3.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the proposed Carthage to Perryville 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 preconstruction conditions almost immediately afterward. Short-term impacts would continue for approximately 3 years following construction. Impacts were considered long-term if the resources would require more than 3 years to recover. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to preconstruction conditions during the life of the proposed Project, such as with 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, general construction and operational impacts, and proposed mitigation for each resource. CEGT, as part of its proposal, agreed to implement certain measures to reduce impacts, and we evaluated the proposed mitigation measures to determine whether or not additional measures would be necessary to further reduce impact. Additional mitigation measures that we have identified appear as bulleted, boldface paragraphs in the text of the EIS. We will recommend that these measures be included as specific conditions to the Certificate that may be issued to CEGT for the proposed Project.

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

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

3.1 GEOLOGY

3.1.1 Geological Setting

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

The proposed Carthage to Perryville Project would lie within two sections of the Coastal Plain physiographic province: the West Gulf Coastal Plain and the Mississippi Alluvial Plain. The Coastal Plain physiographic province is characterized by gentle, low relief topography with wide, flat river valleys at a slightly lower elevation than the surrounding land.

Topography along the proposed pipeline route would be flat to rolling and gently sloping hills. The elevation of the proposed pipeline route would vary from 300 to 400 feet above mean sea level (AMSL) at the western end of the proposed Project in eastern Texas, to a low of 80 to 100 feet AMSL near the proposed pipeline terminus in eastern Louisiana. The steepest slopes traversed by the proposed Project occur along the borders of river floodplains, where surrounding uplands descend to the valley floor.

The proposed pipeline would cross Paleocene (65 Ma to 54.8 Ma) and Eocene (54.8 Ma to 33.7 Ma) deltaic and shallow marine sandstone and mudstone, Pleistocene (1.8 Ma to 10 ka) terrace gravel and sand, Pleistocene valley train glacial outwash, and Holocene (10 ka to Present) alluvium (Table 3.1.1-1). The land surface along the proposed Project primarily consists of soil and unconsolidated Quaternary (1.8 Ma to Present) sediments, and very little bedrock is exposed at the surface.

The U.S. Department of Agriculture (USDA), NRCS defines shallow bedrock as bedrock occurring in the upper 60 inches of the soil profile. The presence of shallow bedrock indicates areas where blasting would be required during construction of the proposed Project. Soil survey databases indicate that shallow bedrock is not likely to be encountered along the proposed pipeline route in Louisiana, but would be encountered in four soil series traversed in Texas (NRCS 2005a). However, the bedrock that would be encountered consists of loosely consolidated, weathered sandstone and shale that should be easily workable with standard construction equipment and techniques. No bedrock blasting is anticipated for the proposed Project. However, if required, CEGT would notify the FERC before blasting and conduct all blasting and disposal of bedrock material in accordance with our Plan and Procedures and in compliance with applicable federal, state, and local laws, permits, and authorizations. CEGT 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, CEGT 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 geology would consist of disturbances to the existing topography along the construction right-of-way. As described in Section 2.3.1, all areas disturbed during pipeline construction would be finish-graded and restored as closely as possible to pre-construction contours during cleanup and restoration. Additionally, blasting is not anticipated as the proposed Project would be unlikely to encounter significant bedrock exposures. Similarly, geologic conditions present at the proposed compressor station and aboveground facility sites would not require blasting, special equipment, or techniques. For these reasons, construction and operation of the proposed Project would be unlikely to result in significant alterations of the topography or geological resources of the proposed Project area.

3.1.2 Mineral Resources

Mineral resources actively extracted in Texas and Louisiana include lignite (coal), salt, sulfur, sand, gravel, and clay. Natural gas and oil are also actively extracted in eastern Texas and western Louisiana. Though salt, sulfur, and lime are also commercially mined in some portions of Louisiana, exploited mineral resources in the proposed Project area primarily consist of lignite, gravel, sand, and clay.

CEGT used U.S. Geological Survey (USGS) topographic maps to identify mining sites within a one-mile radius of the proposed pipeline route and aboveground facilities. No mineral resources were identified within one mile of the proposed Project facilities in the State of Texas, and consequently construction and operation of the proposed Project would be unlikely to affect mineral resources there.

TABLE 3.1.1-1
Geologic Units Underlying the Proposed Carthage to Perryville Project Facilities

Cumulative Length Crossed (miles)	Group/Formation/ Type	Description	Age
0.7	Terrace	Sand	Pleistocene and Holocene
43.8	Alluvium	Gray to brownish gray clay and silty clay, reddish brown in the Red River Valley, some sand and gravel locally. Includes all alluvial valley deposits except natural levees of major streams.	Holocene
14.6	Natural Levees	Gray and brown silt, silty clay, some very fine sand, reddish brown along the Red River. Shown only on past and present courses of major streams.	Holocene
17.4	Braided Stream Terraces	Light gray, tan, and brown fine to coarse sand, some clay, silt, and gravel. Glacial outwash of ancestral Arkansas River.	Pleistocene
7.6	Braided Stream Terraces – Loess	Tan to reddish brown massive silt with some clay and minor amounts of very fine sand. Stippled map units are those overlain by 1 to 9 meters of loess. Also see Qbs detailed description.	Pleistocene
1.0	Deweyville Terrace	Gray mixed with brown-to-red clay and silty clay; some sand and gravel locally. Topographically higher than Holocene alluvium and lower than Prairie terraces. Found along streams of intermediate size.	Pleistocene
3.9	High Terraces	Tan to orange clay, silt, and sand with a large amount of basal gravel. Surfaces are highly dissected and less continuous than lower terraces. Composed of terraces formerly designated as Willana, Citronelle, and the highest Bentley.	Pleistocene
2.0	Intermediate Terraces	Light gray to orange-brown clay, sandy clay, and silt; much sand and gravel locally. Surfaces show more dissection and are topographically higher than the Prairie. Composed of terraces formerly designated as Montgomery, Irene, and most of the Bentley.	Pleistocene
10.2	Prairie Terraces	Light gray to light brown clay, sandy clay, silt, sand, and some gravel. Surfaces generally show little dissection and are topographically higher than the Deweyvile. Three levels are recognized: two along alluvial valleys, the lower coalescing with its broad coastwise expression; the third, still lower found intermittently gulfward.	Pleistocene
25.0	Wilcox Group	Gray to brown lignitic sands and silty to sandy lignitic clays, many seams of lignite; some limestone and glauconite. Includes small Carrizo Sand outcrops.	Paleocene to Eocene
1.5	Cane River Formation	Brown silty clay with basal glauconitic, fossiliferous silts which may weather to ironstone locally.	Eocene
22.2	Cockfield Formation	Brown lignitic clays, silts, and sands; some sideritic glauconite may weather to brown ironstone in lower part.	Eocene
4.2	Cook Mountain Formation	Greenish gray sideritic, glauconitic clay in upper part may weather to brown ironstone; yellow to brown clays and fossiliferous marl in lower part may weather to black soil. Ironstone concretions near base.	Eocene
17.0	Sparta Formation	White to light gray massive sands with interbedded clays; some thin interbeds of lignite or lignitic sands and shales.	Eocene

Source: USGS 1984

Lignite is a low-grade form of coal formed by heating and compression of organic deposits. Lignite has limited economic value because it contains a low percentage of solid carbon and thus has a low energy value per unit mass. Though two, active lignite mines located in DeSoto and Red River Parishes, Louisiana, produce in excess of 3 million tons of lignite per year, no active lignite mines occur near the proposed Project. We are also unaware of any new or planned mines in the area.

Louisiana is a significant producer of construction sand and gravel, industrial sand and gravel, and common clays (Louisiana Geological Survey/USGS 2003), and most of the parishes traversed by the proposed Project contain major production areas for these mineral resources. Caddo, DeSoto, Red River, Bienville, and Ouachita Parishes contain major construction sand and gravel producing areas. Caddo and Bienville Parishes also contain major clay producing areas, and Red River Parish also contains a major industrial sand producing area. CEGT identified seven gravel pits, three sand pits, and two clay pits within one mile of the proposed Project facilities. Of these operations, four sand and gravel pits are located within 0.25 mile of the proposed Project route, and the potential for Project effects to these operations is discussed further below.

An active gravel pit occurs approximately 640 feet north of the proposed pipeline construction right-of-way at MP 63.6. The initially planned pipeline route paralleled an existing natural gas pipeline in the vicinity of this mining operation and would have passed more closely to the mine. However, the pipeline route was shifted to the south in this area to avoid a cemetery and minimize the potential for conflict with the mining operation. Furthermore, the cemetery and existing natural gas pipeline right-of-way would both be located between the current mining operation and the proposed pipeline route, which would greatly limit the potential for future expansion of the mining operation in the direction of the proposed pipeline. The existing natural gas pipeline right-of-way would also lie between the proposed Project route and an inactive sand pit that occurs approximately 300 feet north of the proposed Project route at MP 64.2. For these reasons, it is unlikely that the proposed Project would impact any future activities at either of these mining operations.

The proposed pipeline construction right-of-way would pass approximately 300 feet north of an active sand pit at MP 92.4, and would therefore not impact any current mining activities there. Though the proposed pipeline would parallel an existing electric transmission line right-of-way in this area, the proposed Project route would be located between the existing right-of-way and the sand pit. Therefore, it is possible that future expansion of the sand mining operation would be partially limited due to the presence of the pipeline. Similarly, the proposed pipeline construction right-of-way would intersect a gravel pit at MP 88.3, and would conflict with current and future extraction of mineral resources by that operation. As part of the right-of-way procurement process, CEGT would negotiate with the affected landowners/operators to obtain an easement agreement that eliminates mining activities in the immediate vicinity of the permanent pipeline right-of-way and/or establishes an adequate buffer zone between active mining areas and the proposed pipeline. Compensation for any losses or limitations on future expansion of mining operations would be addressed during those easement negotiations.

Oil and natural gas extraction is common in Panola County, Texas, and DeSoto Parish, Louisiana, and is an important economic resource in those areas. As of February 2006, there were over 4,000 producing gas wells and 239 producing oil wells in Panola County (Railroad Commission of Texas 2006), and over 1,800 producing gas and oil wells were documented in DeSoto Parish during 2005 (Louisiana Department of Natural Resources 2006). Additionally, CEGT identified more than 275 gas and oil wells within 0.25 mile of the proposed pipeline route.

Construction and operation of the proposed Project is not expected to have an impact on exploitable oil and natural gas resources. The proposed pipeline route would avoid all existing well sites, and therefore impacts to any wells at and near the ground surface are unlikely. Excavation of the pipeline

trench would typically only extend to a depth of approximately 6.5 feet below the ground surface, and none of the proposed HDDs would exceed a depth greater than 100 feet below the ground surface. Current oil and gas extraction operations are conducted at thousands of feet below the ground surface and would therefore not be affected by Project-related construction. Furthermore, since new drilling operations would be conducted outside of the permanent right-of-way, the proposed Project would not impact future oil or gas field development.

3.1.3 Paleontological Resources

Paleontological resources are the fossilized remains of prehistoric plants and animals, as well as the impressions left in rock or other materials as indirect evidence of the forms and activities of such organisms. The proposed Project would cross rock units of two distinct ages: Paleocene to Eocene (65 Ma to 33.7 Ma) and Quaternary (1.8 Ma to Present). Quaternary sediments, such as those that occur along the Texas portion of the proposed Project, are generally unconsolidated and have poor preservation potential for fossils. However, some Quaternary fossils have been found in Louisiana, including mastodons and reworked brachiopods eroded from older deposits.

Paleocene and Eocene rocks in Louisiana (Wilcox Group and Claiborne Group) have greater preservation potential and are known to contain some fossils, including whales, and possibly mastodons and camels. However many fossils in these rock units are aragonite, which has low stability and is susceptible to dissolution at near-surface conditions. The proposed pipeline route would cross potentially fossil-bearing Paleocene to Eocene rock units associated with the Cane River Formation (MP 70.4 to 71.4 and MP 71.7 to 72.3) and the Cook Mountain Formation (MP 93.7 to 94.2, MP 95.7 to 99.0, and MP 100.5 to 100.6). However, these rock units have limited or no exposure along the proposed pipeline route, and no known fossil sites have been recorded from these areas previously.

Due to the limited exposure of fossil-bearing rock units crossed by the proposed Project and the general instability of Paleocene and Eocene fossils at shallow depth, it is unlikely that trenching and excavation activities associated with construction of the proposed Project would adversely impact paleontological resources. However, unanticipated paleontological resources could be encountered during construction, and therefore **we recommend that:**

- **CEGT should develop, in consultation with the appropriate agencies, a plan that outlines procedures for documenting unanticipated discoveries of paleontological resources, including photographing and describing specimens, recording detailed location data, and reporting the resources to the Louisiana Geological Survey, the Louisiana Museum of Natural History, and/or the Texas Bureau of Economic Geology. Prior to construction, this plan should be filed with the Secretary for review and written approval by the Director of OEP.**

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. 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

Hazards associated with seismicity and faulting include ground shaking, surface rupture of faults, and offset along normal, reverse, or strike-slip faults. These are especially hazardous to linear, rigid structures, such as pipelines, in which the ground is not moving the same distance or direction.

According to seismic hazard maps of the United States and Louisiana, the proposed Project would be located in a region of low seismic risk (USGS 2006a). The peak acceleration with a 10 percent probability of exceedance in 50 years is 2-3 %g (percent of acceleration due to gravity). The peak acceleration with a 2 percent probability of exceedance in 50 years is 6-8 %g. For comparison, the peak acceleration with a 10 percent probability of exceedance in 50 years near the San Andreas Fault is over 60 %g.

Extreme overthickening of the wedge of sediments in the Gulf of Mexico caused it to collapse under its own weight and spread Gulf-ward. The resulting belt of Gulf-parallel, listric, south-dipping, normal faults borders the Gulf of Mexico and runs through Texas, Louisiana, Mississippi, and Alabama. These faults shallow at depth into detachments in underlying salt, and are decoupled from the crust. Because the stress field of the underlying crust is not known, seismic potential is difficult to determine. However, historically recorded seismicity in the area traversed by the proposed Project has not been significant. Consequently, the potential for seismicity and faulting does not represent a significant risk to 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.

Soils along the proposed pipeline route can be very poorly drained (see Section 3.2), and the resulting saturated soil conditions increase the risk of liquefaction. However, since soil liquefaction risk is closely related to seismic risk, the potential for soil liquefaction is similarly low. Further, the linear extent and ductile nature of pipelines generally make them less susceptible than other structures to the effects of soil liquefaction. Existing building codes and standards applicable to the proposed Project facilities should adequately address the low potential for soil liquefaction.

3.1.4.3 Slope Failures/Landslides

Ground failures can include landslides, debris flows, rock falls, and ground subsidence. Slides, flows, and falls are not anticipated to be of concern to the proposed Project because these phenomena are mainly associated with steep slopes. Topography along the proposed Project is characterized as flat to gently sloping and rolling hills. Additionally, the Landslide Overview Map of the Conterminous United States (USGS 2006b) indicates that the proposed Project lies completely within an area of low landslide susceptibility and incidence.

The proposed compressor and meter station sites are in generally flat areas where slope failure is not expected. Slope failures and landslides would represent a potential hazard along portions of the proposed Project route that would traverse areas of side slopes and rolling terrain. Cutting along slopes, the weight of construction equipment, and unusually high precipitation would increase the potential for slope failures along these areas. However, construction of the pipeline would be accomplished in

accordance with our Plan, which includes measures to control runoff and erosion that would minimize the potential for slope failures. Further, CEGT would implement specialized two-tone construction techniques to provide for safe working conditions in areas potentially susceptible to slope failures (see Section 2.3.2).

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. No areas of karst terrain or subsurface mines are located along the proposed Project, and thus subsidence related to these conditions would not be expected to adversely affect the proposed Project. As described in Section 3.1.2, the proposed Project would traverse areas in eastern Texas and western Louisiana 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 2006c, USGS 2006d). Further, unconsolidated sediments, which are abundant in the Mississippi Embayment, are susceptible to compaction and subsidence.

Ground subsidence can affect pipelines and aboveground facilities by causing a loss of support that would result in bending or rupture of pipelines and weaken the foundations of aboveground facilities. However, the proposed Project facilities would be designed and constructed to meet or exceed the federal safety standards set forth in 49 CFR Part 192, which should ensure integrity of the Project facilities and minimize the potential for any pipe failures due to ground subsidence. Additionally, CEGT 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.

3.2 SOILS

3.2.1 Existing Soil Resources

We analyzed data for soils traversed by the proposed Project using NRCS soil survey databases and county and parish soil surveys. Soil data for Texas are available on the Soil Survey Geographic (SSURGO) database, which is a detailed (1:24,000 scale) geographic information system (GIS) database created by NRCS. Soil data for Louisiana were obtained from printed parish soil surveys and from the State Soil Geographic (STATSGO) database, a coarser-scale (1:250,000) GIS database created by NRCS. Individual county and parish soil surveys from Panola County (USDA 1975) and Caddo (USDA 1980a), Red River (USDA 1980b), Bienville (USDA 2002), Jackson (USDA 1999), Ouachita (USDA 1974), and Richland (USDA 1993) Parishes were also used in our analysis of soil characteristics.

The proposed Project facilities would be located in three Major Land Resource Areas (MLRAs), as designated by NRCS (2006a). The Southern Mississippi Valley Alluvium MLRA is dominated by deep, medium to fine textured Aquept, Aqualf, Aquent, Udoll, and Udalf soils. The Western Coastal Plain MLRA is dominated by deep, coarse textured Udult soils, and the Southern Mississippi Valley Silty Uplands MLRA is dominated by deep, medium textured Udalf soils. Cropland and forestland are the predominant soil uses in each of these MLRAs.

3.2.2 Major Soil Characteristics

3.2.2.1 Pipeline Facilities

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 Table 3.2.2-1, and discussed further below.

Erosion Hazard

Erosion hazard is the potential for soil to erode when unprotected from erosive forces. Many factors influence the erodibility of soils, such as soil structure, drainage characteristics, texture, slope, climate, and vegetation. The NRCS provides an erosion hazard rating in its soil surveys (NRCS 1994). Soils are rated as having a slight, slight-moderate, moderate, or severe erosion hazard. The potential for soil erosion varies along the proposed pipeline route, but about eighty-five percent of the soils that would be traversed have only slight erosion potential (see Table 3.2.2-1). However, about nine percent of the soils are characterized as having severe erosion potential. These soils would generally be confined to areas of side slopes and rolling terrain, which occur along the proposed Project route in Ouachita and Jackson Parishes (MPs 97 to 128).

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 prevent water from draining. Six classes of drainage, ranging from poorly drained to excessively drained, are used to describe the relative wetness of a soil (NRCS 1994). Approximately 30 percent of the soils that would be crossed are moderately well to well drained (see Table 3.2.2-1). Approximately 20 percent of the soils that would be crossed are somewhat poorly to poorly drained.

Presence of Hydric Soils

Hydric soils are defined as “soils that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions” (NRCS 2006b). 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. Hydric soils may also be prone to compaction and rutting. About 44 percent of the soils that would be crossed by the proposed pipeline are classified as hydric (see Table 3.2.2-1). However, much of the land crossed by the proposed pipeline is agricultural land and/or associated with floodplains that are now protected by levees. Consequently, some of the hydric soils crossed by the proposed pipeline route have likely been altered from their undisturbed state.

TABLE 3.2.2-1
Soil Associations Crossed by the Proposed Carthage to Perryville Project Pipeline Facilities

Cumulative Length Crossed (miles)	Soil Association	Drainage Class	Prime Farmland	Hydric Soil	Shallow Bedrock (<60 inches bgs)	Erosion Hazard	Revegetation Potential	Compaction Potential
TEXAS[a]								
0.5	Bienville loamy fine sand, 0 to 5% slopes	Somewhat excessively drained	No	No	No	Slight	Good	Low
0.3	Latch-Mollville complex	Moderately well drained	No	Yes	No	Slight	Poor	Low
0.4	Bowie fine sandy loam, 1 to 8 percent slopes	Well drained	No	No	No	Slight	Good	Low-Moderate
3.3	Cart-Erno complex	Well drained	Yes	No	No	Slight	Good	Low-Moderate
0.7	Kirvin fine sandy loam, 1 to 8 percent slope	Well drained	No	No	Yes	Slight	Good	Moderate
< 0.1	Briley loamy fine sand, 2 to 5% slopes	Well drained	No	No	No	Moderate	Good	Low
0.3	Cuthbert fine sandy loam, 5 to 20 percent	Well drained	No	No	Yes	Moderate	Good	Low-Moderate
1.3	Mantachie clay loam	Somewhat poorly drained	No	Yes	No	Slight	Poor	Low-Moderate
0.3	Marietta fine sandy loam	Moderately well drained	No	No	No	Slight	Fair	Low-Moderate
1.3	Sacul fine sandy loam, 1 to 5 percent slopes	Moderately well drained	No	No	Yes	Moderate	Good	Moderate
1.8	Sacul fine sandy loam, 5 to 20 percent slope	Moderately well drained	No	No	Yes	Moderate	Good	Moderate
1.8	Estes-Mantachie association	Somewhat poorly drained	No	Yes	No	Slight	Poor	Moderate
0.5	Wrightsville loam	Poorly drained	Yes, if Drained	Yes	No	Slight	Fair	Moderate
2.2	Wrightsville-Cart complex	Poorly drained	No	Yes	No	Slight	Fair	Low-Moderate
LOUISIANA[b]								
2.3	Scottsville-Eastwood-Keithville	Moderately well drained to well drained.	Yes	No	No	Slight	Good	Low-Moderate

TABLE 3.2.2-1 (continued)
Soil Associations Crossed by the Proposed Carthage to Perryville Project Pipeline Facilities

Cumulative Length Crossed (miles)	Soil Association	Drainage Class	Prime Farmland	Hydric Soil	Shallow Bedrock (<60 inches bgs)	Erosion Hazard	Revegetation Potential	Compaction Potential
12.6	Keithville-Eastwood-Metcalf	Somewhat poorly drained to moderately well drained	Yes	No	No	Slight	Good	Moderate
4.8	Eastwood-Meth-Guyton	Poorly to moderately well drained	Yes	Yes (Guyton)	No	Slight	Fair	Low-Moderate
3.2	Iuka-Guyton-Mantachie	Very poorly drained to well drained	No	Yes (Guyton)	No	Slight	Moderate	N/A
1.2	Bowie-Ruston-Beauregard	Moderately well to well drained	Yes	No	No	Slight	Good	N/A
2.7	Forbing-Gore-Guyton	Poorly to moderately well drained	No	Yes (Guyton)	No	Slight	Moderate	Moderate
11.4	Moreland-Armistead-Caspiana	Somewhat poorly to well drained	Yes	No	No	Slight	Moderate	Moderate
0.8	Moreland-Severn-Norwood	Somewhat poorly drained to well-drained	Yes	No	No	Slight	Moderate	Moderate
3.7	Bellwood-Sacul-Natchitoches	Well drained to somewhat poorly drained	No	No	No	Slight	Moderate	Moderate-High
9.4	Malbis-Ruston-Boykin	Moderately well to well drained	Yes	No	No	Slight	Good	Low-Moderate
0.5	Boswell-Falkner-Malbis	Moderately well drained to somewhat poorly drained	No	No	No	Slight	Good	Low-Moderate
5.4	Guyton-Ouachita-Iuka	Well drained to very poorly drained	No	Yes	No	Slight	Fair	Low-Moderate
0.6	Buxin-Severn-Urban Land	Well drained to poorly drained	No	No	No	Slight	Fair	Moderate-High

TABLE 3.2.2-1 (continued)
Soil Associations Crossed by the Proposed Carthage to Perryville Project Pipeline Facilities

Cumulative Length Crossed (miles)	Soil Association	Drainage Class	Prime Farmland	Hydric Soil	Shallow Bedrock (<60 inches bgs)	Erosion Hazard	Revegetation Potential	Compaction Potential
9.8	Briley-Betis-McLaurin	Well to somewhat excessively drained	No	No	No	Slight	Moderate	Low-Moderate
9.0	Darley-Sacul-Bowie	Well drained to moderately well drained	Yes	No	No	Slight	Good	Moderate
8.8	Guyton-Iuka-Ouachita	Well drained to poorly drained	Yes	Yes	No	Slight	Fair	Low-Moderate
0.9	Bowie-Mahan-Sacul	Well drained to moderately well drained	Yes	No	No	Moderate	Good	Moderate
5.3	Briley-McLaurin-Bowie	Well drained to moderately well drained	No	No	No	Severe	Good	Low-Moderate
1.4	Bellwood-Vaiden-Oktibbeha	Somewhat poorly drained	No	No	No	Slight	Moderate	Moderate-High
9.5	Sacul-Savannah-Guyton	Moderately well drained to poorly drained	No	Yes (Guyton)	No	Severe	Moderate	Moderate
1.5	Guyton-Frizzell-Cahaba	Somewhat poorly drained	Yes	No	No	Slight	Moderate	Low-Moderate
2.7	Cadeville-Olla-Ora	Moderately well drained	No	No	No	Slight	Moderate	Low-Moderate
1.7	Guyton-Rosebloom-Barclay	Moderately well drained to poorly drained	Yes	Yes	No	Slight	Fair	N/A
4.5	Ruston-Lucy	Well drained	No	No	No	Slight	Good	N/A
2.3	Frizzell-Providence-Guyton	Somewhat poorly drained	Yes	Yes (Guyton)	No	Slight	Moderate	Low-Moderate
7.7	Perry-Portland-Alligator	Somewhat poorly drained to very poorly drained	No	Yes (Alligator)	No	Slight	Moderate	Moderate-High

TABLE 3.2.2-1 (continued)
Soil Associations Crossed by the Proposed Carthage to Perryville Project Pipeline Facilities

Cumulative Length Crossed (miles)	Soil Association	Drainage Class	Prime Farmland	Hydric Soil	Shallow Bedrock (<60 inches bgs)	Erosion Hazard	Revegetation Potential	Compaction Potential
8.7	Hebert-Portland-Rilla	Somewhat poorly drained	Yes	No	No	Slight	Moderate	Low-Moderate
0.7	Wrightsville-Alligator-Crowley	Poorly drained	Yes	Yes (Alligator)	No	Slight	Moderate	Moderate
8.7	Gilbert-Dexter-Gigger	Well drained to poorly drained	No	Yes	No	Slight	Moderate	Moderate
1.1	Forestdale-Perry-Water	Poorly drained	No	Yes	No	Slight	Fair	Moderate-High
6.9	Gilbert-Forestdale-Necessity	Poorly drained to somewhat poorly drained	No	Yes	No	Slight	Moderate	Low-Moderate
6.0	Calhoun-Grenada-Calloway	Poorly drained to moderately well drained	Yes	Yes	No	Moderate to Slight	Moderate	Low-Moderate

Notes:

bgs = below ground surface

N/A = not available

[a] Source: SSURGO database (NRCS 2005a)

[b] Source: STATSGO database (NRCS 2005b)

Compaction Potential

Compaction modifies the structure of soil and as a result alters its strength and drainage properties. Soil compaction decreases pore space and water-retention capacity, which restricts the transport of air and water to plant roots. As a result, soil productivity and plant growth rates may be reduced, soils may become more susceptible to erosion, and natural drainage patterns may be altered. Consequently, soil compaction is of particular concern in agricultural areas where crop yields would be adversely affected. 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. The liquid limit, which is the percent water content at which a soil changes from a plastic state to a liquid state, is a good indicator of susceptibility to compaction and is used here to approximate compaction potential. High liquid limits have greater compaction potential.

We assigned a compaction potential rating of low, low-moderate, moderate, moderate-high, or high to each of the soil types traversed by the proposed pipeline based on the liquid limit of those soils. Many of the soils that would be traversed by the proposed pipeline are somewhat prone to compaction, with about 46 percent of the soils having a moderate or moderate to high compaction potential (see Table 3.2.2-1). About eight percent of the soils are characterized as having high compaction potential.

Presence of Shallow Bedrock

Rock can be introduced into surface layers of soil during various pipeline construction activities such as blasting and trenching. Such introductions can reduce moisture-holding capacity, thereby reducing soil productivity and creating poor revegetation potential. Additionally, some agricultural equipment may be damaged by contact with large rocks. The presence of shallow bedrock, which is defined as bedrock within 60 inches of the land surface, is often used as an indicator of the potential for introductions of rock to surface layers of soils. Only about three percent of the soils that would be crossed by the proposed pipeline route contain shallow bedrock (see Table 3.2.2-1).

Revegetation Potential

Revegetation potential is a rating of the ability of a soil to support revegetation efforts following construction-related disturbance. The potential for revegetation of each soil type that would be affected by construction of the proposed pipeline was assessed based on such factors as soil texture, drainage properties, wetness, and slope. Taking these factors into account, four general classes were defined for revegetation potential ranging from poor to good (see Table 3.2.2-1). Most of the soils that would be affected by pipeline construction are considered to have good (32 percent) or moderate (51 percent) revegetation potential. Only about two percent of the affected soils are considered to have revegetation concerns (i.e., poor revegetation potential).

Prime Farmland Designation

The NRCS (1993) 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." 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, 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 energy expended. The NRCS determines the prime farmland status of all soil units that have been surveyed, and therefore this information is available directly from the soil survey databases. About 50 percent of the soils that would be affected by the proposed pipeline are classified as prime farmland (Table 3.2.2-1).

3.2.2.2 Aboveground Facilities

As described in Section 2.1, the aboveground facilities for the proposed Project include two compressor stations, six meter/regulator stations, and 11 mainline valves. Nine of the mainline valve sites would be located within the proposed permanent pipeline right-of-way, and thus soil characteristics for those facilities are addressed in Section 3.2.2.1. The remaining mainline valve sites would be collocated within the confines of the Panola and Vernon Compressor Stations.

All of the proposed aboveground facilities would be sited on soils with moderate to good revegetation potential and low to moderate compaction potential. Soil drainage characteristics at the proposed HPL M/R Station (MP 0.0) and compressor station sites would be well drained, but soils at the remaining meter/regulator stations, which would be located in areas of hydric soils, would be moderately to poorly drained. Soils at the site of the proposed Vernon Compressor Station (MP 101.3), which is the only major aboveground facility located in an area of rolling terrain, are characterized as having severe erosion potential. All other aboveground facilities would be located in areas of slight topography with only slight to moderate erosion potential. Shallow bedrock would be encountered at the Panola Compressor Station (MP 8.4) and DEFS-Enbridge M/R Station (RMP 1.4) in Panola County, Texas, but would not be of concern at the other aboveground facility sites. Additionally, the Panola Compressor

Station, the Texas Gas M/R Station (MP 135.5), and the Columbia Gulf M/R Station (MP 171.9) would also affect areas of prime farmland soils.

3.2.3 General Impacts and Mitigation

Construction activities associated with the proposed Project, such as clearing, grading, trenching, and backfilling, have the potential to affect soil resources through multiple mechanisms. The most significant effects include potential increases in soil erosion, compaction, and the loss of soil productivity and fertility by mixing of topsoil and subsoil horizons and changing drainage patterns. Removal of vegetative cover increases the possibility of erosion by wind and water. Mixing of topsoil with subsoil and compaction caused by passage of heavy construction equipment can adversely affect revegetation potential and agricultural productivity. Alteration of the surface topography can affect hydrology, influencing stormwater runoff and soil drainage patterns.

In order to minimize and mitigate the impacts to soils resources described above, CEGT would adopt and follow the guidelines described in our Plan during construction and operation of the proposed Project. The intent of our Plan is to identify baseline mitigation measures for minimizing erosion and enhancing revegetation in upland areas. Mitigation measures identified in our Plan 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. The more important aspects of our Plan regarding erosion control are summarized below.

- At least one third-party EI would be deployed for each construction spread during construction and restoration; 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 authorization and order corrective action.
- Project-related ground disturbance would be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the Certificate.
- Mixing of topsoil with subsoil would be minimized 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, and other areas at the landowner's or land managing agency's request.
- Temporary erosion controls would usually be installed after vegetative clearing but prior to excavation. 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.
- Sediment barriers would be installed (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.
- Topsoil and subsoil would be tested for compaction at regular intervals in areas disturbed by construction activities. Soils disturbed by proposed Project-related activities would be revegetated; all turf, ornamental shrubs, and specialized landscaping would be restored in accordance with the landowner's request or the landowner would be compensated.
- All areas disturbed by Project-related activities would be revegetated or otherwise stabilized. Disturbed areas would be seeded in accordance with written recommendations from local soil conservation authorities or the request of the landowner or land management agency.

- Revegetation efforts would be confirmed through post-construction monitoring of all disturbed areas after the first and second growing seasons following completion of construction activities. In areas not used for agriculture, restoration would be considered successful when the density and cover of non-nuisance vegetation is similar to adjacent undisturbed land. In agricultural areas, revegetation would be considered successful if crop yields were similar to adjacent undisturbed portions of the same field.

CEGT would also develop and implement an SWPPP in compliance with federal and state regulations, if required for the proposed Project. The SWPPP would incorporate the requirements for mitigating upland erosion and revegetation described in our Plan, and would further detail the erosion control structural best management practices, inspection procedures, and reporting protocols to be implemented during construction of the proposed Project.

Other potential impacts during construction would include the accidental release of petroleum hydrocarbons or other hazardous materials, as well as the discovery of contaminated soils during trench excavation and grading activities. During construction, CEGT would implement an SPCC Plan to prevent and contain, if necessary, accidental spills of any material that may contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained and cleaned up in an appropriate manner. CEGT has prepared a general SPCC Plan (Appendix C), which describes the management of hazardous materials, such as fuels, lubricants, and coolants that would be used during construction. CEGT has also indicated that site-specific plans would be developed for each construction spread once the construction contractors have been selected. Because the site-specific SPCC plans have not yet been developed, **we recommend that:**

- **Prior to construction, CEGT should file with the Secretary, for review and written approval by the Director of OEP, site-specific SPCC Plans to govern handling, containment, and cleanup of hazardous materials during construction of the proposed Project.**

Contaminated soils could also be encountered during construction activities along the proposed construction right-of-way or extra workspace areas. If contaminated soils were encountered during construction, CEGT would implement procedures to identify and properly manage the contamination. However, mismanagement of contaminated materials would adversely affect soil and other resources, and CEGT has not yet identified the specific procedures that it would implement if hazardous or contaminated materials were encountered during construction. Therefore, **we recommend that:**

- **CEGT should develop a hazardous and contaminated materials management plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations. This plan should be filed with the Secretary for review and written approval by the Director of OEP prior to construction.**

3.2.4 Site-Specific Impacts and Mitigation

During the Pre-Filing and scoping period for the proposed Project, several commentors expressed concerns that construction of the proposed pipeline would adversely affect agricultural areas through soil compaction and alteration of surface topography and drainage characteristics of precision-leveled fields. Commentors also expressed concerns with an impact of the proposed Project on prime farmland soils. These comments are addressed below.

3.2.4.1 Pipeline Facilities

Soil susceptibility to erosion varies along the proposed pipeline route and is a function of variables such as soil type, topography, vegetation, and climate. Though the majority of soils that would be crossed by the proposed pipeline have only slight erosion potential, some areas of highly erodible soils do occur along the proposed Project route. Severe erosion is not anticipated across most of the proposed Project route due to the relatively flat topography. 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 in Ouachita and Jackson Parishes. Several phases of pipeline construction, including vegetation and pavement clearing/removing, grading, topsoil segregation, open trenching and backfilling, destabilize the soil material and make it susceptible to water and wind erosion. Soils are most susceptible to erosion after vegetation is removed, and before reestablishment of a vegetative cover after the pipeline is installed. Soil erosion would also result from off-road vehicle traffic on the right-of-way following construction.

Soil erosion can be reduced with both temporary and permanent erosion control practices. As described in Section 3.2.3, our Plan describes the temporary and permanent erosion control practices that which CEGT would implement during construction and operation of the proposed Project. Temporary erosion controls would be installed immediately after the initial soil disturbance, and in areas with steep slopes, erosion control devices would be installed at closer intervals than required for more moderately sloped areas. Wherever possible, contours would be returned to their approximate preconstruction condition and revegetated to stabilize the slope. As required by our Pan, CEGT would initiate vegetation restoration efforts within six days of final grading, weather and soil conditions permitting. Revegetation measures are described further below and in Sections 2.3.1 and 3.5. Although there may be some short-term increase in erosion in sloped areas, these slopes would eventually be stabilized and permanent erosion control devices would be installed to avoid long-term erosion problems. Therefore, we do not anticipate that significant long-term soil erosion impacts would result from construction and operation of the proposed pipeline facilities.

As required by our Plan, CEGT would take measures to control unauthorized vehicle access to the proposed pipeline right-of-way during construction and operation. 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. CEGT would coordinate with affected landowners regarding the installation of access barriers on their property.

Compaction damages the structure of the soil and restricts transport of air and water to plant roots. As a result, soil productivity and plant growth rates may be reduced, soils may be made more susceptible to erosion, and natural drainage may be altered. In general, about half of the soils that would be crossed by the proposed pipeline are considered prone to compaction due to the prevalence of hydric soils and soils with poor drainage. Use of the construction right-of-way, extra workspaces, and access roads by heavy construction equipment would therefore 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 our Plan and Procedures, measures such as restricting vehicular traffic, reducing loads, employing lower ground-pressure equipment, and rescheduling certain activities may be used when soil moisture is high to avoid and minimize compaction and rutting.

In agricultural, residential, and wetland areas topsoil would be segregated from other materials excavated from the trench and placed in piles that would usually be opposite the working side of the trench (see Sections 2.3.1 and 2.3.2). Therefore, heavy equipment would not travel on the piles, and compaction of excavated topsoils would be minimized. Due to construction-related activities, some topsoil and subsoil located along the working side of the construction right-of-way would be compacted.

These areas would be tested, and if either the subsoil or topsoil is severely compacted, a paraplow or other deep tillage device would be used to break up the soils. However, during cleanup and restoration activities the topsoil and subsoils in all agricultural and residential areas would be tested for compaction at regular intervals using penetrometers or other appropriate devices in accordance with our Plan. Any severely compacted areas would be plowed with a paraplow or other deep tillage device. In areas where the topsoil was segregated, the subsoil would also be plowed before replacing the segregated topsoil. These measures would ensure that any soil compaction resulting from construction of the proposed pipeline would be only temporary, and thus significant or long-term impacts to soil resources associated with compaction are not anticipated.

Introduction of rock to surface soil layers would not be of concern across most of the proposed pipeline route as only about three percent of the soils that would be crossed by the proposed pipeline route contain shallow bedrock. However, trenching and mixing of the excavated materials in these areas would bring large rocks to the surface, which would adversely impact soil productivity and agricultural practices. In accordance with our Plan, CEGT 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.

As the majority of soils that would be disturbed during construction have moderate to good revegetation potential, vegetation restoration should not be of concern across most of the proposed pipeline route. However, a small percentage of the soils that would be disturbed during construction are characterized as having poor revegetation potential. Revegetation is necessary for the stabilization and restoration of the construction right-of-way, extra work spaces, and areas adjacent to access roads. Revegetation potential may be inhibited by soil erosion, loss of soil productivity through soil compaction, damage to soil structure, loss of soil fertility, damage to drainage systems, and unsuitable seed selection, methods, or planting conditions. To avoid or minimize these conditions and as described above and in Section 2.3.1, CEGT would return the construction right-of-way and extra work areas to preconstruction contours to the extent feasible; control erosion by implementing the procedures in our Plan; segregate and de-compact soils and spread topsoil on the right-of-way during final cleanup; repair any damaged drainage systems; place soil nutrients and lime in upland areas; and seed all disturbed areas. Further, CEGT would consult with the local soil conservation authorities to determine the appropriate seed mixtures for stabilization and permanent erosion control. Based on consultations to date, the NRCS offices of Jackson, DeSoto, Caddo, and Red River Parishes have specifically requested the use of native grass and legume seed mixes for revegetation.

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

Heavy equipment traffic and trenching along the construction right-of-way would 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 damage

were not corrected. CEGT indicates that no known drainage structures would be crossed by the proposed Project. However, CEGT would work with property owners to identify locations of existing drainage structures that would be damaged during construction. If active drainage tiles, culverts, or other drainage facilities were damaged during construction, CEGT would replace or repair them to a condition that is equal to or better than their preconstruction condition. Additionally, CEGT would be responsible for ensuring that all areas affected by construction activities were finish-graded and restored as closely as possible to preconstruction contours. Although damage to drainage structures and patterns would result in short-term impacts, the corrective procedures to be implemented by CEGT would avoid or minimize any long-term impacts.

About half of the 2,226.2 acres of land that would be encompassed by the proposed pipeline construction right-of-way and extra workspaces contain soils classified as prime farmland soils. Similarly, about half of the land contained within the permanent pipeline right-of-way contains prime farmland soils. In the Draft EIS, we recommended that CEGT complete any required prime farmland conversion documentation in coordination with the NRCS. However, 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. As described above, CEGT would implement the measures included in our Plan to minimize and mitigate any impacts to prime farmland soils. Additionally, all impacts to prime farmland soils resulting from construction and operation of the proposed pipeline would be temporary since the proposed pipeline would be buried, and disturbed areas within the construction and permanent rights-of-way would largely revert to their preconstruction uses, such as agriculture, following restoration.

3.2.4.2 Aboveground Facilities

Construction and operation of the proposed aboveground facilities would permanently affect about 34.6 acres of land. With the exception of soils at the proposed Vernon Compressor Station site, the soils that would be affected by construction and operation of the proposed aboveground facilities are not highly susceptible to erosion. As described above, our Plan describes the temporary and permanent erosion control practices that CEGT would implement to control and minimize erosion during construction and operation. Consequently any impacts to adjacent soils or sensitive resources from erosion would be minor. Though shallow bedrock would be encountered at the Panola Compressor Station and DEFS-Enbridge M/R Station sites, bedrock in those areas consists of weathered, loosely consolidated sandstone and shale that should be workable with standard construction equipment. Further, any introduction of rock to surface soils at these facilities would not be of concern since the affected areas would be permanently converted to an industrial use.

CEGT reports that construction and operation of the proposed aboveground facilities would result in a permanent conversion of about 11.3 acres of soils classified as prime farmland, including 2.2 acres at the Panola Compressor Station, 2.3 acres at the Texas Gas M/R Station, and 6.8 acres at the Columbia Gulf Meter/Regulator Station. However, only a portion of the acreage that would be affected (about 9.0 acres) consists of actively cultivated cropland. As described above, no further permits or approvals would be required to authorize Project-related impacts to prime farmland soils. 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.

3.3 WATER RESOURCES

3.3.1 Groundwater

3.3.1.1 Existing Groundwater Resources

Groundwater is a significant source of drinking water to selected areas along the proposed Carthage to Perryville Project route, in tandem with surface water supplies as described in Section 3.3.2. Major aquifers in the vicinity of the proposed Project include Carrizo-Wilcox, Red River Alluvial, Sparta, Cockfield, and the Mississippi River Alluvial. Although all of the listed aquifers are utilized, aquifers contributing major drinking water supplies in the vicinity of the proposed Project include the Sparta Aquifer and to a much smaller extent, the Carrizo-Wilcox, Cockfield, and Mississippi River Alluvial Aquifers (Southern Regional Water Program 2006a). Much of the northeastern Texas region, including Panola County, relies on surface water in lieu of groundwater for drinking water supplies (Texas Water Development Board 2006). Although depth to groundwater is variable along the proposed pipeline route, it is often found at or near the ground surface, and the proposed Project is likely to encounter groundwater during construction activities. 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.

Carrizo-Wilcox Aquifer

The Carrizo-Wilcox Aquifer occurs in Panola County, Texas, and DeSoto, Red River, Caddo, and Bienville Parishes, Louisiana. Well yields are typically restricted in this aquifer due to relatively thin water bearing sand beds. The maximum depths to groundwater range from 200 feet AMSL to 1,100 feet below mean sea level (BMSL). The water from this aquifer is considered to be of good quality, and approximately 14.6 million gallons of water per day are extracted for primarily public supply, rural domestic, and general irrigation uses (Sargent 2002).

Red River Alluvial Aquifer

The Red River Aquifer is hydraulically related to the Red River and its major tributaries. This aquifer occurs in DeSoto and Red River Parishes, Louisiana. Groundwater for this aquifer is typically encountered within 30 to 40 feet of the ground surface. Approximately 7.5 million gallons of water per day are withdrawn from this aquifer (Sargent 2002), which is used primarily for irrigation and aquaculture. Water from this aquifer is not used for drinking water due to poor quality in relation to taste, odor, and appearance.

Sparta Aquifer

The Sparta Aquifer occurs in Bienville, Ouachita, and Jackson Parishes, Louisiana. This aquifer receives inflow from the Carrizo-Wilcox and Cockfield aquifers, as well as from overlying terrace and alluvial deposits. The maximum depths to groundwater range from 200 feet AMSL to 1,700 feet BMSL. This aquifer is considered to be of fair to good quality and approximately 68.3 million gallons per day are pumped to support primarily public water supply and industrial uses (Sargent 2002).

Cockfield Aquifer

The proposed Project would cross the Cockfield Aquifer in Jackson, Ouachita, and Richland Parishes, Louisiana. The Cockfield Aquifer is recharged by direct infiltration, movement through alluvial and terrace deposits, and by upward movement from the Sparta Aquifer. The maximum depths to

groundwater range from 200 feet AMSL to 2,150 feet BMSL. The quality of the water withdrawn from this aquifer is considered fair, and approximately 7.4 million gallons per day are extracted for public water supply primarily (Sargent 2002).

Mississippi River Alluvial Aquifer

The Mississippi River Alluvial Aquifer would be crossed by the proposed Project in Ouachita and Richland Parishes, Louisiana. The Mississippi River Alluvial Aquifer is hydraulically related to the Mississippi River and its major tributaries and is recharged by infiltration of rainfall through the overlying silt and clay layers. Groundwater is typically encountered within 30 to 40 feet of the ground surface. The quality of water from this aquifer is considered relatively poor due to the presence of arsenic and poor taste and odor qualities, but approximately 353.6 million gallons per day are pumped to meet primarily irrigation and industrial uses (Sargent 2002).

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. There are no sole-source or principal-source aquifers located in the vicinity of the proposed Project.

Wellhead Protection Areas

As described previously, Panola County relies on surface water withdrawals for domestic drinking water supplies (Texas Water Development Board 2006). CEGT consulted with LDEQ regarding the location of wellhead protection areas, which are designated to protect the drinking water supplies obtained from municipal or community wells. The LDEQ identified 14 drinking water protection areas operated by 11 water systems that are located within the proposed pipeline construction right-of-way. Although these wellhead protection areas are located within the proposed construction right-of-way, the wellheads themselves are all located more than 500 feet from the edge of the construction right-of-way. The locations of the wellhead protection areas crossed by the proposed Project are listed in Table 3.3.1-1.

Wells and Springs

CEGT identified the location of known wells near the proposed Project route through consultation with the Louisiana Department of Transportation (LDOT) and the Texas Water Development Board. Nine wells located within 150 feet of the proposed construction right-of-way were identified, including two industrial wells, four irrigation wells, and three observation wells. No private or public drinking water wells were identified. These wells and their relative location are listed in Table 3.3.1-2. Because the locations of wells listed in the agencies' databases are not exact, CEGT would confirm their actual location in the field prior to construction. CEGT also consulted with the Texas Commission on Environmental Quality (TCEQ), LDOT, and NRCS regarding the presence of springs along the proposed Project route. None of the agencies were able to provide data or information regarding the presence of springs, nor were any springs observed during the environmental field surveys performed by CEGT.

Contaminated Groundwater

CEGT also evaluated the potential for contaminated groundwater to occur along the proposed Project route by examining information available from EPA and LDEQ. No hazardous waste sites or known areas of contaminated groundwater were identified, nor were any such areas observed during the environmental field surveys performed by CEGT.

TABLE 3.3.1-1
Drinking Water Wellhead Protection Areas Crossed by the Proposed Carthage to Perryville Project

Drinking Water Wellhead Protection Area/ Water System	County/Parish	Begin Milepost	End Milepost
Four Forks Water System	Caddo, LA	15.5	17.5
Keatchie Water System (Well 1)	DeSoto, LA	25.9	RMP 27.0
Keatchie Water System (Well 2)	DeSoto, LA	26.2	RMP 27.6
Social Springs Water System	Bienville, LA	63.1	64.6
North Hodge Water System (Well 1)	Jackson, LA	RMP 94.8	RMP 96.6
North Hodge Water System (Well 2)	Jackson, LA	RMP 94.8	96.6
North Hodge Water System (Well 3)	Jackson, LA	RMP 94.8	96.6
East Hodge Water System	Jackson, LA	RMP 95.1	96.8
Hodge Water System	Jackson, LA	RMP 95.4	95.6
Southeast Hodge Water System	Jackson, LA	RMP 95.4	96.1
Ebeneezer Water System	Jackson, LA	105.8	106.2
Chatham Water System	Jackson, LA	112.4	112.5
Southwest Ouachita Waterworks	Ouachita, LA	124.8	126.7
East Columbia Water System	Ouachita, LA	133.3	135.4

TABLE 3.3.1-2
Wells Located Within 150 Feet of the Proposed Carthage to Perryville Project[a]

Well Type	County/Parish	Approximate Milepost	Approximate Well Depth (feet)	Approximate Distance from Centerline (feet)	Approximate Distance from Construction Work Area (feet)
Observation	Bienville, LA	86.3	348	15	Within permanent right-of-way
Industrial	Bienville, LA	87.3	410	127	99
Observation	Bienville, LA	90.7	482	64	Within temporary right-of-way
Industrial	Bienville, LA	90.7	490	171	105
Observation	Jackson, LA	101.4	629	155	170
Irrigation	Jackson, LA	110.9	164	20	Within permanent right-of-way
Irrigation	Richland, LA	147.4	70	203	133
Irrigation	Richland, LA	161.5	100	181	153
Irrigation	Richland, LA	RMP 165.7	Unknown	100	70

Notes:

[a] Actual well locations may vary by as much as 100 feet due to the level of accuracy associated with well coordinate data. CEGT would confirm the actual location of the wells prior to construction.

3.3.1.2 General Impacts and Mitigation

No groundwater withdrawals are proposed in association with construction and operation of the proposed Project. The potential for impacts to groundwater resulting from construction and operation of the proposed Project is a function of the degree to which the Project facilities would cause 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 extent that clearing of vegetation reduces evapotranspiration and pipeline trenching increases the potential for infiltration of rainfall. Increased infiltration and reduced evapotranspiration would result in increased recharge to groundwater, thus increasing groundwater storage at the expense of reduced surface runoff and loss to the atmosphere. Permanent effects would also occur to groundwater recharge as a result of the development of impervious surfaces and structures at the proposed aboveground facility sites. However, these effects would likely be minor considering the relatively small area of the pipeline trench, construction right-of-way, and aboveground facility structures relative to the total potential recharge area.

The pipeline trench would alter the quantity of groundwater that flows to specific points of discharge, such as a well or spring, by altering groundwater flow paths. Altered flow paths, in turn, would result in changes to the quality of groundwater at specific locations. These impacts would be most likely in the shallow aquifers, such as the Red River Alluvial and Mississippi River Alluvial. The proposed pipeline would not change regional flow paths because these are determined by larger-scale geologic features that form the hydrogeologic setting. Therefore, the proposed Project would not impact regional groundwater discharge conditions or quality. Additionally, aquifers that are typically deeper or that are overlain by other aquifers with separating layers, such as the Carrizo-Wilcox, Sparta, and Cockfield aquifers, would not be directly affected by trenching and construction activities because their upper margin would be located well below the depth of the pipeline trench.

Construction of the pipeline would generally require a trench excavation of 6.5 to 7.5 feet (or perhaps deeper at crossings of utilities and foreign pipelines; see Section 2.3.1). Dewatering of the pipeline trench would be necessary where shallow groundwater is encountered within this excavation zone. The water pumped from the excavation would be discharged in accordance with our Procedures, and the potential impact of dewatering would be minimized by discharging the pumped water to well vegetated areas or properly constructed temporary retention structures that would promote infiltration and minimize or eliminate runoff. 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, but such impacts would likely be minor and temporary.

Backfill placed within the pipeline trench would typically be somewhat more permeable than the surrounding soil and rock units, and as a result the trench would act as a preferential pathway for groundwater flow in areas where it intersects the water table. Thus, the pipeline trench would potentially alter the existing groundwater flow patterns within shallow saturated zones. In general, however, most wells located along the pipeline receive water from deeper formations whose flow paths would not be affected by the trench. Additionally, CEGT would install trench breakers at specified intervals, as specified in our Plan and Procedures, to reduce the potential for the trench to act as a preferential groundwater flow path. Trench breakers would reduce the ability of the trench to convey groundwater, and no long-term impacts to the water table or groundwater migration patterns would be anticipated as a result of the proposed Project. Conversely, 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 would be adversely impacted. However, CEGT would implement the measures

identified in our standard Plan, which includes testing and as applicable, mitigation for compacted soils (see Section 3.2 for additional discussion).

Accidental spills and leaks of hazardous materials would cause impacts to groundwater resources through introduction of contaminants, especially in highly permeable areas near wells. CEGT has agreed to adopt the spill prevention and control measures included in our Procedures. These measures are discussed in more detail in Section 3.3.3. Additionally, CEGT has developed a generic SPCC Plan (see Appendix C), which describes the management of hazardous materials, such as fuels, lubricants, and coolants that would be used during construction. CEGT has also indicated that site-specific plans would be developed for each construction spread once the construction contractors have been selected, and we have included a recommendation in Section 3.2 for CEGT to file those site-specific SPCC Plans with the FERC prior to construction. Given the adoption of the measures in our Procedures and these additional measures, the risk of accidental spills or other introductions of hazardous materials to groundwater would be effectively minimized.

No areas containing contaminated groundwater or hazardous waste sites have been identified along the proposed Project route. In the event that such materials were discovered during construction of the proposed Project, CEGT indicates that it would stop work, notify the appropriate state and federal agencies, and proceed in accordance with local, state, and federal regulations. However, mismanagement of hazardous wastes or contaminated materials would adversely affect water, soil, and other resources, and CEGT has not yet identified the specific procedures that it would implement if such materials were encountered during construction. In Section 3.2, we included a recommendation for CEGT to develop a hazardous and contaminated materials management plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations.

3.3.1.3 Site-Specific Impacts and Mitigation

Sole-source and primary-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 were identified along the proposed Project route through resource agency consultations or environmental field surveys conducted by CEGT. During construction, EIs would monitor the construction work areas for any previously unidentified wells, springs, and seeps. If any such features were encountered during construction, CEGT would treat such features as waterbodies and avoid or minimize effects by implementing the measures identified in our Plan and Procedures.

Wellhead protection areas were identified in multiple areas within and along the proposed pipeline route, as identified in Table 3.3.1-1. These areas would potentially be affected by the general impacts described above, thereby possibly impacting public water supplies through impaired quality, decreased yield, or other disruptions of service. However, all of the identified wellheads were located at least 500 feet away from proposed construction work areas. CEGT consulted with LDEQ regarding potential Project-related impacts, and LDEQ indicated that no special construction procedures had been established, nor would any be required for the proposed Project in regard to protection of wellheads (TRC Environmental Corporation [TRC] 2006a). Blasting is not anticipated in association with construction of the proposed Project, and impacts from blasting to wells and other sensitive resources are therefore not anticipated. However, if required, CEGT would notify the FERC before blasting and conduct all blasting in accordance with our Plan and Procedures and in compliance with all applicable federal, state, and local laws, permits, and authorizations. The measures included in our Plan and Procedures specify development of a schedule for all blasting activities and provision for advance notice prior to blasting. Given the distance of the proposed Project to wellhead protection areas, the anticipated lack of blasting,

and in consideration of the associated consultations with LDEQ, we conclude that wellhead protection areas would not be significantly affected by construction and operation of the proposed Project.

CEGT has proposed to offer pre- and post-construction monitoring of private or domestic drinking water wells located within 150 feet of the construction right-of-way. This monitoring would include water quality and well yield. If water quality or yield were found to be impaired due to the proposed Project, then CEGT would provide a temporary water supply and re-test the well within 30 days. If the well was found to be impaired during the second test, then CEGT would continue to provide a temporary water supply until it arranged for a permanent water supply that would be provided at CEGT's expense. However, none of the nine identified wells located within 150 feet of the proposed construction work areas (Table 3.3.1-2) are used for drinking water supply. Rather, these wells are used for industrial, irrigation, and observational purposes, but would also be potentially subject to the general groundwater impacts described above, such as impaired quality, decreased yield, or other disruptions of service. Therefore, **we recommend that:**

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

3.3.2 Surface Water Resources

3.3.2.1 Existing Surface Water Resources

Watershed Descriptions

Regulatory agencies, such as TCEQ and the LDEQ, manage surface water quality on a watershed basis (Southern Regional Water Program 2006b; 2006c). Watershed management activities include identification of issues, monitoring, planning, and implementation of measures to conserve or restore valuable surface water resources. Table 3.3.2-1 identifies the watersheds that would be crossed by the proposed Project.

TABLE 3.3.2-1
Major Watersheds Crossed by the Proposed Carthage to Perryville Project

Watershed Basin Name	Hydrologic Unit Code	County/Parish
Middle Sabine	12010002	Panola, Texas Caddo, Louisiana
Bayou Pierre	11140206	Caddo, DeSoto, and Red River, Louisiana
Middle Red – Coushatta	11140202	Red River, Louisiana
Black Lake Bayou	11140209	Red River and Bienville, Louisiana
Saline Bayou	11140208	Bienville, Louisiana
Dugdemona	08040303	Bienville and Jackson, Louisiana
Castor	08040302	Jackson, Louisiana
Lower Ouachita	08040207	Ouachita, Louisiana
Boeuf	08050001	Ouachita and Richland, Louisiana

Surface Water Quality Standards and Designated Uses

The TCEQ and LDEQ have developed a series of water quality standards to maintain water quality consistent with the associated goals of protecting public health, conserving fish and wildlife, and economic development (TCEQ 2006; LDEQ 2006). As discussed below, each surface waterbody in these states has been assigned a designated use, which characterizes the best intended uses of that waterbody. Water quality is evaluated and compared to established standards to determine if streams are meeting their designated uses. Designated uses for waterbodies in Texas include aquatic life; recreation; general; fish consumption; public water supply; and oyster waters. Designated uses for waterbodies in Louisiana include primary contact recreation (swimming); secondary contact recreation (boating); fish and wildlife propagation; drinking water supply; oyster propagation; agriculture; and outstanding natural resource waters. The designated uses of the waterbodies that would be crossed by the proposed Project are provided in Appendix E of this EIS.

Waterbody Crossings

CEGT identified waterbodies crossed by the proposed Project, including rivers, streams, and ponds using USGS topographic maps, aerial photography, and through field surveys along approximately 99 percent of the proposed Project route where survey permission was granted. The proposed Project would cross 104 perennial streams, 136 intermittent streams, and 6 ponds. A table identifying these waterbodies, as well as their width, location along the proposed Project route, state waterbody classification, and proposed crossing method, is included as Appendix E of this EIS.

The proposed Project would include 33 waterbody crossings in Texas, all of which have designated uses for aquatic life and recreation. Fish Lake Slough and an associated tributary located near MP 3.8 are also designated for general use and fish consumption. Additionally, the single major waterbody (greater than 100 feet in width) crossing in Texas, the Sabine River (MP 4.3), is also designated for general use, fish consumption, and as a public water supply.

In Louisiana, the proposed Project would require 213 waterbody crossings. With the exception of Turkey Creek (MP 169.8), all of these waterbodies have designated uses of primary contact recreation, secondary contact recreation, and fish and wildlife propagation. Turkey Creek is designated for secondary contact recreation and fish and wildlife propagation, but not for primary contact recreation. In addition to this basic suite of designated uses, several waterbodies have additional classifications. These include:

- Bayou Pierre located near MP 41.5 (agriculture);
- Red River near MP 50.1 (drinking water supply and agriculture);
- Loggy Bayou located near MP 53.0 (agriculture);
- two unnamed tributaries to Saline Bayou located near MP 80.7 (agriculture);
- Black Lake Bayou located near MP 66.1 (agriculture and outstanding natural resource waters);
- Saline Bayou located near MP 80.8 (agriculture and outstanding natural resource waters); and
- Ouachita River located near MP 134.0 (drinking water supply).

CEGT completed field surveys at all of the proposed aboveground facility sites. The results of the survey indicate that no waterbodies occur at these locations. Consistent with our Procedures, CEGT has proposed that all extra workspace areas would be located at least 50 feet away from waterbodies.

Construction of the proposed pipeline would require the temporary use of 143 existing access roads of varying lengths and construction. CEGT reports that 50 of these access roads, comprising a length of approximately 25.0 miles, would require upgrades to support construction-related traffic. In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new access roads would also be required in association with the proposed Panola Compressor Station and the Trunkline, Texas Gas, and ANR M/R Stations. See Section 3.8 for additional discussion of access road requirements. Access road improvements that would be required include grading, placement of gravel for stability, replacing or installing culverts, and clearing of overhead vegetation. However, the specific nature of the proposed access road improvements have not been determined, and it is not yet clear whether construction of new access roads or improvement of existing access roads would affect any waterbodies. Therefore, **we recommend that:**

- **Prior to construction, CEGT should file with the Secretary for review and written approval by the Director of OEP access road information specifying the locations and dimensions of all new or improved access roads that would cross waterbodies, provide a plan for crossing (including culvert sizing) and mitigation developed in consultation with the appropriate agencies, and file documentation that the necessary permits and landowner approvals have been obtained.**

If approved, the proposed Project would require the use of pipe storage and contractor yards. CEGT indicated that, where possible, it would preferentially locate these staging areas in existing industrial or commercial areas. Some of these staging areas have been identified and for these areas, no waterbodies would be crossed. However, CEGT indicated that additional pipe storage or contractor yards may be needed and that additional environmental surveys would be conducted if staging areas were selected that were not located within existing industrial or commercial areas. Prior to construction, CEGT would be required to file a complete and updated list of all temporary workspace areas, including pipe storage and contractor yards, with the FERC for review and approval prior to use.

Major and Navigable Waters

Our Procedures define major waterbodies as those greater than 100 feet in width at the time of crossing. Based on the results of field surveys, the proposed Project would cross nine streams defined as major waterbodies. Additionally, the proposed Project would cross one pond that is greater than 100 feet in width at the crossing location. These major waterbodies include the Sabine River (MP 4.3), Bayou Pierre (MP 41.5), Prairie River (MP 45.4), Red River (MP 50.1), Loggy Bayou (MP 53.0), an unnamed channel of the Dugdemona River (RMP 95.0), Ouachita River (MP 134.0), Bayou LaFourche (MP 138.7), Big Creek (MP 163.9), and an unnamed pond (MP 50.8). The location of these waterbodies in relation to the proposed Project facilities is depicted on the maps provided as Appendix B of this EIS.

According to 33 CFR Part 329, navigable waters of the United States “are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce." Navigable waters crossed by the proposed Project include the Sabine River, Loggy Bayou, Bayou Pierre, Boeuf River (MP 145.5), Saline Bayou (MP 80.8), Bayou LaFourche, Red River, and Ouachita River (COE 2006a; COE 2006b).

Sensitive Waterbodies

Sensitive waterbodies include those streams designated as: having special status by federal or state resource agencies; providing habitats for threatened and endangered species; having potable water intakes within three miles downstream of the proposed pipeline crossing; or not attaining specified water quality uses.

Two streams, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8), have been designated as Louisiana Natural and Scenic Rivers, pursuant to the Louisiana Scenic Rivers Act. These streams are recognized as having unique and diverse characteristics and are protected through management by LDWF (2006a). Additionally, the Sabine River is designated by the National Park Service (NPS) as being listed on the Nationwide Rivers Inventory (NRI). Streams included in the NRI are considered to possess "outstandingly remarkable natural or cultural values judged to be of more than local or regional significance" (NPS 2006a). The NRI-listed reach of the Sabine River has diverse riparian habitats and species, minimum human development, and outstanding scenic qualities (NPS 2006b).

The federally endangered pallid sturgeon potentially occurs in the Red River. This species is typically found in large, free flowing, turbid rivers with a diversity of habitats. Two other species, the federally threatened bald eagle and the federally endangered interior least tern, may also occur along large waterbodies crossed by the proposed Project route, including the Red River. However, suitable nesting habitat for these two species was not observed along the proposed route during field surveys performed by CEGT. Additional discussion of endangered, threatened, and special status species and their habitats is provided in Section 3.7.

CEGT consulted with TCEQ and the Louisiana Office of Public Health regarding the potential for state or locally designated surface water protection areas or surface water intakes to be located within three miles downstream of the proposed Project waterbody crossings. Based on the results of these consultations, no such areas are located near any of the proposed waterbody crossing locations.

None of the waterbodies crossed by the proposed Project in Texas are listed as impaired [303(d) list] by TCEQ. However, four streams that would be crossed by the proposed Project in Louisiana are listed as impaired (LDEQ 2005) including: Bayou Pierre (MP 41.5; due to nutrients and low dissolved oxygen), the Red River (MP 50.1; due to color and sulfates), Grand Bayou (MP 60.1; due to nutrients, low dissolved oxygen, fecal coliform bacteria, and mercury), and Black Lake Bayou (MP 66.1; low dissolved oxygen). CEGT consulted with the LDEQ and TCEQ regarding the potential occurrence of contaminated sediments in waterbodies crossed by the proposed Project route. Based on the results of these consultations, there are no records of contaminated sediments in the waterbodies that would be crossed by the proposed Project.

3.3.2.2 General Impacts and Mitigation

CEGT's proposed methods for accomplishing pipeline installation across each identified waterbody are listed in Appendix E. Waterbody crossings would be accomplished using "wet" open-cut or "dry" HDD methods, as described below and in Section 2.3.2. As proposed, virtually all (approximately 95 percent) of the crossings for minor (less than or equal to 10 feet in width) and intermediate waterbodies (greater than 10 feet wide but less than or equal to 100 feet in width) would be accomplished using open-cut methods. The remainder of the crossings for minor and intermediate waterbodies (13 total crossings) would be accomplished using HDD. Each of the nine major stream crossings would be accomplished by HDD, but the single crossing of a pond classified as a major waterbody would be accomplished using open-cut methods.

Though CEGT has identified a proposed crossing method, either open-cut or HDD, for each identified waterbody, it has also indicated that the actual crossing method used, except for the identified HDD crossings, would be determined at the time of construction based on waterbody characteristics and site conditions. In addition to HDD methods, CEGT also discussed two other "dry" crossing approaches. These include the flumed and dam-and-pump crossing methodologies, which are described in Section 2.3.2. Although typically unsuitable in streams with broad channels, unstable banks, or high flow rates,

flumed and dam-and-pump crossing methods typically result in less generation of turbidity and suspended sediments than open-cut methods.

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

Pipeline construction using "wet" open-cut methods would affect the quality of surface waters through clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling of the in-stream trench. These activities can result in increased turbidity, increased sedimentation, decreased dissolved oxygen levels, modifications of aquatic habitat, and increased stream water temperatures. Several commentors noted that the proposed construction activities would result in erosion and associated sedimentation of streams. In addition, disturbance of contaminated soils and sediments would result in adverse impacts to water quality and in-stream habitat. Operation of heavy equipment or other vehicles in and near surface waterbodies would also introduce chemical contaminants, such as fuels and lubricants, into surface waters or result in accidental spills during construction.

The extent of the potential impacts associated with 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, there would be an increased probability for elevated turbidity and suspended sediments compared to locations where the streambed consists of coarser materials such as gravel and cobble. However, stream gradients tend to be relatively low in the area of the proposed Project; thus, stream velocities would also tend to be low, indicating that suspended sediments within these streams would only be transported over short distances.

Increased turbidity can reduce light penetration into the water and thereby reduce photosynthetic activity and levels of dissolved oxygen in the water column. Organic materials suspended in the water can further reduce dissolved oxygen by increasing the biochemical oxygen demand (BOD). Resuspension of sediments can also introduce contaminants, metals, and nutrients bound to the sediments into the water column. However, there are no known contaminated sediments located along the proposed Project route, so adverse effects resulting from resuspension of contaminants is unlikely. Contaminated soils would also be encountered during construction activities along the proposed construction right-of-way or extra works areas. If contaminated soils were encountered during construction, CEGT would implement procedures to identify and properly manage the contamination. In Section 3.2, we included a recommendation for CEGT to develop a hazardous and contaminated materials management plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations.

Except for a variance regarding seasonal construction windows that is discussed below, CEGT has adopted our Procedures in terms of construction related to waterbody crossings. Minor variances to our procedures requested by CEGT regarding wetland crossings are discussed in Section 3.4. Our Procedures are designed to minimize impacts associated with waterbody crossings. These measures include, but are not limited to:

- requirement to obtain all necessary permits from the COE and state agencies prior to construction and notify applicable state agencies at least 48 hours before commencing with instream trenching;

- use of EIs during construction;
- route the proposed pipeline as close to perpendicular to the axis of the waterbody as practicable and minimize the number of individual crossings where waterbodies meander or have multiple channels;
- limit the use of equipment within the waterbody to that necessary to construct the crossing, and utilize equipment bridges for passage of other construction equipment;
- placement of spoil at least 10 feet away from the water's edge with installation of sediment barriers to prevent the flow of spoil or silt-laden water to the waterbody;
- completion of all instream construction activity, including stabilization and re-contouring of banks, within 24 hours for minor waterbody crossings and 48 hours for intermediate waterbody crossings;
- use of temporary erosion and sediment control measures such as sediment barriers and trench plugs; and
- restoration activities including restoration of preconstruction bank contours, installation of slope breakers, and revegetation of disturbed riparian areas.

CEGT has stated its intent to avoid constructing stream crossings during the rainy season and proposes to complete construction activities during fall and early winter. Construction during the lower flows of these relatively dry seasons would minimize impacts in comparison to construction during wetter periods, especially those impacts associated with turbidity and sedimentation. However, CEGT's proposal would result in construction partially outside the time window for warmwater fisheries specified in our Procedures (June 1 through November 30). In a correspondence dated April 25, 2006, LDWF indicated that it did not object to CEGT's proposal to perform waterbody crossings outside of the time window specified in our Procedures. As recommended in the Draft EIS, CEGT also consulted with TPWD regarding this variation to our Procedures. In its comments on the Draft EIS dated July 11, 2006, TPWD concurred with CEGT's proposal to conduct waterbody crossings outside the time window specified in our Procedures. As described above and in accordance with our Procedures, erosion and sediment control best management practices would be implemented at all waterbody crossings during construction to reduce impacts to affected waterbodies. Therefore, and in consideration of the concurrence provided by LDWF and TPWD, CEGT's requested variation to accomplish waterbody crossings partially outside the time window for warmwater fisheries specified in our Procedures is approved.

Removal of vegetation from riparian areas would cause an increase in surface runoff and erosion from the pipeline corridor. However, as specified by our 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 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 because of the limited amount of streambank canopy that would be cleared relative to the existing riparian vegetation in most cases. 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.

Aboveground Facilities

Aboveground facilities such as compressor stations, meter and regulator stations, and mainline valves would be located in upland areas away from waterbodies. CEGT would implement the measures included in our Plan to prevent or minimize erosion in upland areas, thereby limiting impacts to

waterbodies. Some of the mitigation measures identified in our Plan 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). Given these factors and protective measures, any affects to waterbodies associated with construction and operation of the proposed aboveground facilities would be minor.

Construction Spills

CEGT has adopted the measures specified in our Procedures regarding spill prevention, containment, and minimization near waterbodies. These measures include, but are not limited to:

- overall structuring of operations to reduce the risk of accidental spills or exposure of fuels or other hazardous materials into the environment;
- proper training of employees handling fuels and other hazardous materials;
- 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; and
- prompt reporting of any spills to the appropriate agencies.

In those instances where refueling must be conducted within 100 feet of a waterbody, CEGT would employ EIs to supervise refueling activities and construct and use a berm and lined containment area. These measures were identified as part of CEGT's generic SPCC Plan (see Appendix C), which describes the management of hazardous materials, such as fuels, lubricants, and coolants that would be used during construction. CEGT has also indicated that site-specific plans would be developed for each construction spread once the construction contractors have been selected, and we have included a recommendation in Section 3.2 for CEGT to file those site-specific SPCC Plans with the FERC prior to construction. Given the adoption of the measures in our Procedures and these additional measures, the risk of accidental spills or other introductions of hazardous materials to waterbodies would be effectively minimized.

3.3.2.3 Site-Specific Impacts and Mitigation

Sensitive Waterbodies

Grand Bayou, a minor, intermittent waterbody located near MP 60.1 in Bienville Parish, Louisiana, is listed as impaired by the LDEQ due to nutrients, low dissolved oxygen, fecal coliform bacteria, and mercury. This waterbody would be crossed using open-cut methods, but construction-related disturbance would be adequately minimized through implementation of our Procedures, as discussed above. Instream construction, including trenching, pipe installation, backfill, and restoration of the streambed contours, would be completed within 24 hours. Potential effects and mitigation for other impaired waterbodies crossed by the proposed Project are discussed below.

There are no state or locally designated surface water protection areas in the proposed Project area, nor are there any surface water intakes located within three miles downstream of the proposed Project route. Additionally, 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. Potential impacts to waterbodies that are specially designated as Louisiana Natural and Scenic Streams, listed on the NRI, provide habitat for listed species, or are categorized as navigable or major waterbodies are discussed below.

CEGT proposes to cross one unnamed pond that is greater than 100 feet in width using open-cut methods. CEGT has provided preliminary site-specific drawings for each proposed major waterbody crossing. However, our Procedures would require that CEGT file detailed, site-specific construction plans and scaled drawings identifying all areas that would be disturbed by construction activities for all major waterbody crossings, including ponds, prior to construction. These site-specific plans would be developed in consultation with appropriate state and federal resource agencies and would depict the proposed locations of extra work areas, spoil storage areas, sediment control structures, as well as any mitigation for navigational issues.

Horizontal Directional Drill Crossings

CEGT proposes to use 18 separate HDD crossings to accomplish pipeline installation across 22 waterbodies, including 9 major waterbodies, 6 intermediate waterbodies, and 7 minor waterbodies. As described in Section 2.3.2, 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. Waterbodies proposed to be crossed using HDD methods include each of the major and/or navigable streams described in Section 3.3.2.1; two designated Louisiana Natural and Scenic Rivers, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8); the NRI-listed Sabine River (MP 4.3); the river most likely to contain habitat for listed species (the Red River; MP 50.1); and three of the four impaired waterbodies in the proposed Project area.

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 those geotechnical analyses would be provided to the FERC for our review prior to construction. Although these geotechnical analyses are not yet complete, CEGT has experience performing HDDs in the vicinity of the proposed Project route, and it expects that the planned HDDs would be successful. In the event of HDD failure, CEGT would attempt to re-drill the crossing in approximately the same location, as specified in CEGT's DDCP (Appendix D). In the event re-drilling failed, CEGT would accomplish pipeline installation across the waterbody in question using the open-cut construction method, but only after obtaining the necessary permits and approvals from the appropriate state and federal agencies. We do not believe that the HDD methods are likely to fail, however should the planned geotechnical analyses indicate that any proposed HDD crossing is not feasible or if HDD methods fail, **we recommend that:**

- **CEGT 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. CEGT should file the amended crossing plan concurrent with the appropriate state and federal applications required for implementation of the plan.**

A successful HDD is considered a preferred method for crossing sensitive habitats because stream bottom disruption and subsequent impacts along that portion of the pipeline route would be eliminated or minimized. However, HDD methods are not without risk as inadvertent drilling fluid releases would result if the drilling fluid escapes containment at pits that would be excavated at the HDD entrance and exit points or if a "frac-out" occurs. A frac-out occurs when drilling fluids escape the drill

bore hole and is forced through the subsurface substrate to the ground surface. During HDD operations, a frac-out would cause turbidity and sedimentation. Potential impacts from increased turbidity would include decreased water quality and compromised aquatic habitat integrity. As suspended materials settle out of the water column, sedimentation would partially or entirely cover the waterbody substrate and any sessile, benthic organisms.

The proposed HDD drilling fluid would consist of water and bentonite. Bentonite is a mixture of non-toxic clays and rock particles consisting of about 85 percent montmorillonite clay, 10 percent quartz and feldspars, and 5 percent accessory materials, such as calcite and gypsum. Though potentially toxic additives are added to drilling fluids used in some applications, CEGT has stated that it would not use any synthetic or potentially toxic drilling fluid additives. Additionally, CEGT has developed a DDCP (Appendix D) that describes the procedures that would be implemented to monitor for, contain, and clean up any potential releases of drilling fluid during HDD operations. Measures included in the DDCP include, but are not limited to:

- continuous monitoring along the drill path, fluid return pits, and waterbody surfaces for evidence of a release;
- monitoring of drilling fluid pressures, volumes, and return rates;
- immediate cessation of drilling fluid pumping in the event of a complete loss of circulation of drilling fluid;
- containment of any escaped drilling fluid using tools, equipment, and supplies that are readily accessible;
- immediate clean-up of inadvertent releases and restoration as appropriate; and
- notification of the appropriate agencies, including the FERC, in the event of an inadvertent release.

The proposed crossing of Black Lake Bayou and Saline Bayou, as well as the proposed withdrawal of hydrostatic test water from each of these sources, would require approval from LDWF. CEGT submitted a permit application to LDWF for both Black Lake Bayou and Saline Bayou, and LDWF subsequently issued Scenic River Permits on May 26, 2006, authorizing the proposed construction activities at each waterbody. The proposed crossing of, and hydrostatic test water withdrawal from, these waterbodies would be accomplished in accordance with the terms and conditions of the Scenic River Permits. As recommended in the Draft EIS, CEGT has filed the Scenic River Permits with the FERC. Additionally and as recommended in the Draft EIS, CEGT consulted with the NPS regarding the proposed crossing of the Sabine River and its plans for withdrawal of hydrostatic test water there (TRC 2006e). In a correspondence dated March 10, 2006, NPS (2006e) recommended that CEGT mitigate the visual impacts of pipeline construction through appropriate erosion control and vegetative restoration within the riparian corridor. As described above, a successful HDD installation would avoid and minimize impacts to the Sabine River and associated riparian vegetation, thereby minimizing any visual impacts. Vegetative restoration practices would be accomplished in accordance with our Plan and Procedures, as described in Sections 3.4.2 and 3.5.2.

In its comments on the NOI, TPWD commented that stream crossings along the proposed Project route should be installed using HDD to minimize disturbance to the streambed, banks, and adjacent riparian vegetation. Based on our experience we do not believe it is reasonable or practical to use the HDD installation method to accomplish pipeline construction across all streams. CEGT has proposed to cross all of the major and special status streams that occur along the proposed pipeline route using HDD, along with selected other streams. Each of the proposed HDD waterbody crossings would be constructed

in accordance with our Procedures and the terms of any applicable federal or state permits that may be granted. Additionally, CEGT would implement its DDCP to monitor for and address any inadvertent releases of drilling fluids. We believe that these factors combined with the additional mitigation measures recommended above would minimize the potential for adverse environmental impacts associated with the proposed HDD crossings.

3.3.2.4 Hydrostatic Testing

CEGT would hydrostatically test the proposed pipeline after installation to ensure structural integrity in compliance with the DOT pipeline safety regulations identified in 49 CFR Part 192 (see Section 2.3.1). The proposed hydrostatic test water sources, withdrawal locations, and estimated volumes of water required are identified in Table 3.3.2-2. Proposed sources of hydrostatic test water include Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.1), the two designated Louisiana Natural and Scenic Rivers, as well as the NRI-listed Sabine River (MP 4.3). Additionally, CEGT has proposed to withdraw hydrostatic test water from the Red River, Ouachita River, Boeuf River, Caney Lake, and municipal water supplies. Caney Lake is not crossed by the proposed Project, but would provide a source of test water near MP 101.3. Although municipal water supplies may be used as sources of test water for some prefabricated assemblies (such as valve settings and pig launcher and receiver barrels) at some aboveground facility sites, municipal water supplies would not be used as a source of test water for the proposed pipeline.

Withdrawal of large amounts of water for hydrostatic testing of pipeline segments would affect or limit other uses of rivers and streams including water supply, recreation, and aquatic habitat, particularly during low flow and drought conditions, or if the withdrawal was large relative to overall flow. Other impacts would include increased water temperatures, reduced levels of dissolved oxygen, and entrainment of aquatic organisms.

Discharge of hydrostatic test water would contribute to a change in water quality of receiving waters if the source water quality is different than the receiving water, especially during low flow or drought conditions when there is less water available in the receiving stream for dilution. Unregulated discharges would also result in erosion of upland areas or stream banks and increased sedimentation or turbidity in streams. Additionally, if chemical additives were used during hydrostatic testing, the discharge water would introduce contaminants into the receiving water.

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

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

TABLE 3.3.2-2
Summary of Hydrostatic Test Water Requirements for the Proposed Carthage to Perryville Project

Facility	Withdrawal Source	Withdrawal Location[a] (MP)	Approximate Volume (gallons)
Pipeline Facilities			
	Sabine River [b]	4.3	12.4 million
	Red River	50.1	12.1 million
	Black Lake Bayou [c]	66.1	5 million
	Saline Bayou [c]	80.8	18.5 million
	Ouachita River	134.0	19 million
	Boeuf River	145.5	5 Million
Aboveground Facilities			
Panola Compressor Station	Sabine River [b]	8.4	300,000
Vernon Compressor Station	Caney Lake	101.3	300,000
Houston Pipe Line Meter/Regulator (M/R) Station	Municipal supply	0.0	100,000
Duke Energy Field Services-Enbridge Energy M/R Station	Municipal supply	1.4	100,000
Texas Gas M/R Station	Municipal supply	135.5	100,000
Trunkline M/R Station	Municipal supply	149.5	100,000
ANR M/R Station	Municipal supply	164.6	100,000
Columbia Gulf M/R Station	Municipal supply	171.6	100,000

Notes:

[a] Hydrostatic test water discharges would occur in vegetated upland areas near the source locations and at the origin and terminus of the proposed pipeline.

[b] Nationwide Rivers Inventory-listed

[c] Louisiana Natural and Scenic River

As noted above, CEGT consulted with LDWF and NPS regarding potential impacts to special-status streams, including those resulting from hydrostatic testing. LDWF issued Scenic River Permits authorizing water withdrawals from Black Lake and Saline Bayous, and hydrostatic test water withdrawals from those waterbodies would be accomplished in accordance with the conditions of those permits. The NPS (2006e) recommended that any hydrostatic test water discharges to the Sabine River be accomplished in compliance with relevant TCEQ general NPDES permit requirements.

Any water used for hydrostatic testing of pipelines that is point-source discharged into a waterbody would require a general NPDES permit administered by the states with EPA oversight. CEGT has indicated that all hydrostatic test waters would be discharged overland at locations near the test water withdrawals, as well as at both ends of the proposed pipeline. CEGT also proposed the use of energy dissipation devices at all discharge points to reduce discharge velocities and thereby prevent or minimize associated erosion and sedimentation. Additionally, CEGT has indicated that hydrostatic test water

contact would be limited to new pipe and that biocides and other potentially toxic hydrostatic test water additives would not be used during hydrostatic testing. CEGT would also sample all test water to determine its suitability and implement treatment measures, if needed, prior to discharge. Given compliance with our Procedures and CEGT's proposed measures, we believe that impacts to waterbodies resulting from hydrostatic testing would be adequately minimized.

3.4 WETLANDS

Wetlands are areas that are inundated or saturated by 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. Among these are flood flow attenuation, sediment retention, nutrient retention, provision of 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 of disturbance where impacts are unavoidable, to the degree practical. Any unavoidable impacts must be mitigated, and any remaining impacts may require compensatory mitigation. All wetland crossings would be subject to review and approval by the Vicksburg District of the COE, and CEGT would comply with the conditions of the permits issued by the COE, including the provisions of any required wetland compensatory mitigation.

3.4.1 Existing Wetland Resources

CEGT conducted an initial search of potential wetland areas along the proposed pipeline route, at the proposed aboveground facility sites (compressor stations, meter/regulator stations, and mainline valves), and at all extra work areas (extra workspaces, access roads, and pipe storage and contractor yards) through review of available National Wetlands Inventory (NWI) maps and soil surveys. From September 2005 through January 2006, CEGT conducted wetland field surveys to delineate wetland boundaries in accordance with the requirements of the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). Wetland boundaries were surveyed and the linear distance and acreage of impact to wetlands along the proposed Project were calculated by overlaying the proposed aboveground facility boundaries and construction work areas on the surveyed wetland boundaries. The COE is responsible for approving wetland delineations, but field verification of CEGT's wetland delineations have not yet been completed.

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 F, and a summary of the wetland types affected by the proposed Project is provided in Table 3.4.1-1. The proposed sites for the aboveground facilities and pipe storage and contractor yards would not affect any wetlands, and therefore these facilities are not considered further in this section. The majority of the 154 wetlands that would be affected by the proposed Project are located in Louisiana (approximately 84 percent of the total number and cumulative crossing length), with the remainder occurring in Panola County, Texas.

The FWS wetland classification system described by Cowardin et al. (1979) was used to classify the wetlands that would be affected by the proposed Project. Virtually all of the 154 wetlands that would be crossed were identified as:

TABLE 3.4.1-1
Summary of Wetlands Affected by the Proposed Carthage to Perryville Project

Wetland Type [a]	Number of Wetlands Crossed	Estimated Crossing Length (miles)	Temporary Construction Impact (acres)[b]	Permanent Operation Impact (acres)[c]
PEM	25	0.5	4.5	1.8
PEM/PFO	8	1.6	11.0	4.2
PEM/PSS	5	0.1	1.0	0.4
PEM/PUB	1	< 0.1	0.5	0.2
PFO	81	7.3	61.4	24.9
PFO/PEM	13	4.5	39.3	15.4
PFO/PSS	5	0.2	1.7	0.7
PSS	14	0.9	8.0	3.3
PSS/PEM	1	< 0.1	0.1	0.1
PUB/PEM	1	< 0.1	0.2	0.1
Total [d]	**154**	**15.1**	**127.7**	**50.9**

Notes:
PEM = palustrine emergent
PSS = palustrine scrub-shrub
PFO = palustrine forested
[a] Predominant wetland type listed first.
[b] Wetland impact calculations based on a 75-foot-wide construction right-of-way.
[c] Operational impacts for the pipeline facilities were based on a 30-foot-wide, maintained permanent right-of-way.
[d] Totals may differ slightly from data presented due to rounding.

- palustrine forested (PFO);
- palustrine scrub-shrub (PSS);
- palustrine emergent (PEM); and
- combinations of these predominant types.

Additionally, two wetlands were identified as PEM in combination with palustrine unconsolidated bottom (PUB) wetlands, which are typically described as permanently flooded.

Palustrine Forested Wetlands

PFO wetlands are dominated by woody vegetation that is at least 20 feet tall (Cowardin et al. 1979), and these wetlands provide a diverse assemblage of vegetation and an abundance of food and water sources for wildlife. These areas often contain extensive bottomland hardwoods. Common tree species in the PFO wetlands observed within the proposed Project right-of-way include water oak (*Quercus nigra*), swamp-chestnut oak (*Q. michauxii*), willow oak (*Q. phellos*), black willow (*Salix nigra*), water elm (*Planera aquatica*), bald cypress (*Taxodium distichum*), pond cypress (*T. ascendens*), sweet gum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), deciduous holly (*Ilex deciduas*), wild grapes (*Vitis* spp.) and poison ivy (*Toxicodendron radicans*).

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 a canopy. As in the PFO wetlands, PSS wetlands supply an abundance of food and cover resources for mammals and birds. Common shrub species in the PSS wetlands observed within the proposed Project right-of-way include button bush (*Ephalanthus occidentalis*), hawthorne (*Craetagus* spp.), deciduous holly, virginia willow (*Itea virginica*), trumpet creeper (*Campsis radicans*), lady's eardrop (*Brunnichia ovata*), swamp privet (*Foresteria accuminata*), and saplings of water oak, sweet gum, and persimmon.

Palustrine Emergent Wetlands

PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et al. 1979). Wildlife use these areas for nesting and feeding, and during migratory periods. Common herbaceous plants in the PEM wetlands traversed by the proposed Project right-of-way include sedges (*Carex* spp.), woolgrass (*Scirpus cyperinus*), bulrushes (*Scirpus* spp.), smartweeds (*Polygonum* spp.), soft rush (*Juncus effusus*), lizard's tail (*Sarurus cernuus*), and spike rushes (*Eleocharis* spp.).

3.4.1.1 High Quality, Sensitive, or Special-Status Wetlands

CEGT and/or the consulting resource agencies identified two special-status wetland types or areas that would be affected by construction of the proposed Project. These areas include lands included in the NRCS Wetland Reserve Program (WRP) and a significant riparian wetland associated with the Sabine River in Panola County, Texas. Based on available mapping and coordination with the NRCS, CEGT indicated that WRP lands may be crossed by the proposed pipeline route in Red River, Ouachita, and Richland Parishes, Louisiana. Additionally, TPWD (2006a) provided information that a natural plant community in the state designated Water Oak-Willow Oak Series would be crossed by the proposed Project at the Sabine River (MP 4.3). CEGT observed PFO wetland areas, including areas dominated by water oak and willow oak, on both sides of the Sabine River (MP 4.3) during the ecological surveys performed for the proposed Project.

3.4.2 General Impacts and Mitigation

Pipeline construction would result in both short- and long-term alterations of the vegetative cover in wetlands along the proposed construction right-of-way. In the short-term, construction activities have the potential to diminish the recreational and aesthetic value of wetlands through clearing, trenching, spoil placement, vehicle traffic, and related construction disturbances. Wetland functions such as erosion control, buffering and flood flow attenuation, sediment retention, and nutrient retention would also be affected by construction. These effects would typically be greatest during and immediately following construction. Clearing of wetland vegetation would result in both short- and long-term loss of wetland wildlife habitat and some wetland functions, with the duration of the impact varying by habitat type. 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 2 to 4 years. PEM wetlands, which can regenerate more rapidly, would be typically affected only temporarily as they may become re-established in one or two growing seasons.

Our Procedures allow for annual maintenance of a 10-foot-wide strip centered over the pipeline. Additionally, trees that are within 15 feet of the pipeline and greater than 15 feet in height may be cut and

removed. These activities would not affect PEM wetlands, as these herbaceous areas 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 forested or scrub-shrub wetlands within the maintained portion of the permanent pipeline right-of-way would be permanently converted to an herbaceous state. However, the overall acreage of wetlands would not be significantly reduced.

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

3.4.2.1 General Wetland Construction and Mitigation Procedures

For projects where wetland impacts are proposed, 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 wetland crossings would be subject to review by the COE to ensure that wetland impacts are fully identified and appropriate wetland restoration and mitigation measures are implemented. CEGT 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.

CEGT has attempted to avoid or minimize impacts to wetlands through reductions in the nominal construction right-of-way width in wetlands to 75 feet, evaluation of route alternatives, and use of our Procedures. Additionally, CEGT would be required to provide restoration and/or compensatory mitigation for wetland impacts in consultation with the COE (see Section 3.4.4). CEGT adopted several route variations in order to avoid and minimize impacts to waterbodies and in some cases, associated wetlands (see Section 4.4). Additionally and to the extent practicable, CEGT's proposed route would be collocated with or parallel existing pipeline or utility rights-of-way, thereby reducing impacts to previously undisturbed wetlands.

Section 2.3.2 describes the specialized pipeline construction procedures that CEGT would implement to minimize impacts to wetlands. Within the construction right-of-way, CEGT would leave existing root systems intact where possible, install erosion control devices to minimize sediment flow into the wetland, and use special seed mixes during restoration, as may be recommended by local agencies. CEGT would also reduce the width of the maintained portion of the permanent pipeline right-of-way from the 60-foot width proposed for uplands to 30 feet in wetlands.

CEGT 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. CEGT would also minimize impacts to wetlands by implementing the measures identified in the FERC Procedures. These measures include, but are not limited to:

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

3.4.2.2 Requested Modifications to the FERC Procedures

CEGT requested two types of modifications to our standard Procedures. These requests include modifications to Sections VI.B.1.a (location of extra workspaces within 50 feet of wetlands) and VI.B1.e (improvement of existing access roads in wetlands) of our Procedures. CEGT has proposed to site 10 extra workspaces within wetlands and four extra workspaces within 50 feet of a delineated wetland boundary. Additionally, CEGT has proposed to improve four access roads located within wetlands. These areas and associated variance requests are identified in Table 3.4.2-1.

Our Procedures state that all extra work areas (such as staging areas and additional spoil storage areas) 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. Most of CEGT's proposed modifications in regard to extra workspace areas that would be located in wetlands are associated with HDD pull string assembly or HDD entrance/exit areas. Specifically, these extra workspace areas would facilitate HDD installations adopted to reduce overall impacts to waterbodies and associated riparian wetlands. See Section 2.3.2 for further discussion of the HDD installation technique. The remainder of CEGT's proposed modifications are associated with extra workspace requirements for spoil storage at an open-cut waterbody crossing and extra workspace areas that would be located within 50 feet of a wetland boundary, but not directly impact any wetland areas.

As described in Section 3.4.3, we view the identified impacts to PFO wetlands that would result from construction and operation of the proposed Project as potentially significant. We have reviewed alignment sheets and other supporting information for each of CEGT's proposed modifications related to extra workspace areas that would be located within 50 feet of a delineated wetland boundary. Additionally, we have considered further avoidance and minimization of impact to the PFO wetlands that would be affected by the proposed modifications and determined that impacts to those wetlands would be sufficiently minimized (see Section 3.4.3). Based on our review, we have determined that the proposed modifications to our Procedures, including those that would affect PFO wetlands, appear reasonable and

TABLE 3.4.2-1
Summary of Requested Modifications to Our Procedures for the Proposed Carthage to Perryville Project

Affected Wetland/ Facility	Milepost	Affected Wetland Area (acres) [a]	Wetland Type	Applicable FERC Procedures Section	Basis for Requested Variance [b]
Pipeline Facilities					
Wetland HO12	RMP 1.1	0.0 [c]	PSS	VI.B.1.a	Extra workspace sited 31 feet from of an adjacent wetland
Wetland HO12	RMP 1.2	0.0 [c]	PUB	VI.B.1.a	Extra workspace sited 40 feet from an adjacent wetland
Wetland HO14	RMP 1.3	0.0 [c]	PFO	VI.B.1.a	Extra workspace sited 41 feet from an adjacent wetland
Wetland A044	4.0	0.2	PEM/PFO	VI.B.1.a	Extra workspace for Sabine River HDD pull string assembly
Wetland A044	4.1	0.2	PEM/PFO	VI.B.1.a	Extra workspace for HDD crossing (exit) of Sabine River
Wetland A050	41.5	0.2	PEM [d]	VI.B.1.a	Extra workspace for HDD crossing (exit) of Bayou Pierre
Wetland A050	41.6	0.7	PEM [d]	VI.B.1.a	Extra workspace for Bayou Pierre HDD pull string assembly
Wetland A050	45.3	0.5	PEM [d]	VI.B.1.a	Extra workspace for HDD crossing (entrance) of the Prairie River
Wetland A007	80.8	0.2	PEM/PFO	VI.B.1.a	Extra workspace for HDD crossing (exit) of Saline Bayou
Wetland ZW006	RMP 94.2	0.0 [c]	PFO	VI.B.1.a	Extra workspace for construction of a point-of- inflection within 50 feet of a wetland
Wetland ZW006	RMP 94.6	0.2	PFO	VI.B.1.a	Extra workspace for construction of waterbody crossing
Wetland ZW006	RMP 94.6	0.2	PFO	VI.B.1.a	Extra workspace for construction of waterbody crossing
Wetland ZW006	RMP 94.6	0.5	PFO	VI.B.1.a	Extra workspace for HDD crossing (entrance) of the Dugdemona River
Wetland ZW006	RMP 95.1	0.2	PFO	VI.B.1.a	Extra workspace for HDD crossing (exit) of the Dugdemona River

TABLE 3.4.2-1 (continued) Summary of Requested Modifications to Our Procedures for the Proposed Carthage to Perryville Project					
Affected Wetland/ Facility	**Milepost**	**Affected Wetland Area (acres) [a]**	**Wetland Type**	**Applicable FERC Procedures Section**	**Basis for Requested Variance [b]**
Access Roads					
Wetland D025/ Access Road 10-02	11.6	1.5	PEM/PFO	VI.B.1.e	Segment of existing access road crosses delineated wetland and would require improvement
Wetland ZW006/ Access Road 94-02	RMP 94.7	0.4	PFO	VI.B.1.e	Segment of existing access road crosses delineated wetland and would require improvement
Wetland B041/ Access Road 111-01	111.5	< 0.1	PEM/PFO	VI.B.1.e	Segment of existing access road crosses delineated wetland and would require improvement
Wetland C-105/ Access Road 115-01	115.9	< 0.1	PEM/PFO	VI.B.1.e	Segment of existing access road crosses delineated wetland and would require improvement

Notes:

[a] Acreage for access roads presented in table includes only that portion of the access road that would be within a wetland area.

[b] CEGT would prepare site-specific plans to be filed with the FERC prior to construction, as required by the FERC Procedures.

[c] Extra workspace would be sited outside of the delineated wetland boundary and would not directly impact any wetland area.

[d] Extra workspace would be located in the non-forested (PEM) portion of a non-forested/forested wetland (PEM/PFO); no clearing of forested wetland would be required.

adequately justified. However, our Procedures also require that CEGT file a site-specific construction plan for each extra workspace that would not be located at least 50 feet outside of a wetland boundary. Although CEGT has provided some additional information related to the proposed extra workspace areas in wetlands, the required site-specific plans have not yet been submitted. Therefore, **we recommend that:**

- **Prior to construction, CEGT should file site-specific construction plans for all extra workspace areas that would be located within 50 feet of a wetland with the Secretary for review and written approval by the Director of OEP.**

Additionally, our Procedures require that the Director of OEP approve any access road improvements in wetlands. CEGT's proposed modifications for access roads are approved, although CEGT would still be required to implement the other wetland protective measures included in our Procedures. In addition, CEGT would be required to complete all wetland permitting and compensatory

mitigation consultations with the COE before commencing construction at any of the extra workspace areas or improving any access roads located within wetlands, as recommended above.

3.4.3 Site-Specific Wetland Impacts and Mitigation

Construction of the proposed Project would affect 154 wetland areas resulting in a total of approximately 127.7 acres of wetland disturbance during construction. These impacts would include approximately 86.5 acres of PFO wetlands and an additional 41.2 acres of PEM and PSS wetlands (see Appendix F). As described previously, impacts to PEM and PSS wetlands would be temporary or short-term, as regeneration would occur rapidly in these areas. Further, maintenance of the permanent pipeline right-of-way would not result in a permanent conversion of PEM wetlands.

Approximately 34.8 acres of PFO wetlands would be permanently affected by maintenance of the permanent pipeline right-of-way (see Appendix F), and the remaining PFO wetland impacts would be long-term due to the slow regeneration time of forested areas. We view the identified impacts to PFO wetlands that would result from construction and operation of the proposed Project as potentially significant. Therefore, in the Draft EIS we recommended that CEGT consult with the COE, TPWD, LDWF, and other applicable agencies to identify appropriate avoidance and/or minimization measures to further reduce impacts to forested wetlands and develop a Project-specific, forested wetland restoration plan.

In response to our recommendations, CEGT consulted with COE, TPWD, LDWF, and FWS regarding development of a Project-specific forested wetland restoration plan. None of the agencies consulted advocated active planting or reforestation of forested wetlands that would be temporarily impacted by the proposed construction work areas. Rather, the COE (TRC 2006c) indicated that its preference would be to allow natural reforestation to occur in forested wetland areas, with wetland restoration activities limited to restoration of preconstruction contours and seeding with annual vegetation to provide temporary stabilization and erosion control. The other agencies consulted, FWS, TPWD, and LDWF, concurred with the COE recommendation (LDWF 2006e; TPWD 2006c; TRC 2006f), which is also consistent with the wetland restoration measures identified in our Procedures. Additionally, these agencies requested that construction work areas that would be allowed to revegetate naturally be monitored and the occurrence of invasive plant species be corrected. As described in Section 3.4.4, our Procedures require post-construction monitoring to verify the success of wetland revegetation. Additionally, in Section 3.5.3 we have included a recommendation for the development of a Nuisance Species Plan that incorporates the agency recommended measures for the control of invasive plant species during construction and operations.

As recommended in the Draft EIS, CEGT also consulted with COE, TPWD, LDWF, and FWS to evaluate the proposed forested wetland crossings and receive recommendations for further avoidance and minimization measures. As part of that consultation process, representatives of the COE, LDWF, and FWS accompanied CEGT staff on field site visits to evaluate wetland impacts and associated wildlife habitats. The COE indicated that it believes CEGT's proposed construction plans represent appropriate avoidance and minimization measures, and the COE did not provide any recommendations for additional or lengthened HDDs to reduce impacts to forested wetlands (TRC 2006d). As discussed in Section 3.4.3.2, TPWD acknowledged that impacts to forested wetlands associated with the Sabine River crossing (MP 4.3) would be minimized through CEGT's proposed use of HDD installation, and TPWD provided no further recommendations for avoidance or minimization of impacts.

In their comments on the Draft EIS dated July 12 and July 13, 2006, LDWF and FWS, respectively, identified several forested wetlands of particular concern and provided recommendations for further avoidance and minimization in association with the proposed crossing of those wetlands (see

Appendix K). These wetlands, the associated LDWF and FWS comments, and our recommendations are discussed below.

Cannisnia Lake Basin Forested Wetland

In its comments on the Draft EIS, FWS noted that forested habitat, comprised of mature cypress and water tupelo (*Nyssa aquatica*), at the Cannisnia Lake Basin forested wetland (vicinity of MP 43.0) still provides a high degree of wildlife value despite significant alterations to the local hydrology associated with timber practices and levee construction. FWS therefore recommended that the proposed construction right-of-way through the Cannisnia Lake Basin forested wetland be aligned with existing access roads through the area to avoid higher-quality, cypress sloughs as much as possible.

CEGT reports that it developed the proposed Project pipeline alignment through the Cannisnia Lake Basin forested wetland in response to requests from the affected landowner. Moreover, CEGT indicates that the affected landowner specifically requested that existing access roads through the property not be utilized by CEGT. We note that the proposed pipeline alignment extending from MP 42.9 to MP 44.0 would be collocated with an existing canal and levee, which would generally minimize impacts to forested wetland resources there. However, the proposed pipeline route extending from MP 42.3 to MP 42.9 would traverse a relatively continuous forested area, and we concur that further minimization of forested wetland impacts might be feasible and appropriate, as discussed below.

Castor and Sixmile Creek Forested Wetlands

In its comments, LDWF recommended that CEGT implement an HDD crossing to avoid impacts to the Castor Creek (MP 74.8 to 74.9) and Sixmile Creek (MP 79.8 to 79.9) forested wetlands. In particular, LDWF indicated that the proposed open-cut pipeline installation at these wetlands (see Section 2.3.2.2) would result in introduction of a new, permanently maintained right-of-way through relatively undisturbed riparian corridors. Though the proposed Project pipeline alignment would collocate with an existing electric transmission line right-of-way to the east and west of the Sixmile Creek forested wetland, the proposed alignment through that wetland deviates approximately 400 feet to the south of the existing right-of-way to avoid an electrical substation facility at MP 80.0. Due to the presence of high quality wetland vegetation dominated by mature cypress and water tupelo, FWS also recommended implementation of an HDD crossing at the Sixmile Creek forested wetland to avoid the potential for cumulative impacts associated with multiple right-of-way crossings.

In response to the comments and recommendations of LDWF and FWS, we requested that CEGT evaluate the feasibility of implementing an HDD crossing at both the Castor Creek and Sixmile Creek forested wetlands. In its response, CEGT indicated that the bend radius of the proposed 42-inch-diameter, heavy walled pipe would limit the minimum length of a feasible HDD to 1,600 feet. Due to the proposed pipeline alignment at the Sixmile Creek forested wetland, implementation of an HDD there would result in the need for extra temporary workspace to facilitate HDD pull string assembly, which could impact additional forested and/or wetland areas. While we acknowledge the high vegetative quality and habitat value of the Castor and Sixmile Creek forested wetlands, we do not consider that avoidance of these resources, which measure 343 and 404 feet in width, respectively, would justify implementation of HDD crossings measuring 1,600 feet in length, or approximately four times the width of the affected wetland resources. However, we do consider that further minimization of impact to wetland resources, particularly mature trees, would be appropriate at the Castor and Sixmile Creek, as well as the Cannisnia Lake Basin, forested wetlands. Therefore, **we recommend that:**

- **CEGT should consult with FWS and LDWF to develop detailed, site-specific wetland crossing plans for the Cannisnia Lake Basin (MP 42.3 to MP 42.9), Castor Creek (MP**

74.8 to 74.9), and Sixmile Creek (MP 79.8 to 79.9) forested wetlands and file those plans with the Secretary for review and written approval by the Director of OEP prior to construction at each crossing. Each site-specific plan should include a reduction in the width of the proposed construction right-of-way and any associated extra temporary workspace areas that considers all practicable methods to minimize the width of the cleared right-of-way, including: stove-pipe, drag-section, and push-pull flotation ditch (if sufficient water is present). Each plan should also depict the location of any mature, specimen trees (i.e., greater than 24 inches diameter at breast height) within and adjacent to the proposed construction work areas, and identify how impacts to such trees might be avoided.

Saline Bayou Forested Wetland

As proposed, the crossing of the Saline Bayou forested wetland (MP 80.7 to MP 81.5) would be accomplished via a combination of HDD and conventional open-cut installation methods. Both FWS and LDWF recommended that the proposed 1,600-foot-long HDD of Saline Bayou be extended to further reduce impacts to forested wetland resources. Specifically, FWS requested that the HDD be extended approximately 850 feet to the eastern side of an existing electric transmission line right-of-way, and LDWF requested that the HDD be extended to a minimum length of 3,000 feet, which would increase the length of the proposed HDD by approximately 1,400 feet. If implemented, the FWS and LDWF recommendations would reduce construction impacts to the Saline Bayou forested wetland by approximately 1.1 and 2.0 acres, respectively, relative to the proposed construction plan.

The proposed pipeline route was collocated with an existing electric transmission line right-of-way in the vicinity of Saline Bayou, a designated Louisiana Natural and Scenic River, to minimize impacts to that waterbody and its associated forested wetlands. Commission regulations (18 CFR 380.15[d][1]) give primary consideration to the use, enlargement, or extension of existing rights-of-way to reduce potential impacts on sensitive resources. Construction effects and cumulative impacts can normally be reduced by avoiding the creation of new rights-of-way through undisturbed areas. For these reasons, we do not consider the marginal increase in forested wetland impact avoidance that would result from extension of the Saline Bayou HDD to be justified. Additionally, we note that LDWF has already issued a Scenic Rivers Permit authorizing the proposed construction activities at Saline Bayou (see Section 3.8.5). In granting that permit, LDWF considered whether the proposed construction activities would adversely impact the structural and functional integrity of the natural systems and aesthetics associated with Saline Bayou.

Dugdemona River Forested Wetland

In its comments, LDWF recommended that CEGT implement an HDD crossing to reduce impacts to the Dugdemona River forested wetland (RMP 94.2 to RMP 95.5) and avoid the introduction of a new, permanently maintained right-of-way through this relatively undisturbed riparian corridor. Since the issuance of the Draft EIS, CEGT has adopted a route variation in the vicinity of the Dugdemona River forested wetland (see Section 4.4). As part of that reroute, CEGT has proposed to implement an approximately 2,300-foot-long HDD at the Dugdemona River. Relative to CEGT's original proposal, the Dugdemona Reroute would reduce construction impacts to the Dugdemona River forested wetland by approximately 1.4 acres.

In response to the recommendations of LDWF, we also considered the feasibility of implementing a 3,000-foot-long HDD crossing to determine whether such a crossing could result in significant environmental advantages to the proposed HDD installation. Lengthening the proposed HDD would likely reduce construction impacts to the Dugdemona River forested wetland by approximately 1.2

acres. However, CEGT indicated that extending the length of the Dugdemona River HDD would introduce constructability concerns as the pull string for the HDD installation would extend across Bear Creek Road or an existing railroad, depending on whether the drill were initiated from the eastern or western sides of the river, respectively. Additionally, CEGT also consulted with the affected landowner in the vicinity of the Dugdemona Creek forested wetland. The landowner, a timber management company, indicated that it has immediate plans to clear timber from areas including, and in addition to, the proposed Project construction right-of-way (CEGT 2006). For these reasons, we do not consider extension of the proposed Dugdemona River HDD to be justified.

Castor Creek Forested Wetland

As proposed, the crossing of Castor Creek forested wetland (MP 112.9 to MP 113.5) would be accomplished via conventional open-cut installation methods. At the proposed crossing location, the Castor Creek forested wetland is bisected by State Highway 34 and consists of an approximately 3,100-foot-wide wetland community dominated by oak and cypress. To the west of the highway, the proposed pipeline alignment traverses Castor Creek, which consists of a braided system of channels and sloughs containing numerous mature cypress trees. To the east of the highway, the wetland is also bisected by an existing ammonia pipeline right-of-way, and an abandoned railroad line lies just east of the wetland boundary. Both FWS and LDWF recommended that CEGT implement an HDD crossing to reduce construction impacts to the Castor Creek forested wetland and avoid introduction of a new, permanently maintained right-of-way through a relatively undisturbed riparian corridor.

In response to the comments and recommendations of LDWF and FWS, we requested that CEGT evaluate the feasibility of implementing an HDD crossing with a minimum length of 3,000 feet at the Castor Creek forested wetland. CEGT indicated that a 3,000-foot-long HDD might conflict with the existing ammonia pipeline, and instead evaluated conversion of the planned conventional road bore at State Highway 34 to a 2,600-foot-long HDD. As evaluated, the HDD would extend from pasture lands located just west of the Castor Creek forested wetland to a point between State Highway 34 and the ammonia pipeline. Relative to the proposed construction plan, the HDD evaluated by CEGT would reduce construction impacts to the Castor Creek forested wetland by approximately 3.8 acres. However, a 2,600-foot-long HDD would also likely result in the need for extra temporary workspace area within the forested wetland, which would result in additional construction-related wetland impacts. Additionally, a 2,600-foot-long HDD would not avoid the ammonia pipeline, such that an open-cut crossing at that facility would still be required.

We estimated that an HDD of approximately 3,400 feet in length would be required to entirely avoid the Castor Creek forested wetland. Relative to the proposed construction plan, such an HDD would reduce construction impacts to the Castor Creek forested wetland by 4.9 acres, avoid multiple waterbody crossings associated with Castor Creek, and eliminate a conventional bore of State Highway 34, which, in our experience, would likely result in additional forested wetland impacts associated with extra temporary workspace requirements, though we note that CEGT has not yet requested such workspace. Additionally and relative to the HDD evaluated by CEGT, a 3,400-foot-long HDD would further reduce forested wetland impacts, eliminate the potential for conflict with the ammonia pipeline, and avoid the need for extra temporary workspace requirements within the wetland. For these reasons, we consider that such an HDD would offer significant environmental advantages to the proposed construction plan, as well as the HDD installation evaluated by CEGT. From a constructability perspective, CEGT has indicated that an HDD installation exceeding 3,000 feet in length might be problematic given the diameter of the proposed Project pipeline and the associated HDD bore diameter requirements. However, we have reviewed multiple proposals for HDDs of 42-inch-diameter pipeline that exceed 4,000 feet in length, and we consider a 3,400-foot-long HDD to be within the bounds of technical feasibility. Therefore, **we recommend that:**

- **CEGT should implement an HDD crossing rather than the proposed construction plan between MP 112.9 and MP 113.6 to avoid impacts to the Castor Creek (MP 112.9 to MP 113.5) forested wetland, State Highway 34, and an adjacent ammonia pipeline. CEGT should file site-specific crossing plans, details, and plan and profile drawings for the HDD crossing with the Secretary for review and written approval by the Director of OEP prior to construction of the crossing.**

Cutoff Bayou Forested Wetland

In its comments on the Draft EIS, FWS also requested evaluation of a route variation to avoid the proposed open-cut crossing of the Cutoff Bayou forested wetland (MP 132.7 to 133.7). In response to this request, we have considered a route variation (i.e., the Cutoff Bayou Variation) in Section 4.4.6 of this EIS. In that section, we have also included a recommendation for CEGT to adopt a route variation that would further reduce construction impacts to the Cutoff Bayou forested wetland.

3.4.3.1 Conclusions Regarding Site-Specific Wetland Impacts and Mitigation

Given compliance with our Procedures, implementation of our recommendations for development of site-specific wetland crossing plans and incorporation of an additional HDD to further reduce impacts to forested wetlands, and development of a compensatory wetland mitigation plan in consultation with the COE and other applicable resource agencies (see Section 3.4.4), we consider that impacts to PFO wetlands would be sufficiently minimized.

CEGT has requested modifications from our Procedures that would allow 10 extra workspace areas to be located within a wetland boundary and improvement of four access roads located within wetlands (Table 3.4.2-1). Additionally, CEGT has also proposed to site four extra workspaces within 50 feet of a delineated wetland boundary. As described above, we have approved CEGT's request for improvement of existing access roads within wetland areas, and we have determined that the other proposed modifications to our Procedures, including those that would affect PFO wetlands, appear reasonable and adequately justified. However, final determination regarding CEGT's requested variances would not be made until site-specific construction plans are made available for our review.

3.4.3.2 High Quality, Sensitive, or Special-Status Wetlands

As described above, CEGT or the consulting resource agencies identified two special-status wetland types or areas that would be affected by the proposed Project.

Wetlands Reserve Program Lands

Based on available mapping and coordination with the NRCS, CEGT indicated that WRP lands would be crossed by the proposed pipeline route in Red River, Ouachita, and Richland Parishes, Louisiana. The NRCS administers the WRP, which is a voluntary program that offers landowners the opportunity to protect, restore, and enhance wetlands located on their property (NRCS 2006c). The program attempts to improve wetland function and wildlife habitat and to promote long-term conservation through technical and financial assistance.

CEGT would not have definitive information on the exact location and potential impacts to all WRP lands until easement negotiations with the affected property owners are complete. CEGT has thus far identified only one WRP property, which occurs at RMP 154.3, but surface impacts to that property would be avoided by extension of the proposed HDD crossing of Bee Bayou (see Section 4.4). Based on consultations with the NRCS, CEGT would be required to obtain Compatible Use Permits from the

NRCS authorizing the crossing of any WRP lands. Furthermore, it is our understanding that not all lands enrolled in the WRP are classified as wetlands. Therefore, further consideration of potential Project-related effects to WRP lands is provided in our analysis of impacts to special interest areas, which is included in Section 3.8. In that section, we provide recommendations for identification of the extent and location of all affected WRP lands, as well as further consultation with NRCS and acquisition of any required Compatible Use Permits prior to construction.

Sabine River Water Oak-Willow Oak Series

TPWD (2006a) provided information that the proposed Project would cross a significant Water Oak-Willow Oak Series at the Sabine River (MP 4.3) in Panola County, Texas. CEGT's wetland delineations confirmed the presence of PFO wetlands (Wetlands F007 and A044b) on both sides of the Sabine River that include water oak and willow oak as the dominant vegetative species. To minimize wetland impacts to the Sabine River forested wetland, the proposed pipeline route was partially collocated with an existing natural gas pipeline right-of-way. Further collocation opportunities were constrained by the presence of a cultural resources site in this general area (see Section 3.10). Additionally, CEGT would use HDD installation techniques to further avoid and minimize impacts to the Sabine River and associated wetlands. However, the proposed Sabine River HDD would not completely avoid impacts to associated forested wetlands as associated extra workspace areas would result in some impacts to forested wetlands (see Table 3.4.2-1). In total, construction of the proposed Project would impact about 3.4 acres of forested wetlands at the Sabine River crossing. Approximately 1.2 of these acres would be contained within the permanent pipeline right-of-way and would be converted to a herbaceous state for the life of the proposed Project.

As described above, CEGT would be required to provide site-specific plans for the extra workspace areas associated with the Sabine River HDD crossing. Provision of these plans would help ensure that any affects to wetlands would be minimized. Further, implementation of our Procedures and required consultations and permitting activities with the COE would ensure that appropriate wetland restoration and mitigation measures are implemented.

As recommended in the Draft EIS, CEGT consulted further with TPWD to determine whether additional mitigation measures might be appropriate in regard to the proposed construction plans at the Sabine River crossing and associated impacts to the TPWD-designated Water Oak-Willow Oak Series. In its comments on the Draft EIS dated July 11, 2006, TPWD acknowledged that impacts to the Sabine River Water Oak-Willow Oak Series would be minimized through CEGT's proposed use of HDD installation in that area. TPWD provided no further recommendations for avoidance or minimization of impacts, but did recommend that any unavoidable impacts to the Water Oak-Willow Oak Series that would not fall under the jurisdiction of the COE (i.e., those portions of the vegetative community not contained within delineated wetland boundaries) be mitigated through the purchase of mitigation bank credits. It is likely that all unavoidable impacts to the Water Oak-Willow Oak Series would fall under the jurisdiction of the COE and therefore be subject to compensatory mitigation, as described in Section 3.4.4. However, the extent of the Water Oak-Willow Oak Series in relation to CEGT's proposed construction work areas and the limits of the delineated wetland boundaries at the Sabine River have not been clearly defined. Therefore, **we recommend that:**

- **CEGT should consult with TPWD to develop a compensatory mitigation plan to offset any unavoidable impacts to the TPWD-designated Water Oak-Willow Oak Series not covered by its compensatory wetland mitigation plan, and file copies of the Water Oak-Willow Oak Series compensatory mitigation plan with the Secretary prior to construction.**

3.4.4 Compensatory Wetland Mitigation

For temporary and short-term wetland impacts CEGT would revegetate wetlands in accordance with our Procedures. The requirements for wetland restoration measures identified in our Procedures include:

- consultation with appropriate land management or state agencies to develop a Project-specific restoration plan that includes measures for re-establishing herbaceous and woody species;
- prohibition on the use of herbicides or pesticides within 100 feet of a wetland, except as allowed by the appropriate agencies; and
- monitoring of the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is considered successful.

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

As noted above, CEGT would complete wetland permitting, including development of measures for compensatory mitigation for all wetland impacts, in consultation with the COE. Based on the results of the consultations completed to date, CEGT has proposed to compensate for wetland impacts through purchase of wetland mitigation bank credits in the area of the proposed Project. 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. CEGT and the COE are consulting regarding appropriate mitigation for wetland impacts, and because these consultations are not yet complete, **we recommend that:**

- **Prior to construction, CEGT should consult with the COE, FWS, LDWF, TPWD, and other applicable agencies to further develop its compensatory wetland mitigation plan, and file copies of all associated permits and compensatory mitigation requirements with the Secretary.**

3.5 VEGETATION

3.5.1 Existing Vegetation Resources

The Carthage to Perryville Project would traverse the Outer Coastal Plain Mixed Forest and the Lower Mississippi Riverine Forest ecoregions (U.S. Forest Service 2006). These areas mainly include flat or irregular plains containing a variety of native vegetation types, including southern mixed forest, oak-hickory-pine forest, and southern floodplain forest. Based on review of maps, aerial photography, and field surveys, CEGT identified and described vegetative cover types located along the proposed Project. The upland vegetative resources crossed by the proposed pipeline route and located at the proposed aboveground facility sites are comprised of four primary types of vegetative communities: agricultural, upland forest, open land, and pine plantation. Several vegetative communities of special concern and extensive forested tracts would also be crossed, as well as areas containing exotic and/or invasive plant species.

Agricultural areas include locations used to grow field crops, as well as pasture lands that primarily support livestock. Upland forests include the mixed hardwood-loblolly pine association and the sloped, hardwood forest association. Open lands include maintained utility rights-of-way, upland shrub areas, and other non-agricultural herbaceous areas. Pine plantations are actively planted, maintained, and managed for timber production. The upland vegetative cover types crossed by the proposed Project, as well as a listing of representative species, are described in Table 3.5.1-1. Vegetation occurring in wetland habitat types that would be crossed by the proposed Project is discussed in Section 3.4, and potential Project effects on agricultural areas are discussed in more detail in Sections 3.2 and 3.8.

For the proposed Project, CEGT proposes to use existing pipe yards and warehouses in commercial and industrial areas for pipe storage and contractor yards, thereby avoiding impacts to vegetation associated with those construction-related activities. Should CEGT identify the need for additional pipe storage or contractor yards, and if these were not located in previously disturbed commercial or industrial areas, then CEGT would perform appropriate environmental surveys and forward that information to the FERC for review and approval prior to their use.

Pipeline Facilities

Large areas of pine plantation, agricultural land, and upland forest vegetation cover types, and to a lesser extent, open land, would be affected by construction of the proposed pipeline and associated extra workspaces. Of the upland vegetation communities affected by the proposed pipeline, pine plantation accounts for approximately 42 percent, agricultural land accounts for 27 percent, upland forest accounts for 22 percent, and open lands account for remaining 9 percent.

Aboveground Facilities

The proposed Project aboveground facilities include two compressor stations, six meter/regulator stations, and 11 mainline valves. Upland forest and pine plantation are the existing vegetation cover types at the proposed Panola and Vernon Compressor Station sites, respectively. Upland forest is also the primary vegetative cover type at the proposed meter/regulator station sites, along with agricultural and open land to a lesser extent. Two of the proposed mainline valve sites (MLV #1 and #8) would be collocated within the confines of the Panola and Vernon Compressor Stations, respectively. The remaining mainline valve sites would all be located within the bounds of the permanent right-of-way for the proposed pipeline facilities.

Access Roads

CEGT proposes to use 143 existing access roads during construction of the proposed Project, of which 50 would require improvement to support construction-related traffic (see Section 3.8). In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new access roads would also be required in association with the proposed Panola Compressor Station and the Trunkline, Texas Gas, and ANR M/R Stations.

In addition to the upland vegetation types discussed above, the proposed Project would also cross wetland vegetation. The wetland types crossed include forested wetlands (woody vegetation at least 20 feet tall with species such as water oak and bald cypress), scrub-shrub wetlands (shrubby vegetation including species such as button bush, hawthorne, and tree saplings), and emergent wetlands (herbaceous vegetation including species such as sedges and bulrush). Construction of the proposed Project would affect approximately 86.5 acres of forested wetlands and an additional 41.2 acres of emergent and scrub-shrub wetlands. Operation of the proposed Project would permanently affect approximately 34.8 acres of

TABLE 3.5.1-1
Upland Vegetation Cover Types Occurring Along the Proposed Carthage to Perryville Project

Vegetation Cover Type	General Description	Common Species
Agricultural [a]	Areas under active farming, including field crops and pastures.	Field crops – cotton (*Gossypium* spp.), rice (*Oryza sativa*), soybeans (*Glycine* spp.), and corn (*Zea* spp.). Pasture - crabgrass (*Digitaria* spp.), vasey's grass (*Paspalum urvillei*), smut grass (*Sporobolus indicus*), bluegrasses (*Poa* spp.), broom-sedge (*Andropogon virginicus*), bermudagrass (*Cynodon dactylon*), bahia (*Bahia* spp.).
Upland Forest [b]	In mixed hardwood - loblolly pine (*Pinus taeda)* forests, loblolly pine comprises at least 20 percent of the overstory. These forests trend towards hardwood dominance when fire is suppressed.	In mixed hardwood - loblolly pine (*Pinus taeda)* forests, loblolly pine comprises at least 20 percent of the overstory. These forests trend towards hardwood dominance when fire is suppressed.
Upland Forest [b]	Hardwood slope forests occur on slopes of stream floodplains.	Hardwood slope - American beech, white oak *(Q. alba*), water oak *(Q. nigra*), laurel oak *(Q. laurifolia*), black oak *(Q. velutina*), yellow poplar, witch hazel (*Hamamelis virginiana*), american holly (*I. opaca*), flowering dogwood *(Cornus florida*), sweetleaf *(Symplocos tinctoria*), wake-robbins *(Trillium* spp.), smooth solomon's seal *(Polygonatum biflorum*), and bellwort *(Uvularia perfoliatum*).
Open Land [c]	Grassy or shrubby areas, such as utility rights-of way and other non-forested areas excluding agriculture and pastures.	Loblolly pine, sweetgum, and southern red oak saplings, winged sumac *(Rhus copallina*), yaupon (*I. vomitoria*), greenbrier (*Smilax glauca*), blackberry *(Rubus* spp.), bluestem (*Andropogon* spp.), and ragweed (*Ambrosia artemisiifolia*).
Pine Plantation	Pine plantations include varying age stands of loblolly pine that are planted, managed, and periodically cut for timber production.	Loblolly pine, with an understory of sweetgum, yellow Jessamine (*Gelsemium sempervirens*), yaupon, greenbrier, and sawbriar (*R. argutus*).

Notes:

[a] Includes the herbaceous and pasture vegetative cover types.

[b] Includes the upland mixed hardwood-loblolly pine forest and sloped hardwood forest vegetative cover types.

[c] Includes the upland scrub-shrub vegetative cover type.

forested wetlands. However, in Section 3.4.3 we have included recommendations for the development of site-specific wetland crossing plans and incorporation of an additional HDD that would further reduce construction and operational impacts to forested wetlands. Wetland vegetation resources, impacts, restoration, and mitigation are discussed in detail in Section 3.4, and the remainder of this section focuses on potential Project effects to upland vegetation resources.

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, CEGT identified five areas or types of areas with an elevated level of vegetative significance. These areas included a designated FWS conservation easement, lands held in the NRCS Conservation Reserve Program (CRP), and a crossing of the Ouachita Wildlife Management Area (WMA). Additionally, lands and vegetation included in the NRCS-administered WRP and a significant Water Oak-Willow Oak Series at the Sabine River (MP 4.3) in Panola County, Texas, were also identified, but these areas of wetland vegetation are addressed further in Section 3.4.

The FWS works with private landowners that voluntarily restore wetlands or other valuable wildlife habitats on their property by providing financial assistance from the federal government (FWS 2006a). One such area, the W.W. Farms Conservation Easement, is located along the proposed pipeline route near RMP 146.3, just east of the Boeuf River in Richland Parish, Louisiana. Following restoration, which often includes the planting of bottomland hardwoods, as is the case at the W.W. Farms Conservation Easement, these lands are placed in a protective easement for 10 to 25 years.

The NRCS-administered CRP is a voluntary program that allows owners of agricultural land to conserve those lands through planting of grasses, trees, and other cover, with financial assistance from the federal government (USDA 2006). Typically, these areas retire erodible soils or otherwise sensitive croplands from production for a period of 10 to 15 years. CEGT indicated that CRP lands would be crossed by the proposed pipeline route in Red River, Ouachita, and Richland Parishes, Louisiana. However, the exact location and size of these areas have not been determined because easement negotiations with the affected property owners have not been completed.

The proposed pipeline route would cross the Ouachita WMA near MP 138.5 for a distance of approximately 900 feet. The area of the proposed crossing is forested. The Ouachita WMA is a 9,641 acre site managed by the LDWF for hunting of deer, doves, and ducks, among other species, and has been the focus of extensive efforts to restore hardwood forests (LDWF 2006b).

3.5.1.2 Extensive Forested Tracts

CEGT identified several areas of large, relatively non-fragmented forested tracts that would be crossed by the proposed pipeline based on a review of maps, aerial photographs, and field surveys. The location of these tracts and the length of the associated crossings are identified in Table 3.5.1-2. Although these areas are relatively non-fragmented, CEGT indicated that many of these tracts are still subject to periodic harvest and/or thinning, thereby reducing their overall quality.

3.5.1.3 Exotic or Invasive Plant Species

Several exotic plant species were observed by CEGT during field surveys for the proposed Project including: mimosa (Albizia julibrissin), Chinaberry tree (Melia azedarach), Japanese privet (Ligustrum japonicum), bamboo (Phyllostachys spp.), Japanese climbing fern (Lygodium japonicum), Chinese privet (Ligustrum sinense), and Japanese honeysuckle (Lonicera japonica). Additionally, two plant species considered both exotic and invasive, purple loosestrife (Lythrum salicaria) and Chinese tallow tree (Sapium sebiferum), were also observed at several locations along the proposed pipeline route in Louisiana. Purple loosestrife is a perennial herb that invades both disturbed and undisturbed wetlands where it can out-compete native plant species (NPS 2006c). 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

TABLE 3.5.1-2 Extensive Forested Tracts Crossed by the Carthage to Perryville Project			
Location	**Begin Milepost**	**End Milepost**	**Length (miles)**
Panola County, Texas			
	4.5	5.8	1.3
	9.8	11.2	1.4
	11.5	12.4	0.9
Caddo Parish, Louisiana			
	15.5	16.2	0.7
	19.2	20.9	1.7
DeSoto Parish, Louisiana			
	21.5	RMP 27.1	5.5
	31.0	31.8	0.8
	33.0	34.2	1.2
	34.9	35.6	0.7
	37.0	39.2	2.2
Bienville Parish, Louisiana			
	73.0	75.0	2.0
Jackson Parish, Louisiana			
	RMP 94.0	96.3	2.3
	114.9	120.2	5.3
Ouachita Parish, Louisiana			
	120.2	123.0	2.8
	125.8	128.0	2.2
	128.2	131.8	3.6
Total			**34.6**

native vegetation, and is able to successfully invade undisturbed forests (Invasive Species 2006). The FWS and NRCS both identified Chinese tallow tree as an invasive species of potential concern along the proposed Project route.

3.5.2 General Impacts and Mitigation

The primary impact of the proposed Project on vegetative cover types would be the clearing and removal of vegetation that occurs along the proposed route or at the aboveground facility sites during construction. The severity of impact would depend on the type of vegetation impacted, the size of the area cleared, the time required for vegetation to become re-established, and subsequent maintenance practices in cleared areas.

Most impacts to agricultural and open lands would be short term, as these areas would typically return to their herbaceous or shrub status within one to two years following construction, cleanup, and restoration. Areas planted with field crops are typically disturbed by periodic agricultural practices and would be replanted in the next growing season. It is also anticipated that pastures, rights-of-way, and other herbaceous areas would revegetate quickly, given the abundant rainfall and long growing season of northeastern Texas and northern Louisiana. During consultations, both LDWF and TPWD made recommendations and/or requested consultation regarding seed mixtures, revegetation practices, the use of native plant species, and effects of vegetation restoration on wildlife habitat. Our Plan requires that all upland areas disturbed by construction be fertilized, limed, and seeded in accordance with the prescribed dates and seed mixes specified by local soil conservation authorities or land management agencies. In order to ensure that appropriate vegetative restoration practices would be implemented, **we recommend that**:

- **CEGT should consult with LDWF, TPWD, local soil conservation agencies, and other appropriate agencies, regarding seeding and vegetation restoration practices for the proposed Project. Prior to construction, CEGT 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.**

Cutting or removal of vegetation would 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. Additionally, TPWD expressed concern that heavy machinery should not be driven over riparian vegetation when it is extremely wet, nor should heavy equipment be parked on vegetation for extended periods. CEGT has proposed the use of low weight construction equipment and/or equipment fitted with tracks or balloon tires to minimize vegetative disturbance and soil rutting in wet environments, such as riparian bottomlands.

Impacts to forested areas, including pine plantations, mixed hardwood-loblolly pine forests, and sloped hardwood forests, would be long-term as re-growth to preconstruction conditions would take 30 years or more. These impacts would also involve the most significant change in vegetative strata, appearance, and habitat, as mature trees would be replaced for a period of years by herbaceous plants, shrubby growth, or saplings. 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 a 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, CEGT has committed to implementing our Plan, which includes measures for testing and mitigating soil compaction. Additionally, CEGT stated that it would protect trees located outside the right-of-way from mechanical injury by felling trees and brush towards the construction right-of-way and by taking care to prevent or minimize injury to limbs and roots of adjacent trees.

Permanent impacts would also occur at the proposed aboveground facility sites. Notably, permanent impacts to forested areas and/or pine plantations would occur at both of the proposed compressor station sites and at five of the six proposed meter/regulator stations. To a smaller extent, permanent impacts to agricultural land and pasture would also occur in association with construction of the Panola Compressor Station (MP 8.4) and the ANR (MP 164.4) and Columbia Gulf M/R Stations (MP 171.9).

3.5.2.1 The FERC Plan

To minimize construction related effects, CEGT has agreed to adopt our Plan with no requested modifications. The intent of our Plan is to identify baseline mitigation measures for minimizing erosion and enhancing revegetation in upland areas. Implementation of our Plan would aid vegetative restoration and prevent or minimize sedimentation and turbidity in streams and wetlands. The major aspects of our Plan are described further in Section 3.2, and some of the restoration and best management practices identified in our Plan include the following:

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

3.5.3 Site-Specific Impacts and Mitigation

Impacts to vegetative cover types would include occur in those areas affected by pipeline construction and building of the proposed aboveground facilities. The anticipated impacts to vegetation types are listed and enumerated in Table 3.5.3-1. As discussed above, some of the impacts associated with pipeline construction would also affect specially designated vegetation types or conservation programs. These specially designated areas included an FWS conservation easement, CRP lands, and a crossing of the Ouachita WMA.

Pipeline Facilities

CEGT's proposed pipeline installation and extra workspaces would affect approximately 2,053.2 acres of upland vegetation during construction (Table 3.5.3-1). Approximately 64 percent of the vegetation resources affected during construction would consist of pine plantation and upland forest, with agricultural and open lands making up the remainder. As discussed above, agricultural lands and open lands would typically be revegetated within one or two growing seasons, but impacts to pine plantations and upland forest within the temporary construction right-of-way would be long-term, taking up to 30 years or more to recover. Impacts to forested areas would also represent a more substantial change in vegetative strata.

Pine plantations and upland forest would also be permanently impacted by operation and maintenance of the permanent pipeline right-of-way. These impacts would represent a marked, permanent change from forested vegetation to herbaceous or shrubby vegetation. Though agricultural and

TABLE 3.5.3-1 Upland Vegetation Cover Types Affected by the Carthage to Perryville Project				
	Pipeline Facilities[a]		Aboveground Facilities[b]	
Vegetation Cover Type	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)	Temporary Construction Impact (acres)	Permanent Operations Impact (acres)
Agricultural[c]	548.4	295.7	10.6	10.6
Upland Forest[d]	445.7	261.0	15.3	15.3
Open Land[e]	187.2	111.3	1.7	1.7
Pine Plantation[f]	871.9	457.4	6.1	6.1
Total	**2,053.2**	**1,125.4**	**33.7**	**33.7**

Notes:

[a] Acreages reflect a nominal 100-foot-wide construction right-of-way and a 60-foot-wide permanent easement that would be maintained in upland areas following construction.

[b] All of the area impacted during construction of the proposed aboveground facility sites would be permanently affected during operations.

[c] Includes pastures, active cropland, and hayfields.

[d] Includes upland mixed hardwood-loblolly pine forest and sloped hardwood forest.

[e] Includes maintained utility rights-of-way, non-agricultural herbaceous areas, and upland scrub-shrub areas.

[f] Includes actively planted and harvested pine plantation forests.

open lands would also occur within the permanent pipeline right-of-way, the vegetative strata in those areas would not be significantly changed compared to the preconstruction condition.

CEGT would minimize impacts to vegetation resources through implementation of our Plan and Procedures, as described in Section 3.5.2. CEGT would also mitigate impacts to vegetation resources through avoidance and minimization. CEGT has proposed a nominal construction right-of-way width of 100-feet along upland sections of the proposed pipeline that would be installed using conventional, open-cut trenching techniques (see Section 2.3.1), but that right-of-way width would be reduced in wetland areas to minimize impacts to those resources. Additionally, CEGT's proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation. The proposed pipeline route would parallel existing rights-of-way for approximately 40 miles, or about 23 percent of the proposed route.

As described in Section 3.3, CEGT proposes to use HDD techniques to accomplish pipeline installation across 22 waterbodies, including nine major waterbodies; two designated Louisiana State Scenic Streams, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8); and one NPS-designated NRI stream, the Sabine River (MP 4.3). The FWS recommended that HDD extra workspaces be sited in open field habitat adjacent to upland forested habitat, where feasible, to avoid unnecessary, long-term impacts to upland forests. Where implemented, the use of HDD would minimize impacts to riparian vegetation at waterbody crossings. Additionally, in Section 3.4.3 we included a recommendation for implementation of an additional HDD at Castor Creek (MP 113.0) that would avoid construction and operational impacts to riparian vegetation at that waterbody crossing.

TPWD also requested that CEGT mitigate for impacts to riparian and bottomland vegetation, and as necessary provide restoration in those areas. In Section 3.4, we have included recommendations for CEGT to implement a compensatory wetland mitigation plan developed in consultation with the COE,TPWD, and other applicable agencies. We have also recommended that CEGT consult with TPWD to develop a compensatory mitigation plan to offset any unavoidable impacts to the TPWD-designated Water Oak-Willow Oak Series that would not be covered by the compensatory wetland mitigation plan. Both of these requirements would ensure that the comments of TPWD regarding potential Project impacts to riparian and bottomland vegetation are adequately addressed.

Aboveground Facilities

Construction of the Panola Compressor Station and five of the six planned meter/regulator stations would permanently impact approximately 15.3 acres upland forest vegetation. Additionally, construction of the Vernon Compressor Station would permanently affect 6.1 acres of pine plantation. Construction at the Panola Compressor Station (2.2 acres), ANR M/R Station (1.6 acres), and Columbia Gulf M/R Station (6.8 acres) would permanently affect and alter agricultural land vegetation. Additionally, construction of the Duke Energy Field Services-Enbridge M/R Station would permanently affect 1.7 acres of open land vegetation. 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 permanent conversion of some vegetated areas to a potentially non-vegetated industrial/commercial use.

Access Roads

CEGT proposes to use 143 existing access roads during construction of the proposed Project, with 50 of those, comprising a length of approximately 25.0 miles, requiring improvement to support construction-related traffic. In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new access roads would also be required in association with the proposed Panola Compressor Station and the Trunkline, Texas Gas, and ANR M/R Stations. Although access road improvements would include trimming of overhead vegetation and minor widening of roads, it is not anticipated that such improvements would result in significant effects to vegetated areas. Further, the single new access road that would be constructed in association with Panola Compressor Station would be routed through an existing pasture to minimize effects to vegetation resources.

3.5.3.1 Vegetation Communities of Special Concern or Value

The proposed Project would affect identified special-status vegetative communities or areas enrolled in vegetation restoration programs including an FWS conservation easement, CRP lands, and a forested portion of the Ouachita WMA.

In Section 4.4 of the Draft EIS, we considered a route variation (i.e., the Sartor Variation) to minimize effects to the FWS-administered W.W. Farms Conservation Easement (RMP 146.3). Additionally, we included a recommendation in the Draft EIS for CEGT to consult with the FWS North Louisiana National Wildlife Refuge Complex concerning plans and approvals for the proposed crossing of the easement. As a result of those consultations, CEGT adopted the Sartor Variation and also now proposes to accomplish the crossing of the conservation easement via HDD to avoid surface impacts, and associated vegetative clearing and disturbance, at the easement. Following review of CEGT's construction plans, the FWS North Louisiana National Wildlife Refuge Complex issued a letter approving the crossing of the W.W. Conservation Easement (FWS 2006c). The proposed crossing of the easement,

as well as future maintenance activities, would be accomplished in accordance with the terms and conditions of that approval. See Section 3.8.5 of this EIS for additional information.

CEGT indicated that CRP lands would be crossed by the proposed Project in Red River, Ouachita, and Richland Parishes, Louisiana. However, the exact location and size of these areas would not be determined until easement negotiations with potentially affected property owners are completed. CEGT has consulted with NRCS to determine the requirements for crossing CRP lands. Upon disturbance caused by construction of the proposed Project, landowners would no longer be eligible to participate in the program or to receive the payments that they currently obtain from NRCS. Further consideration of potential Project-related effects to CRP lands is provided in our analysis of impacts to special interest areas, which is included in Section 3.8. In that section, we have also provided recommendations for identification of the extent and location of all affected CRP lands, as well as further consultation with NRCS and acquisition of all required Compatible-Use Permits prior to construction.

The proposed pipeline route would cross a forested portion of the Ouachita WMA near MP 138.5 for a distance of approximately 900 feet. However, surface impacts to the Ouachita WMA would be entirely avoided, as CEGT would implement an HDD to accomplish the crossing of the WMA and the adjacent Bayou LaFourche (MP 138.7). CEGT has initiated consultations with the LDWF seeking permission for the proposed crossing of the Ouachita WMA and recommendations on any appropriate mitigation measures, but these consultations are not yet complete. Therefore, **we recommend that:**

- **Prior to construction, CEGT should consult with LDWF and file with the Secretary copies of any agreements for Project-related use and impacts to lands held in the Louisiana WMA program. In that filing, CEGT should also document how it would implement any LDWF-recommended measures to avoid, minimize, or mitigate any unavoidable impacts to WMA lands.**

3.5.3.2 Extensive Forested Tracts

CEGT identified several areas of large, relatively non-fragmented forested tracts that would be crossed by the proposed pipeline. These areas are identified in Table 3.5.1-2. Although these areas are relatively non-fragmented, CEGT indicated that many of these extensive forested tracts are still subject to periodic harvest and/or thinning, thereby reducing their overall habitat quality. These 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. CEGT attempted to minimize impacts to large, contiguous forested tracts by routing the proposed Project along existing rights-of-way to the extent possible (approximately 23 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 wooded areas.

3.5.3.3 Exotic or Invasive Plant Species

A number of exotic plant species, as described in Section 3.5.1, were observed by CEGT during field surveys along the proposed Project route. Two plant species considered both exotic and invasive, purple loosestrife and Chinese tallow tree, were also observed at several locations along the proposed pipeline route in Louisiana. The FWS, LDWF, and NRCS both identified Chinese tallow tree as an invasive species of potential concern along the proposed Project route. Invasive species can out-compete

and displace native plant species, thereby negatively altering the appearance, composition, and habitat value of affected areas. Executive Order 13112 directs federal agencies to prevent the introduction and spread of invasive species, and to minimize the impacts that such species would cause by implementing feasible and prudent measures.

CEGT would implement our Plan and Procedures, as modified in this EIS, and other measures that would limit the potential for the spread of invasive species, including purple loosestrife and Chinese tallow tree, in wetlands and uplands. These measures include erosion controls to limit sedimentation, topsoil stripping, vegetative restoration in accordance with the prescribed dates and seed mixes specified by local soil conservation authorities or land management agencies, and post-construction monitoring to confirm vegetative restoration success. In areas not used for agriculture, restoration would be considered successful when the density and cover of non-nuisance vegetation is similar to adjacent undisturbed land. Additionally, the FWS recommended the following specific measures for control of Chinese tallow tree:

- implement spot treatment of any Chinese tallow trees observed during routine maintenance activities and inspections following construction; and
- monitor all disturbed areas where hardwood forests would be allowed to regenerate annually for five years and apply spot treatment to any tallow trees identified.

As recommended in the Draft EIS, CEGT consulted with FWS, TPWD, and LDWF to identify appropriate control measures for invasive and exotic plant species. Both TPWD (2006) and LDWF (2006) concurred with the monitoring and control measures recommended by FWS for Chinese tallow tree. Therefore, **we recommend that:**

- **CEGT should develop a Nuisance Species Plan that incorporates the FWS recommended measures for control of Chinese tallow tree and identifies the specific measures that would be implemented during construction and operations to control that species, and file that plan with the Secretary for review and written approval by the Director of OEP prior to the start of construction. Following approval, CEGT should also submit copies of the Nuisance Species Plan to FWS, TPWD, and LDWF.**

3.6 WILDLIFE AND AQUATIC RESOURCES

3.6.1 Wildlife

3.6.1.1 Existing Wildlife Resources

Wetlands and upland vegetation communities traversed by the proposed Carthage to Perryville Project route support habitats that provide cover and forage for a variety of wildlife species. These habitats include upland forests, pine plantations, open lands, and agricultural areas. Additionally, wetland and aquatic habitats include forested wetlands, scrub-shrub wetlands, emergent wetlands, and open water. These vegetative communities and habitats are discussed in detail in Sections 3.4 and 3.5, and summarized further below. Most of these habitats occur in areas crossed by the proposed pipeline, with the remainder occurring within the areas proposed for aboveground facilities and access roads. Common wildlife species that may occur within the habitat types traversed by the proposed Project route are listed in Table 3.6.1-1. Rare and endangered species and their habitats, as well as colonial nesting waterbirds and migratory birds, are discussed in Section 3.7

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TABLE 3.6.1-1
Common Wildlife Species that Occur Along the Proposed Carthage to Perryville Project

		Preferred Habitat Type					
Common Name	**Scientific Name**	**Upland Forest**	**Pine Plantation**	**Open Lands and Agriculture**	**Forested and Scrub Wetlands**	**Emergent Wetlands**	**Open Water**
White-tailed deer	*Odocoileus virginianus*	X	X	X	X		
Gray squirrel	*Sciurus carolinensis*	X	X		X		
Bobwhite quail	*Colinus virginianus*	X	X	X			
Wild turkey	*Meleagris gallopavo*	X	X	X	X		
Mourning dove	*Zenaida macroura*	X	X	X			
Pine warbler	*Dendroica pinus*	X	X				
Brown-headed nuthatch	*Sitta pusilla*	X	X				
Rat snake	*Elaphe obsoleta*	X	X	X	X		
Garter snake	*Thamnophis sirtalis*	X	X	X	X		
Green tree frog	*Hyla cinerea*	X					
Osprey	*Pandion haliaetus*	X	X				X
Red-tailed hawk	*Buteo jamaicensus*			X	X		
American robin	*Turdus migratorius*			X			
Red winged black bird	*Agelains phoeniceus*			X			
Box turtle	*Terrapene carolina*	X		X			
Cotton mouse	*Sigmodon hispidus*			X			
Raccoon	*Procyon lotor*			X	X	X	
Armadillo	*Dasypus novemcinctus*			X	X	X	
Wood thrush	*Hylocichla mustelina*				X		
Wood duck	*Aix sponsa*				X		
Cottonmouth	*Agkistrodon piscivorus*				X	X	X
Rice rat	*Oryzomys palustris*					X	
Green heron	*Butorides striatus*					X	X
Southern leopard frog	*Rana utricularia*					X	
Bullfrog	*Rana catesbeiana*					X	
Mud turtle	*Kinosteron* spp.					X	X
Mallard	*Anas platyrhynchos*					X	X
River otter	*Lutra canadensis*				X	X	X
American coot	*Fulica americana*					X	X

Upland Forests

Upland forests include mixed hardwood-loblolly pine habitats and sloped, hardwood forest habitats. Common tree species in the mixed hardwood-loblolly pine habitat include loblolly pine, which comprises at least 20 percent of the overstory, along with sweetgum, American beech, mockernut hickory, and southern red oak. These areas trend towards hardwood dominance when fire is suppressed. Hardwood slope habitats typically occur on slopes above stream floodplains and are dominated by tree species such as American beech, white oak, water oak, laurel oak, and black oak. A variety of shrub and herbaceous plants species also occur in the understory of the upland forests, providing significant cover and forage for wildlife.

Pine Plantations

Pine plantations are actively planted, managed, and cut for timber production. Plant species common in this habitat type include loblolly pine with an understory of sweetgum, yellow jessamine, yaupon, greenbrier, and sawbriar. Differing wildlife species utilize pine plantation habitat based on its age and growth status, with greatest usage typically in early and intermediate stages before the canopy of areas containing larger loblolly pines completely closes. However, in areas where openings and edge habitat occurs, and in areas where prescribed fire is used as a management tool, wildlife habitat quality and diversity can be relatively good.

Open Lands

Open lands include maintained utility rights-of-way, upland shrub areas, and other non-agricultural herbaceous areas. Plant species in these areas include saplings of loblolly pine, sweetgum, and southern red oak, along with winged sumac, yaupon, greenbrier, blackberry, bluestem, and various grasses. Open lands generally provide poor to moderate quality wildlife habitat.

Agricultural Areas

Agricultural areas include locations used to grow field crops, such as rice, soybeans, and corn, as well as pasture lands. Although row crops generally provide poor to moderate cover habitat, they often provide forage to a number of species. Pastures, with herbaceous species such as fescue, crabgrass, smut grass, bluegrasses, bermudagrass, and bahia grass also provide grazing habitat for species such as white-tailed deer.

Forested Wetlands

Forested wetlands are dominated by woody vegetation and provide a diverse assemblage of vegetation and an abundance of food and water sources for wildlife. These areas often contain extensive bottomland hardwoods. Common tree species in the forested wetlands observed within the proposed Project right-of-way include water oak, swamp-chestnut oak, willow oak, black willow, water elm, and bald cypress.

Scrub-Shrub Wetlands

Scrub-shrub wetlands include all wetlands dominated by woody vegetation less than 20 feet tall and are typically not as structurally diverse as forested wetlands due to the lack of tree canopy. Scrub-shrub wetlands supply an abundance of food and cover resources for mammals, reptiles, amphibians, and birds. Common shrub species observed within the proposed Project right-of-way include button bush, hawthorne, trumpet creeper, swamp privet, and saplings of water oak, sweet gum, and persimmon.

Emergent Wetlands

Emergent wetlands are characterized by erect, rooted, herbaceous plants that are used by wildlife closely linked to the aquatic environment. Wildlife use these areas for nesting, feeding, and during migratory periods. Common herbaceous plants in the emergent wetlands crossed by the proposed Project right-of-way include sedges, woolgrass, bulrush, smartweed, soft rush, lizard's tail, and spike rush.

Open Water

Open water habitats include surface areas of streams, rivers, and ponds that occur in the proposed Project area. These areas provide habitat for species such as wading birds, ducks, and other aquatic species.

3.6.1.2 Sensitive or Managed Wildlife Habitats

The proposed Project would cross the Ouachita WMA, and some existing access roads within the Bayou Pierre WMA would be used during construction. The proposed pipeline route would cross a forested portion of the Ouachita WMA near MP 138.5 for a distance of approximately 900 feet. The Ouachita WMA is a 9,641 acre site owned and managed by LDWF for hunting of deer, doves, and ducks, among other species, and has been the focus of significant efforts to restore hardwood forests (LDWF 2006a). The WMA also contains a series of waterfowl management impoundments totaling approximately 1,700 acres, as well as three reservoirs managed for recreational fishing. The impoundments are heavily utilized by waterfowl and non-game birds, and an observation tower provides for public viewing of waterfowl.

Although the Bayou Pierre WMA would not be crossed by the proposed Project, the proposed pipeline would also parallel the northern boundary of the Bayou Pierre WMA for approximately 1-mile (approximate MP 43.0 to 44.0) in Red River Parish, Louisiana. No lands within the Bayou Pierre WMA would be contained within the proposed construction right-of-way, but CEGT has indicated that some existing access roads within the WMA would be used during construction. Bayou Pierre is a 2,212-acre site, owned and managed by LDWF, that supports diverse wildlife habitats including fields, ponded areas, and re-planted hardwood forests (LDWF 2006c). Hunted species include white-tailed deer, rabbits, waterfowl, and doves. Bayou Pierre WMA occupies an area that was formerly cleared and drained for farming, but that activity was ultimately unsuccessful.

CEGT identified several areas of large, relatively non-fragmented forested tracts that would be crossed by the proposed pipeline based on a review of maps, aerial photographs, and field surveys. These areas are discussed in Section 3.5 and the location of these tracts and the lengths of the associated crossings are identified in Table 3.5.1-2. Although these areas are relatively non-fragmented, CEGT indicated that many of these tracts are still subject to periodic harvest and/or thinning, thereby reducing their overall quality somewhat. Some species, often identified as forest interior species, exclusively use or nest in relatively large forested areas. For example, many songbirds (e.g., some warblers) nest in the interior of large forested tracts and avoid disturbed areas and edge habitats.

Other sensitive areas that provide wildlife habitat include a significant Water Oak-Willow Oak vegetative community located near the Sabine River (MP 4.3) in Panola County, Texas, and WRP lands and vegetation managed by NRCS in Red River, Ouachita, and Richland Parishes, Louisiana. Additionally, an FWS conservation easement containing planted hardwoods located near RMP 146.3 and CRP lands and vegetation managed by NRCS in Red River, Ouachita, and Richland Parishes, Louisiana, also occur in the area of the proposed Project and provide habitat for wildlife. These areas and potential Project-related effects are discussed in detail in Sections 3.4, 3.5, and 3.8.

3.6.1.3 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. Temporary impacts within the construction right-of-way and other work areas, such as noise or physical disturbance, displacement, and clearing and trenching of herbaceous upland and wetland habitats would affect wildlife at or near the time of construction, but these habitats and species would generally recover quickly. Impacts to scrub-shrub upland and wetland habitats would generally be short-term, except in the permanent pipeline right-of-way, which would be maintained by mowing, cutting, or trimming once every three years except for a 10-foot-wide corridor over the pipeline centerline that would be maintained annually in a herbaceous state. Upland and wetland forested habitats would be affected most substantially, with a long-term conversion of wooded areas to successional stages in the construction right-of-way and a permanent conversion to scrub-shrub or herbaceous levels within the permanent right-of-way.

Pipeline Facilities

The clearing of vegetation in the construction right-of-way and extra workspaces would reduce cover, nesting, and foraging habitat for some wildlife until construction is complete and vegetation is reestablished along the right-of-way. During construction, more mobile species would be temporarily displaced from the construction right-of-way and surrounding areas to similar habitats nearby. Some wildlife species disturbed or displaced by construction may be able to return to adjacent, undisturbed habitats soon after completion of construction. Less mobile species, such as small mammals, reptiles, amphibians, and birds nesting in the right-of-way, may be affected by construction activities due to direct mortality or permanent displacement, potentially affecting reproduction, recruitment, and survival. Regardless of mobility, some wildlife species would be affected by the loss of cover, nesting, and foraging habitat. Similar effects, although much less extensive, would result from routine maintenance of vegetation along the permanent right-of-way.

Non-forested habitats that would be affected by construction and operation of the proposed Project include open lands, agricultural areas, scrub-shrub and emergent wetlands, and open water. The impact on these habitats and associated wildlife species would be relatively minor and either temporary or short-term. Due to the rapid pace of pipeline installation and the vegetation restoration measures included in our Plan and Procedures, these areas would generally be restored within one growing season or within three years after construction for scrub-shrub habitats. Both TPWD and LDWF requested that they be consulted regarding vegetation restoration plans (e.g., seed mixes) along the proposed pipeline, and we have included a recommendation that CEGT complete these consultations in Section 3.5. Temporary alterations to these habitats would not have a significant or long-term impact on their value as wildlife habitat.

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. 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 forested wetland habitats that would be affected by construction of the proposed Project would be considerable locally. Approximately 54 percent of the total forested area affected during construction, including approximately 40 percent of the affected forested wetlands, would be permanently affected by maintenance of the pipeline right-of-way during operations. TPWD expressed concern that wetlands, riparian areas, and bottomland hardwood communities would be affected by the proposed Project and recommended that appropriate avoidance and mitigation measures be provided to ensure minimization of impacts. Disturbed areas located outside the permanent right-of-way would be allowed to revert to their preconstruction cover type,

but this process would take 30 years or more in some forested habitats, representing a long-term impact. Areas within the permanent right-of-way would be permanently converted and maintained at the herbaceous or scrub-shrub level.

CEGT would minimize impacts to wildlife habitats through implementation of our Plan and Procedures, as described in Section 3.5.2. CEGT would also mitigate impacts through avoidance and minimization. CEGT's proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation and wildlife habitats. The proposed pipeline route would parallel existing rights-of-way for approximately 40 miles, or about 23 percent of the proposed route. CEGT has proposed a nominal construction right-of-way width of 100-feet along upland sections of the proposed pipeline that would be installed using conventional, open-cut trenching techniques (see Section 2.3.1), but that right-of-way width would be reduced to 75-feet in wetland areas to minimize impacts to those resources and associated habitats. Similarly, only a 30-foot-wide corridor would be maintained within the permanent 60-foot-wide pipeline right-of-way through wetland areas.

CEGT has also proposed to use HDD to accomplish pipeline installation across 22 streams, including all nine major waterbody crossings, thereby reducing impacts not only to these streams, but to adjacent wetlands, riparian areas, and bottomland hardwood communities as well. In Section 3.4, we have also included recommendations for CEGT to develop site-specific wetland crossing plans and implement an additional HDD to further reduce impacts to forested wetlands. We also included a recommendation for CEGT to develop a compensatory wetland mitigation plan in consultation with the COE and other applicable agencies (see Section 3.4). Consequently, the anticipated impacts to wildlife due to construction and operation of the proposed pipeline would not be significant. 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 our Plan and Procedures.

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

Construction of the aboveground facilities would permanently affect several types of wildlife habitat and associated species, but we anticipate that these impacts would be minor overall. Aboveground facilities would only affect a small percentage of the land area and wildlife habitats affected by the proposed Project, but wildlife occurring in these areas would suffer mortality or be permanently displaced.

Construction of the Panola Compressor Station and five of the six planned meter/regulator stations would permanently impact approximately 15.3 acres upland forest habitat. Additionally, construction of the Vernon Compressor Station would permanently affect 6.1 acres of pine plantation habitat. Construction at the Panola Compressor Station (2.2 acres), ANR M/R Station (1.6 acres), and Columbia Gulf M/R Station (6.8 acres) would also permanently affect and alter agricultural land habitats. Additionally, construction of the Duke Energy Field Services-Enbridge M/R Station would permanently affect 1.7 acres of open land habitats. 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 permanent conversion of some existing wildlife habitat into potentially non-vegetated industrial/commercial uses.

CEGT proposed to use existing pipe yards and warehouses in commercial and industrial areas as pipe storage and contractor yards for the proposed Project, thereby avoiding impacts to wildlife habitat associated with those construction-related activities. Should CEGT identify the need for additional pipe

storage or contractor yards, and if these were not located in previously disturbed commercial or industrial areas, CEGT would perform appropriate environmental surveys and forward that information to the FERC for review and approval prior to their use.

Construction of the proposed pipeline would require the temporary use of 143 existing access roads of varying lengths and construction. CEGT indicates that 50 of these access roads, comprising a length of approximately 25.0 miles, would require upgrades to support construction-related traffic. In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new access roads would also be required in association with the proposed Panola Compressor Station and the Trunkline, Texas Gas, and ANR M/R Stations. Section 3.8 provides additional information on access roads planned in association with the proposed Project. Improvement, construction, and use of existing access roads would potentially affect a small amount of wildlife habitat. However, most access roads would be used only temporarily during construction, and the number of permanently maintained access roads would be minimal. Further, the single new access road that would be constructed in association with Panola Compressor Station would be routed through an existing pasture to minimize effects to vegetation resources and associated wildlife habitat. CEGT's use of our Plan and Procedures, as modified in this EIS, would also prevent or adequately minimize impacts to wildlife habitats associated with access road improvements, construction, and use.

3.6.1.4 Sensitive or Managed Wildlife Habitats

The Carthage to Perryville Project would affect two WMAs managed by the LDWF, as well as several large, relatively intact, forested tracts identified by CEGT. Potential Project-related impacts to these areas are discussed below.

Wildlife Management Areas

The proposed pipeline route would cross a forested portion of the Ouachita WMA for a distance of approximately 900 feet, just west of Bayou Lafourche (MP 138.7). However, surface impacts to forestland within the Ouachita WMA would be avoided as CEGT would implement an HDD to accomplish crossing of the WMA and the adjacent Bayou Lafourche. Similarly, no impacts would be anticipated during operation of the proposed Project.

Although the Bayou Pierre WMA would not be crossed by the proposed Project, CEGT has indicated that it would use access roads running through the WMA for construction activities. However, CEGT has not proposed any improvement of those access roads. Any construction-related impacts at the Bayou Pierre WMA would therefore be minor and temporary, and no impacts would be anticipated during operation of the proposed Project.

CEGT also indicated that construction may occur during fall and early winter, which would conflict with hunting seasons for species such as deer, rabbits, quail, and squirrels. Construction could interfere with hunting activities through noise disturbance or by affecting wildlife movement patterns, but these impacts would affect a small area for a relatively short period of time during construction.

We do not anticipate that construction and operation of the proposed Project would result in significant impacts to either the Ouachita or Bayou Pierre WMAs, or associated wildlife and habitats. However, use of WMA lands and access roads would require prior approval by LDWF. In Section 3.5 we have included a recommendation that CEGT consult with LDWF and obtain all required approvals to authorize Project-related use and impacts to lands held in the Louisiana WMA program. As a result of those consultations, LDWF may recommend measures to further avoid and minimize impacts to WMA lands.

Extensive Forested Tracts

As discussed above and in Section 3.5, CEGT identified several areas of large, relatively non-fragmented forested tracts that would be crossed by the proposed pipeline. CEGT indicated that many of these tracts are still subject to periodic harvest and/or thinning, thereby reducing their overall quality somewhat. Some species, identified as forest interior species, exclusively use or nest in relatively large forested areas. For example, some species of songbirds and black bears (see Section 3.7) are known to utilize more remote areas that may occur in the interior of large forested tracts, avoiding edge habitats and other areas disturbed by humans.

Impacts to wildlife related to construction and operation in large forested tracts would be diverse and long-term or permanent. These impacts would include:

- loss of forest interior habitat and displacement of wildlife;
- increased stress and mortality, leading to reduced reproduction and recruitment;
- increased rates of nest predation, parasitism, or inter-specific competition;
- increased destruction of habitat of understory species by browsing species;
- inhibition of migration, dispersal, foraging, and other movements of forest interior species that are hesitant to cross openings; and
- increased expansion of non-native or invasive plant or animal species.

In a letter dated January 5, 2006, TPWD indicated that CEGT should collocate its right-of-way with existing rights-of-way to avoid habitat fragmentation to the extent possible. As noted above, approximately 23 percent of the proposed Project route would be collocated with existing rights-of-way. Additionally, much of the remaining proposed right-of-way would pass through other previously disturbed habitats such as agricultural and open lands, as well as other previously disturbed, fragmented, and/or managed wooded areas. Additionally, construction of the proposed Project would actually benefit many wildlife species, such as white-tailed deer, wild turkey, certain raptors, and foxes, that utilize forest edge and open habitats. Given the measures to avoid and minimize impacts to large forested areas, and in consideration that some disturbance occurs and would continue to occur in the identified large forested tracts as a result of commercial timber operations, we conclude that impacts to wildlife from disturbance of these areas would be relatively minor.

Based on the measures planned by CEGT to avoid or minimize Project effects on wildlife and associated habitats, we conclude that construction and operation of the proposed Project would not result in a significant, negative impact to any wildlife resources.

3.6.2 Aquatic Resources

3.6.2.1 Existing Aquatic Resources

The proposed Project would cross 104 perennial streams, 136 intermittent streams, and 6 ponds. A table identifying the waterbodies crossed by the proposed Project, as well as the their width, location along the proposed route, state waterbody classification, and proposed crossing method, is included as Appendix E of this EIS. Waterbodies crossed by the proposed Project are discussed in more detail in Section 3.3.2. These waterbodies provide habitat for a variety of aquatic species, including warmwater fishes and mussels, and Table 3.6.2-1 provides a list of commonly occurring fish and mussel species in the streams along the proposed Project route.

TABLE 3.6.2-1 Fish and Mussel Species Commonly Found in Streams Crossed by the Proposed Carthage to Perryville Project	
Common Name	**Scientific Name**
Fish Species	
White bass	*Morone chrysops*
Largemouth bass	*Micropterus salmoides*
Black crappie	*Pomoxis nigromaculatus*
White crappie	*Pomoxis annularis*
Bluegill sunfish	*Lepomis macrochirus*
Pickerel	*Esox niger*
Longear sunfish	*Lepomis megalotis*
Channel catfish	*Ictalurus punctatus*
Dusky darter	*Percina sciera*
Red shiner	*Cyprinella lutrensis*
Spotted sucker	*Minytrema melanops*
Mussels	
Texas liliput	*Toxolasmus texasensis*
Louisiana fatmucket	*Lampsilis hydiana*
Pondhorn	*Uniomerus tetralasmus*
Mapleleaf	*Quadrula quadrula*
Paper pondshell	*Utterbacki imbecillis*
Threeridge	*Amblema plicata*

The proposed Project would be located in an inland area where marine and estuarine fishes do not occur, and no essential fish habitat under the jurisdiction of the National Marine Fisheries Service occurs along the proposed route. There are no known significant spawning or rearing areas for anadromous species, or recreationally or commercially important fish species, in the vicinity of the proposed Project. However, some fish spawning and rearing undoubtedly occurs in the streams and rivers that would be crossed by the proposed Project.

The proposed Project would include 33 waterbody crossings in Texas, all with designated uses that include aquatic life. Fish Lake Slough and an associated tributary located near MP 3.8 are also designated for general use and fish consumption. Additionally, the single major (greater than 100 feet in width) waterbody crossing in Texas, the Sabine River (MP 4.3), is also designated for general use, fish consumption, and as a public water supply. In Louisiana, the proposed Project would require 207 waterbody crossings. All of these waterbodies have designated uses that include fish and wildlife propagation.

If approved, the proposed Project would require the use of pipe storage and contractor yards and new or improved access roads. CEGT would preferentially locate staging areas in existing industrial or commercial areas and although no waterbodies would be crossed in the areas identified to date, additional yards would be identified. Prior to construction, CEGT would be required to file a complete and updated list of all temporary workspace areas, including pipe storage and contractor yards, with the FERC for review and approval prior to use. Additionally, it is not yet clear whether construction of new access roads or improvement of existing access roads would affect any waterbodies. For this reason, we

included a recommendation in Section 3.3 for CEGT to identify and describe all access roads in relation to waterbodies and other sensitive environmental resources, complete environmental reviews as appropriate, and identify any mitigation measures developed in consultation with appropriate resources agencies, as may be necessary, prior to construction.

Fisheries of Special Concern

Fisheries of special concern would include areas containing exceptional recreational or commercial fisheries, specially designated streams or rivers, and waterbodies supporting rare or endangered aquatic species. No areas containing exceptional recreational or commercial fisheries were identified along the proposed Project route, but specially designated streams or rivers and waterbodies supporting rare or endangered aquatic species would be crossed, as discussed below.

The Sabine River is designated by NPS as being listed on the NRI. Streams listed on the NRI are considered to possess "outstandingly remarkable natural or cultural values judged to be of more than local or regional significance" (NPS 2006b). The NRI-listed reach of the Sabine River has diverse riparian habitats and species, minimum human development, and outstanding scenic qualities (NPS 2006b).

Two streams crossed by the proposed Project, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8), have been designated as Louisiana Natural and Scenic Rivers, pursuant to the Louisiana Scenic Rivers Act. These streams are recognized as having unique and diverse characteristics and are protected through management by LDWF (LDWF 2006a). Additionally, the federally endangered pallid sturgeon potentially occurs in the Red River, which would be crossed at MP 50.1. This species, which is typically found in large, free flowing, turbid rivers with a diversity of habitats, is addressed in more detail in Section 3.7.

3.6.2.2 General Impacts and Mitigation

CEGT's proposed methods for accomplishing pipeline installation across each identified waterbody are listed in Appendix E 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 "wet" open-cut or "dry" HDD methods, as described in detail Sections 2.3.2 and 3.3.2. As proposed, approximately 95 percent of the crossings for minor and intermediate waterbodies would be accomplished using open-cut methods. One pond classified as a major waterbody would be crossed using open-cut methods. Each of the nine major stream crossings and the remainder of the minor and intermediate waterbody crossings (22 total crossings) would be accomplished using HDD.

General impacts from open-cut crossings would occur to aquatic life such as 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 instream cover 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 fishes or reduced stream flows during withdrawals for hydrostatic testing. These potential impacts are discussed below in more detail.

Sedimentation and Turbidity

Pipeline construction using "wet" open-cut methods would result in sedimentation and turbidity in surface waters and aquatic habitats through clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling of the in-stream trench. Turbidity resulting from suspension of sediments during in-stream construction or erosion of cleared right-of-way areas would reduce light penetration and photosynthetic oxygen production (resulting in decreased levels of dissolved oxygen), increase invertebrate drift and reduce fish feeding for brief periods, and affect the benthic community. Benthic macroinvertebrates, which typically provide a key food source for fishes, 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. Increased turbidity can reduce light penetration into the water and thereby reduce photosynthetic activity and levels of dissolved oxygen in the water column. Organic materials suspended in the water can further reduce dissolved oxygen by increasing the biochemical oxygen demand. Reduced levels of dissolved oxygen can result in stress, displacement, and mortality to aquatic life including fishes, particularly during periods of low flows or high water temperatures.

Removal of vegetation from riparian areas would cause an increase in surface runoff and erosion from the pipeline corridor. However and as specified by our 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 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 because of the limited amount of streambank canopy that would be cleared relative to the existing riparian vegetation in most cases. 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. To contain disturbed soils in upland areas and minimize the potential for sediment loss to wetlands and waterbodies, temporary erosion controls would be installed immediately after initial disturbance of soils and maintained throughout construction. Erosion and sedimentation control devices would be installed in accordance with our Plan and CEGT's SWPPP, should one be required by the permitting agencies.

Elevated levels of suspended sediments and turbidity would typically be limited to short periods, as our Procedures require that instream construction be completed within 24 to 48 hours for minor and intermediate waterbodies, respectively. The rapid pace of construction, along with the other measures identified in our Plan and Procedures, would reduce the impacts of sedimentation and turbidity on aquatic life. 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.

CEGT has stated its intent to avoid constructing stream crossings during the rainy season and proposes to complete construction activities during fall and early winter. Construction during the lower flows of these relatively dry seasons would minimize impacts in comparison to construction during wetter periods, especially those impacts associated with turbidity and sedimentation. However, CEGT's proposal would result in construction partially outside the time window for warmwater fisheries specified in our Procedures (June 1 through November 30). As described in Section 3.3.2, both LDWF and TPWD were consulted regarding CEGT's proposal to perform waterbody crossings outside of the time window specified in our Procedures. Additionally, in a correspondence dated June 8, 2006, TPWD concurred that pipeline installation should result in no adverse impacts to fisheries in Panola County, Texas, regardless of season, provided that standard best management practices for erosion control would be implemented.

As described above and in accordance with our Procedures, erosion and sediment control best management practices would be implemented at all waterbody crossings during construction to reduce impacts to affected waterbodies. Therefore, we have approved CEGT's requested variation to accomplish waterbody crossings partially outside the time window for warmwater fisheries specified in our Procedures.

CEGT proposes to use 18 separate HDD crossings to accomplish pipeline installation across 22 waterbodies. As described in Sections 2.3.2 and 3.3, 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. However, HDD methods are not without risk as inadvertent drilling fluid releases would result if the drilling fluid escapes containment at pits that would be excavated at the HDD entrance and exit points or if a "frac-out" occurs. A frac-out occurs when drilling fluid escapes the drill bore hole and is forced through the subsurface substrate to the ground surface. During HDD operations, a frac-out would cause increased turbidity and sedimentation. Potential impacts from increased turbidity would include decreased water quality and compromised aquatic habitat integrity, as described above. As suspended materials settle out of the water column, sedimentation would partially or entirely cover the waterbody substrate and any sessile, benthic organisms.

CEGT has developed a DDCP (Appendix D) that describes the procedures that would be implemented to monitor for, contain, and clean up any potential releases of drilling fluid during HDD operations. Measures included in the DDCP include continuous monitoring for evidence of a release, immediate cessation of drilling fluid pumping in the event of a complete loss of circulation of drilling fluid, containment and immediate clean-up of inadvertent releases (including restoration as appropriate), and notification of the appropriate agencies in the event of an inadvertent release. Given these protective measures, we believe the risk to aquatic habitats and species from a frac-out would be low.

Loss of Cover

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.

As described in Sections 2.0 and 3.1, blasting is not anticipated in association with construction of the proposed Project, and associated impacts to streams and aquatic habitat and cover are therefore not expected. However, if required, CEGT would notify the FERC before blasting and conduct all blasting in accordance with our Plan and Procedures and in compliance with all applicable federal, state, and local laws, permits, and authorizations.

Impacts to fisheries and aquatic habitats resulting from maintenance of the permanent right-of-way would be relatively minor. A 60-foot-wide, permanent pipeline right-of-way would be maintained in all upland areas during operations, but the maintained width would be reduced to a 30-foot-wide corridor through wetland areas. Additionally, our Procedures require that a riparian strip at least 25 feet in width along all waterbodies be allowed to revegetate to preconstruction conditions within the construction right-of-way, although a 10-foot wide corridor centered over the pipeline may be maintained in a herbaceous state. Additionally, herbicides or pesticides would not be used within 100 feet of any waterbody, unless authorized by a land management or state agency.

Introduction of Water Pollutants

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 fishes and other aquatic life through acute or chronic toxicity, and sub-lethal effects would affect reproduction, growth, and recruitment. As noted above, herbicides or pesticides would not be used within 100 feet of any waterbody, unless authorized by a land management or state agency. Additionally, pollutants can also be introduced during discharge of hydrostatic test waters. However, CEGT has stated that biocides and other potentially toxic hydrostatic test water additives would not be used during hydrostatic testing for the proposed Project.

The proposed HDD drilling fluid would consist of water and bentonite. Bentonite contains a mixture of non-toxic clays and rock particles. Though potentially toxic additives are added to drilling fluids used in some applications, CEGT has stated that it would not use any synthetic or potentially toxic drilling fluid additives. This protective measure would prevent the introduction of contaminants resulting from inadvertent releases during HDD operations.

Disturbance and resuspension of contaminated soils and sediments would result in adverse impacts to water quality and instream habitat. However, there are no known contaminated sediments along the proposed Project route, and adverse effects resulting from re-suspension of contaminants is therefore unlikely. Contaminated soils would also be encountered during construction activities along the proposed construction right-of-way or extra works areas. If contaminated soils were encountered during construction, CEGT would implement procedures to identify and properly manage the contamination. In Section 3.2, we included a recommendation for CEGT to develop a hazardous and contaminated materials management plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations. Given these conditions and protective measures, the risk to water quality and aquatic species from contaminated soils and sediments is low.

Operation of heavy equipment or other vehicles in and near surface waterbodies would also introduce chemical contaminants, such as fuels and lubricants, into surface waters or result in accidental spills during construction. CEGT has adopted the measures specified in our Procedures regarding spill prevention, containment, and minimization near waterbodies. These measures, which are discussed in more detail in Section 3.3.2, include proper training of employees, regular inspection of equipment, storage of hazardous materials and fuels at least 100 feet from all waterbodies, and preparations to have necessary tools, equipment, and supplies on hand to contain and recover spilled materials at the job site.

Wherever refueling must be conducted within 100 feet of a waterbody, CEGT would construct and use a berm and lined containment area and employ EIs to supervise refueling activities. These measures were identified as part of CEGT's generic SPCC Plan (see Appendix C), which describes the management of hazardous materials that would be used during construction. CEGT has also indicated that site-specific SPCC plans would be developed for each construction spread once the construction contractors have been selected, and we have included a recommendation in Section 3.2 for CEGT to file those plans with the FERC prior to construction. Given the adoption of the measures in our Procedures and these additional measures, the risk of accidental spills or other introductions of hazardous materials to waterbodies and their effects on aquatic life would be effectively minimized.

Fish Migrations and Spawning

Construction of the proposed Project would also affect fishes 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. Construction would proceed at a rapid pace in small and intermediate waterbodies as described above. We also consider that CEGT's proposal to complete construction activities in fall and early winter would further limit or prevent impacts to most species of spawning fish.

Entrainment and Reduction of Flows During Hydrostatic Testing

Entrainment of fish and other aquatic organisms would occur during withdrawals of hydrostatic test water from the source waterbodies listed in Table 3.3.2-2. These waterbodies include the NRI-listed Sabine River and two designated Louisiana Natural and Scenic Rivers, Saline Bayou and Black Lake Bayou. CEGT would prevent or adequately limit impacts from hydrostatic testing by implementing our Procedures, as modified in the EIS. These measures include screening to limit entrainment of fishes and maintenance of adequate flow rates to protect aquatic life during withdrawals for hydrostatic testing. Although it is possible that fish eggs and larvae would be entrained through the screens, such impacts would most likely be minor during the proposed winter construction period. Additionally and as described in Section 3.3.2, NPS and LDWF were consulted regarding potential Project effects to NRI-listed and Louisiana Natural and Scenic Rivers, respectively.

3.6.2.3 Site-Specific Impacts and Mitigation

CEGT proposes to use 18 separate HDD crossings to accomplish pipeline installation across 22 waterbodies, including 9 major waterbodies, 6 intermediate waterbodies, and 7 minor waterbodies. As described in detail in Sections 2.3.2 and 3.3.2, HDD is a trenchless crossing method that may be used to avoid direct impacts to waterbodies containing fisheries and aquatic habitats by directionally drilling beneath them. A successful HDD would result in little or no impact to the waterbody or aquatic habitat being crossed. Waterbodies proposed to be crossed using HDD methods include each of the major and/or navigable streams described in Section 3.3.2.1; two designated Louisiana Natural and Scenic Rivers, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8); the NRI-listed Sabine River (MP 4.3); and the river most likely to contain habitat for listed species (the Red River; MP 50.1).

The feasibility of each proposed HDD crossing would be evaluated based on the results of ongoing geotechnical studies. Although these geotechnical analyses are not yet complete, CEGT indicated that it has extensive experience performing HDDs in the vicinity of the proposed Project route, and it expects that the planned HDDs would be successful. In the event of an HDD failure, CEGT would attempt to re-drill the crossing in approximately the same location (see Appendix D). In the event re-drilling failed, CEGT would install the pipeline across the waterbody in question using the open-cut construction methods after obtaining the necessary permits and approvals from the appropriate state and federal agencies. In Section 3.3.2, we have included a recommendation for CEGT to develop an amended crossing plan in consultation with applicable agencies prior to initiating an open-cut crossing of any of the waterbodies proposed to be crossed using HDD.

CEGT has proposed to cross all of the major and special status streams that occur along the proposed pipeline route using HDD, and this action would minimize impacts to the aquatic habitats that occur there. Each of the proposed HDD waterbody crossings would be constructed in accordance with our Procedures and the terms of any applicable federal or state permits that may be granted. Additionally, CEGT would implement its DDCP to monitor for and address any inadvertent releases of drilling fluids. These factors combined with the additional mitigation measures recommended above would effectively minimize the potential for adverse environmental impacts associated with the proposed HDD crossings.

Based on the measures planned by CEGT to avoid or minimize Project effects on fisheries, other aquatic life, and associated habitats, we conclude that construction and operation of the proposed Project would not have a significant negative impact on aquatic resources.

3.7 THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

3.7.1 Federally Listed Threatened and Endangered Species

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

To assist the FERC in meeting our Section 7 requirements, CEGT as a non-federal representative, conducted informal consultation with FWS, TPWD, and LDWF. In addition, CEGT reviewed endangered and threatened species related databases maintained by FWS, TPWD, and LDWF. CEGT conducted field surveys of the proposed pipeline route and aboveground facility sites in September and October 2005 and January 2006. No threatened or endangered species were observed during the surveys. We have reviewed the information submitted by CEGT and our analysis of the potential for Project-related effects to federally listed species and their designated critical habitats is provided in this EIS. To comply with Section 7 of the ESA, we request that FWS consider this Draft EIS as our BA for the proposed Project.

Based on consultation with FWS, TPWD, and LDWF and review of existing records, six federally listed endangered, threatened, or candidate species were identified that would potentially occur in the vicinity of the proposed Project. These species and their management status are listed in Table 3.7.1-1. The preferred habitats and potential for occurrence of these species, as well as our assessment of potential Project effects, are discussed further below.

Red-Cockaded Woodpecker

The red-cockaded woodpecker, a federally listed endangered species, ranges from Maryland south to Florida and west to Texas. Habitat utilized by the red-cockaded woodpecker includes open, mature pine woodlands, and rarely deciduous or mixed pine-hardwoods located near pine woodlands. The optimal habitat is a fire-maintained setting characterized as broad savanna with a dense understory of grass and shrubs, an overstory of scattered clusters of pine trees, and lack of a midstory (NatureServe 2006). Fire suppression has altered pine woodlands in the southeastern United States by allowing encroachment of hardwoods and the development of a dense midstory, resulting in red-cockaded woodpecker habitat loss. Red-cockaded woodpeckers nest and roost in tree cavities primarily in longleaf pine, but also in mature loblolly pine, shortleaf pine, slash pine, pond pine, and bald cypress (typically from 60 to 150 years old). Large, old-growth longleaf pine stands have the highest density of red-cockaded woodpecker nesting and roosting cavities. Foraging habitat can be varied, but consists primarily of open pine habitat with older pine trees. Several researchers (Hooper et al. 1980; Conner and Rudolph 1991) suggest that it is difficult to raise young when the foraging area is reduced to 40 hectares or less, and tree cavity clusters are abandoned when forest cover is removed within 800 meters of the cluster.

TABLE 3.7.1-1
Federally Listed Species Potentially Occurring in the Proposed Carthage to Perryville Project Area[a]

Species	Federal Status[b]	Texas Status[b]	Louisiana Status[b]	County/Parish (portion of potential range crossed by Project)
Birds				
Red-cockaded woodpecker *(Picoides borealis)*	E	E	E	Bienville, Caddo, DeSoto, Jackson, and Ouachita Parishes, Louisiana
Interior least tern *(Sterna antillarum athalassos)*	E	E	E	Caddo and Red River Parishes, Louisiana
Bald eagle *(Haliaeetus leucocephalus)*	T	T	E	Panola County, Texas and Caddo, DeSoto, Jackson, and Ouachita Parishes, Louisiana
Mammals				
Louisiana black bear *(Ursus americanus luteolus)*	T	T	T	Richland Parish, Louisiana and Panola County, Texas
Reptiles				
Louisiana pine snake *(Pituophis ruthveni)*	C	T	S2S3	Bienville Parish, Louisiana
Fishes				
Pallid sturgeon *(Scaphirhynchus albus)*	E	--	E	Caddo and Red River Parishes, Louisiana

Notes:

[a] Sources: FWS 2006b, TPWD 2006b, LDWF 2005, NatureServe 2006

[b] E = endangered, T = threatened, C = candidate, S2S3 = imperiled, -- = not listed

No red-cockaded woodpeckers 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 plantation that would be crossed by the proposed Project consists of young, dense pine plantations or older stands of pine in fire-suppressed forests, both of which contain too much midstory vegetation to be considered suitable for red-cockaded woodpeckers.

However, review of existing FWS, TPWD, and LDWF databases and the initial field surveys did identify some areas of potentially suitable red-cockaded woodpecker habitat in the proposed Project area. The LDWF has two recorded occurrences of red-cockaded woodpeckers within 7 miles of the proposed pipeline route in Caddo Parish, Louisiana (LDWF 2006d). Additionally, four stands of pine woodland that offer potentially suitable habitat were identified during initial field surveys along the proposed pipeline route in Panola County, Texas, and Caddo and Ouachita Parishes, Louisiana. Based on consultations with FWS, CEGT completed expanded surveys of these four areas in March 2006 to better assess the potential for Project effects to red-cockaded woodpecker. These surveys included detailed habitat evaluations and, if suitable habitat was found, extensive searches for red-cockaded woodpeckers

and indicators of their presence. Any potential nesting habitat located within 0.5 mile of suitable foraging habitat was also identified and examined. Within areas of potentially suitable nesting habitat, each medium to large pine tree estimated to be at least 60 years old was visually inspected for red-cockaded woodpecker nesting cavities.

The results of the expanded surveys indicated that one site of potential red-cockaded woodpecker habitat in Panola County, Texas, and another in Ouachita Parish, Louisiana, did not contain suitable foraging or nesting habitat, and no individuals were observed. Expanded surveys did identify potentially suitable foraging or nesting habitat at another site in Ouachita Parish, Louisiana, and an additional site in Caddo Parish. However, no red-cockaded woodpeckers or indicators of their presence, including sounds (e.g., calls or drumming), nest cavities, or started cavities, were recorded at any of the sites, and no individuals were observed.

Based on the results of the field surveys conducted by CEGT, it does not appear that construction of the proposed Project would impact any areas of suitable red-cockaded woodpecker habitat that are actively used by the species. On March 29, 2006, CEGT submitted a report to FWS regarding the expanded surveys for the red-cockaded woodpecker and requested concurrence with its findings. The FWS responded in a letter dated April 27, 2006, and concurred with the determination that the proposed Project would be not likely to adversely affect the red-cockaded woodpecker.

Interior Least Tern

The interior least tern, a federally listed endangered species, is a small shore bird that is found throughout much of the United States and migrates as far south as northern South America. The federal listing includes the interior, eastern, and California subspecies of the least tern. Nesting and foraging habitat are near water and include ocean coasts, lagoons, tidal flats, estuaries, beaches, sand dunes, sand bars, and rivers. Interior populations mainly utilize riverine sand bars, islands, and willow riparian habitat (NatureServe 2006), and nesting season is typically from May to August. Threats to the species include habitat loss and destruction due to human disturbance, inundation of riverine habitat caused by damming, and altered hydrologic regimes due to damming. The interior least tern was historically common in Louisiana throughout the Mississippi and Red River valleys (FWS 1985).

In its comments on the NOI, FWS (2006b) stated that several nesting colonies exist along the Red River in northwest Louisiana, and that the breeding range is actively being extended south along the Red River. However, field surveys conducted by CEGT did not identify any suitable nesting habitat along the Red River near the site of the proposed pipeline crossing. Consultations with LDWF also suggested that the potential for Project interaction with interior least tern would be low. Additionally, the Project would be constructed between October and February, as proposed, thereby avoiding the interior least tern nesting season. The crossing of the Red River would also be accomplished using HDD installation techniques to minimize disturbance to that waterbody and adjacent riparian habitats, which would support nesting or foraging habitat.

As described in Section 3.3.4, CEGT anticipates that the proposed HDD crossing of the Red River would be successful based on its previous construction experience in the area. CEGT would further evaluate the feasibility of the proposed Red River HDD crossing prior to construction through planned geotechnical investigations. However, in the unlikely event the proposed HDD crossing were to fail, CEGT's DDCP indicates that pipeline installation across the Red River would be accomplished using conventional open-cut installation techniques (see Section 2.3.2). An open-cut crossing of the Red River would result in temporary impacts to riverine and riparian habitat potentially used by interior least tern. Should the proposed HDD crossing fail or geotechnical investigations indicate that the proposed HDD is not feasible, we have included a recommendation in Section 3.3.4 that CEGT develop a site-specific,

alternative crossing plan in consultation with multiple resource agencies, including FWS and LDWF. This plan would be developed and approved prior to initiating any instream construction activities at the Red River, and it is anticipated that the required agency consultations would identify any appropriate measures to avoid and minimize potential adverse effects to interior least tern.

For these reasons, we have determined that the proposed Project would be not likely to adversely affect the interior least tern. In a letter dated February 17, 2006, the FWS concurred with this determination of effect.

Bald Eagle

The bald eagle, a federally listed threatened species, is a large carnivorous bird whose range covers virtually all of North America. Preferred habitat consists of areas near water bodies, such as coasts, bays, lakes, rivers, and forested wetlands. Bald eagles are opportunistic feeders and will both hunt and scavenge. Primary food sources are fish, waterfowl, and seabirds, though bald eagles are also known to feed on carcasses of large animals such as sheep (NatureServe 2006). Mixed conifer and hardwood forests and woodlands with large, accessible trees are used for roosting and nesting. Threats to the bald eagle include loss of habitat, human disturbance, environmental contamination (particularly dichloro-diphenyl-trichloroethane) decreasing food supply, and illegal shooting (NatureServe 2006). Bald eagles are sensitive to human activity and disturbance and will abandon otherwise suitable habitat if disturbance is consistent (Fraser 1985). Pedestrian, canoe, and boat traffic have been shown to flush individuals from roosting and perching sites in the Chesapeake Bay and Arizona (Buehler et al. 1991; Grubb and King 1991).

Bald eagles are known to occasionally nest near water bodies in Texas and Louisiana from October to May. The FWS (2006b) has identified high numbers of nests in southern portions of Louisiana, but indicated that bald eagles also winter and infrequently nest in northern Louisiana. However, field surveys of the proposed Project route conducted by CEGT identified very little suitable bald eagle habitat. With the exception of the Red and Ouachita River crossings, both of which would be accomplished via HDD, the proposed Project would avoid large, open waterbodies that would be used as foraging habitat. Additionally, no bald eagles or bald eagle nests were observed during the field surveys. Consultations with LDWF also suggested that the potential for Project interaction with bald eagles would be low, and database searches did not identify any known nesting sites in proximity to the proposed Project facilities. For these reasons, we believe that the proposed Project would be not likely to adversely affect the bald eagle. In a letter dated February 17, 2006, the FWS concurred with this determination of effect.

Louisiana Black Bear

The Louisiana black bear, a federally listed threatened species, is closely related to other subspecies of black bear, but has a longer, narrower skull and larger molars. Habitat includes mixed conifer and hardwood forested bottomlands, forested wetlands, standing and fallen logs. Preferred habitat includes remote area with little or no human activity and diverse food resources. Brush piles, ground nests, and hollow trees (especially cypress and tupelo gum) are used as winter (December through April) den sites, particularly by pregnant females. Because tree cavities are a key habitat for the species, legal protection has been extended to candidate and actual denning trees. Candidate denning trees are defined as bald cypress and tupelo gum trees with visible cavities, having a diameter at breast height of 36 inches or greater, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies. Actual denning trees are defined as any tree used by a bear for denning. Habitat degradation, loss, and fragmentation, and human contact are the greatest threats to the species.

The historic range of the Louisiana black bear includes Panola County, Texas, and all of Louisiana (FWS 1992). In its comments on the NOI, FWS (2006b) stated that populations of Louisiana black bear occur in the Tensas River basin, the Upper Atchafalaya River basin, and coastal Iberia and St. Mary Parishes. Within Louisiana, the proposed Project would pass through the currently occupied range in Richland Parish. CEGT conducted field surveys of the proposed Project area in Panola County, Texas and Richland Parish, Louisiana, but did not identify any candidate or actual denning trees along the proposed Project route. Likewise, no Louisiana black bear were observed during the field surveys. However, some areas of potentially suitable Louisiana black bear habitat (forested wetlands and hardwood forested bottomlands) would be affected by construction of the proposed Project.

The LDWF (2005) recommended that further consultation would be required if construction were planned to occur during the denning season or if bald cypress or tupelo gum with diameters at breast high of 36 inches or greater would be removed or destroyed. As proposed, construction of the Project pipeline would extend from October to February, which encompasses a portion of the Louisiana black bear denning season. Although the majority of construction related clearing activities would occur in upland areas, it is possible that some bald cypress or tupelo gum with diameters at breast high of 36 inches or greater would be cut in association with clearing of the proposed pipeline construction right-of-way. Therefore, **we recommend that**:

- **CEGT should consult with LDWF to develop measures (if required) to be implemented during Project construction that would minimize the potential for Project impacts to Louisiana black bear. Copies of all related consultation, including any recommended mitigation measures, should be filed with the Secretary prior to construction.**

No Louisiana black bear were observed during the field surveys, and no candidate or actual denning trees were identified along the proposed Project route. Further, CEGT would implement any agency recommended measures to mitigate potential impacts to Louisiana black bear during construction. Therefore, we conclude that the proposed Project would not be likely to adversely affect the Louisiana black bear. In a letter dated February 17, 2006, the FWS concurred with this determination of effect. Although no further formal consultation would be required, FWS has indicated it would continue to provide CEGT with recommendations to minimize potential Project impacts to the Louisiana black bear should CEGT request additional guidance.

Louisiana Pine Snake

The Louisiana pine snake occurs over a relatively small range in north and central Louisiana and east Texas. Its habitat consists of longleaf open pine savanna with sandy, well-drained soils and thick herbaceous ground cover. The Louisiana pine snake is often found in fields, farmland, and areas of second-growth timber. It is strongly associated with Baird's pocket gophers, which provide burrows and a food source. The greatest threats to the species are habitat destruction and degradation due to logging, grazing, and fire-suppression. Vehicle mortality is also a significant threat to the Louisiana pine snake.

The Louisiana pine snake is currently listed as a candidate species, therefore the ESA does not require consultation regarding potential impacts to that species. Regardless, the FWS encourages avoidance of Project activities or practices that would negatively impact the Louisiana pine snake or its habitat. The largest population of Louisiana pine snake probably exists in Bienville Parish, Louisiana, which the proposed Project would traverse. However, according to LDWF (2006d), the closest known occurrences of the Louisiana pine snake are approximately 9 miles south of the proposed pipeline route in Bienville and Jackson Parishes, Louisiana. Additionally, field surveys did not identify any suitable foraging habitat or evidence of Baird's pocket gopher in the proposed Project area.

For these reasons, we conclude that the proposed Project would have no effect on the Louisiana pine snake. Though there is currently no requirement under the ESA for consultation with FWS regarding Project impacts for this species, further consultation would be required if the Louisiana pine snake were to become federally listed as threatened or endangered in the future.

Pallid Sturgeon

The pallid sturgeon, a federally listed endangered species, is a large, freshwater fish that lives in large, free flowing, turbid rivers with low to medium gradients. Specific habitat conditions vary but can include strong current over gravel and sand, or deep water with slow current. Spawning habitat requirements are not well known, but the species is believed to spawn in Louisiana (FWS 2006b). Pallid sturgeon feed on aquatic insects, crustaceans, mollusks, annelids, eggs of other fishes, and sometimes other fishes. River channelization and dams have resulted in habitat loss for the species throughout its range.

The pallid sturgeon is listed as endangered in Red River and Caddo Parishes, and FWS indicates that the species may occur in the Red River, which would be crossed by the proposed pipeline at MP 50.1. CEGT would avoid instream construction at this waterbody crossing by installing the pipeline using HDD techniques, as described in Sections 2.3.2 and 3.3. However, pallid sturgeon would be affected by an inadvertent release of drilling fluid to the river. To mitigate the potential for harm resulting from such an event, CEGT has developed a DDCP (Appendix D) that describes the procedures that would be implemented to monitor for, contain, and clean up any potential releases of drilling fluid during HDD operations. Additionally, CEGT has stated that it would not use any synthetic or potentially toxic drilling fluid additives, as are used in some drilling applications.

As described in Section 3.3.4, CEGT anticipates that the proposed HDD crossing of the Red River would be successful based on its previous construction experience in the area. CEGT would further evaluate the feasibility of the proposed Red River HDD crossing prior to construction through planned geotechnical investigations. However, in the unlikely event the proposed HDD crossing were to fail, the DDCP states that pipeline installation across the Red River would be accomplished using conventional open-cut installation techniques (see Section 2.3.2). An open-cut crossing of the Red River would result in temporary impacts to riverine habitat potentially used by pallid sturgeon. Should the proposed HDD crossing fail or geotechnical investigations indicate that the proposed HDD is not feasible, we have included a recommendation in Section 3.3.4 that CEGT develop a site-specific, alternative crossing plan in consultation with multiple resource agencies, including FWS and LDWF. This plan would be developed and approved prior to initiating any instream construction activities at the Red River, and it is anticipated that the required agency consultations would identify any appropriate measures to avoid and minimize potential adverse effects to pallid sturgeon.

For these reasons, we have determined that the proposed Project would be not likely to adversely affect the pallid sturgeon. In a letter dated February 17, 2006, the FWS concurred with this determination of effect.

3.7.1.1 Conclusion Regarding Federally Listed Threatened and Endangered Species

Six federally listed endangered, threatened, or candidate species are reported to potentially occur in the vicinity of the proposed Project. Based on our review of these species and the survey reports conducted by CEGT, we have determined that these species and their preferred habitats either do not occur along the proposed Project route or their potential habitats would be avoided through special construction procedures. With implementation of CEGT's proposed construction and mitigation plans and our recommendations, we believe that construction and operation of the proposed Project would have

no effect on the Louisiana pine snake and no adverse effect on the red-cockaded woodpecker, interior least tern, bald eagle, Louisiana black bear, and pallid sturgeon.

Because FWS has provided a letter of concurrence with regards to potential impacts to federally listed threatened and endangered species, no further consultation with FWS is required at this time. However, should construction of the proposed Project not be initiated within one year, follow-up consultation would be required as FWS updates information regarding listed species annually. Additionally, in the event the scope or location of the proposed Project were to change, additional consultation with the FWS-Lafayette Field Office would occur as soon as such changes are made.

3.7.2 Special Status Species

3.7.2.1 State-Listed and Rare Species

In addition to federally listed species, other special status species may also occur within the vicinity of the proposed Project facilities. Special status species include state-listed endangered, threatened, imperiled, or rare species, as well as other species of concern identified through consultations with TPWD, LDWF, and FWS. These species, their status, and preferred habitat are listed in Table 3.7.2-1. The FERC encourages coordination between CEGT and state resource agencies to protect state-listed or rare species.

Texas

The federally listed red-cockaded woodpecker, bald eagle, interior least tern, and Louisiana black bear and the Louisiana pine snake, a federal candidate species, which are considered in Section 3.6.1, are also state-listed species in Texas (see Table 3.7.1-1). In a letter dated February 15, 2006, TPWD identified six state-listed threatened species and eight species of concern that would be potentially impacted by activities associated with the proposed Project (see Table 3.7.2-1). The State of Texas prohibits the taking, possession, transportation, or sale of any of the animal species designated by state law as endangered or threatened without the issuance of a permit. TPWD also recommended that precautions be taken to avoid adverse impacts to rare species identified within the Project area.

Except for those species also afforded federal protection, CEGT did not complete targeted surveys for any of the state-listed or rare species identified by TPWD. As recommended in the Draft EIS, CEGT consulted with TPWD to determine whether additional field surveys are warranted for any state-listed or rare species and, if required, develop mitigation measures to avoid or minimize potential impacts to those species. TPWD determined that no further field surveys would be required (TRC 2006b).

In addition to the species considered above, TPWD also provided information that natural plant communities in the state designated Longleaf Pine-Beakrush, Longleaf Pine-Little Bluestem, and Water Oak-Willow Oak Series would be impacted by the proposed Project. Specifically, TPWD indicated that the proposed Project would cross a significant Water Oak-Willow Oak Series vegetative community at the Sabine River (MP 4.3) in Panola County, Texas. As described in Section 3.2, CEGT has proposed to accomplish pipeline installation across the Sabine River using HDD. As recommended in the Draft EIS, CEGT consulted with TPWD to determine whether additional mitigation measures might be appropriate in regards to the proposed construction plans at the Sabine River crossing and associated impacts to the designated Water Oak-Willow Oak Series. In its comments on the Draft EIS dated July 11, 2006, TPWD acknowledged that impacts to the Sabine River Water Oak-Willow Oak Series would be minimized through CEGT's proposed use of HDD installation in that area. We consider that potential impacts to the

TABLE 3.7.2-1
State Listed Species Potentially Occurring in the Proposed Carthage to Perryville Project Area[a]

Species	Texas Status / Rank[b]	Louisiana Status / Rank[b]	Habitat
Birds			
Bachman's sparrow *(Aimophila aestivalis)*	T	S3	Fire-maintained mature to old pine woodland. Well-developed grass and herb groundcover with limited shrub and hardwood midstory. Able to colonize recent clearcuts, but such habitat is suitable only for a short time. Dry open pine with an undercover of grasses and shrubs, hillsides with patchy brushy areas, overgrown fields with thickets and brambles, grassy orchards, and large clear-cuts.
Mammals			
Rafinesque's big-eared bat *(Corynorhinus rafinesquii)*	T	S3S4 [d]	Shallow caves or rock shelters, hollow trees, abandoned buildings, girder bridges for nesting and roosting. Mature upland and lowland forest.
Reptiles			
Alligator snapping turtle *(Macrochelys temminckii)*	T	S3 [d]	Slow, deep water of rivers, sloughs, oxbows, canals, swamps, bayous, ponds, and shallow creeks.
Timber (canebrake) rattlesnake *(Crotalus horridus)*	T	S3S4 [d]	Hardwood forests in river bottoms, swampy areas, floodplains, wet pine flatwoods, and hydric hammocks.
Fishes			
Creek chubsucker *(Erimyzon oblongus)*	T	S5 [d]	Creeks and small rivers. River mouths, sand- and gravel-bottomed pools, riffles, and lake outlets.
Paddlefish *(Polyodon spathula)*	T	S3 [d]	Slow water in medium and large rivers, channels, oxbows, backwaters, and impoundments.
Invertebrates			
Creeper (squawfoot) *(Strophitus undulatus)*	SC	S2 [d]	Small to large streams, prefers gravel or gravel and mud in flowing water.
Louisiana pigtoe *(Pleurobema riddellii)*	SC	S1S2 [d]	Streams and moderate-sized rivers, usually flowing water on mud, sand, and gravel; generally not in reservoirs.
Pistolgrip *(Tritogonia verrucosa)*	SC	S4 [d]	Stable substrate, rock, hard mud, silt, and soft bottoms.
Rock-pocketbook *(Arcidens confragosus)*	SC-	S3 [d]	Mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water; may tolerate moderates.
Sandbank pocketbook *(Lampsilis satura)*	SC	S2 [d]	Small to large rivers with moderate flows and swift current on gravel, gravel/sand, and sand bottoms.
Southern hickorynut *(Obovaria jacksoniana)*	SC-	S1S2 [d]	Medium sized gravel substrates with low to moderate current.
Texas heelsplitter *(Potamilus amphichaenus)*	SC	SH [d]	Quiet waters in mud or sand, also in reservoirs.
Texas pigtoe *(Fusconaia askewi)*	SC	S3 [d]	Large and medium sized rivers with mud, sand, and fine gravel and fallen trees or other structures.
Pyramid pigtoe (Pleurobema rubrum)	--	S2	Large and medium sized rivers; riffles and shoals, shallow water with coarse-particle substrates, sand bars, or in deep water (>4 meters) with mud and sand bottoms. Moderate to swift currents.
Spike mussel (Elliptio dilatata)	S1[c]	S2S3	Small to large streams in sand or gravel

TABLE 3.7.2-1 (continued)
State Listed Species Potentially Occurring in the Proposed Carthage to Perryville Project Area[a]

Species	Texas Status / Rank[b]	Louisiana Status / Rank[b]	Habitat
Invertebrates			
Silty hornsnail (Pleurocera canaliculata)	--	S2	Freshwater.
Ouachita fencing crawfish *(Faxonella creaseri)*	--	S2	Shallow, temporary pools and roadside ditches.
Sabine fencing crawfish *(Faxonella beyeri)*	--	S1S2	Roadside ditches that are intermittently filled, mostly by rains.
Plants			
Upland swamp privet *(Forestiera ligustrina)*	--	S2	Northwest Louisiana; mesic sandy loam soil.
Smooth twistflower *(Streptanthus hyacinthoides)*	--	S2	Northwest Louisiana; deep, xeric, sandy loam soil, found on roadsides and fields which are regularly cleared.
Prairie scorpionweed *(Phacelia strictiflora)*	--	S2	Northwest Louisiana; xeric, loamy, fine sands; prefers open areas.
Northern burmmania *(Burmmania biflora)*	--	S2	Northern Louisiana; bayhead swamps, forested wetlands, forested seeps, lower slopes. Very conspicuous during flowering, flowering peaks in October.
Fire pink *(Silene virginica)*	--	S2	Northern Louisiana; hardwood slope forests, mixed pine/hardwood forests, mesic sites.

Notes:

[a] Sources: TPWD 2006, LDWF 2006, NatureServe 2006, Hardin 2006, Iowa Department of Natural Resources 2006, and Lester 2005

[b] E = Endangered, T = Threatened, C = Candidate, -- = Not Listed, S1 = Critically Imperiled, S2 = Imperiled, S3 = Rare, S4 = Apparently Secure, S5 = Demonstrably Secure, SC = Species of Concern, SH = historically occurred, but no recent records of collection.

[c] Species is listed as rare or imperiled in Texas, but the Texas Parks and Wildlife Division did not identify the species as potentially affected by the proposed Project in its letter dated February 15, 2006.

[d] Species is listed as rare or imperiled in Louisiana, but the Louisiana Department of Wildlife and Fisheries did not identify the species as potentially affected by the proposed Project in its letter dated December 20, 2006.

TPWD-designated Water Oak-Willow Oak Series would be minimized through CEGT's proposed use of HDD, implementation of our Procedures, and completion of the required consultations and permitting activities with the COE. Additionally, in Section 3.4 we have included a recommendation for CEGT to consult with TPWD to develop a compensatory mitigation plan to offset unavoidable impacts to that vegetative community.

Louisiana

Each of the federally listed species considered in Section 3.6.1 are also afforded special status designations in Louisiana (see Table 3.7.1-1). In a letter dated December 20, 2005, LDWF identified one rare, nine imperiled, and one critically imperiled species that are known to occur in the proposed Project area (see Table 3.7.2-1). LDWF reports that two of these species, smooth twistflower and prairie scorpionweed, are benefited by mechanically maintained, open habitats and that the known occurrences of these species in proximity to the proposed Project are in an area where a maintained pipeline right-of-way already exists. Consequently, LDWF indicates that construction and operation of the proposed

Project would continue to benefit these species if soil disturbance were minimized during construction. The remaining species identified by LDWF would potentially be adversely impacted by construction activities associated with the proposed Project.

Except for those species also afforded federal protection, CEGT did not complete targeted surveys for any of the rare or imperiled species identified by LDWF. However, CEGT indicates that it would continue to consult with LDWF to determine whether additional field surveys are warranted for any of these species 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:**

- **Prior to construction, CEGT should consult with LDWF to determine the need for additional surveys or mitigation that would substantially minimize or avoid potential impacts to state-listed species. CEGT should file with the results of that consultation, as well as any associated survey reports, with the Secretary and receive written approval from the Director of OEP prior to implementing any agency recommended mitigation measures.**

3.7.2.2 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 environments and gather in large colonies, or rookeries, during the nesting season (FWS 2002). Based on consultations with FWS, TPWD, and LDWF, the proposed Project would be located in an area where colonial nesting waterbirds, including herons, egrets, night-herons, ibises, spoonbills, anhingas, comorants, terns, gulls, skimmers, and pelicans, would be present.

In its comments on the proposed Project, FWS (2006b) recommended that any construction activity within 1,000 feet of a rookery should be restricted to non-nesting period (i.e., September 1 through February 15) to minimize disturbance to colonial nesting waterbirds. Should construction be required during nesting season, FWS recommended that a qualified biologist inspect the proposed Project work area for the presence of potentially undocumented nesting colonies and that on-site contractors be informed of the need to identify and avoid colonial nesting waterbirds and their nests. Additionally, LDWF (2005) indicated that any active or inactive nests identified within 1,312 feet (400 meters) of a proposed Project work area would require coordination with that agency.

CEGT indicates that no rookeries were identified during ecological surveys performed to date within the proposed Project corridor. As proposed, the Project would be constructed between October and February, thereby avoiding the majority of the nesting season identified by FWS. Further, most major waterbodies crossed by the proposed Project would utilize HDD installation techniques to minimize disturbance to those waterbodies and adjacent riparian habitats, which would support colonial nesting waterbird rookeries. However, the potential exists for Project-related activities to occur during the nesting season if construction were delayed. If any construction activities were required during the nesting season, CEGT has indicated that it would have Project work areas inspected by a qualified biologist per the FWS recommendation. Should a rookery be identified, CEGT would consult with FWS, LDWF, and TPWD to determine appropriate avoidance, minimization, and mitigation measures.

3.7.2.3 Migratory Birds

The Migratory Bird Treaty Act regulates taking of or impacts to migratory birds, including their nests. CEGT identified 175 migratory bird species that would 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. Though, 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.

As discussed above, the Project would be constructed between October and February, as proposed, thereby avoiding the major migratory bird spring nesting season. Additionally, CEGT would not conduct routine vegetative maintenance of the full pipeline right-of-way more frequently than once every 3 years, except along a corridor not exceeding 10 feet in width centered on the pipeline, which would be maintained annually in an herbaceous state to facilitate periodic corrosion and leak detection surveys. Furthermore, CEGT 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.

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

3.8.1 Land Use

As described in Section 2.1, the proposed Carthage to Perryville Project would consist of an approximately 172.1-mile-long, 42-inch-diameter, interstate natural gas pipeline, two new compressor stations, and associated ancillary facilities. In this section we further quantify the land requirements for construction and operation of the proposed Project, describe the current use or cover type of those lands, and evaluate the significance of the Project-related impacts to those lands.

3.8.1.1 Land Requirements and Existing Cover Types

The land use/land cover types crossed by the proposed pipeline route and located at the proposed aboveground facility sites are comprised of seven primary cover types: agricultural, open land, residential, commercial/industrial, forest, pine plantation, and open water. Table 3.8.1-1 defines these land use/land cover types and summarizes the current uses and cover of those lands that would be affected by construction and operation of the proposed Project.

Construction of the proposed Project would affect approximately 2,497.9 acres (Table 3.8.1-1). Approximately 80 percent of that acreage would be contained within the pipeline construction right-of-way and construction areas associated with the proposed aboveground facilities. Approximately 37 percent of the land that would be affected during construction is characterized as pine plantation, 23 percent is forestland, and 24 percent is agricultural land. The remaining cover types reported in Table 3.8.1-1 each represents less than 10 percent of the proposed construction acreage. Following construction all land temporarily used for extra work areas (construction access roads, extra workspace areas, and pipe storage and contractor yards) would be allowed to revert to its original use and cover type.

During operation of the proposed Project, the permanent pipeline right-of-way and the acreage affected by the aboveground facilities and permanent access roads would encumber about 1,248.0 acres. Approximately 37 percent of the land that would be affected during operation is currently classified as pine plantation, 25 percent is forest, and 25 percent is agricultural, and 10 percent is open land. The remaining cover types each represent less than 3 percent of the acreage required during operation.

Pipeline Facilities

CEGT has proposed a nominal construction right-of-way width of 100-feet along upland sections of the proposed pipeline that would be installed using conventional, open-cut trenching techniques (see Section 2.3.1). In wetland areas the construction right-of-way width would be reduced to 75-feet unless site-specific variances were issued. As detailed in Section 2.2, additional construction areas, or temporary extra workspaces, would also be required for construction at road crossings, railroad crossings, crossings of existing pipelines and utilities, wetland and waterbody crossings, and other areas where specialized construction techniques would be used (see Table G-1 of Appendix G). Approximately 63 percent of the 2,226.2 acres that would be contained within the pipeline construction right-of-way and extra workspace areas consist of pine plantation and forestland. Agricultural and open lands account for an additional 35 percent of this acreage.

Following construction, CEGT would maintain a 60-foot-wide permanent right-of-way centered over the proposed pipeline centerline. In wetland areas, the maintained portion of the permanent pipeline right-of-way would be reduced to 30 feet in width. Acreage located within the construction right-of-way, but outside the permanent right-of-way, and that acreage associated with extra workspace areas, would be allowed to revert to its preconstruction use and cover type. As such, operation of the proposed pipeline would permanently encumber approximately 1,209.7 acres of land. Similar to the construction right-of-way requirements, approximately 62 percent of that acreage would consist of forested areas composed of pine plantation and forest, with agricultural and open lands accounting for an additional 35 percent of the affected acreage.

Aboveground Facilities

The proposed Project would include construction and operation of two compressor stations, six meter/regulator stations, 11 mainline valves, and four pig launcher/receiver facilities. A pig launcher/receiver would be located within the fenced perimeter of each compressor station site. The remaining pig launcher and receiver facilities would be located within the confines of the HPL and Columbia Gulf M/R Stations, respectively. Two of the mainline valves, MLV #1 and MLV #8, would be located within the Panola and Vernon Compressor Stations, respectively, and would not result in additional land requirements beyond that noted for those facilities. The remaining mainline valve sites would consist of a 40-foot by 40-foot fenced area installed within the confines of the permanent pipeline right-of-way. Thus, construction and operation of those facilities would not result in land requirements beyond that already noted for the permanent pipeline right-of-way.

Table 3.8.1-1 details the land cover types that would be affected by construction and operation of the proposed aboveground facilities, and the locations of the various aboveground facilities are depicted in maps provided as Appendix B of this EIS. The land requirements for the proposed aboveground facilities would total 34.6 acres during construction and operation. Approximately 62 percent of that acreage is currently classified as pine plantation or forest, and an additional 30 percent is currently classified as agricultural land. 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.

Access Roads

Where feasible, CEGT would use existing public roadways, existing private roadways, and/or the pipeline right-of-way itself to gain access during construction and operation of the proposed Project. CEGT has indicated that construction of the proposed pipeline would require the temporary use of 143

TABLE 3.8.1-1
Acres Potentially Impacted by the Project

		Affected Land Use/Land Cover (acres)[a]							
		Agricultural		Residential		Commercial/ Industrial		Open Water	
	County/ Parish	C	O	C	O	C	O	C	O
Pipeline Facilities[b]									
	Panola, TX	43.4	23.3	0.1	0.0	5.7	4.3	0.0	0.0
	Caddo, LA	7.4	3.7	0.0	0.0	0.1	0.1	0.0	0.0
	DeSoto, LA	38.4	21.3	0.0	0.0	4.6	2.7	0.2	0.2
	Red River, LA	99.8	55.2	0.0	0.0	2.9	2.2	0.4	0.3
	Bienville, LA	21.6	12.1	0.0	0.0	6.7	4.1	0.0	0.0
	Jackson, LA	21.5	11.4	0.5	0.3	8.8	6.1	0.2	0.1
	Ouachita, LA	31.2	17.1	0.0	0.0	1.5	0.9	0.0	0.0
	Richland, LA	285.1	151.6	0.0	0.0	13.3	11.9	0.3	0.2
Pipeline Facilities Subtotal		**548.4**	**295.7**	**0.6**	**0.3**	**43.6**	**32.3**	**1.1**	**0.8**
Aboveground Facilites[c]									
Panola Compressor Station	Panola, TX	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Vernon Compressor Station	Jackson, LA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Houston Pipe Line Meter/Regulator (M/R) Station	Panola, TX	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0
Duke Energy Field Services-Enbridge M/R Station	Panola, TX	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.0
Texas Gas M/R Station	Ouachita, LA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANR M/R Station	Richland, LA	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Trunkline M/R Station	Richland, LA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Columbia Gulf M/R Station	Richland, LA	6.8	6.8	0.0	0.0	0.0	0.0	0.0	0.0
Aboveground Facility Subtotal		**10.6**	**10.6**	**0.0**	**0.0**	**0.9**	**0.9**	**0.0**	**0.0**
Extra Work Areas[b]									
Pipe Storage and Contractor Yards	Various	0.0	0.0	0.0	0.0	112.0	0.0	0.0	0.0
Access Roads[d]	Various	--	--	--	--	--	--	--	--
Extra Work Areas Subtotal		**0.0**	**0.0**	**0.0**	**0.0**	**112.0**	**0.0**	**0.0**	**0.0**
Total		**559.0**	**306.3**	**0.6**	**0.3**	**156.5**	**33.2**	**1.1**	**0.8**

Notes:

C = Construction Impacts
O = Operation Impacts

[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 temporary extra workspace areas. Table G-1 of Appendix G provides a complete, itemized list of extra workspace 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 Project

		Affected Land Use/Land Cover (acres)[a]							
		Open Land		Forest		Pine Plantation		Total	
	County/ Parish	C	O	C	O	C	O	C	O
Pipeline Facilities[b]									
	Panola, TX	8.1	4.5	89.3	50.2	49.6	26.1	196.2	108.4
	Caddo, LA	0.0	0.0	43.7	22.6	41.9	20.7	93.1	47.1
	DeSoto, LA	29.7	15.8	134.9	70.1	84.7	41.9	292.5	152.0
	Red River, LA	27.6	16.7	17.2	11.7	37.4	20.0	185.3	106.1
	Bienville, LA	56.1	30.8	60.0	34.9	292.3	162.2	436.7	244.1
	Jackson, LA	41.0	22.7	82.6	49.5	213.0	112.3	367.6	202.4
	Ouachita, LA	30.3	17.8	33.1	18.7	144.0	71.0	240.1	125.5
	Richland, LA	35.6	19.1	71.4	38.1	9.0	3.2	414.7	224.1
Pipeline Facilities Subtotal		**228.4**	**127.4**	**532.2**	**295.8**	**871.9**	**457.4**	**2,226.2**	**1,209.7**
Aboveground Facilites[c]									
Panola Compressor Station	Panola, TX	0.0	0.0	4.7	4.7	0.0	0.0	6.9	6.9
Vernon Compressor Station	Jackson, LA	0.0	0.0	0.0	0.0	6.1	6.1	6.1	6.1
Houston Pipe Line Meter/Regulator (M/R) Station	Panola, TX	0.0	0.0	2.9	2.9	0.0	0.0	3.1	3.1
Duke Energy Field Services-Enbridge M/R Station	Panola, TX	1.7	1.7	2.8	2.8	0.0	0.0	5.2	5.2
Texas Gas M/R Station	Ouachita, LA	0.0	0.0	2.3	2.3	0.0	0.0	2.3	2.3
ANR M/R Station	Richland, LA	0.0	0.0	0.5	0.5	0.0	0.0	2.1	2.1
Trunkline M/R Station	Richland, LA	0.0	0.0	2.1	2.1	0.0	0.0	2.1	2.1
Columbia Gulf M/R Station	Richland, LA	0.0	0.0	0.0	0.0	0.0	0.0	6.8	6.8
Aboveground Facility Subtotal		**1.7**	**1.7**	**15.3**	**15.3**	**6.1**	**6.1**	**34.6**	**34.6**
Extra Work Areas[b]									
Pipe Storage and Contractor Yards	Various	0.0	0.0	0.0	0.0	0.0	0.0	112.0	0.0
Access Roads[d]	Various	--	--	--	--	--	--	125.1	3.7
Extra Work Areas Subtotal		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**237.1**	**3.7**
Total		**230.1**	**129.1**	**547.5**	**311.1**	**878.0**	**463.5**	**2,497.9**	**1,248.0**

Notes:

C = Construction Impacts
O = Operation Impacts

[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 extra workspace areas. Appendix G provides a complete, itemized list of extra workspace 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.

existing access roads of varying lengths and construction (see Table G-2 of Appendix G). CEGT reports that 50 of these access roads, comprising a length of approximately 25.0 miles, would require upgrades to support construction-related traffic. Upgrades that could be required include grading, placement of gravel for stability, replacing or installing culverts, and clearing of overhead vegetation. Minor widening could also be required at sharp turns to facilitate passage by pipe trucks. CEGT has not completed the detailed design plans for these access roads, but reports that improvement of existing access roads could require widening to as much as 40 feet in some locations. Assuming a standard construction width of 40 feet (worst-case scenario used in our impact assessment) access road improvements would temporarily affect 121.4 acres during construction.

In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new access roads would also be required in association with the proposed Panola Compressor Station and the Trunkline, Texas Gas, and ANR M/R Stations. Construction and operational access road requirements at these facilities would total approximately 0.8 mile and permanently affect about 3.7 acres, assuming a standard access road width of 40 feet. To minimize impacts, CEGT routed all new access roads through previously cleared or disturbed areas to the extent practicable.

CEGT indicates that only the newly constructed or upgraded access roads associated with the aboveground facilities described above would be maintained during operations. The remaining access roads would revert to their preconstruction uses. Table G-2 of Appendix G provides a listing of the access roads that would be used during construction. These roads are also depicted on the facility location maps provided as Appendix B of this EIS.

Pipe Storage and Contractor Yards

CEGT has proposed the temporary utilization of 10 pipe storage and contractor yards during construction, but also indicates that additional pipe storage and contractor yards could be required during construction. Each of the identified yards would consist of warehouses or open lots located in areas of existing commercial or industrial use, and land requirements for these facilities would total approximately 112.0 acres (Table 3.8.1-1). The general locations of these facilities are depicted in the facility location maps provided as Appendix B of this EIS, and Table G-3 of Appendix G provides a listing of the currently identified pipe storage and contractor yards. All yards would be leased from willing landowners, and upon completion of construction activities, the proposed pipe storage and contractor yards would be returned to their preconstruction condition and former usage. If additional pipe storage and contractor yards were required, CEGT has indicated that it would utilize previously disturbed and/or industrial lands for those facilities to the extent practicable. Prior to construction, CEGT would be required to file a complete and updated list of all temporary workspace areas, including pipe storage and contractor yards, with the FERC for review and approval prior to use.

3.8.1.2 General Impacts and Mitigation

The general impacts to land cover 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, and the nature of the land cover type affected. Section 2.3 provides a detailed discussion of the proposed construction methods and post-construction restoration actions for the proposed Project.

Following construction, areas outside the permanent pipeline right-of-way and other temporary extra work areas would be graded, seeded, or otherwise restored and allowed to revert to approximately 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 preconstruction conditions within two growing seasons, impacts to acreage currently classified as agricultural, commercial/industrial, or open land and located outside the permanent pipeline right-of-way would be short-term and minor. Trees cleared within the construction right-of-way and extra work areas would be allowed to revert to preconstruction conditions and in some cases replanted. However, 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 forest and pine plantation that are located outside the permanent right-of-way would be long-term. However, given the prevalence of these land uses and cover types within the affected counties and parishes, such impacts would not be significant. 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.

Permanent land cover changes would occur to those lands contained within the permanent pipeline right-of-way where reversion to the preconstruction cover type would not be compatible with operation of the proposed Project facilities. Land uses not allowed in the permanent pipeline right-of-way would include aboveground construction, below ground construction, and the growth, planting, or cultivation of trees. Forest and pine plantation land covers and uses would therefore 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 would also be associated with the proposed aboveground facilities and those access roads maintained during operations, as acreage required for these facilities would be converted to a commercial/industrial cover type for the life of the Project. Although these impacts would be permanent, lasting for at least the life of the Project, the overall impact would not be significant given the limited acreage involved.

3.8.1.3 Site-Specific Impacts and Mitigation

Agricultural, Timber, and Pastureland

Construction could effect the productivity of agricultural and pasture lands within the construction and permanent pipeline rights-of-way. To minimize potential Project-related crop losses, CEGT has proposed to accomplish pipeline construction outside of typical growing seasons. As applicable, CEGT would also work with landowners prior to construction to establish compensation agreements for crop damages and for loss of growing time. In accordance with our Plan, CEGT would also implement special construction procedures in agricultural areas to minimize potential impacts and restore the right-of-way to approximately preconstruction conditions (see Sections 2.3 and 3.2). Crop yields would also be monitored following construction to ensure that yields in areas affected by construction were similar to that in adjacent, undisturbed areas, as described in Section 3.2.

During the pre-filing and scoping periods, we received a comment expressing concern for potential Project-related effects on pastureland and livestock grazing during construction. As described above, CEGT would implement special construction and monitoring procedures through agricultural lands, including pastureland, to minimize adverse effects and ensure proper restoration. However, pastureland disturbed by construction could take multiple years to return to preconstruction levels of production. In addition, construction through pastureland could have a temporary effect on 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, CEGT would either construct temporary fencing to keep livestock away from construction areas or make arrangements for the use of alternative pastureland during construction and restoration activities in accordance with our Plan.

As discussed in Section 3.8.1.2, impacts to forestland and land used as pine plantation 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. As described in Section 3.9, CEGT would negotiate with affected landowners to obtain an easement agreement that eliminates timber production within the permanent pipeline right-of-way. Compensation for any losses or limitations on future timber production values within the construction and permanent pipeline rights-of-way would be addressed during those easement negotiations.

Delhi Municipal Airport

The proposed pipeline route would be located approximately 700 feet north of the Delhi Municipal Airport runway (MP 171.5) in Richland Parish, Louisiana. The proposed pipeline would parallel an existing natural gas pipeline through this area. Though a request for federal funding was recently submitted to extend the runway, CEGT's consultations to date with the City of Delhi indicate that there are no current plans to do so. CEGT also consulted with the Federal Aviation Administration (FAA), and determined that the proposed Project would not be located in a runway safety area or runway object free area. Should the Delhi Municipal Airport runway be extended at some time in the future, CEGT would work with airport authorities and the FAA to ensure that the proposed Project would comply with any and all applicable safety regulations. CEGT indicates that an extension of the runway could require the lowering of the pipeline to increase the installed depth below the ground surface. Therefore, **we recommend that:**

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

Levee Crossings

The proposed Project would cross levees associated with the Red (MP 50.1) and Ouachita Rivers (MP 134.0) in Red River and Ouachita Parishes, Louisiana, respectively. These levees provide flood control and augment Louisiana's system of waterborne recreation and transportation. CEGT has proposed to accomplish a pipeline crossing of the levees on both sides of the Red River and the eastern side of the Ouachita River via HDD installation associated with those waterbodies (see Sections 2.3 and 3.3). No levee occurs on the western side of the Ouachita River.

To determine applicable levee crossing requirements, CEGT consulted with the Red River Levee District, the Tensas Basin Levee District, and the COE. CEGT reports that crossing requirements for both levees would include a condition to maintain a maximum river crossing depth of 150 feet past the centerline of the levee. The levee districts and the COE would review CEGT's proposal and detailed construction plans for the crossing of the Red and Ouachita River levees, and the Red River Levee District and COE, respectively, would issue permits authorizing the crossings of these levees. CEGT indicates that the details of its proposed levee crossing plans are under review by the COE, but no crossing permits or authorizations have yet been issued. Therefore, **we recommend that:**

- **Prior to construction, CEGT should file the applicable levee crossing permits and authorizations issued by the Red River Levee District and COE with the Secretary.**

3.8.2 Land Ownership and Easement Requirements

During the pre-filing and scoping periods, we received several comments regarding the easement acquisition process for the proposed Project. Prior to initiating construction, CEGT 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, CEGT 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, CEGT and affected landowners would address the following:

- allowable uses within the right-of-way;
- mechanisms required to allow the pipeline to be traversed by heavy equipment such as log skidders; and
- minor route adjustments to accommodate landowner needs (provided 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 project has been certificated by the FERC, CEGT 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 workspace areas. The company would still be required to compensate the landowner for the right-of-way and for any damages incurred during construction. However, 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 Existing Residences and Planned Developments

The proposed pipeline would traverse primarily rural, unincorporated areas. During the planning stages for the proposed Project, CEGT consulted with county and parish planning agencies to identify currently filed proposals for residential or commercial developments within 0.25 miles of the proposed construction right-of-way or associated aboveground facilities. No such developments were identified. Only one structure, a shed located at MP 111.1, would be located within 50 feet of any proposed construction work area. CEGT adopted a minor route variation to avoid the two barns located at MP 143.2 that would have been located within 50 feet of the proposed construction right-of-way (see Section 4.4). Though no residences would be located within 50 feet of a construction work area, approximately 0.6 acre of land classified as residential would be contained within the construction right-of-way or extra workspace areas. Additionally, a total of four residences would be located in close proximity to the construction right-of-way or extra workspace areas in Bienville Parish (MP 65.4 and MP 69.4) and Jackson Parish (MP 96.3), Louisiana.

3.8.3.1 General Impacts and Mitigation

The general impacts of construction and operation of the proposed Project on residences could include construction-related disturbances, limitation of land use with the permanent pipeline right-of-way, and alteration of future development patterns. Potential construction-related disturbances include inconvenience caused by increased congestion and the noise and dust generated by construction; locally increased traffic; effects on landscaping (including alteration and loss of plantings), wells, and septic systems; and removal of objects such as sheds and trailers from the construction right-of-way. Uses and

structures that would be precluded from the permanent pipeline right-of-way include the construction of aboveground structures, construction of septic system leach fields, and the planting or cultivation of trees or orchards.

To minimize disruptions to residential areas near construction work areas, CEGT 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, CEGT 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;
- attempt to leave mature trees and landscaping within the temporary right-of-way (especially near the outer edge), as safety and construction requirements allow;
- repair any damages to residential property that result from construction activities or provide compensation at fair market value; and
- restore all areas disturbed by construction work areas to “as before or better” conditions.

In general, CEGT 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, the 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 FERC 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, CEGT would be required to develop and implement an environmental complaint resolution procedure that provides landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way (see Section 5.2).

We received several comments during the pre-filing and scoping periods indicating that the proposed Project route could interfere with plans for construction of homes or other structures. In Section 4.4, we evaluate several minor route variations that were identified in response to specific landowner requests. During the easement negotiation process, minor reroutes to the proposed Project 's pipeline alignment could also be made in accordance with landowner needs and requirements if they do not impact significant environmental resources or other landowners. CEGT would not be required to make such changes, but could do so if a request is reasonable.

Prior to construction, CEGT 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, CEGT 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 Transportation

Construction of the proposed Project could have two distinct effects on transportation. First, transportation could be affected if the volume of construction-related vehicles resulted in delays or other inconveniences. Second, transportation could be affected if construction resulted in road closures or lane blockages.

The proposed Project area is predominately comprised of low-density, rural areas. As such, existing transportation infrastructure in the area traversed by the proposed Project route includes mostly rural roads and highways. CEGT has consulted with the counties and parishes crossed by the proposed Project and determined that roadways in the area have the capacity to support normal traffic volumes and construction-related traffic. In addition, CEGT reports that the majority of construction-related traffic would occur in the early morning and late evening, outside the normal times of expected peak traffic. As such, congestion related delays would not be anticipated in association with construction of the proposed Project.

The proposed pipeline route would cross approximately 31 major state and interstate highways (Table 3.8.4-1), including Interstate 49, as well as numerous railroads and lightly traveled paved and unimproved rural dirt 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. Three minor road crossings, Yearwood Road (MP 45.4), McClanahan Road (MP 145.5), and River Road (MP 133.9), would be accomplished via HDDs associated with the crossing of adjacent waterbody features, which would also avoid closure of those roadways. Pipeline crossings of lightly traveled paved and unimproved rural dirt roads would typically 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 roadway features would be accomplished in accordance with our Plan and the requirements of all applicable crossing permits and approvals. Therefore, any effects to local transportation patterns or infrastructure would be temporary and minor. As periodic maintenance and inspection activities along the proposed pipeline route would involve only infrequent light vehicle movement, no impacts to transportation would be expected during operation of the proposed Project.

3.8.5 Recreation and Special Interest Areas

Recreation and special interest areas are defined to include lands 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 conversions and recreational impacts at the recreation and special interest areas that would be traversed by the proposed Project route.

Nationwide Rivers Inventory

The Sabine River is listed on the Nationwide Rivers Inventory (NRI), which is managed by the NPS. 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 2006b). The NRI-listed reach of the Sabine River is approximately 50 miles in length, extending from the headwaters of Toledo Bend Reservoir to the town of Easton, Texas, near Lake Cherokee. Placed on the NRI in 1982, the

TABLE 3.8.4-1
Major Road Crossings for the Proposed Carthage to Perryville Project[a]

Facility/Road Name	Parish/County	Milepost
State Highway 169	Caddo, LA	18.3
State Highway 789	DeSoto, LA	23.2
U.S. Highway 171	DeSoto, LA	RMP 27.1
Interstate 49	DeSoto, LA	34.4
State Highway 175	DeSoto, LA	35.6
State Highway 1	Red River, LA	49.4
State Highway 515	Red River, LA	51.7
U.S. Highway 71	Red River, LA	54.0
State Highway 783	Bienville, LA	59.3
State Highway 783	Bienville, LA	60.7
U.S. Highway 371	Bienville, LA	62.1
State Highway 4	Bienville, LA	65.3
State Highway 792	Bienville, LA	68.0
State Highway 507	Bienville, LA	69.5
State Highway 9	Bienville, LA	80.0
State Highway 155	Bienville, LA	86.3
State Highway 147	Jackson, LA	RMP 94.0
U.S. Highway 167	Jackson, LA	RMP 96.4
State Highway 542	Jackson, LA	99.6
State Highway 811	Jackson, LA	101.4
State Highway 146	Jackson, LA	111.1
State Highway 34	Jackson, LA	113.2
State Highway 548	Jackson, LA	113.9
State Highway 557	Ouachita, LA	124.6
U.S. Highway 165	Ouachita, LA	134.6
State Highway 133	Richland, LA	143.8
State Highway 135	Richland, LA	148.1
State Highway 15	Richland, LA	151.8
State Highway 137	Richland, LA	153.3
State Highway 609	Richland, LA	RMP 165.7
State Highway 17	Richland, LA	171.9

Notes:
[a] All major roads would be crossed using subsurface boring techniques.

Sabine River has been recognized for scenery, wildlife, and historical outstandingly remarkable values. Recreational features include a variety of habitats with minimal development or human imprints, the presence of listed species, archaeological and historical sites, and outstanding scenic qualities (Sabine River Authority 2006, NPS 2006b). The proposed Project would cross the Sabine River at about MP 4.3 in Panola County, Texas. The Sabine River in this segment has diverse riparian habitats and species, minimum human development, and outstanding scenic qualities (NPS 2006b). The proposed pipeline would also cross a significant Water Oak-Willow Oak Series designated by TPWD at the Sabine River (see Section 3.4).

To minimize impacts to the Sabine River and associated riparian, forested wetland, the proposed pipeline route was partially collocated with an existing natural gas pipeline right-of-way in that area. Further collocation opportunities were constrained by the presence of a cultural resources site in this general area (see Section 3.9). Additionally, CEGT would use HDD installation techniques, in accordance with our Procedures, to further avoid and minimize impacts to the waterbody. However, as proposed extra workspace areas associated with the Sabine River HDD would result in some impacts to riparian, forested areas along the Sabine River.

As recommended in the Draft EIS, CEGT consulted with the NPS regarding the proposed crossing of the Sabine River and its plans for withdrawal of hydrostatic test water there. NPS (2006e) recommended that CEGT mitigate the visual impacts of pipeline construction through appropriate erosion control and vegetative restoration within the riparian corridor. As described above, CEGT would use HDD installation to avoid and minimize impacts to the Sabine River and associated riparian vegetation, thereby minimizing any visual impacts. Vegetative restoration practices would be accomplished in accordance with our Plan and Procedures, as described in Sections 3.4.2 and 3.5.2.

Given the avoidance and minimization measures that would be implemented by CEGT, we do not anticipate that construction of the proposed Project would result in a significant impact to the NRI-listed Sabine River.

Louisiana Natural and Scenic Rivers

Two streams that would be crossed by the proposed Project route, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8), have been designated as Louisiana Natural and Scenic Rivers, pursuant to the Louisiana Scenic Rivers Act. These streams are recognized as having unique and diverse characteristics, and are protected through management by LDWF (LDWF 2006a). Black Lake Bayou offers hiking, boating, fishing, and wildlife viewing opportunities (Recreation.gov 2006). Typical site activities along the Saline Bayou include canoeing, floating, and fishing (NPS 2006d).

To minimize impacts to Black Lake Bayou and Saline Bayou, the proposed pipeline route was collocated with existing natural gas pipeline and electric transmission line rights-of-way, respectively, at the proposed crossings of these waterbodies. Additionally, CEGT would use HDD installation techniques, in accordance with our Procedures, to further avoid and minimize direct impacts at each of these crossings. The proposed crossing of Black Lake Bayou and Saline Bayou, as well as the proposed withdrawal of hydrostatic test water from each of these sources, would also require approval from LDWF. CEGT submitted a permit application to LDWF for both of the proposed waterbody crossings, and LDWF subsequently issued Scenic River Permits on May 26, 2006, authorizing the proposed construction activities at Black Lake Bayou and Saline Bayou. The proposed crossing of, and hydrostatic test water withdrawal from, these waterbodies would be accomplished in accordance with the terms and conditions of the Scenic River Permits.

Given the avoidance and minimization measures that would be implemented by CEGT, we do not anticipate that construction of the proposed Project would result in a significant impact to any designated Louisiana Natural and Scenic River.

Wildlife Management Areas

The Ouachita WMA is located in Ouachita Parish, Louisiana, and consists of 9,641-acre site managed by the LDWF for hunting of deer, doves, and ducks, among other species. The WMA contains a series of waterfowl management impoundments totaling approximately 1,700 acres, as well as three reservoirs managed for recreational fishing. The impoundments are heavily utilized by waterfowl and non-game birds, and an observation tower provides for public viewing of waterfowl. A primitive camping area is also located at the Ouachita WMA, which has been the focus of extensive efforts to re-establish hardwood forests.

The proposed pipeline route would cross a forested portion of the Ouachita WMA for a distance of approximately 900 feet, just west of Bayou Lafourche (MP 138.7). However, surface impacts to the Ouachita WMA would be avoided as CEGT would implement an HDD to accomplish a crossing of the WMA and the adjacent Bayou Lafourche. Hunting activity near the construction work areas would be restricted temporarily during construction, but normal recreational use could resume once construction was complete. No impacts would be anticipated during operation of the proposed Project.

The proposed Project would also parallel the northern boundary of the Bayou Pierre WMA for approximately 1-mile (approximate MP 43.0 to 44.0) in Red River Parish, Louisiana. This 2,212 acre WMA, also owned by the LDWF, is bisected by Bayou Pierre and provides waterfowl and upland hunting opportunities. Bird watching is also a popular recreational pursuit at Bayou Pierre WMA, but no camping facilities are available there. No lands within the Bayou Pierre WMA would be contained within the proposed construction right-of-way, but CEGT has indicated that some existing access roads within the WMA would be used during construction. Any construction-related impacts at the Bayou Pierre WMA, such as noise and disturbance associated with utilization of existing roads, would therefore be minor and temporary, and no impacts would be anticipated during operation of the proposed Project.

We do not anticipate that construction and operation of the proposed Project would result in significant impacts to either the Ouachita or Bayou Pierre WMAs. However, use of WMA lands and access roads would require prior approval by LDWF. In Section 3.5 we have included a recommendation that CEGT continue consultations with LDWF and obtain all required approvals to authorize Project-related use and impacts to lands held in the Louisiana WMA program. As a result of those consultations, LDWF may recommend measures to further avoid and minimize impacts to WMA lands.

FWS Conservation Easement

The FWS works with private landowners that voluntarily restore wetlands or other valuable wildlife habitats on their property by providing financial assistance from the federal government (FWS 2006a). One such area, the W.W. Farms Conservation Easement, is located along the proposed pipeline route near RMP 146.3, just east of the Boeuf River in Richland Parish, Louisiana. Following restoration, which often includes the planting of bottomland hardwoods, as is the case at RMP 146.3, these lands are placed in a protective easement for 10 to 25 years. The acreage in question, a narrow strip of mechanically planted trees surrounding a drainage ditch, is currently under the control of the North Louisiana National Wildlife Refuge Complex, though it is not part of that complex.

We received a comment during the scoping period requesting that the proposed Project route be modified to avoid impacts to the conservation easement. In it's comments on the NOI, the FWS also

indicated that CEGT should consult with the FWS North Louisiana National Wildlife Refuge Complex to obtain a Compatible-Use Determination and ascertain the need for any Special Use Permit in association with the proposed crossing of the conservation easement. As a result of these comments, we considered a route variation (i.e., the Sartor Variation) in Section 4.4 of the Draft EIS to minimize effects to the conservation easement. Additionally, we included a recommendation in the Draft EIS for CEGT to consult with the FWS North Louisiana National Wildlife Refuge Complex concerning plans and approvals for the proposed crossing of the easement.

In accordance with our recommendations, CEGT completed additional consultations with the FWS North Louisiana National Wildlife Refuge Complex. As a result of those consultations, CEGT adopted the Sartor Variation and also now proposes to accomplish the crossing of the conservation easement via HDD to avoid surface impacts, and associated vegetative clearing and disturbance, at the easement. Following review of CEGT's construction plans, the FWS North Louisiana National Wildlife Refuge Complex issued a letter approving the crossing of the W.W. Conservation Easement (FWS 2006c). The proposed crossing of the FWS-administered W.W. Farms Conservation Easement, as well as future maintenance activities, would be accomplished in accordance with the terms and conditions of that approval.

Conservation Reserve and Wetland Reserve Program Lands

The CRP and WRP are voluntary programs administered by the NRCS. The CRP allows owners of agricultural land to conserve those lands through planting of grasses, trees, and other cover, with financial assistance from the federal government (USDA 2006). Typically, these areas retire erodible soils or otherwise sensitive croplands from production for a period of 10 to 15 years. The WRP offers landowners the opportunity to protect, restore, and enhance wetlands located on their property (NRCS 2006c). The program attempts to improve wetland function and wildlife habitat and to promote long-term conservation through technical and financial assistance.

CEGT indicated that CRP and WRP lands could be crossed by the proposed pipeline route in Red River, Ouachita, and Richland Parishes, Louisiana. However, the exact location and extent of all these areas would not be determined until easement negotiations with potentially affected property owners are completed. CEGT has thus far identified only one WRP property, which occurs at RMP 154.3, but surface impacts to that property would be avoided by extension of the proposed HDD crossing of Bee Bayou (see Section 4.4). CEGT has consulted with the NRCS to determine the requirements for crossing of CRP and WRP lands. Upon disturbance caused by construction of the proposed Project, landowners would no longer be eligible to participate in the CRP or to receive the payments that they currently obtain from the NRCS. CEGT would be required to obtain Compatible-Use Permits from the NRCS authorizing the crossing of any lands enrolled in the WRP. Therefore, **we recommend that:**

- **CEGT should consult with the NRCS to identify the extent and location of all CRP and WRP lands that would be affected by construction and operation of the proposed Project and obtain any required Compatible-Use Permits or other approvals. CEGT should file documentation of all NRCS recommended measures to avoid and minimize impacts to CRP and WRP lands, with the Secretary prior to construction.**

During the pre-filing period, we received comments noting that landowners receive financial compensation for acreage enrolled in the CRP. Because lands included in the construction or permanent pipeline rights-of-way would no longer be eligible for inclusion in the CRP program, affected landowners would experience an associated financial loss. As part of the right-of-way procurement process, CEGT 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.

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 an area may have for residents or visitors. The proposed Project could alter existing visual resources in three ways: 1) construction activity and equipment may temporarily alter viewscapes; 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 be primarily dependent upon the quality of the current viewshed, the degree of alteration of that view, the number of potential viewers, and the perspective of the viewer.

3.8.6.1 Current Viewshed

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

3.8.6.2 General Impacts and Mitigation

Pipeline Facilities

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

After completion of construction, the temporary right-of-way would be restored to approximately preconstruction contours and allowed to revert to preconstruction uses and cover type. About 35 percent of the proposed pipeline route would traverse agricultural and open lands. Pipeline installation in these areas would not result in a significant change to visual resources as existing vegetative patterns would not be affected during operation of the proposed Project. However, recovery in affected forested areas outside the permanent pipeline right-of-way could take many years to recover, and forested land within the permanent right-of-way would be maintained in a condition free of woody vegetation for the life of the Project. To reduce visual impacts related to the permanent pipeline corridor, CEGT's proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation. The proposed pipeline route would parallel existing rights-of-way for approximately 40 miles, or about 23 percent of the proposed route. In these areas, the visual impacts of the proposed Project would be minor since 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 collocate with existing rights-of-way would generally be limited to a relatively small number of individuals and/or brief observations afforded in areas where the corridor intersects roadways. As a result, the visual impact of the permanent pipeline corridor would be minor.

CEGT has avoided crossing state and federally managed lands to the extent possible and has also avoided most scenic vistas. However, the proposed Project route would cross the NRI-listed Sabine River (MP 4.3) and two Louisiana State Natural and Scenic Rivers (MP 66.1 and 80.8), all three of which have been noted for their visual character, as well as the Ouachita WMA (MP 138.5). As described in Section 3.8.5, the entire length of the Ouachita WMA crossing would be installed via HDD, which would avoid creation of a permanent pipeline corridor through existing, forested areas, as well as any associated visual impact. Similarly the crossing of the Sabine River and both Louisiana State Natural and Scenic Rivers would be accomplished via HDD, and all of the crossings would be located in proximity to an existing, open utility right-of-way crossing. Therefore, construction and operation of the proposed Project would not result in creation or expansion of an existing corridor, and long-term visual impacts to these features should therefore be minimal.

Aboveground Facilities

The proposed Project would include construction and operation of two compressor stations, six meter/regulator stations, 11 mainline valves, and four pig launcher/receiver facilities. Most of the aboveground facilities would either be constructed in areas whose 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, as a group the aboveground facilities 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

Initially, each of the proposed compressor station sites would contain two main buildings, one insulated building housing a compressor unit and associated equipment and another building that would serve as an office. Under Phase II, a second compressor unit would be constructed within another insulated building at each site (see Section 2.4). Aboveground features outside the buildings themselves would include piping and pig launcher/receiver facilities. Portions of these sites may be paved, covered with gravel, or landscaped, depending on facility operations and maintenance requirements. A chain-link fence would surround the perimeter of each compressor station site.

The Panola Compressor Station would be located at MP 8.4 in Panola County, Texas. The proposed site is 6.9 acres, including 4.7 acres of forestland and 2.2 acres of pasture. Existing hardwood and pine forests would border all but the southeastern corner of the compressor station site, which would be bordered by pasture. The closest residence to the proposed Panola Compressor Station site is located approximately 0.6 miles west of the southeastern corner of the site, but it is unlikely that residents would have a view of the proposed compressor station site due to existing topography and vegetation. Additionally, the quality of the current viewshed in the vicinity of the site is already compromised by two natural gas well sites, which would be located just south of the proposed compressor station site.

The Vernon Compressor Station would be located at MP 101.3 in Jackson Parish, Louisiana. The proposed site consists of 6.1 acres of wooded land (pine plantation) bordered to the north by an existing electric transmission line right-of-way and to the northeast by Louisiana State Highway 811. There are no structures or private residences with a direct view to the site, and the only individuals with a potential view of the proposed site would be southbound drivers on Highway 811. CEGT also indicates that tree clearing at the site would be kept to the minimum required. Overall, the change in visual quality in the vicinity of the compressor stations would affect few viewers and would result in a minor, long-term impact.

Mainline Valve Sites

Two of the eleven proposed mainline valves, MLV #1 and MLV #8, would be located within the Panola and Vernon Compressor Stations, respectively, and would not result in additional visual impacts beyond that noted for those facilities. The remaining mainline valve sites would consist of a 40-foot by 40-foot area surrounded by a chain-link fence within the confines of the permanent pipeline right-of-way. Aboveground elements of each mainline valve site would include 12-inch piping with valving extending above ground for blowoffs and bypass.

It is likely that seven of the proposed mainline valves (MLV #2, MLV #4, MLV #5, MLV #6, MLV #9, MLV #10, and MLV #11) would be visible to drivers on nearby roads. Additionally, MLV #4 (MP 51.7), MLV #10 (MP 134.6), and MLV #11 (MP 153.3) would potentially be visible from nearby residences. The other mainline valves would either be installed adjacent to other aboveground facilities or would not be generally visible to nearby residents or the public due to existing vegetation or other visual screens. Each of the visible mainline valves would appear as a small fenced area within a cleared right-of-way corridor unless it is in an open field. This would result in a long-term effect on visual quality, but the significance of the impact would vary with the viewer. Our intent is to screen these facilities from nearby residents, particularly those that may not own the land the aboveground facility is placed on. Since residences may be located within sight of some of the mainline valve facilities, **we recommend that:**

- **CEGT should develop a site screening plan for MLV #4 (MP 51.7), MLV #10 (MP 134.6), and MLV #11 (MP 153.3) and file the plan with the Secretary for review and written approval by the Director of OEP prior to construction.**

Meter/Regulator Stations

Meter/regulator 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 meter/regulator station would include skid-mounted meter and regulator equipment, a filter separator, and control building housed within a fenced perimeter. The HPL (MP 0.0) and Columbia Gulf (MP 171.9) M/R Stations would also include a pig launcher and receiver, respectively. Sizes of the proposed meter/regulation stations would vary from 2.1 acres to 6.8 acres.

Both the DEFS-Enbridge (RMP 1.4) and Columbia Gulf M/R Stations would be constructed adjacent to existing, unscreened pipeline aboveground facilities. Although both sites would be observable from nearby roadways, the visual impact would be long-term but consistent with the current visual setting. The HPL (MP 0.0) and Trunkline (MP 149.5) M/R Stations would be constructed wholly or partially within, and largely screened by, forested land. Though residences are located within 0.5 mile of the proposed Trunkline M/R Station site, views of the site would be mostly or entirely blocked by forested land, and the viewsheds already include an existing, maintained pipeline right-of-way.

Review of the aerial alignment sheets indicates that the Texas Gas (MP 135.5) and ANR (MP 164.4) M/R Stations would be located within approximately 0.5 mile of existing residences across open agricultural fields or pasture. Both of the proposed sites are forested, and CEGT stated that they would reduce visual impacts to residences near the Texas Gas M/R Station by leaving a buffer strip of trees between the facility and the residences. However, it is unclear whether CEGT would retain a buffer strip of existing vegetation to screen the ANR M/R Station from nearby residences. If the trees along the periphery of the ANR M/R Station are removed during construction, **we recommend that:**

- **CEGT should develop a site-screening plan for the ANR M/R Station (MP 164.4) and file that plan with the Secretary for review and written approval by the Director of OEP prior to construction.**

3.8.7 Hazardous Waste Sites

CEGT reviewed both LDEQ and EPA websites to identify any known hazardous waste sites within 1 mile of the proposed Project right-of-way, but none were identified. Similarly, no sites were identified during environmental surveys of the proposed Project route. In the event that a hazardous waste site is discovered during the construction of the proposed Project, CEGT indicates that it would stop work, notify the appropriate state and federal agencies, and proceed in accordance with local, state, and federal regulations. However, mismanagement of hazardous wastes or contaminated materials could adversely affect soil and other resources, and CEGT has not yet identified the specific procedures that it would implement if such materials were encountered during construction. In Section 3.2, we included a recommendation for CEGT to develop a hazardous and contaminated materials management plan that identifies the procedures that would be implemented during construction to identify, test, treat, and dispose of such materials in accordance with the appropriate state and federal regulations.

3.9 SOCIOECONOMICS

3.9.1 Region of Influence

The proposed Carthage to Perryville Project would consist of an approximately 172.1-mile-long, 42-inch-diameter, interstate natural gas pipeline, two new compressor stations, and associated ancillary facilities, as described in Section 2.1. The proposed pipeline would traverse one county in Texas (Panola) and seven parishes in Louisiana (Caddo, DeSoto, Red River, Bienville, Jackson, Ouachita, and Richland). For the purposes of our socioeconomic analysis, we define these counties and parishes as the region of influence for the proposed Project. Though pipe storage and contractor yards have also been identified in Webster and Caldwell Parishes, Louisiana (see Section 3.8.1), these parishes were not defined as part of the region of influence. Quantifiable socioeconomic impacts would not be expected to result from the temporary stockpile and storage of construction-related materials in those areas.

Several potential socioeconomic effects would manifest themselves within the region of influence. Temporary effects during construction of the proposed Project would include alteration of population levels or local demographics, increased demand for housing and 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 long-term 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.

Consistent with the CEQ request that federal agencies actively scrutinize several parameters associated with environmental justice (CEQ 1997a) this section of the EIS also contains an analysis of environmental justice.

3.9.2 Population

Table 3.9.2-1 reports populations and selected demographic characteristics in the states, counties, and parishes that would be traversed by the proposed Project. Based on census data for the year 2000

TABLE 3.9.2-1
Existing Population and Demographics Conditions in the Region of Influence for the Proposed Carthage to Perryville Project[a]

County/Parish	2004 Population	Population Change since 1990 (%)	Population Density	White, non Hispanic (%)	Black or African American (%)	Hispanic (%)	Asian (%)	Native American (%)
Texas	**20,490,022**	**22.8**	**79.6**	**52.4**	**11.5**	**32.0**	**2.7**	**0.6**
Panola County	22,756	3.3	28.4	77.5	17.7	3.5	0.2	0.4
Louisiana	**4,515,770**	**5.9**	**102.6**	**62.5**	**32.5**	**2.4**	**1.2**	**0.6**
Caddo Parish	252,191	1.6	285.9	52.2	44.6	1.5	0.7	0.4
DeSoto Parish	25,494	-0.7	29.1	55.3	42.2	1.6	0.1	0.5
Red River Parish	9,622	1.0	24.7	57.6	40.9	1.0	0.1	0.3
Bienville Parish	15,752	-3.0	19.4	54.6	43.8	0.9	0.2	0.3
Jackson Parish	15,397	-2.9	27.0	70.7	27.9	0.6	0.2	0.3
Ouchita Parish	147,250	3.6	241.2	63.8	33.6	1.2	0.6	0.2
Richland Parish	20,981	1.7	37.6	60.4	38.0	1.1	0.2	0.1

Notes:
[a] Source 2000 Census: State & County QuickFacts (U.S. Census Bureau 2005a).

(U.S. Census Bureau 2005a), the total population in these counties and parishes is 509,443. Populations in the area were relatively stable between 1990 and 2000 with no county or parish having more than a 4 percent change in population over the ten-year period.

Population densities in the region of influence range from a low of 19.4 persons per square mile in Bienville Parish to a high of 285.9 persons per square mile in Caddo Parish. These densities are relatively low compared to urban area densities that typically range from 3,000 to 6,000 persons per square mile (FERC 2003), but are consistent with an area that is predominately rural and agricultural.

The proportion of residents that belong to minority groups within the region of influence is similar to the proportions reported in the states of Texas and Louisiana as a whole. However, the region of influence contains a greater percentage of persons describing themselves as black or African-American and a lower percentage of Hispanic and Asian persons relative to the state-level statistics.

The number of residents within the region of influence would increase temporarily during construction, which would occur between October 2006 and February 2007, as proposed. The peak construction workforce would be 2,000 workers, of which about 70 percent (1,400) would be non-local. Assuming 0.8 family members (FERC 2003) would accompany each non-local worker, total construction-related immigration would be approximately 2,520 persons (Table 3.9.2-2). CEGT indicates that construction of the pipeline would entail the simultaneous activity of five 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.

TABLE 3.9.2-2 Estimated Population Change in the Region of Influence for the Proposed Carthage to Perryville Project								
County/ Parish	Pipeline Workforce	Compressor Stations Workforce	Other Facilities Workforce	Total Workforce	Non-Local Workforce	Family Members	Population Change (Number)	Population Change
Texas								
Panola	135	100	100	335	234	188	422	1.9%
Louisiana								
Caddo	185	0	0	185	129	103	232	0.1%
DeSoto	56	0	0	56	39	31	70	0.3%
Red River	134	0	0	134	94	75	169	1.7%
Bienville	298	0	0	298	209	167	376	2.4%
Jackson	248	100	0	348	244	195	439	2.9%
Ouachita	157	0	50	207	145	116	261	0.2%
Richland	287	0	150	437	306	245	551	2.6%
Total	**1,500**	**200**	**300**	**2,000**	**1,400**	**1,120**	**2,520**	**0.5%**

As depicted in Table 3.9.2-2, construction-related immigration would increase the population in the region of influence by about 0.5 percent. This would represent only a minor, temporary population increase confined to the period of 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 are not anticipated to result from construction of the proposed Project. During operation, CEGT estimates that the proposed Project would employ approximately five 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 230,000 individuals whose major employment sector is education, health and social services. On average, the county and parishes within the region of influence report that unemployment is slightly higher and per capita income is slightly lower than the state-level values reported for Texas and Louisiana (Table 3.9.3-1).

Construction of the proposed Project would result in the hiring of approximately 600 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 on 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 five full-time positions. This would represent a minor, permanent increase in the number of employment opportunities within the region of influence.

TABLE 3.9.3-1
Existing Income and Employment Conditions within the Region of Influence for the Proposed Carthage to Perryville Project[a]

County/Parish	Per Capita Income ($)	1999 Population Below Poverty Level (%)	Civilian Labor Force	Unemployment Rate (%)[b]	Major Industry
Texas	**$19,617**	**15.4**	**9,830,559**	**5.3**	**Educational, health, and social services**
Panola County	$15,439	14.1	9,692	5.8	Educational, health and social services
Louisiana	**$16,912**	**19.6**	**1,997,995**	**7.1**	**Educational, health, and social services**
Caddo Parish	$17,839	21.1	115,370	6.2	Educational, health and social services
DeSoto Parish	$13,606	25.1	10,563	7.4	Educational, health and social services
Red River Parish	$12,119	29.9	3,563	9.8	Educational, health and social services
Bienville Parish	$12,471	26.1	5,939	8.4	Educational, health and social services
Jackson Parish	$15,354	19.8	6,504	6.5	Manufacturing
Ouchita Parish	$17,084	20.7	69,818	5.6	Educational, health and social services
Richland Parish	$12,479	27.9	8,258	8.2	Educational, health and social services

Notes:

[a] Source 2000 Census: State & County QuickFacts (U.S. Census Bureau 2005a)

[b] 2004 Local Area Unemployment Statistics (Bureau of Labor Statistics 2005). Annual average.

3.9.4 Housing

Table 3.9.4-1 reports selected housing statistics for the region of influence. Within this region, there are approximately 10,700 rental units and units used for seasonal, recreational, or occasional use. Approximately 4,500 hotel or motel rooms supplement this potential housing stock.

At its peak, construction of the proposed Project would require about 1,400 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 9.2 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 five, permanent positions generated by operation of the proposed Project would represent a permanent but minor increase in housing demand

TABLE 3.9.4-1
Temporary Housing Units Available within the Region of Influence for the Proposed Carthage to Perryville Project

County/Parish	Rental Units[a]	Rental Vacancy Rate (%)[a]	Units for Seasonal, Recreational, or Occasional Use[a]	Number of Hotel/Motel Rooms	Total Units
Texas	**249,240**	**13.0**	**151,919**	**N/A**	**401,159**
Panola County	227	11.8	414	125[b]	766
Louisiana	**54,185**	**12.5**	**30,333**	**N/A**	**84,518**
Caddo Parish	4,327	10.9	741	2,686[c]	7,754
DeSoto Parish	231	9.3	327	129[c]	687
Red River Parish	67	7.6	59	58[c]	184
Bienville Parish	128	8.7	693	90[c]	911
Jackson Parish	195	12.3	491	24[d]	710
Ouachita Parish	1,969	9.0	395	1,215[e,f]	3,579
Richland Parish	159	7.1	246	160[f]	565
Total	**7,303**		**3,366**	**4,487**	**15,156**

Notes:

[a] Census 2000: American FactFinder (U.S. Census Bureau 2005b).

[b] Texas Economic Development. Accessed on-line 2005 at (http://community.txed.state.tx.us/communities/commpages/45.htm).

[c] The Coordinating & Development Corporation. Accessed on-line 2005 at (http://www.cdconline.org/).

[d] Jonesboro Budget Inn, 2006, pers. comm.

[e] ePodunk. Accessed on-line 2005 at (http://www.epodunk.com/counties/la_county.html).

[f] Hotel-Rates.com. Accessed on-line 2005 at (http://www.hotel-rates.com/us/louisiana/monroe/comfort-suites-monroe.html)

3.9.5 Property Values

During the pre-filing period for the proposed Project, we received several comments regarding the proposed Project's impact on property values and related economic considerations. These concerns generally centered on three topics: devaluation of property if encumbered by a pipeline easement; the responsible party for property taxes within pipeline easement; the potential for Project-effects on landowner insurance premiums; and economic effects resulting from lost timber production values.

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 re-appraised, the landowner would then be responsible for property taxes based upon an appraisal that directly incorporated the easement.

Regarding the potential for insurance premium adjustments associated with pipeline proximity, insurance advisors consulted on other natural gas projects reviewed by the FERC have indicated that LNG terminals and associated pipeline infrastructure do not have an impact on homeowner insurance rates (FERC 2004). As such, the FERC believes that homeowners' insurance rates are unlikely to change as a result of construction and operation of the proposed Project facilities.

As described in Section 3.8, construction and operation of the proposed Project would result in a permanent conversion of some lands currently used for commercial forestry operations to a maintained utility right-of-way. Timber production would be precluded within the permanent pipeline right-of-way, and affected landowners would therefore suffer a loss of economic returns that might otherwise be achieved. As part of the right-of-way procurement process, CEGT would negotiate with the affected landowners to obtain an easement agreement that eliminates timber production within the permanent pipeline right-of-way. Compensation for any losses or limitations on future timber production values would be addressed during those easement negotiations.

3.9.6 Government Revenue

Table 3.9.6-1 reports the total government revenue of the counties and parishes that would be crossed by the proposed Project. A portion of the estimated $65 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. In addition, CEGT has indicated that local suppliers would have the opportunity to submit proposals for Project-related work. To the extent that these local providers bid successfully, local expenditures during construction would increase. The majority of construction-related expenditures would be subject to either Texas' state sales tax of 6.25 percent or Louisiana's state sales tax of 4 percent. This increase in sales tax would represent a minor, short-term increase in government revenues.

TABLE 3.9.6-1
County Revenue and Estimated Annual Taxes for the Proposed Carthage to Perryville Project

County/Parish	Total Revenue	Estimated Annual Taxes	Percent Change
Texas			
Panola County	$64,292,000	$519,716	0.8
Louisiana			
Caddo Parish	$603,142,000	$278,142	<0.1
DeSoto Parish	$61,044,000	$921,347	1.5
Red River Parish	$16,467,000	$577,918	3.5
Bienville Parish	$30,496,000	$1,064,322	3.5
Jackson Parish	$22,833,000	$1,168,720	5.1
Ouchita Parish	$296,142,000	$626,602	0.2
Richland Parish	$55,064,000	$830,352	1.5
Total	**$1,149,480,000**	**$5,708,977**	

Table 3.9.6-1 contains the CEGT's estimate of the annual taxes that would be payable to each county and parish traversed by the proposed Project. On average, operations-related taxes would represent less than 2 percent of the counties' total revenues. Thus, operation of the proposed Project would provide a permanent, minor increase in government revenues.

3.9.7 Public Services

Table 3.9.7-1 summarizes the number of full-time equivalent educational, medical, police, and fire protection employees in the counties and parishes traversed by the proposed Project. These employees serve a population of approximately 500,000 people (Table 3.9.1-1).

Construction of the proposed Project would temporarily increase demand for medical, police, and fire protection services. CEGT has consulted with the counties and parishes in the region of influence and believes that sufficient public services exist to meet Project-related needs. Further, CEGT 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 considerable strain on the region's approximately 14,000 education workers. However, due to the nature of the proposed construction and its relatively short duration (four to six months), non-local workers are not expected to be accompanied by substantive numbers of children. Thus, any impact would be minor and temporary.

During operation workers filling the five full time 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
Existing Educational, Medical, Police, and Fire Full-time Equivalents within the Region of Influence for the Proposed Carthage to Perryville Project[a]

County/Parish	Education	Health & Hospitals	Police Protection	Fire Protection	Total Full-time Equivalent
Texas	**539,530**	**62,160**	**52,718**	**18,680**	**133,558**
Panola County	780	140	44	3	187
Louisiana	**101,050**	**13,675**	**11,791**	**4,280**	**29,746**
Caddo Parish	7,078	84	859	523	1,466
DeSoto Parish	673	0	47	9	56
Red River Parish	338	0	43	0	43
Bienville Parish	430	0	38	0	38
Jackson Parish	421	178	41	5	224
Ouchita Parish	3,657	24	442	374	840
Richland Parish	600	403	21	4	428
Total	**13,977**	**829**	**1,535**	**918**	**3,282**

Notes:
[a] 1997 Census: 1997 Federal, State & Local Governments County Area Finance & Employment (U.S. Census Bureau 2005c).

3.9.8 Impacts on Specific Economic Sectors

During the pre-filing period we received a comment requesting that the potential adverse economic consequences of the proposed Project on agricultural operations be considered in our analysis. Below, we consider the potential for the proposed Project to result in significant effects to agriculture and forestry economic sectors. These sectors are defined to include activities associated with harvested crops, timber production, livestock pasturing, and/or dairy production. This analysis focuses on the effects of potential land use changes (i.e., the incorporation of agricultural lands into the construction or permanent rights-of-way) on regional economic sectors. Additional discussion of the potential for Project-related effects to the agricultural and commercial forestry lands (pine plantations) that would be crossed by the proposed pipeline route is provided in Sections 3.2 and 3.8.

Approximately 77 percent of Louisiana is comprised of forested land (47 percent), pastureland (9 percent), and cropland (21 percent), and approximately 89 percent of Texas is comprised of rangeland (57 percent), cropland (16 percent), pastureland (6 percent), and forested land (6 percent; NRCS 2006a). Cropland in the region of influence is primarily concentrated between the Ouachita and Mississippi Rivers (Ouachita and Richland Parishes) and along the Red River (Red River Parish). Rangeland is dispersed relatively evenly throughout the region of influence, with forested land generally abundant west of the Ouachita River.

As described in Section 3.8, construction and operation of the proposed Project would permanently affect approximately 306.3 acres of agricultural land and 463.5 acres of lands currently utilized for commercial forestry practices, as these areas would be contained within the permanent pipeline right-of-way. As discussed throughout this EIS, agricultural operations within the vast majority of permanent pipeline right-of-way would not be precluded during operations. As affected agricultural lands would largely return to their preconstruction condition and use, no significant effect to that economic sector would be anticipated in association with construction and operation of the proposed Project. Commercial forestry practices would be permanently precluded within the permanent pipeline right-of-way. However, given the magnitude of the land potentially affected relative to the total amount of land dedicated to sector production, no quantifiable impacts to the forestry economic sector would be expected.

3.9.9 Environmental Justice

Consistent with Executive Order 12898, the CEQ called upon federal agencies to actively scrutinize the following issues with respect to environmental justice (CEQ 1997a):

- the racial and economic composition of affected communities;
- health related issues that may amplify Project effects on minority or low-income individuals; and
- public participation strategies, including community or tribal participation in the process.

As discussed in Section 3.9.2, the proportion of residents that belong to minority groups within the region of influence is similar to the statewide proportions reported in Texas and Louisiana. However, the region of influence contains a higher percentage of Black or African-American persons and lower percentage of Hispanic and Asian persons relative to the statewide statistics. As discussed in Section 3.9.3, per capita income in the region of influence is lower than the states as a whole, while the proportion of persons below the poverty level and unemployment rates are higher.

The proposed Project would have negligible to minor effects on socioeconomic characteristics and economies of the region, and many of the Project-related effects would be positive. As discussed throughout this EIS, environmental effects associated with the proposed Project would be minimized and/or mitigated, as applicable. Further, the proposed Project would be located in rural areas of low population density. There is therefore no evidence that the proposed Project would have a disproportionate share of adverse environmental or socioeconomic impacts on any racial, ethnic, or socioeconomic group.

The primary health issue related to the proposed Project would be the risk associated with a pipeline failure. Section 3.12 discusses the risks and associated impacts to public safety that would result from a pipeline failure and describes how applicable safety regulations and standards would minimize the potential for these risks. The route of the proposed Project through rural, sparsely populated areas minimizes the number of persons who would be at risk of injury due to a pipeline failure, and there is no evidence that such risks would be disproportionately borne by any racial, ethnic, or socioeconomic groups.

The public review and comment process that the FERC implemented in association with the environmental review of the proposed Project is discussed in Section 1.4. In addition to the public review and comment process implemented by the FERC, CEGT has communicated directly with the property owners that would be affected by the proposed Project, irrespective of minority or income status, regarding the proposed route and the results of archaeological and environmental surveys of their property. Future landowner contacts may include open houses, communications via local newspapers, mailings to all property owners, and continued discussions with those parties whose interests would be affected by the proposed Project, again without regard to minority or income status. Therefore, all groups have been provided appropriate opportunities to participate in the EIS process.

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. CEGT, as a non-federal party, is assisting the FERC in meeting its obligation under Section 106 of the NHPA by conducting the field surveys and evaluations required by ACHP regulations in 36 CFR 800.

3.10.1 Results of Cultural Resources Survey

3.10.1.1 Texas

CEGT conducted an initial cultural resource survey between September 2005 and January 2006 for the proposed pipeline, compressor station sites, associated aboveground ancillary facilities, and extra work areas within the Texas portion of the proposed Project route. Additionally, CEGT conducted supplemental cultural resources surveys during April and July 2006 along proposed Project reroutes and at extra work areas that were not previously surveyed. The surveys were conducted within a 295-foot-wide survey corridor centered on the proposed pipeline route. The initial approximately 14.9 miles of the total 172.1-mile proposed Project route is within Texas. Of that distance, approximately 1.0 mile of the proposed Project corridor has not been surveyed because access permission was denied by the landowner.

The initial survey within the Texas portion of the proposed Project identified eight prehistoric sites. Six of those sites are considered potentially eligible for listing in the NRHP. However, each of the potentially eligible sites would be completely avoided by a realignment of the proposed pipeline route. The remaining two sites are not considered eligible for listing in the NRHP, and no further work was

recommended. No archaeological sites were identified during the supplemental surveys, and no previously recorded sites are located along the Texas portion of the proposed Project.

CEGT did not identify any historic structures meeting the criteria for NRHP eligibility within the area of potential effect (APE) for the proposed Project in Texas, which includes the viewsheds from access roads and aboveground facilities.

CEGT submitted the initial cultural resources survey report to the Texas Historical Commission, which functions as the State Historic Preservation Office (SHPO) in Texas, on March 7, 2006, and requested concurrence with these findings. CEGT subsequently submitted a revised version of the initial cultural resources survey report, which reflected our comments, to the Texas SHPO on April 27, 2006. Addendum cultural resources survey reports for the supplemental surveys were submitted to the Texas SHPO on May 16 and July 25, 2006. In a correspondence dated May 22, 2006, the Texas SHPO concurred with the findings of the March 7 and May 16, 2006, submittals. We also concur. A response from the Texas SHPO regarding the findings of the supplemental cultural resources report dated July 25, 2006, is pending.

3.10.1.2 Louisiana

CEGT conducted an initial cultural resource survey and testing between September 2005 and January 2006, for the proposed pipeline, compressor station sites, associated aboveground ancillary facilities, and extra work areas within the Louisiana portion of the proposed Project route. Additionally, CEGT conducted supplemental cultural resources surveys during April and July 2006 along proposed Project reroutes and extra work areas that were not previously surveyed. The surveys were conducted within a 295-foot-wide survey corridor centered on the proposed pipeline route. The testing consisted of test excavations at two sites discovered during the survey that were considered to be potentially eligible for listing in the NRHP. Approximately 157.2 miles of the total 172.1-mile proposed pipeline corridor is within Louisiana. Of that distance, approximately 0.9 mile of the proposed Project corridor has not been surveyed because access permission was denied by the landowner.

The initial survey within the Louisiana portion of the proposed Project identified nine prehistoric sites. Two of those sites were considered potentially eligible for listing in the NRHP. Test excavations were conducted at those sites, and both sites were found to be ineligible for the NRHP. All nine sites are considered ineligible for listing in the NRHP and no further work is recommended. Eight previously recorded sites also occur within the Louisiana portion of the proposed Project. Of those sites, six would not be relocated during the surveys associated with the proposed Project, and CEGT recommended that none of these sites would be adversely affected by the proposed Project. Of the two previously recorded sites that were relocated, CEGT did not identify any intact deposits within the surveyed corridor. At site 16OU177 CEGT recommended no further work provided construction was confined to a 150-foot-wide corridor. A single, isolated find was recovered during the supplemental surveys, but CEGT recommended that an official site number was not warranted.

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

CEGT did not identify any historic structures meeting the criteria for NRHP eligibility within the APE for the proposed Project in Louisiana, which includes the viewsheds from access roads and aboveground facilities.

CEGT submitted the initial cultural resources survey report and testing findings to the Louisiana Department of Culture, Recreation & Tourism, Divisions of Archaeology and Historic Preservation, which function as the SHPO in Louisiana, on March 7, 2006. CEGT subsequently submitted a revised version of the initial cultural resources survey report, which reflected our comments, to the Louisiana SHPO on April 25, 2006. The addendum cultural resources survey reports for CEGT's supplemental cultural resources surveys were submitted to the Louisiana SHPO on May 3 and July 25, 2006. In a letter dated June 8, 2006, the Louisiana SHPO concurred with the findings of CEGTs initial report. We also concur. A response from the Louisiana SHPO regarding the findings of the addendum cultural resources reports is pending.

3.10.2 Unanticipated Discoveries Plan

CEGT has filed an Unanticipated Discoveries Plan that outlines the procedures that would be followed in the event that unanticipated cultural resources or human remains were encountered during construction of the proposed Project. The Unanticipated Discoveries Plan has also been filed with the Texas and Louisiana SHPOs.

3.10.3 Native American Consultation

CEGT contacted nine Native American groups regarding the proposed Project. Those groups contacted include the Alabama-Coushatta Tribe of Texas, the Caddo Tribe of Oklahoma, the Chitimacha Tribe of Louisiana, the Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, the Kickapoo Traditional Tribe of Texas, the Mississippi Band of Choctaw Indians, the Quapaw Tribe of Oklahoma, and the Tunica-Biloxi Indian Tribe of Louisiana. Letters were sent to representatives of each of these tribes on August 31, 2005, requesting comments on the proposed Project and the identification of any cultural or religious sites significant to the tribe. In a letter dated October 6, 2005, the Tribal Historic Preservation Officer with the Caddo Tribe of Oklahoma requested consulting party status and for the FERC to consult with the tribe on a government-to-government basis regarding the proposed Project. CEGT provided copies of the initial cultural resources reports for the Texas and Louisiana portions of the Project to the Caddo Tribe of Oklahoma on April 6, 2006. Subsequently, copies of the addendum cultural resources reports were provided to the Caddo Tribe of Oklahoma on May 3 and July 27, 2006.

Follow-up letters were sent to the remaining tribes on October 27, 2005, and three responses were received. The Environmental Director for the Jena Band of Choctaw Indians indicated no concerns or comments regarding the proposed Project. The Cultural Director for the Chitimacha Tribe of Louisiana indicated that the proposed Project area was not part of the Chitimacha homeland and deferred comment to the relevant tribes. The Historical Preservation Officer of the Alabama Coushatta Tribe of Texas requested copies of all cultural resources reports when they become available. CEGT provided the Alabama Coushatta Tribe of Texas with copies of the initial cultural resources reports for the Texas and Louisiana portions of the proposed Project route on April 6 and April 28, 2006, respectively. Subsequently, copies of the addendum cultural resources reports were provided to the Alabama Coushatta Tribe of Texas on May 3 and July 27, 2006.

In addition, we received a response from one tribe regarding our NOI for the proposed Project. In a letter dated February 8, 2006, the Jenna Band of Choctaw Indians indicated that it has no objections to implementation of the proposed Project.

3.10.4 General Impacts and Mitigation

CEGT has not completed cultural resources surveys at some of the proposed extra work areas and along approximately 1.9 miles of the proposed pipeline route where survey permission has not yet been

obtained. The completion of surveys and evaluations within these areas, as well as comments from the Texas and Louisiana SHPOs, would be required to complete the process of compliance with Section 106 of the NHPA.

To ensure that required cultural resource studies and consultation are completed for all proposed Project components and that the FERC's responsibilities under Section 106 of the NHPA are met, **we recommend that:**

- **CEGT 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. CEGT files with the Secretary cultural resources survey and evaluation reports, any necessary treatment plans, and the Texas and Louisiana 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 CEGT 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 Carthage to Perryville Project. Though air emissions would be generated by operation of equipment during construction of the pipeline and aboveground facilities proposed by CEGT, most air emissions associated with the proposed Project would result from the long-term operation of the Panola and Vernon Compressor Stations.

CEGT proposes to construct the Panola Compressor Station near the town of DeBerry in Panola County, Texas, and the Vernon Compressor Station near the town of Jonesboro in Jackson Parish, Louisiana. CEGT would install two, 10,310-hp International Standards Organization-rated, natural gas turbine compressor units at each compressor station. Each compressor unit would be fueled by natural gas and equipped with a low emission combustion system (SoLoNOx technology). The compressor units would be housed in separate buildings at each compressor station, and installation would be completed in phases, as described in Section 2.4. A single compressor unit would be installed at each station initially and would begin operations by February 2007 based on CEGT's proposed schedule. CEGT plans that the second compressor unit would be installed and operational by October 2008. Our analysis of air emissions and the resulting effects on air quality assumes the operation of the total planned compression capacity (20,620 hp) at each station. In addition to the compressor units, CEGT would also install one natural gas burning auxiliary generator engine rated at 237 hp and a 1,200-gallon condensate tank at each compressor station.

3.11.1.1 Existing Air Quality

Ambient air quality is protected by federal and state regulations. The CAA designates six pollutants as criteria pollutants for which the National Ambient Air Quality Standards (NAAQS) are

promulgated. The NAAQS for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10} particulates and $PM_{2.5}$ particulates), carbon monoxide (CO), ozone (O_3), and lead were set to protect human health (primary standards) and human welfare (secondary standards). These standards are summarized in Table 3.11.1-1. State air quality standards cannot be less stringent than the NAAQS, and both Texas and Louisiana have adopted ambient air quality standards that are the same as the NAAQS. The NAAQS program also classifies areas where sufficient data are available as either attainment (does not exceed NAAQS) or non-attainment (exceeds NAAQS). The counties and parishes in which the Project would be located are in attainment for all criteria pollutants.

TABLE 3.11.1-1
National Ambient Air Quality Standards

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

m^3 = cubic meter(s).

N/A = not applicable.

ppm = part(s) per million.

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

[b] Not to be exceeded more than once per year.

[c] 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.

[d] 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.

[e] 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

The CAA, 42 USC 7401 et seq., as amended in 1977 and 1990, is the basic federal statute governing air pollution. The provisions of the CAA that are potentially relevant to the proposed Project include the following, which are discussed further below:

- Air Quality Control Regions (AQCRs);
- Prevention of Significant Deterioration (PSD);
- New Source Review (NSR);
- New Source Performance Standards (NSPS);
- Maximum Achievable Control Technology (MACT) standards; and
- Title V Operating Permits.

In addition, the proposed Project would be subject to applicable Texas and Louisiana state regulations that are more stringent than the federal regulations.

Air Quality Control Regions

AQCRs are categorized as Class I, Class II, or Class III. Class I areas are designated specifically as pristine natural areas or areas of natural significance and receive special protections under the CAA because of their good air quality. If a new source or major modification is subject to the PSD program requirements and is within 62 miles (100 kilometers) of a Class I area, the facility is required to notify the appropriate federal officials and assess the impacts of the proposed Project on the Class I area. 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 designated as Class II.

The Project, as proposed, would be located in a Class II area. Additionally, the nearest Class I area, the Caney Creek Wilderness, is located southeast of Mena, Arkansas, approximately 145 miles north of the proposed Project.

Prevention of Significant Deterioration

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, and amounts over these thresholds trigger PSD review. 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 will 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 will be allowed. These increments for criteria pollutants are based on the PSD review classification of the area. Class I areas have the lowest increment of permissible deterioration, which essentially precludes development near these areas. Class II areas are designed to allow moderate, controlled growth. Class III areas allow for heavy industrial use. The proposed Project would be located in a Class II area.

The proposed Project would not include facilities or operations included on the list of named source categories to which the 100-tpy trigger applies. Further, the proposed Project would not exceed emissions of 250 tpy for any criteria pollutant at either compressor station site. Table 3.11.1-2 summarizes the anticipated emissions from each compressor station for each regulated pollutant, including oxides of nitrogen (NOx), CO, volatile organic compounds (VOCs), PM10, SO2, and hazardous air pollutants (HAPs). The net emissions from each compressor station for each of the criteria

TABLE 3.11.1-2 Estimated Net Emissions for the Carthage to Perryville Project			
Pollutant	Total Facility Emissions[a] (tpy)		Applicability Threshold[b] (tpy)
	Panola Compressor Station	Vernon Compressor Station	
NO_x	49.1	49.1	250
CO	56.8	56.8	250
VOC	2.7	2.7	250
PM_{10}	5.3	5.3	250
SO_2	2.7	2.7	250
HAPs	0.8	0.8	25

Notes:
tpy = tons per year
[a] Includes emissions from turbines, auxiliary generators, tanks, fugitives, and loading.
[b] Prevention of Significant Deterioration New Source Applicability Threshold.

pollutants would be less than the major source applicability thresholds, and PSD permitting is therefore not applicable. The proposed Project would be considered a "minor source" with regards to PSD review, and BACT or PSD (air dispersion) modeling would not be required.

New Source Performance Standards

The NSPS, codified at 40 CFR 60 and incorporated by reference in 30 Texas Administrative Code (TAC) Rule 101.20, and Louisiana Administrative Code (LAC) 33.III.3303 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 proposed 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 itscontents. Subpart Kb applies to new tanks, unless otherwise exempted, that have a storage capacity between 75 cubic meters (m^3; 19,813 gallons) and 151 m^3 (39,890 gallons) and contain VOCs with a maximum true vapor pressure greater than or equal to 15.0 kilopascals (kPa). Subpart Kb also applies to tanks that have a storage capacity greater than or equal to 151 m^3 and contain VOCs with a maximum true vapor pressure greater than or equal to 3.5 kPa. Each of the proposed compressor stations would be equipped with a 1,200-gallon condensate tank, which is well below the regulated capacity. Therefore, the proposed Project would not be subject to NSPS Subpart Kb standards.

On February 18, 2005, the EPA proposed a new NSPS for stationary combustion turbines (Subpart KKKK). Stationary combustion turbines of 1 megawatt (MW) and larger installed after February 18, 2005, would be covered by the proposed NSPS. The proposed standard imposes 1.0 pound NO_x per MW-hour and 0.58 pound SO_2 per MW-hour emission limits on turbine operations. The proposed Project would comply with any applicable standards of the rule, once finalized.

Maximum Achievable Control Technology Standards

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 compressor stations would each emit approximately 0.58 tpy of formaldehyde and 0.78 tpy of total HAPs from combustion sources. Applicability is triggered if potential emissions are greater than 10 tpy of any single listed HAP or if total HAP emissions exceed 25 tpy for the listed HAPs. As potential HAP emissions resulting from operation of the proposed Project would be well below these thresholds, the 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, SO_2, CO, PM_{10}, $PM_{2.5}$, and VOC. The proposed Project would not exceed the 100-tpy criterion pollutant threshold, as shown in Table 3.11.1-2. Therefore, the proposed Project would not require a Title V permit.

State Regulations

In addition to the federal regulations described above, both Texas and Louisiana also have state air quality regulations. Subject to EPA approval, TCEQ and LDEQ manage statewide air permitting, compliance, and enforcement programs in Texas and Louisiana, respectively. The Panola Compressor Station would be authorized under TCEQ's Permit-by-Rule program, and the Vernon Compressor Station would be authorized under a LDEQ minor source permit. Neither Texas nor Louisiana require air dispersion modeling to evaluate minor source permit applications. Pursuant to these permitting programs, CEGT submitted air permit applications to TCEQ and LDEQ in December 2005, seeking authorization to construct and operate the Panola and Vernon Compressor Stations, respectively. CEGT subsequently received Permit-by-Rule authorization from TCEQ on January 26, 2006. A response from LDEQ is pending.

3.11.1.3 General Impacts and Mitigation

Construction Emissions

Air quality impacts associated with construction of the proposed Project would include emissions from fossil-fueled construction equipment and fugitive dust. However, such air quality impacts would generally be temporary and localized. Large earth-moving equipment, skip loaders, trucks, and other mobile sources may be powered by diesel or gasoline and are sources of combustion emissions, including NO_x, CO, VOCs (a precursor of ozone), SO_2, PM_{10}, and small amounts of air toxics. Air pollutants from construction equipment would be generally limited to the immediate vicinity of the construction area and would be temporary. Additionally, CEGT would maintain all fossil-fueled construction equipment in accordance with manufacturer's recommendations to minimize construction-related emissions.

The majority of air emissions during construction activities would be respirable particulate matter, both PM_{10} and $PM_{2.5}$, in the form of fugitive dust. Fugitive dust would result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated would be a function of construction activities, soil type, moisture content, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions would be greater during drier periods and in areas of fine-textured soils. TCEQ regulates the emissions of

particulate matter arising from unpaved streets, access roads, construction, and similar facilities through 30 TAC111.141. The rule applies only to certain areas in El Paso and Harris Counties and is therefore not applicable to the proposed Project. LDEQ regulates fugitive dust emissions through LAC 33.III.1305, which requires application of water or dust retardant chemicals or paving of roadways. CEGT would employ proven construction practices, such as water sprays, to control fugitive dust emissions during construction. Additionally, all areas disturbed by construction would be stabilized in accordance with our Plan. Therefore, fugitive dust emissions during construction would be minor and of short duration.

Operations Emissions

The proposed Panola and Vernon Compressor Stations would emit air pollutants as a result of combustion of natural gas to drive the compressor units, and in association with the periodic operation of the auxiliary generator. Table 3.11.1-2 summarizes the anticipated emissions from each compressor station for NO_x, CO, VOC, PM_{10}, SO_2, and HAPs. Compressor station emissions would be minimized through the use of SoLoNOx technology 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 permitting requirements because the net emissions from each compressor station would not meet the PSD applicability thresholds.

Both compressor stations would include an emergency shut down (ESD) system blowdown, pursuant to DOT safety requirements (see Section 3.12). In the event of an emergency, activation of the ESD system would vent the piping (expel the natural gas) to the atmosphere. The ESD system would be tested at initial commissioning of the station, and property owners in the area would be notified of the test. After the initial test, the ESD system would only be used in the event of an emergency. Additionally, each compressor unit and mainline valve facility would typically include a blowdown valve that would be used in association with maintenance activities (e.g., to relieve pressure when a unit is taken off line). Natural gas blowdowns are not part of routine operation and are considered an insignificant emission source due to the minimal amount of VOC contained in the vented natural gas.

Operation of the proposed pipeline and ancillary facilities would not result in substantial air emissions under normal operating conditions. Typically, only minor fugitive emissions of natural gas would occur from small connections at meter station and valve sites. Because such emissions are very small and discountable, they are not regulated by permit or source-specific requirements. Similarly, use of the access roads along the proposed pipeline for maintenance would generate occasional, minor and short-term increases in fugitive dust. However, such emissions would be similar to that generated by general traffic on other unpaved roads in the area and would have a negligible effect on air quality.

3.11.2 Noise Quality

Noise quality can be affected both during construction and operation of pipeline projects. The ambient sound level of a region is defined by the total noise generated, including sounds from both natural and artificial sources. 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 measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level ($L_{eq(24)}$) and the day-night sound level (L_{dn}). The $L_{eq(24)}$ 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 $Leq_{(24)}$ 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.

In 1974, EPA published *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 ambient noise standards. The EPA determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. The FERC has adopted this criterion and generally uses it to evaluate the impact of the compressor facilities on noise quality. Specifically, we require that noise attributable to compressor stations shall not exceed the 55 dBA L_{dn} level to limit impacts at any noise sensitive area (NSA), such as a residence, school, or hospital, unless the NSA is developed after the compressor station is constructed.

Texas and Louisiana do not regulate noise at the state level. Similarly, none of the counties or local municipalities that would be traversed by the proposed Project have existing regulations or ordinances governing noise from construction or industrial activities. Therefore, no state or local noise regulations would apply to construction and operation of the proposed Project.

3.11.2.1 Existing Noise Levels

The Panola Compressor Station (MP 8.4) would be located in a rural part of Panola County, Texas, near the town of DeBerry. The land surrounding the site is relatively flat and consists of forest and pasture with scattered residences. The nearest NSA (NSA #1) consists of a group of clustered residences about 2,000 feet north of the proposed compressor station site. Another group of residences (NSA #2) is located approximately 4,000 feet west of the proposed site.

The Vernon Compressor Station (MP 101.3) would be located in a rural part of Jackson Parish, Louisiana, near the town of Jonesboro. The land surrounding the site consists of forest with scattered residences in an area of rolling hills. An existing electric transmission line right-of-way and Gladway Road border the northern and eastern borders of the proposed site, respectively. The nearest NSAs are residences located approximately 2,100 feet northwest (NSA #1) and 2,100 feet east-southeast (NSA #2) of the proposed site.

CEGT conducted an ambient sound-level survey to document representative background noise levels at the NSAs closest to each of the proposed compressor station sites. Surveys were performed at the Panola Compressor Station NSAs on November 21 and 22, 2005, and at the Vernon Compressor Station NSAs on October 20 and 21, 2005. In both instances, background noise levels were measured over a continuous 24-hour period. Audible noise sources at both sites were consistent with the rural setting and included traffic on local roads, insects, amphibians, birds, and wind. The measured daytime and nighttime noise levels, as well as the calculated L_{dn} for each NSA are summarized in Table 3.11.2-1.

3.11.2.2 General Impacts and Mitigation

Construction Noise

Construction of the proposed Project would 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 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 would last from several weeks to several months on an intermittent basis. Although construction of aboveground facilities would not share the transient nature of the pipeline construction spreads, these

TABLE 3.11.2-1 Existing Noise Levels at Nearest Noise Sensitive Areas to the Proposed Carthage to Perryville Project Compressor Stations				
Noise Sensitive Area (NSA)	**Distance/Direction of NSA to Compressor Station Site (feet)**	**Measured L_d (dBA)**	**Measured L_n (dBA)**	**Calculated L_{dn} (dBA)**
Panola Compressor Station				
NSA #1	2,000 – north	39.3	35.6	42.8
NSA #2	3,950 – west southwest	51.2	44.1	52.5
Vernon Compressor Station				
NSA #1	2,100 – northwest	53.2	53.5	59.8
NSA #2	2,100 – east southeast	54.8	54.1	60.6

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

activities would be short-term and limited to daylight hours. Construction equipment would be operated on an as-needed basis during those periods and would be maintained to manufacturers' specifications to minimize noise impacts. Although individuals in the immediate vicinity of the construction activities would experience annoyance, the impact on the noise environment at any specific location along the proposed pipeline route would be short term. Similarly, noise associated with the construction of the proposed aboveground facilities would be intermittent during the construction period, but the overall impact would be temporary and would not be expected to be significant. Further, nighttime noise levels would normally be unaffected since most construction activities would be limited to daylight hours. The possible exceptions would be at the proposed HDD sites, where drilling and related construction equipment would likely operate on a continuous, 24-hour per day basis over short periods of time ranging from one to three weeks in duration.

CEGT estimated the noise impacts that would result from HDD activities at the nearest NSA for all HDD sites within 0.5 mile of an NSA (Table 3.11.2-2). The predicted noise impacts indicate that sound levels would exceed 55 dBA at nine of the ten HDD sites, with predicted sound levels ranging from 51 to 74 dBA. Because HDD activities have the potential to exceed the FERC benchmark of 55 dBA Ldn, CEGT has indicated that it would conduct sound surveys for all NSAs within 0.5 mile of an HDD site where drilling equipment would operate on a 24-hour a day basis. If those surveys showed that noise levels exceed 55 dBA, CEGT would either stop drilling and implement mitigation (e.g., temporary noise barriers) to reduce the noise levels to less than 55 dBA or offer to provide the occupants of the affected NSA with temporary housing at a commercial hotel for the duration of HDD activities. To ensure that NSAs are not exposed to excessive noise during nighttime drilling operations, **we recommend that:**

TABLE 3.11.2-2 Predicted HDD Noise Impacts for the Carthage to Perryville Project			
HDD Waterbody Crossing	**Milepost**	**Distance to Nearest NSA (feet)**	**Estimated Sound Level (dBA)**
Prairie River	45.4	514	74
Red River	50.1	1,797	59
Saline Bayou	80.8	1,837	51
Steep Bayou	144.1	1,920	60
Boeuf River	145.5	908	68
Cane Bayou	150.9	770	70
Little Creek	151.4	575	73
Bee Bayou	154.0	2,031	59
Siphon Creek	163.1	1,230	65
Big Creek	163.9	2,557	56

Notes:
HDD = horizontal directional drill
NSA = noise sensitive area
dBA = decibels on the A-weighted scale

- **Prior to construction, CEGT should file a residential HDD noise analysis, mitigation, and compliance plan with the Secretary for review and approval by the Director or OEP. This plan should demonstrate whether noise due to nighttime drilling operations would be below 55 dBA L_{dn} at the nearest NSA and specify all noise mitigation equipment necessary to reduce noise levels to less than 55 dBA L_{dn}. The plan should detail how CEGT would ensure compliance and confirm that where surveys indicate that noise attributable to nighttime drilling would exceed 55 dBA L_{dn}, CEGT should:**
  - **a. stop drilling and mitigate the noise at the affected NSAs to reduce noise levels to 55 dBA L_{dn} or less, or**
  - **b. offer temporary housing to occupants of affected NSAs until L_{dn} levels at the NSAs are reduced to 55 dBA L_{dn} or less.**

Operational Noise

Operation of the proposed pipeline facilities would not adversely affect noise quality since the pipeline would be installed underground and would not be a significant source of noise. Potential noise-related impacts during operation of the proposed Project would primarily 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 cooling fans, yard piping, and valves.

As discussed above, CEGT would also install ESDS (blowdowns) at each of the proposed compressor stations to evacuate natural gas from the facility in the event of an emergency or for

maintenance. Typically emergency blowdowns are triggered during an emergency station shutdown, which is a very rare event. Maintenance or "unit" blowdowns, occur when gas from the compressors and piping must be evacuated. Maintenance blowdowns would occur several times per month, although the exact number is difficult to quantify. Emergency blowdowns are typically much longer and louder than unit blowdowns. Noise from both types of unsilenced blowdown events would be upwards of 100 dBA L_{eq} at a distance of 50 feet, but these events would not be continuous or frequent. To mitigate any noise effects associated with infrequent and short-term blowdown events, the blowdown vent at each compressor station would be fitted with a silencer.

Both compressor stations would include design measures to minimize sound generation. Silencers would be installed on the turbine exhausts, and filter/silencers would be installed on the turbine air intakes. The walls and roof of each building housing a compressor unit would be comprised of acoustical panels consisting of a 26 gauge metal outer skin and 4 inches of fiberglass insulation. Ten-inch thick fiberglass blanket insulation would be installed from the wall girts, and a perforated inner metal skin would cover the insulation. All piping penetrations through the insulated walls would be flashed and caulked, and each building would have a single metal door, which would be insulated and gasketed. The building ventilation system vents would be equipped with acoustical louvers or duct silencers.

The expected L_{dn} at the residence closest to the Panola Compressor Station (NSA #1, located about 2,000 feet north of the proposed compressor station) would be 51.7 dBA due to sound generated by operation of the new station. When combined with the existing noise level, the L_{dn} would be about 52.2 dBA at NSA #1. This level is below an L_{dn} of 55 dBA. As shown in Table 3.11.2-3, the estimated L_{dn} at NSA #2 would also be below 55 dBA. As a result, no significant impact on the noise environment is anticipated as a result of typical operations at the Panola Compressor Station.

The total estimated operating L_{dn} sound levels at the NSAs nearest the Vernon Compressor Station, including ambient noise and compressor station noise, would be 60.5 to 61.2 dBA, as shown in Table 3.11.2-3. Although these predicted noise levels would exceed 55 dBA at both NSAs, sound surveys at both locations showed that existing ambient noise levels already exceed 55 dBA (Table 3.11.2-1). The predicted noise increase at NSA #1 and NSA #2 would be 0.7 dBA and 0.4 dBA, respectively. Noise increases of 3 dBA or less are generally considered to be undetectable by the human ear. Since the predicted sound level increase at the nearest NSAs would be less than 1, we anticipate that typical operations at the Vernon Compressor Station would result in a small, but insignificant effect on the noise environment.

As described in Section 2.4 and 3.11.1, installation of compressor units at the compressor stations would be completed in phases. Our analysis of operational noise effects assumed the operation of the total planned compression capacity (20,620 hp) at each station and predicted that no significant noise-related effects would occur to the NSAs nearest the compressor stations. However, given the phased installation schedule proposed by CEGT, it is possible that NSAs would be constructed nearer to the proposed compressor station sites prior to installation of full operational capacity. If NSAs were constructed closer to the compressor station sites, the predicted noise-related effects evaluated in this EIS would be invalidated. In addition, we also believe that the actual noise levels resulting from operation of the proposed compressor stations should be measured to ensure that they do not exceed those levels analyzed in this EIS. Therefore, **we recommend that:**

TABLE 3.11.2-3
Predicted Compressor Station Noise Impacts for the Carthage to Perryville Project

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]
Panola Compressor Station					
NSA #1	2,000 – north	42.8	51.7	52.2	9.4
NSA #2	3,950 – west southwest	52.5	45.3	53.3	0.8
Vernon Compressor Station					
NSA #1	2,100 – northwest	59.8	52.1	60.5	0.7
NSA #2	2,100 – east southeast	60.6	50.4	61.2	0.4

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 both compressor units at each compressor station with noise control measures installed as proposed.

[b] Estimated total $L_{dn} = 10 \log (10^{(\text{Ambient } L_{dn}/10)} + 10^{(\text{Predicted } L_{dn}/10)})$.

[c] Estimated increase in the ambient L_{dn} sound levels due to operation both compressor units at each compressor station.

- **CEGT should conduct noise surveys to verify that the noise attributable to operation of the compressor stations does not exceed an L_{dn} of 55 dBA at any NSA following the installation of each authorized compressor unit, and file the results of those surveys with the Secretary no later than 60 days after placing each authorized compressor unit in service, or prior to the start of the next phase of construction, whichever is sooner. If the noise attributable to operation of the compressor stations exceeds 55 dBA L_{dn} at any NSA, CEGT should file a report on what additional noise controls are needed to meet that level and install any required controls within one year of the in-service date of the associated compressor unit or prior to the start of the next phase of construction, whichever is sooner. CEGT should confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls or prior to the start of the next phase of construction, whichever is sooner.**

If CEGT provides assurance that any noise impacts have been mitigated, as required by the above recommendations, we believe that 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 ^{o}F and is flammable at concentrations between 5.0 percent and 15.0 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, U.S.C. 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 which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act (NGPSA) provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement action. The majority of the states have either 5(a) certifications or 5(b) agreements, while nine states act as interstate agents.

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

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

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

The pipeline and aboveground facilities associated with the Carthage to Perryville Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and

qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

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

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

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

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the proposed Project have been developed based on the relationship of the proposed pipeline centerline to other nearby structures and manmade features. CEGT has reported that the segment of the proposed pipeline extending from RMP 95.8 to MP 96.9 would be designated as Class 2. The remaining 170.8 miles of the proposed pipeline would be designated as Class 1.

If a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, CEGT 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 (HCAs). The DOT (68 FR 69778, 69 FR 18228, and 69 FR 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in §192.903 of the DOT regulations.

OPS published a series of rules from August 6, 2002, to May 26, 2004 (69 FR 29903), that defines HCAs where a gas pipeline accident would 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 radius[1] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle[2]; or
- any area in Class 1 or 2 where the potential impact circle includes an identified site[3].

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

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

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at § 192.911. The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. As a result of minor route variations adopted since issuance of the Draft EIS (see Section 4.4), CEGT reports that no HCAs would be located along the proposed pipeline route. The pipeline integrity management rule for HCAs requires inspection of the entire pipeline for HCAs every 7 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 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 system and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

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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.

Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. CEGT 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; or
- in the judgment of the operator was significant, even though it did not meet the above criteria.

The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must only report incidents that involve property damage of more than $50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 3.12.2-1 presents a summary of incident data for the 1970 to 1984 period, as well as more recent incident data for 1986 through 2005, recognizing the difference in reporting requirements. The 14.5-year period from 1970 through June 1984, which provides a larger universe of data and more basic report information than subsequent years, has been subject to detailed analysis, as discussed in the following sections.[4]

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.

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

TABLE 3.12.2-1 Natural Gas Service Incidents by Cause		
	Incidents per 1,000 Miles of Pipeline (Percent Distribution)	
Cause	**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); DOT, OPS, http://ops.dot.gov/stats.htm.

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).

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. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

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

Table 3.12.2-3 clearly demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. The data 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.

TABLE 3.12.2-3
External Corrosion by Level of Control (1970 through June 1984)

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

Sources: 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

TABLE 3.12.3-1
Annual Average Fatalities
Natural Gas Transmission and Gathering System

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); DOT, OPS, http://ops.dot.gov/stats.htm.

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] DOT, "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."

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 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 582 years. This would represent a slight increase in risk to the nearby public.

3.13 CUMULATIVE IMPACTS

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

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

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

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

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

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

TABLE 3.13-1
Existing or Proposed Projects that Would Cumulatively Impact Resources in the Carthage to Perryville Project Area

Project	Description	Anticipated Construction Date	Counties/Parishes within Project Area
Natural Gas Pipeline Projects			
Carthage to Perryville	Construct and operate a 172.1-mile-long, 42-inch-diameter natural gas pipeline	2007	Panola County, Texas Caddo, DeSoto, Red River, Bienville, Jackson, Ouachita and Richland Parishes, Louisiana
East Texas Expansion	Construct and operate a 146-mile-long, 42-inch-diameter natural gas pipeline	2007	Panola County, Texas DeSoto, Red River, Bienville, Jackson, Ouachita and Richland Parishes, Louisiana
Regency Pipeline	Construct and operate an 80-mile, 30-inch-diameter intrastate natural gas pipeline and a 40-mile, 24-inch-diameter natural gas pipeline loop	Completed in 2005	Bienville, Jackson, and Richland Parishes, Louisiana
Nonjurisdictional Facilities			
Houston Pipe Line Lateral	Construct and operate a 1.1-mile-long, 42-inch-diameter natural gas pipeline lateral	2006-2007	Panola County, Texas
Duke Energy Field Services Lateral	Construct and operate a 0.4-mile-long, 24-inch-diameter natural gas pipeline lateral	2006-2007	Panola County, Texas
Enbridge Lateral	Construct and operate a 350-foot-long, 12-inch-diameter natural gas pipeline lateral	2006-2007	Panola County, Texas
Unrelated Projects			
Trans-Texas Corridor 69	Construct and operate an intermodal transportation corridor from Texarkana, Texas, to Mexico	N/A	Panola County, Texas
U.S. Highway 171	Widen to four lanes sections of U.S. Highway 171 from Shreveport to Lake Charles, Louisiana	2007 – 2010; work in proposed Project area completed	Caddo and DeSoto Parishes, Louisiana
U.S. Highway 167	Widen to four lanes sections of U.S. Highway 167 from Alexandria, Louisiana, to the Arkansas state line	2007 - 2010	Jackson Parish, Louisiana
U.S. Highway 65	Widen to four lanes sections of U.S. Highway 165 from Jennings, Louisiana, to the Arkansas state line	2007 – 2010; work in proposed Project area completed	Ouachita Parish, Louisiana

Notes:
N/A = not available

The identified projects consist of one existing and one proposed natural gas transmission pipelines, three nonjurisdictional pipeline laterals that would deliver natural gas to the proposed Project (see Section 1.5), and five transportation improvement projects. We identified these projects through scoping and independent research, as well as information provided by CEGT. While we did not specifically contact each county/parish, community, or other entity regarding new projects or plans for expansion, we did request information on other projects in the NOI. We have identified the tentative construction schedules of these projects, as available, but the actual construction schedules would depend on factors such as economic conditions, the availability of funds, and political considerations.

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

3.13.1 Other Natural Gas Pipeline Projects

The FERC is currently considering a proposal for one other natural gas pipeline project that would also traverse northern Louisiana: the Gulf South East Texas Expansion Project. In addition, Regency Intrastate Gas, LLC (Regency) recently completed construction on an expansion of its existing intrastate pipeline facilities in the Project area.

East Texas Expansion Project

Gulf South has proposed construction of a 42-inch-diameter natural gas pipeline system that would extend from Keatchie, DeSoto Parish, to Delhi, Richland Parish, Louisiana. The East Texas Expansion Project would include approximately 146 miles of pipeline, the expansion of an existing compressor station, as well as construction of a new compressor facility, and three meter/regulator stations. The East Texas Expansion Project pipeline would parallel the proposed Carthage to Perryville Project route for approximately 99 miles. Gulf South has indicated that, if approved, the East Texas Expansion Project would be constructed in 2007.

The East Texas Expansion Project is considered here with respect to the potential for cumulative impacts to the natural and human environments of Texas and Louisiana. The project is being evaluated by the FERC, but has not yet been approved. While it is not certain if or when this action will occur, its similarity and proximity to the proposed Carthage to Perryville Project advises further consideration. The FERC (1989) concluded that the general impact of building more than one pipeline would be primarily additive, and the cumulative impact may be calculated by adding together the impact of each individual project. Detailed information regarding the environmental impacts that would be associated with construction and operation of the East Texas Expansion Project are not available at this time as a formal application has not yet been filed. However, based on the project scope, geographic location, and preliminary information, we anticipate that the East Texas Expansion Project would result in environmental impacts similar to that of the proposed Carthage to Perryville Project. Additional information on the East Texas Expansion Project can be viewed on the FERC Internet website (http://www.ferc.gov) at the “e-library” link under Docket No. PF06-17.

Regency Intrastate Pipeline

Regency owns and operates a 280-mile-long, 30-inch-diameter intrastate pipeline system running from Caddo Parish, Louisiana, to Ruston, Louisiana. The Regency pipeline is interconnected at its western end with a 10-mile-long, 20-inch-diameter interstate gas pipeline that runs from Harrison County, Texas, to Caddo Parish, Louisiana (Regency 2006). In December 2005, Regency completed construction of the Regency Intrastate Enhancement Project. This expansion project included installation of 40 miles

of 24-inch-diameter pipeline loop adjacent to the existing pipeline between Haughton, Louisiana, and eastern Bienville Parish; construction of 80 miles of new 30-inch-diameter mainline pipeline between Bienville Parish and Winnsboro, Louisiana; and the addition of approximately 10,000 hp of new compression at an existing compressor station in eastern Bienville Parish.

The Regency Pipeline runs parallel to and generally north of the proposed Carthage to Perryville Project route, and the separation between the two routes ranges from about 10 to 25 miles. However, the recently constructed portion of the Regency Pipeline in Jackson Parish, Louisiana is in close proximity to the proposed Project route and would intersect it near Chatham, Louisiana. Because it is an intrastate pipeline, the FERC did not have jurisdictional authority over the planning or construction of the Regency Intrastate Enhancement Project, and we therefore have only limited information on the design and environmental impacts associated with that project. Construction of the Regency Intrastate Enhancement Project temporarily impacted a total of 42.0 acres of wetlands and resulted in the permanent conversion of approximately 13.5 acres of forested wetlands to emergent and scrub shrub wetlands.

3.13.2 Nonjurisdictional Facilities

As described in Section 1.5, nonjurisdictional facilities for the proposed Project would include three intrastate, natural gas pipeline laterals. These facilities would be constructed and operated by HPL, DEFS, and Enbridge to enable these parties to deliver natural gas to the proposed Carthage to Perryville Project pipeline.

The HPL lateral would consist of an approximately 1.1-mile-long, 42-inch-diameter pipeline and a pig launching facility. The HPL lateral pipeline would extend from an existing HPL interconnect with the Duke Energy Carthage Hub to the proposed Carthage to Perryville Project pipeline in Carthage, Panola County, Texas (MP 0.0). The HPL lateral would be constructed within a 125-foot-wide construction easement parallel to an existing right-of-way. Construction of the HPL lateral would result in impacts to approximately 4.1 acres of wetlands, including the permanent conversion of 1.1 acres of forested wetlands.

DEFS proposes to construct an approximately 0.4-mile-long, 24-inch-diameter lateral pipeline that would connect the existing DEFS natural gas processing facility in Panola County, Texas, with the proposed Carthage to Perryville Project pipeline at RMP 1.4. The DEFS lateral would parallel an existing DEFS right-of-way, but would affect approximately 2.3 acres land during construction. However, no wetlands, waterbodies, or other natural features would be impacted.

Enbridge proposes to construct 350 feet of 12-inch-diameter lateral pipeline that would connect an existing Enbridge meter station with the proposed Carthage to Perryville Project pipeline at RMP 1.4. The Enbridge lateral would be constructed parallel to existing Enbridge right-of-way and on land owned by Enbridge and CEGT. Construction of the Enbridge lateral would affect approximately 0.4 acre of land, and no wetlands, waterbodies, or other natural features would be impacted.

3.13.3 Unrelated Projects

Trans-Texas Corridor 69

A consortium of Texas state transportation planning agencies, including the Texas Department of Transportation (TxDOT) and the Texas Turnpike Authority, have proposed the Trans-Texas Corridor (TTC) Project. The TTC Project would consist of a system of new and existing highways that would provide dedicated travel lanes for cars and heavy trucks, incorporate light and heavy rail and other transit

modes, and provide infrastructure for pipelines and other linear utilities. Elements of the TTC would be evaluated, designed, and constructed over the next 50 years (TTC 2006).

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

U.S. Highway 171 Widening

As part of its Transportation Infrastructure Model for Economic Development (TIMED), a $40 billion 10-year program to improve 536 miles of state highways, the LDOT is adding a fourth travel lane to approximately 121 miles of U.S. Highway 171 between Shreveport and Lake Charles, Louisiana (LDOT 2006). As of October 2005, construction of the U.S. Highway 171 project was approximately 49 percent complete. Construction is scheduled to begin on the remaining portions by mid-2007, with completion of construction slated for 2010. The proposed Carthage to Perryville Project route would intersect U.S. Highway 171 near MP 27.1 in DeSoto Parish, but construction on this portion of U.S. Highway 171 has already been completed.

U.S. Highway 167 Widening

Under another component of the TIMED program, U.S. Highway 167 is being widened to four lanes along a 112-mile stretch between the Arkansas state line and Alexandria, Louisiana (LDOT 2006). As of October 2005, construction of the U.S. Highway 167 widening was approximately 26 percent complete, with all remaining work scheduled to begin by mid-2007 and be complete by 2010. The proposed Carthage to Perryville Project route would intersect U.S. Highway 167 near MP 96.3 in Jackson Parish, and this portion of U.S. Highway 167 is expected to be under construction between 2007 and 2010.

U.S. Highway 165 Widening

LDOT also has plans to expand a 173-mile portion of U.S. Highway 165 to four lanes between the Arkansas state line and Jennings, Louisiana (LDOT 2006). As of October 2005, construction of the U.S. Highway 165 widening was approximately 29 percent complete. The TIMED Project schedule indicates that all construction work on U.S. Highway 165 will start no later than mid-2007 and be completed by 2010. The proposed Carthage to Perryville Project route would intersect U.S. Highway 165 near MP 134.3 in Ouachita Parish, but this portion of U.S. Highway 165 has already been constructed. Another section of U.S. Highway 165 located just south of the proposed pipeline route would be under construction between 2007 and 2010.

3.13.4 Potential Cumulative Impacts of the Proposed Action

Potential cumulative impacts are grouped by resource area in this section. The potential impacts that we view as most likely to be potentially cumulatively significant are related to wetlands and waterbodies, vegetation and wildlife, land use, and air quality and noise.

Except for the East Texas Expansion Project, the FERC has no authority over the permitting, licensing, funding, construction, or operation of the projects listed above. Federal, state, and local

agencies must review these projects for compliance with requirements for construction of facilities at sites or places where a governmental license or permit may be required. The 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.

3.13.4.1 Wetlands and Waterbodies

Construction and operation of the proposed Carthage to Perryville 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 our Procedures (see Section 2.6), but would continue throughout the life of the proposed Project.

If approved and constructed the Carthage to Perryville Project and other reasonably foreseeable future projects would impact wetlands and would include the permanent loss or conversion of some existing wetlands (see Section 3.4); exceptions to this are the proposed DEFS and Enbridge pipeline laterals, which would not affect wetlands or waterbodies. Elements of these projects that have 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 154 wetland areas resulting in a total of approximately 127.7 acres of wetland disturbance, including approximately 86.5 acres of forested wetland impacts. In Section 3.4, we have included recommendations for development of site-specific wetland crossing plans and incorporation of an additional HDD to further minimize forested wetland effects. CEGT has also indicated that compensatory mitigation for wetland impacts associated with the proposed Project would be provided through the purchase of wetland mitigation bank credits in the area of the proposed Project. Further, discharges to wetlands and other surface waters associated with construction and operation would require review, approval, and mitigation (if necessary) under the TCEQ and LDEQ stormwater discharge programs.

Construction of the proposed Carthage to Perryville Project would result in 246 individual waterbody crossings. As described in Section 3.3, CEGT proposes to use HDD techniques to accomplish pipeline installation across 22 waterbodies, including nine major waterbodies, two designated Louisiana State Scenic Streams, Black Lake Bayou (MP 66.1) and Saline Bayou (MP 80.8), and one NPS-designated NRI stream, the Sabine River (MP 4.3). The use of HDD would avoid direct impacts to waterbodies and minimize impacts to riparian vegetation at those crossings. We have also provided a recommendation for implementation of an additional HDD that would further avoid construction and operational impacts to riparian vegetation at an additional waterbody crossing (see Section 3.4). Though impacts to surface waters would occur during the HDD installation process, either through an inadvertent release of drilling fluids (frac-out) or through accidental fuel and chemical spills, the likelihood and potential damage associated with such events would be greatly reduced by the implementation of CEGT's DDCP (Appendix D) and SPCC Plan (Appendix C), respectively.

Because most of the projects listed in Table 3.13-1 are located within the same major watersheds crossed by the proposed Project pipeline, and because some of these projects would likely involve direct

and indirect waterbody impacts, the proposed Project and other reasonably foreseeable future projects would result in some cumulative impacts to waterbodies. However, because the Carthage to Perryville Project would not involve construction of permanent diversions or dams, impacts to surface water quality would be temporary. These temporary impacts would include runoff from construction areas, temporary and localized increases in turbidity and sedimentation associated with in-water construction, and withdrawal and discharge of surface waters for hydrostatic testing of pipeline segments. As described in Section 3.3, these effects would be relatively minor and would be further minimized by implementation of our Procedures and the recommendations included in this EIS.

We conclude that the cumulative impacts of the Carthage to Perryville Project and the projects listed in Table 3.13-1 on wetlands and waterbodies would be minor.

3.13.4.2 Vegetation and Wildlife

Construction of the proposed Project and other reasonably foreseeable future projects would have a cumulative impact on native vegetation and associated wildlife. These cumulative impacts would be most significant if 1) the projects were constructed at or near the same time and within close proximity of one another, and 2) the affected vegetative communities would take a long time to recover. The proposed Project, if approved, would impact native vegetative communities, including approximately 461.0 acres of native upland forest and 878.0 acres of pine plantation. Impacts to forested land and other native vegetative communities associated with the construction and operation of the Regency Intrastate Expansion Project and the proposed East Texas Expansion Project are not available at this time. However, these impacts would likely have a cumulative effect on vegetation and wildlife when considered in conjunction with the proposed Project. The proposed roadway improvement projects listed in Table 3.13-1 are not likely to significantly impact forests or other native plant communities as these projects would largely be sited within existing disturbed roadway rights-of-way.

Cumulative impacts, such as lost acreage of forestland, within a region are additive. Further, 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 since population levels for many such species are currently low and on the decline.

The extent and duration of habitat fragmentation and other cumulative impacts to wildlife habitat associated with construction of the proposed Project and other reasonably foreseeable future projects would be minimized by siting these projects to the greatest extent practicable through existing maintained rights-of-way and other disturbed areas. CEGT's proposed route would be collocated with or parallel existing utility rights-of-way where possible, thereby minimizing impacts to previously undisturbed vegetation. The proposed pipeline route would parallel existing rights-of-way for approximately 40 miles, or about 23 percent of the proposed route. Additionally, approximately 35 percent of the proposed pipeline route would traverse agricultural and open lands that would typically experience rapid revegetation. Further, CEGT would implement the mitigation measures outlined in our Plan and Procedures to encourage the regrowth of native vegetation and discourage the spread of exotic or noxious plant species.

Thirty-one threatened, endangered, and/or special status wildlife and plant 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 have determined that the proposed Project would not be likely to adversely affect any federally listed or special status species. However, if other reasonably foreseeable future projects were to impact the

same habitats as the proposed Project, cumulative impacts to these listed species would occur. However, because the protection of threatened, endangered, and other special status species is considered as part of federal and state permitting processes, impacts to such species would likely be reduced or eliminated through conservation and mitigation measures identified during those relevant permitting processes.

3.13.4.3 Land Use

Construction of the Carthage to Perryville 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 2,497.9 acres of land during construction. Approximately 37 percent of that land would be pine plantation, 23 percent would be forested land, and 24 percent would be agricultural land. Open land, residential, commercial/industrial, and open water land cover and uses would also be affected. 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 463.5 acres of pine plantation and 311.1 acres of forested uplands and wetlands to maintained utility right-of-way.

Land use impacts associated with the construction and operation of the Regency Intrastate Expansion Project and the proposed East Texas Expansion Project are not available at this time. However, land use impacts associated with those projects would likely have a cumulative effect when considered in conjunction with the proposed Project. Because both 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 roadway projects such as TTC 69, which would permanently convert thousands of acres of land to paved impervious surface, much of the land affected during construction of the proposed Project and the other pipeline projects would be restored and allowed to revert to preconstruction uses and condition 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 agricultural or open land would be short-term and minor. Cleared forestland and pine plantation located outside of permanently maintained rights-of-way would take many years to return to preconstruction conditions, with the duration of recovery dependent on the types and ages of trees removed, resulting in long-term impacts. However, given the prevalence of these land uses and cover types within the affected counties and parishes, significant cumulative effects would not be anticipated.

3.13.4.4 Air Quality

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

Because construction-related air emissions would be temporary and localized in nature, they would be unlikely to contribute significantly to cumulative air quality impacts. Air emissions from operations of the proposed Project and the other projects listed in Table 3.13-1 would be additive since they would be discharged into a shared air basin. However, all counties and parishes in which the proposed Project would be constructed are in attainment for all NAAQS criteria pollutants. Further, each

of the projects listed in Table 3.13-1 would be required to meet all applicable federal and state air quality standards. For these reasons, cumulative impacts to air quality are not anticipated.

3.13.4.5 Noise

Potential noise impacts associated with the proposed Project and those projects listed in Table 3.13-1 would occur during construction and operation. Because of the linear nature of these projects, construction-related noise impacts would tend to be of short duration in a given area. Further, most construction activities would be limited to daylight hours, so construction-related noise impacts would not occur at night for the most part. Potential noise-related impacts during operation of the proposed Project and the other pipeline projects listed in Table 3.13-1 would primarily be limited to the vicinity of the associated compressor stations. As described in Section 3.11, the estimated noise that would be generated by the proposed Panola and Vernon Compressor Stations would meet acceptable levels at the nearest NSA.

Noise emissions from compressor station operations may be additive with noise-generating elements of other reasonably foreseeable future projects if they are located near a common NSA. However, no other compressor station, roadway improvement, or other noise-generating source for the identified projects would be located within 1 mile of either of the proposed Carthage to Perryville Project compressor stations. We therefore conclude that the cumulative impact of the proposed Project on the noise environment would be negligible.

3.13.5 Conclusions

In the event both of the pipeline projects currently under our review are certificated, the Carthage to Perryville and East Texas Expansion Projects would be constructed within the same general area, and the effects of these actions would overlap in time. Additionally, the type of project, construction methods, and impacts would be similar. Though the nonjurisdictional projects identified in our analysis would also be constructed within a similar timeframe using similar construction methods, any potential contribution to cumulative impacts of the proposed Project would be negligible due to the small scope of those projects. The unrelated projects identified in our cumulative impact analysis would be of a different nature than the proposed Project, but would affect similar resources. Each of these unrelated projects would result in temporary and minor effects during construction, but 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 the avoidance or minimization of cumulative impacts. We therefore consider that the potential cumulative impacts of the two pipeline projects under our review have been or would be minimized.

We believe that impacts associated with the proposed Project would be relatively minor, and we have included numerous recommendations in this EIS to further reduce the environmental impacts associated with the Project. The environmental impacts associated with the proposed Project would be minimized by careful project routing, utilization of HDD techniques to avoid and minimize impacts to some sensitive resources, and implementation of appropriate mitigation measures. Consequently, only a small cumulative effect is anticipated when the impacts of the proposed Project are added to past, present, or reasonably foreseeable future projects in the area.