PRELIMINARY JURISDICTIONAL DETERMINATION OF WATERS OF THE UNITED STATES

PROPOSED BOIS D'ARC RESERVOIR'S RAW WATER TRANSMISSION PIPELINE

SPONSOR:



NORTH TEXAS MUNICIPAL WATER DISTRICT

PREPARED BY

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Preliminary Jurisdictional Determination of Waters of the United States Proposed Bois d'Arc Reservoir – Raw Water Transmission Pipeline Fannin, Hunt, and Collin Counties, Texas

1) Purpose

The North Texas Municipal Water District (NTMWD) is proposing and sponsoring the Bois d'Arc Reservoir, which would be located in Fannin County, Texas. This roughly 16,600-acre proposed reservoir's primary purpose would be for water supply for customers in the NTMWD's service area within Collin, Dallas, Rockwall, Hunt, Kaufman, Ellis, Rains, and Fannin Counties. As such, a raw water transmission pipeline would be necessary to convey water from Fannin County to Collin County. The outfall location for the proposed pipeline would be located along Pilot Grove Creek, a major tributary to Lavon Lake. The purpose of this Preliminary Jurisdictional Determination (PJD) is to document the extent of waters of the United States (U.S.) within the proposed raw water transmission pipeline's project area. The information from this PJD report will be utilized during the planning stages of the project in order to evaluate layout and designs that will avoid and minimize impacts (to the maximum extent practicable) to any identified waters of the U.S. within the limits of the proposed project area. This report will address the area affected by the proposed raw water transmission pipeline and its associated temporary and permanent easements. This report represents the current preferred pipeline route alternative. Adjustments to the proposed route may occur to accommodate property owners, provide further minimization of environmental impacts, and to avoid identified construction If the pipeline route deviations warrant further investigation, supplemental restraints. information will be provided as addendums to this report.

The proposed project involves approximately 44 miles of pipeline. The total areas of the temporary and permanent easements associated with the proposed pipeline are approximately 210 acres and 420 acres, respectively. The reservoir would provide additional water supply to the NTMWD and subsequently its customer cities. The NTMWD service area is one of the most rapidly growing areas of North Texas and Texas in general. Bois d'Arc Lake is a component of NTMWD's long range water supply plan.

2) Methods

a) <u>Contact Information</u>

Freese and Nichols, Incorporated (FNI), as agent for the NTMWD, has contracted with Alan Plummer Associates, Incorporated (APAI) to provide environmental documentation services including this PJD report for the proposed raw water transmission pipeline project area. Questions concerning the content of this PJD report should be directed toward either FNI or APAI. Information regarding contacts for FNI and APAI are as follows:

Entity	Contact	Address	Telephone	Fax
Freese and	Mr. Steven	4055 International Plaza, Suite 200	(817) 735-	(817) 735-
Nichols, Inc.	Watters	Fort Worth, Texas 76109	7300	7492
Alan Plummer	Mr. Jason	1320 S. University Drive, Suite 300	(817) 806-	(817) 870-
Associates, Inc.	Voight	Fort Worth, Texas 76107-5764	1700	2536

b) **Delineation Methods**

APAI conducted on-site investigations for potential waters of the U.S. in February and March 2008. The delineation of waters of the U.S. was conducted in accordance with the current regulatory procedures outlined in the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (the Manual), Technical Report Y-87-1 (on-line edition). Preliminary data (including but not limited to USGS topographic maps, aerial photographs, and soil survey maps) suggested the potential for waters of the U.S.; therefore, the procedures for a routine on-site determination (as outlined in the Manual) were followed to determine the extent of waters of the U.S. within the limits of the project.

c) Mapping Techniques

Prior to the on-site investigation, a review of the available resources was conducted to identify potential wetlands or waters of the U.S. within the limits of the project area. The resources reviewed included aerial photographs, the USGS topographic maps, the Soil Surveys of Collin, Hunt, and Fannin Counties, and the National Wetlands Inventory maps associated with the USGS topographic maps.

Once located during the onsite investigation, the limits of the identified, accessible jurisdictional areas were determined using the guidelines outlined in the Manual, then mapped using a hand-held global positioning system (GPS) receiver (Garmin GPSMAP 76CSx with 3-meter accuracy; field tested to 5-foot accuracy). Waypoints recorded during the investigation were cross-referenced with the topographic maps and aerial photographs to determine the limits of waters of the U.S. In inaccessible areas, actual field delineation of the identified waters of the U.S. has not been performed for the proposed pipeline crossings. Instead, streams, rivers, impoundments (both on- and off-channel), and potential wetlands were investigated both up and downstream of the proposed crossing at road or other public access points. A formal, in depth delineation will be performed at a later date as the permit process progresses. The estimates provided within this PJD report should be conservative, erring on over summation and spatial quantification.

3) Results

a) Project Location

The proposed reservoir footprint is located northeast of the City of Bonham in Fannin County, Texas and north of U.S. Highway 82. The proposed dam for the reservoir would be centered on Bois d'Arc Creek at river mile **XX**. The pump station facility is proposed to be located along the south shores of the reservoir approximately one mile south of the confluence of Yoakum and Bois d'Arc Creeks. From this location, the proposed 44-mile pipeline would traverse the north Texas Counties of Fannin, Hunt, and Collin sequentially trending in a southwesterly direction. The proposed pipeline would near the towns of Dodd City, Bailey, Leonard, and Blue Ridge. The outfall for the proposed pipeline would be located along Pilot Grove Creek immediately south of the town of Blue Ridge, north of Lavon Lake, and west of State Highway 73. Figure A-1 in Appendix A shows the general location of the proposed project site.

b) Description of the Proposed Project and Project Area

Proposed Project: The proposed pipeline alignment traverses approximately 44-miles of north Texas in a southwesterly direction from the proposed Bois d'Arc reservoir to an outfall structure located along Pilot Grove Creek. The proposed pipeline varies in diameter. A 90-inch diameter pipeline is proposed from the planned pump station to a future planned NTMWD water treatment plant and a 66-inch diameter pipeline from the future proposed NTMWD water treatment plant to the outfall structure located along Pilot Grove Creek. The proposed permanent easement for the pipeline would be 100 feet for the 90-inch diameter segment and 40 feet for the 66-inch diameter segment. A temporary construction easement would increase the total width of easements along the alignment to 120 feet. The outfall structure associated with the pipeline would consist of a velocity dissipation wall, followed with flow retarding structures to further dissipate the water's velocity. Beyond the flow retarding structures, water would continue to cascade over rock rip-rap providing both energy dissipation and aeration prior to its confluence with Pilot Grove Creek.

Project Area: The entire proposed pipeline route would be located in lands characterized as rural with agriculture as the predominant land use. The agricultural land uses consist of crop production and pastureland for livestock. Areas that remain treed are located along fence lines and streams. No independent stands of trees (trees occurring outside of riparian corridors or fence lines) were identified along the proposed pipeline route. The pipeline route, to the extent practicable, parallels county and farm to market roads and existing power line easements to provide minimal environmental and infrastructural disturbances. For descriptive purposes, the pipeline route will be divided into two sections based on the two proposed pipeline diameters.

90-Inch Diameter Segment

The 90-inch diameter segment of the proposed pipeline route is approximately 29 miles in length commencing at the proposed pump station and terminating at its junction with the proposed 66-inch diameter segment. The terminus of the 90-inch diameter segment is in close proximity to State Highway 272 immediately east of U.S. Highway 69 near the town of Leonard. The initial leg of the 90-inch diameter portion of the pipeline route is located in the Bois d'Arc Creek drainage basin, which is a component of the Red River drainage basin. Various named and unnamed streams and tributaries to Bois d'Arc Creek are crossed with this segment of the proposed pipeline. Immediately south of the former U.S. Highway 82, the pipeline follows the ridge dividing the Bois d'Arc Creek drainage basin from the Sulphur River drainage basin. From the former U.S. Highway 82 to the terminus of the proposed 90-inch diameter segment of the pipeline, agricultural croplands dominate the landscape.

66-Inch Diameter Segment

The 66-inch diameter segment of the proposed pipeline is approximately 15 miles in length commencing at its junction with the 90-inch diameter pipeline near the town of Leonard and terminating at Pilot Grove Creek immediately south of the town of Blue Ridge. As this portion of the pipeline crosses U.S. Highway 69, it enters the East Fork of the Trinity River drainage basin. This portion of the proposed pipeline follows existing power line easements for the majority of its course and parallels U.S. Highway 73 for a limited distance. This portion of the proposed pipeline crosses various named and unnamed streams which eventually discharge into Lavon Lake. The primary land uses for this segment of the pipeline are agricultural in nature.

Figures A-2 through A-25 in Appendix A show the proposed project area and the limits of the PJD superimposed on the USGS topographic maps associated with the project area. Figures A-26 through A-49 show the limits of the PJD superimposed onto 2004 and 2007 aerial photographs. Photographs taken during the site investigations are located in Appendix B.

c) <u>Hydrology</u>

The proposed raw water transmission pipeline would be located within three drainage basins: the Red River Basin, the Sulphur River Basin, and the Trinity River Basin. The hydrologic units associated with the drainage basins encountered by the proposed pipeline are as follows:

Red River Drainage Basin (Bois d'Arc Island) – 11140101 Sulphur River Drainage Basin (Sulphur Headwater) – 11140301 Trinity River Drainage Basin (East Fork Trinity) – 12030106

The predominant hydrology within these basins is from surface runoff following rain events. Areas do exist within or adjacent to floodplains that appear to retain water. Specific hydrologic indicators were not recorded for the identified aquatic resources during this initial reconnaissance. If necessary, the specific hydrologic indicators will be recorded during the more intensive investigation as the permit process progresses. Lastly, a multitude of on- and off-channel impoundments of various acreages are located within the aforementioned drainage basins. These impoundments capture surface runoff and influence downstream flows.

d) <u>Vegetation</u>

Table 1 lists notable species observed during the reconnaissance. The Region 6 indicator status is noted for each observed species on Table 1. Table 2 explains the U.S. Environmental Protection Agency's Region 6 Wetland Indicator Status categories. Most tree species were identified along streams or creeks and fence lines. Canopy tree species were also identified as sapling shrub species although not relisted in the table. Most land within the limits of the proposed pipeline is either in cultivation for crops or consists of improved pasture grasses for livestock.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Region 6 Indicator Status</u>
	Canopy Species	
Boxelder	Acer negundo	FACW-
Black Willow	Salix nigra	FACW+
American Elm	Ulmus americana	FAC
Hackberry	Celtis laevigata	FAC
Bois d' Arc	Maclura pomifera	UPL
Post Oak	Quercus stellata	NA*
Cottonwood	Populus deltoides	FAC
	Sapling/Shrub/Vine Species	
Rough-Leaf Dogwood	Cornus drummondii	FAC
Greenbriar	Smilax rotundifolia	FAC
Southern Dewberry	Rubus trivialis	FAC
Grapevine	Vitis spp.	FAC-

	<u>Herbaceous Species</u>	
Bermudagrass	Cynodon dactylon	FACU+
Bushy Bluestem	Andropogon glomeratus	FACW+
Inland Sea Oats	Chasmanthium latifolium	FAC
Little Bluestem	Schizachyrium scoparium	FACU+
Cherokee Sedge	Carex cherokeensis	FACW-
Lovegrass	Eragrostis spp.	OBL-FACU+
Nut Sedge	Cyperus esculentus	FACW
Smartweed	Polygonum spp.	FAC-OBL
Switchgrass	Panicum virgatum	FACW
Camphorweed	Pluchea camphorata	FACW-
Threeawn	Aristida spp.	FAC-UPL
Virginia Wildrye	Elymus virginicus	FAC

TABLE 1: VEGETATION LIST (Cont.)

TABLE 2: EXPLANATION OF PLANT INDICATOR STATUS CATEGORIES¹

Indicator Category	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1 percent) in nonwetlands. Examples: <i>Spartina alterniflora, Taxodium distichum</i> .
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67 percent to 99 percent) in wetlands, but also occur (estimated probability 1 percent to 33 percent) in nonwetlands. Examples: <i>Fraxinus pennsylvanica, Cornus stolonifera.</i>
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33 percent to 67 percent) of occurring in both wetlands and nonwetlands. Examples: <i>Gleditsia triacanthos, Smilax rotundifolia.</i>
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 percent to <33 percent) in wetlands, but occur more often (estimated probability >67 percent to 99 percent) in nonwetlands. Examples: <i>Quercus rubra, Potentilla arguta.</i>
Obligate Upland Plants	UPL	Plants that occur rarely (estimated probability <1 percent) in wetlands, but occur almost always (estimated probability >99 percent) in nonwetlands under natural conditions. Examples: <i>Pinus echinata, Bromus mollis</i> .
No Indicator	NI	No definition for the specific vegetation is provided.
No Agreement	NA	The regional panel was not able to reach a unanimous decision on this species.
¹ Categories we by the National F be species adapte	re originally de lant List Panel d to wetter cor	veloped and defined by the USFWS National Wetlands Inventory and subsequently modified . The three facultative categories are subdivided by (+) and (-) modifiers. (+) is considered to additions whereas (-) is considered to be species adapted to drier conditions.

e) <u>Soils</u>

According to the information obtained from the Soil Surveys of Fannin, Hunt, and Collin Counties (United States Department of Agriculture (USDA), Soil Conservation Service in cooperation with the Texas Agriculture Experiment Station), a total of 21 mapped soil types are traversed by the proposed pipeline route and its associated easements. The soil types are summarized in Table 3. Maps showing the locations of the soil types relative to the proposed 120-foot temporary construction and permanent easement area are included as Figures C-1 through C-24 in Appendix C. The shape files identifying the locations of the soil types were obtained from the Natural Resource Conservation Service website.

Descriptions of the mapped soil types are also included in Appendix C. Two of the mapped soil types are listed as hydric soils for the counties traversed by the proposed pipeline. These soils are Tinn clay, frequently flooded and Trinity clay, occasionally flooded.

Map Unit	Soil Type and Description	Depth to High Water Table
AuB	Austin silty clay, 1 to 3 percent slopes	>6 feet
CrB	Crockett loam, 1 to 3 percent slopes	>6 feet
EsD2	Ellis clay, 5 to 12 percent slopes, eroded	>6 feet
FaA	Fairlie clay, 0 to 1 percent slopes	>6 feet
FdB	Fairlie-Dalco complex, 1 to 3 percent slopes	>6 feet
FeD2 (10)	Ferris clay, 5 to 12 percent slopes, eroded	>6 feet
FeE3	Ferris-Houston clays, 5 to 12 percent slopes, severely eroded	>6 feet
Fr	Frioton silty clay loam, occasionally flooded	>6 feet
HcC2	Houston clay, 3 to 5 percent slopes, eroded	>6 feet
HcD2	Houston clay, 5 to 8 percent slopes, eroded	>6 feet
HfC2	Heiden-Ferris complex, 2 to 6 percent slopes, eroded	>6 feet
HoB (17)	Houston black clay, 1 to 3 percent slopes	>6 feet
HoB2	Houston black clay, 2 to 4 percent slopes, eroded	>6 feet
HwC	Howe-Whitewright complex, 3 to 5 percent slopes	>6 feet
LeB (21)	Leson clay, 1 to 3 percent slopes	>6 feet
NoB	Normangee clay loam, 1 to 3 percent slopes	>6 feet
ShB	Stephen silty clay, 1 to 3 percent slopes	>6 feet
Tc and To	Trinity clay, occasionally flooded	0-3.0 feet
Tf	Tinn clay, frequently flooded	0-3.0 feet
W	Water (no soil type)	
WcB	Wilson clay loam, 1 to 3 percent slopes	0-1.0 feet
WwD2	Whitewright-Howe complex, 5 to 12 percent slopes, eroded	>6 feet

TABLE 3: SOIL TYPE AND DESCRIPTIONS

4) Conclusions

a) Description of Potential Waters of the U.S.

Wetlands

15 areas were identified as potential wetlands. These areas were identified by comparing the USGS topographic maps, soil types, and color infrared aerial imagery in relation to apparent waters of the U.S. From the aerial imagery, these areas appear to contain either emergent vegetation adapted to prolonged periods of inundation or areas occupied by trees adjacent to substantial streams or rivers (forested wetlands). It should be noted that the identified signatures require further field investigation including determination using the routine wetland determination data forms. In addition to the abovementioned areas, fringe wetlands may exist along impoundments encountered by the proposed pipeline and its associated easements. These potential wetland areas are summarized in Table 4 including their classification as either emergent or forested wetlands.

Identification	Aquatic Resource	Classification	120-Foot Temporary Easement
			Area (Acres)
W 1	Along Tributary to Pettigrew Branch	Emergent	0.12
W 2	Along Pettigrew Branch	Emergent	0.35
W 3	Bullard Creek Watershed	Emergent	0.77
W 4	Along Tributary to Tributary to Sloans Creek	Emergent	0.42
W 5	Along Tributary to South Sulphur River	Emergent	0.32
W 6	Boney and Lee Creeks Floodplain	Forested	5.87
W 7	Tributary to Bear Creek	Emergent	0.14
W 8	Tributary to Bear Creek	Emergent	0.25
W 9	Along Tributary to Bear Creek	Forested	0.92
W 10	Indian Creek Floodplain	Forested	1.72
W 11	Tributary to Pot Rack Creek	Emergent	0.08
W 12	Headwaters to Tributary to Pot Rack Creek	Emergent	0.48
W 13	Tributary to Pilot Grove Creek	Emergent	0.27
W 14	Pilot Grove Creek Floodplain	Forested/Emergent	0.12
W 15	Pilot Grove Creek Floodplain	Forested/Emergent	0.11
	Total		11.94

TABLE 4: SUMMARY OF POTENTIAL WETLANDS WITHIN THE PROJECT AREA

Streams and Rivers

The proposed pipeline will have 87 crossings of streams, rivers, or their associated tributaries. These waters vary in size and character. Notable named streams or rivers to be crossed include Pettigrew Branch, Cottonwood Creek, Spring Branch, Bullard Creek, Burnett Creek, Long Branch, Loring Creek, South Sulphur River, Arnold Creek, Boney Creek, Lee Creek, Bear Creek, Indian Creek, Pot Rack Creek, and Pilot Grove Creek. Table 5 summarizes the streams and rivers that would be potentially encountered by the proposed pipeline and its associated easements. This table identifies both length of stream or river at its ordinary high water mark and total area of the stream to be potentially encountered by the proposed pipeline alignment. These calculations are based

	۲ ۲	USGS	Proposed 120-Foot	t Temporary Eas	æment
ld entiteation	Aquatic Resource	Classification	Wilth at OHWM (Feet)	Length (L.F.)	Area (Acres)
S 1	Tributary to Y oakum Creek	Ephemeral	2.5	164.20	0.0100
S 2	Tributary to Ward Creek	Ephemeral	6.0	125.82	0.0173
83 83	Tributary to Ward Creek	Ephemeral	4.0	142.47	0.0131
84 84	Tributary to Ward Creek	Ephemeral	6.0	131.19	0.0181
85 85	Tributary to Ward Creek	Ephemeral	5.0	121.10	0.0139
S 6	Tributary to Ward Creek	Intermittent	6.5	215.48	0.0322
S 7	Tributary to S 8	Ephemeral	7.0	124.80	0.0201
00 00	Tributary to Ward Creek	Intermittent	5.0	358.12	0.0411
89 89	Tributary to Bois d'Arc Creek	Intermittent	7.0	152.18	0.0245
S 10	Tributary to Bois d'Arc Creek	Intermittent	6.0	300.86	0.0414
S 11	Tributary to S 10	Ephemeral	3.0	71.65	0.0049
S12	Tributary to S 13	Ephemeral	5.0	130.25	0.0150
S13	P ettigrew Branch	Intermittent	5.0	201.03	0.0231
S14	Tributary to S 17	Intermittent	3.0	123.75	0.0085
S15	Tributary to S 17	Ephemeral	3.0	209.13	0.0144
S16	Tributary to S 17	Ephemeral	4.0	154.06	0.0141
S17	C ottonwood Creek	Intermittent	10.5	129.20	0.0311
S18	Tributary to S 17	Ephemeral	6.0	123.07	0.0170
S 19	Spring Branch	Intermittent	10.5	195.10	0.0470
S 20	Tributary to S 19	Ephemeral	3.0	108.24	0.0075
S 21	Tributary to S 19	Ephemeral	3.0	963.94	0.0664
S 22	Bullard Creek	Intermittent	10.5	137.69	0.0332
S 23	Burnett Creek	Intermittent	10.5	107.51	0.0259
S24	Tributary to S 22	Ephemeral	3.0	250.37	0.0172
S25	Tributary to Tributary to S 22	Ephemeral	5.0	148.27	0.0170
S 26	Tributary to S 25	Ephemeral	2.5	133.26	0.0076
S 27	Tributary to Tributary to S 22	Ephemeral	2.0	71.66	0.0033
S 28	Tributary to S 22	Intermittent	7.0	152.58	0.0245
S 29	Tributary to Tributary to S 28	Ephemeral	5.0	128.72	0.0148
S 30	Tributary to S 33	Ephemeral	7.0	130.82	0.0210
S31	Tributary to S 33	Ephemeral	10.0	167.64	0.0385
S 32	Tributary to S 33	Ephemeral	8.5	133.49	0.0260
S 33	Long Branch	Ephemeral	10.0	145.59	0.0334

TABLE 5: SUMMARY OF STREAMS WITHIN THE PROJECT AREA

11	A	nses	Proposed 120-Foot	t Temporary Ea:	sement
T W T P T T T Y A T T	ay uater resource	Classification	Wilth at OHWM (Feet)	Length (L.F.)	Area (Acres)
S34	Long Branch	Ephemeral	7.0	141.51	0.0227
S35	Tributary to Sloans Creek	Intermittent	13.0	379.65	0.1133
S36	Tributary to S 35	Ephemeral	10.0	352.55	0.0809
S37	Tributary to S 35	Ephemeral	3.0	167.05	0.0115
S 38	Tributary to S 40	Ephemeral	4.0	141.12	0.0130
S 39	Tributary to S 38	Ephemeral	4.0	128.00	0.0118
S 40	Tributary to Allen Creek	Ephemeral	5.0	134.03	0.0154
S 41	Tributary to S 40	Ephemeral	4.5	161.01	0.0166
S 42	Tributary to Tributary to Davis Creek	Ephemeral	7.0	127.71	0.0205
S 43	Tributary to S 42	Ephemeral	4.0	122.28	0.0112
S 44	Tributary to S 46	Intermittent	6.5	122.81	0.0183
S 45	Tributary to S 46	Intermittent	4.0	135.08	0.0124
S 46	Loring Creek	Intermittent	4.0	141.92	0.0130
S 47	Tributary to S 50	Intermittent	3.0	133.38	0.0092
S 48	Tributary to S 47	Intermittent	5.0	122.82	0.0141
S 49	Tributary to S 47	Ephemeral	2.0	124.53	0.0057
S 50	Mustang Creek	Intermittent	25.0	148.83	0.0854
S 51	Tributary to S 50	Intermittent	8.0	121.42	0.0223
S 52	S outh Sulphur River	Intermittent	8.0	391.99	0.0720
S 53	Tributary to S 52	Ephemeral	10.0	125.24	0.0288
S 54	Tributary to S 52	Ephemeral	3.5	134.64	0.0108
S 55	Tributary to S 54	Ephemeral	3.5	126.63	0.0102
S 56	Tributary to S 52	Intermittent	11.5	329.93	0.0871
S 57	Arnold Creek	Intermittent	12.0	132.39	0.0365
S 58	Tributary to S 57	Intermittent	5.0	132.70	0.0152
S 59	Tributary to S 57	Ephemeral	2.0	303.23	0.0139
S 60	Tributary to S 67	Intermittent	10.0	138.37	0.0318
S 61	Boney Creek	Intermittent	5.0	603.72	0.0693
S 62	Boney Creek	Intermittent	3.0	153.02	0.0105
S 63	Boney Creek	Intermittent	3.5	352.75	0.0283
S64	Lee Creek	Intermittent	15.0	161.53	0.0556
S 65	Tributary to S 67	Ephemeral	6.5	128.58	0.0192

TABLE 5 (CONT.): SUMMARY OF STREAMS WITHIN THE PROJECT AREA

Id autified tion	Annatis Damma	nses	Proposed 120-Foot	Temporary Eas	ement
TUDETING	Aquate resource	Classification	Wilth at OHWM (Feet)	Length (L.F.)	Area (Acres)
S 66	Tributary to S 67	Ephemeral	5.0	131.49	0.0151
S 67	Tributary to S 64	Intermittent	9.5	116.43	0.0254
S 68	Tributary to S 67	Ephemeral	5.0	189.72	0.0218
S 69	Tributary to S 70	Intermittent	3.5	189.45	0.0152
S70	Bear Creek	Intermittent	7.5	167.21	0.0288
S71	Tributary to S 70	Intermittent	6.0	150.06	0.0207
S72	Tributary to S 71	Intermittent	3.5	160.92	0.0129
S73	Tributary to S 70	Intermittent	5.0	122.55	0.0141
S74	Tributary to S 76	Intermittent	5.0	129.42	0.0149
S75	Secondary Indian Creek Charmel	Perennial	10.0	157.27	0.0361
S76	Indian Creek	Perennial	18.0	178.56	0.0738
S77	Tributary to S 76	Intermittent	4.0	157.69	0.0145
S 78	Tributary to S 76	Ephemeral	3.0	125.43	0.0086
S79	Tributary to S 76	Ephemeral	2.5	125.03	0.0072
S 80	Tributary to S 76	Intermittent	6.0	124.70	0.0172
S 81	Tributary to S 82	Intermittent	3.0	211.35	0.0146
S 82	Pot Rack Creek	Intermittent	16.0	165.21	0.0607
S 83	Tributary to Desert Creek	Intermittent	5.0	114.70	0.0132
S 84	Tributary to S 87	Intermittent	7.5	341.96	0.0589
S85	Tributary to Tributary to S 87	Ephemeral	2.0	151.79	0.0070
S86	Remnant Channel Pilot Grove Creek Floodplain	Ephemeral	5.0	127.80	0.0147
S 87	Pilot Grove Creek	Perennial	25.0	120.00	0.0689
	Total			15,532.38	2.29

TABLE 5 (CONT.): SUMMARY OF STREAMS WITHIN THE PROJECT AREA

on the proposed pipeline's 120 feet temporary construction easement. The ordinary high water marks were estimated by observing the stream reach both up and downstream of the proposed crossing at accessible locations. In areas where the stream reach was not accessible near the proposed crossing, aerial photography was utilized to estimate an ordinary high water mark. During construction, impacts to stream crossings may be reduced by limiting construction to the pipeline's proposed permanent easement.

Other Water Types

Other water types to be potentially encountered by the proposed pipeline and its associated easements include open water bodies typically associated with the impoundment of streams or overland flows. 16 impoundments would be potentially encountered by the proposed pipeline and its associated easements. Ponds that capture overland flow exclusively should not be considered waters of the U.S. Table 6 summarizes the acreage of impoundments potentially encountered by the proposed pipeline and its associated easements.

Identification	Aquatic Resource	Classification	120-Foot Temporary Easement
			Area (Acres)
P 1	Yoakum Creek Watershed	Upland	0.06
P 2	Tributary to Ward Creek	On-channel	0.08
P 3	Near Tributary to Bullard Creek	Upland	0.04
P 4	Tributary to Mustang Creek	On-channel	0.21
P 5	Near South Sulphur River	Upland	0.05
Рб	Near Tributary to South Sulphur River	Upland	0.02
Р7	Tributary to Tributary to South Sulphur River	On-channel	0.25
P 8	Tributary to Lee Creek	On-channel	0.00
P 9	Boney Creek	On-channel	0.03
P 10	Tributary to Tributary to Lee Creek	On-channel	0.01
P 11	Near Tributary to Bear Creek	Upland	0.03
P 12	Near Tributary to Indian Creek	Upland	0.21
P 13	Tributary to Pot Rack Creek	On-channel	0.02
P 14	Stock Tank	Upland	0.07
P 15	Stock Tank (Near Desert Creek)	Upland	0.13
P 16	Tributary to Pilot Grove Creek	On-channel	0.02
Total			1.23

TABLE 6: SUMMARY OF IMPOUNDMENTS WITHIN THE PROJECT AREA

b) <u>Summary</u>

The following table is a comprehensive summary of the waters of the U.S. and their adjacent wetlands identified within the limits of the PJD. Only on-channel impoundments were included in the acreage calculation for impoundments. Impoundments that collect overland flow exclusively should not be considered waters of the U.S. Figures A-51 through A-73 in Appendix A identify the aquatic resources within the limits of the PJD. All of the listed waters of the U.S. should be considered jurisdictional due to their hydrologic connection to one of the following navigable waters of the U.S.: Red River, Sulphur River, and the Trinity River.

 TABLE 7: SUMMARY OF AQUATIC RESOURCES IDENTIFIED WITHIN THE

 PROJECT AREA

Aquatic Resource	Туре	Length (L.F.)	Area (Acres)
	Perennial	455.8	0.14
Streams or Rivers	Intermittent	7,927.5	1.34
	Ephemeral	7,149.1	0.78
	Forested	N/A	8.52
Wetlands	Emergent	N/A	3.20
	Forested/Emergent	N/A	0.22
Impoundments	On-channel	N/A	0.62
To	tal	15,532.4	14.82

5) Supporting Information

a) <u>References</u>

- Diggs, G.M., B.L. Lipscomb, and R.J. O'Kennon (1999). *Shinners and Mahler's Illustrated Flora of North Central Texas.* Fort Worth, Texas: Botanical Research Institute of Texas.
- Environmental Laboratory (1987). "Corps of Engineers Wetlands Delineation Manual" Technical Report Y-87-1. U.S. Army Corps of Engineer Waterways Experiment Station, Vicksburg, MS.
- Goerdel, A.R. (2002). *Soil Survey of Fannin County, Texas*. United States Department of Agriculture, Soil Conservation Service, In cooperation with the Texas Agriculture Experiment Station.
- Hanson, Arthur and Frankie F. Wheeler (1969). *Soil Survey of Collin County, Texas.* United States Department of Agriculture, Soil Conservation Service, In cooperation with the Texas Agriculture Experiment Station.

Lane, Gaylan and Edward F. Janak, Jr. (1981). *Soil Survey of Hunt County, Texas.* United States Department of Agriculture, Soil Conservation Service, In cooperation with the Texas Agriculture Experiment Station.

APPENDIX A FIGURES

















































