

Appendix D

ALTERNATIVE CROSSING COMPARISON SUMMARY

All alternative crossings of Bayou Dorcheat (i.e., Alternative 5, Option 1, and Alternative 4) are under consideration for permitting by the Louisiana Department of Wildlife and Fisheries (LDWF) Louisiana Scenic Stream Coordinator at this time; however, no permit application has been filed. The *Scenic Stream Permitting Guidelines* (<http://www.wlf.state.la.us>) require an evaluation of several topics in association with the permit application. Topics that must be addressed in these permit applications have been evaluated for each alternative, and summarized in the table below. Evaluations for each of the three crossing alternatives are provided following this summary.

Comparison of Alternative Crossings

| Criteria | Alternatives 5 and 5.2 | Alternatives 5.1 and 5.1 & 2 | Alternatives, 4, 4.2, and 4.2 & 3 |
|---------------------------------|---|--|---|
| Existing Land Use | Timber management, oil and gas exploration activities, and undisturbed bottomland hardwood forests | Same as Alternative 5. | Same as alternative 5, as well as residential land uses west of Bayou Dorcheat. |
| Historical/ Archeological Sites | High potential for unrecorded archaeological sites. | One recorded archaeological site on west bank of Bayou Dorcheat at crossing; high potential for unrecorded archaeological sites. | High potential for unrecorded archaeological sites. |
| Economic Impact of the Project | Actively under timber management. No businesses displaced by alternative in vicinity of crossing. | Same as Alternative 5. | No active timber management; however, several sand and gravel mining operations in vicinity of crossing, which may be affected. No businesses displaced by alternative in vicinity of crossing. |
| Wilderness/ Rural Quality | High rural quality, but low wilderness quality because of existence of pipeline corridor, timber management operations, and oil and gas operations in vicinity of crossing. | High rural quality, but low wilderness quality because of existence of LA 160 bridge crossing; timber management operations, and oil and gas operations in vicinity of crossing. | High rural quality, but low wilderness quality because of presence of KCS Rail crossing and noise. Residential land use also present in crossing vicinity. |
| Scenic/ Aesthetic Value | Would have the most dramatic post-construction change to viewsheds. | Existence of LA 160 crossings in same reach as planned for Option 1 crossing mitigates adverse scenic effects. | Dense vegetation obscures most views of crossing. Therefore, adverse scenic effects are minimized by this alternative. |

**Bayou Dorcheat Crossing
I-69, SIU No. 14
Haughton, Louisiana to El Dorado, Arkansas**

| Criteria | Alternatives 5 and 5.2 | Alternatives 5.1 and 5.1 & 2 | Alternatives, 4, 4.2, and 4.2 & 3 |
|------------------------------------|---|---|--|
| Recreational Use/ Opportunities | Water depth and open, unobstructed views along Bayou Dorcheat in this crossing location suggests that this crossing location has greatest recreational potential. | Same as Alternative 5, except Bayou Dorcheat reach at Option 1 already has a highway structure (LA 160 bridge) that may already adversely affect recreation. | Water depth and remote location limit this section of Bayou Dorcheat for recreational use. Hunting, however, is an activity that takes place in this area |
| Ecological Systems Present | Adjacent ecological systems include mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas. Bayou Dorcheat at crossing is a robust aquatic habitat. | Adjacent ecological systems include mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas. Bayou Dorcheat at crossing is a robust aquatic habitat. | Adjacent ecological systems include mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas. Bayou Dorcheat at crossing is bottomland hardwood swamp; limited aquatic habitat. |
| Fish and Wildlife in the Area | Robust lotic habitat with similarly healthy adjacent wetlands. No federally protected faunal species records at crossing location, but several Louisiana protected, rare, endangered or threatened species are known to occur along Bayou Dorcheat. | Robust lotic habitat with similarly healthy adjacent wetlands. No federally protected faunal species records at crossing location, but several Louisiana protected, rare, endangered or threatened species are known to occur along Bayou Dorcheat. | Swampy area, with limited resident aquatic community. No federally protected faunal species records at crossing location, but several Louisiana protected, rare, endangered or threatened species are known to occur along Bayou Dorcheat. |
| Botanical Elements | Mature mixed forest adjacent to crossing location. Pipeline corridor cleared and only location where dense herbaceous species present. No local records of rare elements or threatened and endangered species. | Mature mixed forest adjacent to crossing location. No local records of rare elements or threatened and endangered species. | Crossing location is best characterized by swamp, dominated by overcup oak, water hickory, and bald cypress. Storm damage and the railroad corridor have opened forest canopy in many areas. No local records of rare elements or threatened and endangered species. |
| Geological Features | Fairly broad floodplain, with erodible soils. Natural levees present. | Fairly broad floodplain, with erodible soils. Natural levees present. | Braided channels; no apparent thalweg. Floodplain very broad with no natural levees. |

**Bayou Dorcheat Crossing
I-69, SIU No. 14
Haughton, Louisiana to El Dorado, Arkansas**

| Criteria | Alternatives 5 and 5.2 | Alternatives 5.1 and 5.1 & 2 | Alternatives, 4, 4.2, and 4.2 & 3 |
|------------------------|---|---|---|
| Hydrological Features | Fuyton-Ouchita silt loam soils dominant. Crossing location where Bayou Dorcheat reach is straight. Pipeline crossing to north may affect flow in Bayou Dorcheat. | Fuyton-Ouchita silt loam soils dominant. Crossing location where Bayou Dorcheat reach is straight. LA 160 crossing to north may affect flow in Bayou Dorcheat . | Fuyton-Ouchita silt loam soils dominant. Hydrologic regime substantially altered by Kansas City Southern Railroad embankment. |
| Water Quality/Quantity | Well vegetated crossing location expected to filter suspended solids. No evidence of significant point or non-point pollution sources near crossing. Water depth supports robust aquatic community. | Well vegetated crossing location expected to filter suspended solids. No evidence of significant point or non-point pollution sources near crossing. Water depth supports robust aquatic community. | Well vegetated crossing location expected to filter suspended solids. No evidence of significant point or non-point pollution sources near crossing. Shallow water depth supports only a limited aquatic community. |

Based on the LDWF *Scenic Stream Permitting Criteria* alone, Alternative 4 is the preferred and Alternative 5 is the least preferred Bayou Dorcheat crossing. Important facts supporting this conclusion follow:

- Alternative 4 minimizes adverse effects to existing recreation use of Bayou Dorcheat;
- Alternatives 5 and 5.1 have greater future recreation potential than Alternative 4;
- Dense vegetation will obscure views of the proposed I-69 SIU No. 14 bridge and the Kansas City Southern rail tracks at the Alternative 4 crossing of Bayou Dorcheat.
- The existing LA 160 bridge over Bayou Dorcheat in the Alternative 5.1 viewshed will mitigate adverse visual effects of a new bridge;
- The new bridge over Bayou Dorcheat for Alternative 5 will result in the most dramatic post-construction change to a Bayou Dorcheat viewsheds of the three alternative crossing locations.
- Ecological systems present at the Alternative 5 and 5.1 crossing locations are more robust, fulfill more wetland functions, and have greater habitat value than that at the Alternative 4 crossing location; and
- Of the three Bayou Dorcheat crossing locations, Alternative 4 has endured the greatest hydrologic flow alternation from natural conditions from the Kansas City Southern railroad embankment.

ALTERNATIVES 5 AND 5.2 CROSSING

Existing Land Use: This criterion pertains to the potential magnitude of change that the crossing would have on existing land use at and in the vicinity of the crossing. The existing land use around the Bayou Dorcheat crossings of Alternative 5 consists of timber management, oil and gas exploration, and pockets of undisturbed bottomland hardwood habitat.

Historical/Archaeological Sites: This criterion pertains to the potential adverse effects that the crossing would have on recorded and unrecorded cultural areas, including archaeological sites, standing historic structures, and historic Native American lands. There are no recorded historical or archaeological sites within the required right-of-way of the Bayou Dorcheat crossing of Alternative 5. However, due to the proximity of available water, soil types in the area and slope of the land, the entire area around the Alternative 5 crossing has a high probability for potential unrecorded archaeological findings.

Economic Impact of Project: This criterion pertains to the potential that the crossing would directly or indirectly affect commerce. Much of the land surrounding Bayou Dorcheat in the vicinity of Alternative 5 is actively under silvaculture and is bordered by oil and gas wells.



Photo 1: Looking downstream at the Alternative 1 and 2 crossing of Bayou Dorcheat

Wilderness/Rural Quality: This criterion pertains to the potential changes that may result to the existing wilderness and/or rural quality of the area from the crossing. Due to the fact that there is no development along Bayou Dorcheat or within its floodplain at

its crossing by Alternative 5, rural quality of the area is high. However, the wilderness quality is rather low for several reasons. Timber management along both sides of the bayou is present, with cleared areas visible from the water. Several logging and oil and gas activity access roads are visible from the water.

Scenic/Aesthetic Value: This criterion pertains to the potential effects that a crossing would have on the existing scenic vistas along the Scenic Stream. In the area of Alternative 5, Bayou Dorcheat's banks are covered by native, undisturbed vegetation, including mature cypress at the waters edge and mature pine woods or bottomland hardwood forests extending from the bank. While there is a buffer, timber harvesting is visible from the water reducing the aesthetic value. The bayou is a single, fairly large channel at this location, allowing for a broad view shed of the bayou's open reach bordered by large, old growth trees. The proposed crossing of Bayou Dorcheat in the vicinity of Alternative 5 has substantially long reaches of Bayou Dorcheat with unobstructed views along these reaches. The proposed Bayou Dorcheat crossing bridge will become the dominant feature in the landscape along this reach of Bayou Dorcheat. **Photo 1** displays a typical view in the vicinity of the proposed crossing at Alternative 5.

Recreational Use / Opportunities: This criterion pertains to the potential beneficial or adverse effects that a crossing would have on existing and future recreational opportunities associated with the scenic stream. Bayou Dorcheat in the vicinity of Alternative 5 has a well-defined channel that is navigable under all flow conditions. Access from existing logging and oil and gas activity access roads could be improved with parking to facilitate access to Bayou Dorcheat via boat ramps, piers and other means in the vicinity of Alternative 5. Additionally, the deep waters of Bayou Dorcheat south and north of its crossing of Alternative 5 provide a long navigable stretch for boating and fishing activities. Based on existing conditions, Bayou Dorcheat in the vicinity of Alternative 5 appears to have good recreational opportunities. An alignment through this area would become the dominant visual feature in the area although the bridge would be at low-level. This new visual feature at the crossing of Alternative 5 may adversely affect enjoyment of these relatively long and straight reaches of Bayou Dorcheat.

Ecological Systems Present: This criterion relates to the broad (landscape-scale) context of the proposed crossing, including major vegetative cover types and patterns of fragmentation and connectivity. The area within a one-mile radius of the approximate center of the active stream channel crossing of Alternative 5 consists of a mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas to the east. To the west is riparian wetland forest and managed pine forest. The active channel of Bayou Dorcheat meanders through the landscape from northwest to south-southeast, although the frequency and acuity of the bends are somewhat greater in the northwestern two-thirds. This channel is near the toe of a ridge on the eastern side, whereas the active floodplain extends about 4,500 to 4,900 feet westward. The channel is well-incised, between 90 and 130 feet wide, and about 27

feet deep near the thalweg at bankfull stage. The crossing of Alternative 5 is parallel to, and about 200 feet downstream (south) from a liquid petroleum pipeline corridor. The pipeline corridor and two gas-field roads fragment the riparian (floodplain) forest in the vicinity.

Fish and Wildlife in the Area: This criterion pertains to the known or potential occurrence of natural animal communities (both aquatic and terrestrial), including representatives of rare taxa. Although slightly depressed by the localized erosion of the east bank at and near the pipeline crossing for Alternative 5, physical habitat characteristics for a low-gradient stream, based on USEPA Rapid Bioassessment Protocols (RBPs), were relatively favorable as recorded during a September 2003 field study. Many anecdotal observations during this survey indicated the presence of a robust and diverse warm-water aquatic community. According to the 2002 *Louisiana Water Quality Inventory, Section 305(b)* Report, much of the entire bayou upstream from Lake Bistineau supports “good to excellent fish populations.” The forested floodplain on the west side of the stream is extensive and generally secluded; it would therefore be expected to support a diverse community of lowland and ubiquitous terrestrial wildlife. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered species. However, the aforementioned 2002 305(b) Report indicates that several protected/rare/endangered/threatened species (PRETS) occur along Bayou Dorcheat.

Botanical Elements: This criterion relates to the known or potential occurrence of natural vascular plant communities, including representatives of rare taxa. Immediately adjacent to the bayou on both sides of the crossing of Alternative 5 are mature mixed forests; that of the west side is dominated by baldcypress and overcup oak, interspersed with a few loblolly pine, while on the east the same ranking exists but pines are more prevalent. A few feet inland the canopy is virtually complete, so that understory is sparse except along the stream, where water elms and an occasional buttonbush are present. Along the pipeline corridor north of the proposed crossing, there are areas of dense herbaceous ground cover. About 100 to 150 feet inland, on both sides of the stream, the forest becomes dominated by loblolly pine, with those to the west obviously having been planted in the vicinity of Alternative 5. Canopy closure in this stand of pines is intermittent, with the result that understory (mainly sweetgum, American holly, and yaupon) and herbaceous ground cover (various grasses and forbs) are more prevalent. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered species along any of the crossings of Alternative 5.

Geological Features: This criterion pertains to the potential suitability of the project given the existing soils and geologic conditions at the site, as well as the effects to unique geologic features present in the area. In the vicinity of the Bayou Dorcheat crossing of Alternative 5, Bayou Dorcheat has a fairly broad floodplain with natural

levees along the bayou's single main channel. The terrain rises from the floodplain into typical pine wood hills of North Louisiana. Soils along Alternative 5 are a sandy-clay mix and tend to be highly erodible, especially when vegetation is removed. There is evidence of erosion along the banks in the form of sloughing from the bank walls and wash-out holes in the bank's crown.

Hydrological Features: This criterion pertains to the overall hydrological features of the stream at the proposed crossing location including the overall flow regime and the potential for soil erosion (scour). Concerning potential for scour, the crossing location is predominated by Guyton-Ouachita silt loams, frequently flooded, which are common for flood plains of major streams. The soils are mostly silty and poorly drained, which typically leads to a "crust" on the outer covering of the soil. Once exposed, the soils can be susceptible to erosion even at moderate flow rates. Based on preliminary hydraulic evaluation, flow rates along Bayou Dorcheat, in the vicinity of Alternative 5, would not result in an appreciable increase at moderate (25-year) or high (100-year) flood events. Additionally, Alternative 5 appears to cross Bayou Dorcheat in an area where the stream is relatively straight. This will minimize potential scour potential. Alternative 5 has already had hydraulic impacts due to existing bridges at LA 2 (upstream), an oil-field road bridge (downstream), LA 160 (downstream), and the existing pipeline crossing immediately north.

Water Quality / Quantity: This criterion pertains to the potential of the crossing to degrade water quality and/or reduce instream flow requirements for aquatic plant and animal communities. As noted above, aside from the pipeline corridor and some localized bank erosion, the riparian corridor in the vicinity of the crossing is well vegetated and would be expected to protect the downstream reach from excessive inputs of suspended solids. There is no evidence of any significant point or non-point sources of anthropogenic contaminants for several miles upstream of the crossing. The 2002 Section 305(b) Report presents information from the only LDEQ water-quality monitoring station that suggests that fish and wildlife propagation and outstanding natural resource uses are not fully supported in Subsegment 100501 (Arkansas boundary to Lake Bistineau). This monitoring station, however, is more than 30 stream miles below the crossing location for Alternative 5 and is unlikely to represent conditions at the Alternative 5 crossing. Because of the relatively large cross-sectional area of the single active bayou channel at the proposed crossing for Alternative 5, flow volumes are consistently adequate to support substantial lotic communities.

ALTERNATIVES 5.1 AND 5.1 & 2 CROSSING

Existing Land Use: This criterion pertains to the potential magnitude of change that the crossing would have on existing land use at and in the vicinity of the crossing. The existing land use around the Bayou Dorcheat crossing of Alternative 5.1 consists of timber management, oil and gas exploration, and pockets of undisturbed bottomland hardwood habitat.

Historical/Archaeological Sites: This criterion pertains to the potential adverse effects that the crossing would have on recorded and unrecorded cultural areas, including archaeological sites, standing historic structures, and historic Native American lands. There is one recorded archaeological site in the alignment of Alternative 5.1, located on the west bank of Bayou Dorcheat. This site was recorded in January 2005. While its eligibility for listing on the National Register of Historic Places has not yet been determined, research potential was noted as “good” by the recording archaeologist. Additionally, due to the proximity of available water, soil types in the area and slope of the land, the entire area around the crossings of Alternative 5.1 has a high probability for potential unrecorded archaeological findings.

Economic Impact of Project: This criterion pertains to the potential that the crossing would directly or indirectly affect commerce. Much of the land surrounding Bayou Dorcheat in the vicinity of Alternative 5.1 is actively under silvaculture and is bordered by oil and gas wells.

Wilderness/Rural Quality: This criterion pertains to the potential changes that may result to the existing wilderness and/or rural quality of the area from the crossing. Due to the fact that there is no development along Bayou Dorcheat or within its floodplain at its crossing by Alternative 5.1, the rural quality of the general area is high. However, the wilderness quality of the specific Alternative 5.1 crossing is rather low for several reasons. Timber management along both sides of the bayou is present, with cleared areas visible from the water. Several logging and oil and gas activity access roads are visible from the water, as is the existing LA 160 bridge over Bayou Dorcheat.

Scenic/Aesthetic Value: This criterion pertains to the potential effects that a crossing would have on the existing scenic vistas along the Scenic Stream. In the area of Alternative 5.1, Bayou Dorcheat’s banks are covered by native, undisturbed vegetation, including mature cypress at the waters edge and mature pine woods or bottomland hardwood forests extending from the bank. While there is a buffer, timber harvesting is visible from the water reducing the aesthetic value. The bayou is a single, fairly large channel at this location, allowing for a broad view shed of the bayou’s open reach bordered by large, old growth trees. The proposed crossing of Bayou Dorcheat in the vicinity of Alternative 5.1 is a substantially long reach of Bayou Dorcheat with

unobstructed views except to the north because of the presence of the LA 160 bridge over Bayou Dorcheat.

Recreational Use / Opportunities: This criterion pertains to the potential beneficial or adverse effects that a crossing would have on existing and future recreational opportunities associated with the scenic stream. Bayou Dorcheat in the vicinity of Alternative 5.1 has a well-defined channel that is navigable under all flow conditions. Access from LA 160 could be improved with parking to facilitate access to Bayou Dorcheat via boat ramps, piers and other means in the vicinity of Alternative 5.1. Additionally, the deep waters of Bayou Dorcheat south and north of its crossing of Alternative 5.1 provide a long navigable stretch for boating and fishing activities. Based on existing conditions, Bayou Dorcheat in the vicinity of Alternative 5.1 appears to have good recreational opportunities. Because of the existence of the LA 160 bridge structure in this reach of Bayou Dorcheat, post-construction effects to recreation demand should be minimally adverse. However, introduction of a new man-made structure for the Alternative 5.1 crossing of Bayou Dorcheat may further adversely affect views and enjoyment of this long and straight reach of Bayou Dorcheat.

Ecological Systems Present: This criterion relates to the broad (landscape-scale) context of the proposed crossing, including major vegetative cover types and patterns of fragmentation and connectivity. The area within a one-mile radius of the approximate center of the active stream channel crossings of Alternative 5.1 consists of a mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas to the east. To the west is riparian wetland forest and managed pine forest. The active channel of Bayou Dorcheat meanders through the landscape from northwest to south-southeast, although the frequency and acuity of the bends are somewhat greater in the northwestern two-thirds. This channel is near the toe of a ridge on the eastern side, whereas the active floodplain extends about 4,500 to 4,900 feet westward. The channel is well-incised, between 90 and 130 feet wide, and about 27 feet deep near the thalweg at bankfull stage.

Fish and Wildlife in the Area: This criterion pertains to the known or potential occurrence of natural animal communities (both aquatic and terrestrial), including representatives of rare taxa. Physical habitat characteristics for a low-gradient stream, based on USEPA Rapid Bioassessment Protocols (RBPs), were relatively favorable as recorded during a September 2003 field study. Many anecdotal observations during this survey indicated the presence of a robust and diverse warm-water aquatic community. According to the 2002 *Louisiana Water Quality Inventory, Section 305(b)* Report, much of the entire bayou upstream from Lake Bistineau supports “good to excellent fish populations.” The forested floodplain on the west side of the stream is extensive and generally secluded. It would therefore be expected to support a diverse community of lowland and ubiquitous terrestrial wildlife. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered

species. However, the aforementioned 2002 305(b) Report indicates that several protected/rare/endangered/threatened species (PRETS) occur along Bayou Dorcheat.

Botanical Elements: This criterion relates to the known or potential occurrence of natural vascular plant communities, including representatives of rare taxa. Immediately adjacent to the bayou on both sides of the crossing of Alternative 5.1 are mature mixed forests; that of the west side is dominated by baldcypress and overcup oak, interspersed with a few loblolly pine, while on the east the same ranking exists but pines are more prevalent. A few feet inland the canopy is virtually complete, so that understory is sparse except along the stream, where water elms and an occasional buttonbush are present. There is very sparse herbaceous ground cover. About 100 to 150 feet inland, on both sides of the stream, the forest becomes dominated by loblolly pine, with those to the west obviously having been planted in the vicinity of Alternative 5.1. Canopy closure in this stand of pines is intermittent, with the result that understory (mainly sweetgum, American holly, and yaupon) and herbaceous ground cover (various grasses and forbs) are more prevalent. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered species along the Alternative 5.1 crossing.

Geological Features: This criterion pertains to the potential suitability of the project given the existing soils and geologic conditions at the site, as well as the effects to unique geologic features present in the area. In the vicinity of the Bayou Dorcheat crossing of Alternative 5.1, Bayou Dorcheat has a fairly broad floodplain with natural levees along the bayou's single main channel. The terrain rises from the floodplain into typical pine wood hills of North Louisiana. Soils along Alternative 5.1 are a sandy-clay mix and tend to be highly erodible, especially when vegetation is removed. There is evidence of erosion along the banks in the form of sloughing from the bank walls and wash-out holes in the bank's crown.

Hydrological Features: This criterion pertains to the overall hydrological features of the stream at the proposed crossing location including the overall flow regime and the potential for soil erosion (scour). Concerning potential for scour, the Alternative 5.1 crossing location is predominated by Guyton-Ouachita silt loams, frequently flooded, which are common for flood plains of major streams. The soils are mostly silty and poorly drained, which typically leads to a "crust" on the outer covering of the soil. Once exposed, the soils can be susceptible to erosion even at moderate flow rates. Based on preliminary hydraulic evaluation, the Alternative 5.1 crossing would not result in an appreciable increase in flow rates at moderate (25-year) or high (100-year) flood events. Additionally, Alternative 5.1 crosses Bayou Dorcheat in an area where the stream is relatively straight. This will minimize potential scour potential. The Alternative 5.1 site has already had hydraulic impacts due to the presence of the LA 160 bridge upstream, an oil-field road bridge (downstream), and an existing pipeline crossing upstream.

Water Quality / Quantity: This criterion pertains to the potential of the crossing to degrade water quality and/or reduce instream flow requirements for aquatic plant and animal communities. As noted above, the riparian corridor in the vicinity of the crossing is well vegetated and would be expected to protect the downstream reach from excessive inputs of suspended solids. There is no evidence of any significant point or non-point sources of anthropogenic contaminants for several miles upstream from any of the crossing. The 2002 Section 305(b) Report presents information from the only LDEQ water-quality monitoring station that suggests that fish and wildlife propagation and outstanding natural resource uses are not fully supported in Subsegment 100501 (Arkansas boundary to Lake Bistineau). This monitoring station, however, is more than 30 stream miles below the Alternative 5.1 crossing, as well as immediately downstream from an urbanized area. Therefore, it is highly unlikely to be representative of any portions of the bayou above such disturbances. Because of the relatively large cross-sectional area of the single active bayou channel at the proposed crossing for Alternative 5.1, flow volumes are consistently adequate to support substantial lotic communities

ALTERNATIVES 4, 4.2, 4.3 AND 4.2 & 3 CROSSING

Existing Land Use: This criterion pertains to the potential magnitude of change that the crossing would have on existing land use at and in the vicinity of the crossing. Existing land use around the Alternative 4 crossing of Bayou Dorcheat includes timber management, oil and gas exploration, and pockets of undisturbed bottomland hardwood habitat, as well as developed land on the east side of the bayou, which consists of a few residential structures.

Historical/Archaeological Sites: This criterion pertains to the potential adverse effects that the crossing would have on recorded and unrecorded cultural areas, including archaeological sites, standing historic structures, and historic Native American lands. There are no recorded historical or archaeological sites within the required right-of-way of the Bayou Dorcheat crossings of Alternative 4. However, due to the proximity of available water, soil types in the area, and slope of the land, there is a high probability for potential unrecorded archaeological findings.

Economic Impact of Project: This criterion pertains to the potential that the crossing would directly or indirectly affect commerce. Land surrounding the Bayou Dorcheat crossing of Alternative 4 is swampy, with limited silvaculture or development opportunities. However, several gravel mining operations are located along the southern reach of Bayou Dorcheat in the vicinity of Alternative 4.



Photo 1: Looking east at the Alternative 4 crossing of Bayou Dorcheat



Photo 2: Looking west at the Alternative 4 crossing of Bayou Dorcheat



Photo 3: Looking downstream at the Alternative 4 crossing of Bayou Dorcheat, railroad trestle in background



Photo 4: Looking upstream at the Alternative 4 crossing of Bayou Dorcheat

Wilderness/Rural Quality: This criterion pertains to the potential changes that may result to the existing wilderness and/or rural quality of the area from the crossing. The area surrounding the Bayou Dorcheat crossing for Alternative 4 has residential development on the eastern side of the bayou lowering the rural quality of the area, as well. While the floodplain is fairly intact and development is not visible from the bayou, there is timber management on both sides of the floodplain reducing the wilderness quality of Bayou Dorcheat in its reach around Alternative 4. The wilderness quality of this reach is further reduced by a railroad crossing of the bayou, intersecting the Bayou crossing of Alternative 4.

Scenic/Aesthetic Value: This criterion pertains to the potential effects that a crossing would have on the existing scenic vistas along the Scenic Stream. In the vicinity of Alternative 4, Bayou Dorcheat is braided with no main channel. The closed-canopy swamp with no sizable open areas is mature and dense. While sight distance is limited, scenic views are abundant. Residential development and timber management is present in the area; however, these activities are not readily visible from the bayou in the vicinity of Alternative 4. The railroad crossing of Bayou Dorcheat at Alternative 4 will require an overpass structure that will be approximately 40 feet above the average water level of Bayou Dorcheat. While this structure will become the dominant feature in the landscape, the mature, dense swamp in this region limits sight distance and views of the landscape from the water. **Photos 1 - 4** display views in the vicinity of the Alternative 4 crossing of Bayou Dorcheat.

Recreational Use / Opportunities: This criterion pertains to the potential beneficial or adverse effects that a crossing would have on existing and future recreational opportunities associated with the scenic stream. The remote nature of Bayou Dorcheat in the vicinity of its crossing along Alternative 4 has limited the recreational opportunities in this region. The braided and broad nature of the waterway along this reach of Bayou Dorcheat does not provide for parking areas, boat ramps or other means of public

access. Water depth during most of the year precludes most boating activities. Alignments through this region would necessarily be approximately 40 feet high at the Kansas City Southern Railroad in order to provide the necessary 23.5-foot vertical clearance required for railroads. Noise and visual effects from this alignment may adversely affect hunting and nature viewing in this region or have a perceived effect.

Ecological Systems Present: This criterion relates to the broad (landscape-scale) context of the proposed crossing, including major vegetative cover types and patterns of fragmentation and connectivity. The area within the vicinity of the Alternative 4 crossing and the easternmost bayou channel consists of a mixture of managed upland pine forest, pasture, riparian wetland forest, and landscaped residential areas to the east. Riparian wetland forest and managed pine forest are located to the west. Bayou Dorcheat in the vicinity of Alternative 4 is better characterized as a swamp with numerous and braided shallow sloughs. Under base-flow conditions, it appears that there is no continuous surface flow through this reach of the bayou's valley. The active floodplain in this area is about 2,000 feet wide; however, the proposed crossing is on a diagonal traversing about 3,800 feet of swamp. The high structure that will be present for the Alternative 4 crossing will allow for safe and more confident passage by wildlife under the structure.

Fish and Wildlife in the Area: This criterion pertains to the known or potential occurrence of natural animal communities (both aquatic and terrestrial), including representatives of rare taxa. Based on field investigations in September 2003, using the USEPA Rapid Bioassessment Protocols (RBPs), evidence of only a limited resident aquatic community in the vicinity of the Alternative 4 crossing was noted. The forested floodplain on the west side of the stream is extensive and generally secluded; it would therefore be expected to support a diverse community of lowland and ubiquitous terrestrial wildlife. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered species. However, the aforementioned 2002 305(b) Report indicates that several protected/rare/endangered/threatened species (PRETS) occur along Bayou Dorcheat.

Botanical Elements: This criterion relates to the known or potential occurrence of natural vascular plant communities, including representatives of rare taxa. The swamp in the vicinity of the proposed crossing of Alternative 4 is dominated by overcup oak, water hickory, and baldcypress. Apparent storm damage and the railroad corridor have opened the forest canopy in many areas, resulting in localized high densities of understory (mainly water elm, buttonbush, and sweetgum,) and herbaceous ground cover (various grasses [especially panic grass] and forbs). Where there are canopy gaps associated with sloughs, the margins are frequently populated with thickets of water elm, buttonbush, and black willow. Information provided by the Louisiana Natural Heritage Program (LNHP) and the U.S. Fish and Wildlife Service in 2003 did not indicate any local records of rare elements or threatened and endangered species along the crossings of Alternative 4.

Geological Features: This criterion pertains to the potential suitability of the project given the existing soils and geologic conditions at the site, as well as the effects to unique geologic features present in the area. Bayou Dorcheat in the vicinity of Alternative 4 is extremely braided with no substantial channels. Due to this braiding, the area surrounding the Bayou Dorcheat crossing of Alternative 4 is fairly flat and swamp-like with no natural levees as banks.

Hydrological Features: This criterion pertains to the overall hydrological features of the stream at the proposed crossing location including the overall flow regime and the potential for soil erosion (scour). Concerning potential for scour, the Alternative 4 crossings is predominated by Guyton-Ouachita silt, loams, frequently flooded, which are common for flood plains of major streams. The soils are mostly silty and poorly drained, which typically leads to a “crust” on the outer covering of the soil. Once exposed, the soils can be susceptible to erosion even at moderate flow rates. The existing flow regime of the Alternative 4 crossing appears to be hydrologically impacted by the Kansas City Southern Railroad crossing. Alternative 4 crosses Bayou Dorcheat in the immediate vicinity of this railroad crossing of Bayou Dorcheat. The existence of the railroad along the western boundary of the Dorcheat floodplain in this area has impacted the area’s flow regime by directing all flow through the relatively limited opening of the railroad bridge. No further alteration to hydrologic flow would be expected from the new bridge at the Alternative 4 crossing.

Water Quality / Quantity: This criterion pertains to the potential of the crossing to degrade water quality and/or reduce instream flow requirements for aquatic plant and animal communities. The swamp in the vicinity of the Alternative 4 crossing is well vegetated and would be expected to protect the downstream reach from excessive inputs of suspended solids. There is no evidence of any significant point or non-point sources of anthropogenic contaminants for several miles upstream from the Alternative 4 crossing. The 2002 Section 305(b) Report presents information from the only LDEQ water-quality monitoring station that suggests that fish and wildlife propagation and outstanding natural resource uses are not fully supported in Subsegment 100501 (Arkansas boundary to Lake Bistineau). This monitoring station is at least 5 miles below Alternative 4, as well as immediately downstream from an urbanized area, so it is highly unlikely to be representative of any portions of the bayou above such disturbances. Along this reach of Bayou Dorcheat, flow volumes are inadequate to support resident lotic communities.