CITY OF DALLAS SUPPLEMENTAL ENVIRONMENTAL PROJECT – PAVAHO WETLAND

SECTION 408 PERMIT

ENVIRONMENTAL ASSESSMENT

DALLAS COUNTY, TEXAS

PREPARED FOR

UNITED STATES ARMY CORPS OF ENGINEERS

SOUTHWESTERN DIVISION

ON BEHALF OF THE CITY OF DALLAS

BY

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Acronyms and Abbreviations

ALERT	Automated Local Evaluation in Real Time
APAI	Alan Plummer Associates, Inc.
AQCR	Air Quality Control Region
ARC	AR Consultants, Inc.
BMPs	Best Management Practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibels
DCLID	Dallas County Levee Improvement District
DFP	Dallas Floodway Projects
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
EWLIDS	East and West Levee Interior Drainage System
FONSI	Finding of No Significant Impact
ft	feet
gpm	gallons per minute
JD	Jurisdictional Determination
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
NPDES	National Pollutant Discharge Elimination System
NTTA	North Texas Turnpike Authority
NWP	Nationwide Permit
O_3	Ozone
OHWM	Ordinary High Water Mark
$PM_{2.5}$	particulate matter 2.5 microns in diameter
PM_{10}	particulate matter 10 microns in diameter
PCN	Pre-Construction Notification
RCRA	Resource Conservation and Recovery Act
SCADA	Supervisory Control and Data Acquisition
SEP	Supplemental Environmental Project

SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Council on Environmental Quality
TDH	Texas Department of Health
THC	Texas Historical Commission
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department
TPDES	Texas Pollutant Discharge Elimination System
TRCP	Trinity River Corridor Project
TRFCD	Trinity River Flood Control Division
TxDOT	Texas Department of Transportation
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USCB	United States Census Bureau
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

1.0. INTRODUCTION

1.1. Background

The initial concept for the Pavaho Wetland was developed by the U.S. Army Corps of Engineers (USACE) for the improvement of stormwater quality and wetland habitat restoration within the Trinity River Corridor. However, a lack of funding delayed design and construction of the Wetland Project. In 2004, the City of Dallas violated the Clean Water Act and the Resource Conservation and Recovery Act (RCRA) and was mandated through a written Consent Decree to implement construction of a Supplemental Environmental Project (SEP). Following the City's regulatory infractions, the United States Environmental Protection Agency (USEPA) and the Texas Commission on Environmental Quality (TCEQ) required that the City of Dallas provide funding as part of a series of compliance requirements. A portion of that funding was directed to furthering the USACE's Pavaho Stormwater Wetland concept, which also became the City's mandated SEP.

The Consent Decree, initially issued in 2006, establishes that the Pavaho Wetland is in the general public interest. It also set a 60-acre minimum project footprint. Completion of the Pavaho Wetland was originally scheduled for October 2007. However, major changes to USACE policy for review of proposed modifications to federal projects were implemented following failure of federal levees protecting New Orleans, Louisiana during Hurricane Katrina in 2005. In addition, constraints from multiple projects proposed within the same project area required modification of the original Consent Decree and significant changes to the proposed project and project timeline. Appendix A of the modified Consent Decree is included in Appendix A of this document. In May 2007, the City of Dallas selected Alan Plummer Associates, Inc (APAI) to provide engineering design services for the Pavaho Wetland.

The objectives of the Pavaho Stormwater Wetland SEP project include creation of habitat for wetland flora and fauna and water quality improvement of storm runoff reaching the Trinity River. Figure B-1 in Appendix B provides the general location of the proposed project. Figures B-2 and B-3 in Appendix B show the proposed project superimposed onto a 2008 aerial photograph and the USGS topographical map respectively. Photographs from a June 23, 2010 on-site investigation are included in Appendix C with Figure C-1 showing the location of the photographs.

Since the proposed project lies within the Dallas Floodway, its implementation significantly impacts a federal project and therefore requires approval by the Chief of Engineers under 33 USC 408. Under this title, temporary or permanent alteration, occupation, or use of any public works, including levees, for any purpose is only allowable with the permission of the Secretary of the Army. Under the terms of 33 USC 408, any proposed modification to a federal project requires a determination by the Secretary that the proposed alteration, permanent occupation, or use of a federal project is not injurious to the public interest and will not impair the usefulness of

the federal project. The authority to make this determination and approve modification to federal works under 33 USC 408 has been delegated to the USACE's Chief of Engineers.

1.2. System Overview and History of Flood Protection System

The Trinity River was vital to the early development of the City of Dallas. However, numerous large floods, including the catastrophic flood of 1908, led the City of Dallas to seek protection from the Trinity River floodwaters. Between 1928 and 1931, the Dallas County Levee Improvement District (DCLID) constructed levees to protect the City of Dallas from riverine flooding. The DCLID relocated the confluence of the West and Elm Forks of the Trinity River, and filled the remnant channel or set it aside for sump storage. In 1932, the DCLID had completed construction of the original components of the East and West Levee Interior Drainage System (EWLIDS). The EWLIDS includes six pumping plants, associated sumps, seven pressure sewers, and numerous gravity sluices that, in total, serve much of the City of Dallas metropolitan area.

In the mid-1940s, major storms, compounded by continued urbanization in the watershed, resulted in severe flooding in the project area. To reduce flooding within the City of Dallas area, Congress authorized the flood control project termed the "Dallas Floodway" in 1945 and again in 1950. The USACE completed building the authorized Dallas Floodway project in 1958, which included significant improvements to the levees and the EWLIDS.

The same levees that protect the City of Dallas from Trinity River flooding also block local stormwater runoff from the interior (developed) side of the levee from reaching the Trinity River. Thus, the City of Dallas manages interior drainage by allowing the stormwater runoff to pool in sumps (low areas) in interior areas before pumping or gravity feeding it into the Dallas Floodway. For the last 75 years, the City of Dallas (in cooperation with the USACE) has employed this strategy for managing stormwater in the EWLIDS.

Currently, the City of Dallas Trinity River Flood Control Division (TRFCD) operates and maintains the Dallas Floodway and EWLIDS under the regulatory control of the USACE (City of Dallas, 2008). The City of Dallas TRFCD uses a sophisticated Supervisory Control and Data Acquisition (SCADA) system to control and monitor the operation of the pumping plants. As part of the system, the City of Dallas TRFCD incorporates a network of closed-circuit TV cameras and an Automated Local Evaluation in Real Time (ALERT) reporting system that provides real-time measurements of precipitation and stream and sump levels throughout the watershed.

In March 2006, the need for improving the EWLIDS was demonstrated when a significant local storm caused widespread stormwater flooding in the City of Dallas, resulting in one fatality and significant property damage. During this storm, City of Dallas Police and Fire Departments responded to hundreds of emergency rescue calls from stranded motorists and residents, several of which were in the Pavaho Basin. More recently, in June 2009, following approximately five

inches of rainfall in a 24-hour period (National Climate Data Center, 2009), localized street flooding occurred in the Pavaho Basin when the Pavaho Pumping Plant exceeded pumping capacity (WFAA.com, 2010).

Specific to the proposed project, the Pavaho Pumping Plant drains an area of approximately 1,900 acres. Sump storage for the Pavaho Basin consists of a series of three interconnected ponds (Ponds A, B, and C) located generally parallel to the West Levee from the Hampton Street Bridge to east of the Sylvan Street Bridge. Pond A is the westernmost pond and connects to Pond B via a 10 feet by 8 feet reinforced concrete box culvert at Canada Drive. Pond B connects to Pond C via a 72-inch diameter reinforced concrete pipe underneath the Sylvan Avenue Bridge. In addition, a 10 feet by 8 feet reinforced concrete box culvert connects Pond A to the Westmoreland-Hampton Sump at the Hampton Street Bridge.

The Pavaho Pumping Plant was constructed in 1954 as part of the USACE Dallas Floodway project. It consisted of two, 30,000 gallons per minute (gpm) pumps. In 1979, the City of Dallas added one, 6,000 gpm pump. In 2003, the City of Dallas replaced one of the 30,000 gpm pumps with a 46,000 gpm pump. When the Trinity River is low, stormwater flow gravitates via concrete sluices beneath the West Levee into the Trinity River. When the Trinity River rises, the City of Dallas closes the sluice gates and pumps the stormwater into the Trinity River. The Pavaho Pumping Plant outfall is located in the Dallas Floodway.

In June 2010, a final environmental assessment was issued by the USACE to notify state and federal agencies as well as the general public of the City of Dallas' intent to improve the Pavaho Sump System, specifically to increase the Pavaho Pumping Plant capacity. The City of Dallas began construction on the new Pavaho Pump Station, located immediately west of the existing pump station, and is expected to achieve completion by December 2012. The new pump station will increase the existing pumping capacity from 82,000 gpm (1-46,000 gpm, 1-30,000 gpm, and 1-6,000 gpm pump) to 375,000 gpm.

1.3. Purpose and Need

As described above, the Pavaho sump system collects rainfall runoff from a watershed located outside of the West Levee. The Pavaho Pumping Plant periodically pumps stormwater from the Pavaho sump to the Trinity River. Stormwater runoff reaching the Trinity River from the Pavaho Pump Station contains contaminants common in urban runoff. The proposed Pavaho Stormwater Wetland project would consist of three wetland habitat cells created on the river side of the West Levee and a pretreatment wetland constructed within Sump Pond B on the landward side of the West Levee in the vicinity of Canada Drive and the Pavaho Pump Station.

Over time, the substantial modification of the Trinity River and its floodplain for the construction and operation of the Dallas Floodway resulted in significant loss of wetland habitat and functions within the project area. The proposed Pavaho Stormwater Wetland SEP would

recreate habitat for wetland flora and fauna, including habitat that can be maintained during sustained dry periods.

The Consent Decree requires the City of Dallas to be responsible for the satisfactory completion of the Pavaho Stormwater Wetland. The proposed Pavaho Stormwater Wetland Project would include development of approximately 64 acres of shallow emergent marsh, deep marsh, and upland habitat surrounded by open water and/or marsh within the Trinity River floodway and the existing Sump Pond B.

The purpose of the Pavaho Wetland is to improve surface water quality through retention and pretreatment of storm flows and rainfall runoff, create habitat for wetland flora and fauna, and serve as a visually appealing amenity fo the local community. The specific objectives of the Pavaho Wetland include:

- Capture and effective pretreatment of stormwater runoff from urban areas;
- Create a diversity of topography within the wetland to promote establishment of a diverse vegetative community;
- Establish a diverse and dense wetland plant community in the shortest possible time;
- Create functional landscape components within the wetland that augment pollutant removal, enhance wetland habitat, and promote a more natural appearance to include habitat areas that can be maintained during dry periods;
- Reduce future maintenance burden through adaptive management to protect long-term function;
- Provide habitat elements that promote greater wildlife and waterfowl use within the wetland;
- Serve as an attractive yet safe community amenity for adjacent residents;
- Mediate adverse environmental impacts previously caused by the construction and operation of the Dallas Floodway Project; and
- Satisfy terms and conditions of the Consent Decree for the City of Dallas.

2.0. DESCRIPTION OF ALTERNATIVES

2.1. Site and Structural Alternatives

The Consent Decree with USEPA requires the City of Dallas to construct the Pavaho Stormwater Wetland SEP in the vicinity of Sylvan Avenue along the west bank of the Trinity River. The Consent Decree also mandates that the total project size be at least 60 acres in size. The mandated size and location of the proposed project precluded the development of site alternatives. However, site constraints within the mandated project area led to several project design iterations. The narrative below explains the site constraints within the proposed project area, and the site and structural alternatives evaluated.

Site Constraints

The project area for the Pavaho Wetland project lies within the area or vicinity of multiple other projects, each of which imposes some constraints on the development of the preferred alternative design for the Pavaho Wetland. Existing utility easements within the project area also were taken into consideration.

The USACE is considering increasing the height of the existing levee about 4 ft. The slope of the raised levee would then extend further toward the river, which would put the toe of the levee about 40 ft from the existing toe. A 200-foot buffer from the toe of the future levee, as required by the USACE (per USACE Operations staff including Mr. Gene Rice and Mr. Kevin Craig), was included in the design to protect the integrity of the levee.

Geotechnical information developed for the proposed Pavaho Wetland project site indicated a substantial lens of sand overlain by 2 feet of clay within the proposed wetland section west of Sylvan Avenue. To avoid exposing this sand layer and potential wicking of water toward the levee, the proposed design avoids all excavation within the area of capped sand.

The existing Sylvan Road Bridge across the Trinity River is scheduled to be replaced with a new bridge that will have a larger footprint. A 50-foot buffer zone along each side of the proposed bridge footprint was provided in the proposed design of the Pavaho Wetland project to avoid conflicts.

The Trinity River Corridor Project (TRCP) is a multi-agency public works project intended to address regional concerns specific to flood protection, environmental restoration, recreation, transportation, and community/economic development. The TRCP includes realignment of the Trinity River channel within the Pavaho Wetland project area, as well as construction of future trails and other public amenities. The proposed Pavaho Wetland design accommodates the various components of the TRCP through avoidance of the proposed channel realignment areas and employment of buffer zones between the proposed Pavaho Wetland sections and proposed TRCP project areas.

The proposed Pavaho Wetland design incorporates and complements existing jurisdictional wetland areas delineated within the project area to the extent practicable. The proposed design will provide enhanced hydrology to the existing wetland areas. Avoidance and minimization of adverse impacts to the jurisdictional areas was achieved with the proposed design.

Utility easements for a gas pipeline and electric transmission powerline traverse the proposed Pavaho Wetland project area. Wetland excavations within these utility easements were avoided in the proposed Pavaho Wetland design.

Proposed design elements of the Pavaho Wetland project also accounted for the flood protection functions provided by the Dallas Floodway Project. The proposed Pavaho Wetland design minimizes any adverse impacts to these flood protection functions.

2.2. ACTION ALTERNATIVES

2.2.1 No Action Alternative

Under the No Action Alternative, the City of Dallas would not construct the Pavaho Stormwater Wetland Project. As such, the City would not be in compliance with the USEPA Consent Decree. Therefore, the No Action Alternative is not a reasonable action alternative because it does not meet the purpose and need for the Proposed Action or the requirements of the Consent Decree.

However, as required under Council on Environmental Quality (CEQ) regulations (40 C.F.R. § 1502.14(d)), the No Action Alternative does provide a meaningful measure of baseline conditions against which the impacts of the preferred alternative can be compared. Furthermore, the No Action Alternative could describe potential future conditions in the absence of the Proposed Action. In this EA, the No Action Alternative represents the baseline conditions described in the Affected Environment section of Chapter 3.

2.2.2 Alternative 1 (Preferred Alternative)

The preferred alternative would be the construction of approximately 64 acres of wetlands within four separate sections:

- 8.8-acre pretreatment wetland within the sump located at the corner of Sylvan Avenue and Canada Drive;
- 24.3-acre West Section wetland located on the river side of the West Levee, west of the Sylvan Avenue bridge;
- 13.8-acre Central Section wetland located on the river side of the West Levee, east of the Sylvan Avenue bridge and west of the Pavaho Sump discharge channel; and
- 17.4 acre East Section wetland located on the river side of the West Levee, east of the Pavaho Sump discharge channel.

Construction of the three proposed wetland sections on the river side of the West Levee would focus on creation of wetland habitat and to a lesser degree water quality improvement for storm

runoff from adjacent floodplain area as well as river overflows. Although the hydrology would be the same as current conditions, modification of the existing topography would more effectively trap and attenuate runoff and overbank flows. Much of the three proposed wetland areas on the river side will be formed by creating depressional areas by excavating material and removing it from the site. The new depressional areas in conjunction with interior berms and flow control structures would retain water to sustain wetland vegetation. To avoid increasing water surfaces during flood stage conditions, berm heights have been minimized and are less than 2-3 feet above existing grade.

To enhance the Wetland's function as an attractive public amenity, a small, solar-powered pump station will be installed in the Pavaho discharge channel that will provide water to shallow pools (open water zones) located in the West and Central Wetland Sections. This pump station will enable these pools to have a consistent supply of water, even through periods of extended drought. As such, these areas will become a focal point for pedestrian traffic. To accommodate this, two short boardwalks with observation decks may be installed to allow visitors to experience the diverse wetland habitat up close. One boardwalk is planned for installation in the West Section and one in the Central Section.

The pretreatment wetland proposed within the Pavaho Sump Pond B would provide water quality improvement for storm flows collected in the sump prior to conveyance to the river by the pumps. Minor grading and planting of wetland vegetation is proposed to increase retention time of the first flush of storm runoff through the basin. This increased retention time will facilitate natural water quality improvement through physical, chemical, and biological removal processes. By having the water flow through the created wetland areas, nutrients and metals entrained in the stormwater will be filtered and absorbed by the vegetation and wetland soils. This should result in improved water quality (reduction of metals and nutrients) of stormwater discharges to the Trinity River. Figure B-2 illustrates the preferred alternative superimposed over a 2008 aerial photograph.

Although the proposed preferred alternative incorporates the adjacent existing jurisdictional wetlands into the overall design of the three sections on the river side of the levee, it does not account for these existing wetlands in the Consent Decree required 60-acres of wetlands. The City of Dallas intends to create approximately 64 acres of emergent wetlands in addition to the existing wetlands. Efforts were made during the development of the conceptual design to avoid adverse impacts to the existing jurisdictional wetland areas to minimize any unavoidable impacts. Minor fill will be required for installation of certain water level control structures and some containment berms. These impacts from fill activities to existing wetlands are anticipated to be less than 0.5-acre, allowing the project to qualify for authorization under Nationwide Permit (NWP) 32 for enforcement actions or NWP 27 for habitat restoration. The USACE Regulatory Branch has indicated during planning coordination for this project that either NWP 32 or NWP 27 would be viable permitting options for the proposed project.

The preferred alternative attempts to maximize use of the existing topography and soils, which in turn will minimize earthwork costs. This alternative also provides the most practicable design to capture sufficient water to sustain wetland vegetation to support the natural water quality improvement functions, which is the primary purpose for this project. The design also avoids buffer zones along the USACE levee as well as wetland development within existing gas and electrical line easements.

2.2.3 Alternative 2

Action Alternative 2 is the preliminary conceptual design plan developed by the USACE for a wetland complex in the Pavaho sump area. Due to site constraints resulting from existing conditions and future projects as presented in Section 2.1, this alternative was no longer possible and was therefore removed from futher consideration as a viable alternative.

2.2.4 Alternative 3

Action Alternative 3 is one of the first conceptual layouts prepared for Pavaho Wetland by the City's engineer. This design iteration utilized only three wetland areas located within the levee in the location of the proposed West, Central, and East Sections and did not consider the existing Pavaho Sump (proposed Pretreatment Wetland). The boundaries of each of the three wetland sections accommodated the future realignment of the Trinity River on the north and extended close to the levee on the south. These were subsequently changed in accordance with the USACE's request for a 200-foot buffer zone near the levee (see Section 2.1). In addition, this iteration incorporated mostly high marsh within the design.

2.2.5 Alternative 4

Action Alternative 4 is a slight modification of the proposed design for the West and East sections. In the West Section a second berm was proposed that would cross the existing drainage channel and connect the proposed berm to the toe of the levee. By preventing runoff from flowing east to the Central Section more water would likely be diverted into the West Section. In the East Section the portion of the berm located adjacent to the channel at the western edge of the wetland is proposed to extend an additional 400 ft to the south. This would increase the size of the upper marsh and decrease the amount of earthwork in the southwest portion of the East Section. This iteration was not used because it included fill within the 200-foot levee buffer zone.

3.0. EXISTING ENVIRONMENT AND EFFECTS

3.1. Project Setting and Land Use

3.1.1 Existing Conditions

The four wetland sections of the proposed project are located along the West Levee of the Trinity River Floodway in Dallas, Texas. The pretreatment wetland is located outside of the floodway, south (landward side) of the levee. The pretreatment wetland will be located in the stormwater detention sump, identified as Pond B of the Pavaho Sump System, which is surrounded by residential properties. The remaining three proposed wetland sections would be located on the river side of the West Levee within the Trinity River Floodway. The 2005 North Central Texas Council of Governments (NCTCOG) land use designation for the Pavaho sump area is Dedicated-Flood Control and Vacant, and the Dallas Trinity River Floodway is designated as Dedicated-Parks (NCTCOG 2007). The Pavaho Pump Station and proposed Wetland project area are situated at the western border of the Trinity River Corridor Comprehensive Land Use Plan Downtown Lakes District in the Residential Riverside development module (City of Dallas 2005). The area is zoned for agricultural and residential use.

Currently, the portion of the proposed project within the Trinity River Floodway consists of mostly herbaceous vegetation which is routinely maintained. Mature trees and some small trees and shrubs are found mostly along the existing river channel as well as interspersed along the perimeter of the proposed project area. Within the Pavaho Sump Pond B, mostly herbaceous vegetation as well as open water exists. Single family residential homes surround Pond B.

3.1.2 Effects

3.1.2.1 Proposed Action

No changes in land use are anticipated as a result of the proposed Pavaho Wetland project. The project area with the sump area would still serve for flood control. The three wetland sections on the river side of the levee within the Dallas Floodway would still provide both flood control and park functions.

3.1.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.1.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to land use.

3.2. Topography

3.2.1 Existing Conditions

The topography underlying the proposed project area is strongly influenced by the previous modifications to the Trinity River floodplain for the development of the Dallas Floodway. The

pretreatment wetland would be located in the existing Pavaho sump area designated as Pond B. The sump has steep sided slopes and a generally flat bottom. The sump's slopes ranges between 408 feet msl at the top to 392 feet msl at the bottom.

The topography within the Trinity River floodway is gently sloping toward the river and to the east. Shallow depressions formed from settling of the native soils following construction of the floodway levees and river channel contain emergent wetland areas of varying sizes. Elevations range from about 409 to 400 feet msl across the three river side wetland sections.

3.2.2 Effects

3.2.2.1 Proposed Action

Implementation of the preferred alternative involves grading existing contours to accommodate flow and water retention, increase topographic diversity, and create habitat zones within the created wetlands. Created depressional wetlands, low interior berms and flow control structures would be constructed to allow limited stormwater retention. The proposed grading within the wetland sections would create varying water depths to develop habitat zones designated as low marsh (6-18 inch water depths), high marsh (0-6 inch water depths), deep marsh/open water (3-5 foot water depths) and upland habitat (0-2 feet above water level). The overall resulting topographic changes would be relatively minimal within the project area.

3.2.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.2.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to topography.

3.3. Soils and Geology

3.3.1 Existing Conditions

According to the Soil Survey of Dallas County, soils underlying the sump area for the pretreatment wetland are classified as Pits and Dumps, and soil underlying the floodway area for the proposed riverside wetland sections is classified as Trinity-Urban Land Complex. The soils in both areas have been highly disturbed due to fill and excavation activities. Figure B-4 in Appendix B shows the soil map units in the vicinity of the proposed project.

Geological formations underlying the proposed project area consist of alluvial and fluviatile terrace deposits of the Quaternary age. These formations consist of sediment deposits with consistencies ranging from gravel to sand and clay. Figure B-5 in Appendix B shows the geological formations underlying the proposed project area as depicted by the Bureau of Economic Geology's Geological Atlas of Texas – Dallas Sheet.

3.3.2 Effects

3.3.2.1 Proposed Action

Soils would be disturbed through the proposed grading and limited fill activities used to construct the proposed wetlands. However, no import of soils is proposed, so no substantive changes to the soils within the proposed project area would occur. The impact of the minor soil disturbances resulting from the proposed grading activities would be reduced through engineering measures during construction activities and using Best Management Practices (BMPs) as outlined in the Erosion Control Plan included as part of the Proposed Action. The plan would include silt fences, rock filter dams, inlet protection, and vegetation establishment. Any constructed erosion control elements would be removed upon the final stabilization of the site. Wetland vegetation would be planted within the disturbed areas of the proposed wetland section footprints and disturbed areas outside the wetland sections would be seeded or sodded with native plant species. Areas disturbed by construction would be vegetated and monitored periodically to ensure that the vegetation is in good health.

3.3.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.3.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to geology and soils.

3.4. Socioeconomic and Environmental Justice Analysis

3.4.1 Existing Conditions

In 1994, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities. In addition, EO 12898 aims to ensure that any potential disproportionately high and adverse human health or environmental effects on these communities are identified and addressed. Because children may suffer disproportionately from environmental health and safety risks, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced to help ensure that federal agencies' policies, programs, activities, and standards address environmental health and safety risks to children.

Data used for the socioeconomic analysis were collected primarily from the 2000 Census of Population and Housing (U.S. Census Bureau 2010). Demographic data are used to determine if there would be a potential disproportionate burden associated with a proposed action on a minority group (Environmental Justice) or on minors (Protection of Children).

According to the United States Census Bureau (USCB) the proposed project is located in three census tracts, Tract 100.00, Tract 101.01, and Tract 101.02. Table 3.1 below shows racial population demographics and the percentage of the population that is below the poverty level for the two census tracts, Dallas County, and the City of Dallas based on 2000 USCB data. Both of

the census tracts adjacent to the proposed project show minority populations above the percentage for Dallas County and the City of Dallas. The tracts also show a poverty level above the percentage for Dallas County and the City of Dallas County.

Table 3.1: Project Vicinity Demographic Information

	Tract 100.00	Tract 101.01	Tract 101.02	City of Dallas	Dallas County
Population	9,614	3766	3460	1,188,204	2,218,899
White	3,669 / 38%	37 / 1%	135 / 3.9%	411,172 / 34.6%	983,516 / 44.3%
African American	4,042 / 42%	2,265 / 60.1%	114 / 3.3%	303,561 / 25.5%	443,621 / 20.0%
Hispanic	1,689 / 18%	1,459 / 38.8%	3,201 / 92.5%	423,178 / 35.6%	663,125 / 29.9%
American Indian	56 / .3%	0	0	3,420 / 0.3%	8,227 / 0.37
Asian	0	0	0	31,838 / 2.7%	86,793 / 3.9%
Pacific Islander	0	0	0	432 / 0.04%	739 / 0.03%
Other Race	0	0	0	985 / 0.06%	2,222 / 0.1%
Two or More Races	181 / 2%	5 / 0.1%	10 / 0.3%	13,618 / 1.1%	30,656 / 1.4%
Below Poverty	13%	35%	22%	17.80%	17.30%

The neighborhood surrounding the Pavaho Pumping Plant is largely residential. 62.7 percent of those residences are owned by the residents, and 37.3 percent are rented. In 2000, 67.7 percent of the households in the census block had children under 18 living at home; 10.2 percent included children under six years old. Nearly half (47 percent) of the households in the Pavaho Pumping Plant vicinity earn below the 2008 poverty level and 17 percent of the households earn less than half of the 2008 poverty level (U.S. Census Bureau 2010).

3.4.2 Effects

3.4.2.1 Proposed Action

While the proposed project location raises environmental justice concerns due to a disproportionately high minority and low income populations, the proposed project would not cause an adverse human health or environmental effect. The proposed project would be located in existing floodways and a stormwater collection sump. Under the proposed project, the functions of the floodway and stormwater basin would be augmented through the construction of wetlands that would serve to enhance water quality. In addition, the proposed wetland habitat areas will serve as a public amenity to the surrounding area as well as to visitors from outside the immediate area. The implementation of the Proposed Action would, therefore, result in a minor beneficial impact to socioeconomics and there would be no disproportionate impact to minority populations or the health and safety of children.

3.4.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.4.1 would remain unchanged. Existing stormwater flood management including flooding risks for minority and low income populations would continue. Furthermore, potentially affected structures would continue to be subject to economic damages from flooding. The implementation of the No Action Alternative would result in continued adverse, but less than significant impacts to socioeconomics and no disproportional impact to environmental justice.

3.5. System Integrity

HEC-RAS modeling of the Pavaho Wetland project site was performed using topographic layouts. Design of the project was based upon the assumption that an increase in surface elevation along constructed berms located at the perimeter of wetland cells and any increase in surface roughness from planting wetland vegetation would be offset by the overall net decrease in fill taken from the Wetland [offset by the increase of valley storage].

Results of the HEC-RAS model confirm no increase to the flood water surface elevation for a 100-year storm and standard project flooding. The increase in valley storage created by the Pavaho Wetland was able to offset the minimal low berms and increased surface roughness that would potentially cause an increase in flood elevation in the vicinity of the project. The model showed no impact either upstream or downstream of the Pavaho Wetland. Only negligible changes in flow distribution occur as a result of minor topographic modification. This is true particularly during initial overbank flooding when floodwaters are redirected into the depressional wetlands. Overall there should be no local or system-wide impacts that will occur following construction of the Project.

3.5.1 Localized Levee System Integrity

The proposed project would have no impact on levee system integrity. A buffer zone (i.e., set back distance) between the proposed project and the toe of the levee has been included in the project design. The USACE proposes to increase the height of the existing levee which would extend the toe width of the existing levee. The project design includes a 200-foot buffer between the proposed project and the proposed expanded levee toe.

3.5.2. Levee Maintenance and Flood Fighting

The proposed project would have no impact on levee maintenance and flood fighting.

3.5.3. Executive Order 11988

The USEPA Consent Decree requires that the proposed project be located within or adjacent to the floodway in order to enhance habitat diversity and stormwater quality. With the exception of the pretreatment wetland, the entire proposed project would be located in the floodway. According to hydrological studies, the proposed project would not increase the chance of flood loss, and not increase the impact of floods on human safety, health and welfare. Further, by

design and purpose of the Consent Decree, the proposed project is anticipated to enhance the natural and beneficial values served by the floodplain.

3.5.4. CDC Criteria

According to hydrological studies, the proposed project is not anticipated to alter flood elevations, but is anticipated to increase valley storage. The proposed project would meet CDC permitting requirements, and there is no anticipated need for mitigation.

3.6. Water Resources

3.6.1 Existing Conditions

The majority of surface water features in the Dallas Floodway have been substantially modified from their natural condition. These changes began in the late 1920s when the City of Dallas began a major effort to control flooding of the Trinity River in and around the downtown area. The most substantial changes involved the diversion of the Trinity River (old river channel) to its current location within the Dallas Floodway.

A Jurisdictional Determination (JD) was performed by Halff Associates, Inc. (Halff) for the area of the proposed Dallas Floodway and North Texas Tollway Authority (NTTA) Trinity Parkway Projects which included the area for the proposed Pavaho Wetland project. In response to concerns regarding changes in the regulatory setting since the Rapanos decision, the City of Dallas requested that Halff conduct a review of the 2006 wetland delineation. A re-verification of the Dallas Floodway JD (USACE #SWF-2000-00308) dated January 21, 2011 was submitted to the USACE for review. Review of jurisdictional wetlands as delineated in the draft revised JD report indicate that no changes within the proposed Pavaho Wetland immediate project area are indicated. The JD report dated May 2006 and the draft revised JD report dated January 21, 2011 are included in Appendix D of this report. The Trinity River, a navigable water of the United States, is the primary aquatic feature in the proposed project area. The Trinity River flows from the confluence of the Elm Fork and West Fork located upstream of the proposed project area, through downtown Dallas, and continuing generally southeast to the Gulf of Mexico. Within the proposed project area, the ordinary high water mark (OHWM) of the Trinity River varies from between 100 to 150 feet in width. Vegetation within the narrow riparian corridor of the Trinity River is limited to cattails (*Typha* spp.) on silt covered benches, and Virginia wildrye (*Elymus virginicus*) along some overbank areas. The dominant tree species within the corridor are cottonwood (*Populus deltoides*) and black willow (*Salix nigra*). Random red mulberry (*Morus rubra*) saplings were noted in some areas (City of Dallas, 2006).

When water levels in the Pavaho Sumps reach preprogrammed elevations, the pumps transfer water under the West Levee and into the Trinity River. After being pumped/drained to the Floodway, stormwater is conveyed to the Trinity River through the discharge channel aligned perpendicular to the West Levee and the Trinity River channel. During intense rain events, flooding can overwhelm stormwater drainage control measures and threaten structures, people,

and water quality in the Pavaho Basin. Flooding occurs most often in the floodplains adjacent to the sump ponds. Intense rain events may result in river flows over the channel banks into the floodway between the levees. The Trinity River has a bank-full discharge frequency between 1 and 2 years.

The Pavaho Sump Ponds are remnant levee borrow ditches that run adjacent to the levee and serve to store stormwater. Pavaho Sump Pond B, the location for the proposed pretreatment wetland, was determined to be non-jurisdictional (non-waters of the United States – man-made linear sump). Three emergent wetlands determined to be waters of the United States and totaling 46.32 acres as identified in the 2006 Halff JD report (45.11 acres as identified in the 2011 Draft Halff revised JD report; 1.21 acres removed from Emergent Wetland #44 due to construction in the vicinity of the Margaret Hunt Hill Bridge located southeast of the proposed Pavaho Wetland East Section) are located in the vicinity of the three proposed sections of the Pavaho Wetland within the floodway (river side of the levee). Additionally, the discharge channel from the Pavaho pump station was identified as jurisdictional waters of the United States (Open Water – Intermittent, 1.58 acres, 1,035 linear feet) due to its direct connection to the Trinity River.

Most emergent wetlands in the study area are mowed annually to improve the efficiency of flood conveyance. Mowed emergent wetlands in the project area had the same vegetative species composition, hydrology, and soils as the un-mowed emergent wetlands. However, in the mown areas, transition species such as giant ragweed were less than one foot tall, while in un-mowed areas it was often in excess of ten feet tall. Black willow saplings were present as trunk sprouts from prior mowing. Also noted was a thick layer of decaying plant matter on the surface resulting from the annual mowing. Channel overbank flow and surface runoff provide hydrology for the emergent wetlands. (City of Dallas, 2006)

A functional evaluation included in the 2006 Halff JD described functions associated with the aquatic features identified within the project area. Identified functions for the emergent wetlands included dynamic surface water storage, long-term surface water storage, nutrient cycling, removal of imported elements and compounds, maintenance of vegetative communities, and maintenance of wildlife habitat. Several of the functions listed were noted to be impacted by the annual mowing that resulted in low diversity and structure of the plant community.

Because the Pavaho drainage area is highly urbanized, stormwater quality associated with runoff in an urban setting is affected greatly. Urban stormwater carries pollutants from many sources, including oil and grease, heavy metals, chemicals, toxic substances, solid waste (trash and debris), wastewater, effluents, bacteria, sediment, and other waste streams. The amounts of pollutants and chemicals in stormwater can vary depending on factors such as surrounding land use (commercial vs. residential), frequency of rain events and the intensity of rain events.

3.6.1.1 Water Quality Standards and Designated Uses

TCEQ is charged with the responsibility of maintaining and enhancing the waters in the state and has divided surface waters in the State of Texas into numbered segments for the purpose of organizing water quality data and designated water uses and classifications. This information is used to describe the status and trends of the State's waters. Water quality impairments are noted on the Texas 2008 Clean Water Act Section 303(d) List. The list is comprised of segments that do not meet, or are not expected to meet, applicable water quality standards, and includes the reasons for the impairment or threat. The Texas Department of Health (TDH) is responsible for issuance of fish consumption advisories, aquatic life closures, and commercial bans.

The segment within the study area is Segment 0805, the Upper Trinity River. Segment 0805 consists of the Trinity River from a point immediately upstream of the confluence of the Cedar Creek Reservoir discharge canal in Henderson/Navarro County to a point immediately upstream of the confluence of Elm Fork Trinity River in Dallas County. As documented in the Texas 2008 Clean Water Act Section 303(d) List, Segment 0805 is listed as an impaired water under Category 5a, which signifies a water body that does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants and for which a Total Maximum Daily Load (TMDL) study is underway or scheduled. TMDL is a calculation of the maximum amount of pollutant that a water body can receive and meet water quality standards and in allocation of that amount to the pollutant's sources. The upper 8 miles of Segment 0805 is listed for bacteria and PCBs in edible tissue.

According to TCEQ's 2006 Texas Water Quality Inventory Status and Category of All Waters, the designated water uses for this Segment 0805 are high aquatic life use and contact recreation. Contact recreation was not supported due to the presence of occasionally elevated concentrations of bacteria.

3.6.1.2 Aquatic Habitat and Community

Fish species common within the Trinity River watershed and associated tributaries include species such as carp (*Cyprinus carpio*), gizzard shad (*Dorosoma cepedianum*), and long-nose gar (*Lepisosteus osseus*), and smaller pollution-tolerant species such as the mosquito fish (*Gambusia affinis*), sunfish (*Lepomis spp*.), red shiner (*Notropis lutrensis*), and bullhead minnow (*Pimephales viglax*). (TCCD, 2008)

The proposed project would have no direct impact on aquatic habitats and communities. Indirect impacts could be anticipated through water quality improvements.

3.6.1.3 Water Quality

Texas Pollutant Discharge Elimination System

The USEPA promulgated stormwater regulations pursuant to the National Pollutant Discharge Elimination System (NPDES) Program. Texas is an NPDES delegated state and the TCEQ continues to administer the general construction permits for stormwater activities at this time.

Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act

Congress directed the USACE under Section 404 of the Clean Water Act (33 USC 1344) to regulate the discharge of dredged and fill material into waters of the U.S. including wetlands. Congress also directed the USACE under Section 10 of the Rivers and Harbors Act to regulate any work in or affecting navigable waters of the U.S. The Trinity River is both classified as a water of the U.S. as well as a traditional navigable waterway. Activities that result in the discharge of dredged or fill material into waters of the U.S. require a permit under Section 404 of the Clean Water Act. Activities requiring a permit under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act may be authorized by a General Permit (such as Nationwide General Permits, Regional General Permits, or Programmatic General Permits) or an Individual Permit (such as Standard Individual Permits or Letters of Permission). Regulated activities include actions that would result in a discharge of dredged or fill material below the OHWM. The OHWM is defined as a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (33 CFR328.3(e)).

Executive Order 11990

As this project qualifies as a federal action, Executive Order 11990, Protection of Wetlands must be met. Executive Order 11990 requires all executive agencies to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative (May 24, 1977; 42 FR 26961)".

3.6.2 Effects

3.6.2.1 Proposed Action

Implementation of the proposed Pavaho Wetland project would result in increases in wetland area and enhanced functions within the created wetland areas as well as the existing emergent wetlands. No adverse impacts to the hydraulic functions of the Pavaho Sump Pond B or the floodway are projected based on the HEC RAS modeling conducted by Halff (2010). Therefore, implementation of the Proposed Action would result in beneficial impacts to water resources.

Water Quality Standards and Designated Uses

The purpose of the proposed project is to enhance the quality of stormwater entering the Trinity River in the project vicinity. The proposed constructed wetlands would capture stormwater transported contaminants from the surrounding watershed in the pretreatment wetland cell. Additionally, the proposed constructed wetlands within the floodway would retain and polish overflows of the Trinity River, thereby enhancing the water quality of the river.

Texas Pollutant Discharge Elimination System

A Stormwater Pollution Prevention Plan (SWPPP) will be developed for the construction activities planned for the Pavaho Wetland Project. The SWPPP will allow flexibility in complying with the provisions of the TCEQ TPDES General Permit for Stormwater Discharges Associated with Construction Activity. The owner's representative (Authorized Signatory) is responsible for ensuring that the contractor and all other participating subcontractors are in compliance with the provisions of the SWPPP. It is the policy of City of Dallas that all construction activities performed by the contractor and/or a subcontractor are in compliance with all federal, state, and local environmental laws and regulations.

It is USEPA's intent that erosion and sediment controls should be designed to retain sediment on-site to the extent practicable. The TCEQ will at a minimum retain the same erosion and control standards required by the USEPA. The TCEQ has determined that incorporating certain BMPs into Tier I projects would sufficiently address the likelihood that water quality will remain at the desired level. At least one BMP for erosion control, one BMP for post-construction total suspended solids control, and one BMP for sedimentation control from the TCEQ Tier I checklist would be utilized for the project (Table 3.2).

Table 3.2: Best Management Practices

Erosion Control	Sedimentation Control	Post Construction TSS
Temporary Vegetation	Sand Bag Berm	Retention/Irrigation
Blankets/Mulch/Matting	Silt Fence	Vegetative Filter Strip
Mulch	Triangular Filter Dike	Constructed Wetlands
Sod	Rock Berm	Wet Basins
Interceptor Swale	Hay Bale Dike	Vegetation Lined Drainage Ditches
Diversion dikes	Brush Berm	Grassy Swales
Erosion Control Compost	Stone Outlet Sediment Trap	Sand Filter Systems
Mulch Filter Berms/Socks	Sediment Basin	Extended Detention Basins
Compost Filter Berms/Socks	Erosion Control Compost	Erosion Control Compost
	Mulch Filter Berms/Socks	Mulch Filter Berms/Socks
	Compost Filter Berms/Socks	Compost Filter Berms/Socks

All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

Section 404 of the Clean Water Act

The proposed project was designed to avoid waters subject to Section 404 of the Clean Water Act. Proposed project designs indicate that minimal impacts to jurisdictional wetland areas will result from the Proposed Action and may be authorized by a General Permit. The creation of approximately 64 acres of developed wetland and enhancement of functions within the existing emergent wetlands would more than compensate for the minor impacts resulting from the Proposed Action. Therefore, implementation of the Proposed Action would result in less than significant impacts to water resources.

The City of Dallas has coordinated the planning and design of the proposed project with the USACE Regulatory Branch. The Regulatory Branch has indicated that the proposed project could be authorized by either NWP 27 for habitat restoration, or NWP 32 for enforcement actions. Appropriate permit application submittals and coordination with the USACE Regulatory Branch will be done following the completion of Section 408 coordination.

Executive Order 11990

The proposed project was designed to avoid wetlands to the extent practicable thereby meeting the terms of Executive Order 11990.

3.6.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.6.1 would remain unchanged. Existing emergent wetland water resources would continue to have reduced level of habitat and water quality improvement functions. Therefore, implementation of the No Action Alternative would result in adverse, but less than significant impacts to water resources.

3.7. Riparian and Terrestrial Resources

3.7.1 Existing Conditions

Vegetation in the floodway consists of upland to wetland adapted species. Maintenance activities in the floodway include annual mowing to prevent the growth of woody plant species and improve the efficiency of flood conveyance. Typical vegetation within the floodway includes balloonvine (*Cardiospermum halicacabum*), wireweed (*Aster subulatus*), sumpweed (*Iva annua*), cocklebur (*Xanthium strumarium*) and crow-foot caric sedge (*Carex crus-corvi*). Transition areas between wetlands and upland areas were dominated by giant ragweed (*Ambrosia trifida*), cocklebur, and dodder (*Cuscuta* spp.). Scattered large cottonwood trees occur in the vicinity of the proposed Pavaho Wetland areas within the floodway. Black willow saplings are present as trunk sprouts from root stock previously mowed. A thick layer of decaying plant matter resulting from the mowing activities was noted. Due to the limited vegetative structural diversity within the floodway, limited food, forage, and cover is provided for wildlife habitat. Generalist species which have the capacity to adapt to an urban setting are the most commonly observed species.

3.7.2 Effects

3.7.2.1 Proposed Action

The proposed project would enhance riparian and terrestrial resources by increasing available habitat area and vegetative diversity. The proposed plantings of herbaceous and woody species would increase vegetative structural diversity and provide important food, forage, and cover for wildlife habitat. The Proposed Action also includes the discontinuing of mowing activities within the project area. Therefore, implementation of the Proposed Action would result in beneficial impacts to riparian and terrestrial resources.

3.7.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.7.1 would remain unchanged. Existing riparian and terrestrial resources would continue to have limited wildlife habitat. Annual mowing of the proposed project area would continue. Therefore, implementation of the No Action Alternative would result in adverse, but less than significant impacts to riparian and terrestrial resources.

3.8. Species of Special Concern

3.8.1 Existing Conditions

The U.S. Fish and Wildlife Service (USFWS) lists six species of special concern as occurring or potentially occurring within Dallas County. The Texas Parks and Wildlife Department (TPWD) lists 29 species as threatened, endangered, or rare. Table 3.3 below lists the species of special concern for Dallas County and a brief description of their preferred habitat.

Table 3.3: Dallas County Species of Special Concern

Name	STATUS
BIRDS	
American Peregrine Falcon, *Falco peregrinus anatum*	DL, ST
Areas with high, massive cliffs with expansive views near water where prey are numerous and diverse	
Bald Eagle, *Haliaeetus leucocephalus*	DL, ST
Large lakes, nesting in tall trees; feeds in areas of open water where food is available	
Black-capped Vireo, *Vireo atricapilla*	FE, SE
Oak-juniper woodlands with patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; needs ground level foliage for nesting cover; yearly returns to same territory, or one nearby; shrubs and trees provide insects for feeding; nesting season March- summer	
Golden-cheeked Warbler, *Dendroica chrysoparia*	FE, SE
Juniper-oak woodlands; dependent on Ashe juniper for bark strips, used in nest construction; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer	
Henslow's Sparrow, *Ammodramus henslowii*	SR
Wintering individuals (not flocks) found in fields or cut areas where bunch grasses occur with vines and brambles	
Interior Least Tern, *Sterna antillarum athalassos*	FE, SE
Subspecies listed only when inland (more than 50 miles from coastline); nests on sand and gravel bars within braided streams, rivers; and man-made structures; eats small fish and crustaceans, when breeding forages within a few hundred feet of colony	

Peregrine Falcon, *Falco peregrinus*	DL, ST
See American and arctic subspecies above	
Piping Plover, *Charadrius melodus*	FT, ST
Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	
Western Burrowing Owl, *Athene cunicularia hypugaea*	SR
Open grasslands, sometimes in open areas such as vacant lots near human habitation; nests and roosts in abandoned burrows	
White-faced Ibis, *Plegadis chihi*	ST
Prefers freshwater marshes and irrigated rice fields, or saltwater habitats; nests on the ground in or reeds, or on floating mats	
Whooping Crane, *Grus americana*	FE, SE
Marshes, river bottoms, potholes, prairies, and cropland (migratory)	
Wood Stork, *Mycteria americana*	ST
Prairie ponds, flooded pastures or fields, ditches, and other shallow standing water	
INSECTS	
Black Lordithon rove beetle, *Lordithon niger*	SR
Historically known from Texas	
MAMMALS	
Cave myotis bat, *Myotis velifer*	SR
Roosts in caves, rock crevices, old buildings, carports, under bridges, in abandoned cliff swallow nests; in clusters of up to thousands; hibernates in caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore	
Plains Spotted Skunk, *Spilogale putorius interrupta*	SR
Open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	
MOLLUSKS	
Fawnsfoot, *Truncilla donaciformis*	SR
Rivers especially on sand, mud, sand, gravel, silt, and cobble bottoms in flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins	
Little spectaclecase, *Villosa lienosa*	SR
Creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins	
Louisiana pigtoe, *Pleurobema riddellii*	ST
Streams and rivers, on mud, sand, and gravel substrates; not typically in impoundments; Sabine, Neches, and Trinity (historic) River basins	
Texas heelsplitter, *Potamilus amphichaenus*	ST
Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins	
Wabash pigtoe, *Fusconaia flava*	SR
Streams on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow	
REPTILES	
Alligator snapping turtle, *Macrochelys temminckii*	ST
Perennial water bodies with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October	
Texas garter snake, *Thamnophis sirtalis annectens*	SR
Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August	
Texas Horned Lizard, *Phrynosoma cornutum*	ST
Open, arid and semi-arid regions with sparse vegetation	

Timber/Canebrake Rattlesnake, C*rotalus horridus*	ST
swamps, floodplains, upland pine and deciduous forests, riparian zones, abandoned farmland, prefers dense brush	
PLANTS	
Glen Rose yucca, *Yucca necopina*	SR
Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June	
Warnock's coral-root, *Hexalectris warnockii*	SR
In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; in the White Rock Escarpment (Dallas County), flowering June-September; individual plants do not usually bloom in successive years	
Federal and State Status Designation Codes: FE : Listed Federally Endangered, FT : Listed Federally Threatened, SE : Listed State Endangered, DL : Federally Delisted, ST : Listed State Threatened, SR : Listed State Rare	

On September 14, 2007, biologists from Alan Plummer Associates, Inc. conducted a field investigation for species of special concern within the proposed project area. The investigation showed that the proposed project area did not likely contain species of special concern or habitat preferred by species of special concern. A field investigation conducted in June 2010 verified that conditions were not significantly changed from the previous investigation in 2007. The 2007 threatened and endangered species report submitted to the USFWS is included in Appendix E.

3.8.2 Effects

3.8.2.1 Proposed Action

No state or federally listed special status species are located in the proposed project area. Therefore, implementation of the Proposed Action would result in no impacts to special status species or their preferred habitat.

3.8.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.8.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to special status species or their preferred habitat.

3.9. Air Quality

3.9.1 Existing Conditions

The study area is located in Dallas County, and is included within the Metropolitan Dallas Fort Worth Air Quality Control Region (AQCR) 215. Emissions in the study area come from a variety of stationary and mobile sources. Emission sources include vehicles, aircraft, industrial operations, and on-going construction activities. Approximately 70 percent of the Dallas/Fort Worth region's air pollution comes from mobile sources such as cars, trucks, airplanes, construction equipment, and lawn equipment. The Dallas/Fort Worth region has experienced a steady decline in ozone levels measured across the study area. Emission reductions have been achieved from stationary sources (stack) emissions, cleaner cars and construction equipment, and cleaner fuels (Green Dallas 2010).

3.9.2 Effects

Emission thresholds associated with federal Clean Air Act (CAA) conformity requirements are the primary means of assessing the significance of potential air quality impacts associated with implementation of a proposed action under NEPA. On March 24, 2010, the USEPA revised the general Conformity regulations. These rules implement CAA provisions prohibiting federal agencies from taking actions that may cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS) (USEPA 2010). A formal conformity determination is required for federal actions occurring in nonattainment or maintenance areas when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds.

3.9.2.1 Proposed Action

Air quality impacts would occur from the use of equipment during construction activities, other project-related vehicles, and worker commuting trips. Total emissions resulting from project activities have been estimated using data presented in Chapter 2, general air quality assumptions, and standard emission factors.

For the purposes of establishing compliance with conformity requirements, the estimated emissions for implementation of the Proposed Action were divided over the course of 6 to 8 months. Implementation of the Pavaho Wetland project was assumed to begin in 2013 and be completed within the same calendar year. Therefore, this approach provides estimated annual construction emissions for 2013.

Implementation of the Proposed Action would result in temporary *de minimis* increases in criteria pollutant emissions associated with construction activities. Estimated average annual emissions resulting from proposed activities have been estimated and compared with basic non-attainment area *de minimis* thresholds for planning purposes only. Table 3.4 shows the emission factors for constructed equipment that could be used in the proposed project. Table 3.5 shows the estimated use of construction equipment for the proposed project. Table 3.6 shows the estimated emissions for the proposed project construction.

Table 3.4: Proposed Project Equipment and Emission Factors

Equipment / Vehicle Type	Emission Factors (*Pounds per Hour,**Grams per Mile)				
	NOx	VOC	PM 2.5	SO_4	CO
***Dozer**	2.714	0.199	0.18	0.496	0.818
***Grader**	1.513	0.121	0.107	0.265	0.511
***Backhoe**	1.47	0.353	0.322	0.213	1.681
***Front End Loader**	3.402	0.204	0.194	0.496	0.866
****Water Tanker**	9.984	0.242	0.324	0.0132	1.529
****Dump Truck**	9.984	0.242	0.324	0.0132	1.529
****Semi Truck with Trailer**	6.488	0.713	0.453	0.0056	0.746

Table 3.5: Proposed Project Estimated Equipment Use for Six Month Construction Period

Equipment / Vehicle Types	Number Used	Days Used	Miles/Day
Dozer	2	100	N/A
Grader	1	20	N/A
Backhoe	1	50	N/A
Front End Loader	2	100	N/A
Water Tanker	1	100	20
Dump Truck	1	50	20
Semi Truck with Trailer	4	100	20

Table 3.6: Estimated Emissions Resulting from Implementation of the Proposed Action

Equipment / Vehicle Type	**Tons Per Year**				
	NOx	**VOC**	**PM 2.5**	**SO_4**	**CO**
Dozer	1.628	0.119	0.108	0.298	0.491
Grader	0.121	0.010	0.009	0.021	0.041
Backhoe	0.147	0.035	0.032	0.021	0.168
Front End Loader	2.041	0.122	0.116	0.298	0.520
Water Tanker	0.044	0.001	0.001	0.000	0.007
Dump Truck	0.022	0.001	0.001	0.000	0.003
Semi Truck with Trailer	0.057	0.006	0.004	0.000	0.007
Total	4.004	0.288	0.267	0.638	1.229

Table 3.7: Project Emissions Compared with *De Minimis* Thresholds

Projected Emissions Tons Per Year	**Pollutant**				
	VOCs[1]	**NO_x[1]**	**CO[2]**	**SO_4[2]**	**$PM_{2.5}$[2]**
Average Annual Emissions (2013)	4.004	0.288	0.267	0.638	1.229
De Minimis Threshold	100	100	100	100	100
Exceeds *De Minimis* Threshold	No	No	No	No	No

Notes: [1]The Metropolitan Dallas Fort Worth AQCR is in a "moderate" non-attainment for the federal O_3 standard; VOCs and NO_x are precursors to the formation of O_3.

[2]the Metropolitan Dallas-Fort Worth AQCR is in attainment of the federal CO, SO_2, $PM_{2.5}$, and PM_{10}, standards. *De minimis* thresholds are not applicable to NAAQS attainment areas; however, estimated average annual emissions have been compared with moderate non-attainment *de minimis* thresholds for planning purposes only.

Sources: TCEQ 2010, USEPA 2010.

Vehicle emissions generated by proposed construction activities would be temporary and short-term; no long-term increases in vehicle emissions would occur under the Proposed Action. Emission associated with construction-related vehicles and equipment would be minor, as most vehicles would be driven to and kept at the relevant site until project activities are complete. There would be no long-term increase in mobile or stationary source emissions in the region.

Fugitive dust (i.e., PM_{10} and $PM_{2.5}$) would increase as a result of surface disturbances associated with construction and would temporarily impact local air quality. However, fugitive dust generated by proposed construction activities would be temporary and short-term; no long-term

increases in fugitive dust would occur. In addition, increases in PM_{10} and $PM_{2.5}$ would be moderated through BMPs (i.e., watering exposed soils, soil stockpiling, and soil stabilization), thereby limiting the total quantity of fugitive dust emitted during project implementation.

Estimated emissions would be below *de minimis* levels for conformity. Therefore, implementation of the Proposed Action would not trigger a formal conformity determination under Section 176(c) of the CAA, and less than significant impacts to air quality would occur.

3.9.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.9.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to air quality.

3.10. Noise

3.10.1 Existing Conditions

Vehicular and air traffic in the vicinity of the Pavaho Pumping Plant represent the primary sources of noise at the project site. On September 14-16, 2009, baseline noise levels were recorded for 5-minute intervals throughout the Dallas Floodway and drainage area to characterize baseline noise conditions. Ambient noise 15-20 ft from Canada Drive ranged from 48 to 75 dBA.

3.10.2 Effects

3.10.2.1 Proposed Action

Under the Proposed Action, construction and ground-disturbing activities would create localized, temporary noise impacts from construction equipment/vehicles. These vehicles and equipment can typically generate noise levels of approximately 80 to 85 dBA at approximately 50 ft (USEPA 1974). These noise levels would not be significantly higher than baseline noise levels measured from Canada Drive; furthermore, nearby sensitive receptors (residences) are approximately 250 ft away. Prior to implementation of the Proposed Action, the City of Dallas would notify nearby residents of the construction schedule. In addition, all construction activities would occur between the hours of 7:00 A.M. and 7:00 P.M. and staging areas would be sited to minimize impacts to surrounding areas. Therefore, implementation of the Proposed Action would result in less than significant impacts to noise.

3.10.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.10.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no increased noise impacts.

3.11. Hazardous Materials

3.11.1 Existing Conditions

There were no hazardous materials identified during site investigations of the proposed project area. Further, there were no signs of past hazardous material contamination such as unusual odors or discolored vegetation identified. A limited TCEQ and USEPA environmental database search showed a brownfield site approximately 400 feet west of the proposed pretreatment wetland site. The identified brownfield site is a currently vacant lot that formerly had soil contaminated with lead. The site has been sufficiently remediated and is ready for redevelopment.

3.11.2 Effects

3.11.2.1 Proposed Action

The proposed project is not anticipated to cause any impacts related to hazardous materials. Vehicle fueling and maintenance activities would be performed off site or on site in a manner that would not result in site contamination. A spill contingency plan will be developed by the construction contractor. The spill plan would establish procedures and best management practices that would prevent, contain, and or clean any spills of hazardous materials.

3.11.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.11.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impact from hazardous material spills.

3.12. Cultural Resources

3.12.1 Existing Conditions

The proposed Pavaho Wetland sections are located well south of the historical Trinity River channel. Multiple cultural resources surveys have been previously conducted for the Dallas Floodway area including the proposed project area. Testing associated with previous surveys determined that the floodplain inside the levees contains a mixed jumble of excavated matrices and fill from a variety of sources outside the area. More recently, AR Consultants, Inc. (ARC) conducted testing in the floodplain sediments just to the east and to the west of the proposed wetland areas (ARC, 2006). Based on the results of these two major studies, as well as other studies in surrounding parts of the downtown Trinity River floodplain, archaeologists, with the assistance of several geomorphologists, have concluded that there is little potential of finding significant prehistoric or archaeological site deposits shallowly or deeply buried in floodplain sediments more than two hundred lateral feet from the historic Trinity River channel. Texas Department of Transportation (TxDOT) has confirmed this distance as a reasonable area of high probability in planning with regard to the Trinity Tollway (USACE 2010).

For the proposed Pavaho Wetland project area, ARC conducted a review of Sam Street's Map of Dallas County which showed that the areas of the proposed wetland sites are in an undeveloped tract south of the old river channel. The areas through which the river now runs includes property then owned by G.W. Dooley, J.C. Read, A. Hannah, and W. R. Overton. Historical street maps show several "renter" houses in this area which are no longer present. Fence lines are shown in better detail on the 1917 Trinity River West Dallas Sheet prepared by the Texas Reclamation Department in Austin which was overlaid on a recent 7.5' USGS map of the same area. No rent houses were shown in the proposed wetland areas. Similar results were apparent on a section of the 1920 Dallas County Soil Map which was also prepared before the levees were built in the late 1920s. Therefore, the historic structure potential in the proposed project areas is low to non-existent (USACE 2010).

The Pavaho Pump Station is located centrally within the project area for the proposed wetland sections. In a letter report submitted to the Texas Historic Commission (THC) on October 23, 2009, the USACE Fort Worth District determined the Pavaho Pump Station to be individually eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion A for its association with local planning and development as well as Criterion C for its design and construction values. The THC concurred with the USACE's findings of the Pavaho Pump Station's NRHP eligibility in a letter to the USACE Fort Worth District dated November 12, 2009 (USACE 2010).

While Section 405(a) of the 2010 Supplemental Disaster Relief and Summer Jobs Act (Public Law 111-000) exempts the USACE from making a determination under the National Historic Preservation Act for the Dallas Floodway project, the USACE prepared the "*Final Intensive Engineering Inventory and Analysis of the Dallas Floodway, Dallas, Texas"* report in November 2010 to fulfill federal requirements in preparing the Dallas Floodway Environmental Impact Statement to identify and evaluate cultural resources to assess cultural impacts under the NEPA. It was determined that "the Dallas Floodway met the NEPA definition as a significant historic and cultural resource, therefore must be considered in the assessment of environmental impacts.

Appendix F contains pertinent cultural resources correspondence and documentation.

3.12.2 Effects

3.12.2.1 Proposed Action

Implementation of the proposed Pavaho Wetland project would not impact the Pavaho Pump Station, so no historic buildings would be impacted by the proposed action. In email correspondence with the THC and the USACE, they concurred that any additional archaeological surveys within the proposed Pavaho Project area would not be needed as the potential for finding any cultural resources in the area, other than the floodway itself, would be highly unlikely. Creating wetlands within the floodway is not a significant impact to the resource because it

actually enhances the the function of the floodway and does not impair its hydraulic function or design.

If Native American human remains and/or objects subject to the Native American Graves Protection and Repatriation Act (25 U.S. code 3001 et seq.) are encountered during the proposed construction activities, the USACE and/or the City of Dallas will immediately notify the THC and consult with appropriate federally recognized Tribe(s) to determine appropriate measures in agreement with 36 C.F.R. Part 800.13.

Lastly, if any buried remains and/or objects are unearthed during construction, the USACE and/or the City of Dallas will immediately notify the THC. The City of Dallas will also enlist the services of an archaeological expert to determine the extent of the find. Both the THC and the archaeological expert will determine the best course of action should any buried remains and/or objects be unearthed.

3.12.2.2 No Action Alternative

Under the No Action Alternative, existing conditions as described in Section 3.12.1 would remain unchanged. Therefore, implementation of the No Action Alternative would result in no impacts to cultural resources.

3.13. Cumulative Impacts

Cumulative impacts are defined as the "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions (40 C.F.R. 1508.7)."

3.13.1. Reasonably Foreseeable Actions of the USACE

Specific to the proposed project area, the City of Dallas and the USACE intend to upgrade the Pavaho Pump Station to effectively convey the 100-year, 24-hour storm event. Regarding the Trinity River Corridor Project, the USACE intends to raise the existing levees by 4 feet thus expanding the footprint of the existing levees. Furthermore, the Trinity River Corridor Project intends to relocate portions of the existing Trinity River to create a more meandering course. Also, various park and amenity improvements are slated for the areas immediately surrounding the proposed project area.

3.13.2. Reasonably Foreseeable Actions of Others

The following projects are part of the Dallas Floodway Projects (DFP) Environmental Impact Statement (EIS) Proposed Action and are located in the vicinity of the proposed project area:

- Baker Pumping Plant: The USACE Fort Worth District is currently preparing an EA for proposed improvements to the Baker Pumping Plant.

- Trinity Parkway: The Trinity Parkway is a proposed 9-mile toll road that would extend from the SH-183/IH-35E juncture to U.S. 175/Spur 310. The Federal Highway Administration is analyzing action alternatives in their NEPA process (Federal Highway Administration 2008).
- Ecosystem Restoration and Recreation Features: These elements include ecosystem restoration and recreation features defined in *"The Balanced Vision Plan for the Trinity River Corridor, Dallas, TX,"* dated December 2003, and amended in March 2004 and include the Flex Fields, the Trinity River Meanders, Trails, the West Dallas Gateway Park, and Urban Lake.
- Pavaho Wetlands: The City of Dallas proposes to develop approximately 64 acres of stormwater wetlands adjacent to the Pavaho Pumping Plant outfall.

There are several projects not part of the DFP EIS Proposed Action that are located in the vicinity of the Proposed Action Projects of note include the:

- Continental Pedestrian Bridge: As part of the Margaret Hunt Hill Bridge construction, the Continental Avenue Bridge would be converted from vehicular to pedestrian and bicycle use.
- Beckley Boulevard Improvements: The City of Dallas plans to enhance Beckley Boulevard from Commerce Street to north of Continental Avenue with the addition of four new vehicle lanes and a new major drainage system
- Sylvan Bridge: TxDOT proposes to replace the existing low water Sylvan Avenue crossing with a 3,400-ft long structure that would include sidewalks; four, 12-ft wide driving lanes; and two, 14-ft wide shared bicycle and vehicle lanes.
- Riverfront Boulevard: The City of Dallas proposes to retain Riverfront (formerly Industrial) Boulevard as a six-lane facility, and add turn lanes at Riverfront Boulevard and the ramps to/from the overhead Spur 366 extension. Through lanes would consist of three, 11-foot wide lanes in each direction.
- Trinity Lakes Street Car Loop: The City of Dallas proposed creating a streetcar loop to better connect Oak Cliff and West Dallas to downtown. The route would zigzag from the convention center hotel, down the east-west commercial district, and finally up to the Arts District.
- Margaret Hunt Hill Bridge: The Margaret Hunt Hill Bridge was one of three proposed "signature" bridges that would span the Trinity Floodway. This structure, completed in 2012, is located between the Continental Avenue and Union Pacific Railroad bridges. (USACE, 2010)

3.13.3. Land Use

The proposed project would not result in any direct or cumulative land use impacts. The proposed project will serve to augment the current land use of stormwater storage and polishing. The only foreseeable land use cumulative impact would be from the protected status (through a

restrictive covenant) of proposed project area which would preclude any future development within the project area. However, this impact would be minor since the proposed project has been accounted for in the overarching master plans of other projects. Any development within the floodway would continue to be limited.

3.13.4. Socioeconomic and Environmental Justice

The Proposed Action would result in beneficial impacts to socioeconomic and no disproportionate adverse impacts to minority populations or the health and safety of children. The identified cumulative projects would result in a beneficial impact to socioeconomics by improving connectivity between the economic centers of the City of Dallas and the more economically depressed residential areas and potentially increase tourism. In addition, construction of the identified cumulative projects would result in a temporary increase in construction-related spending in the local economy. Therefore, the Proposed Action, in conjunction with identified cumulative projects, would result in beneficial cumulative impacts to socioeconomics. There would be no cumulative disproportionate impact to minority populations or the health and safety of children (USACE, 2010).

3.13.5. Water Resources

Due to their proximity to the Trinity River, the proposed project and identified cumulative projects were designed to avoid and minimize direct and cumulative impacts to water resources. The proposed project serves as a component for enhancing water resources and water quality within the project area.

3.13.6. Wildlife Habitat and Vegetation

Within the project area, small depressions dominated by emergent wetland vegetation are periodically inundated by rainfall or when the Trinity River overtops its banks. The floodway is routinely mowed to control growth of woody vegetation and to minimize detention of storm flood flows within the floodway. The dominant vegetation in the floodway project area consists primarily of herbaceous species ranging from obligate to upland species. Areas of balloonvine (*Cardiospermum halicacabum*), switchgrass (*Panicum virgatum*), johnsongrass (*Sorghum halepense*), and bermudagrass (*Cynodon dactylon*) were observed. In areas that are routinely inundated, obligate to facultative species such as pink smartweed (*Polygonum pensylvanicum*), pale dock (*Rumex altissiumus*), spikerush (*Eleocharis* spp.), sedges (*Carex* spp.) and flatsedges (*Cyperus* spp.) were observed. Small tree and shrub species were limited to black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), red mulberry (*Morus rubra*), green ash (*Fraxinus pennsylvanica*), and American elm (*Ulmus americana*).

The proposed project is intended to expand species diversity. No unforeseen impacts to existing habitat and vegetation are anticipated with the proposed project or with the projects associated with the Trinity River Corridor Projects.

4.0. PUBLIC AND AGENCY INTEREST REVIEW

No comments were received from the general public. The design drawings and draft environmental assessment were reviewed by the USACE. All comments received from the USACE, substantive and editorial, were addressed during final preparation of the 90 percent and final design drawings and EA.

5.0. RECOMMENDATION

This EA has evaluated the potential environmental, structural and cultural impacts associated with the construction of the Pavaho Wetland Project. Based on the findings and conclusions in this EA, it is anticipated that the proposed project would not be a major federal action that would require an Environmental Impact Statement. A Finding of No Significant Impact (FONSI) is therefore anticipated.

6.0. REFERENCES

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Appendix A

Modified Consent Decree (Appendix A)

Pavaho Storm Water Wetland SEP

Introduction. The Pavaho pump station is located along the land side (as opposed to the river side) of the Dallas Floodway West Levee south of Sylvan Street. The sump at the Pavaho pump station collects rainfall runoff from a watershed located outside of (on the land side of) the West Levee. Runoff from approximately 1843 acres of land drains into the Pavaho sump, which has a maximum storage capacity of 386 acre-feet of water.

The Pavaho Sump station periodically pumps storm water from the Pavaho sump to the Trinity River. At present, three pumps with capacities of 46,000-gallon-per-minute (gpm), 30,000 gpm, and 6,000 gpm, respectively, pump storm water from the Pavaho sump through the West Levee to a channel that empties into the Trinity River. Each of the three pumps is installed at a different elevation. The 6,000-gpm pump is at the lowest elevation and therefore operates more frequently than the other pumps.

The City shall construct the Pavaho Storm Water Wetland SEP in accordance with the following objectives and requirements:

I. Location and Size

The City shall construct the Pavaho Storm Water Wetland in the vicinity of Sylvan Avenue along the west bank of the Trinity River within the Dallas Floodway. The total project area shall be at least 60 acres in size and consist of at least the following components: several areas of excavated depressional wetlands in the general vicinity of Sylvan Avenue on the river side of the West Levee; and a constructed pretreatment wetland, eight acres or larger, on the landward side of the West Levee in the general vicinity of Canada Drive and Svlvan Avenue.

Areas that are already considered delineated wetlands by the U.S. Army Corps of Engineers, including delineated emergent wetlands, shall not count towards the 60-acre minimum.

II. Objectives of the Project

One objective of the Pavaho Storm Water Wetland SEP is to create habitat for wetland flora and fauna, including habitat that can be maintained during sustained dry periods. Another objective of the SEP is to improve the quality of the storm water runoff reaching the Trinity River by having the water flow through wetland vegetation that absorbs nutrients and metals from the storm water. The purpose of the pretreatment wetland, in particular, is to reduce metals and nutrients in storm water that flows to the Pavaho Pump Station.

III. Submissions, Schedule, Minimum Plant Survival

A. Pavaho Wetland Project Manager and Design Consultant. No later than one (1) month after the Effective Date of this Consent Decree, the City shall notify EPA in writing of the name and title of the City employee who shall be the City's Project Manager for the Pavaho Storm Water Wetland SEP. If the City changes the Project Manager, the City shall notify EPA in writing of the name and title of the new Project Manager, no later than the date that the Project Manager assumes his or her duties.

No later than two (2) months after the Effective Date of this Consent Decree, the City shall submit to EPA a list of contractors, including the qualifications of each contractor, that the City is considering retaining to be the Pavaho Wetland Design Consultant, which shall, among other things, prepare the Workplan required by this Appendix. EPA will issue a written notice stating whether it disapproves of any of the proposed contractors. If EPA disapproves all of the contractors proposed by the City, the City shall submit to EPA a new list of contractors,

including the qualifications of each contractor within 30 days of receipt of EPA's disapproval of the contractors previously proposed. EPA will issue a written notice stating whether it disapproves of any of the proposed contractors.

No later than seven (7) months after the Effective Date of this Consent Decree, the City shall notify EPA in writing of the name of the contractor selected to be the Pavaho Wetland Design Consultant. If at any time thereafter the City proposes to change a Pavaho Wetland Design Consultant, the City shall give such notice to EPA and must obtain an authorization to proceed from EPA, before the new Pavaho Wetland Design Consultant performs, directs, or supervises any work under this Appendix.

[1/] B. Conceptual Design. No later than three (3) months after entry of an order approving this Modified Appendix A, the City shall submit a Conceptual Design to the United States Army Corps of Engineers (USACE) for approval. Simultaneously, the City shall submit the Conceptual Design to EPA for informational purposes. The Conceptual Design shall be approximately at the 35%-design level per USACE requirements in order for the USACE to assess the project's effect on planned future improvements to the West Levee and compliance with post-Hurricane-Katrina policies governing construction within federal levees and modifications of federal levees. The Conceptual Design shall contain, or be accompanied by, a written request by the City for USACE approval of the project and contain the following information:

1. A physical and functional description of the existing federal project;

[1/] Question to the City: what changes to the schedule do you propose to allow you to submit an Environmental Assessment with the 35% design plan? [See your comment 3 in your June 10 letter.]

2. A detailed description of the proposed City project, including proposed modifications to the existing federal project;

3. The purpose or need for the modification of the existing federal project;

4. A description of any related, ongoing USACE studies or efforts in the watershed;

5. A public interest determination (see 33 C.F.R. § 320.4);

6. Any documentation required by the National Environmental Policy Act, 42 U.S.C. §§ 4321 - 4370f, (NEPA) (Environmental Assessment or Environmental Impact Statement);

7. A discussion of the indirect effects of the proposed City project;

8. A discussion of Executive-Order-11988 considerations, Exec. Order No. 11988, 42 Fed. Reg. 26,951 (May 25, 1977);

9. A technical analysis, which shall include at least: a) sufficient detail to ensure the technical adequacy of the design; b) changes in water surface profiles and flow distribution; c) assessment of anticipated local and system-wide impacts, i.e., impacts on system integrity; d) upstream and downstream impacts of the proposed alterations, including potential impacts to existing floodplain management and water control management plans of federal projects within the basin; e) a discussion of residual risk.

If the Pavaho Storm Water Wetland SEP requires a Section 404/Section 10 permit process, the public interest and technical evaluations, which are independently required under 33 U.S.C. § 408, can be conducted concurrently with the Section 404/Section 10 permit process.

C. Workplan. No later than five (5) months after final USACE approval of the Conceptual Design, the City shall submit to EPA and USACE for approval a Workplan for

the Pavaho Storm Water Wetland SEP. The Workplan shall contain a detailed description of, and design for, the work to be performed. The Workplan shall include, without limitation: (a) a statement of the elevations, water depths, and location of the wetland to be constructed; (b) a description of plant species to be planted, the spacing of the plants, and the number of plants to be planted per acre; (c) a plan to supply water to the wetlands with water trucks during droughts, if necessary to ensure the survival of the plants; (d) plans for vector (including mosquito) control; (e) an identification of the principal dry- and wet-season pollutants and pollutant concentrations in the water in the Pavaho sump; (f) an evaluation of whether steps need to be taken to control erosion in and around the pre-treatment wetland; (g) an evaluation of whether planting a transitional vegetative buffer zone around all or some of the wetland cells would significantly improve the habitat created by the project; and (h) an evaluation of the extent to which the acreage selected for the Project was previously wetland, and if possible, the hydroperiod and hydrodynamic of the previous wetland. The Workplan shall also contain: (i) photos of the area taken before the start of any work; (j) aerial photos, maps, sketches, or drawings, as appropriate, of the work proposed to be performed; (k) a plan for the removal of woody vegetation (the City shall remove woody stems in excess of one inch in diameter at breast height ("1" dbh") by either manual or mechanical methods; to minimize the disturbance to the surrounding herbaceous vegetation, the removal of woody stems greater than 1" dbh shall occur only once per year during dry conditions); (l) a plan for preventing the mowing of wetland areas in the SEP (if the USACE approves of the "no mow" policy) by marking the perimeter of wetland areas in the SEP with signs, placed no more than 75 feet apart, indicating that the areas shall not be mowed; (m) a proposed monitoring plan to determine the water quality

improvements that are due to the wetland; (n) a long-term operations and maintenance plan for the project, which shall, at a minimum, shall address:

i. The minimum frequency of monitoring inspections;

ii. The minimum qualifications of monitoring inspectors;

iii. What information will be reported to EPA as part of the [Semi-Annual Reports required by Paragraph __ of the Consent Decree]; and

iv. The timing and nature of the corrective measures the City will employ if undesirable vegetative species become dominant (corrective actions to consider include "scalding" by watering, herbicides, and hand removal).

(o) a budget for the project; and (p) a schedule consistent with the following deadlines:

City submits names of proposed Construction Contractors to EPA	2 months after EPA approval of Workplan
Applications for all Permits submitted	3 months after EPA approval of Workplan
Construction commences	12 months after EPA approval of Workplan
Construction and initial planting completed	7 months after construction commences
Monitoring continues for at least	For the pretreatment wetland: 5 years after construction and initial planting are completed; for all other portions of the project: 3 years after construction and initial planting are completed.

D. Construction Contractor. No later than two (2) months after EPA approval of the Workplan for the Pavaho Storm Water Wetland SEP, the City shall submit to EPA a list of contractors and/or City Departments, including the qualifications of each contractor and/or City Department, that the City is considering retaining or using to construct the Pavaho Storm Water Wetland SEP. EPA will issue a written notice stating whether it disapproves of any

of the proposed contractors or City Departments. If EPA disapproves all of the contractors and Departments proposed by the City, the City shall submit to EPA a new list of contractors and/or City Departments, including the qualifications of each, within 30 days of receipt of EPA's disapproval of the contractors or City Department previously proposed. EPA will issue written notice stating whether it disapproves of any contractor(s) or City Departments.

No later than six (6) months after EPA approval of the Workplan for the Pavaho Storm Water SEP, the City shall submit to EPA the name of the Construction Contractor or City Department selected to construct the Pavaho Storm Water Wetland SEP. If at any time thereafter the City proposes to change the Pavaho Wetland Construction Contractor or Department, the City shall give such notice to EPA and must obtain an authorization to proceed from EPA before the new Pavaho Wetland Construction Contractor or City Department performs, directs, or supervises any work under this Appendix.

E. As-Built Drawings. The City shall submit two as-built drawings of the Pavaho Storm Water Wetland SEP for EPA approval, the first within 30 days after excavation and grading is complete and the second after the initial planting is complete.

F. Minimum Plant Survival. The City shall achieve at least 50% ground cover after the first growing season. The City shall achieve at least 80% ground cover after the second growing season and thereafter maintain plant coverage over at least 80% of the wetland area. If the plant coverage after the first growing season is less than 50%, the City shall replant to achieve a 50% coverage rate. If the plant coverage after the second growing season is or falls below 80%, the City shall replant until the 80% coverage rate or a greater coverage rate is achieved, but the City shall not be required by this Consent Decree to continue replanting after

the minimum three-year and five-year monitoring periods prescribed above have passed.

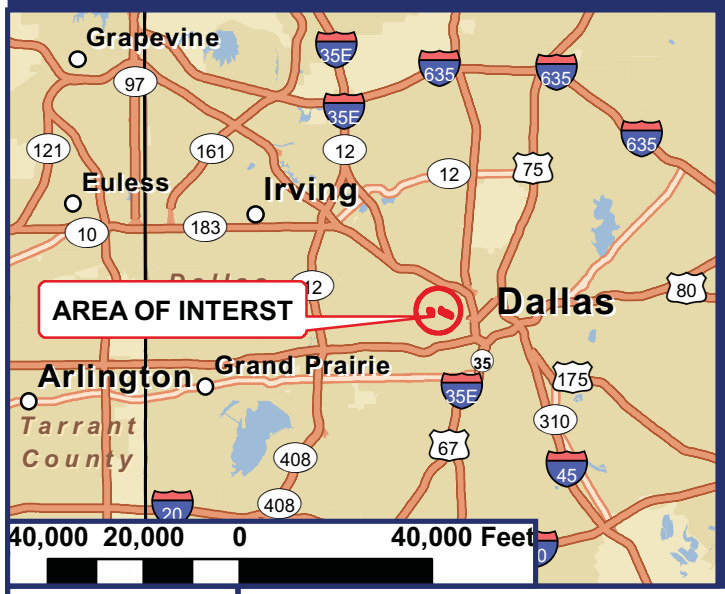
G. Access for Scientific Studies. The City shall make the Pavaho Storm Water Wetland SEP available, on reasonable terms, to any academic or government scientist who wishes to study the wetland.

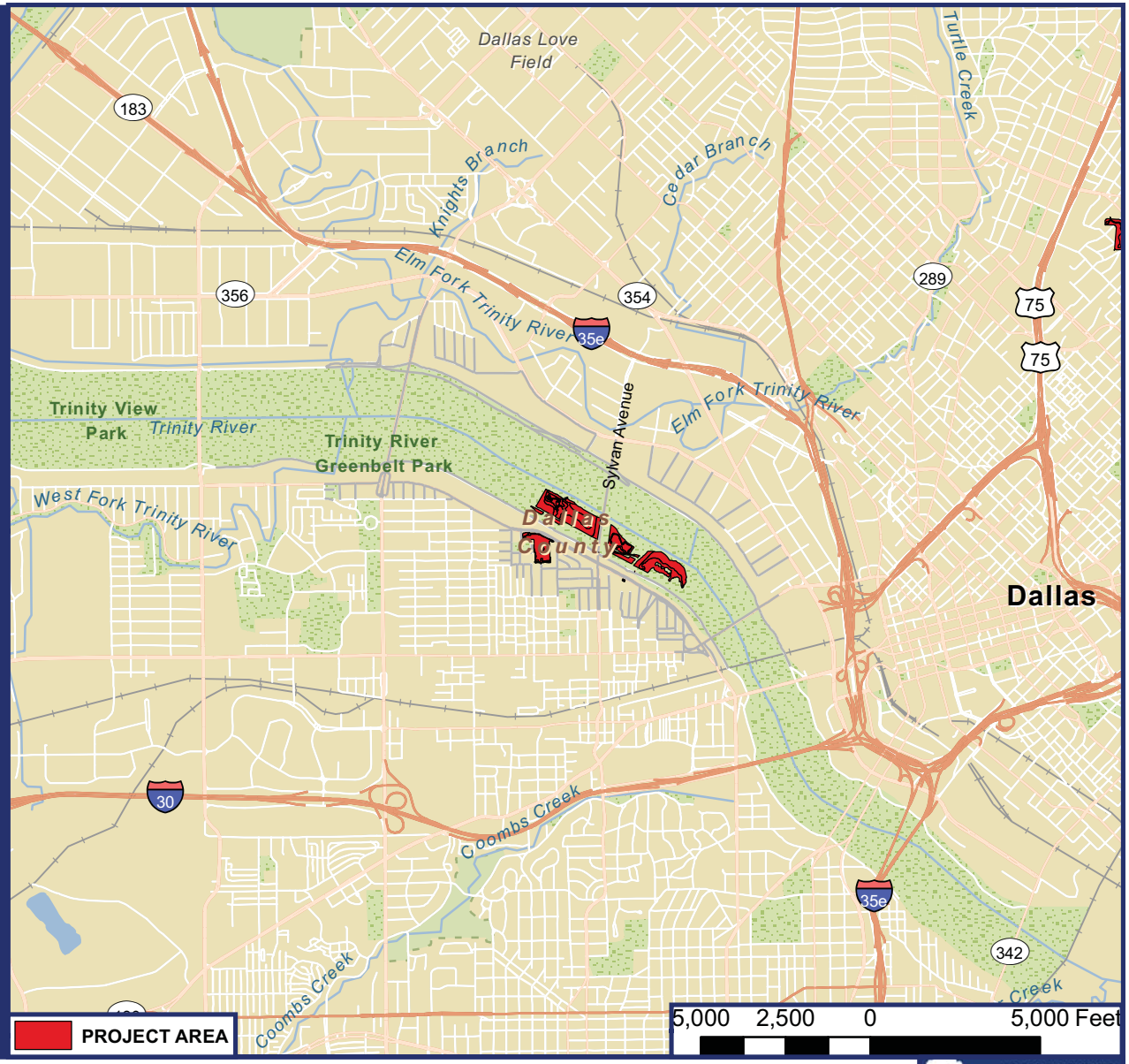
IV. Minimum Funding

The City shall spend not less than $675,000 on the project described in this Appendix.

Appendix B

Figures





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DATE: JULY 13, 2010

FIGURE B-1
GENERAL LOCATION
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. UNIVERSITY DRIVE
SUITE 300
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

FIGURE 1 OF 5

SOURCE: Texas Natural Resource Information Service (TNRIS). ESRI ArcGIS Resources.

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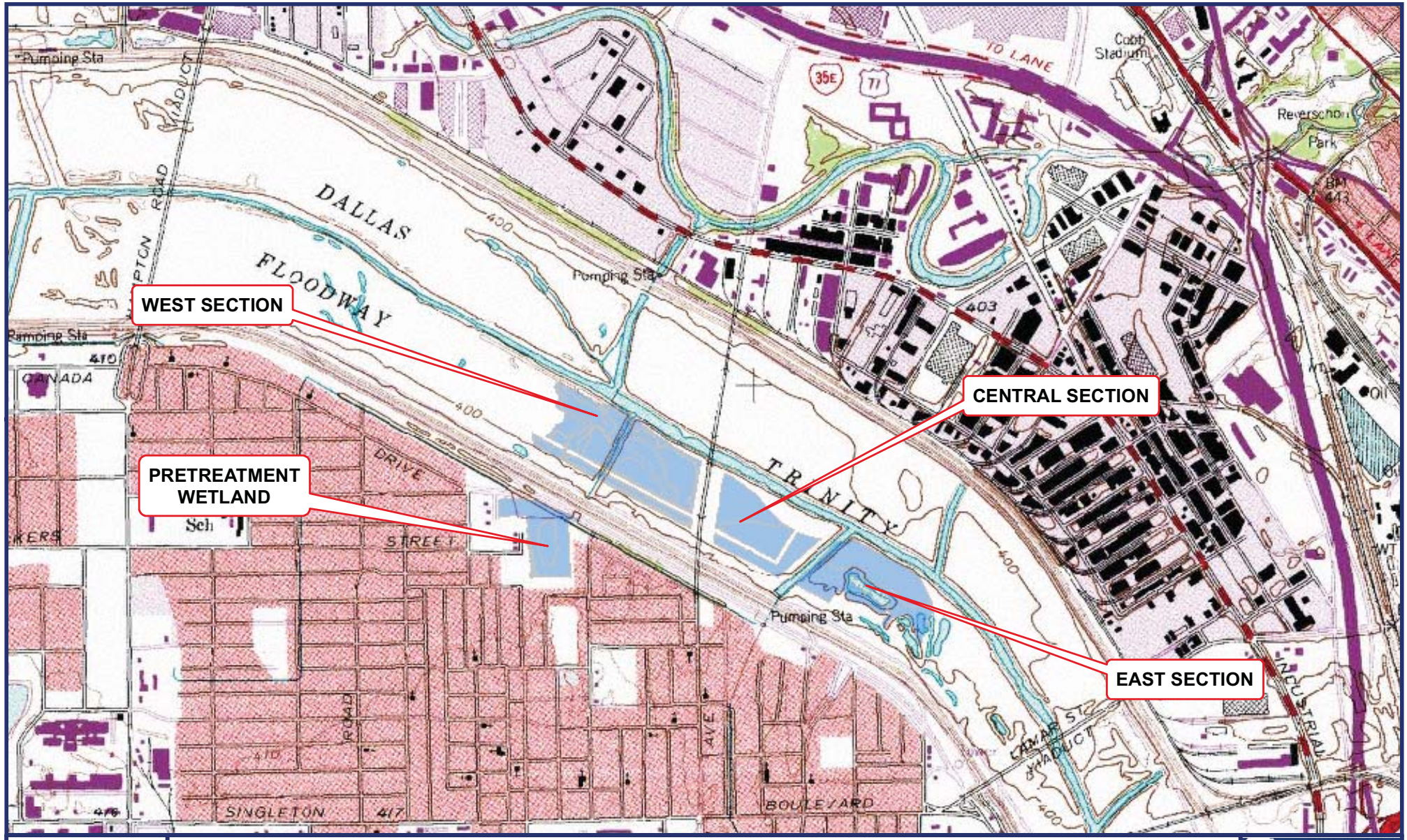
DATE: JULY 13, 2010

FIGURE B-2
2008 AERIAL PHOTOGRAPH
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS
1320 S. UNIVERSITY DRIVE
SUITE 300
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

Feet
0 350 700 1,400

SOURCE: TNRIS



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DATE: JULY 13, 2010

FIGURE B-3
USGS TOPOGRAPHIC MAP
DALLAS, TEXAS QUADRANGLE
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
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SUITE 300
FORT WORTH, TEXAS 76107
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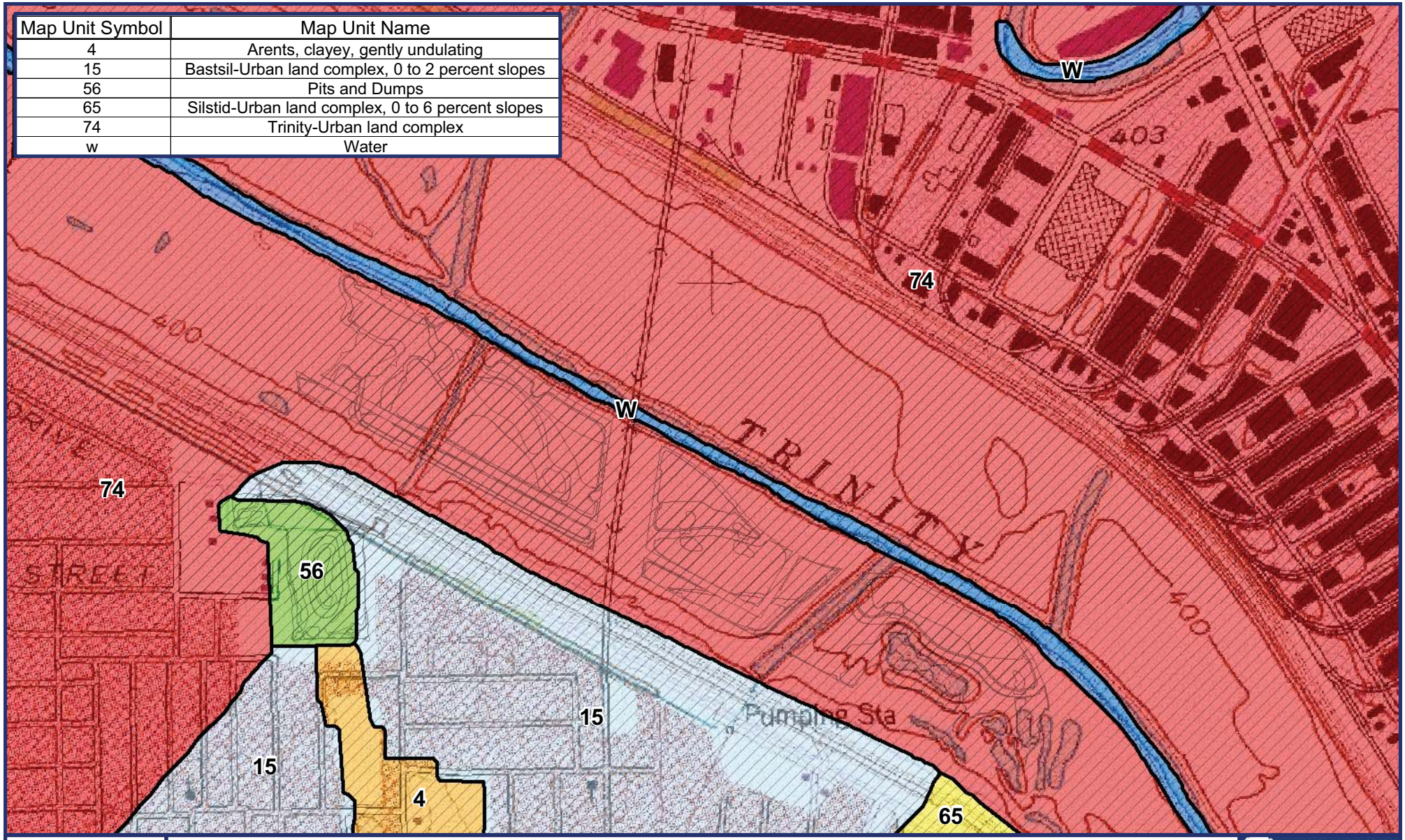
FIGURE 3 OF 5

Feet
0 750 1,500 3,000

SOURCE: TNRIS

USACE PROJECT NUMBER:

Map Unit Symbol	Map Unit Name
4	Arents, clayey, gently undulating
15	Bastsil-Urban land complex, 0 to 2 percent slopes
56	Pits and Dumps
65	Silstid-Urban land complex, 0 to 6 percent slopes
74	Trinity-Urban land complex
w	Water



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DATE: JULY 13, 2010

FIGURE B-4
PROJECT AREA SOIL MAP UNITS
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
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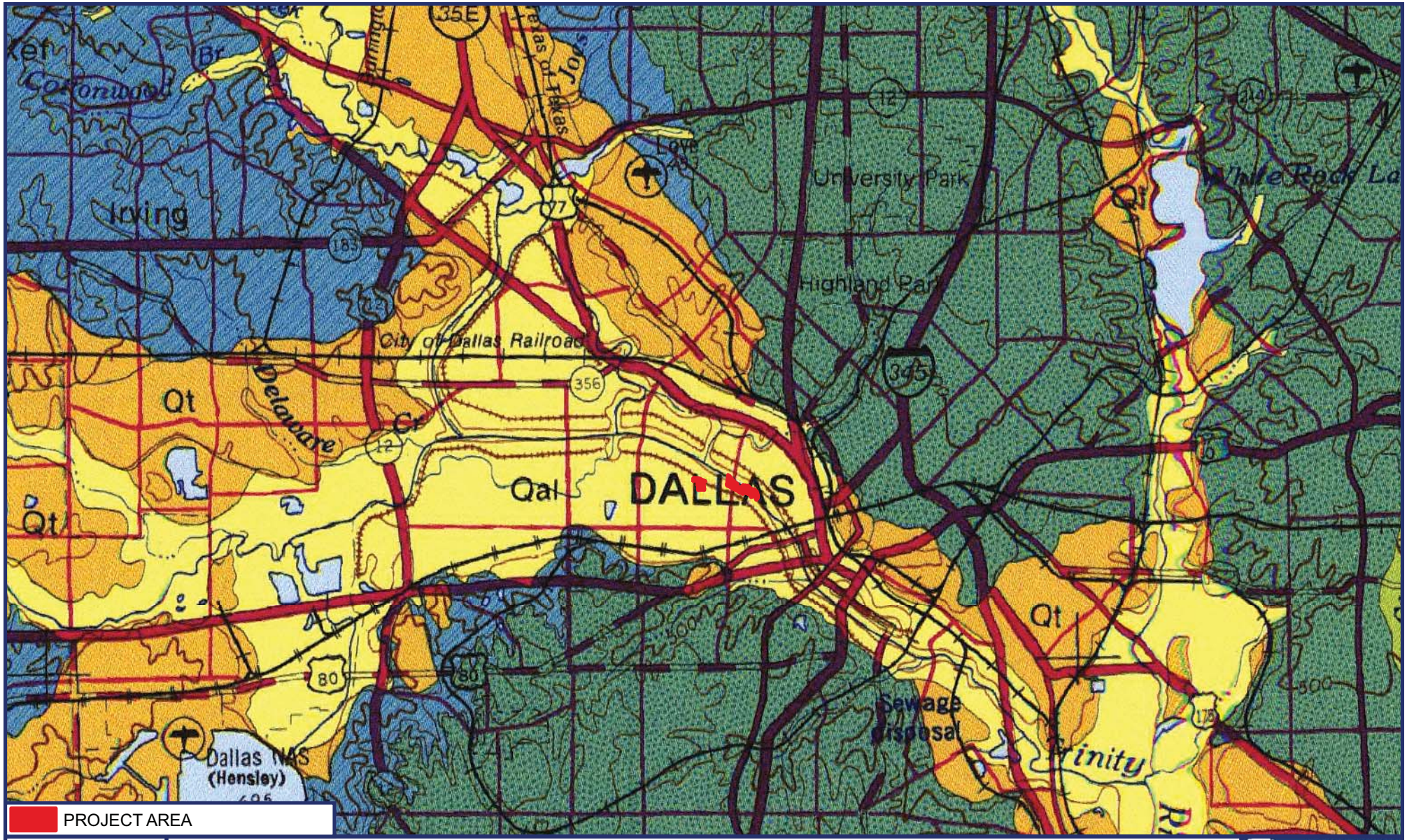
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

Feet
0 400 800 1,600

SOURCE: TNRIS.

USACE PROJECT NUMBER:



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DATE: JULY 13, 2010

FIGURE B-5
UNDERLYING GEOLOGICAL UNITS
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
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FIGURE 5 OF 5P

Feet
0 5,000 10,000 20,000

SOURCE: TNRIS

USACE PROJECT NUMBER:

Appendix C

Site Photographs

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DATE: JULY 13, 2010

FIGURE C-1
SITE PHOTOGRAPH LOCATIONS
PAVAHO STORMWATER WETLAND
DALLAS, TEXAS

ALAN PLUMMER ASSOCIATES, INC.
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FIGURE 1 OF 1

Feet
0 400 800 1,600

SOURCE: TNRIS

USACE PROJECT NUMBER:

P 1. Western constructed wetland cell location, looking east.

P 2. Pretreatment constructed wetland cell located in stormwater sump outside of floodway levees, looking south.

P 3. Central constructed wetland cell location, looking north.

P 4. Eastern constructed wetland cell location, looking northeast.

P 5. Sylvan bridge and electricity line right of way adjacent to central constructed wetland cell location, looking north.

P 6. Pavaho pump station, looking south.

Appendix D

Jurisdictional Determination Report dated May 12, 2006

Revised Jurisdictional Determination Report

dated January 21, 2011

Halff Associates
ENGINEERS • ARCHITECTS • SCIENTISTS • PLANNERS • SURVEYORS

8616 NORTHWEST PLAZA DRIVE
DALLAS, TEXAS 75225
(214) 346-6200
FAX (214) 739-0095

May 12, 2006
AVO 17826

Ms. Jessica Napier
U.S. Army Corps of Engineers
Regulatory Branch
819 Taylor Street
Fort Worth, Texas 76102-0300

Re: USACE Project #200000308 – Proposed Jurisdictional Determination for the Dallas Floodway and NTTA Trinity Parkway, Dallas Texas.

Dear Ms. Napier:

As stated in a letter dated March 30, 2000, and subsequent follow-up submittals, Halff Associates (Halff) is currently involved with several projects, namely the North Texas Tollway Authority (NTTA) Trinity Parkway and the City of Dallas Balanced Vision Plan, which could potentially impact waters of the United States, including wetlands, within or associated with the Dallas Floodway (Floodway) near downtown Dallas, Texas. These projects vary in size and scope, however, the majority of impacts could occur in or around the Floodway between the Elm Fork/West Fork confluence and the Central Wastewater Treatment Plant.

The study area includes over 3,000 acres within and around the Floodway from the confluence of the Elm Fork and West Fork of the Trinity River, downstream to the Martin Luther King Boulevard bridge. The study area also includes historic channel segments of the Trinity River and non-jurisdictional man-made linear sumps, all of which are immediately outside of the Floodway. **Sheet 1** shows a project vicinity map for a portion of the Floodway. The limits of the proposed jurisdictional determination are shown as the study area boundary on **Sheet 2**, and are shown in greater detail on **Sheet 3** through **Sheet 17**. This letter serves as a response to a request for additional information submitted to Halff by the USACE on November 1, 2005. A copy of the USACE request for additional information along with responses from Halff is attached in **Appendix D**.

HISTORY OF THE DALLAS FLOODWAY

Construction of the Floodway began in the summer of 1928, with the construction of levees and viaducts and the reclamation of over 10,000 acres of floodplain land. The levees were designed to have 2,000 to 3,000 feet distance between the inside slopes, and each was 156 feet thick at the base and 30 feet high, with three to one side slopes. The capacity of the Floodway was originally estimated to provide flood conveyance of about 500,000 cubic feet/second (cfs), but further studies by the U.S. Army Corps of Engineers (USACE) in the 1940's estimated the capacity to be no more than 300,000 cfs with no levee freeboard.

By the 1950's the levees were in disrepair and the growth of Dallas fostered several projects to reconstruct the levees and install new sump/pump stations throughout the Floodway to alleviate drainage

problems in nearby areas. The river channel was also excavated to extend its bottom width to 50 feet and to lower its bottom depth by 8 feet. The project completed in the 1950's resulted in a floodway designed to carry 226,000 cfs with 4 feet of levee freeboard.

In the 1960's additional pumps were installed to provide additional interior drainage capacity, further pump improvements have since been made, as well as the installation of box culverts to augment gravity flow capacity at some pump stations. The Floodway's ability to contain the 100-year design flood has diminished over the years as a result of upstream drainage alterations due to urban development and as a result of the growth of the Great Trinity Forest downstream of the Floodway.

RECENT SECTION 404 ACTIVITIES WITHIN THE DALLAS FLOODWAY

In 1993, the City of Dallas (City) applied for a Section 10 and a 404 permit (USACE #199300146) to desilt and excavate a section of the Trinity River within the Floodway. Dallas Public Works retained Halff to assist in delineating jurisdictional wetlands within the floodway as part of that project. Also in 1993, Dallas Water Utilities (DWU) applied for a permit (USACE #199300265) for the West Bank Interceptor Line, a 132-inch-diameter gravity flow sewer line that parallels the western levee of the Floodway. The project was authorized under Nationwide Permit 12 for utility line backfill and bedding. In 2000, Halff submitted an updated delineation to supplement existing delineations performed for the above mentioned projects (USACE #200000308). After field meetings with the USACE at the Floodway, most recently in February 2005, it was deemed necessary to take supplemental data points to assess changes resulting from permitted activities. This updated delineation will be utilized to assess impacts of upcoming projects.

WATERS OF THE UNITED STATES

All aquatic features which can be classified as "waters of the United States" are subject to regulation, by the USACE, under Section 404 of the Clean Water Act. Additionally, all aquatic features which can be classified as "navigable waters of the United States" are subject to regulation, by the USACE, under Section 10 of the Rivers and Harbors Act of 1899 in addition to regulation under Section 404 of the Clean Water Act. Any aquatic features classified as "non-waters of the United States" are not regulated by the USACE and are not subject to regulation under Section 404 of the Clean Water Act or regulation under Section 10 of the Rivers and Harbors Act of 1899.

The primary aquatic feature within the study corridor is the Trinity River. According to the USACE Fort Worth District's Navigable Waterways list, the Trinity River, from the point of intersection of Houston, Madison, and Walker counties upstream to Riverside Drive in Fort Worth, Tarrant County, Texas, is a navigable water of the United States, and is thus subject to Section 10, regulation as well as Section 404 regulation. The Trinity River within the study area falls within the reach described above and thus is considered a navigable waterway. The historic channels of the Elm Fork Trinity River and West Fork Trinity River which are located on the landside of the levees are also considered navigable waters of the United States based on their historic function as a flowing river. The ordinary high water mark (OHWM) of the Trinity River varies from 100 to 200 feet within the Floodway and from 100 to 150 feet

downstream of the Floodway where the river retains its natural characteristics. The OHWM of the Trinity River, and other tributaries within the study area, were determined by observing physical characteristics such as shelving, destruction of terrestrial vegetation, and a clear natural line depressed on the banks of the channels. The Trinity River has an OHWM defined by shelving and the clear natural line depressed along the bank of the channel due to constant water flow. In areas where silt/sand deposits are present within the channel, the OHWM is wider because channel flows commonly overtake these areas during rainfall events.

Emergent wetlands within the study corridor consist of shallow depressions that seasonally flood and then dry out during the summer months, becoming exposed mud flats or vegetated depressions. These areas contain a variety of emergent plant species such as water primrose (*Ludwigia peploides*), smartweed (*Polygonum* spp.), balloonvine (*Cardiopsermum halicacabum*) umbrella sedge (*Cyperus* spp.), sedges (*Carex* spp.), spike-rush (*Eleocharis* spp.), and curly dock (*Rumex crispus*). Forested wetlands include tree species such as green ash (*Fraxinus pennsylvanica*), cedar elm (*Ulmus crassifolia*), and sugar hackberry (*Celtis laevigata*). Limits of wetlands within the study area were determined by observing abrupt changes in vegetation, such as the sudden emergence or absence or hydrophytic species, and the presence of hydrology indicators, such as watermarks, drift lines, or inundation.

The herbaceous and small woody vegetation is mowed on a regular basis by the City of Dallas Streets and Sanitation Department to maintain the flood conveyance ability of the Floodway. According to Mr. Ron Shindoll, who is responsible for the maintenance of the levees, the floodway levees are mowed four times a year. The vegetation within the Floodway is projected to be mowed twice a year; however this is contingent upon access constraints such as muddy conditions, or excess rainfall.

Additional aquatic features associated with the Floodway include the historic channels of the Elm Fork Trinity River and West Fork Trinity River and man-made drainage sumps associated with the historic river channels. The historic channels represent the locations of the Elm Fork and West Fork prior to their realignment into the current floodway in the 1920's. Pursuant to the Rivers and Harbors Act of 1899, a determination of navigability was made for the Trinity River for the reach previously described. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events, which may impede or destroy navigable capacity. Thus the historic channels of the Trinity River and the West Fork Trinity River are still considered navigable waters and regulated as such.

Several drainage sumps lie along the outside base of the levees, these features are man-made drainage ditches, constructed in an upland area, and are located outside the 100-year floodplain of the Trinity River. These features have been classified as non-waters of the United States and thus would not be subject to Section 404 regulation. In the past, the USACE Fort Worth District has not extended jurisdiction to man-made drainage ditches constructed in uplands, and is in accordance with this practice that the determination of no jurisdiction was extended to these features.

Woody vegetation within the study corridor varies depending upon location. Within the Floodway, the riparian corridor is very narrow, with cottonwood (*Populus deltoides*), black willow (*Salix nigra*) as the most common woody species. The riparian corridor is significantly wider downstream of the AT&SF Railroad Bridge, where the river enters the Great Trinity Forest, and vegetation is more diverse with the addition of American elm (*Ulmus americana*), cedar elm, sugar hackberry, and green ash and hard-mast producing species such as pecan (*Carya illinoensis*), bur oak (*Quercus macrocarpa*), and Shumard oak (*Quercus shumardii*).

Soils within the study corridor are dark, black, silty clays. According to the Natural Resource Conservation Service's (NRCS) Soil Survey of Dallas County, Texas (1980), two mapped soil units encompass the majority of the soils within the study corridor. The two mapped soil units are Trinity Clay, frequently flooded and Trinity/Urban land complex. The Trinity series is made up of deep, somewhat poorly drained soils formed in recent alluvium on floodplains, with slopes often less than one percent. Permeability of the soil is very slow; the available water capacity of the soil is high, with slow runoff and slight hazard of erosion. The soil has high potential for pasture and low potential for urban and recreation uses, with flooding, shrink/swell potential, and clayey texture as its main limitations.

The mapping unit of Trinity/Urban land complex is primarily composed of the Trinity soil, Urban land, which consists of areas covered with pavement and buildings, makes up as much as 20 percent of the complex. This mapping unit dominates the horizontal center of the study corridor, between Martin Luther King Jr. (MLK) Boulevard and Inwood Road. The Trinity Clay, frequently flooded mapping unit is listed on the NRCS Hydric Soils of Texas (1995), and is located towards the eastern and western extremes of the study corridor, where the river retains its more natural characteristics.

UPDATED DELINEATION

Supplemental field investigations of the study corridor were conducted in April and August 2005 by Halff environmental staff in association with personnel from the USACE, U.S. Fish and Wildlife Service, Environmental Protection Agency, and Texas Department of Transportation. Prior to field reconnaissance, 2003 and 2005 aerial photographs, soil survey maps, U.S. Fish & Wildlife National Wetland Inventory (NWI) maps, and existing delineations were reviewed. Based on the large amount of information available, the level 2 routine on-site determination method, as outlined in the *1987 USACE Wetland Delineation Manual*, was used.

The wetland data forms and site photographs from the 2000 delineation (USACE #200000308) were used as a baseline reference in completing the current delineation. Transects were established perpendicular to the hydrological gradient of the Trinity River at intervals determined after a review of baseline information and prior delineations. April 2005 digital color aerial photography (**Figure A-1**) and 2001 one-foot interval surface contours were also used as a guideline to determine wetland boundaries. Wetland delineation points were concentrated near known wetland areas from prior delineations. Mapped wetlands were field-checked to ensure that vegetation, soils, and hydrology still met the criteria to be considered jurisdictional wetlands. In addition, the annual maintenance mowing of the Floodway

began in late July and was mostly complete at the time of August site visits, allowing for clear sight lines for determining wetland limits by changes in terrestrial vegetation.

Wetland areas were delineated with a Trimble Pro-XRS Global Positioning System (GPS) unit with sub-meter accuracy and real-time OMNISTAR corrections, and post processed with the regional reference position. Data was interpreted using ArcView Geographic Information System (GIS) software; all coordinates are in the State Plane 1983, Texas North Central Zone 4202, U.S. Survey Feet. Figures characterizing current conditions within the Floodway and study area are enclosed in **Appendix A** and completed wetland data forms are enclosed in **Appendix B**. **Table 1** lists the waters of the United States within the study corridor, and **Table 2** lists aquatic features that are not waters of the United States. Mapped aquatic features are shown on **Sheet 2** through **Sheet 17**.

TABLE 1
WATERS OF THE UNITED STATES

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
1	Emergent Wetland	2.09	---
2	Emergent Wetland	0.52	---
3	Open Water - Perennial	17.94	---
4	Emergent Wetland	11.83	---
5	Emergent Wetland	0.20	---
6	Emergent Wetland	7.03	---
9	Emergent Wetland	4.17	---
10	Emergent Wetland	0.20	---
11	Emergent Wetland	0.55	---
12	Emergent Wetland	0.76	---
13	Emergent Wetland	0.50	---
14	Emergent Wetland	1.00	---
15	Emergent Wetland	1.07	---
16	Emergent Wetland	0.60	---
17	Emergent Wetland	0.04	---
18	Emergent Wetland	1.45	---
19	Emergent Wetland	1.66	---
20	Emergent Wetland	3.73	---
21	Emergent Wetland	0.08	---
22	Emergent Wetland	1.42	---
24	Trinity River (Perennial Stream)	143.77	42,400
25	Emergent Wetland	2.74	---
26	Emergent Wetland	1.29	---
27	Emergent Wetland	3.98	---

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
28	Open Water - Intermittent	0.64	1,300
29	Emergent Wetland	7.98	---
30	Open Water - Intermittent	2.18	1,850
31	Emergent Wetland	11.64	---
32	Emergent Wetland	6.49	---
33	Emergent Wetland	5.19	---
34	Open Water - Intermittent	3.87	1,200
35	Open Water - Intermittent	2.58	1,240
36	Emergent Wetland	20.76	---
37	Trammel Crow Lake (Open Water – Perennial)	6.72	---
42	Emergent Wetland	0.53	---
43	Open Water - Intermittent	1.58	1,035
44	Emergent Wetland	25.03	---
46	Emergent Wetland	3.28	---
47	Open Water - Intermittent	1.99	935
48	Emergent Wetland	2.61	---
49	Open Water - Intermittent	0.87	650
50	Emergent Wetland	0.15	---
51	Open Water - Intermittent	1.75	950
52	Emergent Wetland	2.42	---
53	Emergent Wetland	4.24	---
54	Emergent Wetland	7.95	---
55	Historic Trinity River Channel	5.44	3,500
56	Emergent Wetland	0.95	---
57	Open Water - Intermittent	1.65	900
58	Open Water - Intermittent	1.62	975
59	Emergent Wetland	2.03	---
60	Emergent Wetland	1.70	---
61	Open Water - Intermittent	1.32	725
62	Open Water - Intermittent	2.32	750
63	Open Water - Intermittent	1.39	695
65	Emergent Wetland	6.80	---
66	Emergent Wetland	7.80	---
67	Emergent Wetland	6.30	---
68	Emergent Wetland	8.88	---
69	Emergent Wetland	57.13	---
70	Historic Trinity River Channel	25.63	6,300

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
71	Emergent Wetland	0.86	---
74	Emergent Wetland	6.23	---
75	Emergent Wetland	2.21	---
76	Forested Wetland	2.77	---
77	Cedar Creek (Perennial Stream)	4.82	4,050
78	Intermittent Stream	0.21	400
79	Historic Trinity River Channel	1.72	2,400
80	Historic Trinity River Channel	10.57	8,400
81	Historic Trinity River Channel	2.80	3,375
82	Historic Trinity River Channel	8.25	9,650
83	Historic Trinity River Channel	3.08	3,100
84	Emergent Wetland	0.97	---
TOTAL:		**504.52**	**97,460**

TABLE 2
AQUATIC FEATURES THAT ARE NOT WATERS OF THE UNITED STATES

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
7	Man-Made Linear Sump	15.91	---
8	Man-Made Linear Sump	6.33	---
23	Man-Made Linear Sump	18.82	---
38	Man-Made Linear Sump	28.29	---
39	Man-Made Linear Sump	7.46	---
40	Man-Made Linear Sump	12.80	---
41	Man-Made Linear Sump	4.49	---
45	Man-Made Linear Sump	10.5	---
64	Man-Made Linear Sump	1.30	---
72	Man-Made Linear Sump	8.17	---
73	Man-Made Linear Sump	1.75	---
TOTAL:		**115.82**	---

Halff recognizes that segments of the historic West Fork Trinity River and Elm Fork Trinity River channels are navigable waters of the United States. The segments of historic river channel collect stormwater runoff from urbanized Dallas and Oak Cliff. This runoff then collects in on-channel (to the historic river channel) drainage sumps before draining into the floodway. The man-made linear sumps were formed as a result of the levee construction and are located at the exterior base of the Floodway levee and are not believed to have replaced any historic river channel drainage functions. The linear sumps provide conveyance of stormwater to the aforementioned drainage sumps and in turn to the Trinity

River and serve as shallow collection points for urban runoff outside of the Floodway levees. Based on these conclusions, Halff has determined that the man-made linear drainage sumps are not waters of the United States and thus are not subject to Section 404 regulation.

Halff requests that the USACE approve our delineation and proposed jurisdictional determination of waters of the United States and navigable waters of the United States. We would be pleased to meet with you in your office or in the field to discuss this proposed jurisdictional determination or to discuss the Floodway in general. If you have any questions or require any information, please contact me at (214) 346-6363.

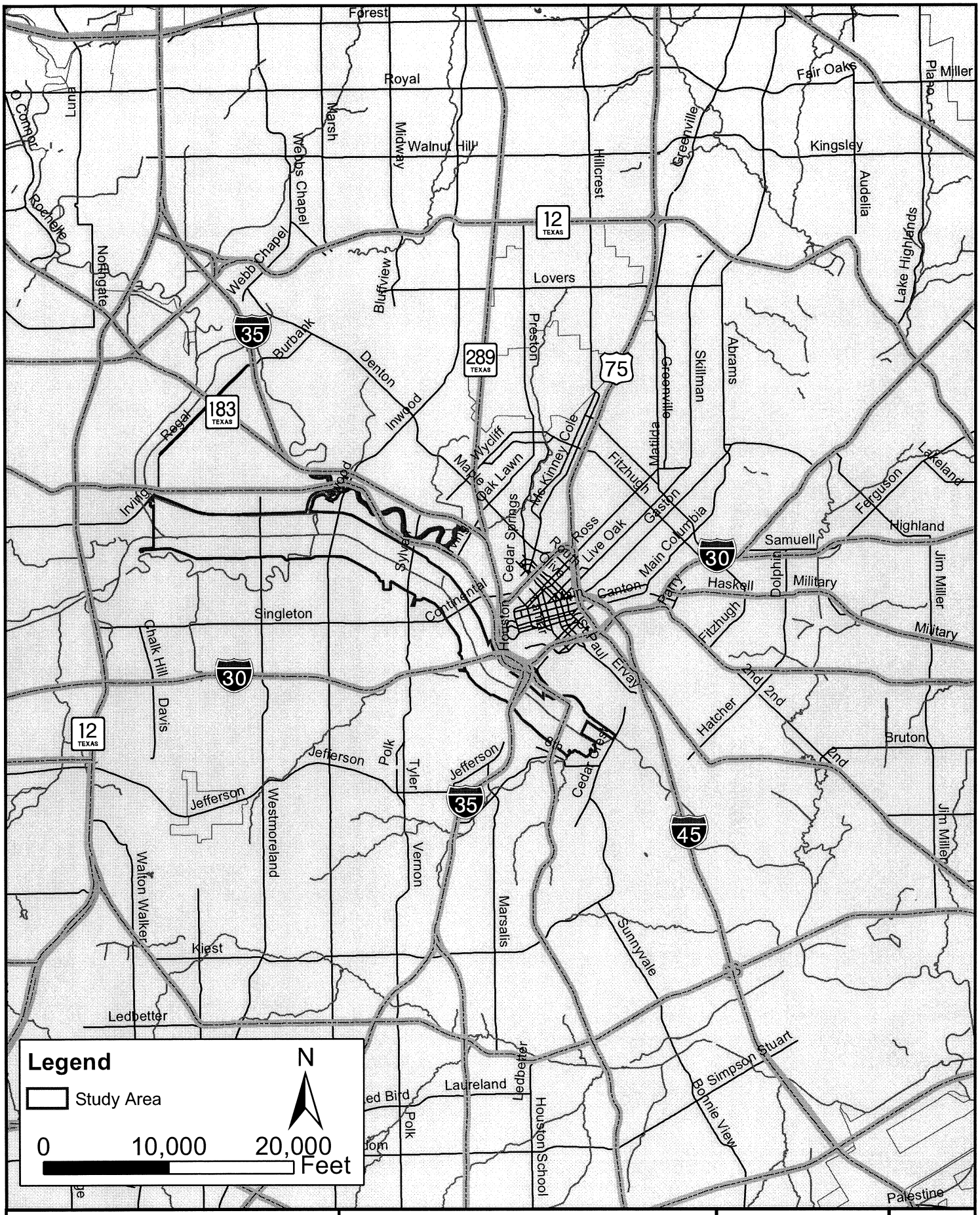
Sincerely,

HALFF ASSOCIATES

Danny Griffith
Environmental Scientist

Enclosures

C: Mr. Chris Anderson – NTTA
Mr. Greg Ajemian, P.E. – City of Dallas



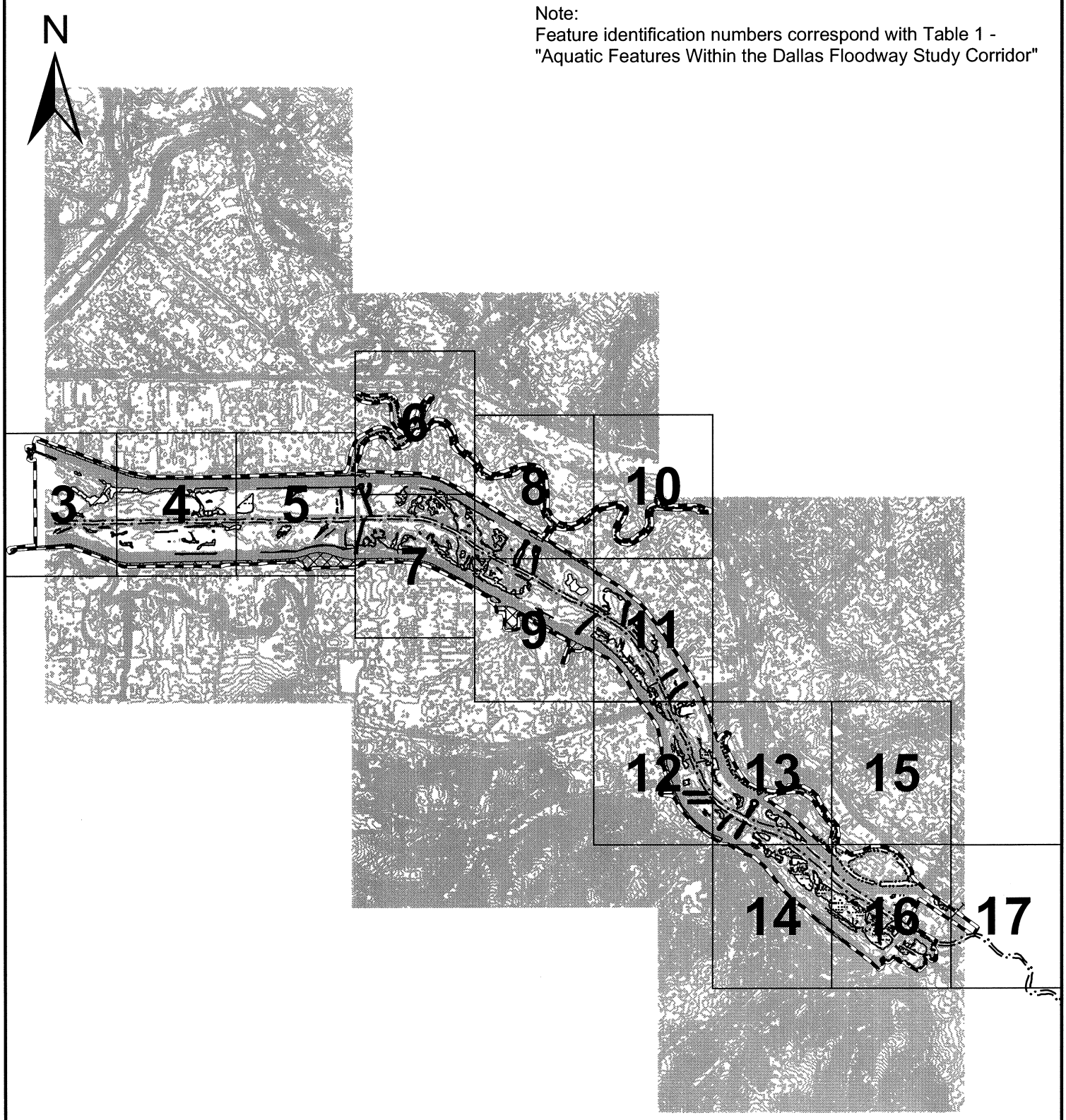
Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors
8616 Northwest Plaza Drive
Dallas, Texas 75225
TEL (214) 346-6200
FAX (214) 739-0095

Project Location Map
Dallas Floodway
Proposed Jurisdictional Determination
Dallas County, Texas
USACE Project No. 200000308

Source:
NCTCOG

Sheet
1 of 17

Note:
Feature identification numbers correspond with Table 1 - "Aquatic Features Within the Dallas Floodway Study Corridor"



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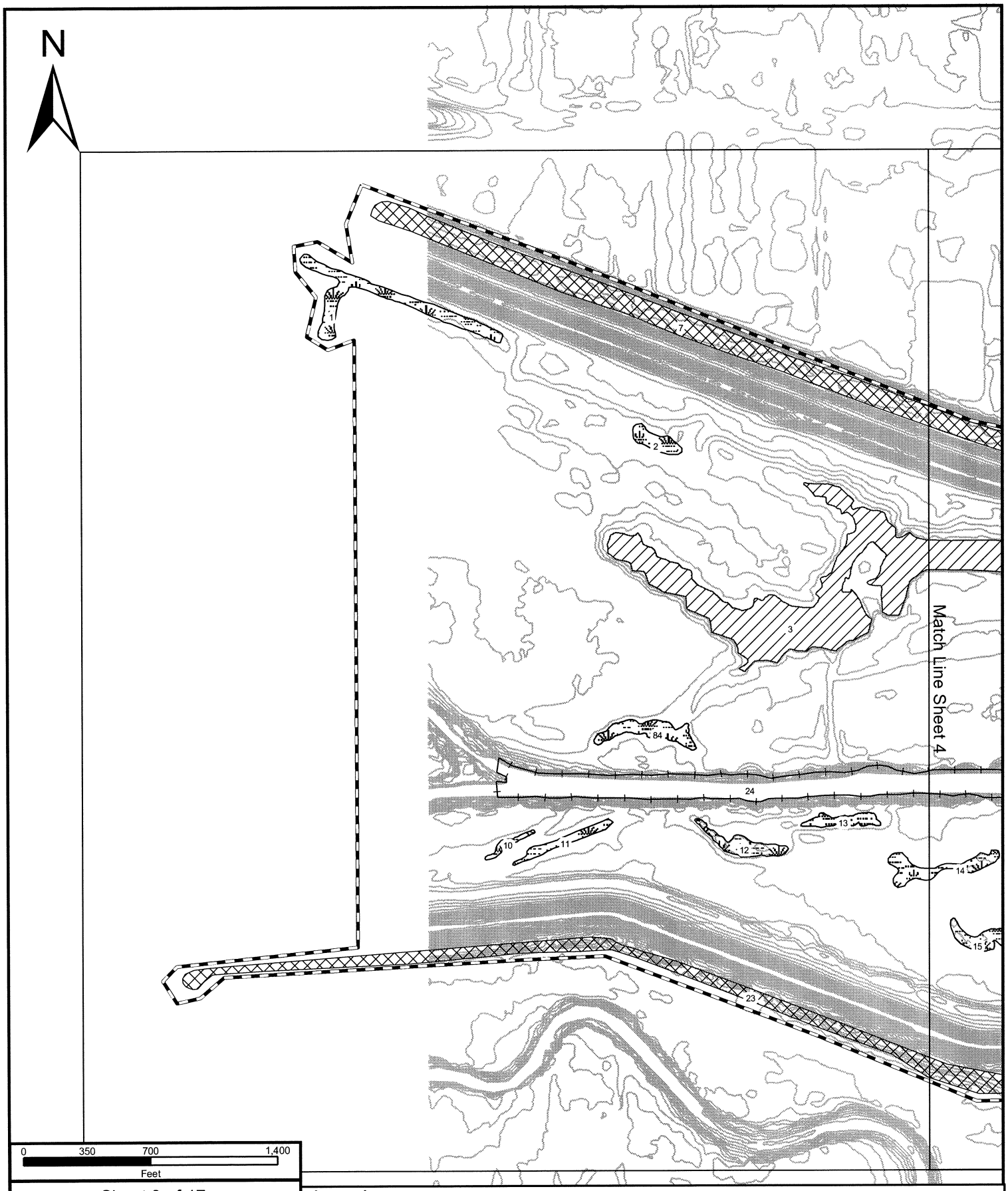
Sheet 2 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
- Waters of the United States: Perennial Stream
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



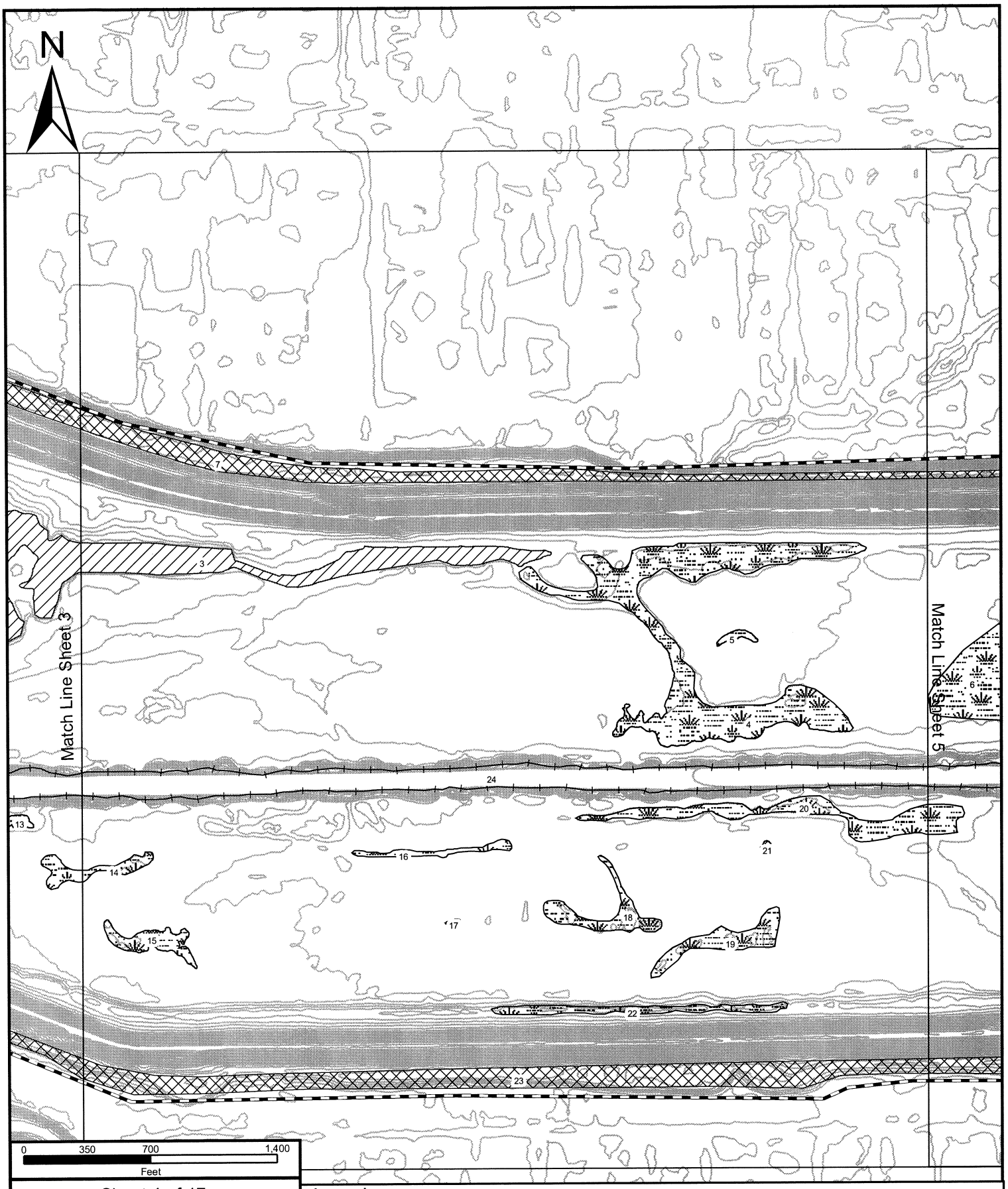
Sheet 3 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
- Waters of the United States: Perennial Stream
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 4 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
- Waters of the United States: Perennial Stream
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump

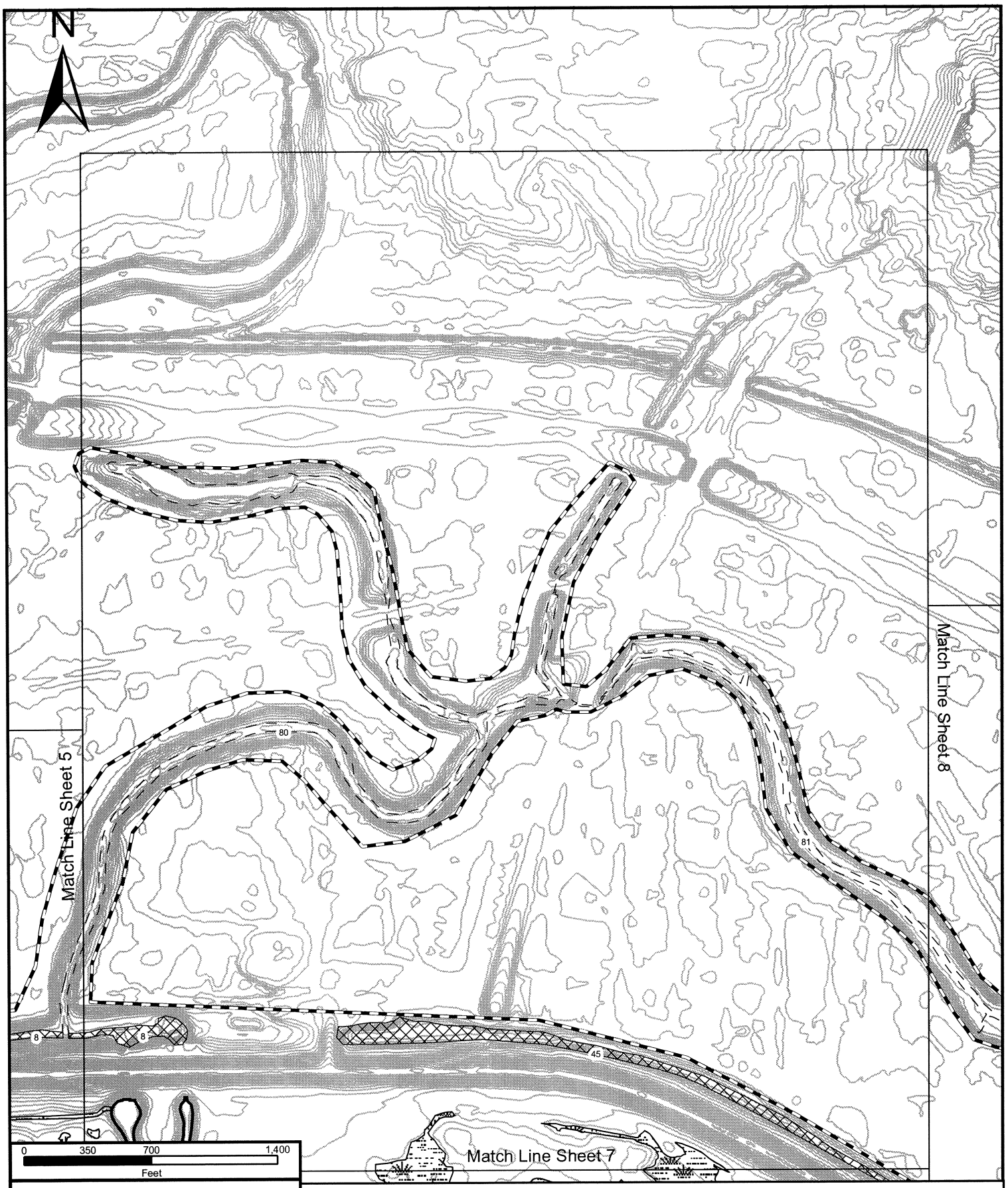
Sheet 5 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
- Waters of the United States: Perennial Stream
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 6 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
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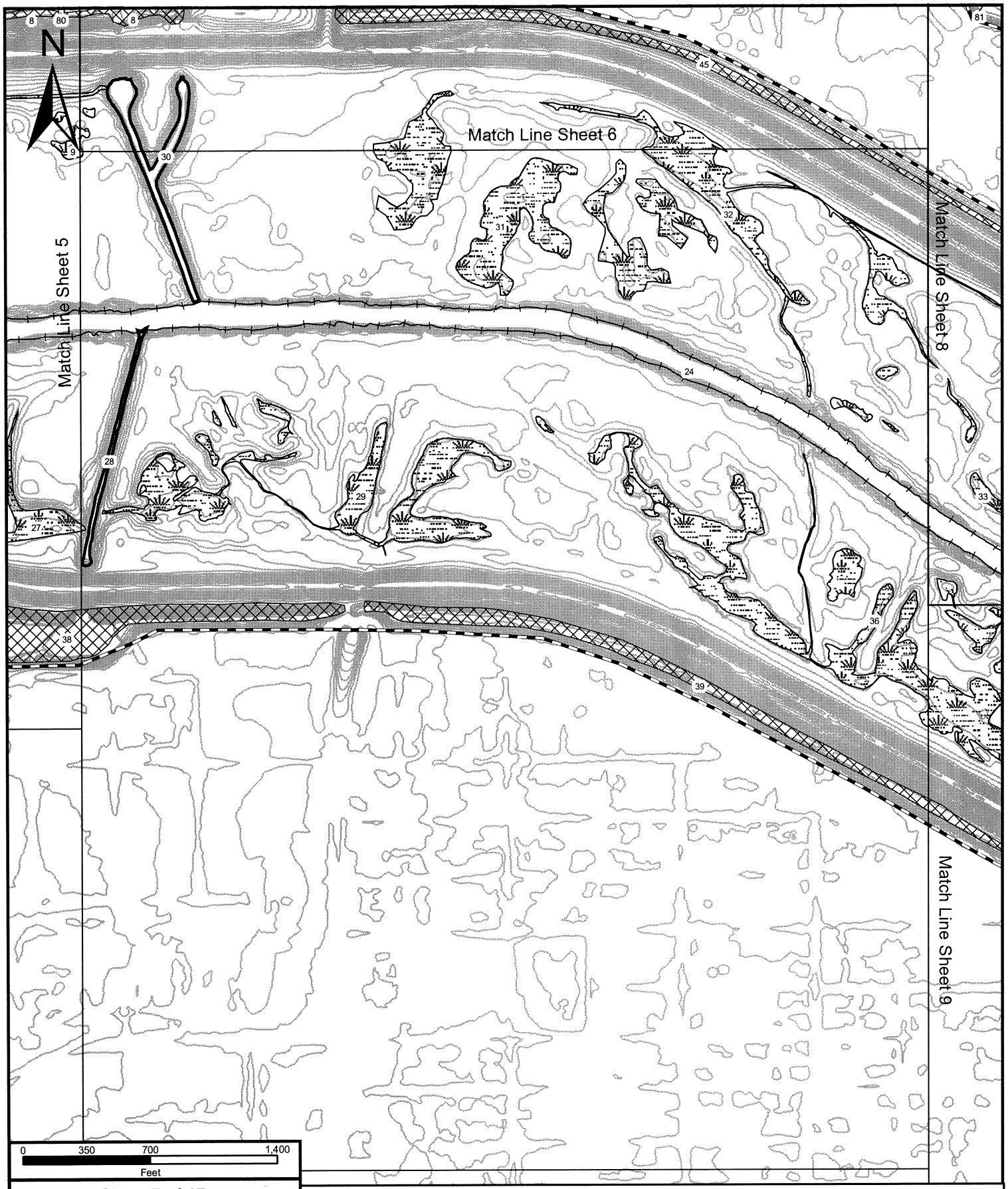
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 7 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

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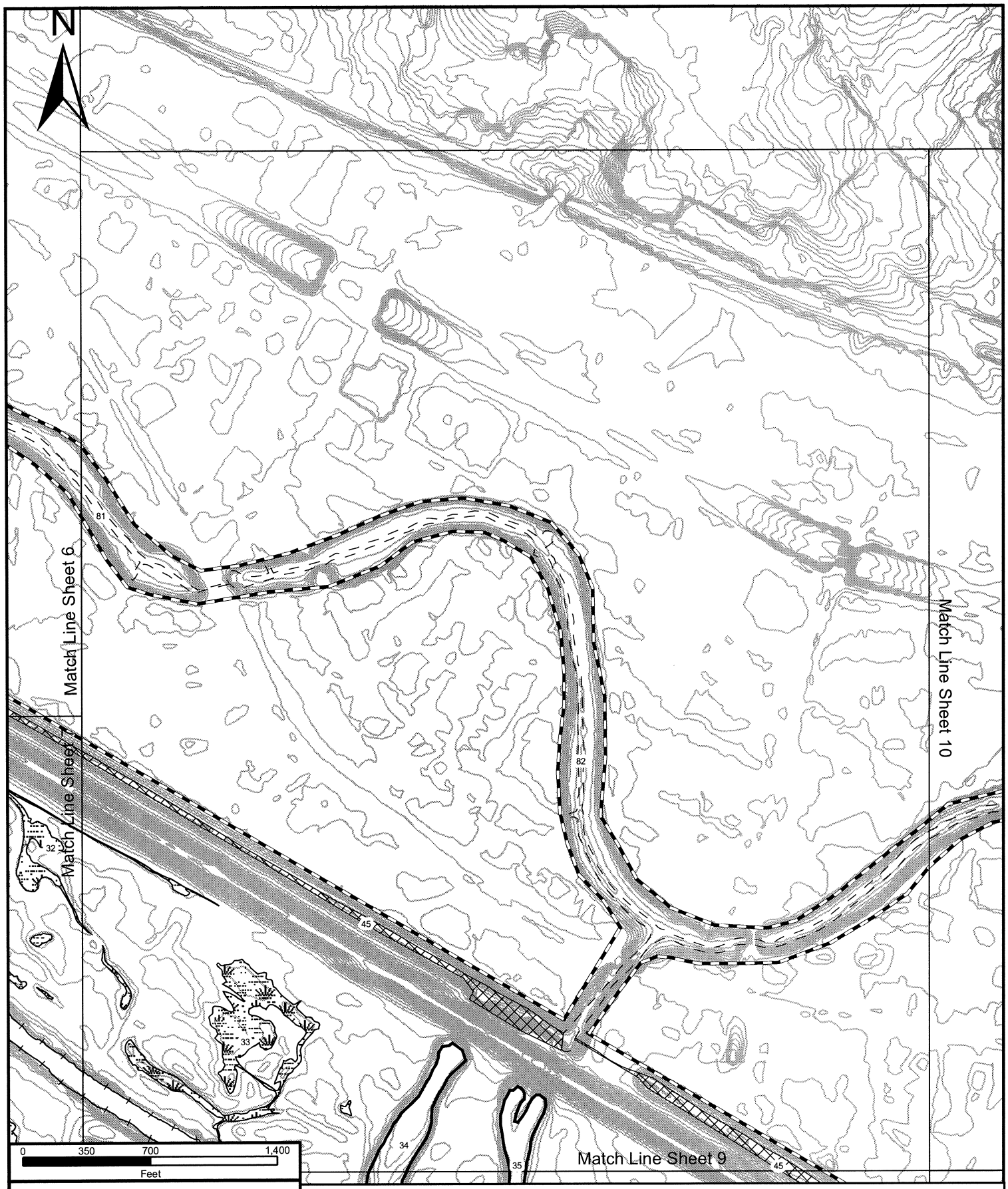
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 8 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
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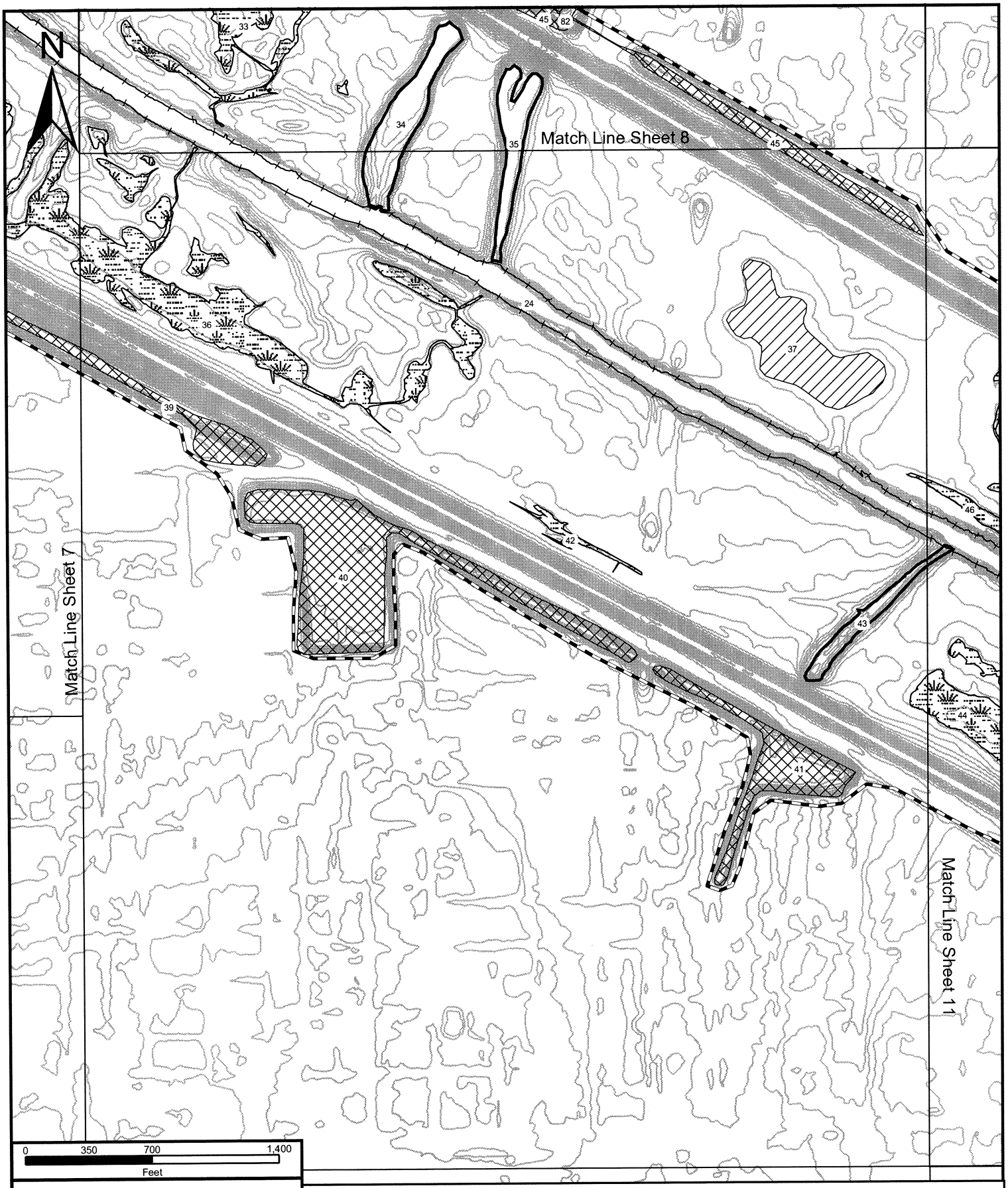
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 9 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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- Study Area Boundary
- Navigable Waters of the United States: Trinity River
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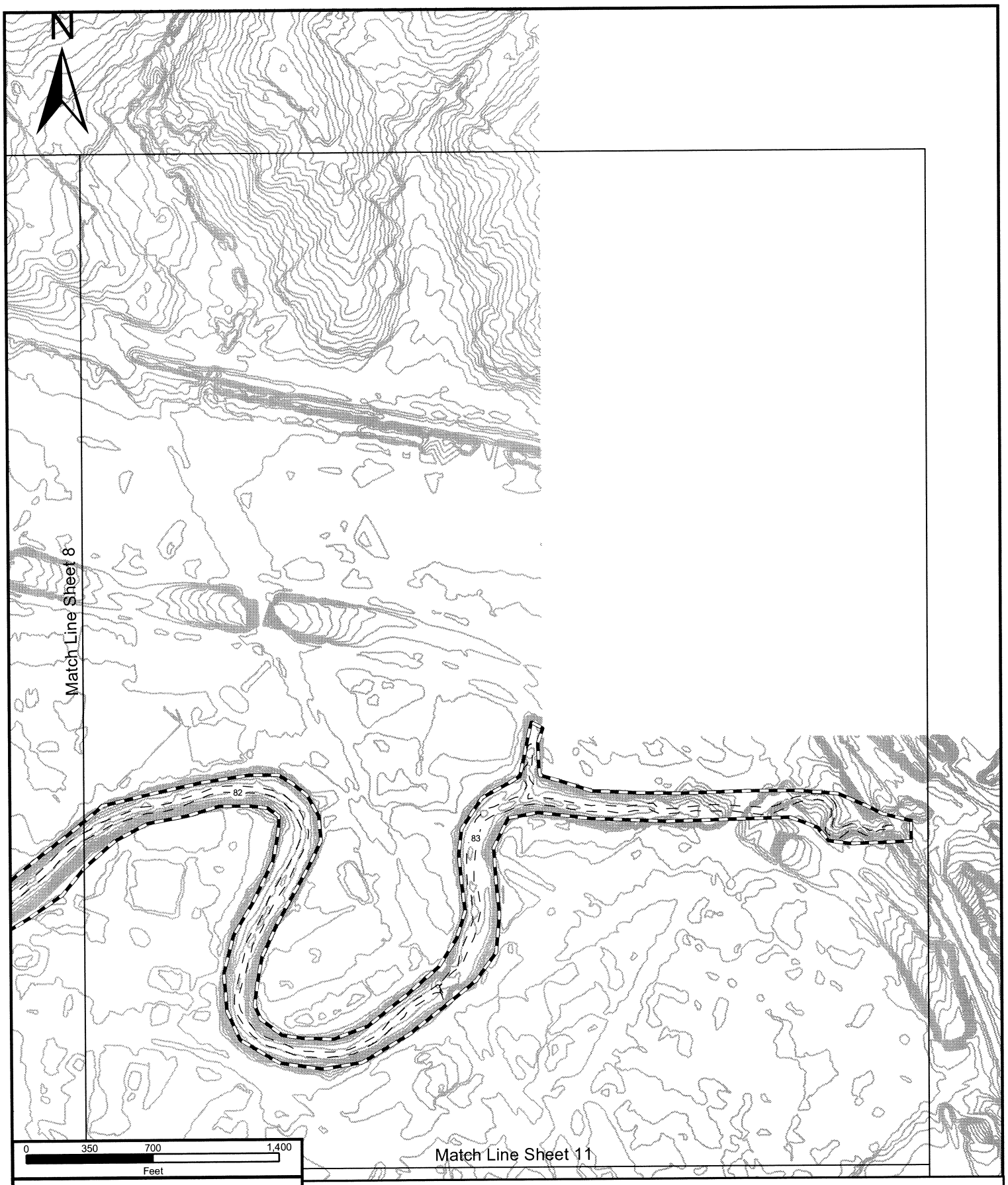
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



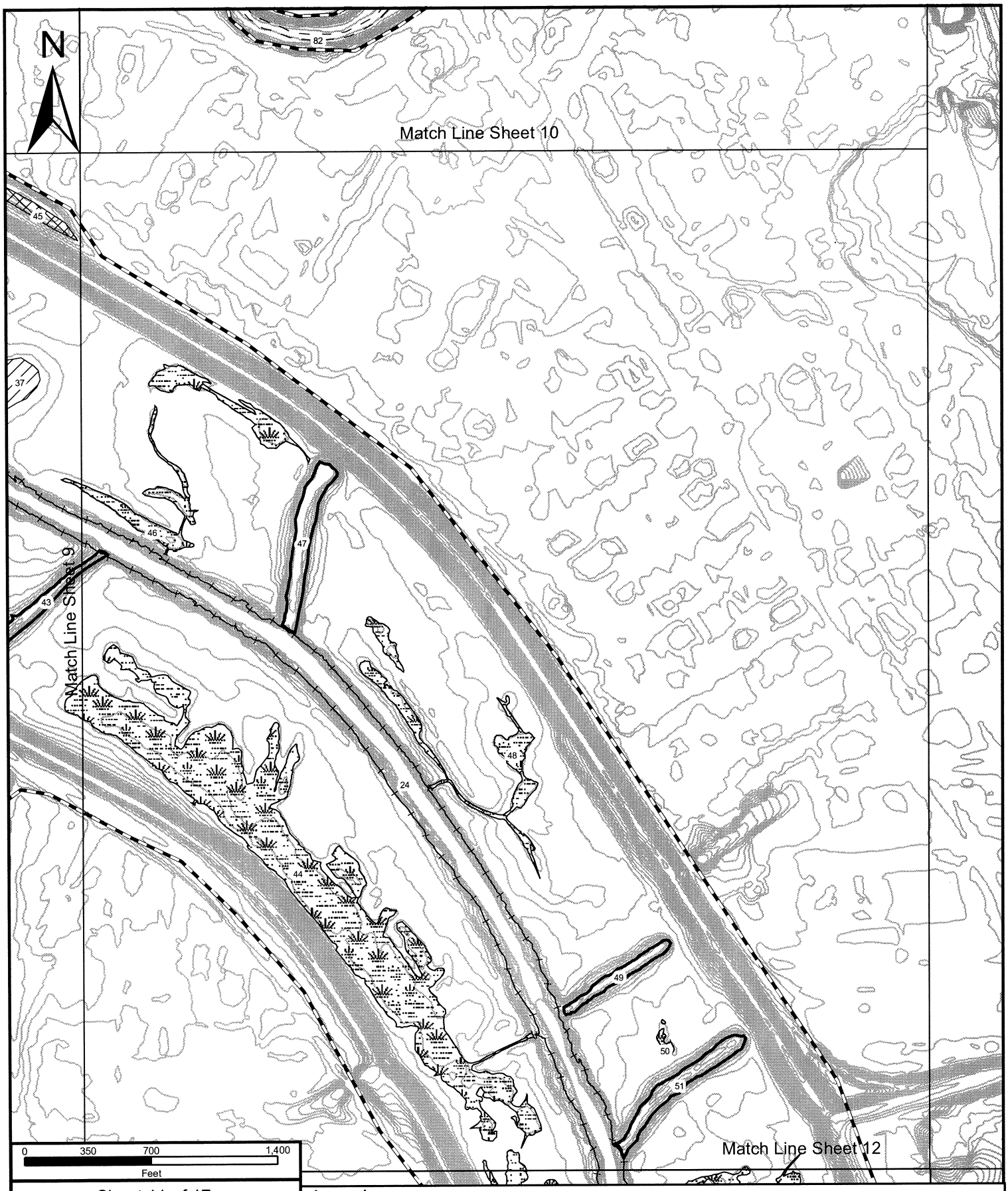
Sheet 10 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
- Waters of the United States: Perennial Stream
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 11 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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- Navigable Waters of the United States: Trinity River
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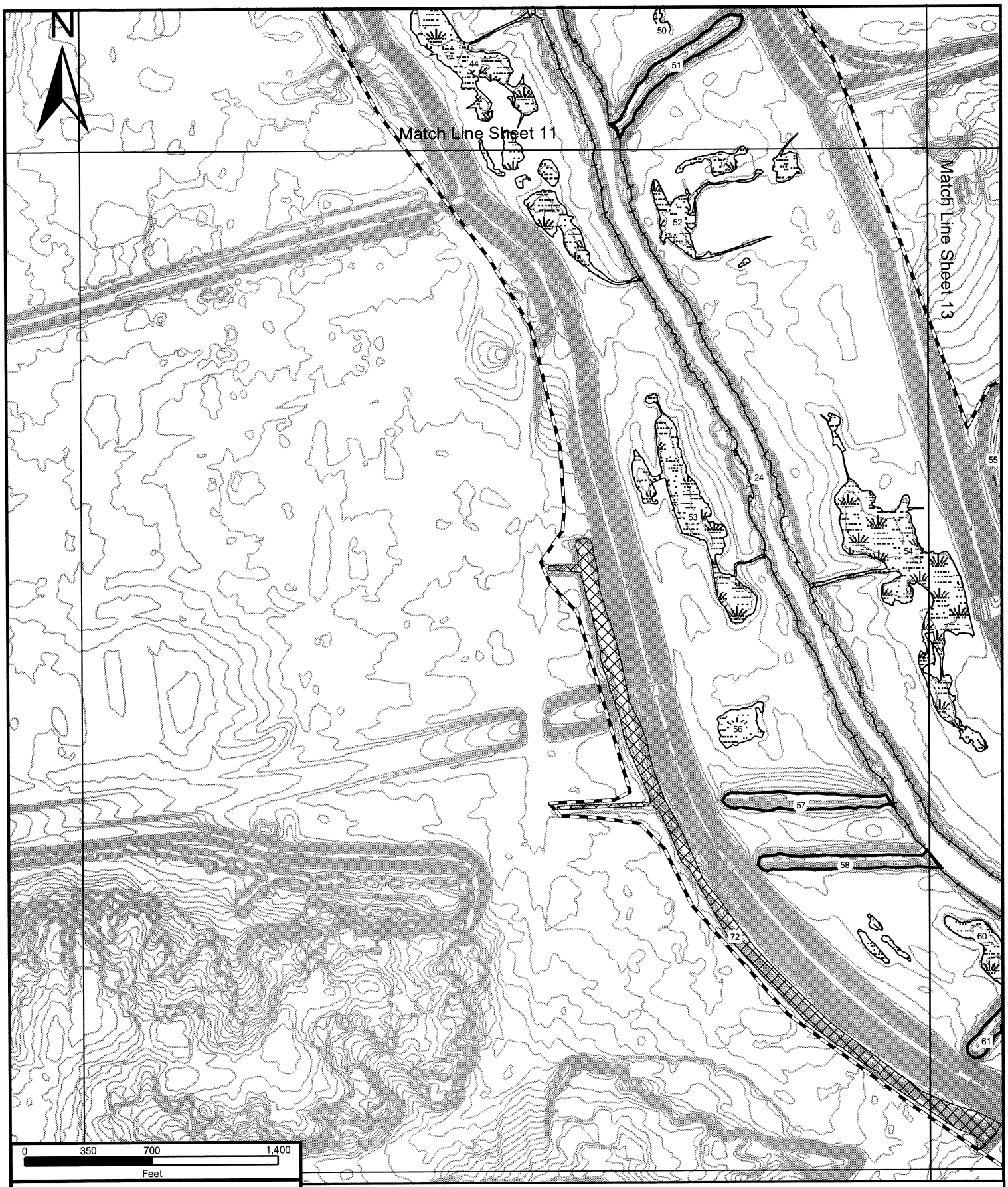
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 12 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

Legend

- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
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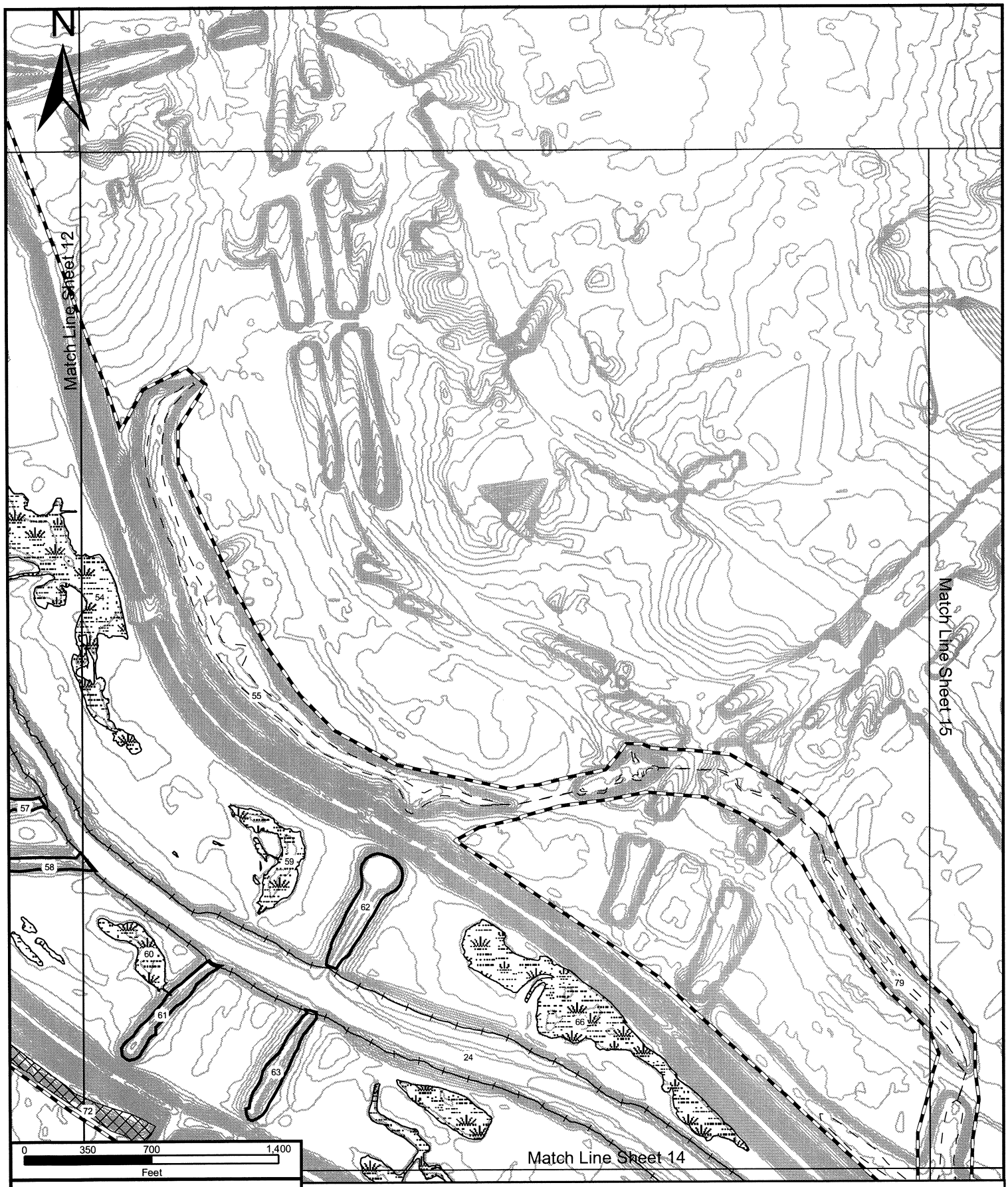
- Waters of the United States: Intermittent Stream
- Waters of the United States: Forested Wetland
- Waters of the United States: Emergent Wetland
- Waters of the United States: Open Water - Perennial
- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 13 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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- Study Area Boundary
- Navigable Waters of the United States: Trinity River
- Navigable Waters of the United States: Historic Trinity River Channel
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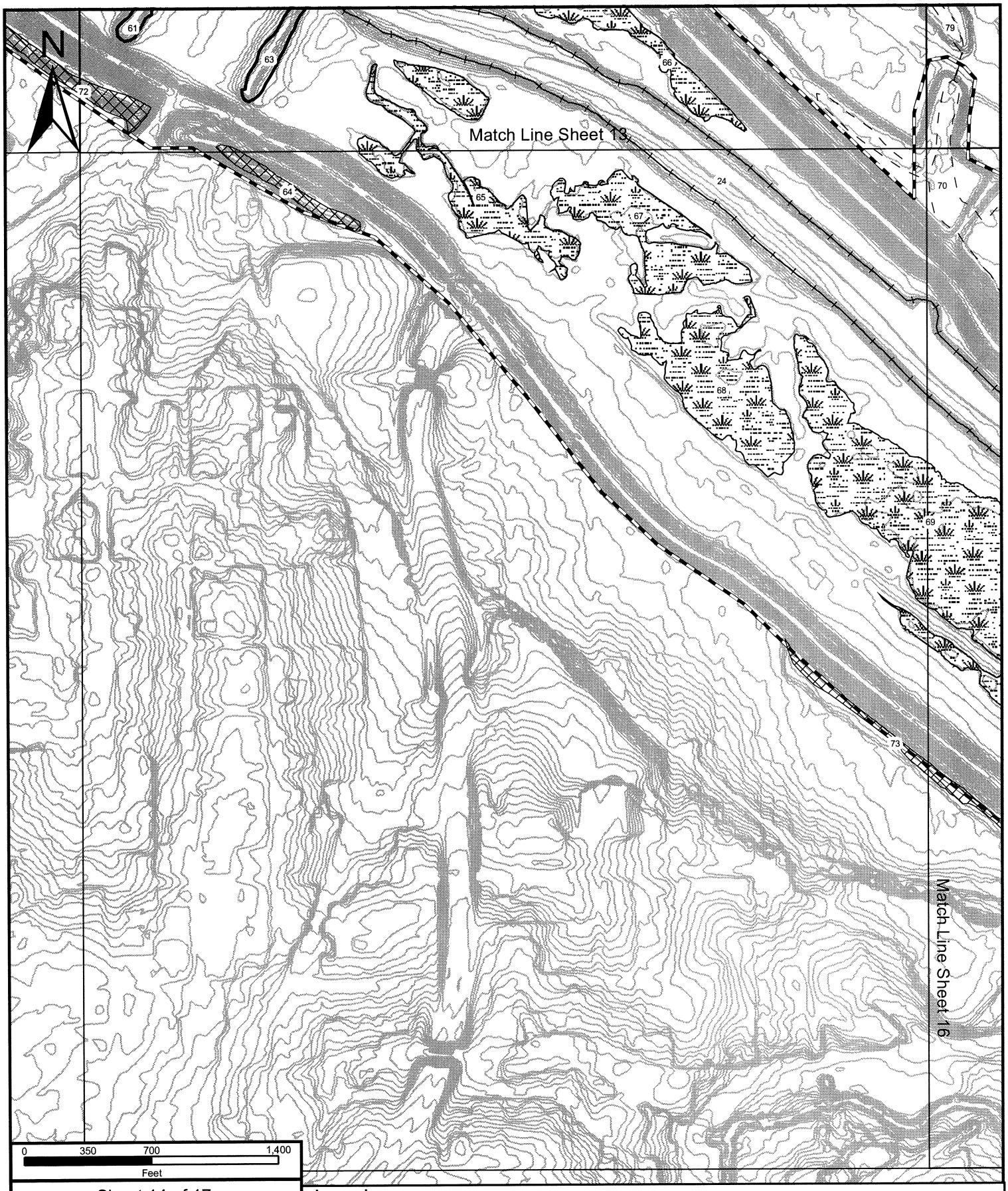
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 14 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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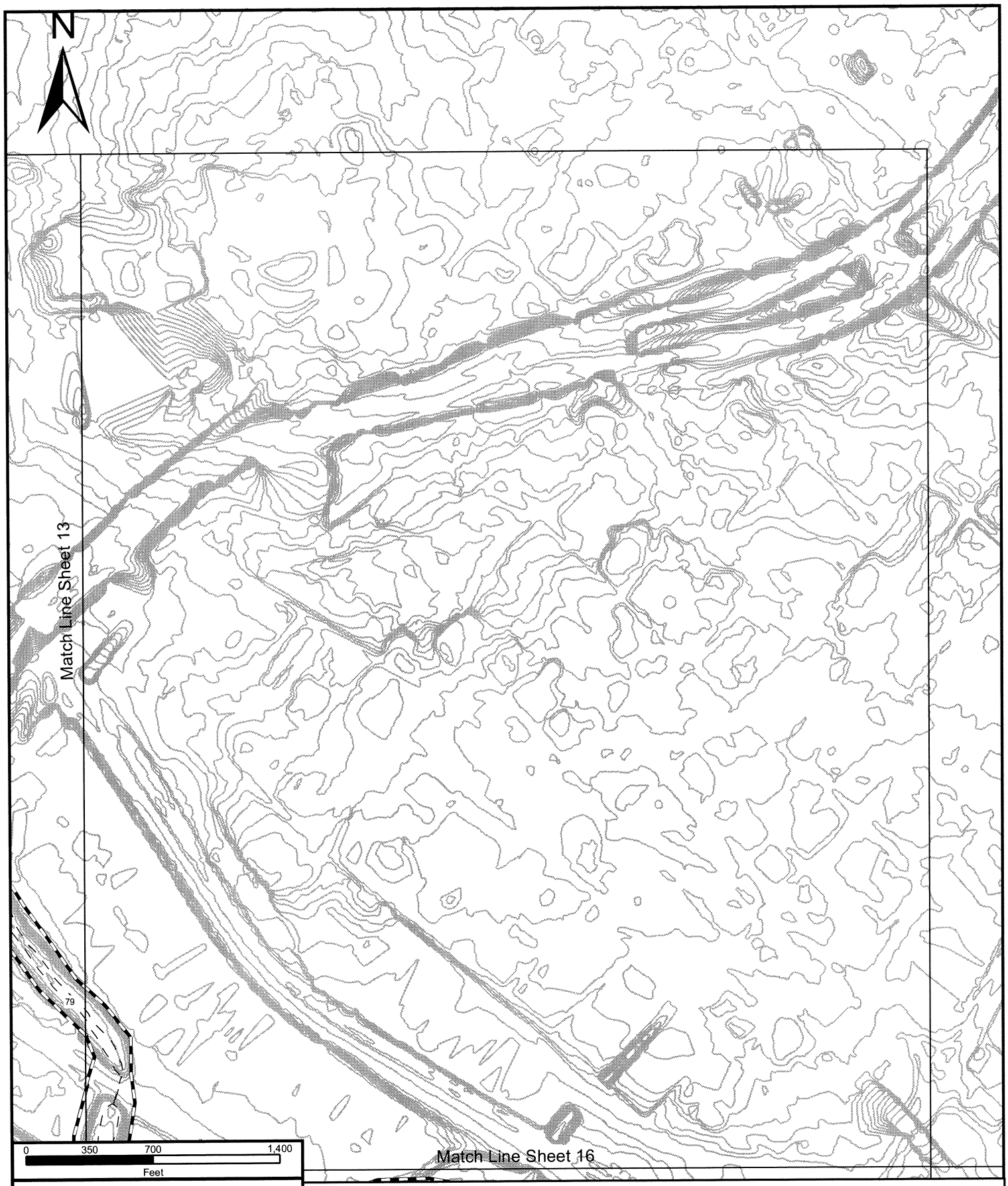

Sheet 15 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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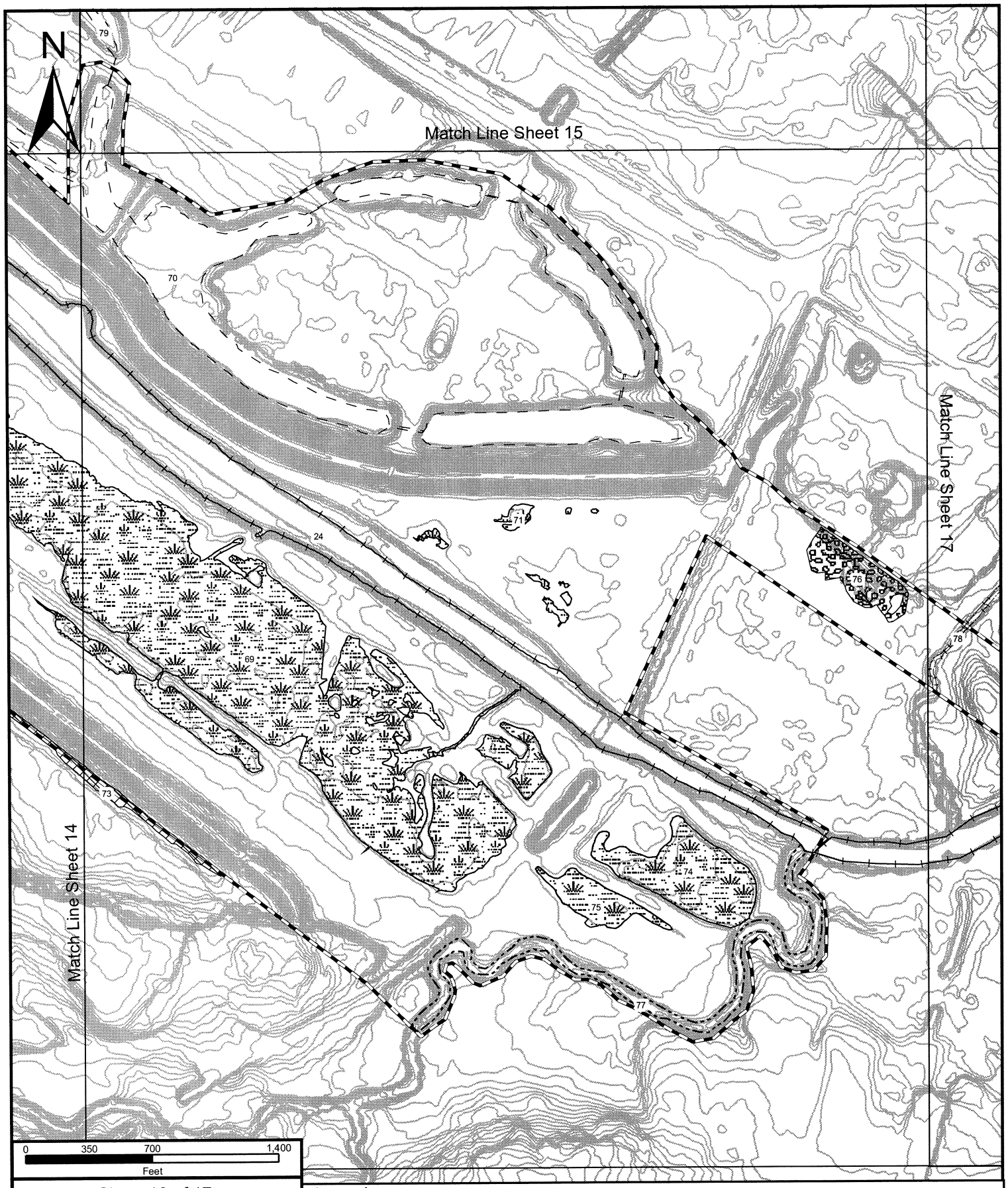
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 16 of 17

Jurisdictional Determination Map

Halff Associates Inc.
Engineers Architects Scientists Planners Surveyors

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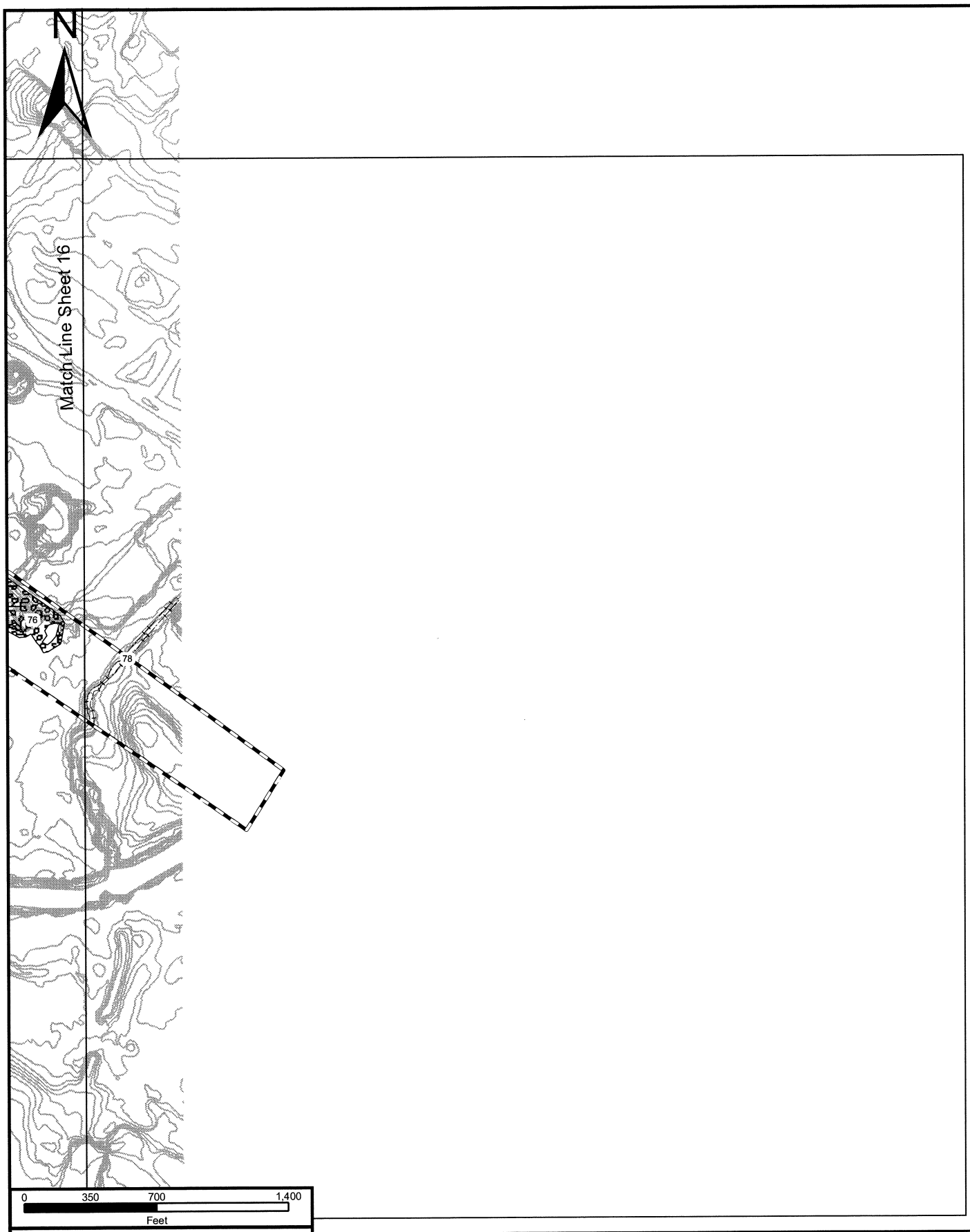
- Non-Waters of the United States: Man-Made Linear Sump



Sheet 17 of 17

Jurisdictional Determination Map

Halff Associates Inc.
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- Waters of the United States: Open Water - Intermittent
- Non-Waters of the United States: Man-Made Linear Sump

APPENDIX A

SITE PHOTOGRAPHS

Photo 1 – View to the northwest of Feature 74, an emergent wetland in TXU Right-of-way.

Photo 2 – Downstream view of Cedar Creek, Feature 77.

Photo 3 - View to the west of mowed emergent wetland areas east of IH-35.

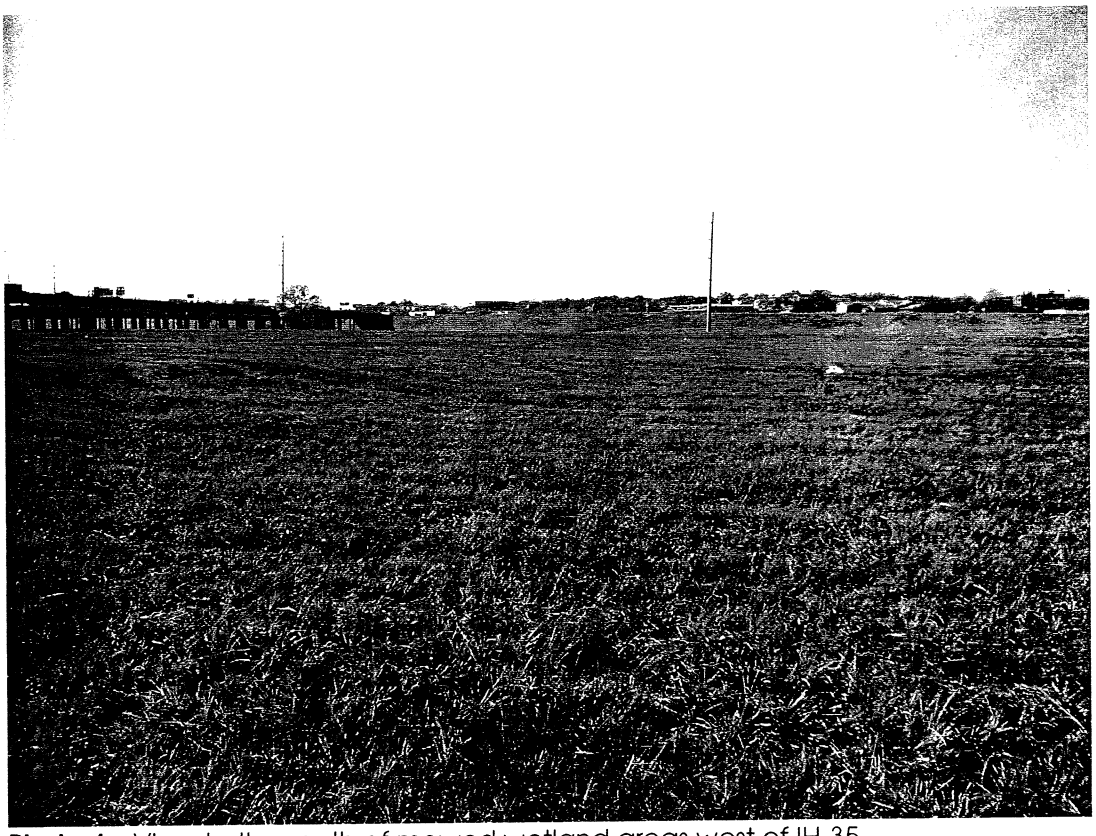

Photo 4 - View to the south of mowed wetland areas west of IH-35.

Photo 5 – View to the south of mowed emergent wetland areas west of Continental Ave.

Photo 6 – View to the south of upland area between Commerce St. and UPRR.

Photo 7 – Downstream view oif unnamed intermittent stream, Feature 78.

Photo 8 – View of historic river meander east of Industrial Boulevard.

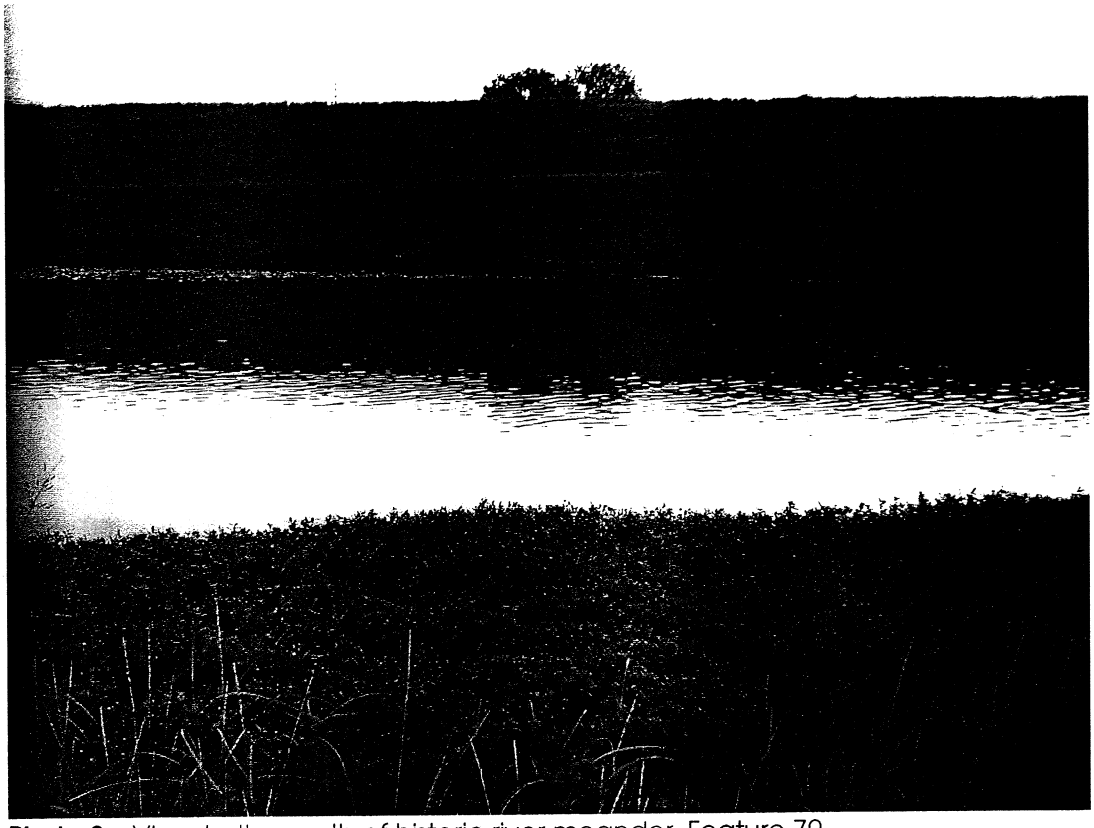

Photo 9 – View to the south of historic river meander, Feature 70.

Photo 10 – View of perennial open water area, Feature 3.

Photo 11 - View to the south of an unmowed emergent wetland area.

Photo 12 - View to the north of an intermittent open water feature.

Photo 13 – View to the west of an unmowed upland area near IH-35.

Photo 14 – View to the east a forested wetland, Feature 76.

Photo 15 – View of the Trinity River looking downstream towards Corinth Street.

APPENDIX B

WETLAND DATA FORMS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Dallas Floodway Applicant/Owner: NTTA Investigator: Griffith\Flesher			Date: 08-19-05 County: Dallas State: Texas
Do Normal Circumstances exist on the site: Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse)	☒Yes ☐Yes ☐Yes	☐No ☒No ☒No	Community ID: un-Mowed Emergent Transect ID: 1 Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Aster subulatus*	Herb	OBL	9.		
2. *Eleocharis acicularis*	Herb	OBL	10.		
3. *Iva annua*	Herb	FAC	11.		
4. *Ambrosia trifida*	Herb	FAC	12.		
5. *Elymus virginicus*	Herb	FAC	13.		
6. *Cuscuta gronovii*	Herb	UPL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-) 83%

Remarks: Vegetation criteria met.

HYDROLOGY

☒Recorded Data (Describe in Remarks):
- ☐Stream, Lake, or Tide Gauge
- ☒Aerial Photographs
- ☐Other

☐No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐Inundated
- ☐Saturated in Upper 12 Inches
- ☐Water Marks
- ☐Drift Lines
- ☐Sediment Deposits
- ☒Drainage patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐Oxidized Root Channels in Upper 12 inches
- ☐Water-Stained Leaves
- ☐Local Soil Survey Data
- ☐FAC-Neutral Test
- ☐Other (Explain in Remarks)

Remarks: Sample point is within a depression area. Hydrology criteria met.

SOILS

Map Unit Name (Series and Phase): Trinity Clay, frequent flooded	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup): Thermic Typic Pelluderts	Field Observations Confirm Mapped type? ☒ Yes ☐ No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2			

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Soil is listed on the state hydric soil list. Soil criteria met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No	Is this Sampling Point Within a Wetland? ☒ Yes ☐ No
Wetland Hydrology Present?	☒ Yes	☐ No	
Hydric Soils Present?	☒ Yes	☐ No	

Remarks: Sample point is within a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Dallas Floodway Applicant/Owner: NTTA Investigator: Griffith\Flesher			Date: 08-19-05 County: Dallas State: Texas
Do Normal Circumstances exist on the site: Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse)	☒Yes ☐Yes ☐Yes	☐No ☒No ☒No	Community ID: Emergent Transect ID: 1 Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Carex crus-corvi*	Herb	OBL	9.		
2. *Ambrosia trifida*	Herb	FAC	10.		
3. *Iva annua*	Herb	FAC	11.		
4. *Cuscuta gronovii*	Herb	UPL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-) 75%

Remarks: Vegetation criteria met.

HYDROLOGY

☒Recorded Data (Describe in Remarks):
- ☐Stream, Lake, or Tide Gauge
- ☒Aerial Photographs
- ☐Other

☐No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐Inundated
- ☐Saturated in Upper 12 Inches
- ☐Water Marks
- ☐Drift Lines
- ☐Sediment Deposits
- ☐Drainage patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐Oxidized Root Channels in Upper 12 inches
- ☐Water-Stained Leaves
- ☐Local Soil Survey Data
- ☐FAC-Neutral Test
- ☐Other (Explain in Remarks)

Remarks: Hydrology criteria not met.

SOILS

Map Unit Name (Series and Phase): Trinity Clay, frequently flooded Taxonomy (Subgroup): Thermic Typic Pelluderts	Drainage Class: Somewhat poorly drained Field Observations Confirm Mapped type? ☒ Yes ☐ No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2			

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Soil is listed on the state hydric soil list. Soil criteria met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No	Is this Sampling Point Within a Wetland? ☐ Yes ☒ No
Wetland Hydrology Present?	☐ Yes	☒ No	
Hydric Soils Present?	☒ Yes	☐ No	

Remarks: Sample point is not within a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Dallas Floodway Applicant/Owner: NTTA Investigator: Griffith\Flesher			Date: 08-19-05 County: Dallas State: Texas
Do Normal Circumstances exist on the site: Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse)	☒Yes ☐Yes ☐Yes	☐No ☒No ☒No	Community ID: Un-Mowed Emergent Transect ID: 2 Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Polygonum hydropiperoides*	Herb	OBL	9.		
2. *Aster subulatus*	Herb	OBL	10.		
3. *Salix nigra*	Sapling	FACW+	11.		
4. *Xanthium strumarium*	Herb	FAC-	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-) 75%

Remarks: Vegetation criteria met.

HYDROLOGY

☒Recorded Data (Describe in Remarks):
- ☐Stream, Lake, or Tide Gauge
- ☒Aerial Photographs
- ☐Other

☐No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐Inundated
- ☐Saturated in Upper 12 Inches
- ☒Water Marks
- ☐Drift Lines
- ☒Sediment Deposits
- ☐Drainage patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐Oxidized Root Channels in Upper 12 inches
- ☐Water-Stained Leaves
- ☐Local Soil Survey Data
- ☐FAC-Neutral Test
- ☐Other (Explain in Remarks)

Remarks: Area is likely to be inundated frequently. Hydrology criteria met.

SOILS

Map Unit Name (Series and Phase): Trinity Clay, frequently flooded	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup): Thermic Typic Pelluderts	Field Observations Confirm Mapped type? ☒ Yes ☐ No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 5/4	5YR 5/8	Medium	sandy

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Sandy silty layer and mottles at the depth of 14". Soil is listed on the state hydric soil list. Soil criteria met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No	Is this Sampling Point Within a Wetland? ☒ Yes ☐ No
Wetland Hydrology Present?	☒ Yes	☐ No	
Hydric Soils Present?	☒ Yes	☐ No	

Remarks: Sample point is within a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Dallas Floodway Applicant/Owner: NTTA Investigator: Griffith\Flesher			Date: 08-19-05 County: Dallas State: Texas
Do Normal Circumstances exist on the site: Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse)	☒Yes ☐Yes ☐Yes	☐No ☒No ☒No	Community ID: Un-Mowed Emergent Transect ID: 2 Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Polygonum hydropiperoides*	Herb	OBL	9.		
2. *Ludwigia peploides*	Herb	OBL	10.		
3. *Aster subulatus*	Herb	OBL	11.		
4. *Fraxinus pennsylvanica*	Sapling	FACW+	12.		
5. *Panicum virgatum*	Herb	FACW	13.		
6. *Xanthium strumarium*	Herb	FAC-	14.		
7.			15.		
8.			16.		
Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-) 83%					
Remarks: Vegetation criteria met.					

HYDROLOGY

☒Recorded Data (Describe in Remarks):
- ☐Stream, Lake, or Tide Gauge
- ☒Aerial Photographs
- ☐Other

☐No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐Inundated
- ☐Saturated in Upper 12 Inches
- ☐Water Marks
- ☐Drift Lines
- ☒Sediment Deposits
- ☐Drainage patterns in Wetlands

Secondary Indicators (2 or more required):
- ☒Oxidized Root Channels in Upper 12 inches
- ☐Water-Stained Leaves
- ☐Local Soil Survey Data
- ☐FAC-Neutral Test
- ☐Other (Explain in Remarks)

Remarks: Hydrology criteria met.

SOILS

Map Unit Name (Series and Phase): Trinity Clay, frequently flooded Taxonomy (Subgroup): Thermic Typic Pelluderts	Drainage Class: Somewhat poorly drained Field Observations Confirm Mapped type? ☒ Yes ☐ No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2			

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Soil is listed on the state hydric soil list. Soil criteria met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No

Is this Sampling Point Within a Wetland? ☒ Yes ☐ No

Remarks: Sample point is within a wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Dallas Floodway Applicant/Owner: NTTA Investigator: Griffith\Flesher			Date: 08-19-05 County: Dallas State: Texas
Do Normal Circumstances exist on the site: Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse)	☒Yes ☐Yes ☐Yes	☐No ☒No ☒No	Community ID: Mowed Emergent Transect ID: 3 Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Aster subulatus*	Herb	OBL	9.		
2. *Ambrosia trifida*	Herb	FAC	10.		
3. *Solidago gigantea*	Herb	FAC	11.		
4. *Cynodon dactylon*	Herb	FACU+	12.		
5. *Sorghum halepense*	Herb	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-) 60%

Remarks: Sample area has been recently mowed. Vegetation criteria met.

HYDROLOGY

☒Recorded Data (Describe in Remarks):
- ☐Stream, Lake, or Tide Gauge
- ☒Aerial Photographs
- ☐Other

☐No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐Inundated
- ☐Saturated in Upper 12 Inches
- ☐Water Marks
- ☐Drift Lines
- ☐Sediment Deposits
- ☐Drainage patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐Oxidized Root Channels in Upper 12 inches
- ☐Water-Stained Leaves
- ☐Local Soil Survey Data
- ☐FAC-Neutral Test
- ☐Other (Explain in Remarks)

Remarks: Hydrology criteria not met.

SOILS

Map Unit Name (Series and Phase): Trinity Clay, frequently flooded	Drainage Class: Somewhat poorly drained
Taxonomy (Subgroup): Thermic Typic Pelluderts	Field Observations Confirm Mapped type? ☒ Yes ☐ No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 3/2			

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Soil is listed on the state hydric soil list. Soil criteria met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No	Is this Sampling Point Within a Wetland? ☐ Yes ☒ No
Wetland Hydrology Present?	☐ Yes	☒ No	
Hydric Soils Present?	☒ Yes	☐ No	

Remarks: Sample point is not within a wetland.

APPENDIX C

FUNCTIONAL ASSESSMENT

1.0 Identification of Aquatic Features

The study area contains several types of aquatic features, including emergent wetlands, forested wetlands, open water, non-jurisdictional linear sumps, historic river channels, and perennial and intermittent stream channels. This section discusses each type of aquatic feature, and will provide a detailed analysis of a representative area for each feature type.

Forested Wetlands

One forested wetland is located between the DART/AT&SF railroad bridges and Martin Luther King Boulevard. There is little or no herbaceous vegetation within the wetland and the overstory layer consists of green ash (*Fraxinus pennsylvanica*), sugar hackberry (*Celtis laevigata*) and cedar elm (*Ulmus crassifolia*), with boxelder (*Acer negundo*) and cottonwood (*Populus deltoides*) present in smaller numbers. Hydrology indicators such as drift lines and water marks are present, presumably from overbank flooding of the Trinity River. Soils in the area are typical of the Trinity Series mapped in the Dallas County Soil Survey.

Un-mowed Emergent Wetlands

At the time of site visits in August 2005, un-mowed emergent wetlands in the study area were located on the east bank of the Trinity River beginning at the upstream boundary of the study area and extending just downstream of the Hampton Road/Inwood Road bridge. The annual mowing had been completed on the west bank of the Trinity River and was progressing upstream from the downstream boundary of the study area.

Vegetation in the un-mowed emergent wetlands was predominately balloonvine (*Cardiospermum halicacabum*), wireweed (*Aster subulatus*), sumpweed (*Iva annua*), cocklebur (*Xanthium strumarium*) and crow-foot caric sedge (*Carex crus-corvi*). In some areas, small black willow (*Salix nigra*) saplings were present. Transition areas between wetlands and upland areas were characterized by the presence of giant ragweed (*Ambrosia trifida*) and cocklebur and dodder (*Cuscuta* spp.) was present in many areas.

Over the course of the study, the wetlands have been observed both inundated and dry, depending upon the time of year. The wetlands are recharged via precipitation, surface runoff and overbank flows from the Trinity River. Because of their location within the floodway and proximity to the river, a subsurface flow connection to the Trinity River may be assumed.

Soils in these wetlands are representative of the Trinity Clay, frequently flooded classification, which along with the Trinity-Urban land complex, comprises all of the mapped soils in the floodway. At

the time of the most recent site visits (August 2005), the soils were exposed as bare mudflats or vegetated depressions, with wide, deep cracks in the surface after a dry summer.

Mowed Emergent Wetlands

All emergent wetlands in the study area are mowed annually to improve the efficiency of flood conveyance. At the time of the most recent site visits, the entire west side of the floodway had been mowed and mowing was in progress on the east side of the floodway. Mowed emergent wetlands in the study area had the same vegetative species composition, hydrology, and soils as the un-mowed emergent wetlands. However, in these areas, transition species such as giant ragweed were less than one foot tall, while in un-mowed areas it was often in excess of ten feet tall. Black willow saplings were present as trunk sprouts from prior mowing. Another noticeable difference is the thick layer of decaying plant matter on the surface, left as a result of the annual mowing.

Perennial Streams

The Trinity River, a navigable water of the United States, is the primary aquatic feature in the study area. The Trinity River flows for approximately 42,000 linear feet within the study area, from the confluence of the Elm Fork and West Fork, to just downstream of the DART Railroad Bridge. The ordinary high water mark (OHWM) of the Trinity River varies from between 100 to 150 feet, with the wider sections located downstream of the IH-35 Bridges.

Vegetation within the narrow riparian corridor of the Trinity River is limited to cattails (*Typha* spp.) on silt covered benches, and Virginia wildrye (*Elymus virginicus*) along some overbank areas. The dominant tree species within the corridor are cottonwood and black willow. Random red mulberry (*Morus rubra*) saplings were observed in some areas.

Cedar Creek is a perennial stream which enters the study area from the south, just downstream of the DART/AT&SF railroad bridges. Cedar creek has an OHWM of 15-20 feet and flows for approximately 4,000 linear feet before its confluence with the Trinity River. Cedar Creek has a cobbled/gravel bottom and riffle/pool areas within its course through the study area. Vegetation along Cedar Creek includes cottonwood, black willow, cedar elm, green ash, and giant ragweed.

Intermittent Streams

One intermittent stream is located in the study area, between the DART/AT&SF railroad bridges and Martin Luther King Boulevard. The stream flows south, towards the Trinity River and has an

average OHWM of ten feet. The stream is in a wooded area, outside of the maintained area of the floodway with tree species such as green ash, sugar hackberry, and cedar elm adjacent to the channel.

Historic Trinity River Channels

Several remnant meanders of the Trinity River remain after the re-alignment of the river into the existing Floodway in the early twentieth century. These historic channels collect runoff from surrounding urban areas and some of the segments are connected to other aquatic features, such as the open-water linear sumps outside the levees.

Vegetation within the historic channels is regularly mowed and none of the historic channels have any woody vegetation. Emergent vegetation associated with the historic meanders included species of spike-rush (*Eleocharis* spp.), American waterwillow (*Justicia americana*), crow-foot caric sedge and cattails. The shoreline fringe is narrow and vegetation quickly transitions into upland grass species such as bermudagrass (*Cynodon dactylon*). Soils in the area are dark clays, characteristic of the Trinity-Urban land complex soil classification.

Perennial Open Water

Trammel Crow Lake is a perennial open water feature that is located in a maintained park setting at the Sylvan Avenue crossing. The lake has formed concrete retaining walls as most of its banks and the only typical vegetation is regularly mowed bermudagrass (*Cynodon dactylon*) with cattails (*Typha* spp.) in shallow areas. During August 2005 site visits, the water level of the lake was down, revealing a flat, un-vegetated earthen bottom in many areas.

Another large open water feature lies between the confluence of the Elm Fork Trinity River and West Fork Trinity River and Westmoreland Drive. This feature is a deep depression with an emergent vegetated fringe dominated by giant ragweed, cocklebur and smartweed (*Polygonum* spp.). There was standing water present during August 2005 field visits, and a review of aerial photography revealed that this feature typically has standing water throughout the year. This feature was presumably formed as a result of sand and gravel mining activities that were active after the construction of the levees was completed in the early twentieth century.

Intermittent Open Water – Linear Drainage Sumps

The linear drainage sumps, during a year with normal patterns of precipitation, have standing or flowing water for sufficient duration to establish an OHWM. The function of the linear drainage sumps is to provide an avenue for stormwater to be pumped from outside the levees into the Trinity

River. Vegetation associated with these features is typically non-emergent, sparse, or in most cases, absent. Typically, the drainage sumps have standing water for most of the year, with the exception of periods of prolonged drought. During August 2005 field visits, the level of the river was down and most of the drainage sumps were completely dry with cracked earthen bottoms.

2.0 Identification of Functions

Aquatic features within the study area consist of open water habitats and wetlands that are primarily recharged from channel overbank flow and surface runoff. The Trinity River, a perennial tributary and navigable water of the United States, and several linear drainage sumps, which convey stormwater pumped from outside the levees into the Trinity River, are dominant features of the study area. Aquatic features such as these may serve a variety of chemical, physical, and biological functions, each of which are dependent on specific variables that are necessary for the function to occur. Variables common to different types of functions may include frequency and duration of overbank flow, depth of inundation, topographic variability, vegetative biomass, vegetative structural diversity, and water table fluctuation. This section discusses common functions typically associated with aquatic features similar to those on-site in an effort to provide a qualitative assessment of functions impacted by the project. This functional evaluation is modeled after the USACE document "*A Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands*" (Wetlands Research Program Technical Report WRP-DE-11).

<u>Dynamic Surface Water Storage</u>

Dynamic surface water storage of an aquatic feature refers to the capacity to detain moving water from overbank flow for a short duration during flood events. As overbank flow is detained in a wetland, the timing of the flood wave is reduced, thereby resulting in reduced and delayed downstream peak flows. The flood damage reduction potential is the perceived public interest or value. Frequency and duration of overbank flow is the most important variable of this function, as other functions, such as sediment retention, are dependent on it. Higher than average frequencies may overload the site with sediment and nutrients thereby impacting other functions such as maintenance of plant communities. Conversely, lower than average frequencies can affect vegetative communities as well as affect the avenue for organisms to access aquatic areas for feeding and recruitment. Other factors such as plant density and structure may be considered, as higher densities and various strata reduce velocities; however, overbank flow or surface water flow is an absolute requirement when considering this function. The bank-full discharge frequency for the Trinity River channel within the study area is between the 1 and 2 year flood interval.

Due to the design and purpose of the floodway, overbank flows may be common during a given year. These overbank flows provide aquatic features with the opportunity to provide dynamic surface water storage during these events. Emergent wetlands throughout the study area vary in their depth and vegetative diversity, but many have densely vegetated bottoms which act to slow both surface runoff and overbank flow velocities. There are some strictly open water features in the study area, but due to their lack of vegetative growth and their position in a maintained urban setting, they provide little towards reducing over bank flow velocities.

Long-Term Surface Water Storage

This function differs from dynamic surface water storage in that it is associated with standing water that is not moving over the surface. The source of water may be overbank flow, surface flow, or direct precipitation. Aquatic features that store water from overbank flows eventually recharge surficial ground water which would eventually become base channel flows and could lead to the moderation of seasonal flows. Long-term storage of water can be visually pleasing and would likely be the foremost recognized public value. Furthermore, long-term storage is critical in the maintenance of specific plant and animal communities, which can also be considered a public value.

Open water features in the study area provide the greatest opportunity for long-term surface water storage. Trammel Crow Lake is a maintained open water feature in a park setting and is recognized as an element of public value within the Floodway. Several unnamed open water features on the east bank of the Trinity River, between the confluence and Westmoreland Drive, had standing water during August 2005 field visits, leading to the assumption that these are perennial open water features.

Large emergent wetlands provide an opportunity for long-term water storage, but to a lesser degree than the open water features. Over the course of the study, emergent wetlands were observed both with and without standing water, however most did not have standing water during August 2005 field visits.

Nutrient Cycling

Nutrient cycling is a commonly referenced function that may be simply described as the process of converting nutrients and other elements from one form to another. Two major variables for this process are primary productivity, in which nutrients are taken up by plants, and detritus turnover, whereby nutrients are released for renewed uptake by plants, thus completing the cycle. The presence of living biomass, such as herbaceous plants, is a reliable indicator that nutrient uptake

processes are occurring. Likewise, the presence of down and dead woody debris, or other organic debris are reliable field indicators of detritus stock.

The annual maintenance mowing of the floodway provides the opportunity of detrital stock, though it inhibits the formation of dense, diverse vegetative communities such as scrub/shrub and forested wetlands. This is also supplemented by the introduction of woody debris that is deposited with overbank flows. Many of the emergent wetlands have diverse herbaceous layers which is evidence for nutrient uptake. The forested wetland, which is outside the maintenance area may function at a higher level as it has enough local woody debris to aid detritus turnover. Open water classifications generally have a low basal coverage of emergent vegetation, which is often limited to the shoreline transition to upland areas. This transition is usually steep and this zone is very narrow. These characteristics are also true for the channels associated with the drainage sumps, where vegetation is limited to shoreline vegetation, if vegetation is present at all.

Removal of Imported Elements and Compounds

This function pertains to the ability of an aquatic feature to intercept and remove non-point source pollution from the waterway. This implies the long-term accumulation of elements and compounds, in contrast to the nutrient cycling function that recycles through the system on a periodic basis. Important variables affecting the removal are the frequency of overbank flow and upland surface flow. If an aquatic feature is to remove imported elements, the elements must have an avenue to enter the system. In areas where overbank flows are infrequent, upland surface flows may provide an avenue when precipitation rates exceed soil infiltration rates. Sorption properties of the soil must also be considered as finer textured soils tend to have greater sorption capacities than coarse textures. Organic matter also has sorptive properties and may also provide a surface for microbial activity which plays an additional role in the removal of elements.

The Trinity River has a bank-full discharge frequency between 1 and 2 years, which provides a source for the introduction of non-point source pollution into the aquatic system of the Floodway. This function is also supplemented by elements introduced via the linear drainage sumps. Soils within the study area are typical of the Trinity Clay, frequently flooded soil classification, which is a fine textured soil with sorptive properties that promote the removal of imported elements and compounds. Emergent wetlands with a dense herbaceous layer have a high organic matter content which provides an additional opportunity for microbial activity to contribute to the removal of imported elements and compounds. The forested wetland may have a greater capacity for the removal of imported

elements because it has the soils and hydrology sufficient to recycle compounds, and because it is not subject to periodic maintenance activities which may interrupt these cycles.

Maintenance of Vegetative Communities

This function relates to the diversity and structure of the plant community as revealed by the dominant species of each vegetative stratum, as well as by the physical characteristics of the vegetation. This function is important since a diverse plant community is a variable in the evaluation of many of the aquatic functions already discussed. Diverse plant communities create roughness for the reduction of flood velocities, provide organic matter for soil development and nutrient cycling, and provide an array of wildlife habitats for resident and migratory wildlife.

Due to the annual maintenance mowing of the Floodway, the diversity and structure of the plant community is essentially static because there is little opportunity for scrub/shrub or forested wetland communities to develop. The Trinity River deposits seed from upstream sources, which helps aid diversification of herbaceous communities, but a thorough analysis of the study area revealed fairly homogenous vegetation throughout each community type. Features downstream of the DART/AT&SF railroad bridges, with the exception of those within TXU easements, have a greater capacity for this function because plant communities are allowed to develop both tree and understory strata to increase the diversity and quality of the vegetative communities.

Maintenance of Wildlife Habitat

The ability of aquatic areas to function as wildlife habitat is a very broad notion that must consider several variables. Generally, this function is associated with the suitability of vegetation structure, not composition, for sustaining animal populations. There are different quantitative analyses implemented by the resource agencies such as the Habitat Evaluation Procedure or Wildlife Habitat Appraisal Procedure, which focus on vegetative structure and spatial relationships to evaluate wildlife habitat. Species composition generally is a minor component of these evaluations. The spatial relationship is significant since connectivity to various aquatic habitats is important for species with multiple specific habitat life requirements. The difficulty with evaluating spatial relationships is that connectivity is a matter of scale depending on the type of wildlife species in question.

As previously mentioned, vegetative structural diversity within the study area is generally absent. With the exception of the narrow riparian corridor surrounding the Trinity River, the study area provides limited vegetative cover for wildlife. Generalist species which have the capacity to adapt to an urban setting, are the most commonly observed species. Wildlife observed the study area includes

shorebirds and migratory water fowl, and hawks are known to reside in the trees within the riparian corridor. Though not observed, there was evidence of beaver, otter, and rodent activity in some areas. These species are known to inhabit the larger emergent wetland communities, but the smaller, lower quality communities provide limited food, forage, or protection and wildlife use would be limited to only occasional use by migratory water fowl, reptile, and amphibian species.

HALFF

January 21, 2011
AVO 27786

Mr. Barry Osborn
U.S. Army Corps of Engineers
Regulatory Branch
P.O. Box 17300
Fort Worth, Texas 76102-0300

Re: Re-verification of Dallas Floodway Jurisdictional Determination (USACE# SWF-2000-00308)

Dear Mr. Osborn:

Halff Associates (Halff) is currently involved with several ongoing projects, namely the proposed North Texas Tollway Authority (NTTA) Trinity Parkway and the City of Dallas Balanced Vision Plan, which could potentially impact waters of the United States, including wetlands, within or associated with the Dallas Floodway (Floodway) near downtown Dallas, Texas. Halff completed a delineation of waters of the United States for the Floodway in May 2006 and the delineation was approved by the U.S. Army Corps of Engineers (USACE) in a letter dated June 19, 2006 (SWF-2000-00308). In response to concerns regarding changes in the regulatory setting since the Rapanos decision, Halff has been contracted by the City of Dallas to review the wetland delineation prior to its May 2011 expiration and verify that the jurisdictional status of mapped waters of the United States would be valid under current guidance, specifically the Regional Supplement to the USACE Wetland Delineation Manual: Great Plains Region.

The study area includes over 3,000 acres within and around the Floodway from the confluence of the Elm Fork and West Fork of the Trinity River, downstream to the Martin Luther King Boulevard bridge. The study area also includes historic channel segments of the Trinity River and non-jurisdictional man-made linear sumps, all of which are immediately outside of the Floodway along the exterior toe of the levees. **Sheet 1** shows a project vicinity map for a portion of the Floodway. The limits of the proposed jurisdictional determination are shown as the study area boundary on **Sheet 2**, and are shown in greater detail on **Sheet 3** through **Sheet 17**.

Based on recent verbal communication with USACE Regulatory Branch staff, Halff is aware of the following projects that have recently occurred or are scheduled to occur in the project study area:

Floodway Project	Project Status	Section 404 Permit Status
Margaret Hunt Hill Woodall Rodgers Bridge	Under Construction	Approved
Standing Wave	Under Construction	Approved
Sante Fe Trestle Trail	Under Construction	Approved
Pavaho Pump Station	Under Construction	Approved
Sylvan Bridge	Proposed Construction	Approved

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Hampton Bridge	Completed	Unknown
Westmoreland Bridge	Completed	Unknown
Oncor Electric Transmission Towers	Completed	Approved

Halff is aware that these projects may have individual smaller jurisdictional determinations associated with their respective project areas as required by the Section 404 permitting process. However, Halff's updated delineation of waters of the United States, including wetlands, is based upon physical characteristics observed and measured in the field during dates noted in this document, and may not reflect limits of waters of the United States, including wetlands, of permitted record as represented by these projects.

METHODOLOGY

Field investigations were conducted in November 2010 to determine the present day extent of the waters of the United States within the study area limits. Limits of waters of the United States were identified in the field by Halff personnel with training and experience in the identification and mapping of waters of the United States. Water feature limits were identified based on the presence of the ordinary high water mark (OHWM) of the surface tributary system, or the presence of wetland indicators where applicable. This updated delineation placed emphasis on verifying the current-day limits of wetlands within the study area and does not specifically address limits of tributaries or other aquatic features unless notable changes were observed during the field investigation.

Because the intent of this study was to verify an existing, approved delineation, transects were not established perpendicular to the Trinity River. Instead sample areas were selected following a review of the previously approved maps and a windshield survey of the study area. It should also be noted that the previously approved delineation was based upon analyis of two-foot topographic contours dated 2000, and this updated delineation compared the exisiting data to one-foot interval contours from 2010. Following the windshield survey, Halff recorded multiple wetland data points where field conditions appeared to differ from previously mapped features. Vegetation, hydrology, and soil characteristics were documented at each location on wetland determination data forms, provided in **Appendix B**. The collection of wetland data points was consistent with the USACE guidelines for wetland delineations per the "1987 Corps of Engineers Wetlands Delineation Manual," in addition to the "Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (October 2008)."

All aquatic features which can be classified as "waters of the United States" are subject to regulation, by the USACE, under Section 404 of the Clean Water Act. Additionally, all aquatic features which can be classified as "navigable waters of the United States" are subject to regulation, by the USACE, under Section 10 of the Rivers and Harbors Act of 1899 in addition to regulation under Section 404 of the Clean Water Act. Any aquatic features classified as "non-waters of the United States" are not regulated

by the USACE and are not subject to regulation under Section 404 of the Clean Water Act or regulation under Section 10 of the Rivers and Harbors Act of 1899.

RESULTS

Herbaceous wetlands previously mapped within the study area consisted of shallow depressions that seasonally flood and then dry out during the summer months, often becoming exposed mud flats or sparsely vegetated depressions. These areas contained a variety of plant species such as water primrose (*Ludwigia peploides*), smartweed (*Polygonum* spp.), balloonvine (*Cardiopsermum halicacabum*) umbrella sedge (*Cyperus* spp.), sedges (*Carex* spp.), spike-rush (*Eleocharis* spp.), and curly dock (*Rumex crispus*). Limits of wetlands within the study area were determined by observing abrupt changes in vegetation, such as the sudden emergence or absence or hydrophytic species, and the presence of hydrology indicators, such as watermarks, drift lines, or inundation. The primary hydrophytic vegetation indicator at sampling locations was a dominance test result of greater than 50% OBL, FACW, or FAC species.

Following a review of the previously approved delineation, Halff concluded that vegetation within mapped wetlands in the study area was consistent with the 2006 study. Woody vegetation was rarely observed in the study area wetlands as the City of Dallas mows the Floodway two to four times annually, thus preventing any woody vegetation from developing past the sapling stage. Recent mowing had occurred prior to the 2010 site visits, but some black willow (*Salix nigra*) saplings and cuttings were observed near wetland areas.

Primary hydrology indicators at sampling points included sediment deposits (B2), inundation visible on aerial imagery (B7), drift deposits (B3), and oxidized rhizospheres on living roots (C3). Secondary indicators included sparsely vegetated concave surfaces (B8), drainage patterns (B10), and crayfish burrows (C8).

Soils in the study area are mapped on the Dallas County Soil Survey as "Trinity Clay, frequently flooded", and "Trinity-Urban land complex" classifications. The "Trinity Clay, frequently flooded" is listed on the National Resource Conservation Service (NRCS) state hydric soils list. It should be noted that the urban land component of the "Trinity-Urban land complex" is absent within the study area and that soils are more consistent with the "Trinity Clay, frequently flooded" classification. Hydric soil indicators were primarily represented by depleted matrix (F3) and redox depressions (F8) as the soils observed typically had a matrix of 3 or less and a chroma of 2 or less with redox concentrations observed at some locations. Though Halff did not conduct tests with alpha, alpha-dipyridyl, soils at sampling locations that lacked redox concentrations would likely meet the reduced vertic (F18) indicator for problematic soils.

In general, limits of mapped wetlands were consistent with those observed during the 2006 study; however some locations exhibited notable differences in previously mapped limits. One location along

the east overbank area just downstream of IH-35E exhibited hydric indicators extending almost 200 feet downstream of its previously mapped limits. Topography in this area was generally level and it was concluded that vegetation indicators may have been easier to observe following an above average rainfall year, rather than the dry summer months of the 2005 field work for the previously approved delineation. Two other areas of the western overbank along the Houston Street viaduct and the IH-30 bridges were also added to the updated delineation as these areas were observed in the field, but not on the existing maps, or differed greatly from previously mapped limits.

Additionally, construction staging for the Margaret Hunt Hill Bridge has resulted in the discharge of fill material into an herbaceous wetland along the western overbank area. Appendix A contains maps of the updated delineation, with changes noted in wetland limits where applicable. Each aquatic feature was assigned an individual identification number on the maps for reference purposes, the identification numbers correspond to the numbers for each feature shown in **Table 1**.

TABLE 1
WATERS OF THE UNITED STATES

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
1	Emergent Wetland	2.09	---
2	Emergent Wetland	0.52	---
3	Open Water - Perennial	17.94	---
4	Emergent Wetland	11.83	---
5	Emergent Wetland	0.20	---
6	Emergent Wetland	7.03	---
9	Emergent Wetland	4.17	---
10	Emergent Wetland	0.20	---
11	Emergent Wetland	0.55	---
12	Emergent Wetland	0.76	---
13	Emergent Wetland	0.50	---
14	Emergent Wetland	1.00	---
15	Emergent Wetland	1.07	---
16	Emergent Wetland	0.60	---
17	Emergent Wetland	0.04	---
18	Emergent Wetland	1.45	---
19	Emergent Wetland	1.66	---
20	Emergent Wetland	3.73	---
21	Emergent Wetland	0.08	---
22	Emergent Wetland	1.42	---
24	Trinity River (Perennial Stream)	143.77	42,400

HALFF

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
25	Emergent Wetland	2.74	---
26	Emergent Wetland	1.29	---
27	Emergent Wetland	3.98	---
28	Open Water - Intermittent	0.64	1,300
29	Emergent Wetland	7.98	---
30	Open Water - Intermittent	2.18	1,850
31	Emergent Wetland	11.64	---
32	Emergent Wetland	6.49	---
33	Emergent Wetland	5.19	---
34	Open Water - Intermittent	3.87	1,200
35	Open Water - Intermittent	2.58	1,240
36	Emergent Wetland	20.76	---
37	Trammel Crow Lake (Open Water – Perennial)	6.72	---
42	Emergent Wetland	0.53	---
43	Open Water - Intermittent	1.58	1,035
44**	Emergent Wetland	23.82	---
46	Emergent Wetland	3.28	---
47	Open Water - Intermittent	1.99	935
48	Emergent Wetland	2.61	---
49	Open Water - Intermittent	0.87	650
50	Emergent Wetland	0.15	---
51	Open Water - Intermittent	1.75	950
52	Emergent Wetland	2.42	---
53	Emergent Wetland	4.24	---
54	Emergent Wetland	7.95	---
55	Historic Trinity River Channel	5.44	3,500
56	Emergent Wetland	0.95	---
57	Open Water - Intermittent	1.65	900
58	Open Water - Intermittent	1.62	975
59	Emergent Wetland	2.03	---
60	Emergent Wetland	1.70	---
61	Open Water - Intermittent	1.32	725
62	Open Water - Intermittent	2.32	750
63	Open Water - Intermittent	1.39	695
65	Emergent Wetland	6.80	---
66*	Emergent Wetland	8.20	---
67	Emergent Wetland	6.30	---

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
68	Emergent Wetland	8.88	---
69	Emergent Wetland	57.13	---
70	Historic Trinity River Channel	25.63	6,300
71	Emergent Wetland	0.86	---
74	Emergent Wetland	6.23	---
75	Emergent Wetland	2.21	---
76	Forested Wetland	2.77	---
77	Cedar Creek (Perennial Stream)	4.82	4,050
78	Intermittent Stream	0.21	400
79	Historic Trinity River Channel	1.72	2,400
80	Historic Trinity River Channel	10.57	8,400
81	Historic Trinity River Channel	2.80	3,375
82	Historic Trinity River Channel	8.25	9,650
83	Historic Trinity River Channel	3.08	3,100
84	Emergent Wetland	0.97	---
85*	Emergent Wetland	1.82	---
86*	Emergent Wetland	0.48	---
87*	Emergent Wetland	0.14	---
88*	Emergent Wetland	0.07	---
89*	Emergent Wetland	0.07	---
TOTAL:		**509.89**	**97,460**

***added in 2010 reverification**
**** 1.21 acres impacted by construction since 2006 delineation and removed from totals**

JURISDICTIONAL DETERMINATION

Federal regulations (33 CFR Section 328.3(a)) note that waters of the United States may include intrastate rivers and streams, including impoundments and other waters. In response to a recent Supreme Court decision (Rapanos v. U.S., 547 *S. Ct.* 715 [2006]) addressing the limits of federal jurisdiction, the USACE and Environmental Protection Agency (EPA) have issued further guidance, and require additional documentation to support jurisdiction. The USACE continues to assert jurisdiction over traditionally navigable waters and non-navigable tributaries of traditionally navigable waters where the tributaries are relatively permanent waters (i.e., tributaries that typically flow year round or have continuous flow at least seasonally). The USACE Fort Worth District has classified the Trinity River as a navigable waterway upstream to Riverside Drive in Fort Worth, thus the segment of the Trinity River within the study area would be considered a traditionally navigable water for purposes of this jurisdictional determination.

Further evaluation is needed to determine the jurisdictional status for the remainder of the aquatic features in the study area. The current USACE guidelines require a jurisdictional evaluation to determine if the features have a significant nexus to traditionally navigable waters for: (1) waterbodies and tributaries that are not are relatively permanent waters, including adjacent wetlands if present; and, (2) wetlands adjacent to, but not directly abutting, a relatively permanent tributary. A significant nexus exists if a waterbody has more than a speculative or insubstantial effect on the chemical, physical, and/or biological integrity of a traditionally navigable water. Establishment of a significant nexus is necessary to establish jurisdiction as a water of the United States.

An argument for significant nexus can be made for all mapped wetlands in that their primary function is to capture and filter overflow during flood events. Secondary to this, they serve as a buffer to local surface runoff from adjacent uplands within the Floodway. Through these primary and secondary functions, the mapped wetlands demonstrate more than a speculative or insubstantial effect on the chemical, physical, and/or biological integrity of a traditionally navigable water. In sum, the mapped wetlands should be considered waters of the United States under the current guidance. Similarly, perennial and intermittent tributaries of the Trinity River, and intermittent open water features within the study area perform the same primary and secondary functions and thus also should be considered waters of the United States.

As noted in the 2006 study, additional aquatic features associated with the Floodway include the historic channels of the Elm Fork Trinity River and West Fork Trinity River and man-made drainage sumps associated with the historic river channels. The historic channels represent the locations of the Elm Fork Trinity River and West Fork Trinity River prior to their redirection into the current alignment in the 1920's. Pursuant to the Rivers and Harbors Act of 1899, a determination of navigability was made for the Trinity River for the reach previously described. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events, which may impede or destroy navigable capacity. Thus the historic channels of the Trinity River and the West Fork Trinity River are still considered navigable waters of the United States and would be regulated as such.

Several man-made linear drainage sumps lie along the outside base of the levees, these features are man-made drainage ditches, constructed in an upland area, and are located outside the 100-year floodplain of the Trinity River. In the past, the USACE Fort Worth District has not extended jurisdiction to man-made drainage ditches constructed in uplands, and is in accordance with this practice that the determination of no jurisdiction was extended to these features. These features were classified as non-waters of the United States in the 2006 jurisdictional determination. As stated above regarding the post-Rapanos guidance, a significant nexus determination is required if a waterbody has more than a speculative or insubstantial effect on the chemical, physical, and/or biological integrity of a traditionally navigable water. The man-made linear sumps collect runoff from urbanized Dallas and Oak Cliff, this runoff is then pumped inside the levees during storm events for eventual discharge into the Trinity River via drainage sumps (classified as "intermittent open water" features).

In the 2006 jurisdicational determination, distance from a traditionally navigable water and presence outside a floodplain was used as the primary means for making the determination, but these are not considered an acceptable means of making a significant nexus determination. However, because the levees serve as a physical barrier between the man-made linear sumps and the Trinity River, and flow from the sumps into the levee system is controlled manually by pumps, the sumps lack the ability to demonstrate a significant nexus to the Trinity River. Based on these conclusions, Halff has determined that the man-made linear drainage sumps are not waters of the United States and thus are not subject to Section 404 regulation. Aquatic features that are not waters of the United States are summarized in **Table 2**.

TABLE 2
AQUATIC FEATURES THAT ARE NOT WATERS OF THE UNITED STATES

ID. NO.	FEATURE TYPE	AREA (ACRES)	LENGTH (LINEAR FEET)
7	Man-Made Linear Sump	15.91	---
8	Man-Made Linear Sump	6.33	---
23	Man-Made Linear Sump	18.82	---
38	Man-Made Linear Sump	28.29	---
39	Man-Made Linear Sump	7.46	---
40	Man-Made Linear Sump	12.80	---
41	Man-Made Linear Sump	4.49	---
45	Man-Made Linear Sump	10.5	---
64	Man-Made Linear Sump	1.30	---
72	Man-Made Linear Sump	8.17	---
73	Man-Made Linear Sump	1.75	---
TOTAL:		**115.82**	---

Halff requests that the USACE review and verify this wetland delineation/jurisdictional determination of waters of the United States and navigable waters of the United States. We would be pleased to meet with you in your office or in the field to discuss the findings of this document if necessary. If you have any questions or require any information, please contact me at (817) 847-1422.

Sincerely,

HALFF ASSOCIATES

Danny Griffith
Environmental Scientist

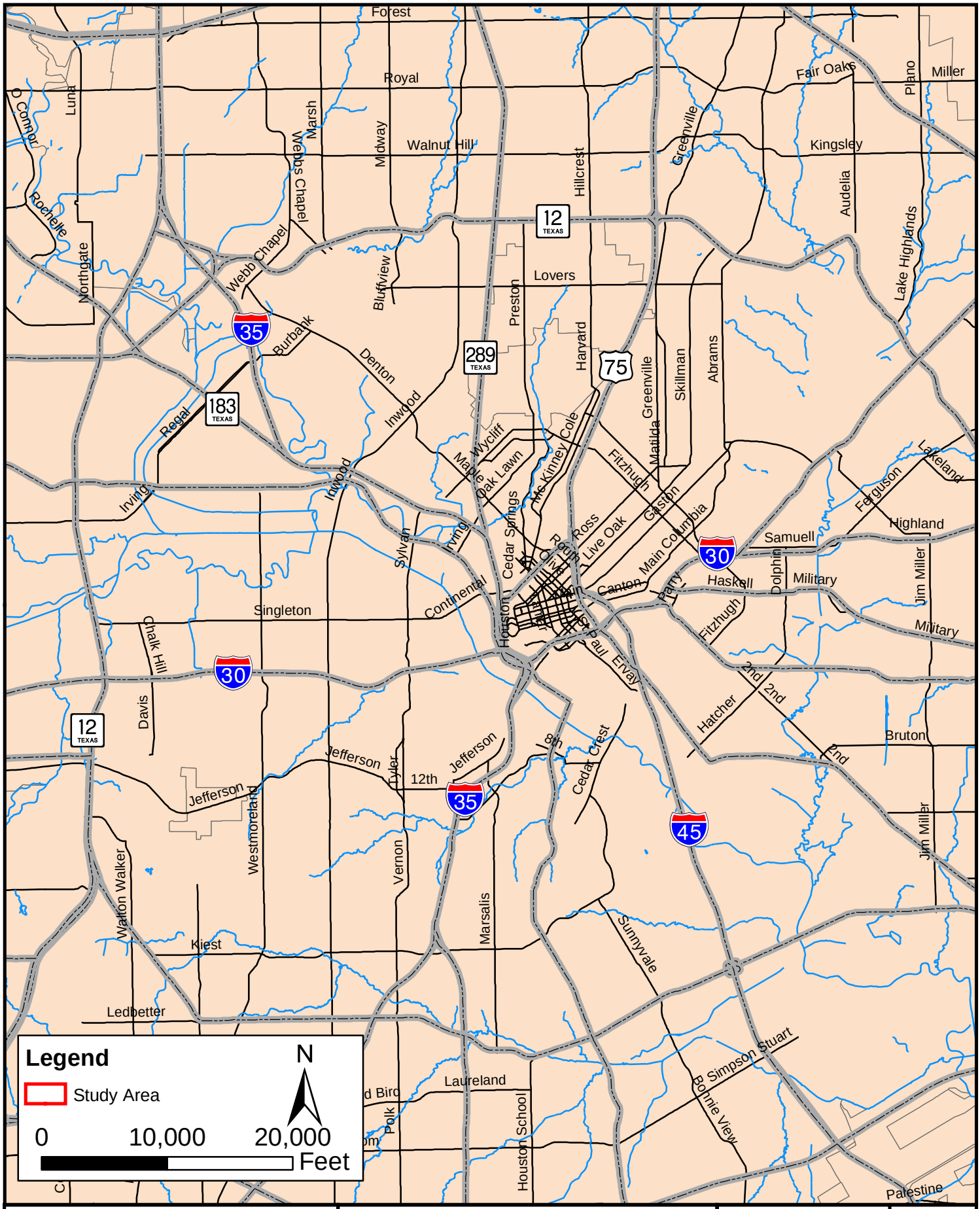
Enclosures

C:

Mr. Greg Ajemian, P.E. – City of Dallas
Mr. Dan Chapman, P.E. – North Texas Tollway Authority, PMO

APPENDIX A

JURISDICTIONAL DETERMINATION MAPS

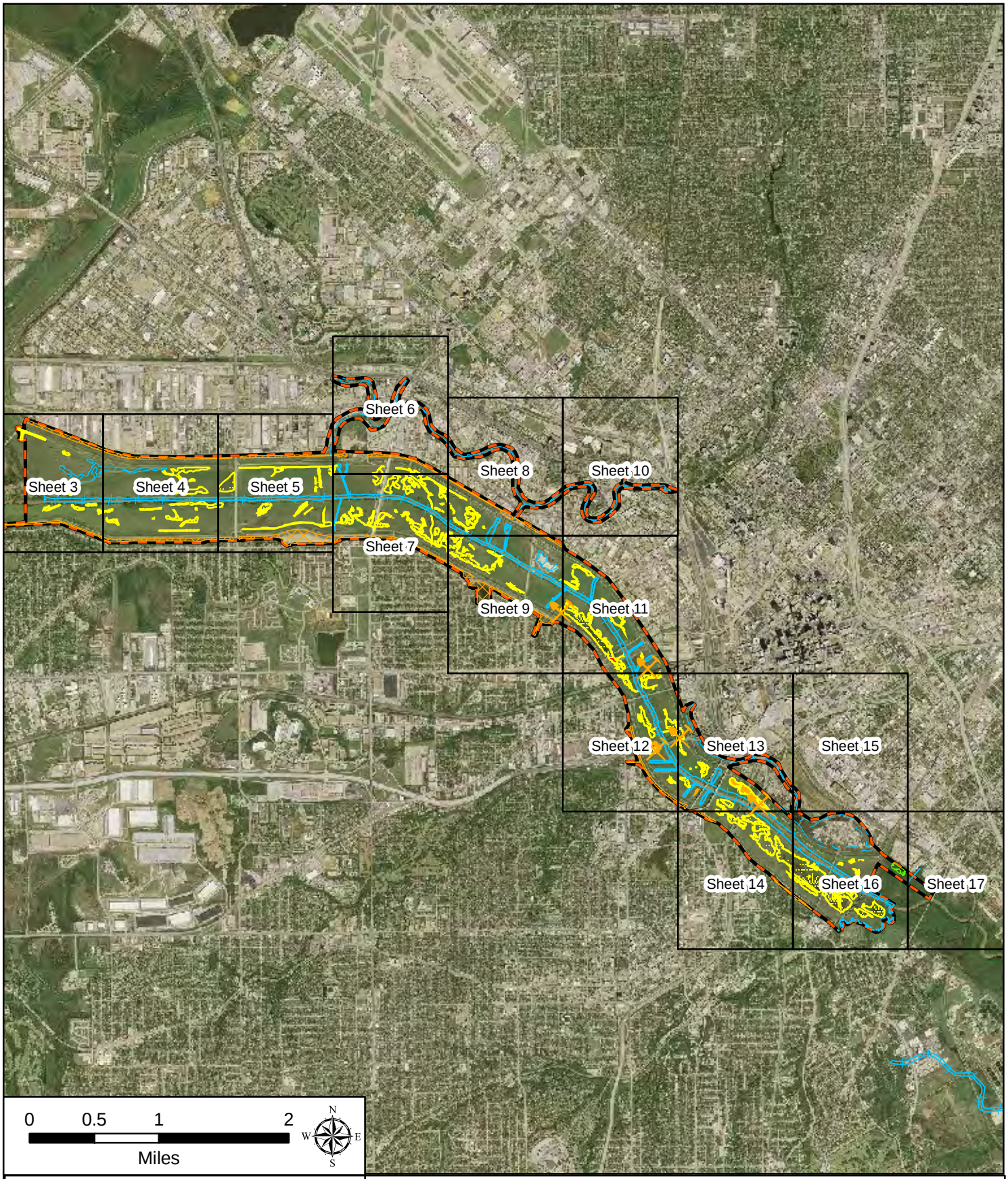


HALFF

Project Location Map
Dallas Floodway
Reverification of Jurisdictional Determination
Dallas County, Texas
USACE Project No. 200000308

Source:
NCTCOG

Sheet
1 of 17



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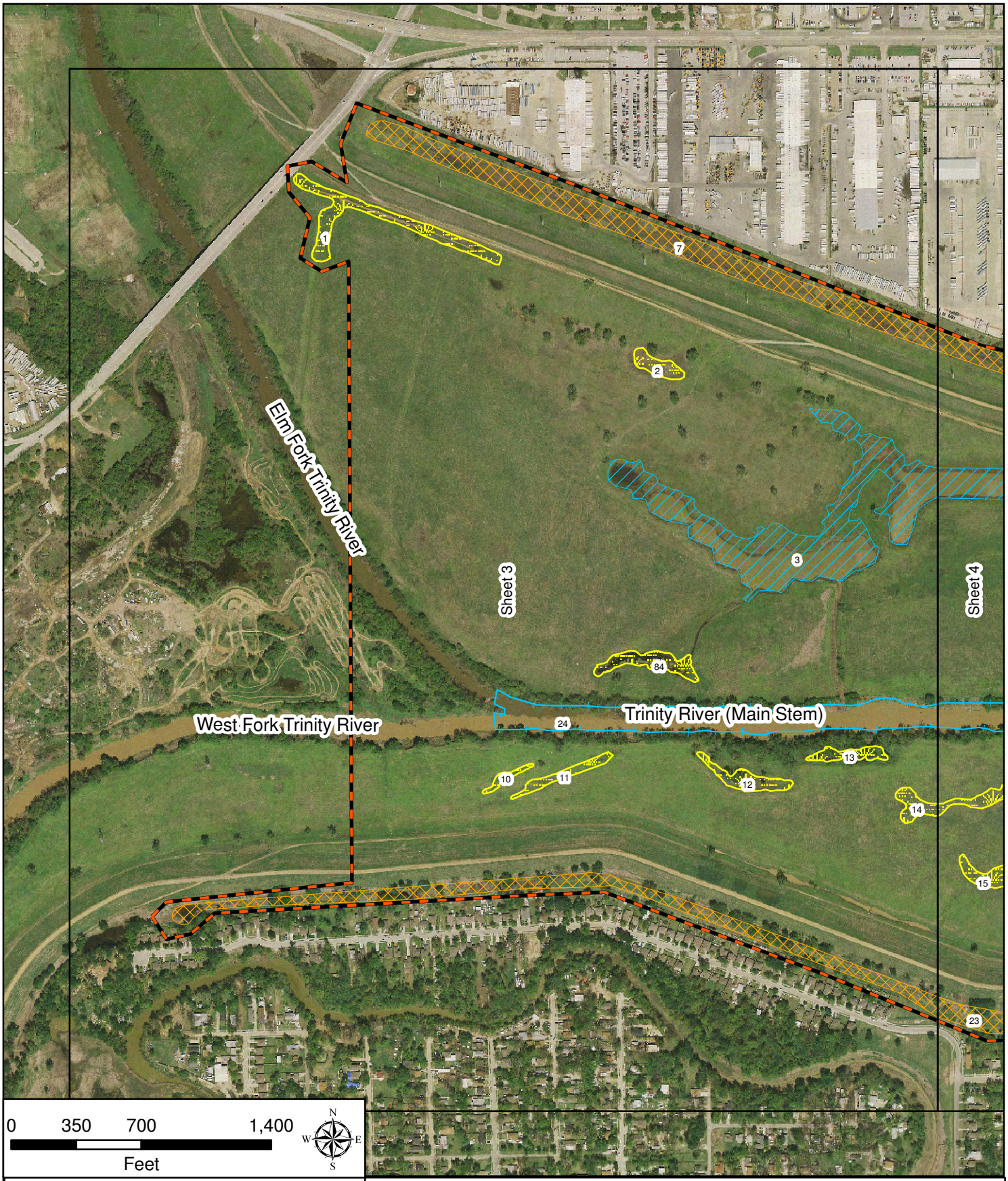

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Aerial Photography - 2009

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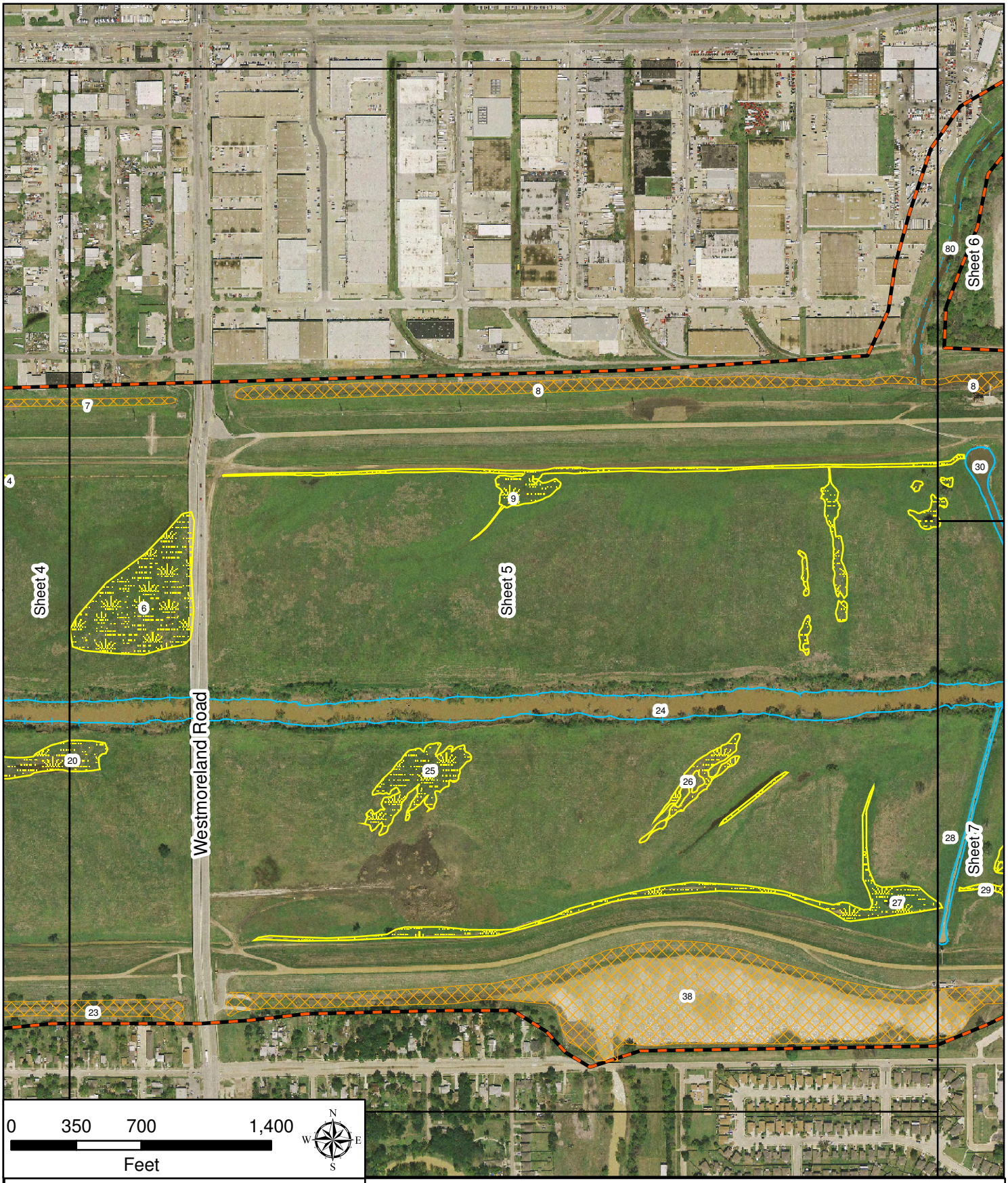

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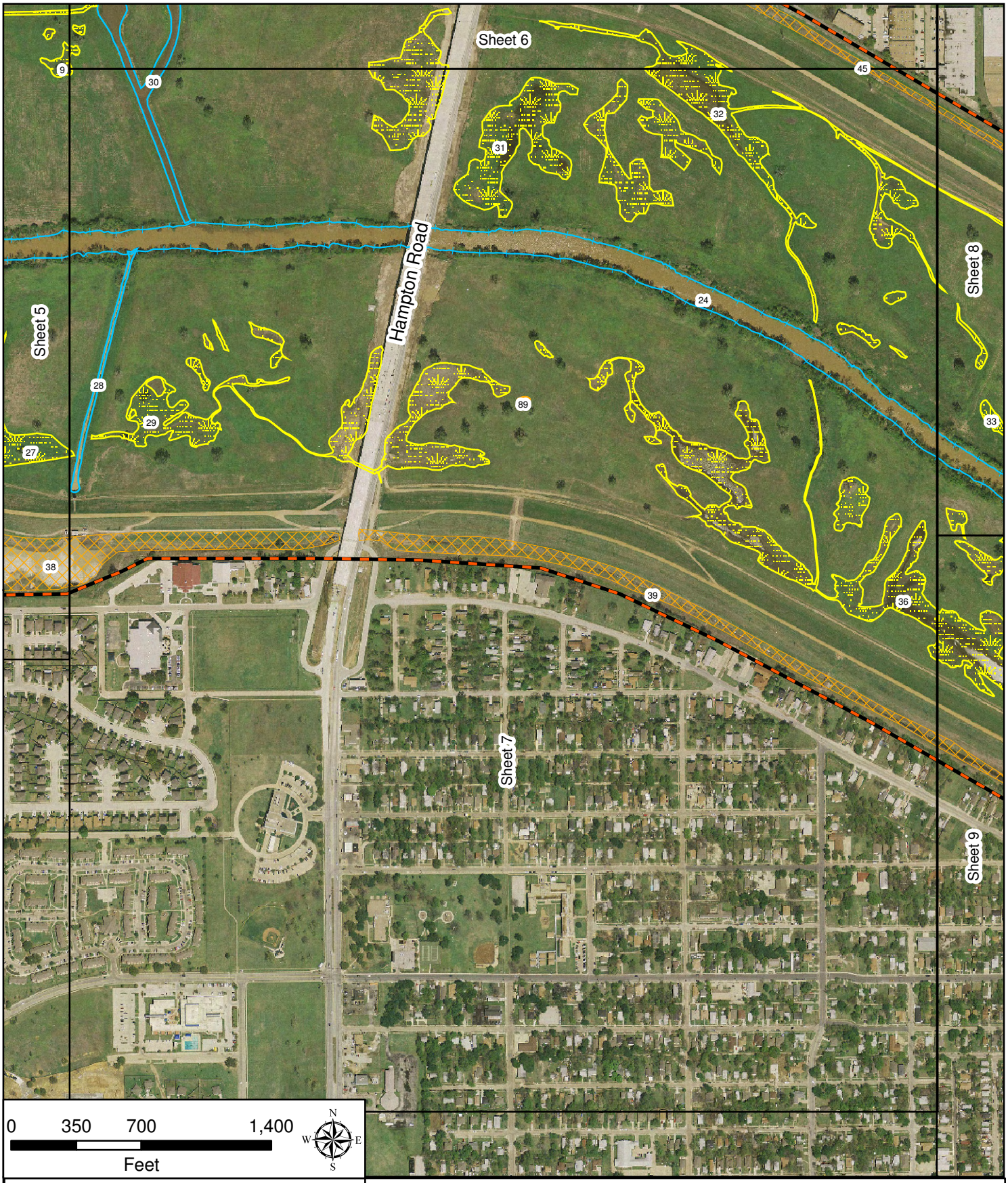

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0 350 700 1,400
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Aerial Photography - 2009

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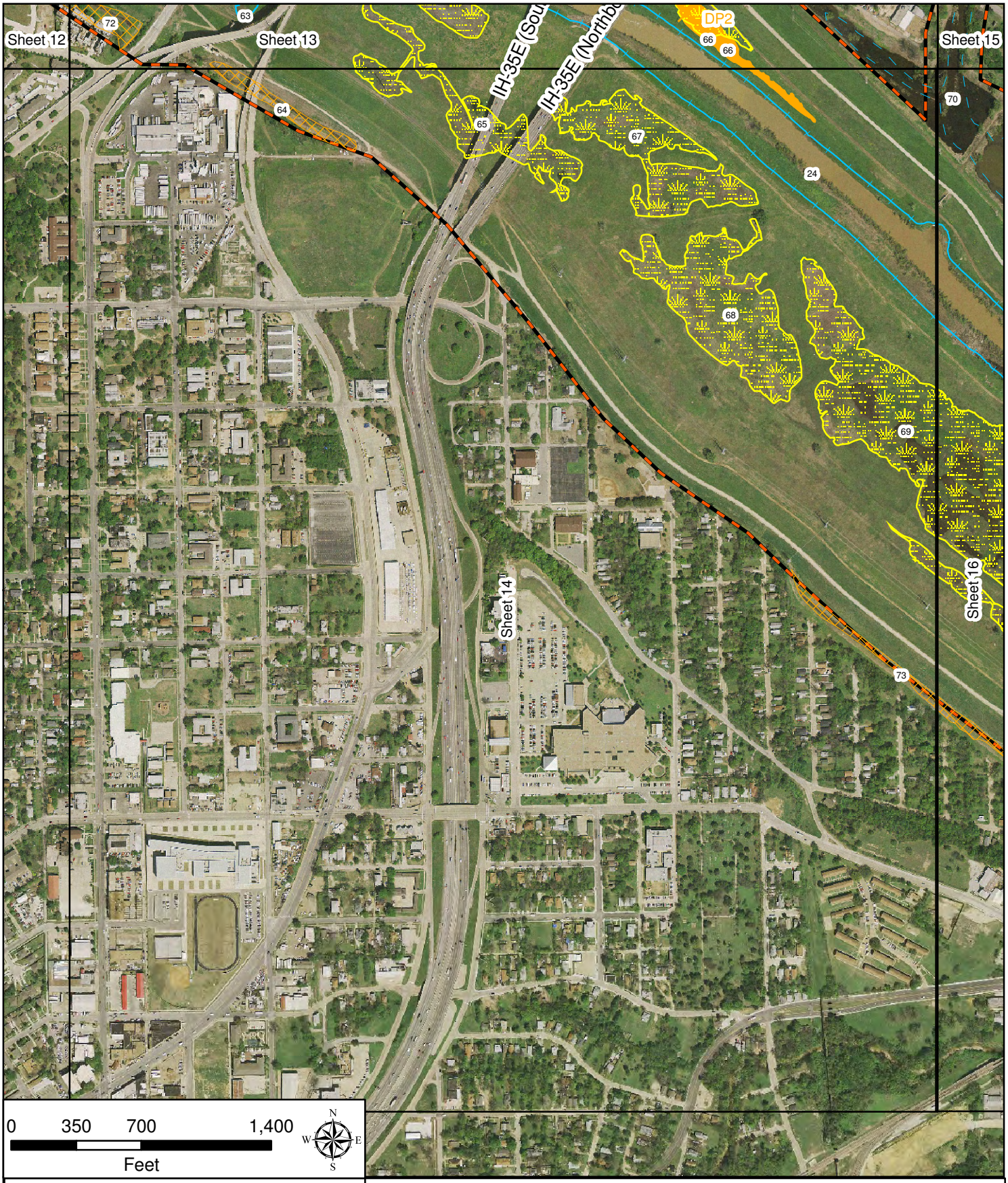

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Feet

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APPENDIX B

WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Dallas Floodway City/County: Dallas, Dallas County Sampling Date: 11/22/2010

Applicant/Owner: City of Dallas State: TX Sampling Point: 1

Investigator(s): Griffith Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): J: Southwestern Prairies Lat: 6967484.81°N Long: 2486241.16°W Datum: State Plane 1983

Soil Map Unit Name: Trinity-Urban land complex NWI classification: POWF

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil X, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?**	Yes X	No _____
Hydric Soil Present?	Yes X	No _____			
Wetland Hydrology Present?	Yes X	No _____			

Remarks: Soils in this area represent a reduced Vertic soil that often receive new deposits that inhibit the develpoment of redoxomorphic features

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: 10'x10')			
1. *Salix nigra*	30	Yes	FACW
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Carex crus-corvii*	80	Yes	OBL
2. *Rumex crispus*	20	Yes	FACW
3. *Polygonum hyrdopiperoides*	20	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	120	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC –): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Lot[2]	Texture	Remarks
0-16	10YR 3/2	100					silty clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR F**)
__ 1 cm Muck (A9) (**LRR F, G, H**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (s1)
__ 2.5 cm Mucky Peat or Peat (S2) (**LRR G,H**)
__ 5 cm Mucky Peat or Peat (S3) (**LRR F**)

__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

__ 1 cm Muck (A9) (**LRR I, J**)
__ Coast Prairie Redox (A16) (**LRR F, G, H**)
__ Dark Surface (S7) (**LRR G**)
__ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)
[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
X Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)

__ Salt Crust (B11)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Dry-Season Water Table (C2)
__ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
__ Presence of Reduced Iron (C4)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
__ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
__ FAC-Neutral Test (D5)
__ Frost-Heave hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? Yes ____ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in sections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Dallas Floodway City/County: Dallas, Dallas County Sampling Date: 11/23/2010

Applicant/Owner: City of Dallas State: TX Sampling Point: 2

Investigator(s): Griffith Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): concave (slightly) Slope (%): 0

Subregion (LRR): J: Southwestern Prairies Lat: 6964732.45°N Long: 2489470.45°W Datum: State Plane 1983

Soil Map Unit Name: Trinity-Urban land complex NWI classification: PEMIC

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil X, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X	No ____
Hydric Soil Present?	Yes X	No ____			
Wetland Hydrology Present?	Yes X	No ____			

Remarks: Soils in this area represent a reduced Vertic soil that often receive new deposits that inhibit the develpoment of redoxomorphic features

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Carex crus corvii*	40	Yes	OBL
2. *Polygonum hydropiperoides*	90	Yes	FACW
3. *Rumex crispus*	40	Yes	FACW
4. *Ludwigia peploides*	20	Yes	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	190	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC –): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Lot[2]	Texture	Remarks
0-16	10YR 3/2	95	5YR4/6	5	C	M,PL	clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR F**)
__ 1 cm Muck (A9) (**LRR F, G, H**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (s1)
__ 2.5 cm Mucky Peat or Peat (S2) (**LRR G,H**)
__ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
X Redox Depressions (F8)
__ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR I, J**)
__ Coast Prairie Redox (A16) (**LRR F, G, H**)
__ Dark Surface (S7) (**LRR G**)
__ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1)
X Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
X Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Dry-Season Water Table (C2)
X Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
__ Presence of Reduced Iron (C4)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
__ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
__ FAC-Neutral Test (D5)
__ Frost-Heave hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? Yes ____ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in sections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Dallas Floodway City/County: Dallas, Dallas County Sampling Date: 11/23/2010

Applicant/Owner: City of Dallas State: TX Sampling Point: 3

Investigator(s): Griffith Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): J: Southwestern Prairies Lat: 6970285.71°N Long: 2484963.33°W Datum: State Plane 1983

Soil Map Unit Name: Trinity-Urban land complex NWI classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil X, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X	No ____
Hydric Soil Present?	Yes X	No ____			
Wetland Hydrology Present?	Yes X	No ____			

Remarks: Soils in this area represent a reduced Vertic soil that often receive new deposits that inhibit the develpoment of redoxomorphic features

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Carex crus-corvii*	30	Yes	OBL
2. *Rumex crispus*	20	Yes	FACW
3. *Sorghum halepense*	10	No	UPL
4. *Cherokee sedge*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC –): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Lot[2]	Texture	Remarks
0-16	10YR 3/1	100					sandy clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR F**)
__ 1 cm Muck (A9) (**LRR F, G, H**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (s1)
__ 2.5 cm Mucky Peat or Peat (S2) (**LRR G,H**)
__ 5 cm Mucky Peat or Peat (S3) (**LRR F**)

__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR I, J**)
__ Coast Prairie Redox (A16) (**LRR F, G, H**)
__ Dark Surface (S7) (**LRR G**)
__ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)

__ Salt Crust (B11)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Dry-Season Water Table (C2)
__ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
__ Presence of Reduced Iron (C4)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
__ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
X Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
__ FAC-Neutral Test (D5)
__ Frost-Heave hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? Yes ____ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in sections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Dallas Floodway City/County: Dallas, Dallas County Sampling Date: 11/23/2010

Applicant/Owner: City of Dallas State: TX Sampling Point: 4

Investigator(s): Griffith Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): J: Southwestern Prairies Lat: 6972584.06°N Long: 2481435.54°W Datum: State Plane 1983

Soil Map Unit Name: Trinity-Urban land complex NWI classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil X, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X	No ____
Hydric Soil Present?	Yes X	No ____			
Wetland Hydrology Present?	Yes X	No ____			

Remarks: Soils in this area represent a reduced Vertic soil that often receive new deposits that inhibit the develpoment of redoxomorphic features

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Carex crus-corvii*	90	Yes	OBL
2. *Eleoharis obtusa*	60	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	150	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC –): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Lot[2]	Texture	Remarks
0-16	10YR 3/1	100					clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR F**)
__ 1 cm Muck (A9) (**LRR F, G, H**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (s1)
__ 2.5 cm Mucky Peat or Peat (S2) (**LRR G,H**)
__ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR I, J**)
__ Coast Prairie Redox (A16) (**LRR F, G, H**)
__ Dark Surface (S7) (**LRR G**)
__ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
X Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
X Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Dry-Season Water Table (C2)
__ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
__ Presence of Reduced Iron (C4)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
__ Drainage Patterns (B10)
__ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
X Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Geomorphic Position (D2)
__ FAC-Neutral Test (D5)
__ Frost-Heave hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0-16

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in sections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Dallas Floodway City/County: Dallas, Dallas County Sampling Date: 11/23/2010

Applicant/Owner: City of Dallas State: TX Sampling Point: 5

Investigator(s): Griffith Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): J: Southwestern Prairies Lat: 6966972.31°N Long: 2485299.587°W Datum: State Plane 1983

Soil Map Unit Name: Trinity-Urban land complex NWI classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil X, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?**	Yes X	No ____
Hydric Soil Present?	Yes X	No ____			
Wetland Hydrology Present?	Yes X	No ____			

Remarks: Soils in this area represent a reduced Vertic soil that often receive new deposits that inhibit the develpoment of redoxomorphic features

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Carex crus-corvii*	90	Yes	OBL
2. *Eleocharis obtusa*	80	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	170	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC –): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide Supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Lot[2]	Texture	Remarks
0-6	10YR 3/1	100					clay	
6-16	10YR 4/3	95	5YR 4/6	5	C	M	clay	

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR F**)
__ 1 cm Muck (A9) (**LRR F, G, H**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (s1)
__ 2.5 cm Mucky Peat or Peat (S2) (**LRR G,H**)
__ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
X Redox Depressions (F8)
__ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR I, J**)
__ Coast Prairie Redox (A16) (**LRR F, G, H**)
__ Dark Surface (S7) (**LRR G**)
__ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1)
X Sediment Deposits (B2)
X Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Dry-Season Water Table (C2)
__ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
__ Presence of Reduced Iron (C4)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
__ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
X Crayfish Burrows (C8)
X Saturation Visible on Aerial Imagery (C9)
__ Geomorphic Position (D2)
__ FAC-Neutral Test (D5)
__ Frost-Heave hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? Yes ____ No X Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in sections), if available:

Remarks:

Appendix E

Threatened and Endangered Species Report

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS • DESIGNERS • SCIENTISTS

JAMES L. ALTSTAETTER, P.E.
STEPHEN J. COONAN, P.E.
PEGGY W. GLASS, Ph.D.
DAVID A. GUDAL, P.E.
BETTY L. JORDAN, P.E.
ALAN H. PLUMMER, JR., P.E., DEE
RICHARD H. SMITH, P.E.
ALAN R. TUCKER, P.E.

0356-016-02

November 7, 2007

Mr. Tom Cloud
U.S. Fish and Wildlife Service
Arlington, Texas Ecological Service Field Office
711 Stadium Drive, Suite 252
Arlington, Texas 76011

RE: Dallas Pavaho Wetland Proposed Project Site – On Site Evaluation for the Potential Occurrence of Federal and State Listed Threatened/Endangered Species and Their Critical Habitat

Dear Mr. Cloud:

The City of Dallas is required under a Consent Decree with the U.S. Environmental Protection Agency to construct the Pavaho Storm Water Wetland along the west bank of the Trinity River within the Dallas Floodway. The site is to be located downstream of Sylvan Avenue and the wetland is to be at least 60 acres in size. Alan Plummer Associates, Inc. (APAI) is the consultant selected to prepare the engineering design for the storm water wetland. Numerous environmental studies have been conducted recently along the Trinity River in connection with another series of proposed projects that make up the Trinity River Corridor Project. Where possible, information developed from the environmental studies for the large project area was used for this project. However, due to the time constraints for the Pavaho Storm Water Wetland project, a project-specific evaluation for potential impacts to threatened or endangered species was conducted for the proposed project area. This letter provides a report of the project site evaluation.

EVALUATION OF POTENTIAL IMPACTS

The proposed project would consist of the construction of an approximately 60-acre stormwater treatment wetland in the Dallas Floodway of the Trinity River (Floodway). The general location of the project is north of the intersection of Sylvan Avenue and Canada Drive adjacent to the City of Dallas' Pavaho Sump on the west side of the Trinity River. The proposed project area consists of relatively level ground, some within the sump area west of the levee and the remaining within the confined floodplain of the Trinity River. Small depressions dominated by emergent wetland vegetation in the proposed project area are periodically inundated by rainfall or when the Trinity River overtops its banks. A preliminary jurisdictional determination prepared by Halff and Associates, dated May 12, 2006,

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details the locations and dominant species within these depressions. The remainder of the project area consists of facultative to upland species. The project area is routinely mowed to control growth of woody vegetation and minimize detention of storm flood flows within the Floodway.

On-site investigation of the proposed Pavaho Storm Water Wetland project area for potential habitat for the species of concern as well as their preferred and designated critical habitat as listed by the USFWS and the TPWD for Dallas County was conducted on September 14, 2007 by biologists from Alan Plummer Associates, Inc. Current federal and state lists for Dallas County were accessed from the U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD) websites, respectively, just prior to the on-site investigation. These lists were used as a basis for the survey. Description of preferred and designated critical habitat for the listed species was also accessed from the websites. The information accessed from the websites and used as a basis for the survey is included in Appendix A.

As observed during the on-site investigation, the dominant vegetation in the area consists primarily of herbaceous species ranging from obligate to upland species. Areas of balloonvine (*Cardiopsermum halicacabum*), switchgrass (*Panicum virgatum*), johnsongrass (*Sorghum halepense),* and bermudagrass (*Cynodon dactylon*) were observed. In areas that are routinely inundated, obligate to facultative species such as pink smartweed (*Polygonum pensylvanicum*), pale dock (*Rumex altissiumus*), spikerush (*Eleocharis* spp.), sedges (*Carex* spp.) and flatsedges (*Cyperus* spp.). were observed. Small tree and shrub species were limited to black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), red mulberry (*Morus rubra*), green ash (*Fraxinus pennysylvanica*) and American elm (*Ulmus americana*).

Other notable features in the proposed project area include the storm water discharge channel to convey stormwater to the Trinity River from the Pavaho Sump located on the west side of the Floodway levee. This channel is earthen and contains sparsely vegetated banks. The project area is also bisected by Sylvan Avenue and its associated bridge in a northern direction.

The U.S. Fish and Wildlife Service (USFWS) list five endangered or threatened species as occurring or potentially occurring within Dallas County. These are the Bald Eagle (threatened/delisted), the Interior Least Tern (endangered), the Black Capped Vireo (endangered), the Golden-cheeked Warbler (threatened, endangered), and the Piping Plover (endangered).

The Texas Parks and Wildlife Department (TPWD) lists an additional nine endangered or threatened species as occurring or potentially occurring in Dallas County. These species are the American Peregrine Falcon (endangered), the Arctic Peregrine Falcon (threatened), the Peregrine Falcon (threatened), the White-faced

Ibis (threatened), the Whooping Crane (endangered), the Wood Stork (threatened), the Alligator Snapping Turtle (threatened), the Texas Horned Lizard (threatened), and the Timber/Canebrake Rattlesnake (threatened).

The TPWD also lists sixteen rare species as occurring or potentially occurring in Dallas County. These species are Henslow's Sparrow, the Western Burrowing Owl, the Black Lordithon Rove Beetle, the Cave Myotis Bat, Plains Spotted Skunk, Fawnsfoot, Little Spectaclecase, Louisiana Pigtoe, Pistolgrip, Rock-pocketbook, Sandbank Pocketbook, Texas Heelsplitter, the Wabash Pigtoe, the Texas Garter Snake, the Glen Rose Yucca, and Warnock's Coral-root.

A table summarizing the federal and state listed endangered, threatened, or rare species in Dallas County, with a brief description of preferred habitat for each species is also included in Attachment A.

During the on-site investigation, the project area was visually assessed for the occurrence of the listed species as well as their suitable habitats. Designated critical habitat is not present for any of the federal or state listed endangered or threatened species within the project area. Additionally, none of the federal or state listed species were observed during the on-site investigations.

Several federal and state listed species such as the bald eagle (*Haliaeetus leucocephalus*) are known to migrate through the area. The bald eagle nests in tall trees near open water and large lakes. While such habitat exists in Dallas County, none of those habitat features occur in the proposed project area.

While some habitat features preferred by the Whooping Crane (*Grus Americana*) such as emergent marshes and open areas, are in the proposed project area, more suitable and desirable habitat can be found elsewhere in less populated areas. The same is true for the White-faced Ibis (*Plegadis chihi*), and the Wood Stork (*Mycteria Americana*).

Habitat features preferred by the Black Capped Vireo (*Vireo atricapilla)* and Interior Least Tern (*Sterna antillarum athalassos*) were not observed in the project area. The Black Capped Vireo prefers mixed deciduous/evergreen shrubland. Breeding vireos use shrubby growth of irregular height and distribution with spaces between the small thickets and clumps with vegetative cover extending to ground level. Interior Least Terns occur primarily on barren to sparsely vegetated riverine sandbars, dike field sandbar islands, sand and gravel pits, and lake and reservoir shorelines. Since these habitat requirements do not exist on the subject property, the likelihood of these species occurring within the proposed project area is unlikely.

American and Arctic Peregrine Falcons (*Falco peregrinus anatum* and *Falco peregrinus tundrius*), and the Piping Plover (*Charadrius melodus*) migrate through

northeast Texas and breed along the Texas coast. Preferred habitats for the Peregrine Falcon species and Piping Plover do not occur in the proposed project area; therefore, the likelihood of these species occurring within the project area would only be temporary during migration, and the possibility of an occurrence would have a very low probability.

Habitat for the Golden-cheeked Warbler (*Dendroica chrysoparia*) is primarily juniper/oak woodlands. The Warbler is dependent on Ashe Juniper (*Juniperus ashei*) for its long, fine bark strips for nest building. Since Ashe Juniper is not located on or near the project site, Golden-cheeked Warblers are not likely to occur within the project area.

The TPWD also lists eight species of aquatic mollusks as rare. The stormwater discharge channel and the Trinity River could provide some habitat for mollusk species. Since construction activities would occur outside of perennial aquatic areas or other areas of suitable habitat for mollusks, no rare mollusks would be impacted by the proposed project area.

The stormwater discharge channel and Trinity River could provide suitable habitat for the Alligator Snapping Turtle (*Macrochelys temminckii*). However, for the proposed project, there would be no construction within these areas.

There are no federally-listed endangered or threatened plant species within the vicinity of the project area. The TPWD does list the Warnock's Coral-root (*Hexalectris warnockii*) and the Glen Rose Yucca (*Yucca necopina*) as rare. These plants were not observed in the project area. Furthermore, habitat conditions conducive for Warnock's Coral-root and the Glen Rose Yucca are not found on the project site since a majority of the project area is within the floodplain of the Trinity River and is subject to periodic inundation. The likelihood of these species occurring on the project site is extraordinary.

The Western Burrowing Owl (*Athene cunicularia hypugaea*) and the Plains Spotted Skunk (*Spilogale putorius interrupta*) prefer similar habitat of open fields or grasslands. Since the Floodway is routinely maintained and could be construed as an open field, the likelihood of the western burrowing owl or the plains spotted skunk occurring in the project area should be considered although the possibility would be rare.

Henslow's Sparrow (*Aimophila aestivalis*) prefers weedy fields or "cut-over" areas with areas of bare ground where bunch grasses and vines occur. The proposed project area did contain areas of vines and bunch grasses giving the appearance of weedy fields. It is possible that the Henslow's Sparrow could occupy areas of the project area; however, unlikely.

The Texas Garter Snake (*Thamnophis sirtalis annectens*) prefers wet or moist microhabitats. Timber/Canebrake Rattlesnake (C*rotalus horridus*) prefers swamps, floodplains, deciduous woodlands, riparian zones, and abandoned woodlands. The proposed project area being within the floodplain of the Trinity River indicates that these species may occur within the project area. However, the wooded riparian zone surrounding the Trinity River further downstream would be a more desirable habitat for these species than the proposed project area.

The Texas Horned Lizard (*Phrynosoma cornutum*) prefers habitat consisting of arid and semi-arid regions with sparse vegetation including grass, cactus, scattered brush or scrubby trees. The horned lizard's primary food source is carpenter ants. During the on-site investigation, no carpenter ants were observed. Furthermore, the entire site was vegetated with species accustomed to periodic inundation. The occurrence of this species within the project area is unlikely.

Habitat for the Cave Myotis Bat (*Myotis velifer*) would not be impacted by the proposed project. The proposed project area consists of open areas with no areas or structure for roosting with the exception of the Sylvan Avenue Bridge. During the on-site investigation, no indications of any bats were observed beneath the Sylvan Avenue Bridge.

The Black Lordithon Rove Beetle (*Lordithon niger*) was neither identified during the on-site investigation, nor any suitable habitat observed for the beetle. This species prefers lowland hardwood forests which are not present within the proposed project area.

CONCLUSIONS

Based on the on-site observations, the proposed project will not result in any potential adverse impacts to any of the listed endangered or threatened, or their critical habitats. Should you have any questions or comments regarding this report, please do not hesitate to call me at (979) 694-7619.

Respectfully,

ALAN PLUMMER ASSOCIATES, INC.

Loretta E. Mokry

Loretta E. Mokry
Senior Environmental Scientist

Attachment

ATTACHMENT A

PROTECTED SPECIES INFORMATION

TABLE A-1

Federal and State Listed Species in Dallas County

	Common Name	Scientific Name	Habitat	Status
Birds	American Peregrine Falcon	*Falco peregrinus anatum*	areas with high, massive cliffs with expansive views near water where prey are numerous and diverse	State listed threatened
	Arctic Peregrine Falcon	*Falco peregrinus tundrius*	areas with high, massive cliffs with expansive views near water where prey are numerous and diverse	State listed threatened
	Bald Eagle	*Haliaeetus leucocephalus*	large lakes, nesting in tall trees; feeds in areas of open water where food is available	Federally and State listed threatened
	Henslow's Sparrow	*Ammodramus henslowi*	weedy fields or cut-over areas with some bare ground where bunch grasses and vines occur	State listed as rare
	Interior Least Tern	*Sterna antillarum athalassos*	Subspecies is listed only when inland (>50 miles from a coastline); nests on sand and gravel bars, in braided streams, rivers, man-made structures (inland beaches, treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony	Federally and State listed endangered
	Piping Plover	*Charadrius melodus*	Wintering migrant along the Texas Gulf Coast, beaches and bayside mud or salt flats.	Federally listed endangered and threatened
	Western Burrowing Owl	*Athene cunicularia hypugaea*	open grasslands, especially prairie, plains, and savannas, nest and roosts in abandoned burrows	State listed rare
	White-Faced Ibis	*Plegadis chihi*	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	State listed threatened
	Whooping Crane	*Grus americana*	marshes, river bottoms, potholes, prairies, and cropland (migratory)	Federally and State listed endangered
	Wood Stork	*Mycteria americana*	prairie ponds, flooded pastures or fields, ditches, and other shallow standing water	State listed threatened
	Golden-cheeked Warbler	*Dendroica chrysoparia*	juniper-oak woodlands, uses Ashe juniper for long fine bark strips for nesting material, forages for insects in broad-leaved trees and shrubs.	Federally and State listed endangered
	Black-capped Vireo	*Vireo atricapilla*	includes oak-juniper woodlands with distinctive patchy, two-layered aspects consisting of shrub and tree layers with open, grassy spaces, also needs foliage reaching to ground level for nesting cover.	Federally and State listed endangered

Federal and State Listed Species in Dallas County – Continued

	Common Name	Scientific Name	Habitat	Status
Mammals	Cave Myotis Bat	*Myotis velifer*	colonial and cave-dwelling; also roosts in rock crevices, old buildings, and other structutres; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle; opportunistic insectivore	State listed rare
	Plains Spotted Skunk	*Spilogale putorius interrupta*	open filds, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	State listed rare
Insects	Black Lordithon Rove Beetle	*Lordithon niger*	Lowland hardwood; mesic hardwood; dry hardwood; late successional forest	State listed rare
Mollusks	Fawnsfoot	*Truncilla donaciformis*	small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters	State listed rare
	Little Spectaclecase	*Vilosa lienosa*	creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents	State listed rare
	Louisiana Pigtoe	*Pleurobema riddellii*	streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments	State listed rare
	Pistolgrip	*Tritogonia verrucosa*	stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply	State listed rare
	Rock-pocketbook	*Arcidens confragosus*	mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs	State listed rare
	Sandbank Pocketbook	*Lampsillis satura*	small to large rivers with moderate flows and swift current on gravel, and sand bottoms	State listed rare
	Texas Heelsplitter	*Potamilus amphichaenus*	quiet waters in mud or sand and also in reservoirs; Sabine, Neches, and Trinity River basins	State listed rare
	Wabash Pigtoe	*Fusconaia flava*	creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities	State listed rare
Reptiles	Alligator Snapping Turtle	*Macrochelys temminckii*	perennial water bodies; deep water of river, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; usually in water with mud bottom and abundant aquatic vegetation	State listed threatened
	Texas Garter Snake	*Thamnophis sirtalis annectens*	wet or moist microhabitats	State listed rare
	Texas Horned Lizard	*Phrynosoma cornutum*	open, arid and semi-arid regions with sparse vegetation	State listed threatened
	Timber/Canebrake Rattlesnake	*Crotalus horridus*	swamps, floodplains, upland pine and deciduous forests, riparian zones, abandoned farmland, prefers dense brush	State listed threatened
Plants	Glen Rose Yucca	*Yucca necopina*	grasslands on sandy soils; flowering April-June, also found in limestone bedrock, clayey soil on top of limestone, and gravelly limestone alluvium	State listed rare
	Warnock's Coral-root	*Hexalectris warnockii*	leaf litter and humus in oak-juniper woodlands in mountain canyons in the Trans Pecos but at lower elevations to the east, often on narrow terraces along creekbeds	State listed rare

U.S. Fish & Wildlife Service

Endangered Species List

Back to Start

List of species by county for Texas:

Counties Selected: Dallas

Select one or more counties from the following list to view a county list:

Anderson
Andrews
Angelina
Aransas
Archer

View County List

Dallas County

Common Name	Scientific Name	Species Group	Listing Status	Species Image	Species Distribution Map	Critical Habitat	More Info
bald eagle	*Haliaeetus leucocephalus*	Birds	DM				P
black-capped Vireo	*Vireo atricapilla*	Birds	E				P
golden-cheeked warbler (=wood)	*Dendroica chrysoparia*	Birds	E				P
least tern	*Sterna antillarum*	Birds	E				P
piping Plover	*Charadrius melodus*	Birds	E, T				P

DALLAS COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	E

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	T

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Bald Eagle	*Haliaeetus leucocephalus*	DL	T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Black-capped Vireo	*Vireo atricapilla*	LE	E

oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer

Golden-cheeked Warbler	*Dendroica chrysoparia*	LE	E

juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer

Henslow's Sparrow *Ammodramus henslowii*

wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking

Interior Least Tern	*Sterna antillarum athalassos*	LE	E

subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Peregrine Falcon	*Falco peregrinus*	DL	E T

DALLAS COUNTY

BIRDS

Federal Status State Status

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, thus the species level shows this dual listing status; because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Piping Plover *Charadrius melodus* LT T

wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats

Western Burrowing Owl *Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

White-faced Ibis *Plegadis chihi* T

prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats

Whooping Crane *Grus americana* LE E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

Wood Stork *Mycteria americana* T

forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

INSECTS

Federal Status State Status

Black Lordithon rove beetle *Lordithon niger*

historically known from Texas

MAMMALS

Federal Status State Status

Cave myotis bat *Myotis velifer*

colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore

Plains spotted skunk *Spilogale putorius interrupta*

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

DALLAS COUNTY

MOLLUSKS

		Federal Status	State Status
Fawnsfoot	*Truncilla donaciformis*		

small and large rivers especially on sand, mud, rocky mud, and sand and gravel, also silt and cobble bottoms in still to swiftly flowing waters; Red (historic), Cypress (historic), Sabine (historic), Neches, Trinity, and San Jacinto River basins.

Little spectaclecase *Villosa lienosa*

creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins

Louisiana pigtoe *Pleurobema riddellii*

streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins

Pistolgrip *Tritogonia verrucosa*

stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins

Rock pocketbook *Arcidens confragosus*

mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs, east Texas, Red through Guadalupe River basins

Sandbank pocketbook *Lampsilis satura*

small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River

Texas heelsplitter *Potamilus amphichaenus*

quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins

Wabash pigtoe *Fusconaia flava*

creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow

REPTILES

		Federal Status	State Status
Alligator snapping turtle	*Macrochelys temminckii*		T

perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October

Texas garter snake *Thamnophis sirtalis annectens*

wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August

Texas horned lizard *Phrynosoma cornutum* T

DALLAS COUNTY

REPTILES

		Federal Status	State Status
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			
Timber/Canebrake rattlesnake	*Crotalus horridus*		T
swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto			

PLANTS

		Federal Status	State Status
Glen Rose yucca	*Yucca necopina*		
grasslands on sandy soils; flowering April-June(?), also found in limestone bedrock, clayey soil on top of limestone, and gravelly limestone alluvium			
Warnock's coral-root	*Hexalectris warnockii*		
leaf litter and humus in oak-juniper woodlands in mountain canyons in the Trans Pecos but at lower elevations to the east, often on narrow terraces along creekbeds			

Appendix F

Cultural Resources Report and Correspondence

To: Bill Martin, THC and Skipper Scott, COE
From: S. Alan Skinner, PhD, AR Consultants, Inc.
Re: Pahavo Wetland Conceptual Plan, Trinity River Project, Dallas, Texas

Alan Plummer and Associates, Inc. (APAI) has prepared the attached plan (Figure 1) with regard to the development of wetland areas east and west of Sylvan Road and south of the present Trinity River channel. These locations are well south of the original river channel. Three major wetland areas are shown inside the levees on Figure 1 and a fourth wetland is proposed to be developed at the site of an existing low area where runoff water is currently collected outside the existing south levee, which is even further from the original river channel. This is an area where Geo-Marine did a study for the Corps of Engineers (Cliff, Shanabrook, Hunt, Autin, and Prior 1999) although their study focused more heavily on the area west of Hampton Road and just east of Sylvan. As shown on the Geo-Marine Figure 2, the wetland areas proposed by APAI are situated well away from where the old West Fork of the Trinity River channel crossed through the floodplain west of Hampton Road. Moreover, the old Trinity River channel downstream from the junction of the West Fork and the Elm Fork is north of the present river levee that extends from Hampton Road through the downtown Dallas area. Consequently, the proposed wetland areas are each more than a kilometer from the West Fork and Trinity River channels.

A review of Sam Street's Map of Dallas County (Figure 2) shows that the areas of the proposed wetland sites are in an undeveloped tract south of the old river channel. The areas through which the river now goes includes property then owned by G.W. Dooley, J.C. Read, A. Hannah, and W. R. Overton. Street shows several "renter" houses in this area and certainly they are no longer present. Fence lines are shown in better detail on the 1917 Trinity River West Dallas Sheet (Figure 3) prepared by the Texas Reclamation Department in Austin which we have overlaid on a recent 7.5' USGS map of the same area. Virtually no rent houses are shown in the wetland areas. Similar results are apparent on a section of the 1920 Dallas County Soil Map (Figure 4) which was also prepared before the levees where built in the late 1920s. Therefore, the historic structure potential of the area is decidedly low to non-existent.

More recently, AR Consultants conducted testing in the floodplain sediments just to the east and to the west of the proposed wetland areas (Frederick, Trask, and Skinner 2006). Based on the results of these two major studies, as well as other studies in surrounding parts of the downtown Trinity River floodplain (Skinner, Whorton, Trask, Scott, Caran, and Dillon 1996; Skinner and Wheeler 2000; Skinner 2001; Cliff, Hunt, Prior, Gaither, and Autin 1998), Cliff and Skinner, with the assistance of several geomorphologists, have concluded that there is little potential of finding significant prehistoric or archaeological site deposits shallowly or deeply buried in floodplain sediments more than two hundred lateral feet from the old river channel. TxDOT has confirmed this distance as a reasonable area of high probability in planning with regard to the Trinity Tollway.

In summary, it is my recommendation that the archaeological potential of the proposed wetland sites is very low and that an archaeological survey of these areas is unwarranted. If you have any questions, please give me a call at 214 368 0478.

References Cited

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Street, Sam

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US Department of Agriculture

1920 *Dallas County Soil Map*. Bureau of Soils in cooperation with the Texas Agricultural Experiment Station.

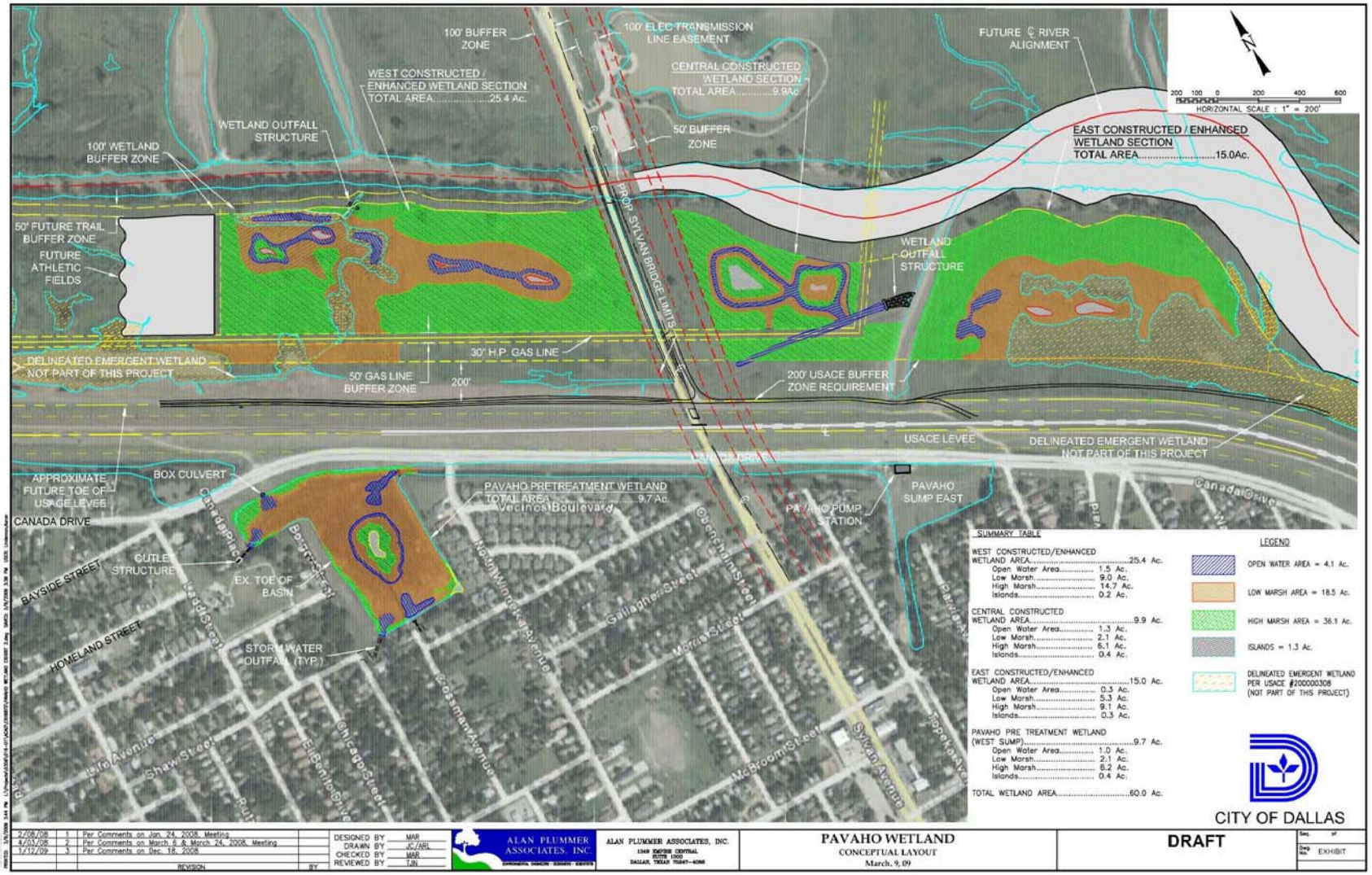

Figure 1. Pahavo Wetland Preliminary Schematic map.

Figure 2. Study area shown on a section of Sam Street's Map of Dallas County.

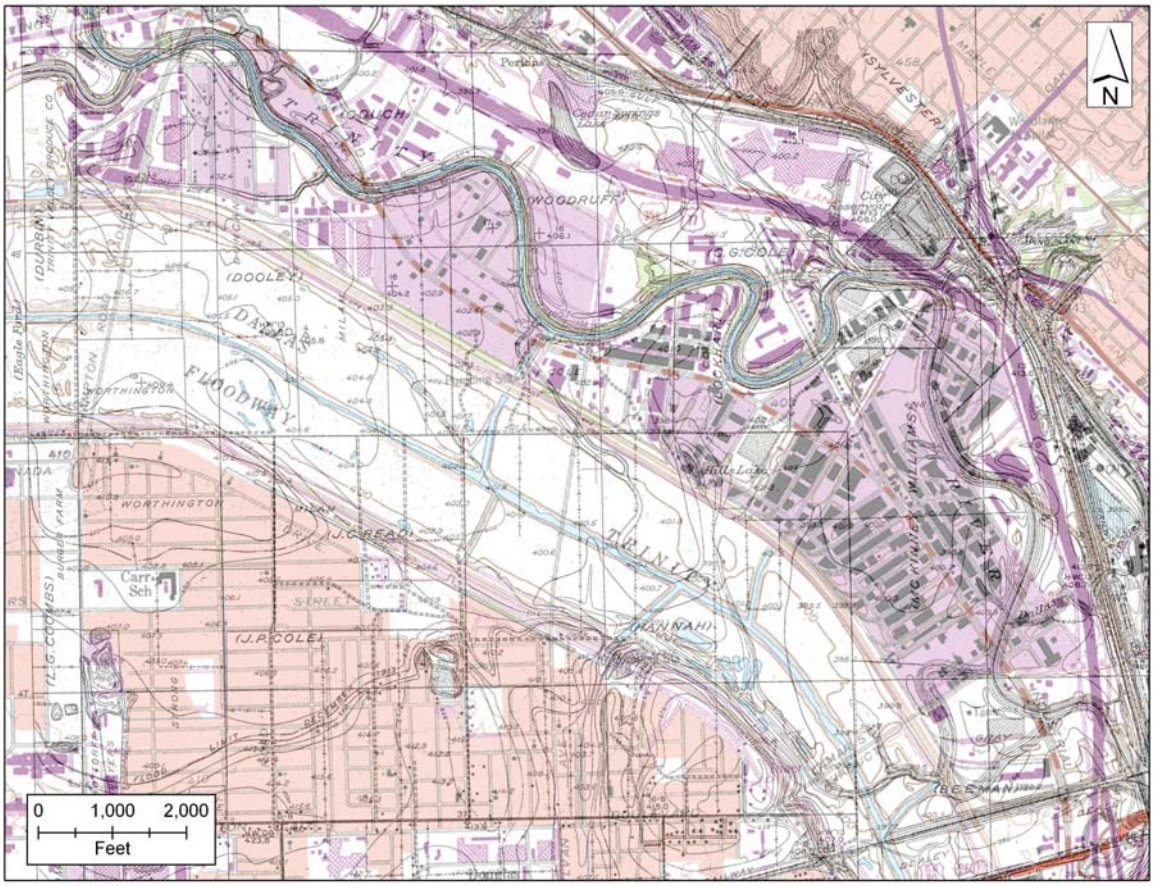

Figure 3. 1917 topographic map titled Trinity River West Dallas Sheet overlaid on a recent 7.5' USGS map of the downtown area showing the relation of the original and channelized river channels to the proposed wetland areas.

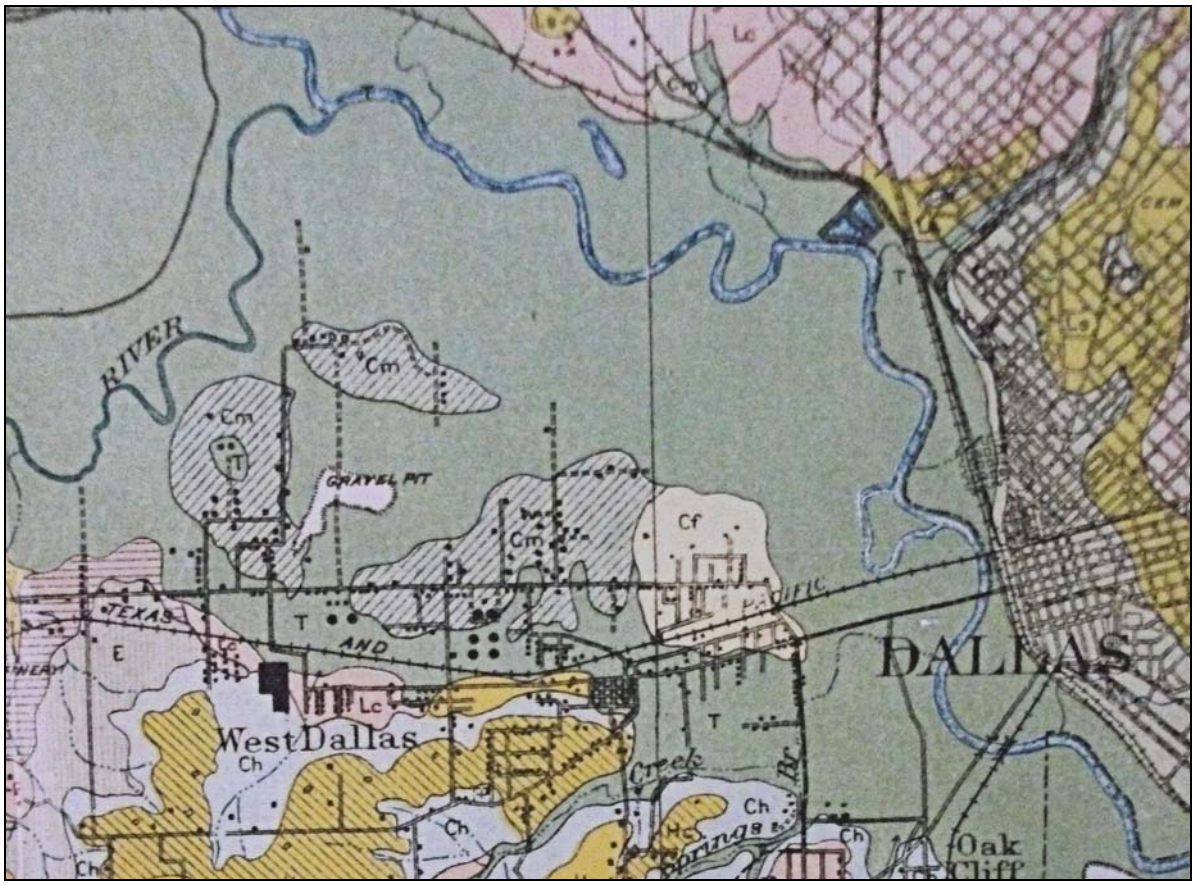

Figure 4. Study area shown on a section of the 1920 Dallas County soil map.

Capps, Tim

From: Mokry, Loretta
Sent: Thursday, September 30, 2010 10:50 AM
To: Capps, Tim
Subject: FW: Pahavo Wetland areas downtown Dallas

#3

Loretta Mokry
Alan Plummer Associates, Inc.
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-----Original Message-----
From: Scott, Skipper SWF [mailto:Skipper.Scott@usace.army.mil]
Sent: Wednesday, July 14, 2010 9:34 AM
To: Bill Martin; ARCDigs@aol.com
Cc: Mokry, Loretta
Subject: RE: Pahavo Wetland areas downtown Dallas

Bill:
Spooky - I was reading it when your msg arrived.
I agree. We have quite a few BHT's in the floodway over the years and lots of trash to show for it.
Skipper

-----Original Message-----
From: Bill Martin [mailto:Bill.Martin@thc.state.tx.us]
Sent: Wednesday, July 14, 2010 9:32 AM
To: ARCDigs@aol.com; Scott, Skipper SWF
Cc: lmokry@apaienv.com
Subject: RE: Pahavo Wetland areas downtown Dallas

I concur. Finding anything there would be miraculous.

From: ARCDigs@aol.com [mailto:ARCDigs@aol.com]
Sent: Tuesday, July 13, 2010 4:00 PM
To: Bill Martin; Skipper.Scott@usace.army.mil
Cc: lmokry@apaienv.com
Subject: Pahavo Wetland areas downtown Dallas

Bill and Skipper,

I have been wrestling with these locations and have concluded that a survey or backhoe trenching in them would be a general waste of time and money.
Testing has shown that the floodplain inside the levees is a mixed jumble of excavated matrices and fill from a variety of sources outside the area.
Consequently my recommendation is that these areas do not warrant archaeological work. This of course flies in the face of what I said in SMU's Dallas Archaeological Potential report but I changed my opinion on that in
2000/01 and TxDOT bought into high potential areas being 200 feet from the original channel with regard to plans for the Trinity Tollway.

If you have any questions, please give me a call.

Alan

S. Alan Skinner, PhD, RPA
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