



Water Quality Technical Memorandum

ArDOT JOB NO. CA0602

I-30 (From I-530/I-440 to I-40) and
I-40 (From Hwy. 365/MacArthur Dr. to Hwy. 67)

Pulaski County, Arkansas

October 2017



U.S. Department
of Transportation
**Federal Highway
Administration**



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1 1.0 INTRODUCTION

2 Approved by Arkansas voters, the Arkansas Department of Transportation (ArDOT) is
3 implementing an accelerated State Highway Construction and Improvement Program
4 named the Connecting Arkansas Program (CAP).

5 A major component of the CAP is to implement a project to improve a portion of
6 Interstate 30 (I-30) from Interstate 530 (I-530) and Interstate 440 (I-440) to Interstate 40
7 (I-40), including the Arkansas River Bridge, and a portion of I-40 from Highway (Hwy.)
8 365 (MacArthur Drive [Dr.]) to Hwy. 67. This project is CA0602: I-530 - Hwy. 67 (Widening
9 & Reconst.) (I-30 & I-40), commonly known as the 30 Crossing project. **Figure 1**
10 illustrates the proposed 7.3-mile project limits.

11 1.1 Existing Facility

12 I-30 is one of the critical links of the Central Arkansas Freeway System. It connects
13 communities within the Central Arkansas Region and serves local, regional and national
14 travelers with varied destinations and trip purposes.

15 The I-30 corridor generally consists of three main lanes in each direction with parallel one-
16 way discontinuous frontage roads on each side of the interstate. In the northern portion
17 of the project limits, the I-40 corridor consists of three to four main lanes in each direction
18 with parallel one-way frontage roads on each side of the interstate between the I-30/I-40
19 interchange and North Hills Boulevard (Blvd.). Within the 7.3-mile corridor, four system
20 interchanges are located:

- 21 • I-30 with I-530 and I-440
- 22 • I-30 with I-630
- 23 • I-30 with I-40
- 24 • I-40 with Highways 67/167

25 1.2 Proposed Alternatives

26 1.2.1 No-Action Alternative

27 The No-Action Alternative represents the case in which the proposed project is not
28 constructed, but could include future projects identified through the long range planning
29 process for maintaining a state of good repair as funding becomes available.

30 1.2.2 Action Alternatives

31 Two different main lane configurations are under consideration. Both would include the
32 replacement of the Arkansas River Bridge.

- 33 • Eight-Lane General Purpose (GP) Alternative would provide four main lanes in each
34 direction with no Collector Distributor (C/D) lanes.
- 35 • Six-Lane with C/D Lanes Alternative would reconstruct the existing six-lane (three
36 in each direction) roadway while adding two decision lanes on each side that
37 ultimately feed into a C/D system located at the Arkansas River Bridge.

38 The current Hwy. 10 (Cantrell Rd.) interchange provides direct access to the downtown
39 business district of Little Rock. Its proximity to the Arkansas River Bridge and the I-30
40 interchange with I-630 creates a unique level of complexity. In order to balance various
41 project goals, two interchange concepts are being considered for replacement of this
42 interchange:

- 43 • An elevated Single Point Urban Interchange (SPUI) constructed in the same location
44 as the current interchange;
- 45 • A Split Diamond Interchange (SDI) constructed south of the existing interchange at
46 4th and 9th Streets.

47 Combining the two main lane configurations with the two Hwy 10 (Cantrell Rd.) interchange
48 concepts results in the four Action Alternatives as follows:

- 49 Alternative 1A: 8-Lane GP with SPUI Alternative
- 50 Alternative 1B: 8-Lane GP with SDI Alternative
- 51 Alternative 2A: 6-Lane with C/D Lanes with SPUI Alternative
- 52 Alternative 2B: 6-Lane with C/D Lanes with SDI Alternative

53 For detailed information on the Action Alternatives, refer to the **30 Crossing**
54 **Environmental Assessment** (EA) for the proposed project.

55 2.0 GOVERNING REGULATIONS

56 The following water quality regulatory requirements apply to the project:

- 57 • Provisions of the Federal Water Pollution Control Act, later renamed the Clean
58 Water Act (CWA), including Section 401; Water Quality Certification, Section 402;
59 National Pollutant Discharge Elimination System (NPDES), and Section 404;
60 Permits for Dredged or Fill Material.
- 61 • Water quality standards established by the Arkansas Pollution Control and Ecology
62 Commission (APC&E) as part of the Arkansas Water Pollution Control Act of 1949.
- 63 • Regulations outlined in the ArDOT Statewide Storm Water Management Program
64 (SWMP), Permit No. ARR040000, August 1, 2014 and ArDOT/City of Little Rock
65 NPDES Permit No. ARS00002.

66 The US Environmental Protection Agency (EPA) has delegated authority for the
67 implementation of the CWA to The Arkansas Department of Environmental Quality
68 (ADEQ). Sections 401 and 402 of the CWA are administered by the ADEQ permit branch.
69 Section 404 of the Clean Water Act is administered by the US Army Corps of Engineers
70 (USACE). Section 404 permitting is discussed in the Water Resources Technical
71 Memorandum. The proposed project will comply with all of the above requirements.

72

FIGURE 1: PROJECT LOCATION MAP



73

74 3.0 REGULATORY BACKGROUND

75 ADEQ regulates disturbance to water bodies which may cause an impact to water quality
76 under Section 401 of the CWA. A Short Term Activity Authorization (STAA) may be
77 required to demonstrate compliance with Section 401.

78
79 ADEQ regulates storm water discharge to water bodies which may cause an impact to
80 water quality under Section 402. Compliance with the NPDES Construction General
81 Permit and the SWMP must be demonstrated. The SWMP includes best management
82 practices (BMP's), control techniques, and system, design and engineering methods
83 intended to manage the quantity and/or improve the quality of storm water runoff from
84 ArDOT highways, and to prevent degradation of receiving water bodies due to
85 construction of ArDOT highways. BMP's were chosen to reduce the discharge of
86 pollutants to the maximum extent practicable. Although the SWMP is intended to be
87 applicable statewide, it prohibits storm water discharges that have the reasonable
88 potential to contribute to a violation of the water quality standard for the receiving water
89 body. Storm water discharges to impaired water bodies and to those water bodies with
90 established Total Maximum Daily Limits (TMDL's) are permitted only if ArDOT either
91 determines that there are no significant sources of pollutants from highways within the
92 drainage area of the impaired water body or commits to reducing the impact of the storm
93 water discharge.

94
95 ADEQ classifies surface waters throughout the state based on their past, present, and
96 future potential uses and values, and sets water quality standards for each class of
97 surface water. The classes of water bodies are Extraordinary Resource Waters,
98 Ecologically Sensitive Waterbody, Natural and Scenic Waterway, Primary Contact
99 Recreation, Secondary Contact Recreation, and Aquatic Life. The water quality standard
100 for each class of water body varies by location throughout the state (ecoregion). There
101 are six ecoregions in Arkansas: Ozark Highlands, Boston Mountains, Arkansas River
102 Valley, Ouachita Mountains, Gulf Coast Plain, and Mississippi Delta.

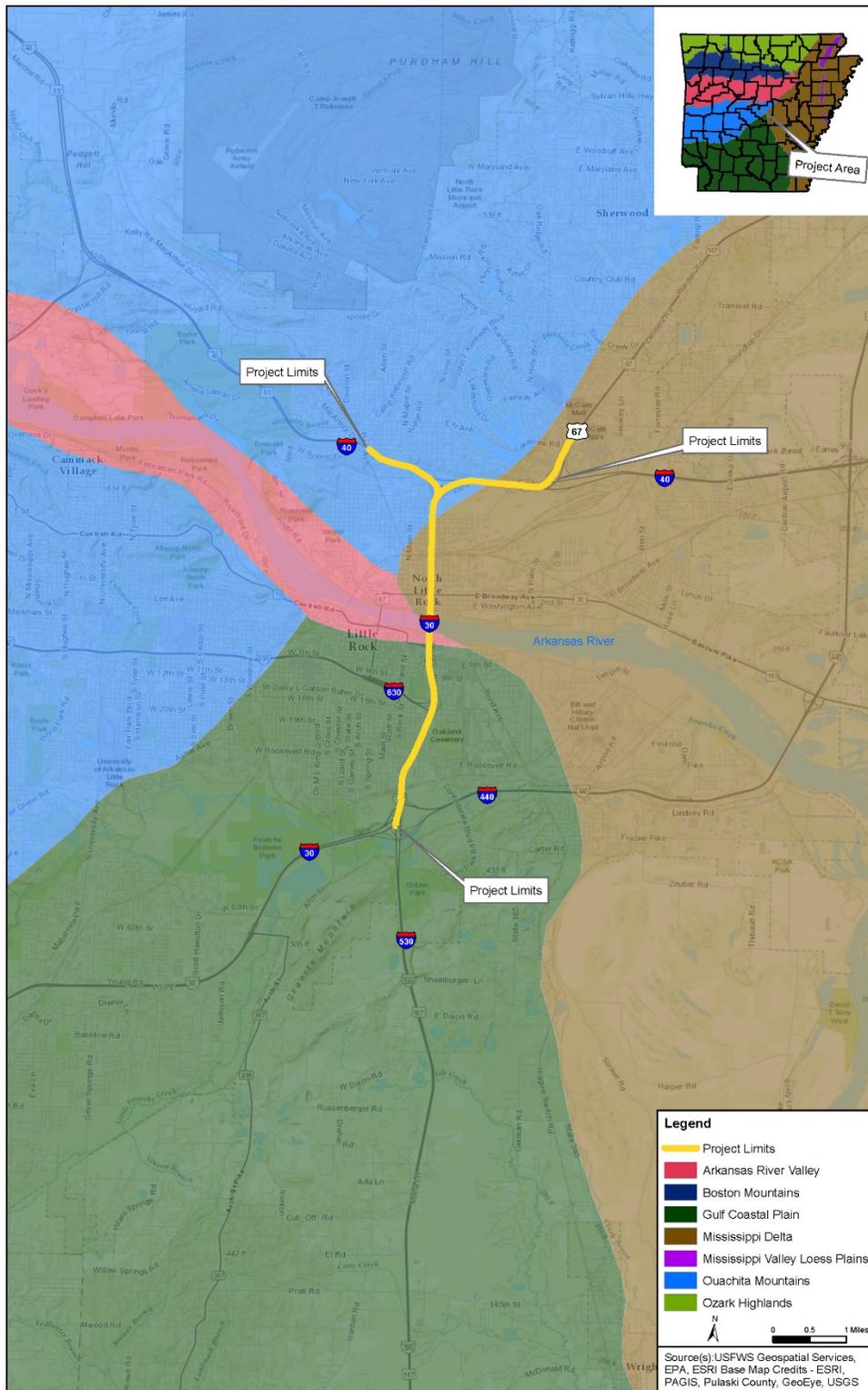
103 4.0 EXISTING CONDITIONS

104 The proposed project study area spans four ecoregions: Arkansas River Valley, Ouachita
105 Mountains, Gulf Coastal Plain, and Mississippi Delta (**Figure 2**). There are three water
106 bodies in the project study area: the Arkansas River (Arkansas River Valley and
107 Mississippi Delta), Lakewood Lakes (Ouachita Mountains), and Fourche Creek (Gulf
108 Coastal Plain). The three water bodies are shown in **Figure 3**.

109
110 Lakewood Lakes are a series of interconnected impoundments in North Little Rock north
111 of I-40. The southernmost lake, Lake Number One, discharges into the Dark Hollow
112 drainage channel, which flows south, under I-40 and through Dark Hollow, into the
113 Redwood Tunnel to the Arkansas River. Lakewood Lakes are classified as Primary
114 Contact Recreation.

115
116 The Arkansas River flows from west to east through the project study area. I-30 crosses
117 the Arkansas River between the Cities of Little Rock and North Little Rock. The Arkansas
118 River is classified as Primary Contact Recreation.

FIGURE 2: 30 CROSSING ECOREGIONS



122
123

FIGURE 3: WATER BODIES IN THE PROJECT AREA



124

125 Fourche Creek flows from west to east through the southern part of the project study area,
 126 which is the I-30/ I-530/ I-440 interchange. Fourche Creek through the project area is
 127 Reach 22. Reach 22 joins the Arkansas River approximately 4.0 miles downstream of the
 128 I-30 Bridge. Fourche Creek is classified as Primary Contact Recreation.

129
 130 Fourche Creek is on the Draft 2016 Impaired Waterbodies List (303(d)) as a Category 5,
 131 Low Priority. Category 5 is classified as, "The waterbody is impaired, or one or more water
 132 quality standards may not be attained." Low prioritization means;

- 133 1) waters currently not attaining one or more water quality standards, but all
 134 designated uses are determined to be supported; or
- 135 2) there is insufficient data to make a scientifically defensible decision concerning
 136 designated use attainment; or
- 137 3) waters ADEQ assessed as unimpaired, but were assessed impaired by EPA.

138
 139 Fourche Creek is listed as impaired for low dissolved oxygen concentrations, elevated
 140 surface erosion and turbidity, and temperature. The greatest threats to the Fourche Creek
 141 Watershed are sedimentation, development, and floodplain encroachment.

142
 143 Water quality standards for the four applicable ecoregions are shown in **Table 1**.

144
 145 **Table 1: Water Quality Requirements in the Project Area**

Parameters		Ecoregion			
		Arkansas Valley	Mississippi Delta	Ouachita Mountains	Gulf Coast Plain
Temperature (degrees Celsius)		32	32	30	30
Dissolved Oxygen (mg/L)	Primary	5	5	6	5
	Critical	5	5	2	2
pH		6 to 9	6 to 9	6 to 9	6 to 9
Base Flow Turbidity (NTU)		50	50	10	21
Pathogen Indicators: Individual Sample (col/100 mL)	<i>E. Coli</i>	410	410	410	410
	Fecal Coliform	400	400	400	400
Chlorides (mg/L)		250	36	6	14
Sulfates (mg/L)		100	28	15	31
TDS (mg/L)		500	390	128	123
Oil and grease (mg/L): Ave./Max.		10/15	10/15	10/15	10/15
Copper (ppb): Acute and Chronic		0.96	0.96	0.96	0.96
Zinc (ppb)	Acute	0.978	0.978	0.978	0.978
	Chronic	0.986	0.986	0.986	0.986

146 Source: Arkansas Pollution Control and Ecology Commission 2014. *Regulation No. 2; Regulation Establishing Water*
 147 *Quality Standards for Surface Waters of the State of Arkansas*

148 Note: The turbidity standard for lakes and reservoirs in all ecoregions is 25 NTUs.

149 The *E. coli* Individual Sample standard for lakes and reservoirs in all regions is 298 col/100 mL; the Fecal
 150 Coliform standard is 400 col/100 mL.

151 5.0 ENVIRONMENTAL CONSEQUENCES

152 The 30 Crossing Action Alternatives involve widening and reconstruction of portions of
153 I-30 and I-40 that discharge to the water bodies described above. Potential long-term
154 impacts of the project on water quality include an increase in the type and quantity of
155 pollutants, such as sediment, nutrients, organics, oil and grease, and heavy metals. In
156 addition, the increase in impervious surface can increase the quantity of runoff, which can
157 lead to increases in erosion and sedimentation of receiving water bodies. The provisions
158 of the SWMP are intended to address these potential long-term impacts.

159
160 The general categories of structural BMP's intended to address these potential long-term
161 water quality impacts include:

- 162 • Infiltration systems;
- 163 • Detention systems;
- 164 • Retention systems;
- 165 • Constructed wetland systems;
- 166 • Filtration systems;
- 167 • Vegetated systems;
- 168 • Minimization of directly connected impervious surface; and
- 169 • Miscellaneous and vendor-supplied systems.

170
171 In addition, non-structural BMP's including education programs, source control, recycling,
172 and maintenance programs for storm water collection and treatment systems are also
173 included in the SWMP.

174
175 During construction, soil disturbance can result in increased erosion and sedimentation,
176 which can result in localized, short-term adverse water quality impacts. Construction
177 impacts to water quality are addressed by means of Storm Water Pollution Prevention
178 Plans (SWPPP's), which are required as part of the SWMP to be developed for each
179 construction project that disturbs an area equal to or greater than one acre.

180
181 The No-Action Alternative would not result in new direct impacts to water quality within
182 the study area; however, existing impacts to water quality resulting from lack of structural
183 and non-structural BMP's would not be addressed.

184

185 6.0 MITIGATION

186 The Design-Build Contractor for the 30 Crossing project will be required to obtain an
187 STAA under Section 401 of the CWA and to implement a SWPPP as required under the
188 Section 402 of the CWA, the SWMP and the statewide NPDES General Storm Water
189 Permit for Construction Activities. After development and approval of the SWPPP, ArDOT
190 will submit a Notice of Intent to use the NPDES General Storm Water Permit for
191 Construction Activities at the start of construction, and a Notice of Termination at the end
192 of construction.

193

194 SWPPP's include, at a minimum:

195

- 196 • Requirements to implement appropriate erosion and sediment control BMP's;
- 197 • Requirements to control waste such as demolition materials, truck washouts,
198 chemicals, litter, and sanitary waste;
- 199 • Procedures for site plan review which incorporate water quality considerations;
- 200 • Procedures for receipt and consideration of information received by the public; and
- 201 • Procedures for site inspection and enforcement of control measures.

202

203 The SWPPP must contain a detailed description of the construction project; a detailed
204 site map demonstrating drainage, erosion controls, and discharge locations; a description
205 of the erosion controls to be used on site; inspection and maintenance procedures for the
206 erosion controls, documentation for Total Maximum Daily Load (TMDL) and Water Quality
207 Standards compliance; and all required certifications.

208

209 The Specific non-structural BMP's likely to be part of the SWPPP for the 30 Crossing
210 project include:

211

- 212 • Establishment of permanent vegetation;
- 213 • Preservation of existing vegetation;
- 214 • Maintenance of buffer zones along streams;
- 215 • Protection of wetlands;
- 216 • Personnel training for BMP structural maintenance; and
- 217 • Source control such as litter collection and street sweeping.

218

219 Specific structural control measures likely to be part of the SWPPP for the 30 Crossing
220 project include:

221

- 222 • Concrete spillways, grouted riprap or other outlet structures;
- 223 • Detention/retention ponds;
- 224 • Grassed swales;
- 225 • Vegetated filter strips;
- 226 • Rip rapped or hard surface slopes and channels;
- 227 • Inlet grating; and
- 228 • Velocity dissipaters.

229

230 The intent of the ArDOT SWMP is to remove at least 80% of the total suspended solids
231 from the increase in runoff due to the project. The Design-Build contractor will be required
232 to perform weekly inspections of the project and to document the findings on an NPDES
233 storm water inspection report in order to demonstrate compliance with the NPDES permit.

234 7.0 SUMMARY AND CONCLUSIONS

235 The provisions of the ArDOT SWMP and the SWPPP prepared for the 30 Crossing project
236 by the Design-Build contractor will prevent any degradation in the water quality standards
237 listed in Table 1 resulting from the project.

238 8.0 REFERENCES

239 Arkansas Pollution Control and Ecology Commission 2014. *Regulation No. 2; Regulation*
240 *Establishing Water Quality Standards for Surface Waters of the State of Arkansas*
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254 *Practices* (<https://www3.epa.gov/npdes/pubs/owm0307.pdf>)