

CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

Chapter IV of the DEIS provided an analysis of the environmental consequences¹ (social, economic, and ecological impact) that would result from implementation of the no-build alternative, the reasonable alternatives, and the Preferred Alternative. Because the Preferred Alternative is unchanged since the DEIS, this chapter will focus on the new data made available to the project team since the distribution of the DEIS. Specifically, this chapter will:

- 1) Summarize the Preferred Alternative impacts identified in the DEIS
- 2) Present clarifications or new data obtained since the distribution of the DEIS

Chapter IV of the DEIS also included a discussion of the measures incorporated in the Preferred Alternative that were intended to minimize the harm associated with it. This discussion is in **Appendix D**.

A. Summary of the Impacts Associated with the Preferred Alternative

Environmental impacts described in this chapter are organized in the same way as the resources are presented in **Chapter III**:

- Social and Economic Impacts
- Environmental Impacts

1. Social and Economic Impacts

a. Demographics and Environmental Justice

The Metro 2020 Plan identifies the EC-EIS study area as primarily within the “neighborhood district.” This district is suitable for residential subdivisions, small commercial centers, office complexes, and other support uses such as schools, churches, and parks. That description accurately describes the area in the vicinity of the Preferred Alternative. The demographic and environmental justice survey found that the



The Preferred Alternative includes the following modifications:

- The extension of Route 740 from just east of US-63, using a new alignment to the St. Charles Road interchange with I-70
- The improvement of Route WW from US-63 to Olivet Road using the existing alignment
- The extension of Ballenger Lane, as a locally sponsored project

A large-scale depiction of the Preferred Alternative is contained in **Exhibit S-1**. A complete depiction of the roadway configuration for the Preferred Alternative is contained in **Exhibit II-4**. The depiction of the project footprint and direct impacts is contained in **Exhibit IV-1**.

¹An environmental effect or consequence is defined as a modification or change in the existing environment brought about by the action taken. Effects can be direct, indirect, or cumulative and can be temporary (short term) or permanent (long term). Effects can vary in degree, ranging from only a slight discernable change to a drastic change in the environment.

populations affected by the Preferred Alternative were very similar to typical populations throughout Columbia and Boone County.

None of the EC-EIS alternatives would have a disproportionate impact on minority or impoverished populations. As discussed in the DEIS (Chapter III.A.1), available data indicates that there are a low incidence of protected populations in the study area. There is a slightly higher ratio of minorities in the census blocks south of Route WW between the North and South Forks of Grindstone Creek. This area is dominated by the El Chaparral subdivision (see Exhibit IV-D1). The Preferred Alternative (and all reasonable alternatives) avoided encroachments on El Chaparral. Similarly, the percentage of persons below the poverty level in the vicinity of the Preferred Alternatives is also low, comparable to Boone County and the City of Columbia.

Additionally, the residential relocations associated with the Preferred Alternative are distributed throughout the project. Because of this distribution, the residential impacts are better characterized as individual impacts rather than population impacts. As described in **Chapter IV.B.1**, few relocations are expected (+/- 50) and nearly all of the homes to be acquired have appraised values above the median for the area.

Based on census data, public involvement activities, and field work it was concluded that the Preferred Alternative would not have a disproportionate adverse impact on minority and/or low-income populations as defined by Executive Order 12898 and FHWA Order 6640.23.

b. Community Resource Impacts

There would be no relocations of any *churches*. The improvement of Route WW would have a peripheral impact on the Lighthouse Community Church property, located just north of Route WW (4275 Route WW). The Preferred Alternative would encroach on the *southern* edge of the property, potentially affecting some parking areas and requiring reconfiguration of the access point, but would not directly affect the building. A minor amount of frontage along Route WW at Olivet Road may also be required from the Olivet Christian Church and Bible Baptist Church, but no buildings would be affected. The extension of Route 740 would encroach upon the southeastern corner of a parcel owned by the Columbia Christian Church just south of St. Charles Road, but would not affect any buildings or access to the property. There would be no direct impacts to *schools*. The nearest school is Cedar Ridge Elementary (located at the corner of Route WW and Roseta Avenue). While the school will not be directly affected by the improvement of Route WW, allowances may be necessary to maintain school bus access during construction. Coordination with the school administrators will be made in accordance with MoDOT standard procedures and are considered an environmental commitment of this project.

There would be no direct impacts to *cemeteries* as a result of any of the reasonable alternatives.

Relative to *emergency services*, the improvement of Route WW would displace Boone County Fire Protection District Station 12. There would be no relocation of police facilities or other types of facilities. Emergency service vehicle access could be affected during the construction process. Allowances will be required to maintain access to all properties during construction.

There would be no direct impacts to *hospitals* or other medical service facilities as a result of implementing any of the reasonable alternatives.

No direct impacts to *parks or other public open spaces* are expected. However, the improvement of Route WW is adjacent to American Legion Park and construction-related impacts are possible. Allowances may be necessary to maintain access during construction. Coordination with the administrators will be made in accordance with MoDOT standard procedures and are considered an environmental commitment of this project.

c. Consistency with Transportation Planning Goals

The Preferred Alternative is consistent with the CATSO 2025 Transportation Plan.

d. Acquisition, Land Uses, and Planning Impacts

The Preferred Alternative would acquire 275 acres of private property. The current appraised use of these properties is 84 percent farm, 12 percent residential, 3 percent commercial, and 1 percent industrial. Using current zoning classifications, the properties are designated as 31 percent farm, 57 percent residential, 11 percent commercial/industrial, and 1 percent other.

The Preferred Alternative would require the acquisition of 37 structures. The updated breakdown of these structures include: 14 residences, 8 commercial/industrial operations, 8 agricultural buildings, and 7 support/out-buildings. See **Chapter IV.B.1** for updated information related to relocation impacts.

The Preferred Alternative is consistent with the roadway alignments shown in the *Metro 2020* and CATSO plans, and therefore, consistent with community planning.

2. Environmental Impacts

a. Mineral Resource Impacts

Numerous mines, surface and subsurface, were known to be previously active within the study area. Coordination with the Missouri Department of Natural Resources (MDNR) indicated that their records did not show any underground mines within one-half mile of the project. However, MDNR indicated that many mines are not recorded in their records and that any of the proposed routes could encounter problems with underground openings or undesirable geotechnical properties.

b. Farmland Resource Impacts

The Preferred Alternatives would have limited direct impacts to currently cultivated farmlands. In accordance with the Farmland Protection Policy Act (FPPA), the Natural Resources Conservation Service (NRCS) concluded that "*Since the alternatives presented for the most part follow existing roads and highways in an urban developed area, there will be no further loss of prime or statewide important farmland.*"

c. Groundwater and Water Supply Impacts

Based on available geographic information system (GIS) data, approximately 12 public water wells exist in the general vicinity of the EC-EIS project. The development of the

Preferred Alternative is expected to have no measurable impact on the quality of groundwater in nearby wells. According to the MDNR (2005), the primary risk to groundwater quality is the unfiltered flow of contaminated surface runoff or leachate resulting from agricultural and suburban/urban stormwater runoff, wastewater disposal, and lawn care activities directly into aquifers through karst features such as sinkholes or losing streams. There are no known karst features in the project area. The project-related addition of impervious surfaces is not expected to influence aquifer recharge. Land development that will be facilitated by the project is a potentially larger concern. As a general proposition, adherence to appropriate land development policies are necessary to maintain water quality. Since the Preferred Alternative is in accordance with regional planning, it provides the best framework for the appropriate development of eastern Columbia/Boone County, including the protection of water resources.

d. Surface Water Resource Impacts

Relative to *stream impacts*, the Preferred Alternative minimizes impacts to major stream crossings. However, there is a roughly perpendicular crossing of the Hominy Branch associated with the Ballenger Lane extension. Improvements to Route WW would require modification of the existing bridges over the Hominy Branch, the North Fork of Grindstone Creek, and the South Fork of Grindstone Creek. Overwhelmingly, stream impacts are concentrated among the numerous ephemeral streams located in the study area. Roughly 80 percent of stream impacts occur to ephemeral streams.

Relative to *soil erosion/sediment control*, a short-term impact of the EC-EIS is the potential for erosion of soils exposed during construction and sedimentation in streams and wetlands. The primary long-term impacts include altered stormwater runoff patterns due to the additional pavement, pollutants in stormwater runoff from vehicles and roadway maintenance, and continued risk of discharge of pollutants by accidental spillage from vehicles along the roadway.

A wetland delineation was conducted since the DEIS was published. **Chapter IV.B.2** contains updated information relative to impacts.

e. Floodplain Impacts

The Preferred Alternative affects the 100-year floodplains of Hominy Branch, the South Fork of Grindstone Creek, and the North Fork of Grindstone Creek (see **Exhibit IV-1**). The FHWA's floodplain encroachment policy requires the avoidance of longitudinal encroachments wherever practicable. EC-EIS alternatives were developed to avoid longitudinal impacts. An environmental commitment of this project involves obtaining appropriate floodplain permits from the State Emergency Management Agency (SEMA).

f. Wetland and Pond Impacts

Wetland features occur throughout the EC-EIS study area. As a result, there are no prudent and feasible alternatives that would enable complete avoidance of all wetland impacts. The DEIS reported that the wetland impacts associated with the Preferred Alternative would involve 1.59 acres. A wetland delineation was conducted since the DEIS was published. **Chapter IV.B.2** contains updated information relative to impacts.

g. Terrestrial Habitats and Wildlife Impacts

The Preferred Alternative had the lowest total terrestrial habitat impact of the reasonable alternatives considered. The 275 acres of property acquired consisted of 110 acres of woodland areas, 1 acre of cropland, 71 acres of grassland/pasture, 56 acres of scrub/shrub, and 37 acres of urban development areas.

h. Threatened and Endangered Species Impacts

Through coordination with the U.S. Fish and Wildlife Service (USFWS), it was concluded that the potential for impacts on the foraging habitats (the area's stream corridors) of the gray bat and the Indiana bat could be minimized through implementation of approved best management practices.

Coordination with the Missouri Department of Conservation (MDC) concluded that no state- or federal-listed rare species or rare natural communities were found to occur within or near the EC-EIS study area.

i. Hazardous Substance Impacts

Based on a literature search, a commercial database search, and a limited field study to identify potential hazardous waste generators, a total of 29 areas of potential concern were identified within the entire EC-EIS study area. The sites were typical commercial and industrial sites. None of the 29 sites seemed to present cleanup costs that could be considered extraordinary.

Amongst the properties that intersected the Preferred Alternative footprint, five areas of potential concern were identified. These include:

- The (Petro Mart) located on St. Charles Road. Three UST's are reported on the site for fuel storage. No spills or leaks have been reported on this site.
- A construction debris dump located east of Crump Road, north of I-70. The dump appears to mainly be composed of concrete and wood debris.
- Superior Motor Sales is located on I-70 Drive (SE). The site sells and repairs automobiles.
- A Casey's General Store located in the northwestern corner of the Route WW/EI Chaparral intersection. There was a spill on this site in August of 1994.
- A-1 Auto Recyclers is located at 3821 East Broadway (Route WW). There are many vehicles stored here in varying states of disassembly, including several that have large trees growing through them.

Clean-up costs for these sites are expected to be from low to medium. Further investigations would be required to better characterize these sites and to determine the impact these sites would have on the project. If regulated solid or hazardous wastes are found unexpectedly during construction activities, the MoDOT construction inspector would direct the contractor to cease work at the suspect site. The contractor would develop a plan for sampling, remediation if necessary and continuing project construction. If necessary, the MDNR would be contacted for coordination and approval of required activities.



The environmental site assessment is available in the project's administrative record.

j. Air Quality Impacts

The EC-EIS project study area is located within the Northern Missouri Intrastate Air Quality Control Region in a nonclassified area. Therefore, the requirements of 40 Code of Federal Regulations (CFR) Part 93 do not apply to this project.

The construction phase of the proposed project does have the potential for temporarily affecting ambient air quality due to emissions from construction equipment and fugitive dust from construction activities. Adherence to all applicable MoDOT construction protocols would ensure that appropriate measures would be taken to reduce fugitive dust and other emissions generated during construction.

k. Traffic Noise Impacts

Traffic noise impacts were evaluated using the configuration of the major noise sensitive receptors, and the traffic noise model, which includes look-up tables and the changes proposed by the reasonable alternatives. Noise impacts occur when predicted noise levels approach or exceed the Noise Abatement Criteria. The evaluation of the reasonable alternatives concluded that only alternative RR-2B would not involve the potential for a traffic noise impact.

Based on a preliminary evaluation of the Preferred Alternative, traffic noise impacts are expected within the vicinity of Richland Road and Grace Lane. See **Exhibit IV-1F**. When noise impacts are identified, noise abatement is considered and implemented if found to be both reasonable and feasible.

When noise-abatement measures are being considered, every reasonable effort is made to obtain substantial noise reductions. Reasonable and feasible factors also include the following:

- The noise wall must provide noise reduction of at least 5 dBA.
- The noise wall must provide attenuation for more than one receptor.
- The noise wall must be 18 feet (5.5 meters) or less in height above normal grade.
- The noise wall must not interfere with normal access to the property.
- The noise wall must not pose a traffic-safety hazard.
- The noise wall must not exceed a cost of \$30,000 per benefited receptor. A benefited receptor is defined as a receptor that receives a noise reduction of 5 dBA or more.
- The majority of affected residents must agree that a noise wall is desired.

Based on planning level engineering evaluations, a 10-foot noise barrier between Richland Road and Grace Lane is expected to mitigate traffic noise levels consistent with highway traffic noise analysis and abatement guidelines. The preliminary analysis concluded that the cost per benefited receptor would be \$25,000; based on the following:

- Maximum Barrier Length – 3,000 feet
- Average Barrier Height – 10 feet
- Barrier Cost - \$20 per square foot
- Benefited receptors - 24

When available, detailed engineering data will be used to evaluate if noise abatement measures are required in this area and if so, can be designed such that they are both reasonable and feasible. The detailed design will provide updated information that may substantially affect the reasonability and feasibility determinations, including updated traffic speeds and volumes, the three dimensional relationship between the noise source and the receptors, and the costs of construction. For example:

- The Preferred Alternative allows for a possible connection between St. Charles Road, the Route 740 extension, and Grace Lane. The area was environmentally cleared to allow for the connection, and is not a required element of the system. The decision on whether this connection is constructed will be made in the future based on need. This decision may affect the both the cost and effectiveness of a noise barrier.
- The implementation of the Preferred Alternative may include phased construction. The scheduling of the individual project elements will be developed based on available resources in accordance with the processes outlined in the *MoDOT Engineering Policy Guide*. Consequently, the development of the Route 740 extension as an expressway may be done in phases—perhaps a traditional two-lane facility will be initially constructed with later capacity and access improvements. This type of phasing will have potential cost/effectiveness and construction scheduling ramifications.

In addition to the inclusion of detailed design data into the analysis, the possible noise abatement types and locations will be presented and discussed with the benefited residents during the design phase. Adherence to MoDOT's Noise Policy is an environmental commitment of this project.

Relative to construction noise, the major sources are expected to be demolition, earthmoving, hauling, grading, paving, and bridge construction. Noise generated by construction equipment would vary greatly depending on the equipment type, mode, duration of operation and specific type of work in progress. Considering the short-term nature of construction noise, impacts are not expected to be substantial. To reduce the impacts of construction noise, MoDOT has special provisions in the construction contract that requires that all contractors comply with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Further, MoDOT monitors project construction noise and requires noise abatement in cases where the criterion is exceeded. These provisions are also an environmental commitment of this project.

I. Cultural Resource Impacts

The DEIS reported about the *architectural* survey that concluded that there would be “no significant cultural resources impacted by the proposed roadway construction.” In September 2008, the State Historic Preservation Office (SHPO) concurred with these findings.



In accordance with MoDOT protocols, an *archaeological* survey was conducted for the Preferred Alternative. The Archaeological Research Center completed the survey in April 2009. The report identified four prehistoric habitation sites that appear to be eligible for the NRHP according to Criterion D. The archaeological survey is discussed in **Chapter IV.B.3**.

m. **Visual Resource Impacts**

Views of the proposed roadways from surrounding areas and views from the facility to the surrounding areas are considered in evaluating visual impacts. The Preferred Alternative would largely be at-grade, so that there would be few structures, if any, visible from a great distance. However, the path of the roadway would likely be visible for some distance because there is little relief in the topography except along the major stream valleys, and the roadways would be located on higher ground to avoid impacts to the streams, where possible.

n. **Section 4(f)/Section 6(f) Impacts**

Based on the data available in the DEIS, the Preferred Alternative avoided all Section 4(f) and Section 6(f) impacts. **Chapter IV.B.4** contains updated information relative to impacts.

B. Clarifications or New Data Obtained Since the Distribution of the DEIS

1. Relocation Impacts

Pursuant to the distribution of the DEIS, structures proposed for acquisition were reexamined. The refinements included the update of the uses associated with the acquisitions. For example, there are two structures at the Canine Sports Center (4506 I-70 Drive SE) (**Exhibit IV-1G**). The smaller building was incorrectly identified as a residence, but is actually used as an office/supply room. In another example, a building on St. Charles Road was originally identified as a “vacant commercial building” is more accurately identified and a residential outbuilding.

With these corrections, the Preferred Alternative would still require the acquisition of 37 structures. The revised distribution is 14 residences, 8 primary commercial/industrial buildings, 8 agricultural buildings, and 7 support/out-buildings.

The total tax assessor appraised value of all of the parcels (in their entirety) that are intersected by the Preferred Alternative is roughly 14 million dollars. While the value of the portions of these parcels that will actually be acquired is expected to be much less, the preliminary right-of-way acquisition cost estimate is 15.6 million dollars.

a. **Residential Impacts**

The residences to be acquired by the Preferred Alternative are all detached single-family homes. According to the Boone County Assessor, these residences have two or three bedrooms. The US Census reports that 98 percent of residences, in the Columbia

Metropolitan Area, have one or less occupants per bedroom. Consequently, it is expected that less than 50 individuals will be relocated as a result of the Preferred Alternative.

The oldest of the impacted residences was built in 1920; the newest in 2007. Based on the Tax Assessors records, the median appraised value of the residential buildings (R1) in the project's study area² is roughly \$93,000. Only four of the 14 residences have appraised values less than \$93,000. Three of these are farmsteads. The large farmland component affects the appraisal value. The fourth residence is a modest two-bedroom/one-bath home at the intersection of Route WW and Olivet.



Typical view of the residence expected to be displaced by the EC-EIS preferred Alternative (7200 Route WW)

b. Commercial Impacts

In addition to residential structures and various outbuildings, buildings will be acquired from eight commercial operations, as a result of the Preferred Alternative. These facilities are summarized below:

A-1 Auto Recyclers is located at 3821 E Broadway (Route WW). A-1 Auto Recyclers is a private company in the used motor vehicle parts business. They have a stock of 6,500 cars and specialize in foreign and Ford parts from the 1980's-1990's. Older British parts are also a specialty. Manta Business Services estimates that this company employs a staff of approximately five to nine. The structure that may require acquisition is a trailer-like structure on this large car part lot. There are several other unaffected buildings on the property. It is not expected that this business will be forced to close as a result of the Preferred Alternative. See **Exhibit IV-1E**.



Typical view of District Station #12

Boone County Fire Protection District Station 12 is located 980 El Chaparral Avenue (northeast quadrant of Route WW and El Chaparral Avenue). The Fire District operates 14 fire stations and some 120 emergency vehicles. The District operates with a volunteer staff of approximately 300. The entire career staff of 12 performs the administrative, maintenance, training, fire prevention, and management functions to support the volunteer staff. The total budget of the Boone County Fire Protection District is

approximately \$2 million per year. All Boone County Fire District stations are also equipped with living quarters where volunteer firefighters actually reside. Many volunteer firefighters

² Roughly bounded by US Route 63, Interstate Route 70, Route Z and New Haven Road. See **Exhibit I-1**.

are students or otherwise single men and women who, in exchange for their services as fire apparatus operators, live in our fire stations at no charge. All fire stations are equipped with kitchen facilities and many are equipped with training rooms and other support facilities. As a tax exempt facility the Tax Assessor provides no appraisal value for the building. In addition to the structure, the entire 1.22 acres of property falls within the footprint of the Preferred Alternative. Consequently, the Fire District will require adjustment as a result of the loss of Station 12. See **Exhibit IV-1C**.



Typical view of the Lake of the Woods Warehouse Building

The Lake of the Woods Warehouse Building is located at 720 North Grace Lane. This building is a single story corrugated metal warehouse. At the time of the last survey, two businesses were active: Championship Gym and James Fencing. Manta Business Services estimates that James Fencing has annual revenue of \$1 to 2.5 million and employs a staff of approximately 5 to 9. No information about the Championship Gym is

available, although few employees are expected. The structure, an outbuilding and virtually all of the property falls within the footprint of the Preferred Alternative. Consequently, these operations will require relocation. The minimal infrastructure needs provided by the current facility indicates that suitable replacements sites will not be difficult to find. See **Exhibit IV-1G**.



Typical view of the Lake of the Woods Strip Mall

The Lake of the Woods Strip Mall is located at the intersection of St. Charles Road and Grace Lane (5400 St. Charles Road). The tenants have varied throughout the life of the EC-EIS project. Currently, they include the showroom for the Wood Link Fence Company, the Columbia Climbing Gym, Noah's Pets and More and Lake of the Wood storage. The entire site falls within the footprint of the Preferred Alternative.

Consequently, these operations will require relocation. The existing facility is of the standard strip mall design that is abundant throughout Columbia. See **Exhibit IV-1G**.



Typical view of the Conoco Gas Station

A Conoco Gas Station (5481 E St. Charles Road) is located on the southwest corner of the intersection of I-70 and St. Charles Road. This facility is an operating fuel service station and convenience store. The gas pumps fall within the footprint of the Preferred

Alternative. Based on the configuration of the site, it is expected that the business can be effectively reconfigured and remain in operation at this location. Consequently, business impacts are expected to be minor and temporary. See **Exhibit IV-1G**.

The Mary Niles Tax Service is located in a small building on I-70 Drive (SE). It is affected by the Ballenger Lane Extension. A small outbuilding is also onsite. This facility is a sole proprietorship that may only operate seasonally. The entire site falls within the footprint of the Preferred Alternative. Consequently, this operation will require relocation. The minimal infrastructure needs provided by the current facility indicates that suitable replacements sites will not be difficult to find. See **Exhibit IV-1G**.

The Canine Sports Center is located on I-70 Drive (SE). It is affected by the Ballenger Lane Extension. This is a recent development. The tax assessor attaches a total appraised value of \$626,573, although the property owners believe this is very low. The facility conducts



View of the Canine Sports Center (left) and Superior Motor Sports (right).

dog training and holds trials. They list 3 owner-operators and 16 instructors. The main building for the Canine Sports Center is a marquee or membrane type structure. Tent-like, they are ideal for sports use because of the large open space provided. Although expensive and requiring specialized equipment to erect, all structural components can be disassembled and transported to another location. Preliminary analysis suggests that the site may be able to be reconfigured to reestablish the facility in this area. See **Exhibit IV-1G**.

Superior Motor Sales is located on I-70 Drive (SE). It is affected by the Ballenger Lane Extension. The business is currently composed of three buildings, on three parcels. One large garage building falls within the footprint of the Preferred Alternative. Superior Motor Sales is a private company established and incorporated in Missouri in 2004. Manta Business Services estimates this company has annual revenues of \$1 to \$2.5 million and employs a staff of approximately 1 to 4. Although management failed to supply its own estimate, activity on site seems to indicate the number of employees is much higher. The footprint of the Preferred Alternative affects only one of the three parcels; consequently, it is likely that the triangular piece of land can be effectively reestablished. See **Exhibit IV-1G**.

2. Aquatic Resource Impacts

Executive Order 11990 requires that federal agencies avoid, to the extent practicable, long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, the order directs federal agencies to avoid new construction in wetlands unless there is no practicable alternative and, where wetlands cannot be avoided, the proposed action must include practicable measures to minimize harm to the wetlands.

Overall, wetlands are not abundant in the study area. The DEIS estimated total wetland encroachments for the reasonable alternatives of between 0.84 and 5.17 acres. The wetland impacts associated with the Preferred Alternative was 1.59 acres. This analysis is based on available wetland mapping and limited field investigation.

To refine the impact estimates, a detailed wetland delineation field study was performed for the preferred alternative. This delineation authoritatively establishes the areas that meet the federal definition of wetlands and waters of the United States. The delineation is subject to confirmation by the Kansas City District of the USACE. The wetland/upland boundary was established using a field-grade global positioning system (GPS).

The delineation established that the preferred alternative will affect 2.2 acres - 1.5 acres of jurisdictional wetlands and 0.7 acres of jurisdictional non-wetland waters (open water/ponds).

| By Type | By Stream Watershed | By Project Component |
|------------------------------|------------------------------------|---------------------------------|
| Emergent Wetlands: 1.3 acres | Hominy Branch: 0 acres | Route WW Improvement: 0.1 acres |
| Forested Wetlands: 0.2 acres | Grindstone (North Fork): 2.1 acres | Stadium Extension: 1.9 acres |
| Open Water: 0.7 acres | Grindstone (South Fork): 0.1 acres | Ballenger Extension: 0.2 acres |

The location and size of all wetlands and ponds identified during the delineation (jurisdictional and non-jurisdictional) are depicted on **Exhibit IV-1**. A tabular depiction of wetlands identified during the wetland delineation is also described in **Appendix E**.

The fieldwork associated with the wetland delineation also allowed for updating stream coverage. The DEIS reported total stream impacts that varied between 13,186 linear feet and 21,007 linear feet, depending on the reasonable alternative. The Preferred Alternative was expected to have a total stream impact of 14,421 linear feet.

Based on the wetland delineation, the total stream impact associated with the Preferred Alternative was revised to 16,437 linear feet (lf).

| By Stream Type | By Impact Type |
|------------------------|---|
| Ephemeral: 13,500 lf | Modifications at Existing Bridges: 1,076 lf |
| Intermittent: 1,473 lf | Modifications at Stream Work: 4,700 lf |
| Perennial: 1,464 lf | New Stream Impacts: 10,661 lf |

| By Stream Watershed | By Project Component |
|-------------------------------------|--------------------------------|
| Hominy Branch: 1,306 lf | Route WW Improvement: 5,136 lf |
| North Fork of Grindstone: 10,988 lf | Stadium Extension: 8,807 lf |
| South Fork of Grindstone: 4,143 lf | Ballenger Extension: 2,494 lf |

The location of the revised stream locations are depicted on **Exhibit IV-1**. A tabular depiction of the stream impacts identified during the wetland delineation is also described in **Appendix E**.



3. Environmental Site Assessments

In enumerating the number of sites recommended for further environmental site assessment, the DEIS took a narrow interpretation of what constituted a site. The DEIS recommendations looked at the specific location of the activities of concern and its proximity to the reasonable alternative's footprint. If it fell within footprint, it was tallied. Using this technique, the DEIS reported the following number of sites recommended for further environmental site assessment:

- Reasonable Alternative SC-2A (Preferred Alternative): 2
- Reasonable Alternative SC-2B: 2
- Reasonable Alternative SC-2C: 2
- Reasonable Alternative RR-2A: 4
- Reasonable Alternative RR-2B: 3

During the investigation of the impacts to the commercial/industrial acquisitions it became clear that the operations of concern were not always contained within single parcels or even parcels listed under a single owner. Consequently, a broader approach seemed prudent. Using all of the properties that compose the operation in question that intersect the alternative's footprint, the following revised number of sites is recommended for further environmental site assessment:

- Reasonable Alternative SC-2A (Preferred Alternative): 5
- Reasonable Alternative SC-2B: 5
- Reasonable Alternative SC-2C: 5
- Reasonable Alternative RR-2A: 8
- Reasonable Alternative RR-2B: 6

Since the cleanup costs for these sites are expected to be low or medium and the ratio of sites amongst the alternatives is equivalent, this revised enumeration does not affect the selection of the Preferred Alternative. **Chapter IV.A.2.i** identifies the sites affected by the Preferred Alternative. Further investigations would be required to better characterize these sites and to determine the impact these sites would have on the project. If regulated solid or hazardous wastes are found unexpectedly during construction activities, the MoDOT construction inspector would direct the contractor to cease work at the suspect site. The contractor would develop a plan for sampling, remediation if necessary and continuing project construction. If necessary, the MDNR would be contacted for coordination and approval of required activities.

The environmental site assessment is available in the project's administrative record.

4. Cultural (Archeological) Resource Impacts

In accordance with MoDOT protocols, an *archaeological* survey was conducted for the Preferred Alternative. The Archaeological Research Center completed the survey in April 2009. The report identified four prehistoric habitation sites that appear to be eligible for the NRHP according to Criterion D. Criterion D represents sites that have yielded, or may be likely to yield, information important in prehistory or history. These four sites have been identified as follows:



- 23BO2417 – Section 17 – Prehistoric Habitation
- 23BO2418 – Section 15 – Prehistoric Habitation
- 23BO2422 – Section 10 – Prehistoric Habitation
- 23BO2423 – Section 9 – Prehistoric Habitation

These sites are lithic scatters that exhibit evidence of at least temporary residences for prehistoric peoples. The archaeological survey has been coordinated and approved by the SHPO. The recommendations from the SHPO approval are environmental commitments of the EC-EIS.

In accordance with MoDOT policy, the location of the sites will not be depicted on project materials. This is primarily to safeguard private property rights. All cultural resource studies are stored in the project's administrative record.

5. Section 4(f)

Section 4(f) applies to all archaeological sites that are on or eligible for inclusion on the National Register and that warrant preservation in place.

According to the Section 4(f) Policy Paper (Office of Planning, Environment, and Realty Project Development and Environmental Review – March 1, 2005), Section 4(f) does not apply if FHWA, after consultation with the SHPO, determines that the archaeological resource is important chiefly because of information obtained through data recovery (even if it is agreed not to recover the resource) and has minimal value for preservation in place (23 CFR 771.135[g]).

This is the situation associated with the archaeological resources identified above (**Chapter IV.B.3**). Consequently, there is no change to the DEIS conclusion that the Preferred Alternative avoids all Section 4(f) impacts.

Relative to park-related Section 4(f) properties, the improvement of Route WW is adjacent to American Legion Park; however, the Preferred Alternative was designed to avoid all direct impacts. Because of its location along Route WW, allowances may be necessary to maintain access during construction. These easements will be temporary in nature and won't impact the use of the park. Temporary easements are not subject to Section 4(f) provided that they meet certain conditions. The temporary construction easements are not subject to Section 4(f) in this instance because such closure:

- Will be of short duration and less than the time needed for construction of the project
- Will result in no change of ownership or retention of long-term interests in the land for transportation purposes
- Will not result in any adverse change to the activities, features, or attributes which are important to the purposes or functions that could qualify the resource for protection under Section 4(f)
- Will include only a minor amount of land

Coordination with the administrators will be made in accordance with MoDOT standard procedures and are considered an environmental commitment of this project.