refer to Table 3.3.2.3-1 for a summary of hydrostatic test water requirements for the proposed Project.

Project Component	Water Source	Withdrawal Location (MP) ⁵	Approximate Volume (gallons)	Discharge Location (MP)	Discharge Rate (gal/min) ⁶
Pipeline					
	Dabbs Creek ^{1,2}	12.6	450,000	12.6	1,500
	Campbell Creek ¹	16.1	300,000	16.1	1,500
	Strong River ^{2,3}	18.0	6,795,000	18.0	3,000
	Oakohay Creek	34.1	300,000	34.1	1,500
	Leaf River ^{2,4}	44.2	9,857,000	44.2	3,000
	West Tallahala River ²	N/A (Trucked in)	132,000	45.3	1,500
	Tallahoma Creek	55.9	7,200,000	55.9	3,000
	Tallahala Creek ¹	62.6	110,000	62.6	1,500
	I-59/CR8	N/A (Trucked in)	150,000	69.6	1,500
	Shubuta Creek	82.7	132,000	82.7	1,500
	Chickasawhay River ^{1,2,3,4}	89.3	15,605,000	89.3	3,000
	Bucatanna River ^{2,4}	100.4	7,803,000	100.4	3,000
	Okatuppa Creek ⁴	107.3	300,000	107.4	1,500
Aboveground Facilities					
Harrisville Compressor Station	Trucked In	N/A	50,000	0.0	1,500
Destin Compressor Station	Trucked In	N/A	50,000	82.9	1,500
Southern Natural M/R Station	Trucked In	N/A	10,000	45.7	1,500
Tennessee Gas M/R Station	Trucked In	N/A	10,000	72.5	1,500

Project Component	Water Source	Withdrawal Location (MP) ⁵	Approximate Volume (gallons)	Discharge Location (MP)	Discharge Rate (gal/min) ⁶
Destin M/R Station	Trucked In	N/A	10,000	82.9	1,500
Transco M/R Station	Trucked In	N/A	10,000	110.8	1,500

* The discharge location would be located at the site of the proposed Delhi Compressor Station, which is 89.5 miles northwest of MP 0.0

1 Impaired (biological) waterbody
2 May contain habitat for threatened and endangered species
3 Listed in National Rivers Inventory
4 COE navigable waterbody
5 MP = Milepost
6 gal/min = gallons/minute
7 N/A = Not Applicable

Gulf South would avoid or adequately minimize potential effects to waterbodies resulting from hydrostatic testing by implementing its Procedures, which include but are not limited to the following measures:

- Obtaining and complying with all applicable water withdrawal permits and special-status stream permits.
- Addressing the operation and fueling of any pumps located within 100 feet of waterbodies or wetlands in the SPCC Plan.
- Maintaining adequate flow rates in all source waterbodies to protect aquatic life and to provide for all downstream uses.
- Screening all hydrostatic test water withdrawal intakes to prevent entrainment of fish and aquatic organisms.
- Regulating the discharge of hydrostatic test waters by using energy dissipation devices to prevent erosion, scour, turbidity, or excessive streamflow.

Additionally, Gulf South indicates that biocides, chemical dewatering 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. The MDWFP further requested in its May 30, 2007 approval that Gulf South notify prior to withdrawals from streams exhibiting a 7Q10 flow rate for an extended period to protect aquatic resources.

Six waterbodies (Dabbs Creek, Leaf River, West Tallahala River, Chickasawhay River, Bucatunna Creek, and Strong River) are sensitive waterbodies that contain threatened or endangered species or critical habitat, including habitat for Gulf Sturgeon. Site access to these waterbodies for setting up and operating hydrostatic test water withdrawals may require disturbance to their associated riparian and wetland areas. In response to our recommendation in the Draft EIS, Gulf South initiated consultation with the MDWFP (May 22, 2007) regarding its plans/mitigation for withdrawing water from these waterbodies for hydrostatic testing purposes. Gulf South submitted detailed crossing plans, construction measures, and hydrostatic test water withdrawal plans to the MDWFP. Plans submitted included site-

specific drawings, descriptions of how these waterbodies would be accessed, alternative hydrostatic test water sources, and measures that would be employed to minimize impacts to these waterbodies and adjacent riparian and/or wetland resources.

Gulf South states that access to each of these waterbodies would be obtained by using existing pipeline or road rights-of-way to avoid any additional clearing. Gulf South would withdraw and discharge to and from these sensitive waterbodies in compliance with its Procedures as well as other state and local agency requirements, and would include screened intakes to avoid entrainment of fish and energy dissipation devices to reduce erosion and sedimentation. In addition, Gulf South would locate hydrostatic testing equipment outside wetlands and riparian zones wherever possible. Site-specific drawings of the areas to be disturbed by each hydrostatic test water withdrawal were also submitted to the FERC in Gulf South's May 25, 2007, filing. In response to our recommendation in the Draft FEIS, Gulf South has provided site-specific plans for the withdrawal of hydrostatic test water from sensitive waterbodies. Gulf South's use of these plans should help to ensure that potential impacts to these streams and the habitats for rare species they support are adequately minimized. Based on Gulf South's proposed measures, compliance with its 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.

Given compliance with its Procedures, 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 the open-cut method, but they would be crossed in less than 48 hours and restored and stabilized rapidly. Major or sensitive waterbodies and all designated NRI and navigable waterbodies, 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 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, surface water management, filtration of non-point source pollutants and compounds, sediment and nutrient retention, and providing wildlife habitat, groundwater recharge and discharge, recreation, 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 avoidance of wetlands where possible, and minimization and compensation for disturbance where impacts are unavoidable, to the degree practical.

3.4.1 Existing Wetland Resources

Gulf South conducted field investigations to identify, characterize, and survey the boundaries of wetland resources along the pipeline construction right-of-way and the areas identified for ancillary facilities.

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

- Palustrine forested (PFO)
- Palustrine scrub-shrub (PSS)
- Palustrine emergent (PEM)
- Palustrine Open Water (POW)

Palustrine Forested Wetlands

PFO wetlands are dominated by woody vegetation, including bottomland hardwoods, 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 cover for wildlife. A significant portion of the PFO wetlands found along the proposed route consist of regrowth hardwoods of various ages. Some PFO wetlands also contain mature bald cypress (*Taxodium distichum*) or water tupelo (*Nyssa aquatica*). Common vegetative species typically found in PFO wetlands observed within the proposed Project construction right-of-way include water oak (*Quercus nigra*), swamp chestnut oak (*Quercus michauxii*), willow oak (*Quercus phellos*), black willow (*Salix nigra*), water tupelo, bald cypress, American sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), tulip tree (*Liriodendron tulipifera*), river birch (*Betula nigra*), sweetbay magnolia (*Magnolia virginiana*), persimmon (*Diospyros virginiana*), poison ivy (*Toxicodendron radicans*), and buttonbush (*Cephalanthus occidentalis*).

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 with PFO wetlands, PSS wetlands supply an abundance of food and cover for wildlife. Common vegetative species found in the PSS wetlands observed within the proposed Project construction right-of-way include various bulrushes (*Scirpus* spp.), wool-grass (*Scirpus cyperinus*), buttonbush, wax myrtle (*Myrica cerifera*), baccharis (*Baccharis halimifolia*), swamp cyrilla (*Cyrilla racemiflora*), and sweet leaf (*Symplocos tinctoria*).

Palustrine Emergent Wetlands

PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin, et al., 1979). Wildlife typically use these areas for nesting and feeding during migratory periods. Common vegetative species found in the PEM wetlands traversed by the proposed Project construction right-of-way include needlerush (*Juncus roemerianus*), lizard's-tail (*Saururus cernuus*), narrow-leaved cattail (*Typha angustifolia*), and southern wild rice (*Zizaniopsis miliacea*). Persistent species found in palustrine systems include cattails (*Typha* spp.), bulrushes, beakrushes (*Rhynchospora* spp.), saw grass (*Cladium jamaicense*), sedges (*Carex* spp.), common reed (*Phragmites*

australis), and goldenrod (*Solidago* spp.). There are also a variety of broad-leaved persistent emergent species, such as dock (*Rumex mexicanus*), waterwoldow (*Decodon verticillatus*), and smartweeds (*Polygonum* spp.). Non-persistent species found in emergent wetlands include sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmunda cinnamomea*), arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), and arrowheads (*Sagittaria* spp.).

Palustrine Open Water Wetlands

POW wetlands are characterized by areas of open water less than 6.6 feet deep. There are often submerged or floating-leaved plants in the shallower portions along the edges of the waterbody (abbreviated OW). Common vegetative species found in the POW wetlands traversed by the proposed Project construction right-of-way include sedge (*Carex* sp.), goldenrod (*Solidago* sp.), giant reed grass (*Phragmites australis*), and soft rush (*Juncus effusus*).

The location, wetland classification, crossing length, and affected acreage for each wetland that would be affected by construction and operation of the proposed Project is listed in Appendix E. A summary of the wetlands affected by the proposed Project is provided in Table 3.4.1-1.

High-Quality, Sensitive, or Special-Status Wetlands

PFO wetlands containing significant tupelo and bald cypress trees occur along the proposed route and may be considered a component of a relatively higher-quality forested wetland system, especially when the specimens are mature and large. Gulf South did not identify lands in the NRCS Wetland Reserve Program (WRP) or the associated Prior Converted Wetlands Program along the proposed route.

**TABLE 3.4.1-1
Summary of Wetlands Affected by the Proposed Southeast Expansion Project**

Location ¹	Wetland Type ²	Number of Wetland Crossings	Permanent Operation Impacts (acres) ^{3,4,5}	Temporary Construction Impacts (acres) ⁵	Estimated Crossing Length (miles)
Pipeline					
Simpson County, MS	PEM	9	0	0.28	0.11
	PFO	24	4.43	10.75	1.55
	PSS	8	0	7.75	0.92
	PFO/PEM/PSS	1	0.12	0.24	0.19
Smith County, MS	PEM	2	0	0.94	0.21
	PFO	12	4.41	10.03	1.29
	PSS	8	0	0.71	0.27
	PEM/PFO	1	0.07	0.18	0.03
Jasper County, MS	PEM	5	0	2.07	0.30
	PFO	14	4.87	11.25	1.59
	PSS	3	0	5.99	0.69
Clarke County, MS	PEM	15	0	1.20	0.29
	PFO	16	2.41	5.93	1.84
	PSS	10	0	7.16	0.92

**TABLE 3.4.1-1
Summary of Wetlands Affected by the Proposed Southeast Expansion Project**

Location ¹	Wetland Type ²	Number of Wetland Crossings	Permanent Operation Impacts (acres) ^{3,4,5}	Temporary Construction Impacts (acres) ⁵	Estimated Crossing Length (miles)	
Choctaw County, AL	PEM/PFO	2	0.52	1.27	0.20	
	PEM/POW	1	0	0.15	0.01	
	PEM	4	0	0.56	0.15	
	PFO	1	0.26	0.67	0.03	
	PSS	5	0	1.04	0.29	
	PEM/PSS	1	0	0.22	0.03	
	PEM/PFO	3	0.23	0.55	0.17	
	Subtotal Impacts:		145	17.32	68.94	11.08
	Aboveground Facilities					
	PEM	0	0	0	N/A	
	PFO	0	0	0	N/A	
	PSS	0	0	0	N/A	
	Subtotal Impacts:		0	0	0	N/A
	Access Roads and ATWSs					
PEM	N/A	0	0	N/A		
PFO	N/A	0	0	N/A		
PSS	N/A	0	0	N/A		
PEM/PFO	N/A	0	0	N/A		
Subtotal Impacts:		N/A	0	0	N/A	
Total Impacts:		145	17.32	68.94	11.08	

1 MS = Mississippi

AL = Alabama

2 Wetland Type

PEM = Palustrine emergent

PFO = Palustrine forested

PSS = Palustrine scrub-shrub

POW = Palustrine open water

3 Impact calculations are based on an operationally maintained 30-foot-wide corridor through wetlands.

4 Permanently maintained forested wetland impacts would result only in a conversion to either PSS or PEM wetlands. PEM and PSS wetlands would be allowed to completely revegetate to pre-construction conditions and would result in no conversion or loss of function.

5 Permanent maintenance impacts and temporary construction impacts are avoided in wetlands crossed by HDD construction methods. Temporary construction impacts are based on a 75-foot-wide corridor through wetlands.

3.4.2 General Wetland Impacts

The Louisiana portion of the Project does not impact any wetlands. The majority of the 145 wetlands that would be affected by the proposed Project are located in Mississippi (approximately 90 percent of the total number), with the remainder occurring in Alabama. As shown in Table 3.4.1-1, construction of the proposed Project would result in a total of approximately 68.94 acres of wetland disturbance during construction. These impacts would include approximately 38.01 acres of PFO wetlands, 2.91 acres of mixed-type wetlands that include a PFO component, and an additional 28.02 acres of PSS, PEM, and POW wetlands. The majority of the acreage of forested wetlands affected by this Project is associated with riparian zones.

Construction and operation of the proposed pipeline would result in both short- and long-term effects to wetlands. In the short-term, construction activities, including clearing, trenching, spoil placement, vehicle traffic, and related construction disturbances, would diminish the recreational and aesthetic value of wetlands. Wetland functions, such as erosion control, buffering and flood flow attenuation, sediment retention, and nutrient retention, would also be affected by construction activities. Construction activities would also result in both short- and long-term loss of wildlife habitat and the reduction of habitat quality.

Effects to wetlands would vary depending on wetland type. 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. Impacts to PSS wetlands would be mostly short-term, as regeneration would likely occur within two to four years. PEM and POW wetlands, which can regenerate more rapidly, would be typically affected only temporarily as they may become reestablished in one or two growing seasons.

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 or POW wetlands as these herbaceous areas would not typically 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 PFO or PSS 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

Wetlands affected by the proposed Project are identified in a table in Appendix E. Location by milepost, classification, crossing widths, acres of temporary and permanent impacts, and crossing methods are included in the table.

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 would use special seed mixes during restoration. Gulf South proposes to maintain annually a 30-foot-wide herbaceous right-of-way in wetlands.

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 is 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.
- Dewatering 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 refueling within 100 feet of a wetland.
- Restoration of pre-construction contours, vegetative restoration, and monitoring.

In addition to these measures, the COE requires that all appropriate and practicable actions be taken to avoid or minimize those 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 proposed 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 implemented. Gulf South would also comply with all conditions of the Section 404 authorizations that may be issued by the COE. See Section 3.4.4 for additional discussion of compensatory mitigation requirements.

3.4.2.2 Alternative Measures to Our Procedures

Gulf South has proposed as part of its Procedures, 50 site-specific alternative measures from Section V.B.2 (location of ATWSs near waterbodies) and VI.B.1 (location of ATWSs in wetlands) of our Procedures. Section V.B.2 of our Procedures states that all ATWSs, such as those used for staging and storing additional spoil, should be located at least 50 feet from the water's edge, except where the adjacent upland consists of actual cultivated or rotated cropland or other disturbed land. Section VI.B.1 of our Procedures states that access roads and ATWSs, such as those used for staging or storing additional spoil, 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. Table 3.4.2.2-1 lists the locations and justifications associated with these proposed alternative measures to our Procedures.

TABLE 3.4.2.2-1 Proposed Site-Specific Alternative Measures to FERC's Procedures for the Proposed Southeast Expansion Project			
Milepost	Affected Wetland Area (acres)	Applicable FERC Procedures Section	Justification for Alternative Measure
1.7	0.0 ^b	VI.B.1.a	ATWS needed for wetland and stream excavation
5.5	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
6.8	0.0 ^a	VI.B.1.a	ATWS needed for side hill slope
10.2	0.23	VI.B.1.a	ATWS needed for road bore
10.2	0.23	VI.B.1.a	ATWS needed for road bore
10.3	0.23	VI.B.1.a	Stream in wetland & ATWS needed for bank excavation
10.3	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
12.8	0.0 ^b	VI.B.1.a	HDD entry/exit next to wetland & ATWS needed for HDD
13.0	0.32	VI.B.1.a	Foreign Pipeline in wetland & ATWS needed for excavation
14.6	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
15.6	0.0 ^b	VI.B.1.a	ATWS needed near wetland for excavation

**TABLE 3.4.2.2-1
Proposed Site-Specific Alternative Measures to FERC's Procedures for the
Proposed Southeast Expansion Project**

Milepost	Affected Wetland Area (acres)	Applicable FERC Procedures Section	Justification for Alternative Measure
15.8	0.55	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
17.5	0.0 ^b	VI.B.1.a	ATWS needed for road bore
18.3	0.0 ^b	VI.B.1.a	HDD entry/exit next to wetland & ATWS needed for HDD
19.5	0.0 ^b	VI.B.1.a	Foreign Pipeline in wetland & ATWS needed for excavation
23.6	0.0 ^a	V.B.2.a	ATWS needed for road bore
25.8	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
34.7	0.8	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
39.8	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
45.2	0.0 ^b	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
51.8	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation and railroad bore
51.9	0.25	VI.B.1.a	ATWS needed for railroad bore
55.9	0.35	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
56.2	0.58	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
59.8	0.02	VI.B.1.a	ATWS needed for road bore
60.6	0.22	VI.B.1.a	Stream in wetland & ATWS needed for bank excavation
65.9	0.46	VI.B.1.a	Ditch in wetland & ATWS needed for bank excavation
66.4	0.6	VI.B.1.a	Road in wetland & ATWS needed for road bore
66.9	0.46	VI.B.1.a	Stream in wetland & ATWS needed for bank excavation
68.7	0.0 ^a	V.B.2.a	ATWS needed for road bore
69.6	0.0 ^a	V.B.2.a	HDD entry/exit near stream & ATWS needed for HDD
70.5	0.14	VI.B.1.a	ATWS needed for road bore
70.6	0.21	VI.B.1.a	ATWS needed for road bore
78.3	0.0 ^c	V.B.2.a	ATWS needed for foreign pipeline crossing and side hill slope
80.3	0.0 ^a	V.B.2.a	ATWS needed for road bore
82.2	0.01	VI.B.1.a	ATWS needed for foreign pipeline crossing and side hill slope
82.4	0.0 ^c	V.B.2.a	HDD entry/exit near stream & ATWS needed for HDD
83.0	1.19	VI.B.1.a	ATWS needed for meter and compressor station construction
83.3	0.01	VI.B.1.a	ATWS needed for road bore
89.0	0.28	VI.B.1.a	HDD entry/exit in wetland & ATWS needed for HDD
93.4	0.0 ^b	VI.B.1.a	ATWS needed for road bore
95.1	0.0 ^c	V.B.2.a	HDD entry/exit near stream & ATWS needed for HDD
99.9	0.24	VI.B.1.a	Road in wetland & ATWS needed for road bore
100.2	0.54	VI.B.1.a	HDD entry/exit near stream & ATWS needed for HDD
101.2	0.0 ^a	V.B.2.a	ATWS needed for stream bank excavation
102.9	0.14	VI.B.1.a	Road next to wetland & ATWS needed for road bore
104.8	0.0 ^b	VI.B.1.a	ATWS needed for side hill slope
104.9	0.0 ^b	VI.B.1.a	ATWS needed for side hill slope
106.6	0.0 ^b	VI.B.1.a	ATWS needed for side hill slope
110.8	0.77	VI.B.1.a	ATWS needed for meter and compressor station construction

Notes:

- a - No ATWS within stream but is less than 50' from stream
- b - No ATWS within wetland but is less than 50' from wetland
- c - Small intermittent stream within ATWS

Based on our review, we have determined that the proposed alternative measures as described in Table 3.4.2.2-1 appear reasonable and are adequately justified. Gulf South has provided preliminary site-specific drawings for the proposed ATWSs in wetlands. In accordance with its Procedures, Gulf South would be required to file these site-specific construction plans prior to the start of construction.

3.4.3 Site-Specific Impacts and Mitigation

3.4.3.1 High-Quality, Sensitive, or Special-Status Wetlands

Gulf South indicates that old-growth tupelo trees occur within the proposed Project right-of-way at or adjacent to three wetland locations as listed in Table 3.4.3.1-1: Wetlands W1CSI004 at MP 12.7-12.8; W1BJS004 at MP 62.1-62.2; and W9DCK001 at MP 101.1-101.2. No wetlands were identified as containing mature cypress trees. To minimize impacts to tupelo and/or cypress trees, Gulf South would avoid clearing mature tupelo and/or cypress trees that are greater than or equal to 24 inches in diameter at breast height (dbh) within buffer zones comprised of the outermost 10 feet of the spoil side of the Project's construction ROW. Mature trees in this buffer zone would not be cut, rather they would be avoided and spoil would be placed around them where feasible and where its usage would not negatively impact safe construction and operation.

As recommended in the Draft EIS, Gulf South re-surveyed these areas for trees larger than 24 inches dbh and developed site-specific crossing plans including measures to minimize impacts to these mature trees. Approximately 27 mature trees were found to be outside the proposed construction right-of-way limits by 9 to 200 feet, one was found to be within five feet of these limits, and two were found to be within 10 feet of the centerline. Gulf South indicated that it could not avoid these two trees for safety reasons. Given that most identifiable mature trees are outside of Gulf South's construction work limits, and its proposed use of a buffer zone to protect a portion of the mature trees located within or adjacent to these wetlands, we believe that with the implementation of Gulf South's proposed mitigation plan, impacts to mature tupelo and cypress trees would be minimized.

Milepost	Approximate Distance Crossed (feet)
12.7 to 12.8	1,003
62.1 to 62.2	211
101.1 to 101.2	1,478

3.4.4 Wetland Restoration and Compensatory Mitigation

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.
- Monitoring of the success of wetland revegetation annually for the first three years after construction or until wetland revegetation is considered successful.

As noted above, Gulf South would complete wetland permitting, including development of measures for compensatory mitigation for all wetland impacts in consultation with the COE Mobile District. 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.

3.4.5 Conclusion Regarding Impacts to Wetlands

The proposed Project would impact a number of wetlands resulting in short- and long-term impacts to wetlands. 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. Given the measures identified in Gulf South's Procedures and its adherence to COE permitting requirements, 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 five general upland vegetative communities: upland forest, pine plantation, open land (scrub-shrub), agriculture, and pasture. In addition to the upland vegetation types, the proposed Project would cross PFO wetlands, PSS wetlands, PEM wetlands, and POW wetlands, which are discussed in detail in Section 3.4.

The upland vegetative communities and representative species crossed by the proposed Project are described in Table 3.5.1-1.

Vegetation Community	General Description	Common Species
Upland Forest	Includes slope hardwood and mixed hardwood-loblolly pine. In mixed hardwood-loblolly pine (<i>Pinus taeda</i>) forests, loblolly pine comprises at least 20 percent of the overstory. These forests trend toward hardwood dominance when fire is suppressed.	Drier locations – loblolly pine (<i>Pinus taeda</i>), shortleaf pine (<i>Pinus echinata</i>), southern red oak (<i>Quercus falcata</i>), red maple (<i>Acer rubrum</i>), cherrybark oak (<i>Quercus pagoda</i>), mockernut hickory (<i>Carya tormentosa</i>), winged elm (<i>Ulmus alata</i>), black gum (<i>Nyssa sylvatica</i>), white oak (<i>Quercus alba</i>). Wetter locations – laurel oak (<i>Quercus laurifolia</i>), southern magnolia (<i>Magnolia grandiflora</i>), water oak (<i>Quercus nigra</i>), blue beech (<i>Carpinus caroliniana</i>), eastern hop hornbeam (<i>Ostrya virginiana</i>), sweetgum (<i>Liquidambar styraciflua</i>). Understory in fire-suppressed areas – sassafras (<i>Sassafras albidum</i>), Japanese honeysuckle (<i>Lonicera</i>

**TABLE 3.5.1-1
Upland Vegetation Communities Occurring Along the Proposed Southeast Expansion Project**

Vegetation Community	General Description	Common Species
		<p><i>japonica</i>), Sebastian bush (<i>Sebastiania fruticosa</i>), gallberry (<i>Ilex glabra</i>), hawthorn (<i>Crataegus</i> spp.), sweet leaf (<i>Symplocos tinctoria</i>), swamp cyrilla (<i>Cyrilla racemiflora</i>), yaupon (<i>Ilex vomitoria</i>), American holly (<i>Ilex opaca</i>), flowering dogwood (<i>Cornus florida</i>), wax myrtle (<i>Myrica cerifera</i>), poison ivy (<i>Toxicodendron radicans</i>), green briar (<i>Smilax</i> spp.), blackberry (<i>Rubus</i> spp.), Carolina jasmine (<i>Gelsemium sempervirens</i>).</p> <p>Understory in fire-maintained areas – panicum (<i>Panicum</i> spp.), broomsedge (<i>Andropogon</i> spp.), three-awn (<i>Aristida</i> spp.).</p>
Pine Plantation	Pine plantations are primarily managed for pulp and poles, with an average rotation time of 20 to 30 years.	Loblolly pine. Associated sedges (<i>Carex</i> spp.), blackberry, yaupon, greenbriar, and Carolina jasmine.
Open Land (scrub/shrub)	Includes clear-cut areas that have not been replanted and are overgrown, and maintained rights-of-way.	Sapling stage of woody vegetation in upland forest, greenbriar, blackberry, peppervine (<i>Ampelopsis arborea</i>), holly (<i>Ilex</i> spp.).
Agriculture	Areas under active farming, including field crops.	Wheat (<i>Triticum aestivum</i>) and hay.
Pasture	Improved or unimproved areas dominated by grasses and used by livestock for grazing.	Bermuda grass (<i>Cynodon dactylon</i>), crabgrass (<i>Digitaria</i> spp.), broomsedge, bluegrass (<i>Poa</i> spp.), Bahia grass (<i>Paspalum notatum</i>).

Pipeline Facilities

Relatively large areas of upland forest, pine plantation, and open land vegetation, and to a lesser extent, agriculture and pasture vegetation, would be affected by construction of the proposed pipeline and associated ATWSs. Approximately 591.8 of the 1,580.3 acres (37 percent) that would be contained within the pipeline construction right-of-way and ATWSs consist of upland forest. Pine plantation (560.6 acres, 35 percent), open land (170.3 acres, 11 percent), pasture (56.3 acres, 4 percent), and agriculture (10.4 acres, 1 percent) account for most of the remaining areas that would be crossed (see Table 3.5.1-2) by the proposed Project.

Aboveground Facilities

The proposed aboveground facilities include three new compressor stations, five M/R stations, one side valve, and eight MLVs. Agriculture, upland forest, and pine plantation are the existing vegetation cover types at the proposed Delhi, Harrisville, and Destin Compressor Station sites, respectively (see Table 3.5.1-2). The CenterPoint M/R Station would be located within the Delhi Compressor Station site, and the Destin M/R Station would be located within the Destin Compressor Station site. The remaining proposed M/R station sites occur within the upland forest and open land vegetation types. MLV sites would impact an additional 0.5 acre of land currently classified as upland forest and open land. The remaining acreages impacted by MLV sites would all be located within the boundaries of the permanent right-of-way for the proposed pipeline facilities.

Access Roads

Gulf South proposes to use 138 access roads, 47 of which would be new and/or upgraded roads and 91 would be existing roads to be used without modification. Approximately 98 percent of the 58.3 acres encompassing new or modified access roads would be within the other/roads category areas where vegetation is lacking. The remainder of the vegetation types affected by access roads would be comprised of upland forest and open land (see Table 3.5.1-2).

Pipe Storage and Contractor Yards

Gulf South indicated that the pipe storage and contractor yards would be located in existing commercial and industrial areas, thereby avoiding impacts to vegetation associated with those construction-related activities.

3.5.1.1 Vegetative Communities of Special Concern or Value

Based on a review of maps, field surveys, available information, and consultations with the resource agencies, only Conservation Reserve Program (CRP) lands were identified as lands containing vegetative communities of special concern or value. As described further in Section 3.8, the Farm Service Agency (FSA) administers the CRP, which 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, reduce 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.

Vegetation Cover Type	Pipeline Facilities ^a		Aboveground Facilities		Access Roads	
	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)
Upland Forest	591.8	301.2	54.4	34.9	0.4	--
Pine Plantation ^b	560.6	271.7	18.2	11.7	--	--
Open Land ^c (scrub-shrub)	170.3	95.4	3.9	3.2	0.8	--
Agriculture	10.4	5.7	69.5	69.5	--	--
Pasture	56.3	31	--	--	--	--
Total	1,389.4	705	146	119.3	1.2	0.0

Notes:

a Acreages based on pipeline, pipe storage and contractor yards, and ATWSs. Acreages reflect a nominal 100-foot-wide construction right-of-way. Permanent impacts are based on Gulf South's 60-foot wide permanent right-of-way; however, we are recommending that Gulf South's permanent right-of-way be limited to a width of 50 feet.

b Includes actively planted and harvested pine plantation forests.

c Includes areas that have been clear-cut without replanting and maintained rights-of-way.

The MNHP identified the wooded seep, spring seep, and wet terrace habitat types as potentially occurring within the Project area. However, none of these habitat types were observed during field surveys conducted by Gulf South.

3.5.1.2 Extensive Forested Tracts

Based on a review of maps, aerial photographs, and field surveys, several areas of large, relatively non-fragmented forested tracts would be crossed by the proposed pipeline. Although these areas are relatively non-fragmented, Gulf South indicated that many of these tracts are subject to periodic harvest and/or thinning. The location of these tracts and the length of the associated crossings are identified in Appendix F.

3.5.2 General Impacts and Mitigation

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

The proposed 60-foot wide permanent right-of-way would be mowed or otherwise maintained every three years and a 10-foot-wide corridor over the pipeline centerline would be maintained annually in an herbaceous state; however, we are recommending in Section 2.0 that Gulf South should limit the width of its right-of-way to 50 feet.

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.

The cutting or removal of vegetation could increase soil erosion potential, increase sedimentation and turbidity in streams and wetlands, increase invasive or exotic plant species, and reduce wildlife habitat. Additionally, heavy machinery could damage vegetation associated with waterbodies, whether the equipment is moving or parked for extended periods. 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, a change

in appearance, conversion of community type, and loss of habitat. Several of these impacts would be long-term as regrowth to pre-construction condition would take 30 years or more.

Periodic maintenance of the 60-foot-wide, permanent pipeline right-of-way would prevent restoration of forested habitat as the area would be mowed or otherwise maintained every three years, and a 10-foot corridor over the pipeline centerline would be maintained annually in an herbaceous state. Clearing and construction activities along the pipeline right-of-way would also result in soil compaction and damage to the trunks, branches, or roots of adjacent trees left standing, thereby reducing their overall health and long-term survival. However, Gulf South has committed to implementing the measures identified in its plans, which include measures for testing and mitigating soil compaction.

Permanent impacts would also occur at the proposed aboveground facility sites. Notably, permanent impacts to forested areas and/or pine plantations would occur at two of the three proposed compressor station sites and at three of the five proposed M/R stations. Permanent impacts to agricultural land and open land would also occur in association with construction of the Delhi and Harrisville Compressor Stations, and the CenterPoint and Transco M/R Stations.

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

- Use of at least one EI per construction spread, who would ensure compliance with the plans, 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.
- Post-construction monitoring and maintenance of revegetated areas.

Furthermore, Gulf South's 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:**

- **Prior to construction, Gulf South should consult further with the MDWFP, the LDWF, the ADCNR, the NRCS, and other appropriate agencies regarding seeding and vegetation restoration practices for the proposed Project. Gulf South should file a report with the Secretary for review and written approval by the Director of OEP that describes the outcome of these consultations and identifies the agency-recommended seeding and vegetation restoration practices that Gulf South plans to implement.**

Project impacts to vegetative communities would vary depending upon disturbance duration, magnitude, and vegetation cover type. As described above, approximately 72 percent of the disturbed vegetation would be forested. Due to the nature of forest regrowth, the clearing of these areas may result in long-term to permanent effects in these areas. These long-term and permanent impacts to forested areas would be minimized by the measures described above. Additionally, Gulf South avoids forested areas to the extent possible through selective routing, and minimizes impacts to vegetation through extensive collocation with existing rights-of-way. Impacts to agricultural, open-land, or pasture lands would be minimal and limited primarily to the construction phase. 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 plans, we believe that impacts to general vegetative communities would be minimized.

3.5.3 Impacts and Mitigation to Vegetation Communities of Special Concern or Value

Conservation Reserve Program Lands

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 grassland or forest.

CRP lands occurring at MP 17.1 in Simpson County Mississippi, MP 37.5 and MPs 41.6 to 42.4 in Smith County, Mississippi, and an undetermined amount in Clarke County, Mississippi would be released from the CRP. 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.

Extensive Forested Tracts

The proposed Project may affect extensive forested tracts. The large forested tracts 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 early herbaceous, shrub, and sapling strata. Forested areas within the 60-foot-wide permanent pipeline right-of-way would be permanently affected and replaced by herbaceous and shrubby areas. Gulf South attempted to minimize impacts to large, contiguous forested tracts by routing the proposed Project along existing rights-of-way to the extent possible (approximately 66 percent of the proposed route) and through other previously disturbed areas, such as agricultural and open lands, as well as other previously disturbed, fragmented, and/or managed forested areas. We have included a condition regarding minimization of impacts to individual trees within certain wetlands previously in Section 3.4.3.1

3.5.4 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. Chinese tallow tree (*Sapium sebiferum*) was observed at two locations along the route of the proposed pipeline, between MPs 50.74 to 50.84 and at MP 52.65. 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).

The MNHP identified cogon grass (*Imperata cylindrica*) and itchgrass (*Rottboellia cochinchinensis*) as potentially occurring within the proposed Project area. 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). Itchgrass is an aggressive weed that is spread by water, animals, contaminated crop seed, and harvesting equipment. Needlelike hairs on its leaf sheath break off in the skin, which may cause painful infections to people coming into contact with itchgrass.

In order to minimize the impacts of exotic and invasive species, Gulf South would implement its plans, which include measures to reduce erosion such as topsoil stripping and specific vegetation restoration measures. Furthermore, 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, the LDWF, the MDWFP, the ADCNR, and the NRCS. This plan should identify the specific measures that Gulf South would implement during construction and operation to control exotic and invasive plant species.**

The temporary removal of vegetation may result in increased opportunities for invasive and exotic species to establish themselves in Project rights-of-way and ATWSs. Adherence to its plans 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 proposed Project area.

3.5.5 Conclusion Regarding Impacts to Vegetation

The proposed Project would impact five upland vegetation communities (see Table 3.5.1-1) that would include CRP lands and extensive forested tracts. Long-term and permanent effects would occur within the permanent right-of-way within forested areas. However, vegetation impacts would be minimized by the collocation of the proposed pipeline with existing rights-of-way and the implementation of Gulf South's Procedures. 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 plans, we believe that impacts to general vegetative communities would be minimized.

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 crossed by the proposed Project. Representative wildlife species commonly found with the proposed Project area are listed in Table 3.6.1.1-1. Upland forest, pine plantation, open land, PFO, PSS, PEM, and POW habitats would all be affected by construction and operation of the proposed Project. Threatened and endangered species and state-listed species are discussed in Section 3.7, and colonial nesting birds and migratory birds are discussed below.

Wildlife Species

Migratory Birds

The Migratory Bird Treaty Act regulates the taking of, or impacts to, migratory birds, including their nests. Gulf South identified 170 migratory bird species that could potentially occur along the proposed Project. Migratory birds would be expected to occur at least as transients in the proposed Project throughout most of the year. Although construction and maintenance of the pipeline right-of-way would benefit some species through the creation and maintenance of edge habitats, other species would be adversely affected, especially if nesting activities were disturbed by vegetative clearing activities associated with construction and maintenance of the proposed Project.

The Project would be constructed between September and December, as proposed, thereby avoiding the major migratory bird spring nesting season. Additionally, Gulf South would not conduct routine vegetative maintenance of the full pipeline right-of-way more frequently than once every three 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 indicates that routine vegetative maintenance clearing would not occur between April 15 and August 1 of any year to minimize the potential for Project-related disturbance of migratory bird nesting periods. The potential exists for Project-related construction activities to occur during the migratory bird nesting season if construction were delayed, but population-level impacts would not be expected if impacts did occur.

**TABLE 3.6.1.1-1
Representative Wildlife Species That Occur Along the Proposed Southeast 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>Dasyus 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		

Colonial Nesting Waterbirds

"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 riparian zones or major waterways. According to consultations with FWS, no colonial nesting birds are anticipated to occur within the Project area. Additionally, no colonial nesting water birds were noted in the survey corridor. However, Gulf South would include training material for construction workers to familiarize them with the identification of waterbird colonies, and all EIs would be trained to notify Gulf South immediately upon the unanticipated discovery of a waterbird colony in the proximity of the right-of-way. In the unlikely event that a waterbird colony is encountered, Gulf South would implement appropriate measures to meet site-specific needs and would coordinate with the FWS and applicable state agencies as necessary.

Habitat Types

Upland Forest

Approximately one-half of the proposed Project would cross upland forest habitat which consists of loblolly pine-hardwood/pine forests and slope hardwood forest. Although pine/hardwood forests can have an understory of small shrub species and herbaceous growth, the understory would naturally trend toward hardwood dominance without periodic fire suppression. This habitat type provides necessary food, cover, and young-rearing habitat for a wide variety of wildlife species.

Pine Plantation

Pine plantations provide various elements necessary to support wildlife populations. Early and intermediate successional stages are typically the stages that are most highly 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. Many of the species that inhabit the mixed and slope forests use adjacent pine plantations at different times. The numbers and types of wildlife are usually greater along the edges.

Open Land

Open lands include maintained utility rights-of-way, upland scrub-shrub areas, and other non-agricultural herbaceous areas. Plant species in these areas include saplings of many of the tree species listed above, along with smilax (*Smilax* spp.), dewberries (*Rubus* spp.), peppervine (*Ampelopsis arborea*), holly species (*Ilex* spp.), and various grasses. Open lands generally provide poor to moderate quality wildlife foraging habitat and moderate to good cover habitat; however, the open land cover type is important to many of the same species found in the forested habitats because it provides "edge" habitat that is important for feeding and raising young. Edge habitats are transition zone areas where two different habitat types meet, such as forested and open land or agriculture fields. These transition zones provide distinct changes in available food types, unique nesting or breeding habitats, and travel corridors. Typical edge species that are somewhat dependent on this type of land cover are the white-tailed deer (*Odocoileus virginianus*), red-tailed hawk (*Buteo jamaicensis*), eastern meadowlark (*Sturnella magna*), cotton mouse (*Peromyscus gossypinus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginianus*), striped skunk (*Mephitis mephitis*), and various migratory birds.

Wetlands

Wetland types crossed by the proposed Project include PFO, PSS, PEM, and POW communities. For a more detailed description of each of these wetland types, refer to Section 3.4. Although a number of the wildlife species noted above may occupy these wetland areas from time to time and depend on them for a portion of their normal habitat, several species are typically found only in these land cover types. Among the animals that are normally found only in wetland ecosystems are the wood duck (*Aix sponsa*), American wigeon (*Anas americana*), cottonmouth (*Agkistrodon piscivorus*), diamond-backed water snake (*Nerodia rhombifer*), southern leopard frog (*Rana sphenoccephalus*), bullfrog (*Rana catesbiana*), beaver (*Castor canadensis*), green heron (*Butorides striatus*), various other reptiles and amphibians, and numerous neotropical migratory songbirds. During periods of flooding, these areas also provide important wintering habitat for migratory waterfowl such as mallard ducks (*Anas platyrhynchos*).

3.6.1.2 General Impacts and Mitigation

The extent and duration of impacts to wildlife and their habitats resulting from construction and operation of the proposed Project would depend on the species present in each habitat type and their individual life history requirements.

Pipeline Facilities

Construction of the proposed pipeline would require the clearing of vegetation within the construction right-of-way, which would temporarily remove and reduce the quality of cover, nesting, and foraging habitat for wildlife. The loss and reduction in quality of wildlife habitat would result in the temporary displacement and avoidance of wildlife, which would increase stress, injury, and the potential for mortality. Less mobile species may be affected by construction activities due to direct mortality or permanent displacement, potentially affecting reproduction, recruitment, and survival.

Similar effects, although much less extensive, would result from routine maintenance of vegetation along the permanent right-of-way. Approximately 60 percent of the total upland forested area (including pine plantation) affected during construction, and approximately 42 percent of the affected PFO wetlands, would be permanently affected by maintenance of the pipeline right-of-way during operations. Areas within the permanent right-of-way would be permanently converted and maintained as PEM or PSS wetlands.

Non-forested habitats that would be affected by construction and operation of the proposed Project include agricultural areas, pastures, open lands, PSS, and PEM wetlands. Refer to Section 3.8 for a summary of the acreage impacts to each of these habitats. The impact on these habitats and associated wildlife species would be relatively minor and either temporary or short-term. Temporary impacts to wildlife along the pipeline corridor and associated workspaces would be limited to the time of construction activities. However, these impacts would be of relatively short duration and species and their habitats should recover quickly. Due to the rapid pace of pipeline installation and the vegetation restoration measures included in Gulf South's plans and Procedures, the areas would generally be restored within one growing season or within three years after construction for scrub-shrub habitats. Following construction, all extra work areas outside the permanent right-of-way, including ATWSs, would be allowed to revert to pre-construction conditions. In wetlands, all workspace outside the 30-foot-wide permanently maintained right-of-way would likewise be allowed to revert to natural conditions. Gulf South's Procedures allow for periodic selective thinning of trees within 15 feet of the pipeline that grow taller than 15 feet in wetlands, and this selective thinning is anticipated to have minimal impact on wildlife.

Effects to wildlife using forest habitats would be more severe than that to wildlife inhabiting other habitat types, as vegetative strata in those areas would undergo a more marked change. These changes include the conversion of forested habitat to non-forested habitat within the permanent right-of-way and competition with other species for food and foraging areas. Potential impacts to wildlife would include not only the broader loss of habitat in general, but also potential losses of den or nesting sites. The area of upland forest, pine plantation, and PFO habitats that would be affected by construction of the proposed Project would be considerable locally. With the exception of the 15-foot selective tree thinning mentioned above, disturbed areas located outside the permanent right-of-way would be allowed to revert to their pre-construction cover type, but this process would take 30 years or more in some forested habitats, representing a long-term impact. Construction would affect a relatively small percentage of the forested habitats in the general vicinity of the proposed Project, and routine maintenance activities during operations would be relatively infrequent and performed in accordance with Gulf South's Plan and Procedures.

Gulf South would minimize impacts to wildlife species and habitats resulting from construction and operation of the proposed Project through the implementation of its plans and Procedures. Gulf South would also mitigate impacts to wildlife species and habitats through avoidance and minimization. Specifically, the proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed wildlife habitats. The collocation and overlapping of rights-of-way would substantially reduce the amount of wildlife habitat clearing required as compared to construction in greenfield or other areas where overlapping was not possible.

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

Construction of the aboveground facilities would permanently affect several wildlife habitats; however, these areas represent a small percentage of the land area and wildlife habitats affected by the proposed Project. Generally, wildlife occurring in these areas would be permanently displaced, which would result in increased stress, injury, and/or mortality.

Construction of the proposed Delhi, Harrisville, and Destin Compressor Stations, M/R stations, ancillary valves, pig launchers, and receivers would permanently impact approximately 46.6 acres of upland forested habitat (including pine plantation). Additionally, approximately 69.5 acres of agriculture and 3.2 acres of open lands would be permanently affected by operation of aboveground facilities. Areas temporarily disturbed during construction of the aboveground facilities would be allowed to revert to their pre-construction conditions. All disturbed areas associated with the aboveground facilities that would not contain infrastructure, such as buildings and other enclosures, would be finish-graded and seeded or covered with gravel, as appropriate. All roads and parking areas would be graveled. Thus, construction of the aboveground facility sites would result in the loss and permanent conversion of some existing wildlife habitat into potentially non-vegetated industrial/commercial uses. No wetlands or waterbodies would be affected by maintenance of these aboveground facilities.

Three pipe storage and contractor yards would be used for storage and construction of pipeline materials and facilities and would affect approximately 41.0 acres of previously classified commercial/industrial use. This acreage would only be temporarily impacted by construction.

Gulf South stated that it would access the proposed pipelines and facilities using public and private roads to the extent practical. In addition, improvement or addition of access roads would cause temporary impacts to approximately 0.4 acre of upland forested areas and 0.8 acre of open land. There are also no anticipated construction impacts to agricultural or pasture habitats. Section 3.8 provides additional information on access roads planned in association with the proposed Project.

3.6.1.3 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 3.3.2, the proposed Project would cross a total of 308 waterbodies: 103 perennial streams, 196 intermittent streams, and 9 ponds. Fishery classifications, timing restrictions, and other general information regarding the surface waterbodies crossed by the pipeline route were obtained from FWS, LDWF, MDWFP, MNHP, ADCNR, and ADEM. These waterbodies are classified as warmwater and support numerous aquatic species, including fish and mussels. Table 3.6.2.1-1 lists warmwater fish and mussel species commonly found in waterbodies affected by the proposed Project. Refer to Section 3.7.1 for more detailed information regarding potential impacts to threatened and endangered species potentially existing in waterbodies traversed by the proposed Project.

No essential fish habitat (EFH), as managed by the National Marine Fisheries Service (NMFS) is located within the proposed Project area.

TABLE 3.6.2.1-1 Fish and Mussel Species Occurring in the Proposed Southeast Expansion Project Area	
Common Name	Scientific Name
Fish	
Alligator gar	<i>Atractosteus spatula</i>
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>
Black crappie	<i>Poxomis nigromaculatus</i>
Bluegill sunfish	<i>Lepomis macrochirus</i>
Channel catfish	<i>Ictalurus punctatus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Long-eared sunfish	<i>Lepomis megalotis</i>
Longnose gar	<i>Lepisosteus osseus</i>
Red-eared sunfish	<i>Lepomis microlophus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
White crappie	<i>Poxomis annularis</i>
Mussels	
Round pearlshell	<i>Glebula rotundata</i>
Bankclimber	<i>Plectomerus dombeyanus</i>
Bleufer	<i>Potamilus pupuratus</i>
Mapleleaf	<i>Quadrula quadrula</i>

TABLE 3.6.2.1-1 Fish and Mussel Species Occurring in the Proposed Southeast Expansion Project Area	
Common Name	Scientific Name
Southern mapleleaf	<i>Quadrula apiculata</i>
Tapered pondhorn	<i>Uniomerus declivus</i>
Three ridge	<i>Amlema plicata</i>
Wabash pigtoe	<i>Fusconaia flava</i>
Washboard	<i>Megaloniaias nervosa</i>
Threehorn	<i>Obliquaria reflexa</i>
Pondmussel	<i>Ligumia subrostrata</i>
Pistolgrip	<i>Tritogonia verrucosa</i>
Paper pondshell	<i>Utterbackia imbecillis</i>

Fisheries of Special Concern

Fisheries of special concern include areas containing exceptional recreational or commercial fisheries, specially designated streams or rivers, and waterbodies supporting rare or endangered aquatic species.

As described previously, the proposed Project would cross seven waterbodies that may contain threatened or endangered species or critical habitat; Little Creek (MP 7.1), Strong River (MP 18.0), Dabbs Creek (MP 12.4), Leaf River (MP 44.2), West Tallahala River (MP 45.3), Chickasawhay River (MP 89.3), and Bucatunna Creek (MP 100.5). Dabbs Creek, Leaf River, West Tallahala River, Chickasawhay River, Bucatunna Creek, and the Strong River are designated as critical habitat for the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), and the Strong River is critical habitat for the Ringed Map Turtle (*Graptemys oculifera*). The Chickasawhay, Leaf, and Strong Rivers could provide suitable habitat for the threatened yellow-blotched map turtle (*Graptemys flavimaculata*). Little Creek is designated as critical habitat for the Natchez stonefly (*Alloperla natchez*). Each of these species is discussed in more detail in Section 3.7.

3.6.2.2 General Impacts and Mitigation

Gulf South's proposed waterbody crossing methods are listed in Appendix D of this EIS. Depending on the construction method used, direct impacts to aquatic habitats and species would either be avoided (e.g., through HDD) or would occur in localized areas. Waterbody crossings would be accomplished using open-cut or HDD methods, as described in detail in Section 2.3. The use of the open-cut crossing method would result in several temporary effects to aquatic resources, including plankton, aquatic vegetation, amphibians, fish, and aquatic invertebrates including mussels. Impacts to water quality and associated aquatic habitats would include sedimentation, turbidity, altered water temperatures and dissolved oxygen levels, and introduction of contaminants, all of which can affect the ability of aquatic life to survive and reproduce. Impacts would also include the physical disturbance or destruction of in-stream habitat due to trenching and removal of riparian vegetation. Construction activities would also result in blockage of fish migrations, interruptions of spawning activities, as well as entrainment of fish or reduced stream flows during withdrawals for hydrostatic testing. These potential impacts are discussed below in more detail.

Pipeline construction using open-cut methods would result in sedimentation and turbidity in surface waters and aquatic habitats. Sedimentation and turbidity-related impacts were previously described in Section 3.3.2.2. Resulting disruptions of aquatic life-support processes could include physical disturbance, interruptions to fish passage, altered water temperatures and dissolved oxygen levels, and the introduction of contaminants. Benthic macroinvertebrates, which typically provide a key food source for fish, may be buried under accumulated sediments along with fish nesting sites containing eggs or larvae. 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 would only be transported over short distances. As described in Section 3.3.2.2, some of these impacts would be lessened or avoided by Gulf South's use of sediment and erosion controls during construction, hydrostatic test water discharge measures, the relative lack of riparian vegetation to be cleared along waterbody banks, and measures to revegetate riparian and wetland areas. Overall, the impact to aquatic species resulting from construction of the proposed Project would be minor, localized, and short-term, as most waterbody habitats would remain undisturbed. Additionally, 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.

Gulf South indicated that it would construct the proposed Project during the period of September 1 through December 31, 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). In order to ensure that the proposed Project does not significantly affect fisheries resources we recommend in Section 3.3 that Gulf South consult with the FWS, MDWFP, and ADCNR regarding the timing of construction in waterbodies and file approvals with the Commission. As described above and in accordance with Gulf South's Procedures, erosion and sediment control best management practices would be implemented at all waterbody crossings during construction to reduce impacts to affected waterbodies.

As described in Section 2.3, HDD is considered a preferred method for crossing sensitive habitats because stream bottom disruption and subsequent impacts to aquatic habitats along that portion of the pipeline route would be eliminated or minimized. HDD construction methods are discussed in Section 3.3.2.2. Gulf South has developed a HDD 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 these protective measures, we believe the risk to aquatic habitats and species from a frac-out would be low.

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 operations. Pollutants would affect fish and other aquatic life through acute or chronic toxicity, and sub-lethal effects would affect reproduction, growth, and recruitment. Additionally, pollutants can be introduced during discharge of hydrostatic test waters. However, Gulf South has stated that biocides and other potentially toxic hydrostatic test water additives would not be used during hydrostatic testing for the proposed Project. The disturbance and resuspension of contaminated soils and sediments would result in adverse impacts to water quality and in-stream habitat. However, there are no

known contaminated sediments along the proposed Project route, and adverse effects resulting from re-suspension of contaminants is therefore unlikely. Given these conditions and protective measures, the risk to water quality and aquatic species from contaminated soils and sediments is low.

Construction of the proposed Project would also affect fish by blocking migration pathways and interrupting spawning activities. Although construction disturbances would temporarily displace fish or hinder migrations in streams, we anticipate that these effects would be localized, temporary, and generally minor. We also anticipate that Gulf South's proposal to complete construction activities in fall and early winter would further limit or prevent impacts to most species of spawning fish.

Entrainment of fish and other aquatic organisms could occur during withdrawals of hydrostatic test water from the source waterbodies listed in Table 3.3.2.3-1. Gulf South would prevent or adequately limit impacts from hydrostatic testing by implementing measures in its Procedures. These measures include screening to limit entrainment of fish 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 during the proposed winter construction period.

3.6.2.3 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 ESA requires federal agencies 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 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 or proposed species or their designated critical habitat may occur in the proposed 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).

Based on consultation with the FWS and a review of existing records, we have identified 10 federally listed threatened or endangered species potentially occurring in the vicinity of the proposed Project (Table 3.7.1-1). A description of these species, their preferred habitats, and potential for occurrence, as well as our assessment of potential effects to them resulting from construction and operation of the proposed Project, is provided below.

**TABLE 3.7.1-1
Federally Listed Species Potentially Occurring Along the
Proposed Southeast Expansion Project**

Common Name/Scientific Name	Federal Status^a	Alabama Status^b	Mississippi Status^c	Louisiana Status^d	County/Parish (Portion of Potential Range Crossed by the Proposed Project)^e
Gopher tortoise ^g (<i>Gopherus polyphemus</i>)	T	T	E	T	Clarke, MS; Choctaw, AL
Eastern indigo snake ^h (<i>Drymarchon corais</i>)	T	T	E	--	Clarke, MS; Choctaw, AL
Yellow-blotched map turtle ^h (<i>Graptemys flavimaculata</i>)	T	--	E	--	Clarke, MS
Ringed map turtle ^h (<i>Graptemys oculifera</i>)	T	--	E	T	Simpson, MS
Louisiana black bear ^h (<i>Ursus americanus luteolus</i>)	T	--	E	T	Simpson, Smith, Jasper and Clarke, MS; Richland, LA
Gulf sturgeon ^h (<i>Acipenser oxyrinchus desotoi</i>)	T	T	E	T	Clarke and Simpson, MS; Choctaw, AL
Bald eagle ^{f, h} (<i>Haliaeetus leucocephalus</i>)	T	T	E	E	Statewide in Mississippi; Richland, LA; Choctaw, AL
Wood stork ^h (<i>Mycteria americana</i>)	E	E	E	--	Choctaw, AL
Red-cockaded woodpecker ⁱ (<i>Picooides borealis</i>)	E	--	E	E	Jasper and Smith, MS
Inflated heelsplitter mussel ⁱ (<i>Potamilus inflatus</i>)	T	T	E	T	Choctaw, AL

Notes:

a <http://www.fws.gov/endangered/>
b Letter dated August 17, 2006, from Penny Ragland (ADCNR)
c http://www.mdwfp.com/museum/downloads/animal_tracking.pdf
d <http://www.wlf.louisiana.gov/experience/threatened/threatenedandendangeredtable/>
E = Endangered
T = Threatened
e AL = Alabama
LA = Louisiana
MS = Mississippi
f Delisted effective August 8, 2007
g Determination of Effect – may affect
h Determination of Effect – not likely to adversely affect
i Determination of Effect – no effect

Based on our review of these species, we have determined that construction and operation of the proposed project would result in no effect to the red-cockaded woodpecker and the inflated heelsplitter; is not likely to adversely affect the Louisiana black bear, eastern indigo snake, yellow-blotched map turtle, ringed map turtle, Gulf sturgeon (including its critical habitat), bald eagle, and the wood stork; and may affect the gopher tortoise.

With the issuance of the DEIS on April 13, 2007, we requested that the FWS accept the DEIS as our BA and requested the initiation of formal consultation as required by Section 7 of the ESA. In a letter dated April 23, 2007 to the Commission, the FWS Jackson Field Office acknowledged the receipt of the DEIS and accepted our request for initiation of formal consultation. Based on its review of the proposed Project and the BA provided by Staff, the FWS issued a Biological Opinion (BO) on July 6, 2007. In its BO the FWS concurred with our determinations of "not likely to adversely affect" and

determined that the proposed Project is not likely to jeopardize the continued existence of the gopher tortoise, is not likely to adversely modify designated critical habitat and issued an incidental take statement. The FWS also identified several non-discretionary terms and conditions applicable to the gopher tortoise which must be adhered to in order to be exempt from prohibitions of section 9 of the ESA. Additionally, three discretionary conservation recommendations were made by the FWS to further protect the gopher tortoise and its habitat. These non-discretionary terms and conditions and conservation recommendations have been incorporated into the gopher tortoise species description below.

Since the issuance of the BO, Gulf South has modified its proposed route and identified new access roads and additional temporary workspaces. Gulf South has compiled additional information on species occurrence and habitat that has not been reviewed by the FWS; therefore, to ensure that these areas are properly reviewed for the presence or absence of federally listed species and their habitats, and that any mitigation or construction related to these areas is in accordance with applicable FWS requirements, **we recommend that:**

- **Gulf South should not begin construction activities on modified work areas 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.**

3.7.1.1 Gopher Tortoise

The gopher tortoise is a medium-sized turtle with a dark brown to grayish-black colored carapace ranging in size from 9 to 11 inches in length, 6 to 10 inches in width, and 8 to 10 pounds in weight. Typical gopher tortoise habitat consists of well-drained sandy soils that provide abundant herbaceous vegetation for food, and plentiful sunlit areas for nesting and foraging. Gopher tortoises excavate burrows in open landscapes such as roadsides, fence-rows, old fields, and the edges of overgrown uplands. The size of a gopher tortoise burrow varies depending on the size of the turtle; however, burrows are generally about 15 feet long and 6 feet deep with the entrance shaped in the form of a half moon. Gopher tortoises are territorial with well-defined home ranges that increase in size with age. Gopher tortoises also occur in colonies of two or more active burrows that are typically located within 600 feet of each other. Gopher tortoises mate between May and July, with nesting taking place from mid-April through mid-July (Nature Serve, 2006).

Using approved FWS survey guidelines and methodologies as described in Appendix K, 21 gopher tortoise burrows were identified within or adjacent to the proposed Project corridor.

Construction of the proposed Project, including clearing and trenching, would adversely affect gopher tortoises and gopher tortoise habitat found within the temporary construction right-of-way. Specifically, as described in Appendix K, Gulf South would relocate gopher tortoises found within the proposed temporary construction right-of-way. Gulf South's relocation efforts would result in stress to gopher tortoises and could lead to injury and/or mortality. Following the relocation of found gopher tortoises, Gulf South would construct the proposed pipeline which would result in the permanent removal of existing gopher tortoise burrows and would temporarily affect gopher tortoise habitat by removing vegetation and disturbing soils.

Operation of the proposed Project, including inspection and maintenance (i.e., mowing) activities that would require the use of light and heavy equipment, could adversely affect gopher tortoises. The general use of equipment could result in stress to gopher tortoises or modification of their habitat.

Conversely, construction and operation of the proposed Project could also beneficially affect gopher tortoises by creating and maintaining habitat that gopher tortoises find favorable.

In order to minimize potential adverse impacts to gopher tortoises during construction and operation of the proposed Project, Gulf South has developed a conservation strategy based on information provided by the FWS. Gulf South's conservation strategy is described in detail in Appendix K and includes measures to: educate construction personnel; survey for gopher tortoises prior to, during, and following construction; collect and relocate gopher tortoises; protect gopher tortoises adjacent to proposed construction areas; and monitor and report on these efforts.

Based on known gopher tortoise characteristics, habitat requirements, proposed construction and operation measures and procedures, and Gulf South's conservation strategy, we determined that the proposed Project may affect this species, and as required by Section 7 of the ESA we initiated formal consultation with the FWS regarding this species. As described above, the FWS determined in its BO that the proposed Project is not likely to jeopardize the continued existence of the gopher tortoise, is not likely to adversely modify designated critical habitat, and issued an incidental take statement. Additionally, the FWS also provided the following non-discretionary terms and conditions regarding tortoise relocation efforts:

- a. All tortoise burrows found within the construction ROW, regardless of activity status (active, inactive, or abandoned), will be scoped first, then excavated using the backhoe method described in the BA to definitively determine that the burrow is unoccupied.
- b. Tortoises that cannot be relocated into an unoccupied burrow will be penned for a minimum of two weeks, at which time pens will be removed.
- c. Once released into an unoccupied burrow, or after the two-week penning period, tortoises will be monitored using radio-telemetry. The location of each tortoise will be determined once each day during the first two weeks, once each week until September 1, and then once each month (including dormant season) for one year (September 1 of the following year).
- d. If a tortoise moves outside of its original colony range within the first two weeks after its release into an unoccupied burrow (or after the two-week penning period), that tortoise will be recaptured and temporary-penned for two weeks.
- e. Tortoises collected between **October 1 and October 15** will require these additional procedures:
 - i. Tortoises will be relocated into suitable inactive or abandoned burrows unoccupied by another tortoise and enclosed by a suitable pen for the duration of the dormant season, until April 1.
 - ii. Tortoises will be monitored late in the afternoon when the predicted nighttime low temperature will be below 60 degrees. Monitoring will be conducted for each of the first five nights when such low temperatures are predicted. Monitoring will identify any tortoise located aboveground outside the burrow. The air temperature at ground level will be recorded at the time any aboveground tortoise is observed. Also, the behavior of any aboveground tortoises will be recorded, noting whether animals are moving within the enclosure, digging at the enclosure walls, or whether they are stationary at the mouth of the burrow.

- iii. Monitoring will continue after sundown to determine if any aboveground tortoises observed during late afternoon have taken shelter in their burrow, or if they remain aboveground, or if they periodically emerge aboveground after sundown. If any tortoise is found aboveground, its behavior will be observed and recorded with the measured air temperature at ground level. If any tortoise is observed aboveground at or after sundown, the animal will be pushed into the burrow and the burrow will be staked to prevent the tortoise from emerging. Stakes will be removed the following morning by 10:00 AM. Monitors will observe special precautions to approach the burrows and enclosures quietly so as not to disturb tortoises or alter their behavior due to the monitors' presence.
- iv. Whenever a tortoise has been observed aboveground after sundown during such monitoring, the MS Field Office will be contacted the next day to report and evaluate the observed incident. One of three options will be implemented with concurrence of the MS Field Office.
 - 1. The first option will be a continuation of monitoring, as previously described.
 - 2. The second option will be to stake the entrance of the burrow closed with survey stakes during the late afternoon to prevent the tortoise from leaving the burrow at night, regardless of whether the animal is within the burrow when the opening is staked. Stakes will be removed during the day, from 10 AM to 4 PM, to allow for normal basking behavior. On any day following a night when the burrow was staked closed, the behavior of the tortoise will be monitored and the air ground temperature recorded. If the tortoise remains aboveground the following night when temperatures are below 60 degrees, the tortoise will be placed in the burrow and the opening staked closed again. The MS Field Office must be contacted the next day to determine which of these options to continue.
 - 3. The third option will be a continuation of monitoring, but if the tortoise is observed aboveground again, it will be hand-captured from within the enclosure and removed to temporary captivity in a climate controlled indoor facility. Tortoises must be transported in a suitable container (not a wire cage) within the vehicle to the facility. The Service must approve the facility and the procedures for captive care for the duration of the dormant season. After March 31, any captive tortoises will be transported and released at the site as described by the BA.
- f. Following the relocation of tortoises, a report documenting the capture and displacement of gopher tortoises will include the following information: (1) names and qualifications of the investigators; (2) survey dates; (3) area surveyed; (4) specific burrow locations, including UTM's or lat/longs; (5) burrow size, condition, and activity level; (6) the individual marking used to identify each relocated tortoise and their associated original and relocated burrow sites; (7) date of relocation; and (8) monitoring results. The survey report will be sent to the MS Field Office.
- g. The Service will be notified if construction is completed without the capture (trapping or excavation) and relocation of gopher tortoises from construction workspaces.

The FWS has also provided the following discretionary conservation recommendations to minimize or avoid adverse effects of the proposed action on listed species and critical habitats, and to help carry out recovery plans or to develop additional species information.

1. Avoid identifying gopher tortoise burrow locations to the public. Undue public attention to gopher tortoise colonies may increase the risk of human harassment, injury, and/or capture.
2. Develop a management plan for controlling cogongrass along the new ROW. The plan should include the following:
 - (a) Gulf South maintenance personnel will be trained to identify cogongrass
 - (b) Mowing equipment will be cleaned after mowing cogongrass infected areas
 - (c) Cogongrass areas will be treated using appropriate herbicide treatments
3. Conduct a gopher tortoise burrow inventory of all Gulf South ROWs within the range of the federally protected gopher tortoise. This inventory should be completed on a 3-5 year rotation, and the results should be sent to the FWS and the Mississippi Museum of Natural Science for inclusion into the state's tracking database.

In order to ensure that the gopher tortoise is protected and to ensure compliance with FWS terms and conditions, **we recommend that:**

- **Gulf South should file a revised Conservation Strategy for the Gopher Tortoise and Eastern Indigo Snake that incorporates all non-discretionary terms and conditions of the FWS's BO for this Project, as well as conservation recommendations 1 and 2.**

Gulf South proposes to monitor the pipeline ROW for three years following the initial relocations of gopher tortoises. Since Gulf South proposes post construction monitoring that we believe is sufficient to assess project-related impacts of gopher tortoise relocations, we are not recommending the discretionary conservation recommendation 3.

3.7.1.2 Eastern Indigo Snake

In the vicinity of the proposed Project, the eastern indigo snake is typically associated with inactive gopher tortoise burrows. The eastern indigo snake is generally believed to be extirpated from the proposed Project area. However, since gopher tortoise burrows have been identified within and near the proposed Project, Gulf South would, based on its consultations with the FWS and to minimize potential affects to this species, adhere to Eastern Indigo Snake Protection Measures. These measures are:

- If an eastern indigo snake is sighted during construction, the contractor would be required to cease all operation(s) that might cause harm to the snake.
- If the snake does not move away from the construction area, a state or federal biologist would be contacted to capture and relocate the snake to suitable habitat either adjacent to the Project area or off-site to an acceptable donor site.
- If an eastern indigo snake is killed or found dead within the construction area, the snake should be frozen and the FWS Jackson Field Office notified immediately.

Based on the believed scarcity of the eastern indigo snake and Gulf South's adherence to its identified protection measures, we have determined that construction and operation of the proposed Project is not likely to adversely affect this species.

3.7.1.3 Yellow-Blotched Map Turtle

The yellow-blotched map turtle is a medium sized turtle reaching a maximum of 7 inches long. It is only known to exist in the Pascagoula River and its tributaries in Mississippi. The areas along the pipeline route that would be expected to contain this species include the Leaf and Chickasawhay Rivers (MNHP, 2006).

The yellow-blotched map turtle's habitat requirements include strong currents and large sandbars. This turtle spends several hours each day basking on tree limbs, requiring abundant snags or downed trees in rivers wide enough for sunlight penetration. The species is threatened by the recreational use of nesting areas such as sand bars and beaches by humans, the colonization of nesting areas by non-native vegetation, water pollution, and a relatively low reproductive frequency (Nature Serve, 2006).

Gulf South proposes to cross the Leaf and Chickasawhay Rivers via HDD. In the event of a frac-out, Gulf South's HDD Plan would be implemented to minimize any impact to the species. Additionally, the drilling fluid that would be used by Gulf South would be non-toxic. Given the proposed crossing methods of these rivers and the HDD Plan, we determine that the proposed Project is not likely to adversely affect the yellow blotched map turtle.

3.7.1.4 Ringed Map Turtle

The ringed map turtle is a medium-sized turtle reaching a maximum of 8 inches in females, with a dark, olive green carapace and distinctive black spine-like projections along the middle ridge of the carapace. Within the Project area, the ringed map turtle is known to inhabit the Strong River in Simpson County, Mississippi (MNHP, 2006).

Typical ringed map turtle habitat consists of medium- to large-sized rivers with strong currents and large, open sandbars suitable for nesting. Like the yellow-blotched map turtle, the ringed map turtle spends much of its time basking and requires abundant snags or downed trees in rivers that are wide enough to allow for ample sunlight penetration (Nature Serve, 2006). Nesting typically occurs in June with the female laying a clutch of three to four eggs. In some cases, nesting may take place twice a year (Nature Serve, 2006). The species is threatened by the recreational use of nesting areas such as sand bars and beaches by humans, the colonization of nesting areas by non-native vegetation, and water pollution (Nature Serve, 2006).

Gulf South proposes to cross the Strong River via HDD. In the event of a frac-out, Gulf South's HDD Plan would be implemented to minimize any impact to the species. Additionally, the drilling fluid that would be used by Gulf South would be non-toxic. Given the proposed crossing method for the Strong River and the HDD Plan, we have determined that the proposed Project is not likely to adversely affect the ringed map turtle.

3.7.1.5 Louisiana Black Bear

The Louisiana black bear is closely related to other subspecies of black bear but has a longer, narrower skull and larger molars. The Louisiana black bear is primarily associated with forested wetlands; however, it may use a variety of habitat types, including marsh, spoil banks, and upland forests. Within forested wetlands, black bear habitat requirements include soft and hard mast for food, thick

vegetation for escape cover, vegetated corridors for dispersal, large trees for den sites, and isolated areas for refuge from human disturbance (FWS, 2006b).

The primary threats to this species are continued loss of bottomland hardwoods and fragmentation of remaining forested tracts. In addition to habitat loss, human-bear conflicts are a major threat to the conservation and protection of the Louisiana black bear. Losses of bears result from collisions with automobiles, intentional/illegal killing, and removal from the wild, which is often necessary when bears become habituated to humans (FWS, 2006b).

Louisiana black bears, particularly pregnant females, normally den from December through April. Preferred den sites include bald cypress and water-tupelo trees with visible cavities that have a dbh of 36 inches or greater in or along rivers, lakes, streams, bayous, sloughs, and other waterbodies. In areas where suitable den trees are uncommon, Louisiana black bears often den in shallow burrows or depressions within areas of dense cover. To further protect denning bears, the FWS has extended legal protection to actual or candidate den trees. As the terms imply, "actual den tree" refers to any tree used by a denning bear during the winter and early spring seasons, and "candidate" den trees are defined in the final rule as bald cypress and tupelo gum with visible cavities having a dbh of 36 inches or greater in or along rivers, lakes, streams, bayous, sloughs, or other waterbodies. Results of recent research involving Louisiana black bears indicate that they use virtually any species of tree for a den site, if it is large enough and has a cavity as described above (FWS, 2006b).

No Louisiana black bear were observed during the field surveys, and no candidate or actual denning trees were identified along the proposed Project route. Furthermore, Gulf South would implement any agency-recommended measures to mitigate potential impacts to Louisiana black bears should they be encountered during construction. Therefore, we have determined that the proposed Project is not likely to adversely affect the Louisiana black bear.

3.7.1.6 Gulf Sturgeon

The Gulf sturgeon is a large fish known to reach lengths in excess of 8 feet and weights over 200 pounds. Historically, this species occurred from the Mississippi River to the Suwannee River in Florida. In Mississippi, it was found in the Pearl, Bogue Chitto, and Pascagoula River drainages and could occur in any of the larger tributaries (MNHP, 2006).

The Gulf sturgeon is anadromous, spending much of its time in saltwater, but returning to freshwater to spawn. Mature adults enter freshwater in the spring to spawn and remain until autumn. They have not been recorded feeding while in freshwater and thus only grow in the marine environment. Spawning of Gulf sturgeon is not well documented, but the presence of larvae in April and May indicate a spring spawning cycle. Ultrasonically tagged females apparently choose stream areas with a rocky substrate in the immediate vicinity of springs for spawning.

Based on consultations with and recommendations from the FWS, the Chickasawhay, Leaf, and Strong Rivers are believed to potentially support the Gulf sturgeon. Furthermore, the proposed Project traverses the Chickasawhay River within the officially-designated Gulf sturgeon critical habitat. Gulf South has indicated that the Chickasawhay, Leaf, and Strong Rivers would be traversed using HDD technologies. In the event of a frac-out, Gulf South's HDD Plan would be implemented to minimize any impact to the species. Additionally, the drilling fluid that would be used by Gulf South would be non-toxic. Given the proposed crossing methods of the Chickasawhay, Leaf, and Strong Rivers, and the HDD Plan, we have determined that construction and operation of the proposed Project is not likely to adversely affect the Gulf sturgeon.

3.7.1.7 Bald Eagle

The bald eagle is listed as a federally threatened species. However, effective 8 August 2007, the bald eagle will no longer be federally listed as threatened in the lower 48 states. However, protection provided to the bald eagle under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA) will continue to remain in place after the species is delisted. The BGEPA and MBTA, known collectively as the Eagle Act prohibit disturbance of eagles, their nests, or their eggs.

The bald eagle is a large carnivorous bird whose range covers virtually all of North America. Bald eagles are large and distinctive birds, with wingspans of close to 7 feet and a body length of approximately 35 inches. Adult bald eagles have white heads and tails, yellow bills, feet, and legs, and dark brown bodies. Immature birds are brown and lack the white head and tail of the adults. Bald eagles are opportunistic foragers, and their diet varies based on prey species available. They prefer fish but would eat a great variety of mammals, amphibians, crustaceans, and birds, including many species of waterfowl. They frequently scavenge and are often seen with vultures feeding on carcasses.

Bald eagles are relatively uncommon nesters in the area traversed by the proposed Project. They generally construct extremely large nests of sticks in the tops of tall trees, often selecting the tallest tree in a given area as a preferred site. Typically, the nest trees selected are in a riparian area, along a major river or near a lake. The nests are very conspicuous and are often reused for years and in some cases for generations. The southern bald eagle is a winter nester, with most nesting and rearing in the Project vicinity occurring from October to May.

No individual bald eagles or bald eagle nests have been identified within the proposed Project area. Based on bald eagle habitat requirements, surveys conducted by Gulf South, the location of the proposed facilities, the absence of bald eagle sightings, the lack of suitable habitat, and our consultations with the FWS, we have determined that construction and operation of the proposed Project is not likely to adversely affect the bald eagle.

3.7.1.8 Wood Stork

The wood stork is a large, tall bird with a wingspan of up to 61 inches and a long, down-curved beak that averages 40 inches long. The wood stork has a very large range spanning from the southeastern U.S. to South America.

The wood stork is a non-migratory species that is chiefly found in areas containing freshwater marshes, swamps, lagoons, ponds, and flooded fields capable of supporting various fish species and other small animals commonly associated with aquatic habitats. The wood stork typically nests in the tops of large cypress, mangrove, or dead hardwood trees. Nesting is directly tied to abundant food sources, regardless of season (Nature Serve, 2006).

In Choctaw County, Alabama, it is believed that the wood stork occurs primarily in the eastern portion of the county and is unlikely to be found in the proposed Project area (Felder, 2006).

Based on wood stork habitat requirements, surveys conducted by Gulf South, the location of the proposed facilities, the absence of wood stork sightings, the lack of suitable habitat, and our consultations with the FWS, we have determined that construction and operation of the proposed Project is not likely to adversely affect the wood stork.

3.7.1.9 Red-Cockaded Woodpecker

The red-cockaded woodpecker (RCW) requires open pine woodlands and savannahs with large, old pines for "cluster" nesting and roosting habitat. RCWs are generally found in colonies that consist of a breeding pair and one or more helpers. The helpers are generally young from previous broods that assist the breeding adults in feeding the young and in defending the territory against encroachment by other woodpeckers.

Large, old pines are preferred by the RCW as cavity trees and must be in open stands with little or no hardwood midstory and few or no overstory hardwoods. As a general rule, the preferred trees are quite old, often in excess of 100 years old. They have significant crown volume and a dbh of 15 inches or greater, although smaller and younger trees are occasionally used. Due to their longevity and tendency to develop red heart rot as they age, RCWs prefer longleaf pines (*Pinus palustris*) as cavity trees. They also use short-leaf and slash pines (*Pinus elliotii*) with some frequency. Loblolly pines are used less often due to their relatively short lifespan.

RCWs also require abundant foraging habitat consisting of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and groundcover. Fire suppression (resulting in hardwood encroachment) and lack of cavity trees are the foremost factors limiting suitable nesting habitat. Forest fragmentation is another primary factor directly limiting potential breeding groups because of the resultant isolation of those groups, disrupted dispersal of their helpers, and failure to replace breeders; consequently, areas of contiguous habitat represent preferred foraging habitat.

Consultations with the FWS have indicated that RCW habitat within Jasper and Smith Counties, Mississippi, is limited to lands contained within national forests, and that no known suitable habitat exists within the proposed Project area (Felder, 2006). Observations made during Gulf South field surveys confirmed that forested habitats traversed by the proposed Project contain large percentages of hardwood species, or contain a dense understory layer, thus being unsuitable for RCW habitat.

No RCWs were observed during field surveys along the proposed Project route, and most habitat in the proposed Project area is characterized as unsuitable for nesting/roosting and foraging. The majority of the pine plantations that would be crossed by the proposed Project consists of young, dense pine or older stands of pine in fire-suppressed forests, both of which contain too much midstory vegetation to be considered suitable for RCWs. Based on the lack of suitable RCW habitat and our consultation with the FWS, we have determined that construction and operation of the proposed Project would not affect RCWs.

3.7.1.10 Inflated Heelsplitter

The inflated heelsplitter is a small oval mollusk that may reach up to 5.5 inches as an adult. The shell is brown to black, and the inside of the shell is pink to purple. The inflated heelsplitter is known to occupy soft, stable substrata with slow to moderate current. It occurs in sand, mud, silt, and sandy gravel.

The inflated heelsplitter is historically found in the Amite and Tangipahoa Rivers, Louisiana; the Pearl River, Mississippi; and the Tombigbee, Black Warrior, Alabama, and Coosa Rivers, Alabama. The current distribution in Alabama is limited to the Tombigbee and Black Warrior Rivers (Nature Serve, 2006).

Because the current range of the inflated heelsplitter is outside of the proposed Project area, we have determined that construction and operation of the proposed Project would result in no affect to this species.

3.7.2 Special Status 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, imperiled, or rare species, as well as other species of concern identified through consultation with MNHP, MDWF, LDWF, and ADCNR.

State-Listed and Rare Species

The MNHP, MDWFP, LDWF, and ADCNR have identified 46 species listed as either endangered or threatened that potentially occur within the proposed Project area. These species are listed in Table 3.7.2-1. No state-listed species were identified during field surveys conducted by Gulf South; however, suitable habitat for many of these species was observed within affected work areas. Of these 46 species, 10 (bald eagle, wood stork, Gulf sturgeon, inflated heelsplitter, Louisiana black bear, gopher tortoise, yellow blotched map turtle, eastern indigo snake, RCW, and ringed map turtle) are discussed above and are not discussed in this section. As discussed in Section 3.7.1, the ADCNR was not able to make a determination as to which threatened or endangered species may potentially occur within the proposed Project area; however, a list of threatened or endangered species for Choctaw County, Alabama was provided.

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 habitat along the right-of-way.

**TABLE 3.7.2-1
State Listed and Rare Species Potentially Occurring in the Proposed Southeast Expansion Project Area^a**

Species	Alabama Status/Rank ^b	Mississippi Status/Rank ^b	Louisiana Status/Rank ^b	Habitat
Amphibians				
Red salamander (<i>Pseudotriton ruber</i>)	--	S3	--	Cold, clear, rocky streams and springs in wooded or open areas. Adults occur in or near water in leaf litter and under rocks and in crevices and burrows near water. Adults sometimes disperse into woods. Eggs are attached to underside of rocks in water. Larvae occur in still pools.
Bay Springs salamander (<i>Plethodon ainsworthi</i>)	--	SH	--	Prefers hardwood forests with fallen logs or debris. May occur in springhead litter.
Birds				
Bachman's sparrow (<i>Aimophila aestivalis</i>)	S3	--	S3	Habitats include dry, open pine (southern states) or oak woods (e.g., western portion of range) with an undercover of grasses and shrubs, hillsides with patchy brushy areas, overgrown fields with thickets and brambles, grassy orchards, and large clear-cuts (usually at least 20 hectares). In the southeastern U.S., Coastal Plain breeding habitat usually is open pine woods with thick cover of grasses or saw palmetto.
Bewick's wren (<i>Thryomanes bewickii</i>)	SH	S2/E	--	Brushy areas, thickets and scrub in open country, open and riparian woodland, and chaparral. More commonly in arid regions but locally also in humid areas (subtropical and temperate zones), including country towns and farms.
Black-crowned night-heron (<i>Nycticorax nycticorax</i>)	--	S3?	--	Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; saltwater, brackish, and freshwater situations. Roosts by day in mangroves or swampy woodlands.
Cerulean warbler (<i>Dendroica cerulean</i>)	S1	--	S1	Habitat is frequently described as mature deciduous forest, particularly in floodplains or other mesic conditions.
Henslow's sparrow (<i>Ammodramus henslowii</i>)	S2	--	--	Open fields and meadows with grass interspersed with weeds or shrubby vegetation, especially in damp or low-lying areas, adjacent to salt marsh in some areas. Uses unmowed hayfields (abandoned if cut). Found in a variety of habitats that contain tall, dense grass and herbaceous vegetation.
White ibis (<i>Eudocimus albus</i>)	S3	S3	--	Various saltwater and freshwater habitats: marshes, mangroves, lagoons, lakes, marsh prairie, pasture, coastal swamps.
Fish				
Alabama shad (<i>Alosa alabamae</i>)	S2	S1	--	Anadromous; adults live in saltwater and migrate into medium to large coastal rivers to spawn.
Crystal darter (<i>Crystallaria asprella</i>)	S3	S1/E	S2S3	Small to medium rivers with expanses of clean sand and gravel. Usually in water more than 60 centimeters (cm) deep with strong current.
Frecklebelly madtom (<i>Noturus munitus</i>)	S2	S2/E	--	Chiefly in rocky riffles, rapids, and runs of medium to large rivers. This small fish's movements are impeded by dams and impoundments.
Pearl darter (<i>Percina aurora</i>)	--	S1/E	--	Pearl darters have been collected from gravel riffles and rock outcrops; deep runs over gravel and sand pools below shallow riffles; swift (90 cm/second), shallow water over firm gravel and cobble in mid-river channels; and swift water near brush piles.
Invertebrates				
Natchez stonefly (<i>Alloperla natchez</i>)	--	S2	--	Members of this genus and family are found in cold lotic habitats and are very sensitive to eutrophication.
Prairie mole cricket (<i>Gryllotalpa major</i>)	--	SH	--	Inhabitant of prairie soil ranging from mesic to dry-mesic; southern tallgrass prairie of the United States. Not found in pastures. Some individuals are found in mixed grass prairie, although these sites may not be optimal habitat as much as habitat that is both acceptable and available.

**TABLE 3.7.2-1
State Listed and Rare Species Potentially Occurring in the Proposed Southeast Expansion Project Area^a**

Species	Alabama Status/Rank^b	Mississippi Status/Rank^b	Louisiana Status/Rank^b	Habitat
Mussels				
Alabama hickorynut (<i>Obovaria unicolor</i>)	S1	S3	--	Sand/gravel substrates in moderately flowing water.
Black sandshell (<i>Ligumia recta</i>)	S1	S2	S1	Occur chiefly in flow refuges, or relatively stable areas that displayed little movement of particles during flood events.
Spike (<i>Elliptio dilatata</i>)	--	S1/E	S2S3	Large rivers or creeks, medium rivers, and springs/spring brooks.
Delicate spike (<i>Elliptio arctata</i>)	S2	S1/E	--	Large rivers and creeks of low gradient. Medium rivers with moderate gradient and riffle.
Mississippi pigtoe (<i>Pleurobema beadleianum</i>)	--	S3?	--	Freshwater.
Pyramid pigtoe (<i>Pleurobema rubrum</i>)	--	S1/E	S2	Inhabits large rivers but may occur in medium-sized lotic environments. It tends to occupy riffles or shoals in relatively shallow water and coarse-particle substrates, along sand bars, or in deep water (>4 meters) with mud and sand bottoms.
Ebonysnail (<i>Fusconaia ebena</i>)	--	--	S3	Freshwater.
Snails				
Silty hornsnail (<i>Pleurocera canaliculata</i>)	--	--	S2	Freshwater.
Mammals				
Oldfield mouse (<i>Peromyscus polionotus</i>)	--	S2	--	Favors dry, sandy fields and beaches with grass/shrub cover.
Plants				
American Bladdernut (<i>Staphylea trifolia</i>)	--	S3	--	Grows in average, dry to medium wet, well-drained soils in part shade to full shade. Tolerates wide variety of soils. Prefers moist soils.
Black-stem spleenwort (<i>Asplenium resiliens</i>)	--	S1	--	In semi-shade or full sun in well-drained calcareous substrates; often in cedar glades or on limestone cliffs.
Canada wild-ginger (<i>Asarum canadense</i>)	--	S2S3	--	Found in upland rich woods, typically higher pH soils and associated with calcareous rock outcrops or rich soils; it is also found in high nutrient-rich coves in mountains. This species is occasionally found in regenerating deciduous woodlands.
Common hoptree (<i>Ptelea trifoliata</i>)	--	S3S4	--	Prefers well-drained soil, full sun or shade, and moist soil.
Crested coral-root (<i>Hexalectris spicata</i>)	--	S2	--	Calcareous sandy or organic soils in oak, hickory, or conifer woods.
Crested fringed orchid (<i>Platanthera cristata</i>)	--	S3	--	Terrestrial in moist, open, acidic bogs, prairies, pine woods, and roadsides.
Needle palm (<i>Rhapidophyllum hystrix</i>)	--	S3	--	Prefers fairly moist, well-drained soils with abundant organic matter but is very adaptable to less than ideal conditions.
Smoother sweet-cicely (<i>Osmorhiza longistylis</i>)	--	S3	--	Rich, often alluvial woods and thickets. Woods often along the sides of streams.
Purple coneflower (<i>Echinacea purpurea</i>)	--	S3, S4	S2	Medium wet, well-drained soil in full sun.
Yellow water-crowfoot (<i>Ranunculus flabellaris</i>)	--	--	S1	Occurs mainly in wetlands.
Yellowleaf tinker's-weed (<i>Triosteum angustifolium</i>)	--	--	S2	Open prairies and near the edge of forests.
Reptiles				
American alligator (<i>Alligator mississippiensis</i>)	--	S4	--	Fresh and brackish marshes, ponds, lakes, rivers, swamps, bayous, large spring runs.

**TABLE 3.7.2-1
State Listed and Rare Species Potentially Occurring in the Proposed Southeast Expansion Project Area^a**

Species	Alabama Status/Rank ^b	Mississippi Status/Rank ^b	Louisiana Status/Rank ^b	Habitat
Southern hognose snake (<i>Heterodon simus</i>)	SH	SH/E	--	Inhabits open, xeric habitats with well-drained, sandy or sandy-loam soils such as sand ridges, stabilized coastal sand dunes, pine flatwoods, mixed oak-pine woodlands and forests, scrub oak woods, and oak hammocks; also old fields and river floodplains. This snake spends considerable time burrowed in the soil.

a In Alabama, Mississippi, and Louisiana, the respective Natural Heritage Commissions have ranked species according to their imperiled status.
b Rank S1 – Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).
Rank S2 – Imperiled in the state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.
Rank S3 – Rare or uncommon in the state (21 to 100 known populations).
Rank S4 – Apparently secure in the state (101 to 1,000 known populations).
Rank SH – Historical occurrence; possibly extinct.
Rank E – A species that is in danger of extinction throughout all or a significant portion of its range.
"?" indicates status uncertain.
Source: LDWF, 2006; MDWFP, 2006; MNHP, 2002; ADCNR, 2006; Nature Serve, 2006

Gulf South has indicated that it would continue to consult with the LDWF, MDWFP, and the ADCNR to determine whether additional field surveys are warranted for any of the species listed in Table 3.7.2-1 and, if required, develop mitigation measures to avoid or minimize potential impacts to those species. Because those consultations have not yet been completed, **we recommend that:**

- **Gulf South should continue to consult with the LDWF, the MDWFP, and the ADCNR to determine the need for surveys or mitigation that would substantially minimize or avoid potential impacts to state-listed species. Gulf South should file copies of the results of these consultations, as well as any associated survey reports and mitigation plans, with the Secretary prior to construction.**

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 to specially designated areas, transportation corridors, visually sensitive areas, and hazardous waste sites.

There are 10 land use types crossed by the proposed pipeline and affected by the proposed aboveground facility sites: agricultural, pine plantation, upland forest, pasture, open land, open water, residential land, industrial/commercial land, wetlands, and other roads. Table 3.8.1-1 identifies the amount of acreage by land use type that would be affected by construction and operation of the proposed Project.

Construction of the proposed Project would affect approximately 1,726.5 acres (Table 3.8.1-1). Approximately 1,240.3 acres (72 percent) of that acreage would be contained within the pipeline construction right-of-way. Construction of aboveground facilities would affect approximately 146.2 acres (8 percent), and the remaining 340.0 acres (20 percent) would be affected by the use of ATWSs, access roads, pipe storage, and contractor yards. Approximately 646.6 acres (37 percent) of the

land that would be affected during construction is currently characterized as upland forest, 578.8 acres (34 percent) would be pine plantation, and 175.0 acres (10 percent) would be open land. The remaining cover types reported in Table 3.8.1-1 collectively represent less than 20 percent of the proposed construction acreage. Following construction, lands temporarily used for construction (pipe storage and contractor yards, access roads, and ATWSs) would be able to revert to their original use type.

As described in Section 2.0, the proposed Project would be collocated with existing pipeline rights-of-way for approximately 72.7 miles (approximately 66 percent) of its length. Gulf South proposes to parallel existing pipeline or utility corridors to the extent practical. This collocation would be adjacent to and abut a Denbury Resources (Denbury) pipeline for 0.2 mile (MP 30.3 to MP 30.5), a Crosstex Mississippi (Crosstex) pipeline for approximately 39.4 miles (MP 38.3 to MP 77.7), and a Transco pipeline for approximately 33.1 miles (MP 77.7 to MP 110.8). For the portion of the project paralleling existing foreign pipelines, Gulf South's new permanent right-of-way would be 60 feet wide, abutting the adjacent existing right-of-way. The additional 60 feet (40 feet in wetlands) of temporary construction right-of-way would be located on the opposite side of the new permanent right-of-way from the existing utility corridor.

During operation of the proposed Project, the permanent pipeline right-of-way, aboveground facilities and permanent access roads would affect approximately 857.6 acres. About 39 percent of the land that would be affected during operation is currently classified as upland forest, 33 percent is pine plantation, and 11 percent is open land. The remaining land use types collectively represent less than 20 percent of the acreage required during operation.

Pipeline Facilities

Approximately 1,240.3 acres of land would be impacted by construction of the proposed pipeline. Approximately 77 percent of this acreage would consist of pine plantation and upland forest. Open land, wetlands, pasture, industrial/commercial, residential, other/roads, agricultural, and open water accounts for the additional 23 percent of this acreage.

Operation of the proposed pipeline would permanently affect approximately 731.4 acres of land. Similar to the construction right-of-way requirements, approximately 78 percent of the land that would be affected during operation is currently classified as upland forest and pine plantation, while open land, wetlands, industrial/commercial, residential, agricultural, and open water make up the remaining 22 percent.

Aboveground Facilities

In addition to lands affected by construction of the proposed pipeline, construction of the proposed aboveground facilities would affect approximately 146.2 acres of land while operation would affect approximately 119.2 acres. Table 3.8.1-1 provides data regarding the land cover types that would be affected by construction and operation of the proposed aboveground facilities. Of the 119.2 acres required for operation of the aboveground facilities, approximately 29 percent would be upland forest, while 58 percent would be agricultural land and 10 percent would be pine plantation. Construction and operation of the proposed aboveground facilities would result in a conversion of those lands to a commercial/industrial cover type for the life of the proposed Project.

**TABLE 3.8.1-1
Acres Potentially Impacted by the Proposed Southeast Expansion Project**

		Affected Land Use/Land Cover (acres) ^a							
County/Parish		Agricultural Const	Agricultural Oper	Pine Plantation Const	Pine Plantation Oper	Upland Forest Const	Upland Forest Oper	Pasture Const	Pasture Oper
Pipeline Facilities^b									
	Simpson, MS	1.0	0.6	87.1	52.3	165.3	100.5	14.5	8.6
	Smith, MS	3.9	2.4	80.0	48.3	94.6	59.0	11.3	7.0
	Jasper, MS	0.8	0.5	66.2	40.2	142.8	88.7	19.5	11.6
	Clarke, MS	2.8	2.2	178.0	105.6	90.2	53.0	6.2	3.8
	Choctaw, AL	0.0	0.0	47.8	25.3	0.0	0.0	0.0	0.0
	Pipeline Facilities Subtotal	8.5	5.7	459.1	271.7	492.9	301.2	51.5	31.0
Aboveground Facilities^c									
	Delhi Compressor Station	Richland, LA	69.5	69.5	0.0	0.0	0.0	0.0	0.0
	Harrisville Compressor Station	Simpson, MS	0.0	0.0	0.0	0.0	15.3	15.3	0.0
	Destin Compressor Station	Clarke, MS	0.0	0.0	17.2	11.7	17.2	11.6	0.0
	CenterPoint Energy M/R Station	Richland, LA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Southern Natural M/R Station	Smith, MS	0.0	0.0	0.0	0.0	3.5	0.9	0.0
	Tennessee Gas M/R Station	Jasper, MS	0.0	0.0	0.0	0.0	3.2	0.8	0.0
	Destin M/R Station	Clarke, MS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Transco M/R Station	Choctaw, AL	0.0	0.0	0.0	0.0	11.9	6.0	0.0
	Valves and Other Facilities	Various	0.0	0.0	1.0	0.0	3.3	0.3	0.0
	Aboveground Facilities Subtotal		69.5	69.5	18.2	11.7	54.4	34.9	0.0
Extra Work Areas^b									
	Pipe Storage and Contractor Yards	Various	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Access Roads ^d	Various	0.0	0.0	0.0	0.0	0.4	0.0	0.0
	ATWSs	Various	1.9	0.0	101.5	0.0	98.9	0.0	4.8
	Extra Work Areas Subtotal		1.9	0.0	101.5	0.0	99.3	0.0	4.8
	Total		79.9	75.2	578.8	283.4	646.6	336.1	56.3

Notes:

Const = Construction Impacts

Oper = Operation Impacts. Permanent impacts are based on Gulf South's proposed 60-foot wide permanent right-of-way; however, we are recommending that Gulf South's permanent right-of-way be limited to a width of 50 feet.

a Agricultural Land – Active cropland, pasture, and/or hayfields

Residential Land – Yards, subdivisions, mobile home parks, and planned developments

Commercial/Industrial Land – Power or utility stations, manufacturing or industrial plants, commercial or retail facilities, and roads

b Construction acreage requirements for pipeline facilities includes ATWSs. Table G-1 of Appendix G provides a complete, itemized list of extra work areas and associated impacts.

c Minor land requirements associated with mainline valves would be contained within the compressor station sites and the construction and permanent pipeline rights-of-way and are thus already included in the acreage estimates for those facilities.

d Existing access roads that would be upgraded or otherwise modified in association with construction of the proposed Project traverse a variety of land uses and cover types. Land requirements of new and improved access roads based on a typical construction width of 40 feet. Table G-2 of Appendix G provides a complete, itemized list of construction access roads.

TABLE 3.8.1-1 (continued)
Acres Potentially Impacted by the Proposed Southeast Expansion Project

		Affected Land Use/Land Cover (acres) ^a							
		Open Land		Open Water		Residential		Industrial/ Commercial	
County/Parish		Const	Oper	Const	Oper	Const	Oper	Const	Oper
Pipeline Facilities^b									
	Simpson, MS	38.7	23.3	0.0	0.0	2.5	1.3	2.1	1.8
	Smith, MS	24.4	14.9	0.0	0.0	0.3	0.1	1.0	0.8
	Jasper, MS	36.9	22.3	0.0	0.0	0.9	0.5	3.5	2.5
	Clarke, MS	24.1	18.0	0.0	0.0	1.6	1.0	1.1	1.0
	Choctaw, AL	22.3	16.9	0.0	0.0	0.0	0.0	0.0	0.0
	Pipeline Facilities Subtotal	146.4	95.4	0.0	0.0	5.3	2.9	7.7	6.1
Aboveground Facilities^c									
	Delhi Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Harrisville Compressor Station	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
	Destin Compressor Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CenterPoint Energy M/R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Southern Natural M/R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tennessee Gas M/R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Destin M/R Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Transco M/R Station	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
	Valves and Other Facilities	1.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0
	Aboveground Facilities Subtotal	3.9	3.2	0.0	0.0	0.0	0.0	0.3	0.0
Extra Work Areas^b									
	Pipe Storage and Contractor Yards	0.0	0.0	0.0	0.0	0.0	0.0	41.0	0.0
	Access Roads ^d	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ATWSs	23.9	0.0	0.0	0.0	1.6	0.0	1.3	0.0
	Extra Work Areas Subtotal	24.7	0.0	0.0	0.0	1.6	0.0	42.3	0.0
	Total	175.0	98.6	0.0	0.0	6.9	2.9	50.3	6.1

Notes:
Const = Construction Impacts
Oper = Operation Impacts. Permanent impacts are based on Gulf South's proposed 60-foot wide permanent right-of-way; however, we are recommending that Gulf South's permanent right-of-way be limited to a width of 50 feet.
a Open Land – Non-forested lands, maintained utility rights-of-way, and shrub-scrub wetland
Forest – Tracts of upland or wetland forest
Pine Plantation – Planted/harvested pine plantation forest
b Construction acreage requirements for pipeline facilities includes temporary ATWSs. Appendix G provides a complete, itemized list of extra work areas and associated impacts.
c Minor land requirements associated with mainline valves would be contained within the compressor station sites and the construction and permanent pipeline rights-of-way and are thus already included in the acreage estimates for those facilities.
d Existing access roads that would be upgraded or otherwise modified in association with construction of the proposed Project traverse a variety of land uses and cover types. Land requirements of new and improved access roads based on a typical construction width of 40 feet. Appendix G provides a complete, itemized list of construction access roads.

**TABLE 3.8.1-1 (continued)
Acres Potentially Impacted by the Proposed Southeast Expansion Project**

		Affected Land Use/Land Cover (acres) ^a					
		Wetlands		Other/Roads		Total	
County/Parish		Const	Oper ^e	Const	Oper	Const	Oper
Pipeline Facilities^b							
	Simpson, MS	19.0	4.6	0.0	0.0	330.2	193.0
	Smith, MS	11.9	4.5	0.0	0.0	227.4	137.0
	Jasper, MS	19.3	4.9	0.0	0.0	289.9	171.2
	Clarke, MS	15.7	2.9	0.0	0.0	319.7	187.5
	Choctaw, AL	3.0	0.5	0.0	0.0	73.1	42.7
	Pipeline Facilities Subtotal	68.9	17.4	0.0	0.0	1240.3	731.4
Aboveground Facilities^c							
	Delhi Compressor Station	0.0	0.0	0.0	0.0	69.5	69.5
	Harrisville Compressor Station	0.0	0.0	0.0	0.0	16.2	16.2
	Destin Compressor Station	0.0	0.0	0.0	0.0	34.4	23.3
	CenterPoint Energy M/R Station	0.0	0.0	0.0	0.0	0.0	0.0
	Southern Natural M/R Station	0.0	0.0	0.0	0.0	3.5	0.9
	Tennessee Gas M/R Station	0.0	0.0	0.0	0.0	3.2	0.8
	Destin M/R Station	0.0	0.0	0.0	0.0	0.0	0.0
	Transco M/R Station	0.0	0.0	0.0	0.0	13.9	8.0
	Valves and Other Facilities	0.0	0.0	0.0	0.0	5.5	0.5
	Aboveground Facilities Subtotal	0.0	0.0	0.0	0.0	146.2	119.2
Extra Work Areas^b							
	Pipe Storage and Contractor Yards	0.0	0.0	0.0	0.0	41.0	0.0
	Access Roads ^d	0.0	0.0	57.1	7.0	58.3	7.0
	ATWSs	6.8	0.0	0.0	0.0	240.7	0.0
	Extra Work Areas Subtotal	6.8	0.0	57.1	7.0	340.0	7.0
	Total	75.7	17.4	57.1	7.0	1726.5	857.6

Notes:

Const = Construction Impacts

Oper = Operation Impacts. Permanent impacts are based on Gulf South's proposed 60-foot wide permanent right-of-way; however, we are recommending that Gulf South's permanent right-of-way be limited to a width of 50 feet.

a Open Land – Non-forested lands, maintained utility rights-of-way, and shrub-scrub wetland

Forest – Tracts of upland or wetland forest

Pine Plantation – Planted/harvested pine plantation forest

b Construction acreage requirements for pipeline facilities includes temporary ATWSs. Appendix G provides a complete, itemized list of extra work areas and associated impacts.

c Minor land requirements associated with mainline valves would be contained within the compressor station sites and the construction and permanent pipeline rights-of-way and are thus already included in the acreage estimates for those facilities.

d Existing access roads that would be upgraded or otherwise modified in association with construction of the proposed Project traverse a variety of land uses and cover types. Land requirements of new and improved access roads based on a typical construction width of 40 feet. Appendix G provides a complete, itemized list of construction access roads.

e Operational wetland impacts only include impacts to PFO wetlands, as PEM and PSS wetlands would be allowed to return to pre-construction conditions.

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. Where feasible, Gulf South would use existing public roadways, existing private roadways and the pipeline right-of-way itself to gain access during construction and operation of the proposed Project. Gulf South indicates that only three newly constructed or upgraded access roads would be permanently maintained during operations. The remaining access roads would be allowed to revert to their preconstruction uses. Gulf South has indicated that construction of the proposed pipeline would require the use of 138 access roads of varying lengths and construction. Of the 138 access roads, 91 would be unmodified existing roads, and 47 (comprising approximately 34.8 miles of road) would be new or upgraded roads, of which 44 roads would be for temporary use, while three roads would be for permanent use (see Appendix G). Gulf South would upgrade access roads by placing gravel for stability, grading, replacing or installing culverts, clearing overhead vegetation, or by making minor widenings at sharp turns to facilitate passage by pipe trucks.

Pipe Storage and Contractor Yards

Gulf South proposes to use three pipe storage and contractor yards during construction, temporarily affecting approximately 41.0 acres of land (Table 3.8.1-1). Each of the identified pipe storage and contractor yards would consist of warehouses or open lots located in previously disturbed areas.

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.
- 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 extra work areas. 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

The general impacts to land use associated with construction of the proposed Project would be a function of the construction methods employed, the restoration actions implemented once construction has been completed, the nature of the land cover type affected before construction, and the allowable use of the land following construction. Section 2.3 provides a detailed discussion of the proposed construction methods and post-construction restoration actions for the proposed Project.

Construction

Following construction, areas outside the permanent pipeline right-of-way and other temporary work areas would be graded, seeded, or otherwise restored and would be allowed to revert to existing conditions, except where individual landowner agreements negotiated during the easement acquisition process dictate other acceptable restoration measures. As a result, land use impacts to these areas would be temporary. Because non-woody vegetation would be expected to return to pre-construction conditions within two growing seasons, impacts to lands currently classified as agricultural, pasture, open land, residential, or industrial/commercial and located outside the permanent pipeline right-of-way would be short-term and minor.

Trees cleared within the temporary construction rights-of-way would be allowed to revert to pre-construction conditions and in some cases may be replanted. This process 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 PFO, forest, and pine plantation lands that are located outside the permanent right-of-way would be long-term. Additional discussion of general impacts and mitigation measures that would be implemented to minimize impacts to forested areas is provided in Sections 3.4 and 3.5.

Operation

Permanent land use changes would occur to those lands contained within the permanent pipeline right-of-way where reversion to the pre-construction cover type would not be compatible with operation of the proposed Project facilities. Activities typically not allowed in the permanent pipeline right-of-way would include aboveground construction, below ground construction, and the growth, planting, or cultivation of trees. Upland forest and pine plantation land covers and uses therefore would be precluded from the permanent pipeline right-of-way. Allowable land uses generally permitted within the permanent right-of-way would include use of farming equipment, cultivation of row crops, and utilization as pastureland. Permanent changes also would 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 cover type for the life of the Project. Gulf South indicates that only three newly constructed or upgraded access roads associated with the aboveground facilities described above would be permanently maintained during operations.

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 proposed 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.

Agriculture, Timber, and Pasture Lands

Construction could affect the productivity of agricultural, timber (upland forest and pine plantation), 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 has proposed to accomplish pipeline construction between September and December 2007, which encompasses typical growing seasons. Thus, Project-related crop losses could 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 plans, Gulf South would implement construction procedures in agricultural areas to minimize potential impacts and restore the right-of-way to approximate pre-construction conditions (see Sections 2.3 and 3.2). Gulf South's plans require them 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 special construction and monitoring procedures through agricultural lands, including pasture, to minimize adverse effects and ensure proper restoration. However, construction through pasture 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 in Section 3.8.1, impacts to pine plantation and upland forests would range from long-term in areas outside the permanent right-of-way to permanent for areas within the permanent right-of-way. As such, timber production within the construction and permanent rights-of-way would be temporarily reduced or permanently precluded, respectively. As described in Section 3.8.2, Gulf South would negotiate with affected landowners to obtain an easement agreement that would effectively eliminate timber production within the permanent pipeline right-of-way. However, after Gulf South has completed restoration of the right-of-way, timber harvesting equipment would be able to move freely across the pipeline to access adjacent forested areas with no expected effect on pipeline safety or operations. Compensation for any losses or limitations on future timber production values within the construction and permanent pipeline rights-of-way would be addressed during easement negotiations. Prescribed burns are often used in the vicinity of the proposed Project to manage planted pines, and pipeline rights-of-way may in some cases serve as fire breaks. Gulf South has committed to coordinating with landowners to mitigate any potential impact to prescribed burning activity caused by the proposed Project.

Appropriate landowner settlements, special construction measures, restoration, and post-construction monitoring would ensure that landowners are able to resume pre-Project activities in construction easements or that such impacts would be mitigated. Furthermore, 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. Table 3.8.3.1-1 identifies the residences within 50 feet of the construction work area. The pipeline route has otherwise been adjusted so that no displacements of residences would occur. Only three residences are located within 25 feet of the construction workspace, one of which may be abandoned. Approximately 6.9 acres of land classified as residential would be contained within the construction right-of-way or ATWSs, and 2.9 of those acres would be retained for the permanent right-of-way. During the planning stages for the proposed Project, Gulf South consulted with county and parish planning agencies and reviewed development plans to identify currently filed proposals for residential or commercial developments within 0.25 mile of the proposed construction right-of-way or associated aboveground facilities. From MP 10.6 to MP 11.2, the Braxton Estates development, owned by Equity Development Group, Inc., is located adjacent to the north side of Gulf South's proposed construction right-of-way.

**TABLE 3.8.3.1-1
Residences Within 50 Feet of Construction Work Area and Proposed Mitigation**

MP ¹	County, State ²	Number of Residences	Distance from Construction Work Area (feet)	Distance from Pipeline Centerline	Direction from the Right-of-Way	Proposed Mitigation
3.6	Simpson County, MS	1	27	116	South	None
11.1	Simpson County, MS	1	15	55	North	Yes*
11.6	Simpson County, MS	1	27	130	South	None
14.1	Simpson County, MS	1	27	145	South	None
14.9	Simpson County, MS	1	27	112	South	None
30.3	Simpson County, MS	1	47	173	South	None
36.4	Smith County, MS	1	36	116	South	None
41.7	Smith County, MS	1	29	85	South	None
52.9	Jasper County, MS	1	34	89	South	None
53.0	Jasper County, MS	1	37	187	South	None
94.8**	Clarke County, MS	1	40	165	South	None
98.9	Clarke County, MS	1	11	52	South	Yes***
99.1****	Clarke County, MS	1	11	85	South	Yes***

Mitigation Notes:

- * Immediately restore all lawn areas after backfilling the trench, fence the construction work throughout the open trench phase of construction, and use water trucks to minimize fugitive dust.
- ** This residence would not be impacted by Gulf South's proposed HDD of State Hwy. 511.
- *** Reduce the construction work area to maintain 25 feet between the residence and the construction work area.
- **** Residence appears to be abandoned. Gulf South would continue evaluation/monitoring of this property.
- 1 MP = Milepost
- 2 MS = Mississippi

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 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.
- Restore all areas disturbed by construction work areas to "as before or better" conditions.

Additionally, for all residence located within 50 feet of the construction work area Gulf South would:

- Leave mature trees and landscaping up to the edge of the construction work area, unless necessary for safe operation of the construction equipment.
- Restore all lawn areas and landscaping within the construction work area consistent with the requirements of its plans immediately after backfilling the trench.
- Fence the edge of the construction work area adjacent to the residence for a distance of 100 feet on either side of the residence.
- Try to maintain a minimum distance of 25 feet between the residence and the edge of the construction work area.

Gulf South prepared site-specific residential construction plans, detailing the location of the proposed pipeline alignment, construction limits, and residential access for the three residences that would be located within 25 feet of the construction right-of-way.

In the Draft EIS, we recommended that Gulf South provide an assessment of how the proposed Project's construction would affect or be affected by the Braxton Estates development between

MPs 10.6 and 11.2. Gulf South has met with Equity Development Group, Inc., and has executed an easement agreement with the developer. As a result, Gulf South would install the pipeline farther away from Braxton Estates adjacent to the existing railroad right-of-way, along the southern boundary of the tract, to minimize impacts to potential future development. Currently, there is only one residence in the proximity of the construction corridor (15 feet outside of the workspace boundary). Gulf South has prepared a site-specific residential detail drawing for this residence that details the construction mitigation measures, which we have reviewed and find acceptable. Gulf South states that it has no indication from the developer that additional construction is planned prior to construction of the proposed pipeline. If additional residences are constructed within 25 feet of the construction corridor prior to or during the installation of the pipeline, Gulf South would provide a similar site-specific construction mitigation plan for review and approval by the Director of OEP.

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 must also 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 Certificate, if granted, including those residential mitigation measures identified above. Additionally, the FERC staff is 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 proposed 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 list several route variations that Gulf South incorporated into the proposed Project route during the Pre-filing phase in response to specific landowner requests. Additional minor reroutes to the proposed Project's pipeline alignment could be made during the easement negotiation process 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 Delhi Compressor Station is approximately 3,000 feet east of the Delhi Municipal Airport in Richland Parish, Louisiana. The airport has plans for a 2,000-foot runway expansion in the future. As described in the Final EIS that was issued for Gulf South's East Texas to Mississippi Expansion Project (CP06-446-000), the pipeline proposed in that project would be located about 1,070 feet north of the Delhi Municipal Airport runway at MP 148.2 in Richland Parish, Louisiana. In that proceeding we found out that the airport has plans for a 2,000-foot runway expansion in the future. Gulf South indicated that it was consulting with the Federal Aviation Administration (FAA), the airport, and the City of Delhi to determine whether the project would interfere with aircraft operations. **We recommend that:**

- **Prior to construction, Gulf South should consult with the Delhi Municipal Airport officials and the FAA regarding impacts of the proposed Project, specifically the proposed Delhi Compressor Station, on airport operations, and file a site-specific construction plan that addresses any concerns identified by those authorities with the Secretary.**

Gulf South now plans to locate and build the Delhi Compressor Station as described in this proceeding. The compressor station would be located almost 3,000 feet east of the north-south oriented runway, and also in proximity to the airport's planned expansion. We believe the consultation and construction plans as required by the above recommendation stated would prevent adverse impacts to the Delhi Municipal Airport.

Thigpen Field Airport

The proposed pipeline route would be located approximately 500 feet south from current construction activities extending the north-south runway of Thigpen Field Airport at MP 55.1 near Bay Springs in Jasper County, Mississippi. The runway runs perpendicular to the proposed pipeline, which would be placed parallel to and on the south side of the Crosstex Pipeline's existing natural gas pipeline right-of-way. The runway's vegetative clear zone extends southward across the Crosstex Pipeline right-of-way for another approximately 1,300 feet. Gulf South has not indicated the results of any consultations it has had with the FAA, the airport, or the Town of Bay Springs to determine if the proposed Project would interfere with aircraft operations, the runway safety area, or the runway object-free area. Gulf South has not indicated whether it is aware of applicable safety regulations it would abide by, or of any special construction procedures, such as deep pipeline installation, that might be required in the vicinity of the Thigpen Field Airport. Therefore, **we recommend that:**

- **Prior to construction, Gulf South should consult with the Thigpen Field Airport officials and the FAA regarding impacts of the proposed Project on airport operations, and file a site-specific construction plan that addresses any concerns identified by those authorities with the Secretary.**

We believe the consultation and construction plans as required by the above recommendation stated would prevent adverse impacts to the Thigpen Field Airport.

Hazardous Waste Sites

Gulf South used Environmental Data Resources database reviews to identify any known hazardous waste sites within 1 mile of the proposed Project right-of-way and identified 10 sites. Three of these sites are located within 0.25 mile of the proposed route. Nine sites were underground storage tanks (UST), and one site is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site.

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

Recreation and special interest areas are defined to include lands administered by federal, state, county, or local agencies. Recreational areas along the proposed Project route consist of natural areas used for hunting, fishing, wildlife viewing, hiking, boating and canoeing, and other outdoor activities. No lands managed by The Nature Conservancy are located within the project area. These areas also include NRI streams and are discussed in detail below.

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 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 Lands 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 six Sixteenth Section Lands in Simpson, Jasper, and Clarke Counties, Mississippi (Table 3.8.4-1). Due to these tracts' extensive size and the Project's collocation with existing pipeline crossings at three of the six 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. 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.

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, 2006). The proposed Project would cross two NRI waterbodies: the Strong River at MP 18.0 in Simpson County, Mississippi; and the Chickasawhay River at MP 89.3 in Clarke County, Mississippi. The NRI reach of the Strong River extends from its confluence with the Pearl River upstream approximately 72 miles, to 1 mile below

the Interstate 20 bridge. The Strong River is an unspoiled stream with riffles and rapids in overhanging vegetation, and the entire reach is floatable. The NRI-listed reach of the Chickasawhay River extends from its confluence with the Pascagoula River upstream approximately 145 miles. The Chickasawhay River is a quiet, remote stream distinctive for its clay and limestone bluffs (NPS, 2004).

As described in Sections 2.3.2.1 and 3.3, Gulf South would use HDD installation techniques, in accordance with our Procedures, to avoid and minimize impacts to the waterbodies and adjacent riparian areas. As proposed, ATWSs associated with the Chickasawhay River HDD would result in some impacts to forested areas near this river. However, we believe these impacts would be relatively minor as the ATWSs would be located at least 1,650 feet from the edge of this stream. We have included a recommendation in Section 3.3.2.1 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.

Mileposts		Landowner	Routing and Crossing Information
Begin	End		
8.8	9.4	Simpson County School District	Gulf South's proposed pipeline is not collocated with an adjacent right-of-way through this area. Any alternative route would also not be collocated. The only alternatives to the proposed crossing would involve non-collocated routes that would create a new cleared corridor to the north of the property.
20.8	21.8	Simpson County School District	Gulf South's proposed pipeline is not collocated with an adjacent right-of-way through this area. Any alternative route would also not be collocated. The only alternatives to the proposed crossing would involve non-collocated routes. In addition, there are environmental constraints to the west of this property that would be impacted should an alternative to the west be identified.
26.8	26.9	Simpson County School District	Gulf South's proposed pipeline is not collocated with an adjacent right-of-way through this area. However, the proposed pipeline is just traversing the southwest corner of the section.
64.8	65.5	Jasper County School District	Gulf South's proposed pipeline would be adjacent to the CrossTex pipeline 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.
84.5	85.5	Clarke County School District	Gulf South's proposed pipeline would be adjacent to the Transco pipeline 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.
103.7	104.4	Clarke County School District	Gulf South's proposed pipeline would be adjacent to the Transco pipeline 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.

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 Strong or Chickasawhay Rivers.

Farm Service Agency Managed Lands

The CRP program is a voluntary program administered by the FSA. 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 (USDA, 2006). Typically, these easements retire croplands with erodible soils or otherwise sensitive croplands from production for a period of 10 to 15 years. Gulf South indicates that at least three CRP lands would be crossed by the proposed pipeline route as listed in Section 3.5.3.

The proposed pipeline route is collocated with other existing rights-of-way in many places where FSA 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 accept a 50-foot-wide permanent right-of-way.

As a result of the disturbance caused by the construction of the proposed Project, as well as operations, landowners may no longer be eligible to participate in the CRP or to receive the payments that they currently obtain from the FSA due to modified land use or modified vegetation type or strata. Since lands included in the construction or permanent pipeline rights-of-way would potentially be no longer eligible for inclusion in the CRP program, affected landowners could experience an associated financial loss. 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.

Gulf South continues to consult with FSA regarding the crossing of FSA managed lands, as well as considerations for routing, construction methods, revegetation, and other impact minimization measures. Based on our consultations with FSA, we believe a series of impact minimization or mitigation measures may be appropriate in easements managed by FSA 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 FSA. Since consultations with the FSA are not complete, **we recommend that:**

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

Based on the characteristics of FSA managed lands, Gulf South's proposed construction measures, and our above recommendation, we believe that impacts to FSA 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 predominantly 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. As such, congestion-related delays would not be anticipated in association with construction of the proposed Project.

The proposed pipeline route would cross approximately 15 major U.S. or state highways, including Interstate 59, 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 US 49 (MP 12.6), Campbell Creek Road (MP 16.0), State Highway 13 (MP 18.2), and Interstate 59 (MP 69.4) would be accomplished via HDD associated with the crossing of adjacent waterbody features, which would also 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 would also be made to schedule lane closures outside of peak traffic periods.

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

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 would primarily 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 primarily through rural areas that consist of pine plantation, 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 viewing points 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. 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 approximate pre-construction contours and would be allowed to revert to pre-construction uses and cover type. About 18 percent of the proposed pipeline route would traverse agricultural, pasture, open lands, residential, and industrial/commercial land use types. 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 proposed 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 has avoided crossing state and federally managed lands and has also avoided most scenic vistas. As described in Section 3.8.4, however, the proposed Project route would cross two NRI-listed rivers, which have been noted for their visual character. The crossing of these resources would be accomplished via HDD; therefore, construction and operation of the proposed Project would not result in creation or expansion of an existing corridor, and long-term visual impacts to these features should be minimal. Furthermore, we have included recommendations in Section 3.3 for Gulf South to complete consultations with NPS and identify any plans to address additional mitigation measures that may be recommended by those agencies.

Aboveground Facilities

The proposed Project would include installation of three compressor stations, five meter and regulator facilities, one side valve and eight mainline valves. 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.

In the Draft EIS, we recommended that Gulf South file a description of the surrounding landscape, potential for visual impacts to nearby residents from, and the need for visual screening for, the proposed Delhi Compressor Station and the associated CenterPoint M/R Station. The proposed Delhi Compressor Station would be located in an area of active row-cropping. Gulf South would purchase and permanently maintain approximately 69.5 acres of land in this area. The landscape surrounding the proposed Delhi Compressor Station is currently comprised of agricultural fields, pastures, thin strips and patches of forested land, several residences, and a small cemetery. Some residences to the southwest of the site would have minimal sight barriers in the form of scattered strips of trees along State Highway 17 and the fence along the proposed compressor station boundary. We believe that the direct line of sight to residences along Highway 17 poses a long-term significant adverse visual effect that could be addressed with minimal vegetation measures to reduce visual impacts to nearby residents on the part of Gulf South. Therefore, **we recommend that:**

- **Prior to construction, Gulf South should file with the Secretary for review and written approval by the Director of OEP a visual screening plan to reduce the long-term adverse effects on the visual quality of residences located along Highway 17 that would result from installation of the Delhi Compressor Station.**

The proposed Harrisville Compressor Station would be located in an area dominated by upland forest. Gulf South would purchase and permanently maintain approximately 16.2 acres in this area. The proposed site is completely surrounded by upland forest that would visually screen the compressor station. No residences or businesses are within view of the Harrisville Compressor Station.

The proposed Destin Compressor Station and Destin M/R Station would be located in an area dominated by pine plantation and upland forest. Gulf South would purchase and temporarily disturb approximately 20 acres in this area, and would permanently maintain only about 23.3 acres. The remaining 11.1 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 residences or businesses are within view of the Destin 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.

MLV and M/R Stations

MLV sites would consist of an area surrounded by a chain link fence within the confines of the permanent pipeline right-of-way. Approximately 0.5 acre of land currently designated upland forest and open land would be permanently impacted outside of the permanent pipeline right-of-way. Aboveground elements of each MLV site would include 12-inch piping with valving extending aboveground and connected on each side of the 42-inch valve with a crossover.

Based on review of aerial alignment sheets and information provided by Gulf South, it is likely that components of the proposed Project would be visible from nearby residences in two locations (MP 30.3 and MP 110.8). The MLV at MP 30.3 would be located adjacent to County Road 503. This facility would be visible to residences located approximately 300 feet to the southwest, 375 feet south, and 525 feet northwest of this proposed facility. The MLV located at MP 110.8 would be located in an open area, adjacent to the proposed Transco M/R Station and the existing Transco right-of-way. The

facilities at MP 110.8 would be visible to a residence located approximately 350 feet to the northeast. To reduce the potential for visual impacts to residences, Gulf South proposes to add vegetative buffers wherever they may be viewed by nearby residences.

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 Transco M/R Station (MP 110.8) would also include a pig receiver. Sizes of the proposed Southern Natural and Tennessee Gas M/R stations would each be approximately 1 acre, and the Transco M/R station would be approximately 8 acres.

The Southern Natural (MP 45.7) and Tennessee Gas (MP 72.5) 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, forested land, further limiting the visual impact of these facilities.

With the recommendations discussed above, combined with the lack of proximate residences to other above ground facilities, we believe the proposed Project would not result in 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 at the Delhi Compressor Station.

3.9 SOCIOECONOMICS

3.9.1 Region of Influence

The proposed Project would consist of an approximately 110.8-mile-long, 42-inch-diameter, interstate natural gas pipeline, three new compressor stations, and associated ancillary facilities, as described in Section 2.1. The proposed pipeline would traverse four counties in Mississippi (Simpson, Smith, Jasper, and Clarke), and one county in Alabama (Choctaw). Additionally, a proposed compressor station is located in Richland Parish, Louisiana. For the purposes of our socioeconomic analysis, we define these counties and parishes as the region of influence for the proposed Project.

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 parish that would be traversed by the proposed Project. Based on census data for the year 2000 (U.S. Census Bureau, 2000), the total population in these counties and parish is 116,828. Populations in Louisiana experienced a growth between 1990 and 2000, with a 5.9 percent increase in population over the 10-year period. Richland Parish was relatively stable during this time period with a 0.5 percent decrease in population. Mississippi experienced considerable growth in the 10-year period, with increases between 2.1 and 16.7 percent occurring in the counties affected by the proposed Project. Although Alabama in general experienced growth over the 10-year period, the county affected by the proposed Project experienced a 7.6 percent decrease from 1990 to 2000.

**TABLE 3.9.2-1
Existing Population and Demographic Conditions in the
Region of Influence for the Proposed Southeast Expansion Project**

Parish/County, State	2000 Population	Population Change Since 1990 (%)	Population					Native American (%)
			Density per Square Mile	White, Non- Hispanic (%)	Black or African- American (%)	Hispanic (%)	Asian (%)	
Louisiana	4,468,976	5.9	102.6	2,794,391 (63)	1,443,390 (32)	107,738 (2)	54,256 (1)	24,129 (<1)
Richland, LA	20,981	-0.5	37.6	12,667 (60)	7,927 (38)	227 (1)	36 (<1)	26 (<1)
Mississippi	2,844,658	10.5	60.6	1,727,908 (61)	1,028,473 (36)	39,569 (1)	18,349 (<1)	11,224 (<1)
Simpson, MS	27,639	16.7	46.9	17,686 (64)	9,432 (34)	318 (1)	35 (<1)	32 (<1)
Jasper, MS	18,149	6.1	26.8	8,378 (46)	9,561 (53)	117 (<1)	12 (<1)	11 (<1)
Smith, MS	16,182	8.5	25.4	12,268 (76)	3,728 (23)	96 (<1)	15 (<1)	1 (<1)
Clarke, MS	17,955	2.1	26.0	11,518 (64)	6,220 (35)	120 (<1)	19 (<1)	17 (<1)
Alabama	4,447,100	72.8	87.6	3,125,819 (70)	1,150,076 (26)	75,830 (2)	30,989 (<1)	1,059 (<1)
Choctaw, AL	15,922	-7.6	17.4	8,724 (55)	6,985 (44)	107 (<1)	6 (<1)	24 (<1)

Source: U.S. Census Bureau, 2000

Population densities in the region of influence range from a low of 17.4 persons per square mile in Choctaw County, Alabama, to a high of 46.9 persons per square mile in Simpson County, Mississippi. These densities are relatively low compared to urban area densities that typically range from 3,000 to 6,000 persons per square mile (FERC, 2006), but are consistent with an area that is predominantly rural and agricultural.

The number of residents within the region of influence would increase temporarily during construction, which would occur for approximately four months between September 2007 and December 2007, as proposed. The peak construction workforce would be 1,400 workers, of which about 98 percent

(1,372) would be non-local. Assuming 0.8 family members (FERC, 2006) would accompany each non-local worker, total construction-related immigration would be approximately 2,470 persons. Gulf South indicates that construction of the pipeline would entail the simultaneous activity of three individual construction spreads over the proposed Project route. Additional work crews would also be employed at each of the proposed aboveground facilities. 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 to 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, 2.1 to 0.1 percent, on average. This would represent a minor, temporary population increase confined to the period of proposed Project construction. The FERC does not believe the work force would have a significantly different demographic profile than that observed within the region of influence. As such, changes to local demographics would not be anticipated.

During operation, Gulf South estimates that the proposed Project would employ approximately three full-time workers. This would represent only 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 47,000 individuals whose major employment sector is education, health, social services, retail trade, and manufacturing. With the exception of Smith County, Mississippi, some of the counties and the parish within the region of influence report that the average unemployment is slightly higher and the average per capita income is slightly lower than the state-level values reported. In Smith County, Mississippi, the per capita income is considerably higher and unemployment is considerably lower than the state values (Table 3.9.3-1).

Construction of the proposed Project would result in the hiring of approximately 28 local workers. Additional jobs would also be created as a result of secondary activity associated with construction of the proposed Project, as purchases made by non-local workers of food, clothing, lodging, gasoline, and entertainment would have a temporary, stimulatory effect on the local economy. These jobs would represent a temporary, moderate increase in employment opportunities within the region of influence.

During operation, the proposed Project would create three full-time positions. This would represent a minor, permanent increase in the number of employment opportunities within the region of influence.

3.9.4 Housing

Table 3.9.4-1 reports selected housing statistics for the region of influence. Within this region there are approximately 2,148 rental units and units used for seasonal, recreational, or occasional use. Approximately 16,635 hotel or motel rooms supplement this potential housing stock, but most are located in the areas presented in Table 3.9.4-1.

At its peak, construction of the proposed Project would require about 1,372 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 8.2 percent of the temporary housing within the region of influence. Thus, the temporary housing available within the region of influence would be capable of meeting the temporary

and moderate increased demand for housing resulting from construction of the proposed Project. Housing demand for the three permanent positions generated by operation of the proposed Project would represent a negligible increase in housing demand.

3.9.5 Property Values

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

TABLE 3.9.3-1 Existing Income and Employment Conditions Within the Region of Influence for the Proposed Southeast Expansion Project					
County/Parish	Per Capita Income (\$)	1999 Population Below Poverty Level (%)	Civilian Labor Force	Unemployment Rate (%)	Major Industry
Louisiana	\$16,912	19.6	3,381,306	7.3	
Richland Parish	\$12,479	23.4	8,249	6.9	Education, health, and social services
Mississippi	\$15,853	19.9	2,165,089	7.4	
Simpson County	\$13,344	19.7	11,389	6.3	Retail trade
Smith County	\$25,137	16.4	6,996	6.6	Manufacturing
Jasper County	\$12,889	20.8	7,228	8.3	Retail trade
Clarke County	\$14,288	18.9	7,312	8.5	Manufacturing
Alabama	\$18,189	16.1	3,479,035	6.2	
Choctaw County	\$14,635	23.4	6,019	8.8	Retail trade

Notes:
U.S. Census Bureau, 2000

TABLE 3.9.4-1 Housing Statistics Within the Region of Influence for the Proposed Southeast Expansion Project	
City, County, State	Number Hotel/Motel Rooms
Jackson, Hinds County, Mississippi	5,643
Hattiesburg, Forrest County, Mississippi	2,122
Meridian, Lauderdale County, Mississippi	1,312
Laurel, Jones County, Mississippi	952
Richland Parish, Louisiana	665
Notes: Hattiesburg Convention and Visitors Bureau, 2006 Meridian Chamber of Commerce, 2006 Jones County Economic Development Authority, 2006	

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. However, 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 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 would appeal the assessment and subsequent property taxation to the local property taxation agency. If the parcel were reappraised, the landowner would then be responsible for property taxes based upon 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

A portion of the estimated \$60.5 million Project construction payroll would be spent locally for the purchase of housing, food, gasoline, and entertainment during construction. The exact amount would be dependent upon the proportion of the workforce that was local, the behavior of individual workers, and the duration of their stay. The majority of construction-related expenditures would be subject to either Louisiana's state sales tax of 4 percent, Mississippi's state sales tax of 7 percent, or Alabama's state sales tax of 4 percent (American Institute of Certified Public Accountants [AICPA], 2006). This increase in sales tax would represent a minor short-term increase in government revenues.

Table 3.9.6-1 contains Gulf South's estimate of the annual taxes that would be payable to each county and parish traversed by the proposed Project. Operation of the proposed Project would provide a permanent, minor increase in government revenues.

TABLE 3.9.6-1 Estimated Annual Taxes for the Proposed Southeast Expansion Project	
County/Parish	Estimated Annual Taxes
Louisiana	
Richland Parish	\$501,105
Mississippi	
Simpson County	\$1,871,749
Smith County	\$1,013,896
Jasper County	\$1,316,551
Clarke County	\$1,708,542
Alabama	
Choctaw County	\$118,875
Total	\$6,530,718

3.9.7 Public Services

Table 3.9.7-1 summarizes the number of full-time equivalent medical, police, and fire protection employees in the parish and counties affected by the proposed Project. These employees serve a population of approximately 116,828.

Construction of the proposed Project would temporarily increase demand for medical, police, and fire protection services. Gulf South has consulted with the counties and parish in the region of influence and believes that sufficient public services exist to meet Project-related needs. Furthermore, Gulf South 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 the school year, and a significant influx of students would place a considerable strain on the region's educational workers. However, due to the nature of the proposed construction and its relatively short duration (four 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 of the proposed Project, workers filling the three permanent positions and their associated family members would represent a minor permanent increase in the demand for the provision of public services. However, this increased demand would be offset by the Project-related increase in government revenues associated with operation.

**TABLE 3.9.7-1
Emergency Staff and Facilities in the Parish and Counties Affected
by the Proposed Southeast Expansion Project**

County/Parish	Police Protection	Fire Protection	Health and Hospitals	Total Full-time Equivalent
Louisiana				
Richland Parish	Parish Sheriff's office and each municipality have their own law enforcement offices.	Six fire departments within the county.	One hospital with emergency capabilities.	911 service is available as well as medical air transport.
Mississippi				
Simpson County	Seven fire stations; five have medical capabilities. All stations are manned by volunteers.	Two hospitals with emergency capabilities.	Police department is responsible for four cities. Sheriff's department covers the entire county.	911 and ambulance service throughout the county. Air service is available from Jackson, requiring about 5 minutes' air time. Agreements in place with neighboring counties for HazMat personnel.
Smith County	One volunteer fire department in Taylorsville, Mississippi.	One hospital with emergency capabilities.	Two city police departments and one Sheriff's office within the county.	911 service is available throughout the county.
Jasper County	Eight volunteer fire departments within the county.	Jasper County Hospital is available with 66 beds and a trauma center.	Sheriff and city police departments are located in Bay Springs, Mississippi.	Jasper County First Responders 601-764-2820 (EMS).
Clarke County	Fifteen volunteer fire departments.	H. C. Watkins Memorial Hospital has 50 beds and emergency capabilities.	County Sheriff's office and each municipality have their own law enforcement offices.	Ambulance service and paramedics available throughout the county.
Alabama				
Choctaw County	Six fire departments within the county.	One hospital with emergency capabilities.	County Sheriff's office and two cities have their own law enforcement offices.	911 service throughout the county.

3.9.8 Impacts on Specific Economic Sectors

To date, Gulf South has not received any comments from landowners or other interested parties requesting information regarding 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.

As described in Section 3.8, construction and operation of the proposed Project would permanently affect approximately 75.2 acres of agricultural land and 283.4 acres of lands currently used for commercial forestry practices (pine plantation), 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 obligations under Section 106 of the NHPA and the ACHP's regulations set forth at 36 CFR 800.

3.10.1 Results of the Cultural Resources Survey

3.10.1.1 Louisiana

Information about the Delhi Compressor Station (the only portion of the project in Louisiana) was provided to the Louisiana State Historic Preservation Office (SHPO) in November 2006. The Louisiana SHPO advised on December 4, 2006 that no survey was needed for the Delhi Compressor Station site. No significant cultural resources or historic properties would be affected by project construction in Louisiana.

3.10.1.2 Mississippi

Gulf South conducted an initial cultural resource survey between August and November 2006, and January and March 2007, for the proposed pipeline, compressor station sites, associated aboveground ancillary facilities, and extra work areas (ATWSs, access roads, and pipe storage and contractor yards) within the Mississippi portion of the proposed Project. Additional surveys performed for three new contractor/storage yards identified by Gulf South in its May 29, 2007, response to the May 7, 2007, Data Request have yet to be filed.

The Mississippi survey identified 43 prehistoric sites. Nine of those sites are considered potentially eligible for listing in the NRHP. The remaining 34 prehistoric sites are not considered eligible for listing in the NRHP, and no further work was recommended. A total of 21 historic sites, four of which are standing structures, were identified in the Mississippi portion of the proposed Project. Of those historic resources, one historic standing structure is considered potentially eligible for listing in the NRHP. Finally, three sites were identified as multi-component sites and two are considered eligible for listing in the NRHP. Gulf South has adopted route variations that avoid impacts to all cultural resource sites identified as potentially eligible for listing in the NRHP.

The Mississippi Cultural Resource survey results are currently in review by the SHPO. Gulf South would need to develop plans for additional investigations at potentially significant sites to determine if they could be adversely affected by project construction. In the event that significant archaeological deposits or structures could not be avoided, treatment plans for data recovery and recording would need to be developed in consultation with the SHPO.

3.10.1.3 Alabama

Gulf South surveyed the 6.4-mile Alabama portion of the proposed pipeline, identifying no historic or prehistoric cultural resources. Gulf South has submitted a cultural resources survey report to the Alabama SHPO. To date, the Alabama SHPO has not submitted a response.

3.10.2 Unanticipated Discoveries Plan

Gulf South has filed an acceptable Unanticipated Discoveries Plan with the FERC that outlines the procedures that would be followed in the event that unanticipated cultural resources or human remains are encountered during construction of the proposed Project.

3.10.3 Native American Consultation

Gulf South contacted two Native American groups regarding the proposed Project. Those groups contacted include the Mississippi Band of Choctaw Indians and the Poarch Band of Creek Indians of Alabama. Letters were sent to representatives of each of these tribes on August 21, 2006, requesting comments on the proposed Project and the identification of any cultural or religious sites significant to the tribe. As of May 2007, no replies have been received from these tribes.

3.10.4 General Impacts and Mitigation

Gulf South has completed most of the necessary cultural resources surveys and submitted the required cultural resource survey reports to the Mississippi and Alabama SHPOs. Cultural resource surveys performed for modified work areas are still under review by the Mississippi and Alabama SHPOs. No response from either agency has been received to date. To ensure that required cultural resource studies and consultations 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 Mississippi and Alabama 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 Delhi Compressor Station near Delhi in Richland Parish, Louisiana; to construct the Harrisville Compressor Station near Harrisville in Simpson County, Mississippi; and to construct the Destin Gas Transmission pipeline interconnect near Shubuta in Clark County, Mississippi.

At the Delhi Compressor Station, Gulf South proposes to install four Caterpillar 3616TALE engines equipped with oxidation catalyst, with a planned compression capacity of 18,940 Hp, one gas-fired 1,155-Hp Waukesha VGF standby generator engine limited to 500 hours/year, one 0.75 MMBtu/hr fuel gas heater, a condensate tank, condensate truck loading point, and an ESD blowdown stack.

At the Harrisville Compressor Station, Gulf South proposes to install four Caterpillar 3616TALE engines equipped with oxidation catalysts, with a planned compression capacity of 18,940 Hp, one gas-fired 470-Hp Waukesha VGF 24GL standby generator engine limited to 500 hours/year, a condensate tank, condensate truck loading point, and an ESD blowdown stack.

At the Destin Compressor Station, Gulf South proposes to install two Caterpillar 3612 engines equipped with oxidation catalysts with a planned compression capacity of 7,100 Hp, one gas-fired 425-Hp Waukesha VGF 18GL standby generator engine limited to 500 hours/year, one 0.75-MMBtu/hour fuel gas heater, one condensate storage tank, condensate truck loading point, and an ESD blowdown stack.

3.11.1.1 Existing Air Quality

The proposed Project would be constructed in portions of Richland Parish in Louisiana; Simpson, Smith, Jasper, and Clarke Counties in Mississippi; and Choctaw County in Alabama. These counties and parishes are characterized by a temperate climate. Rainfall at Jackson, Mississippi, located near the center of the proposed pipeline route, averages 55.95 inches annually (Weather.com). April is the wettest month in Jackson, averaging 5.98 inches of precipitation; and September is the driest month, averaging 3.23 inches. The warmest month is July, with an average high temperature of 91° Fahrenheit (F) and an average low temperature of 71°F. January is the coldest month, with an average high temperature of 55°F and an average low temperature of 35°F.

The CAA designates six pollutants as criteria pollutants for which the National Ambient Air Quality Standards (NAAQS) are promulgated. The NAAQS for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter with an aerodynamic diameter less than 10 microns (PM₁₀), particulate matter with an aerodynamic diameter less than 2.5 microns (PM_{2.5}), carbon monoxide (CO), ozone (O₃), and lead were set to protect human health (primary standards) and human welfare (secondary standards). State air quality standards cannot be less stringent than the NAAQS. Both Louisiana, and Mississippi have adopted the NAAQS, as defined in 40 CFR 50; these standards are summarized in Table 3.11.1.1-1.

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", which refers to areas with insufficient data to make a determination. The counties and parishes in which the proposed Project would be located are designated as "attainment" or "unclassifiable" for all criteria pollutants.

**TABLE 3.11.1.1-1
National Ambient Air Quality Standards**

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

Notes:
µg = Microgram(s)
m³ = Cubic meter(s)
N/A = Not applicable
ppm = Part(s) per million

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

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
- General Conformity

New Source Review/Prevention of Significant Deterioration

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

The PSD review regulations apply to proposed new major sources or major modifications to existing major sources located in an attainment area. The PSD regulations (40 CFR 52.21) define a "major source" as any source type belonging to a list of named source categories that emit or have the potential to emit 100 tons per year (tpy) or more of any regulated pollutant. A major source under PSD 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 proposed Delhi, Harrisville, and Destin Compressor Stations are all subject to the 250 tpy threshold.

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

None of the new facilities or additions to existing facilities would exceed emissions of 250 tpy of any criteria pollutant (see Tables 3.11.1.2-1 through 3.11.1.2-3 and the discussion under "Operations Emissions"). Therefore, PSD permitting is not applicable to the proposed Project.

Air Quality Control Regions and PSD

AQCRs are categorized as Class I, Class II, or Class III. Class I areas are designated specifically as pristine natural areas or areas of natural significance and have the lowest increment of permissible deterioration, which essentially precludes development near these areas. Class III designations, intended for heavily industrialized zones, can be made only on request and must meet all requirements outlined in 40 CFR 51.166. The remainder of the United States is classified as Class II. Class II areas are designed to allow moderate, controlled growth. The proposed Project would be located in a Class II area. The nearest Class I areas are the Caney Creek Wilderness, located south of Mena, Arkansas, and the Breton Sound Wilderness Area, located southeast of New Orleans. The proposed Delhi Compressor Station is approximately 215 miles south of the Caney Creek Wilderness Area. The proposed Harrisville and Destin Compressor Stations are approximately 170 miles north of the Breton Sound Wilderness Area.

**TABLE 3.11.1.2-1
Proposed Emissions^a for the Delhi Compressor Station**

Emissions Source	NOx (TPY)	CO (TPY)	VOC (TPY)	PM₁₀ (TPY)	PM_{2.5} (TPY)	SO₂ (TPY)	HAPs (TPY)
Compressor Engine #1	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #2	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #3	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #4	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Emergency Backup Generator	1.66	1.11	0.48	0.02	0.02	0.00	0.18
Condensate Storage Tank ^b	--	--	6.61	--	--	--	0.49
Truck Loading of Condensate ^b	--	--	1.14	--	--	--	0.17
Fuel Gas Heater	0.33	0.28	0.02	0.02	0.02	0.00	0.01
Piping Components (Fugitives)	--	--	3.27	--	--	--	0.01
Unpaved Roads (Fugitives)	--	--	--	0.43	0.06	--	--
Engine Blowdown Stack	--	--	6.29	--	--	--	0.32
Area Releases	--	--	5.33	--	--	--	0.27
Total	130.03	33.39	112.74	6.11	5.74	0.32	16.25

Notes:

a Based on full load and continuous operation. Emergency generator based on 500 hours/year.

b Estimated using GRI-GlyCalc3.01.

**TABLE 3.11.1.2-2
Proposed Emissions^a for the Harrisville Compressor Station**

Emissions Source	NOx (TPY)	CO (TPY)	VOC (TPY)	PM₁₀ (TPY)	PM_{2.5} (TPY)	SO₂ (TPY)	HAPs (TPY)
Compressor Engine #1	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #2	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #3	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Compressor Engine #4	32.01	8.00	22.40	1.41	1.41	0.08	3.70
Emergency Backup Generator	1.66	1.11	0.48	0.02	0.02	0.00	0.18
Condensate Storage Tank ^b	--	--	6.61	--	--	--	0.49
Truck Loading of Condensate ^b	--	--	1.14	--	--	--	0.17
Fuel Gas Heater	0.33	0.28	0.02	0.02	0.02	0.00	0.01
Piping Components (Fugitives)	--	--	3.27	--	--	--	0.01
Unpaved Roads (Fugitives)	--	--	--	0.43	0.06	--	--
Engine Blowdown Stack	--	--	6.29	--	--	--	0.32
Area Releases	--	--	5.33	--	--	--	0.27
Total	130.03	33.39	112.74	6.09	5.74	0.32	16.25

Notes:
a Based on full load and continuous operation. Emergency generator based on 500 hours/year.
b Estimated using GRI-GlyCalc3.01.

**TABLE 3.11.1.2-3
Proposed Emissions^a for the Destin Compressor Station**

Emissions Source	NOx (TPY)	CO (TPY)	VOC (TPY)	PM₁₀ (TPY)	PM_{2.5} (TPY)	SO₂ (TPY)	HAPs (TPY)
Compressor Engine #1	24.00	6.00	16.80	1.06	1.06	0.06	2.78
Compressor Engine #2	24.00	6.00	16.80	1.06	1.06	0.06	2.78
Emergency Backup Generator	0.61	0.41	0.18	0.01	0.01	0.001	0.07
Condensate Storage Tank ^b	--	--	6.61	--	--	--	0.49
Truck Loading of Condensate ^b	--	--	1.14	--	--	--	0.17
Fuel Gas Heater	0.33	0.28	0.02	0.02	0.02	0.002	0.01
Piping Components (Fugitives)	--	--	3.27	--	--	--	0.01
Unpaved Roads (Fugitives)	--	--	--	0.43	0.06	--	--
Engine Blowdown Stack ^c	--	--	6.29	--	--	--	0.32
Area Releases	--	--	5.33	--	--	--	0.27
Total	48.94	12.69	56.44	2.58	2.21	0.12	6.90

Notes:
a Based on full load and continuous operation. Emergency generator based on 500 hours/year.
b Estimated using GRI-GlyCalc3.01.
c The engine blowdown stack is for venting of natural gas from the compressor during maintenance activities.

New Source Performance Standards

The NSPS, codified in 40 CFR 60 and incorporated by reference in 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 square meters (m²) (19,813 gallons) and 151 m² (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 m² 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 a condensate tank, which is below the regulated capacity. Therefore, the proposed Project would not be subject to NSPS Subpart Kb standards.

On June 12, 2006, EPA proposed a new NSPS (40 CFR 60 Subpart JJJJ) for stationary spark ignition (SI) internal combustion engines. The proposed compressor stations each contain natural gas-fired compressor engines and emergency generators that may be potentially subject to 40 CFR 60 Subpart JJJJ. The proposed standard for stationary SI engines applies to all new, modified, and reconstructed stationary SI engines regardless of size. The pollutants to be regulated by the proposed NSPS for stationary SI engines are nitrogen oxides (NO_x), CO, and non-methane hydrocarbons (NMHC). Gulf South would comply with any applicable standards of EPA's proposed rule once it is finalized.

No other NSPSs are applicable to the proposed Project.

National Emission Standards for Hazardous Air Pollutants

The NESHAP, codified in 40 CFR Parts 61 and 63, regulates hazardous air pollutant (HAP) emissions. Part 61 was promulgated prior to the 1990 Clean Air Act Amendments (CAAA) and regulates only eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride).

The 1990 CAAA established a list of 189 HAPs, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology (MACT) standards, regulates HAP emissions from major sources of HAP emissions and specific source categories that emit HAPs. Part 63 defines a major source of HAPs as any source that has the potential to emit 10 tpy of any single HAP or 25 tpy of HAPs in aggregate. MACT standards are intended to reduce emissions of air toxics or HAPs through installation of control equipment rather than enforcement of risk-based emission limits. The proposed Delhi, Harrisville, and Destin Compressor Stations each would emit less than 25 tpy of total HAPs, as shown in Tables 3.11.1.2-1, 3.11.1.2-2, and 3.11.1.2-3, and no more than 10 tpy of any single HAP as reflected in Gulf South's emission estimates. Potential HAP emissions resulting from the proposed Project would be well below the 10/25 tpy thresholds at each station; 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 NO_x, SO₂, CO, PM₁₀, PM_{2.5}, and VOC. Emissions of NO_x and VOC at the Delhi and Harrisville Compressor Stations would exceed the 100 tpy criteria pollutant threshold, as shown in Tables 3.11.1.2-1 and 3.11.1.2-2. Therefore, the Delhi and Harrisville Compressor Stations would require a Title V permit. None of the criteria pollutants would be emitted at the 100 tpy level at the Destin Compressor Station; therefore, a Title V permit would not be required for this facility.

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, both Louisiana and Mississippi have state air quality regulations. The LDEQ manages air quality issues in Louisiana and the MDEQ manages air quality issues in Mississippi. Subject to EPA approval, these agencies manage the statewide air permitting, compliance, and enforcement programs. The Delhi Compressor Station would be authorized under the LDEQ Part 70 program, and the Harrisville and Destin Compressor Stations would be authorized under the MDEQ construction permit program. The Harrisville Compressor Station would file for a Title V permit with the MDEQ within a year after construction is completed.

3.11.1.3 General Impacts and Mitigation

Construction Emissions

Construction of the pipeline and access roads would generate air emissions during grading, trenching, backfilling, and 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 impact to local ambient air quality as a result of fugitive dust and combustion emissions generated by construction equipment. Criteria pollutant emissions during operation of the fossil-fueled construction equipment would occur

from combustion products resulting from the use of gasoline and diesel fuels, primarily NO₂, CO, VOCs, PM₁₀, small amounts of SO₂, and small amounts of HAPs (e.g., formaldehyde, benzene, toluene, and xylene) produced by the construction equipment engines. Impacts from construction equipment would be temporary and would be expected to result in an insignificant impact on air quality.

LDEQ regulates the emissions of particulate matter arising from unpaved streets, access roads, construction activities 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 engines at all locations would be minimized through the use of Clean Burn technology, oxidation catalysts, and the use of clean burning natural gas fuels. As described in Section 3.11.1.2, the compressor stations would be operated in compliance with federal and state air quality regulations driven by the CAA. As stated previously, the proposed project would not be subject to PSD.

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 3.11.1.2-1 through 3.11.1.2-3 list the anticipated emissions of criteria pollutants and HAPs from the operation of each compressor station. Gulf South is completing air permit applications for the Delhi, Harrisville, and Destin Compressor Stations. Gulf South will provide the FERC copies of these applications upon submittal to the state permitting authorities.

Following the Draft EIS, Gulf South filed a revised screening analysis (using SCREEN3) for NO_x emissions for the Harrisville and Destin Compressor Stations. Emissions from the Delhi Compressor Station were not modeled. SCREEN3 is a conservative model used to determine if refined modeling is needed. It does not take into account specific local terrain or meteorological data. Since the equipment and emissions from the Delhi Compressor Station would be the same as the equipment and emissions from the Harrisville Compressor Station, NO₂ concentrations would be expected to be similar to the SCREEN3 modeled results for the Harrisville Compressor Station.

Gulf South used typical conversion factors in calculating the various concentrations for different averaging times as recommended in EPA's "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised" (EPA-454/R-92-019, October 1992), a document for applying screening techniques to estimate the air quality impact of stationary sources.

The Destin analysis included the NO_x emissions from the two new gas compressor engines and the emergency generator engine. Emissions from the small heater were not considered in this analysis since the potential to emit is less than 1/2 tpy. The worst-case hourly impact for the two engines and the emergency generator was estimated to be 200.04 µg/m³. The estimated annual NO_x impact is 16.0 µg/m³. Background NO₂ concentrations at this location were not available; however, background concentrations of NO₂ were available for Jackson County, Mississippi, averaging 13.16 µg/m³ over the past three years. Assuming this is a worst-case background concentration, when added to station impacts

this results in a total off-site NOx concentration of 29.16 $\mu\text{g}/\text{m}^3$. This is well below the NAAQS of 100 $\mu\text{g}/\text{m}^3$ for NO₂. In addition, this finding is conservative since it does not include an NO₂/NOx reduction ratio. Based on these results, refined modeling is not needed.

The Harrisville analysis included the NOx emissions from the four new gas compressor engines and the emergency generator engine. Emissions from the small heater were not considered in this analysis since the potential to emit is less than 1/2 tpy. The worst-case hourly impact for the four engines and the emergency generator was estimated to be 275.66 $\mu\text{g}/\text{m}^3$. The estimated annual impact is 22.05 $\mu\text{g}/\text{m}^3$. Background NO₂ concentrations at this location were not available; however, background concentrations of NO₂ were available for Jackson County, Mississippi, averaging 13.16 $\mu\text{g}/\text{m}^3$ over the past three years. Assuming this is a worst-case background concentration, when added to station impacts, this results in a total off-site NOx concentration of 35.21 $\mu\text{g}/\text{m}^3$. This is well below the NAAQS of 100 $\mu\text{g}/\text{m}^3$ for NO₂. In addition, this finding is conservative since it does not include an NO₂/NOx reduction ratio. Based on these results, refined modeling is not needed.

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_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} with 10 decibels on the A-weighted scale (dBA) added to nighttime sound levels between the hours of 10 p.m. and 7 a.m. to account for people's greater sensitivity to sound during nighttime hours. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA.

3.11.2.1 Regulatory Requirements

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

Mississippi and Louisiana do not regulate noise at the state level. Similarly, no noise regulations or ordinances that govern noise pollution from construction or industrial activities have been identified for any of the counties or local municipalities to be traversed by the proposed Project.

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 Delhi Compressor Station would be located in Richland Parish, Louisiana, on the south side of Delhi, Louisiana. The land surrounding the site consists of pasture and active agriculture. There are currently no existing facilities at the site although there is a natural gas compressor station (i.e., Columbia Gulf Transmission Corporation's (CGTs) Delhi Compressor Station) near the site of the proposed Delhi Compressor Station. The closest NSA (NSA #1) consists of homes located approximately 1,100 feet west of the anticipated location of the compressor building (i.e., site center), and the next closest NSA (NSA #2) consists of two homes located approximately 1,500 feet northwest of the site center. NSA #3, while located only 900 feet northwest of the site, is not expected to be present after installation of the compressor station, and is therefore not evaluated as the nearest NSA. On September 26, 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, birds, and wind. Measured noise at NSA #1 ranged from 45.0 to 53.6 dBA, with a calculated L_{dn} of 54.2 dBA (Table 3.11.2.2-1). Measured noise at NSA #2 ranged from 45.0 to 60.9 dBA, with a calculated L_{dn} of 59.5 dBA. Measured noise at NSA #3 ranged from 40.0 to 40.2 dBA, with a calculated L_{dn} of 46.4 dBA.

The Harrisville Compressor Station would be located in Simpson County, Mississippi, approximately 9 miles south of Florence, Mississippi. The land surrounding the site consists primarily of forest. The nearest NSAs are residences 4,200 feet east (NSA #1), 5,600 feet south-southeast (NSA #2), and 4,800 feet northwest (NSA #3) of the proposed station. On September 20, 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 was determined to be 37.1 dBA, with a calculated L_{dn} of 43.5 dBA. At NSA #2, measured noise was determined to be 42.1 dBA, with a calculated L_{dn} of 48.5 dBA. At NSA #3, measured noise was determined to be 38.2 dBA, with a calculated L_{dn} of 44.6 dBA. On June 15, 2007, Gulf South submitted a revised acoustical analysis for the Harrisville Compressor Station. The revised analysis was required since the potential noise impact of the Station on the Twin Lakes Camping Area (owned by the First Presbyterian Church of Jackson, Mississippi) was not addressed in the initial acoustical analysis (September 20, 2006) for the station. The three NSAs at the Twin Lakes Camping Area include NSA #4 (Wilderness Camp Area, 2,600 feet northwest), NSA #5 (Area of Restrooms/Cabins, 3,700 feet north-northwest,) and NSA #6 (Ropes Course, 4,000 feet north-northwest). At NSAs #4, #5, and #6, measured noise was determined to be 38.2 dBA at each location, with a calculated L_{dn} of 44.6 at each location (Table 3.11.2.2-1).

The Destin Compressor Station would be located in Clarke County, Mississippi, approximately 8 miles northwest of Shubuta, Mississippi. The land surrounding the site consists primarily of forest. The nearest NSA is a residence located approximately 1,400 feet east-northeast of the anticipated location of the compressor station. On September 22, 2006, Gulf South conducted an ambient sound-level survey at the NSA. Noise sources during the sound-level survey included traffic on local roads, insects, birds, and wind. Measured noise at NSA #1 was determined to be 41.9 dBA, with a calculated L_{dn} of 48.3 dBA (Table 3.11.2.2-1).

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.

TABLE 3.11.2.2-1 Existing Noise Levels at Nearest Noise-Sensitive Areas from the Proposed Southeast Expansion Project Compressor Stations				
Noise Sensitive Area (NSA)	Distance/Direction of NSA to Compressor Station Site (feet)	Measured L_d (dBA)	Estimated L_n (dBA)	Calculated L_{dn} (dBA)
Delhi Compressor Station				
NSA #1	1,100 – west	53.6 dBA	45.0 dBA	54.2 dBA
NSA #2	1,500 – northwest	60.9 dBA	45.0 dBA	59.5 dBA
NSA #3	900 – northeast	40.2 dBA	40.0 dBA	46.4 dBA
Harrisville Compressor Station				
NSA #1	4,200 – east	37.1 dBA	37.1 dBA	43.5 dBA
NSA #2	5,600 – south southeast	42.1 dBA	42.1 dBA	48.5 dBA
NSA #3	4,800 – northwest	38.2 dBA	38.2 dBA	44.6 dBA
NSA #4	2,600 – northwest	38.2 dBA*	38.2 dBA*	44.6 dBA*
NSA #5	3,700 – north-northwest	38.2 dBA*	38.2 dBA*	44.6 dBA*
NSA #6	4,000 – north-northwest	38.2 dBA*	38.2 dBA*	44.6 dBA*
Destin Compressor Station				
NSA #1	1,400 east northeast	41.9 dBA	41.9 dBA	48.3 dBA
Notes:				
L _d = daytime sound levels				
L _n = nighttime sound levels				
L _{dn} = day-night equivalent sound level				
dBA = decibels on the A-weighted scale				
* Ambient sound level not measured but should be similar to measured ambient sound level at NSA #3				

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 (L_{dn}) 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 10 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 (L_{dn}) at two of the 24 HDD entry and exit sites due to HDD operations. Predicted sound levels ranged from 57.3 to 59.21 dBA (L_{dn}) at these two sites, as

shown in Table 3.11.2.3-1. Based on the acoustical assessment, all HDD locations would contribute below a 10 dBA noise increase above the ambient sound levels.

To ensure that NSAs are not exposed to excessive noise during nighttime drilling operations, Gulf South developed a plan for HDD operations that have the potential to exceed 55 dBA (L_{dn}), as listed in Table 3.11.2.3-1 below. The plan would install a temporary noise barrier system around the primary area of equipment at either the HDD entry side or HDD exit side. The barrier could be installed around two or three sides of the HDD equipment area. For example, the barrier could be constructed of 3/4-inch-thick plywood panels (e.g., barrier height should be at least 16 feet). If a plywood-type barrier is employed, it is also recommended that at least 60 percent of the inside surface of the barrier (i.e., surface facing the equipment) should be sound absorptive (e.g., attach 2-inch-thick fiberglass duct board). In addition, it is recommended that any diesel engines used to drive generators/pumps associated with HDD operations should include an adequate exhaust muffler (e.g., minimum, hospital-grade exhaust silencer). It should be noted that reducing the noise of mobile equipment, such as a crane or backhoe, is much more difficult than stationary engines and equipment since mobile equipment may have to work outside the general HDD equipment area.

Table 3.11.2.3-1 summarizes the projected L_{dn} at the closest NSA at each HDD site in which the benchmark sound criterion could be exceeded assuming that a temporary noise barrier is not employed successfully. For reference, a barrier system, if properly employed, could provide approximately 6 to 8 dB reduction of the noise associated with HDD stationary equipment. Based on the projected HDD noise levels, distances from HDD activity to the nearest NSAs, and Gulf South's HDD plan described above, HDD activity impacts would be minor and temporary at all nearby NSAs.

HDD No.	Location of HDD in Which Benchmark Criterion Could Be Exceeded	Entry or Exit Point	Distance and Direction of Closest NSA	Calculated L_{dn} Due to Drilling Activity	Estimated L_{dn} With a Temporary Noise Barrier Employed
01	Dabbs Creek and Hwy. 49	Entry	1,200 ft. (west)	57.3 dBA	51.2 dBA
08	Interstate 59	Entry	1,000 ft. (SW)	59.1 dBA	53.0 dBA

Operational Noise

During operation of the proposed Project, potential noise impacts would be limited to the vicinity of the new 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 perforated liner. The building ventilation system vents would be equipped with acoustical louvers or duct silencers.

The expected L_{dn} at NSA #1 closest to the Delhi Compressor Station would be 51.0 dBA due to sound generated by operation of the new station. When combined with the existing ambient noise level, the L_{dn} would be about 55.9 dBA at NSA #1, as shown in Table 3.11.2.3-2. The expected L_{dn} at NSA #2 is an estimated 47.6 dBA and 59.8 dBA when combined with the existing ambient noise level. Expected noise levels for NSA #3 is estimated to be 52.9 dBA and 55.5 dBA when combined with existing ambient noise levels. Predicted noise at the NSAs attributable to the Delhi Compressor Station is below the FERC specification of 55 dBA (L_{dn}). It should be noted that although NSA #3 is located 900 feet from the compressor station, this site is not expected to exist at the time of operation. As a result, no significant impact on the noise environment is anticipated as a result of typical operations at the Delhi Compressor Station.

The expected L_{dn} at NSA #4 closest to the Harrisville Compressor Station would be 42.3 dBA due to sound generated by operation of the new station. When combined with the existing ambient noise level, the L_{dn} would be about 44.6 dBA at NSA #4. Table 3.11.2.3-3 provides the ambient sound level at each NSA, the estimated contribution of the proposed station operating at full load at each NSA, the calculated sum of the two, and the potential noise increase at each NSA due to the station's contribution. The predicted noise attributable to the Harrisville Compressor Station at all NSAs is below the FERC specification of 55 dBA (L_{dn}). As a result, no significant impact on the noise environment is anticipated as a result of typical operations at the Harrisville Compressor Station.

The expected L_{dn} at NSA #1 closest to the Destin Compressor Station would be 49.0 dBA due to sound generated by operation of the new station. When combined with the existing ambient noise level, the L_{dn} would be about 51.7 dBA at NSA #1, as shown in Table 3.11.2.3-4. This level is below the FERC specification of 55 dBA (L_{dn}). As a result, no significant impact on the noise environment is anticipated as a result of typical operations at the Destin Compressor Station.

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 3.11.2.3-1, and that hospital-grade mufflers would be installed on engines that do not move while operating at HDD sites listed in Table 3.11.2.3-1.

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

TABLE 3.11.2.3-2 Predicted Noise Contribution of the Delhi Compressor Station at NSAs					
Noise-Sensitive Area (NSA)	Distance/Direction of NSA to Compressor Station Site (feet)	Existing Ambient L_{dn} (dBA)	Estimated Project L_{dn} (dBA)^a	Total Estimated L_{dn} (dBA)^b	Predicted Noise Increase (dBA)^c
Delhi Compressor Station					
NSA #1	1,100 feet (W)	54.2 dBA	51.0 dBA	55.9 dBA	1.7 dB
NSA #2	1,500 feet (NW)	59.5 dBA	47.6 dBA	59.8 dBA	0.3 dB
NSA #3	900 feet (NE)	46.4 dBA	52.9 dBA	55.5 dBA	3.6 dB
Notes:					
L _{dn} = day-night equivalent sound level					
dBA = decibels on the A-weighted scale					
a Estimated L _{dn} sound levels are based on operation of compressor units at compressor station with noise control measures installed as proposed.					
b Estimated total L _{dn} = 10 log (10(Ambient L _{dn} /10) + 10 (Predicted L _{dn} /10)).					
c Estimated increase in the ambient L _{dn} sound levels due to operation of compressor units at compressor station.					

TABLE 3.11.2.3-3 Predicted Noise Contribution of the Harrisville Compressor Station at NSAs					
Noise Sensitive Area (NSA)	Distance/Direction of NSA to Compressor Station Site (feet)	Existing Ambient L_{dn} (dBA)	Estimated Project L_{dn} (dBA)^a	Total Estimated L_{dn} (dBA)^b	Predicted Noise Increase (dBA)^c
Harrisville Compressor Station					
NSA #1	4,200 feet (E)	43.5 dBA	36.9 dBA	44.4 dBA	0.9 dB
NSA #2	5,600 feet (SSE)	48.5 dBA	33.6 dBA	48.6 dBA	0.1 dB
NSA #3	4,800 feet (NW)	44.6 dBA	35.5 dBA	45.1 dBA	0.5 dB
NSA #4	2,600 feet (NW)	44.6 dBA	42.3 dBA	44.6 dBA	2.0 dB
NSA #5	3,700 feet (NNW)	44.6 dBA	38.4 dBA	45.5 dBA	0.9 dB
NSA #6	4,000 feet (NNW)	44.6 dBA	37.6 dBA	45.4 dBA	0.8 dB
Notes:					
L _{dn} = day-night equivalent sound level					
dBA = decibels on the A-weighted scale					
a Estimated L _{dn} sound levels are based on operation of compressor units at compressor station with noise control measures installed as proposed.					
b Estimated total L _{dn} = 10 log (10(Ambient L _{dn} /10) + 10 (Predicted L _{dn} /10)).					
c Estimated increase in the ambient L _{dn} sound levels due to operation of compressor units at compressor station.					

TABLE 3.11.2.3-4 Predicted Noise Contribution of the Destin Compressor Station at NSAs					
Noise Sensitive Area (NSA)	Distance/Direction of NSA to Compressor Station Site (feet)	Existing Ambient L _{dn} (dBA)	Estimated Project L _{dn} (dBA) ^a	Total Estimated L _{dn} (dBA) ^b	Predicted Noise Increase (dBA) ^c
Destin Compressor Station					
NSA #1	1,400 feet (ENE)	48.3 dBA	49.0 dBA	51.7 dBA	3.4 dB
Notes:					
L _{dn} = day-night equivalent sound level					
dBA = decibels on the A-weighted scale					
a Estimated L _{dn} sound levels are based on operation of compressor units at compressor station with noise control measures installed as proposed.					
b Estimated total L _{dn} = 10 log (10(Ambient L _{dn} /10) + 10 (Predicted L _{dn} /10)).					
c Estimated increase in the ambient L _{dn} sound levels due to operation of compressor units at compressor station.					

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

- Gulf South should file noise surveys with the Secretary no later than 60 days after placing each of the Delhi, Harrisville, and Destin Compressor Stations in service. If the noise attributable to operation of all of the equipment at any compressor station at full load exceeds an L_{dn} of 55 dBA at any nearby NSA, Gulf South should file a report on what changes are needed and should install the additional noise controls to meet the level within one 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.**

If Gulf South provides assurance that any noise impacts have been mitigated, as required by the above recommendations, we believe that Project-related operations would not result in a significant effect on the noise environment.

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) 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 would 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 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 above ground 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 man-made features. Gulf South has reported that the following segments of the proposed pipeline would be designated as Class 2:

- MP 29.2 to MP 30.4 (6,448 feet)
- MP 36.2 to MP 36.5 (1,745 feet)
- MP 54.2 to MP 55.0 (3,967 feet)
- MP 75.5 to MP 76.3 (3,008 feet)
- MP 87.1 to MP 88.0 (4,545 feet)
- MP 88.1 to MP 88.6 (2,643 feet)
- MP 94.4 to MP 95.4 (5,075 feet)

The remainder 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 must 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 (HCA). 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 do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate in 49 USC 60109 for OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

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

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

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

- 20 or more buildings intended for human occupancy
- 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. HCAs along the proposed Project route include the following locations:

- MP 7.3 to MP 7.8 (2,839 feet)
- MP 51.3 to MP 52.0 (3,897 feet)

The pipeline integrity management rule for HCAs requires inspection of the entire pipeline HCAs every seven years.

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

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

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

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

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
- 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 a 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.

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
- In the judgment of the operator was significant, even though it did not meet the above criteria

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

information than subsequent years, has been subject to detailed analysis, as discussed in the following sections.⁴

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

Sources: Jones et al. (1986); USDOT, OPS, <http://ops.dot.gov/stats.htm> (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.

TABLE 3.12.2-2 Outside Forces Incidents by Cause (1970 through 1984)	
Cause	Percent
Equipment operated by outside party	67.1
Equipment operated by or for operator	7.3
Earth movement	13.3
Weather	10.8
Other	1.5

Source: Jones, et al. (1986)

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

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

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

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. Furthermore, 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 shows 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.

Corrosion Control	Incidents per 1,000 Miles per Year
None – bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11

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 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.

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 301,000 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 901 years. This would represent a slight increase in risk to the nearby public.

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

Notes:

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

b 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).

Sources: Jones et al. (1986); USDOT, OPS, <http://ops.dot.gov/stats.htm> (2006).

TABLE 3.12.3-2 Nationwide Accidental Deaths	
Type of Accident	Fatalities
All accidents	90,523
Motor vehicle	43,649
Falls	14,985
Drowning	3,488
Poisoning	9,510
Fires and burns	3,791
Suffocation by ingested object	3,206
Tornado, flood, earthquake, etc. (1984 to 1993 average)	181
All liquid and gas pipelines ^a (1978 to 1987 average)	27
Gas transmission and gathering lines ^b (non-employees only, 1970 to 1984 average)	2.6
Notes:	
a USDOT, "Annual Report on Pipeline Safety – Calendar Year 1987."	
b Jones et al. (1986).	
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, 118th Edition."	

3.12.4 Additional Security and Safety Issues

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. The FERC has taken measures to limit the distribution of information to the public regarding facility design to minimize the risk of sabotage. Facility design and location information is removed from the FERC's website to ensure that sensitive information filed under Critical Energy Infrastructure Information is not readily available. Furthermore, 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.

3.13 CUMULATIVE IMPACT

In accordance with NEPA and the FERC policy, we considered the cumulative impacts of the proposed Southeast Expansion 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, 1997; USEPA, 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.
- Cause this impact within all, or part of, the time span 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 parish traversed by the proposed project. Most effects of more distant projects we identified are not assessed because their impact would generally be localized and not contribute significantly to cumulative impact in the proposed project area.

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.

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 3.13.1-1).

3.13.1 Other Natural Gas Pipeline Projects

The FERC has applications for two other proposed natural gas pipeline projects that would traverse the same general areas as the proposed Southeast Expansion Project in Louisiana, Mississippi, and Alabama. They include (1) CenterPoint Energy and Spectra Energy's Southeast Supply Header (SESH) Project, and 2) Gulf South's East Texas to Mississippi Expansion (ETM) Project. In addition, the FERC recently issued a Certificate for CenterPoint Energy Gas Transmission Company's (CEGT's) Carthage to Perryville Project (CTP Project), which is also located in northern Louisiana. See Figure 3.13.1 and Tables 3.13.1-1 and 3.13.1-2 for illustration of the locations and comparative impacts of these three projects along with the proposed Project.

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 the issuance of permits. 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.

TABLE 3.13.1-1 Existing or Proposed Natural Gas Projects that Would Cumulatively Impact Resources in the Southeast Expansion Project Area			
Project	Description	Anticipated Construction Date	Counties/Parishes within Project Area
Natural Gas Pipeline Projects			
Carthage to Perryville	Construct and operate 172 miles of 42-inch-diameter natural gas pipeline	2006-2007	Panola County, Texas Caddo, DeSoto, Red River, Bienville, Jackson, Ouachita, and Richland Parishes, Louisiana
East Texas to Mississippi Expansion Project	Construct and operate 242 miles of 42-inch-diameter natural gas pipeline	2007	Panola County, Texas DeSoto, Red River, Bienville, Jackson, Ouachita, and Richland Parishes, Louisiana Warren, Hinds, Copiah, Simpson, and Walthall Counties, Mississippi
Southeast Supply Header Project	Construct and operate 104 miles of 42-inch-diameter and 165 miles of 36-inch-diameter (269 miles total) natural gas pipeline	2008	Richland and Madison Parish, Louisiana Warren, Claiborne, Copiah, Lawrence, Jefferson Davis, Covington, Jones, Forrest, Perry, Greene, George, and Jackson Counties, Louisiana Mobile County, Alabama
Southeast Expansion Project	Construct and operate 111 miles of 42-inch-diameter natural gas pipeline	2007-2008	Simpson, Smith, Jasper, Clarke Counties, Mississippi Choctaw County, Alabama Richland Parish, Louisiana
Gulf Crossing Project	Construct and operate a 351-mile-long, 42-inch-diameter natural gas pipeline, and 16 miles of 42-inch-diameter looping	2008	Grayson, Fannin, Lamar, Delta, Hopkins, Franklin, Titus, Morris, and Cass Counties, Texas Bryon County, Oklahoma Caddo, Bossier, Webster, Claiborne, Lincoln, Union, Ouachita, Morehouse, Richland and Madison Counties, Louisiana
MidContinent Express Project	Construct and operate 262 miles of 42-inch-, 193 miles of 36-inch-, and 40 miles of 30-inch-diameter (495 miles total) natural gas pipeline	2008	Looping (Hinds, Copiah, Simpson, Mississippi) Bryan County, Oklahoma Lamar, Red River, Franklin, Titus, Morris, and Cass Counties, Texas Caddo, Bossier, Webster, Claiborne, Lincoln, Union, Ouachita, Morehouse, Richland, and Madison Counties, Louisiana Warren, Hinds, Rankin, Simpson, Smith, Jasper, and Clarke Counties, Mississippi Choctaw County, Alabama
Notes: N/A = Not Available Associated proposed lateral pipelines not included			

Non-Internet Public

ENVIRONMENTAL IMPACT STATEMENT FOR THE
PROPOSED SOUTHEAST EXPANSION PROJECT
Docket No. CP07-032-000

Page 3-120

Figure 3.13-1

Approximate Location of Natural Gas Pipeline Projects Near the
Proposed Southeast Expansion Project

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

While it is not certain if or when these actions will occur, its similarity and proximity to the proposed Project merits further consideration. The FERC (1989) considers that the general impacts of building multiple pipelines would be primarily additive. Based on the project scope, geographic location, and preliminary information, we anticipate that the SESH Expansion, ETM Expansion and CTP Projects would result in environmental impacts similar to those of the proposed Project.

CEGT's Carthage to Perryville Project

CEGT completed construction of its CTP Project in June 2007, a 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 consists of 172 miles of pipeline and two compressor stations that total 41,240 hp. The pipeline connects multiple receiving points in east Texas with CenterPoint's Perryville Hub and four new interstate pipeline interconnections. The FERC issued CEGT its Certificate on October 2, 2006.

The CTP Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Texas and Louisiana. Detailed information regarding the environmental impacts that would be associated with construction and operation of the CTP 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.

East Texas to Mississippi Expansion Project

The ETM Expansion Project, also proposed by Gulf South, is an approximate 242-mile, 36-inch and 42-inch OD natural gas pipeline. This project includes the addition of 40,302 Hp of additional compression at one existing compressor station, and two new compressor stations with 30,000 Hp and 40,302 Hp. The ETM Expansion Project runs from Panola County, Texas in an easterly direction across Louisiana and ends in Simpson County, Mississippi. The terminus of the pipeline is Gulf South's existing Index 130, which is also the beginning of the proposed Southeast Expansion Project. The ETM Expansion Project was approved by the Commission on June 18, 2007, and is currently under construction.

The ETM Expansion Project is considered here with respect to the potential for cumulative impacts to the natural and human environments in Louisiana (Delhi area) and Mississippi. The proposed project has been filed and a Final EIS was issued in May 2007 and is being evaluated by the FERC. Detailed information regarding the environmental impacts that would be associated with construction and operation of the ETM Expansion Project can be viewed on the FERC website under Docket No. CP06-446-000.

Southeast Supply Header Project

Spectra Energy Gas Transmission (SEGT) and CEGT have proposed construction of a new 36-inch-diameter natural gas pipeline system that would extend approximately 269 miles southeast from Delhi, Louisiana in Richland Parish, Louisiana to near Coden, Alabama, in Mobile County, Alabama. In addition to the 270 miles of pipeline construction, the SESH Project would add three new compressor stations totaling 51,385 Hp. 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 has been filed and is being evaluated by the FERC. The Draft EIS was issued on April 27, 2007. 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.

**TABLE 3.13.1-2
Environmental Resources That Would Be Cumulatively Affected During Construction and Operation of Projects
in the Vicinity of the Proposed Southeast Expansion Project**

Project (Anticipated Construction Date)	Total Length/ Length of Collocation (miles)	Total Land Disturbance (acres)	Pipeline Diameter and Proposed Perm ROW Width	Open-Cut Waterbody Crossings	Wetlands Disturbed During Construction	Forested Wetlands Disturbed	Forestland Cleared	Federally Listed Endangered, Threatened, or Candidate Species	Residences Within 50 Feet	Potential National Register of Historic Places Sites
Carthage to Perryville (2006-2007)	172 40	2,498 (1,248 permanently)	42-inch 60 feet	104 perennial 136 intermittent	127 wetlands 50 acres	86 acres	1,316 acres	6	0	2
East Texas to Mississippi Expansion Project (2007) Docket No. CP06-446	242 185	4,034 (1,542 permanently)	42-inch 50 feet	780	301 wetlands 115 acres	81 acres	1,838 acres	10	4	
Southeast Supply Header Project (2008) Docket No. CP07-44, 45	269 0	3,417 (1,631 permanently)	36-inch for 165 miles 42-inch for 104 miles 50 feet	177 perennial 448 intermittent	246 wetlands 239 acres	249 acres	2,171 acres	19	6	6
Southeast Expansion Project (2008) Docket No. CP07-32	111 73	1,727 (857 permanently)	42-inch 50 feet	92 perennial 159 intermittent	129 wetlands 89 acres	48 acres	1,329 acres	9	18	9
Gulf Crossing Project (2008) Docket No. CP07-398	367 212	5651 (2698 permanently)	42-inch 60 feet	245 perennial 627 intermittent	147 wetlands 163 acres	127 acres	2,398 acres	16	15	3

Gulf Crossing Project

Boardwalk Pipelines has proposed construction of a new 42-inch-diameter natural gas pipeline system that would extend approximately 351 miles southeast from Grayson County, Texas, to Madison Parish, Louisiana. Additionally, the Gulf Crossing Project would include 4.5 miles of 42-inch-diameter pipeline looping in Madison Parish, Louisiana, and 11.2 miles of 42-inch-diameter pipeline looping in Hinds, Copiah, and Simpson Counties, Mississippi. The route would be collocated for 289 miles with the proposed MidContinent Express Project.

The Gulf Crossing Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Louisiana. The project was filed with the Commission on June 19, 2007, and is being evaluated by the FERC, but has not yet been approved. Detailed information regarding the environmental impacts that would be associated with construction and operation of the Gulf Crossing Project can be viewed on the FERC website under Docket No. CP07-398.

MidContinent Express Project

Kinder Morgan has proposed construction of a new 24-inch and 36 -inch-diameter natural gas pipeline system that would extend approximately 495 miles southeast from Bryan County, Oklahoma to Choctaw County, Alabama. The route would be entirely collocated with the SESH Project, then the ETM Expansion Project, and finally with the proposed Project. Landowners along the proposed Project could be (or may have already been) approached by Kinder Morgan representatives regarding an additional easement on their land. If the MidContinent Express Project is constructed as presently envisioned, this would represent a cumulative land use effect along with the proposed Project's right-of-way.

The MidContinent Express Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Louisiana, Mississippi and Alabama. The project is in the Pre-filing stage and is being evaluated by the FERC, but has not yet been approved. Detailed information regarding the environmental proceedings of the MidContinent Express Project are on the FERC website under Docket No. PF07-004-000.

3.13.2 Unrelated Projects

Local government planning officials were contacted to determine whether any new development is scheduled to occur in the vicinity of the Southeast Expansion Project. One proposal for new residential development was found to be pending within 0.25 mile of the construction right-of-way at MP 11 (Section 3.8.3). Based on our own research, no road projects are known to be located in the area of the proposed Project. The FERC would have no authority over permitting, licensing, funding, construction, or operation of highway projects. Federal, state, and local agencies must review highway 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 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. See Tables 3.13.1-1 and 3.13.1-2 for a comparative summary of the proposed construction projects in the vicinity of the proposed Project.

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 plans (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 145 wetland areas, resulting in a total of approximately 68.94 acres of wetland disturbance, including approximately 17.85 acres of PFO 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. Furthermore, discharges to wetlands and other surface waters associated with construction and operation would require review, approval, and mitigation (if necessary) under the, LDEQ, MDEQ and ADEM stormwater discharge programs.

Construction of the proposed Project would result in 308 individual waterbody crossings. Gulf South proposes to use 15 HDDs to accomplish pipeline installation, including the following five major waterbodies: the Leaf River (MP 44.1), the West Tallahala River (MP 45.3), the Chickasawhay River (MP 89.3), and one unnamed pond (MP 87.8). The Chickasawhay River is also one of the NPS-designated Nationwide Rivers Inventory (NRI) streams that would be crossed. The use of the HDD method would avoid direct impacts to waterbodies and minimize impacts to riparian vegetation at those crossings. Any inadvertent release of drilling fluids (frac-out) or accidental fuel and chemical spills would be greatly reduced by the implementation of Gulf South's HDD Plan and SPCC Plan.

Because most of the projects listed in Tables 3.13.1-1 and 3.13.1-2 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. 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 plans and Procedures and our recommendations; therefore, we believe that cumulative impacts to wetlands and waterbodies would be adequately minimized.

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 646.6 acres of upland forest (slope hardwood and loblolly pine-hardwood forest) and 578.8 acres of pine plantation.

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 such as Crosstex and Transco 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 73 miles, or about 66 percent of the proposed route. Additionally, approximately 33 percent of the proposed pipeline route would traverse agricultural, industrial, open lands, pastures, and other areas that would typically experience rapid revegetation. Furthermore, Gulf South would implement the mitigation measures outlined in its plans and Procedures to encourage the regrowth of native vegetation and discourage the spread of exotic or noxious plant species.

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

3.13.3.3 Land Use

Construction of the proposed Project and other reasonably foreseeable future projects would result in temporary and permanent changes in land use within the Project area. The proposed Project would encumber a total of approximately 1,727 acres of land during construction. Approximately 71.0 percent of that land would be upland forest or pine plantation, 4.6 percent would be agricultural, 10.0 percent would be open land, 3.3 percent would be pasture, and 4.4 percent would be wetland. Residential land, other/roads, commercial/industrial land, and open water land use types would also be affected, accounting for the remaining 6.7 percent. While most of these impacts would be temporary in nature, construction of the proposed Project would result in some permanent land use changes, including

conversion of approximately 283.4 acres of pine plantation, 336.1 acres of forested uplands, and 17.9 acres of forested wetlands to maintained utility right-of-way.

Land use impacts associated with the proposed ETM Expansion Project include approximately 4,034 acres. Land use impacts associated with the existing Denbury, Crosstex, and Transco pipelines have already been accounted for during the permitting of the respective lines. Land use impacts associated with the pipeline projects would likely cause a cumulative effect when considered in conjunction with the proposed Project. Because some or parts of 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 transportation projects 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 currently constructed CTP Project, the proposed Project, and the proposed ETM and SESH Projects, all would contribute to ongoing air emissions associated with operation of compressor stations. In the Delhi, Louisiana area, the proposed Delhi Compressor Station would produce cumulative impacts in association with the CEGT's existing Delhi Compressor Station and the proposed SESH Delhi Compressor Station. Any proposed or planned roadway improvements in the area of the proposed Project 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 in nature, they would be unlikely to contribute significantly to cumulative air quality impacts. Air emissions from operations of portions the proposed Project and the portions of other projects listed in Table 3.13-2 with compressor stations located in the same air quality control region could present a cumulative impact since they would be discharged into a shared air basin. The Delhi Compressor Station is the only station that would be constructed in the same region as other compressor stations listed in Table 3.13-2. Initial screening modeling has been recommended to be performed for the Delhi Compressor Station to identify potential impacts and determine whether further cumulative analysis is warranted. The counties and parish in which the proposed Project would be constructed are in attainment for all NAAQS criteria pollutants. Also, each of the projects listed in Table 3.13-2 would be required to meet all applicable federal and state air quality standards.

3.13.3.5 Noise

Potential noise impacts associated with the proposed Project and those projects listed in Table 3.13-2 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 minor temporary impacts at NSAs near HDD sites. Potential noise-related impacts during operation of the proposed Project and the other pipeline projects listed in Table 3.13-2 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 proposed Delhi, Destin, and Harrisville Compressor Stations 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, for example, in the Delhi, Louisiana, area where two new compressor stations are being proposed. However, both compressor stations would be required to comply with the FERC standards for noise levels. A cumulative noise analysis is currently being performed at the NSAs in common for both compressor stations which should identify any potential noise impacts at this location.

The proposed project would include 18,940 Hp at the Harrisville Compressor Station. The Gulf Crossing Project would add an additional 30,000 Hp at this compressor station. At a minimum, both projects would be required to comply with the FERC standards for noise levels. With both projects complying with the FERC noise level requirements, noise impacts would not be considered significant.

3.13.4 Conclusions

If the proposed Project and the SESH Project are certificated, along with the recently certificated CTP and ETM Expansion Projects, all construction would be within the same general area, and the effects would overlap in time from the years 2006 through 2009. Additionally, the type of project, construction methods, and impacts would be similar. 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 three proposed pipeline projects under our review, the recently certificated CTP Project, Gulf South's proposed project routed along the existing Crosstex and Transco pipeline corridors, have been or would be minimized.

We are recommending additional measures to further reduce the environmental impacts associated with the proposed Project, including requiring Gulf South to evaluate whether it can use about 10 feet of other existing utility rights-of-way to further reduce impacts. 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. For any project that still requires a FERC certificate, we would evaluate the impact during our NEPA review process.