Waters of the United States Technical Report

North Houston Highway Improvement Project

From US 59/I-69 at Spur 527 to I-45 at Beltway 8 North
CSJ 0912-00-146
Prepared by: TxDOT Houston District
Date: January 2018

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

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1.0 Introduction

The Texas Department of Transportation (TxDOT) proposes to construct improvements to Interstate Highway 45 (I-45) in the northern portion of the City of Houston. The proposed project, referred to as the North Houston Highway Improvement Project (NHHIP), begins at the interchange of I-45 and Beltway 8 North and continues south along I-45 to Downtown Houston where it terminates at the interchange of United States Highway (US) 59/I-69 and Spur 527 south of Downtown Houston. The project area also includes portions of I-10 and US 59/I-69 near Downtown Houston. The project area is composed of three study segments, Segments 1 through 3 (*Exhibit 1 – Vicinity Map*).

This Waters of the United States (U.S.) Technical Report supports the Final Environmental Impact Statement (Final EIS) that evaluates the social, economic, and environmental impacts potentially resulting from the Preferred Alternative for the proposed project.

2.0 Project Description

2.1 Existing Facility

2.1.1 Segment 1: I-45 from Beltway 8 North to north of I-610 (North Loop)

I-45 within this segment consists of eight general purpose lanes (i.e., mainlanes; four lanes in each direction), four frontage road lanes (two lanes in each direction), and a reversible high occupancy vehicle (HOV) lane in the middle, all within a variable right-of-way (ROW) width of 250 to 300 feet. The existing posted speed limit along the general purpose lanes and reversible HOV lane is 60 miles per hour (mph). The existing posted speed limit for the frontage roads is 45 mph. The length of Segment 1 is approximately 8.8 miles, and the area of the existing ROW is approximately 349 acres.

2.1.2 Segment 2: I-45 from north of I-610 (North Loop) to I-10

I-45 within this segment primarily consists of eight at-grade general purpose lanes (four lanes in each direction), six frontage road lanes (three lanes in each direction), and a reversible HOV lane in the middle, all within a variable ROW width of 300 to 325 feet. Segment 2 also includes a depressed section that consists of eight general purpose lanes (four lanes in each direction) and a reversible HOV lane in the middle, all below grade, within a 245-foot ROW. The six frontage road lanes associated with the depressed section (three lanes in each direction) are located at-grade. The existing posted speed limit is 60 mph along the general purpose lanes, 55 mph along the reversible HOV lane, and 40 mph along the frontage road lanes. The I-45 and I-610 frontage roads are discontinuous at the I-45/I-610 interchange. The length of Segment 2 is approximately 4.5 miles, and the area of the existing ROW is approximately 220 acres.

2.1.3 Segment 3: Downtown Loop System (I-45, US 59/I-69, and I-10)

The Downtown Loop System consists of three interstate highways that create a loop around Downtown Houston. I-45 forms the western and southern boundaries of the loop and is known locally as the Pierce Elevated because it partially follows the alignment of Pierce Street. I-10 forms the northern boundary of the loop, and US 59/I-69 forms the eastern boundary of the loop. The loop includes three major interchanges: I-45 and I-10, I-10 and US 59/I-69, and US 59/I-69 and I-45. The interchange of US 59/I-69 and Spur 527 is located south of Downtown Houston.

I-45 along the west side of Downtown Houston consists of six elevated general purpose lanes (three lanes in each direction) within an existing ROW width of 205 feet. I-45 along the south side of Downtown Houston (the Pierce Elevated) consists of six elevated general purpose lanes (three lanes in each direction). I-10 north of Downtown Houston, between I-45 and US 59/I-69, consists of 10 general purpose lanes (five lanes in each direction) within an existing ROW width of 420 feet. US 59/I-69 along the east side of Downtown Houston consists of six general purpose lanes (three lanes in each direction) within an existing ROW width of 225 feet. Generally, local streets serve as one-way frontage roads within Segment 3, except near the I-10 and US 59/I-69 interchange, where the frontage roads are discontinuous. The length of Segment 3, which includes the Downtown Loop System, is approximately 13.1 miles, and the existing ROW is approximately 638 acres.

2.2 Proposed Facility

The Preferred Alternative for the proposed project is described below, by study segment. The Preferred Alternative includes changes to the Recommended Alternative (for each segment) presented and evaluated in the Draft Environmental Impact Statement. Section 2.0 of the Final EIS discusses the design changes, including proposed storm water detention areas.

2.2.1 Segment 1: I-45 from Beltway 8 North to north of I-610 (North Loop)

The Preferred Alternative would widen the existing I-45 primarily on the west side of the roadway to accommodate four managed express (MaX) lanes. The proposed typical section would include eight to ten general purpose lanes (four to five lanes in each direction), four MaX lanes (two lanes in each direction), and four to six frontage road lanes (two to three lanes in each direction). The general purpose lanes and MaX lanes would be at-grade except at major cross streets, where they would be elevated over the intersecting streets. Approximately 200 to 225 feet of new ROW would be required, mostly to the west of the existing I-45. New ROW would be required to the east of the existing I-45 ROW at intersections with major streets and between Crosstimbers Street and I-610. The new ROW would include several proposed storm water detention areas west of I-45. Approximately 246 acres of new ROW would be required, and the project length would be approximately 8.8 miles.

2.2.2 Segment 2: I-45 from north of I-610 (North Loop) to I-10 (including the interchange with I-610)

The Preferred Alternative would widen the existing I-45 to accommodate four MaX lanes. Within the at-grade section of I-45, the proposed typical section would include eight general purpose lanes (four lanes in each direction), four MaX lanes (two lanes in each direction), and four frontage road lanes (two lanes in each direction), all at-grade. I-45 would be depressed from north of Cottage Street to Norma Street, a distance of approximately 1,800 feet. Within the depressed section of I-45, the proposed typical section would include eight below-grade general purpose lanes (four lanes in each direction) and four below-grade MaX lanes (two lanes in each direction), while the four frontage road lanes (two lanes in each direction) would be at-grade. The proposed I-45 and I-610 frontage roads would be continuous through the I-45/I-610 interchange. New ROW would be required from both the east and west sides of the existing I-45. The new ROW would include proposed storm water detention areas on the east side of I-45, south of Patton Street. Approximately 44 acres of new ROW would be required, and the project length, including interchange improvements, would be approximately 4.5 miles.

The Preferred Alternative provides a structural “cap” over a portion of the depressed lanes of I-45 from north of Cottage Street to south of N. Main Street. Future use of the structural cap area for another purpose would require additional development and funding by entities other than TxDOT.

2.2.3 Segment 3: Downtown Loop System (I-45, US 59/I-69, and I-10)

The Preferred Alternative would reroute I-45 to be parallel with US 59/I-69 on the east side of Downtown Houston. The existing elevated I-45 roadway along the west and south sides of Downtown would be removed and relocated to be parallel to I-10 on the north side of Downtown and parallel to US 59/I-69 on the east side of Downtown. Access to the west side of Downtown would be provided via “Downtown Connectors,” which would provide access to and from various Downtown streets. To improve safety and traffic flow in the north and east portions of Segment 3, both I-10 and US 59/I-69 would be realigned to eliminate the current roadway curvature. I-45 and US 59/I-69 would be depressed along a portion of the alignment east of Downtown. South of the George R. Brown Convention Center, I-45 would begin to elevate to the interchange of I-45 and US 59/I-69 southeast of Downtown, while US 59/I-69 would remain depressed as it continues southwest toward Spur 527.

The four proposed I-45 MaX lanes in Segments 1 and 2 would terminate/begin in Segment 3 at Milam Street/Travis Street, respectively. I-10 express lanes (two lanes in each direction) would be located generally in the center of the general purpose lanes within the proposed parallel alignment of I-10 and I-45 on the north side of Downtown. The I-10 express lanes would vary between being elevated and at-grade.

New ROW to the east of the existing US 59/I-69 along the east side of Downtown would be required to accommodate the proposed realigned I-45. The existing Hamilton Street would be realigned to be adjacent to US 59/I-69 to serve as a southbound access road, and the existing St. Emanuel Street would serve as a northbound access road. The project ROW would include areas to be developed as storm water detention. Approximately 160 acres of new ROW would be required, the majority of which would be for the I-10 and US 59/I-69 realignments and to construct the proposed I-45 lanes adjacent to US 59/I-69 along the east side of Downtown. The project length, including interchange improvements, would be approximately 11.9 miles. The length of the proposed project does not include existing roadways that would be removed: I-45 (Pierce Elevated) along the south side of Downtown, and sections of I-10 and US 59/I-69 where the roadways would be straightened.

The Preferred Alternative provides a structural "cap" over the proposed depressed lanes of I-45 and US 59/I-69 from approximately Commerce Street to Lamar Street. Future use of the structural cap area for another purpose would require additional development and funding by entities other than TxDOT.

3.0 Methodology

The project area—which is defined as the existing I-45 ROW and the proposed ROW of the Preferred Alternative—was investigated using a combination of field delineation and interpretation of available rectified aerial photography, high-resolution elevation Light Detection and Ranging (LiDAR) data, and databases: National Hydrography Dataset (NHD), Harris County Flood Control District (HCFCD), and City of Houston ditches. Aerial photographs, historical U.S. Geological Survey (USGS) topographic maps, electronic maps, and electronic databases used to identify areas in the project area exhibiting signatures consistent with aquatic features include the following:

- 2012 True-color aerial photograph, Houston-Galveston Area Council (H-GAC)
- 2014 True-color aerial photograph, H-GAC
- 2016 True-color aerial photograph, H-GAC
- 2017 True-color aerial photograph Environmental Systems Research Institute (ESRI)
- 1916 and 1954 Aldine, Texas USGS 7.5' Quadrangle maps
- 1921 and 1983 Bellaire, Texas USGS 7.5' Quadrangle maps
- 1922 and 1955 Houston Heights, Texas USGS 7.5' Quadrangle maps
- 1922 and 1955 Park Place, Texas USGS 7.5' Quadrangle maps
- 1922 and 1955 Settegast, Texas USGS 7.5' Quadrangle maps
- High-resolution NHD from USGS
- HCFCD Channel Centerlines, downloaded 1/7/15
- H-GAC and HCFCD digital elevation model from 2008 LiDAR data
- Federal Emergency Management Agency (FEMA) National Flood Hazard layer data from FEMA's web portal 11/16/2017

Field delineations were conducted in December 2017 within the existing roadway ROW and on selected parcels within the proposed project ROW where right-of-entry (ROE) authorization was granted. ROE access was authorized for 53 parcels within the proposed project ROW. The delineations followed the June 5, 2007 guidance from the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE), as presented in the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*. Wetlands were identified using the routine determination methodology published in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1 On-Line Edition), as amended by the November 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Version 2.0).

Soil samples were obtained, and the boundaries of identified aquatic resources were surveyed in areas accessed during the December 2017 field investigations. The locations of representative data points (soil stations) documented within the existing and proposed project ROW are shown in *Exhibit 4 – Floodplain, NWI, and Soils.* The data forms are included in *Appendix B – Wetland Determination Data Forms*.

Several named and un-named water courses and drainage features traverse the existing and proposed project ROW. For those water courses and drainage features where pedestrian access and travel along the channel banks was possible, ordinary high water marks were surveyed using global positioning system (GPS) equipment. For those water courses and drainage features not able to be accessed during the field investigations because of steep, eroded channel banks or other limitations precluding pedestrian travel, the limits of ordinary high water were estimated through the interpretation of remotely-sensed desktop data. Additional investigation of Buffalo Bayou and White Oak Bayou using a boat to mark and survey the ordinary high water mark along the channel banks is anticipated in the future to more accurately define the limits of ordinary high water within the project area.

An estimation of the areal extent of aquatic resources identified within parcels where ROE access was not authorized was made based on interpretation of remotely-sensed desktop data and observations made from adjacent roadway ROW and accessible parcels during the December 2017 field investigations.

Named water courses are identified by name in the tables and exhibits included in this report. Un-named drainage features that are associated with a NHD stream are labelled with the NHD permanent identifier NHD code (e.g., 113251601). Un-named drainage features not associated with a NHD stream were identified as un-named ditches. The identified water bodies are presented in this report by project segment. The lengths of water bodies exhibiting stream characteristics (i.e., bayous, streams, and drainage channels) are presented in a separate table to indicate the lengths of these water bodies within the existing and proposed project ROW.

4.0 Investigation Findings

4.1 Waters of the United States

Twenty-nine (29) water bodies were identified within the project area that collectively total approximately 26.9 acres (*Table 1; Exhibit 2 – Water Bodies in Project Area*). The section of White Oak Bayou that is in the NHHIP area is part of a federally-funded project, with HCFCD as the local sponsor. Therefore, any activities within the White Oak Bayou federal project area would require Section 408 coordination with the local sponsor, HCFCD, and the USACE per Section 14 of the Rivers and Harbors Act of 1899, as codified in 33 U.S. Code §408. The other 28 water bodies are not within a federally-funded project area and would not require Section 408 coordination. Twenty-one (21) of the 29 water bodies are bayous, streams, or drainage channels that have a total length within the project area of approximately 20,727 linear feet, or approximately 3.93 miles (*Table 2*). Twenty-five (25) of the 29 water bodies are preliminarily identified as potentially jurisdictional waters of the U.S. and would require a Department of the Army permit for any fill activities that may occur within these water bodies. The other four water bodies are potentially non-jurisdictional waters of the U.S. because they are existing detention basins, a water fountain, or a constructed drainage channel conveying ephemeral storm water flows (*Table 1,* and *Appendix A, Site Photographs*).

Table 1. Potentially Jurisdictional and Non-Jurisdictional Water Bodies

Segment	Number	Water Body	Acreage in Existing ROW	Acreage in Proposed ROW	Potentially Jurisdictional	Section 408 Coordination
1	1	113251601	0.192	0.000	Yes	No
	2	Wetland 1	0.000	0.008	Yes	No
	3	113252111	0.000	0.037	Yes	No
	4	Wetland 2	0.000	0.627	Yes	No
	5	Halls Bayou	0.212	0.237	Yes	No
	6	Wetland 3	0.000	0.024	Yes	No
	7	113252481	0.107	0.053	Yes	No
	8	113252861	0.000	0.016	No	No
	9	Wetland 4	0.016	0.000	Yes	No

Segment	Number	Water Body	Acreage in Existing ROW	Acreage in Proposed ROW	Potentially Jurisdictional	Section 408 Coordination
1	10	Wetland 5	0.009	0.000	Yes	No
	11	113253277	0.039	0.028	Yes	No
	12	113253377	0.083	0.026	Yes	No
	13	113253359	0.000	0.169	Yes	No
	14	Janowski Ditch	0.000	0.331	Yes	No
	15*	Little White Oak Bayou 1 in Segment 1	0.401	0.000	Yes	No
	16	Un-named Ditch 1	0.016	0.000	Yes	No
		Segment 1 Subtotal	**1.075**	**1.556**		
		Segment 1 Potentially Jurisdictional Subtotal	**1.075**	**1.540**		
2	15*	Little White Oak Bayou 1 in Segment 2	2.438	0.000	Yes	No
	17	Little White Oak Bayou 2	0.000	0.040	Yes	No
	18	Little White Oak Bayou 3	0.758	0.261	Yes	No
	19	Un-named Ditch 2	0.145	0.000	Yes	No
	20	Little White Oak Bayou 4	0.510	0.025	Yes	No
	21	Little White Oak Bayou 5	0.331	0.000	Yes	No
		Segment 2 Potentially Jurisdictional Subtotal	**4.182**	**0.326**		
3	22	Little White Oak Bayou 6	0.342	0.000	Yes	No
	23	White Oak Bayou	3.117	0.000	Yes	Yes
	24	Buffalo Bayou East	4.878	4.505	Yes	No
	25	Buffalo Bayou West 1	1.413	0.043	Yes	No
	26	Buffalo Bayou West 2	2.112	0.105	Yes	No
	27	Water Fountain	0.115	0.000	No	No
	28	Detention Basin 1	0.336	0.000	No	No
	29	Detention Basin 2	2.809	0.000	No	No
		Segment 3 Subtotal	**15.122**	**4.653**		
		Segment 3 Potentially Jurisdictional Subtotal	**11.862**	**4.653**		
		Total	**20.379**	**6.535**		
		Total Potentially Jurisdictional	**17.119**	**6.519**		

*Water Body 15 is located in both Segments 1 and 2

Table 2. Potentially Jurisdictional and Non-Jurisdictional Streams

Stream	Segment	Estimated Linear Feet (Existing ROW)	Estimated Linear Feet (Proposed ROW)	Potentially Jurisdictional
113251601	1	453	0	Yes
113252111	1	0	160	Yes
Halls Bayou	1	339	548	Yes
113252481	1	308	199	Yes
113252861	1	0	15	No
113253277	1	595	373	Yes
113253377	1	264	396	Yes
113253359	1	481	194	Yes
Janowski Ditch	1	0	470	Yes
Little White Oak Bayou 1 – Segment 1*	1	585	0	Yes
Un-named Ditch 1	1	154	0	Yes
Segment 1 Subtotal		**3,179**	**2,355**	
Little White Oak Bayou 1 – Segment 2*	2	2,859	0	Yes
Little White Oak Bayou 2	2	0	216	Yes
Little White Oak Bayou 3	2	685	461	Yes
Un-named Ditch 2	2	458	0	Yes
Little White Oak Bayou 4	2	580	23	Yes
Little White Oak Bayou 5	2	264	0	Yes
Segment 2 Subtotal		**4,846**	**700**	
Little White Oak Bayou 6	3	545	197	Yes
White Oak Bayou	3	2,607	1,885	Yes
Buffalo Bayou East	3	1,391	1,235	Yes
Buffalo Bayou West 1	3	725	29	Yes
Buffalo Bayou West 2	3	983	50	Yes
Segment 3 Subtotal		**6,251**	**3,396**	
Total Linear Feet		**14,276**	**6,451**	
Total Miles		**3.93**		

* Little White Oak Bayou 1 is located in both Segments 1 and 2

Table 3 presents the acreages of all water bodies and total stream linear feet in the project area, and the potentially jurisdictional water bodies and streams in the project area, for the existing ROW and the proposed ROW in each project segment as shown on *Exhibit 2 – Water Bodies in Project Area*.

Table 3. Potentially Jurisdictional Waters of the United States within the Existing and Proposed ROW

Segment	Categories	Total Acres	Total Potentially Jurisdictional Acres	Total Linear Feet of Stream	Total Linear Feet of Potentially Jurisdictional Stream
1	Existing ROW	1.075	1.075	3,179	3,179
	Proposed ROW	1.556	1.540	2,355	2,340
2	Existing ROW	4.182	4.182	4,846	4,846
	Proposed ROW	0.326	0.326	700	700
3	Existing ROW	15.122	11.862	6,251	6,251
	Proposed ROW	4.653	4.653	3,396	3,396
Total		**26.914**	**23.638**	**20,727**	**20,712**

4.2 Interpretation of Aerial Photographs and Existing Electronic Data Sources

The 1916 and 1954 Aldine, Texas topographic quadrangle maps show that Drainage Ditch 113251601 and Halls Bayou were present in 1916 and 1954 (*Exhibit 3*, *Sheet 1*). However, Wetlands 1, 2, and 3 are not shown. The aerial photographs and site visit photographs confirm the presence of Drainage Ditch 113251601, Halls Bayou, and Wetlands 1, 2, and 3 (*Exhibit 2*, *Sheet 1; Appendix A*, *Exhibit 1*, *Photos 1, 2, 4,* and *5; Appendix A*, *Exhibit 2*, *Photo 6*). Halls Bayou appears to have been rectified between 1916 and 1954 as indicated by a diversion channel and channel realignment shown on the 1954 Aldine, Texas topographic quadrangle map (*Exhibit 3*, *Sheet 1*). Wetlands 2 and 3 are adjacent to Halls Bayou.

Wetland 2 is not shown on the 1916 or 1954 Aldine, Texas topographic quadrangle maps, or on the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (*Exhibit 3 Sheet 1; Exhibit 4*, *Sheet 1*). Wetland 2 is a forested wetland situated within the one-percent Annual Exceedance Probability (AEP), or 100-year, Flood Hazard area of Halls Bayou (*Exhibit 4*, *Sheet 1; Appendix A*, *Exhibit 1*, *Photo 4*).

Drainage Ditch 113252111 and Wetland 1 are not shown on the 1916 or 1954 Aldine, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 1*). However, this drainage ditch is included in the NHD as a canal/ditch, and is included in the HCFCD drainage system database as P118-30-00, which is shown as an open ditch (*Exhibit 2, Sheet 1; Exhibit 4*, *Sheet 1; Exhibit 5*, *Sheet 1*). Review of aerial photographs and site visits to the project area confirm that Drainage Ditch 113252111 is an open drainage ditch, and Wetland 1 is adjacent to Drainage Ditch 113252111 (*Exhibit 2, Sheet 1; Exhibit 4*, *Sheet 1; Appendix A*, *Exhibit 1*, *Photos 2* and *3*).

Drainage Ditch 113252481 is not shown on the 1916 Aldine, Texas topographic quadrangle map, but is shown on the 1954 Aldine, Texas topographic quadrangle map (*Exhibit 3*, *Sheet 2*). Drainage Ditch 113252481 is visible in the 2017 aerial photograph and is shown in the site visit photographs, with the majority of this ditch being enclosed within underground storm sewer culverts (*Exhibit 2, Sheet 2; Exhibit 4*, *Sheet 2; Appendix A*, *Exhibit 2*, *Photos 7* and *8*).

The 1922 Houston Heights, Texas topographic quadrangle map shows Drainage Ditch 113252861 connecting to a north-south drainage ditch adjacent to Northline Drive. The 1955 Houston Heights, Texas topographic quadrangle map does not show Drainage Ditch 113252861, while the NHD shows Drainage Ditch 113252861 as a canal/ditch that connects to a north-south drainage ditch halfway between I-45 and Northline Drive (*Exhibit 2, Sheet 2; Exhibit 3*, *Sheet 2; Exhibit 4*, *Sheet 2*). Review of aerial photographs and site visits to the project area confirm that Drainage Ditch 113252861 is a concrete-lined drainage within the existing and proposed project ROW (*Appendix A*, *Exhibit 2*, *Photo 9*). The HCFCD drainage system database shows Drainage Ditch 113252861 as E101-18-04, which is identified as an open ditch (*Exhibit 5*, *Sheet 2*).

Wetlands 4 and 5 are not shown on the 1922 or 1955 Houston Heights, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 2*). The NHD indicates that Wetlands 4 and 5 are associated with canal/ditch 113252861, and the HCFCD drainage system database indicates that Wetlands 4 and 5 are associated with a storm sewer unit identified as number E101-18-00 (*Exhibit 2, Sheet 2; Exhibit 4*, *Sheet 2; Exhibit 5*, *Sheet 2*). Wetlands 4 and 5 were identified during the site visits as being areas of minimal wetland vegetation within open ditches (*Appendix A*, *Exhibits 2* and *3*, *Photos 10* and *11*).

Drainage Ditches 113253277 and 113253377 are shown on the 1922 and 1955 Houston Heights, Texas topographic quadrangle maps; however, both drainages have been rectified and moved from their original locations (*Exhibit 3*, *Sheet 2*). The NHD shows both drainage ditches orientated north-south until reaching the I-45 ROW, then following the I-45 western ROW northward approximately 200 linear feet as open ditches (*Exhibit 2, Sheet 2; Exhibit 4*, *Sheet 2*). The HCFCD drainage system database shows Drainage Ditch 113253277 as an open ditch south of the I-45 frontage road, and as a historical drainage under and continuing north of I-45 (*Exhibit 5*, *Sheet 2*). The HCFCD drainage system database shows Drainage Ditch 113253377 as an open ditch south of the I-45 frontage road, and under and north of I-45 as a storm sewer to Tidwell Road. Both drainage ditches continue through the eastern portion of the project area as underground storm sewers, as confirmed by review of recent aerial photographs and as shown in site visit photographs (*Exhibit 2, Sheet 2; Exhibit 4*, *Sheet 2; Appendix A*, *Exhibit 3*, *Photos 12* and *13*).

Drainage Ditch 113253359 is shown on the 1922 and 1955 Houston Heights, Texas topographic quadrangle maps, but the existing Drainage Ditch 113253359 has been rectified and moved from its original location (*Exhibit 3*, *Sheet 2*). Approximately 175 linear feet in the downstream portion of this drainage is an open concrete-lined drainage ditch (*Exhibit 2, Sheet 3; Exhibit 4*, *Sheet 2; Appendix A*, *Exhibit 3*, *Photo 14*). The remainder of Drainage Ditch 113253359 is enclosed underground within storm sewers. The NHD shows Drainage Ditch 113253359 crossing I-45 diagonally, whereas the HCFCD shows the drainage (E101-12-00) as an open ditch within the I-45 project area, then crossing perpendicular to I-45 (*Exhibit 4*, *Sheet 2; Exhibit 5*, *Sheets 2* and *3*). For this report, the location of the underground portion of this ditch is estimated based on the HCFCD drainage system database.

Janowski Ditch is shown on the 1922 and 1955 Houston Heights, Texas topographic quadrangle maps, but is not included in the NHD (*Exhibit 2, Sheet 3; Exhibit 3*, *Sheet 3; Exhibit 4*, *Sheet 3*). The HCFCD drainage system database shows Janowski Ditch as historical from the southbound I-45 frontage road outfall and continuing northward. The HCFCD drainage system database identifies Janowski Ditch as E101-11-00, which is an open ditch starting at the southbound frontage road outfall (*Exhibit 5*, *Sheet 3*). Site visits to the project area indicate that Janowski Ditch is a riprap-lined rectified channel starting at the southbound I-45 frontage road outfall (*Appendix A*, *Exhibit 3*, *Photo 15*). From the outfall and continuing northeast, Janowski Ditch is an underground storm sewer (*Exhibit 2, Sheet 3; Exhibit 4*, *Sheet 3*).

Un-named Ditch 1 is not shown on the 1922 or the 1955 Houston Heights, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 3*) and is not included in the NHD (*Exhibit 2, Sheet 3; Exhibit 4*, *Sheet 3*). Based on review of aerial photographs and as observed during the site visits, this drainage ditch extends eastward from the north side of BNSF railroad tracks near Stokes Street to Little White Oak Bayou. Un-named Ditch 1 is identified by the HCFCD drainage system database as open canal/ditch with unit number E101-08-00 (*Exhibit 5, Sheet 3*).

Little White Oak Bayou crosses the existing and proposed project ROW at six locations (*Exhibit 2, Sheet 3; Exhibit 3*, *Sheet 3; Exhibit 4*, *Sheet 3*). Little White Oak Bayou is shown on the 1922 and 1955 Houston Heights, Texas and on the 1922 and 1955 Settegast, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 3*). Little White Oak Bayou has been rectified and enclosed within culverts in portions of the existing and proposed project ROW, including culvert crossings at Stokes Street, I-610, West Cavalcade Street, Coronado Street, Patton Street, and White Oak Drive. Review of recent and historical aerial photographs confirmed that Little White Oak Bayou has been rectified and placed within underground culverts at the road crossings listed above (*Exhibit 2, Sheet 3; Exhibit 4*, *Sheet 3*). Site visit photographs of Little White Oak Bayou that are not culverted are shown in *Appendix A*, *Exhibit 4*, *Photos 16, 17, 18,* and *19*).

Un-named Ditch 2 is shown on the 1922 and 1955 Settegast, Texas topographic quadrangle maps as a tributary to Little White Oak Bayou (*Exhibit 3*, *Sheet 3*). However, it is not included in the NHD or HCFCD drainage system database (*Exhibit 2, Sheet 3; Exhibit 4*, *Sheet 3; Exhibit 5*, *Sheet 3*). It is shown as an artificial flowline in the City of Houston database. Within the project area, Un-named Ditch 2 is an underground storm sewer and was confirmed by review of recent aerial photographs and observations during project site visits. The Un-named Ditch 2 outfall is shown at the eastern ROW edge in *Appendix A*, *Exhibit 4*, *Photo 20*.

White Oak Bayou is shown on the 1922 and 1955 Settegast, Texas topographic quadrangle maps (*Exhibit 3*, *Sheets 3* and *4*). Within the existing ROW, White Oak Bayou is a rectified channel. Approximately 1,900 linear feet of the upstream portion of the channel that is within the project area is concrete-lined. The concrete lining is visible in aerial photographs, and was observed during the site visits (*Exhibit 2*, *Sheets 3* and *4; Exhibit 4, Sheets 3* and *4; Appendix A*, *Exhibit 5*, *Photos 21, 22, 23, 24,* and *25*). Within the project area, White Oak Bayou is bridged 11 times, as determined from review of aerial photographs.

Buffalo Bayou is shown on the 1922 and 1955 Settegast, Texas topographic quadrangle maps (*Exhibit 3*, *Sheets 4* and *5*). The bayou crosses the project area at three locations (*Appendix A, Exhibits 6* and *7, Photos 26, 27, 28, 29, 30, 31, and 32*). Aerial photography shows that Buffalo Bayou is bridged 20 times within the project area.

Ingraham Gully is shown on of the 1922 and 1955 Settegast, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 5*). It is not included in the NHD and is listed as a historical canal/ditch (G122-00-00) in the HCFCD drainage system database (*Exhibit 2, Sheet 4; Exhibit 4*, *Sheet 4; Exhibit 5*, *Sheet 4*). Review of recent aerial photographs and site visits to the project area indicate that Ingraham Gully is no longer an open ditch south of I-10 and north of Market Street, which is located north of I-10. However, there is an open drainage ditch that flows from an outfall at Market Street into culverts at the ROW boundary of I-10.

The 1921 Bellaire, Texas and 1922 Park Place, Texas topographic quadrangle maps show drainage ditches on both sides of an existing railroad track within the project area near the current interchange of I-69 and State Highway (SH) 288 (*Exhibit 3*, *Sheet 4*). The 1983 Bellaire, Texas and 1955 Park Place, Texas topographic quadrangle maps show that the railroad track and the associated drainage ditches have been removed (*Exhibit 3*, *Sheet 4*). Review of recent aerial photographs confirms the removal of the ditches and the railroad track (*Exhibit 2, Sheet 4; Exhibit 4, Sheet 5*). Detention Basins 1 and 2 are not shown on the 1921 or the 1983 Bellaire, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 4*); however, the detention basins are visible on aerial photographs (*Exhibit 2, Sheet 4; Exhibit 4*, *Sheet 5*). Site visits to the project area indicate that both detention basins have become overgrown with voluntary vegetation (*Appendix A*, *Exhibit 7, Photo 33*). Access to both basins was not available due to perimeter fencing around the basins.

An ornamental water fountain on the west side of Downtown Houston is located mostly within existing ROW (I-45, Pease Street, and Jefferson Street). The eastern portion of the fountain appears to be outside existing ROW on privately-owned commercial property (*Exhibit 2, Sheet 4; Exhibit 4*, *Sheet 4*). The water fountain is not shown on the 1922 and 1955 Settegast, Texas topographic quadrangle maps (*Exhibit 3*, *Sheet 4*). The water fountain is identified as a palustrine unconsolidated bottom semi-permanently flooded excavated (PUBFx) feature in the NWI (*Appendix A, Exhibit 7, Photo 34*).

4.3 Site Topography

Elevations within the project area range from approximately 88 feet North American Datum (NAD) 1983 High Accuracy Reference Network (HARN) near the I-45 and Beltway 8 North interchange to approximately 0 feet NAD 1983 HARN at Buffalo Bayou (*Exhibit 5*, *2008 HCFCD Digital Elevation Model*). The southern end of the project area is approximately 48 feet NAD 1983 HARN along US 59/I-69, and 44 feet NAD 1983 HARN along SH 288. The eastern end of the project is approximately 42 feet NAD 1983 HARN at I-10. The project area is relatively level with less than one-percent slope from Beltway 8 North to Buffalo Bayou, and less than one-percent slope southeastward from SH 288 to Brays Bayou, which is south of the project area.

4.4 Soils

According to the Natural Resources Conservation Service (NRCS), the project area is mapped as urban soil mapping units, with the exception of approximately 50.3 acres of the Clodine fine sandy loam mapping unit in the northern portion of the project area (*Table 4*). Urban land consists of soils that have been altered or covered by buildings and other structures, making classification impractical (*Exhibit 4*, *Floodplain, NWI, and Soils*). It was determined from review of aerial photographs and site visits that the approximately 50.3 acres of soils mapped as Clodine fine sandy loam in the project area have been disturbed or developed (*Exhibit 4*, *Sheet 1*).

Table 4. NRCS Soil Map Units within the Project Area

Map Unit Symbol	Map Unit Name	Acres in Project Area	Percent of Project Area
Ak	Addicks-Urban land complex	152.6	9.2%
As	Aris-Urban land complex	92.5	5.6%
BadA	Bacliff-Urban land complex, 0 to 1 percent slopes	62.2	3.8%
Bg	Bernard-Urban land complex	115.3	7.0%
Cd	Clodine fine sandy loam, 0 to 1 percent slopes	50.3	3.0%
Ce	Clodine-Urban land complex	241.7	14.6%
Gu	Gessner occasionally ponded-Urban land complex, 0 to 1 percent slopes	223.8	13.5%
Mu	Verland-Urban land complex	77.9	4.7%
TeuB	Texla-Urban land complex, 0 to 2 percent slopes	13.2	0.8%
URLX	Urban land	545.0	32.9%
VauA	Vamont-Urban land complex, 0 to 1 percent slopes	74.7	4.5%
W	Water	7.3	0.4%
	Total for Project Area	**1,656.5**	**100.0%**

4.5 FEMA Maps

Flood Insurance Rate Maps were used to review the hydrology of the area (GIS Servers\Web Map Service NFHL on hazards.fema.gov). Map numbers, showing effective dates in parentheses, 48201C0460M (10/16/2013), 48201C0470L (6/18/2007), 48201C0660M (6/9/2014), 48201C0680L (6/18/2007), 48201C0670M (6/9/2014), 48201C0690M (6/9/2014), 48201C0860L (6/18/2007), and 48201C0880L (6/18/2007) were reviewed and show that approximately 70 percent of the project area is outside of the one-percent AEP (100-year) floodplain or other flood hazard areas as determined by FEMA (*Exhibit 4, Floodplain, NWI, and Soils*). Areas adjacent to and including parts of Halls Bayou, Wetlands 4 and 5, Drainage Ditches 113253277, 113253377, and 113253359, Janowski Ditch, Un-named Ditches 1 and 2, Little White Oak Bayou, White Oak Bayou, and Buffalo Bayou are within the one-percent AEP floodplain.

4.6 NWI Maps

The USFWS NWI maps (GIS Servers\Web Map Service USFWS_WMS_CONUS_Wetlands on wetlandswms.er.usgs.gov) were used to gather information on the location of potential wetlands within the project area. Only four water resources are mapped by the NWI as being within the limits of the project area (*Exhibit 4*, *Floodplain, NWI, and Soil*). Three of the water resources are bayous: Little White Oak Bayou, White

Oak Bayou, and Buffalo Bayou. All three are identified as riverine lower perennial unconsolidated bottom permanently flooded and excavated (R2UBH and R2UBHx) features. The fourth water resource is a water fountain identified as a palustrine unconsolidated bottom semi-permanently flooded excavated (PUBFx) feature.

5.0 Potentially Jurisdictional Waters of the United States

Twenty-nine (29) water bodies were identified within the project area (*Table 1*), of which four water bodies appear to be non-jurisdictional. Two of the water bodies are detention basins (Detention Basins 1 and 2), which are excavated from uplands. One water body is an artificial ornamental feature (water fountain), which is not included in the definition of jurisdictional waters. Drainage Ditch 113252861 is a concrete-lined linear water body that appears to have ephemeral flow and is not identified as a relocated or excavated tributary of a natural water course. Therefore, this water body would likely not be determined by the USACE to be a jurisdictional water of the U.S. The other 25 water bodies meet the regulatory definition of waters of the U.S, and it is expected that the USACE would regulate them as jurisdictional waters of the U.S. However, only the USACE and the EPA can determine the jurisdictional status of aquatic resources identified as waters of the U.S.

6.0 Potentially Jurisdictional Waters of the United States within the Existing and Proposed ROW

The approximate acreage of water bodies and linear feet of streams associated with the identified waters of the U.S. and the potentially jurisdictional waters of the U.S. within the existing and proposed project ROW for the NHHIP are shown in *Table 3*. This assessment is preliminary, as only the USACE and EPA can determine the jurisdictional status of aquatic resources identified as waters of the U.S.

In Segments 1 and 2, all the identified waters, including streams, located within the project ROW were identified as potentially jurisdictional, except for drainage ditch 113252861. In Segment 3, three water bodies were considered to be potentially non-jurisdictional waters: a water fountain, and Detention Basins 1 and 2. These three water bodies are manmade and are typically considered to be non-jurisdictional waters by the USACE.

7.0 Possible Impacts to Potentially Jurisdictional Waters of the United States within the Existing and Proposed ROW

Possible impacts to potentially jurisdictional waters of the U.S. were estimated based on the preliminary assessment of water bodies in the project area and the conceptual design for the project. The proposed project may result in impacts to potentially jurisdictional waters of the U.S. as described in *Table 5*. Reconstruction and/or removal of existing roadways and structures and construction/expansion of new roadway and structures would occur within areas of existing and proposed project ROW, and would be expected to impact some potentially jurisdictional waters of the U.S.

The design of the proposed project is preliminary. Halls Bayou, Janowski Ditch, Little White Oak Bayou 1, Un-named Ditch 1, Little White Oak Bayou 2, Little White Oak Bayou 6, White Oak Bayou, and the three segments of Buffalo Bayou would likely be bridged. Detailed design of each bridge crossing has not been developed, but it is anticipated that existing bridge structures would be removed or modified. Dependent on the bridge designs, existing bridge support columns currently within the channels of the water bodies above may be removed, and new or additional bridge support columns may be required within the channels. A bridge structure that completely spans a stream segment with no discharges of fill material below the plane of ordinary high water or high tide elevation of the water body may have no impact on the water body. Alternatively, the bridge designs could involve impacts associated with removal of existing structures, construction of new structures, and stabilization of channel banks that would require a Department of the Army individual permit. The bridges might be designed such that impacts to jurisdictional waters of the U.S. are minimized, allowing the bridges to be considered for permit authorization by the USACE's nationwide permit program.

Table 5 presents possible impacts to potentially jurisdictional waters of the U.S. Some of the water bodies within the existing ROW are currently bridged or enclosed in culverts. Other water bodies are either located completely outside the existing ROW or are channels extending from the existing ROW into the proposed ROW. For the estimated possible impacts, it was assumed that water bodies that are currently bridged or culverted would remain unchanged from their current condition (i.e., blank areas in the Existing ROW and Proposed ROW columns). However, depending on the design of the proposed improvements within areas of existing ROW, some impacts to these water bodies may occur, such as culvert replacements/expansions, bridge support column construction, bank stabilization, and storm water outfalls.

Drainage Ditches 113251601, 113252111, 113252481, 113252861, 113253277, 113253377, 113253359, and Little White Oak Bayou 4 and 5 may be impacted by the proposed project. Specific impacts to the drainage ditches and the two segments of Little White Oak Bayou would be determined during detailed design. Existing culverts may be extended in areas of new ROW to accommodate the proposed roadway improvements. Appropriate stream mitigation for stream impacts would be determined as detailed design plans are developed. The potential impacts shown in *Table 5* reflect a maximum impact scenario, where these waters would be culverted.

Wetlands 1 through 5 may be avoided, or partially or completely filled, depending on the final design of the proposed improvements. Compensatory mitigation for unavoidable impacts to wetlands would be determined as detailed design plans are developed. Detention Basins 1 and 2 are expected to be avoided. Little White Oak Bayou 3 and Un-named Ditch 2 are completely culverted within the project area and are not expected to be changed. The water fountain is not expected to be impacted.

Table 5. Estimated Possible Impacts to Potentially Jurisdictional Waters of the United States

	Number	Water Body	Acres	Possible Impacts	
				Existing ROW	Proposed ROW
Segment 1	1	113251601	0.192		
	2	Wetland 1	0.008		160-foot culvert extension westward
	3	1113252111	0.037		160-foot culvert extension westward
	4	Wetland 2	0.627		Fill
	5	Halls Bayou	0.449		Bridge
	6	Wetland 3	0.024		Bridge or Fill
	7	1113252481	0.16		31-foot culvert extension westward
	8	1113252861	0.016		
	9	Wetland 4	0.016	Culvert	
	10	Wetland 5	0.009	Culvert	
	11	1113253277	0.067	245-foot culvert extension southward	350-foot culvert extension southward
	12	1113253377	0.109	230-foot culvert extension southward	385-foot culvert extension southward
	13	1113253359	0.169		180-foot culvert extension westward

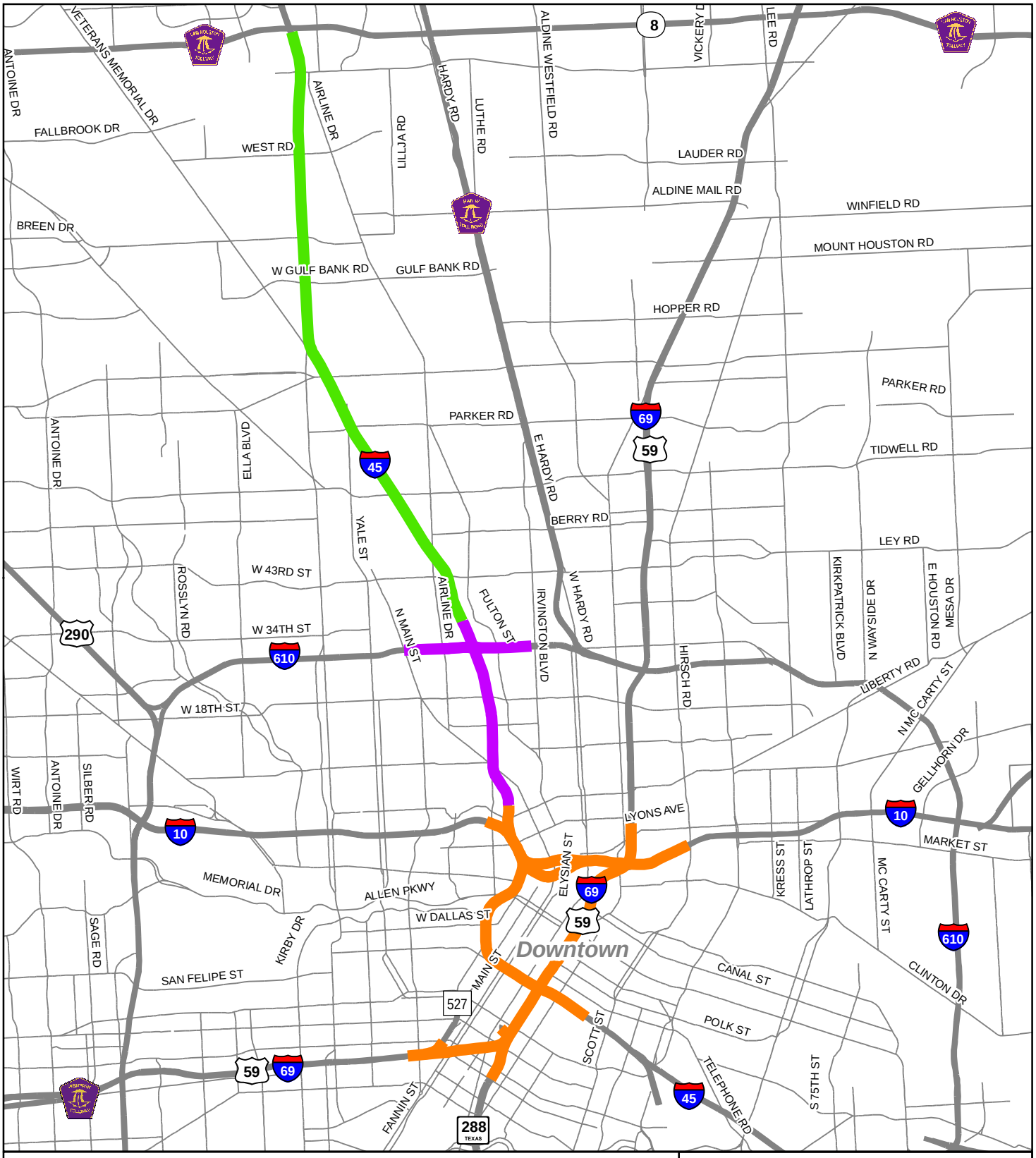
	Number	Water Body	Acres	Possible Impacts	
				Existing ROW	Proposed ROW
Segment 1	14	Janowski Ditch	0.331		Bridge or Culvert
	15*	Little White Oak Bayou 1 in Segment 1*	0.401	Bridge	
	16	Un-named Ditch 1	0.016	Bridge	
Segment 2	15*	Little White Oak Bayou 1 in Segment 2*	2.438	Bridge	
	17	Little White Oak Bayou 2	0.040		Bridge
	18	Little White Oak Bayou 3	1.019		
	19	Un-named Ditch 2	0.145		
	20	Little White Oak Bayou 4	0.535	40-foot culvert extension northward	
	21	Little White Oak Bayou 5	0.331		
Segment 3	22	Little White Oak Bayou 6	0. 342	Bridge	Bridge
	23	White Oak Bayou	3.117	Bridge	Bridge
	24	Buffalo Bayou East	9.383	Bridge	Bridge
	25	Buffalo Bayou West 1	1.456	Bridge	Bridge
	26	Buffalo Bayou West 2	2.217	Bridge	Bridge
	27	Water Fountain	0.115		
	28	Detention Basin 1	0.336		
	29	Detention Basin 2	2.809		

* Little White Oak Bayou 1 is located in both Segments 1 and 2

8.0 Section 408 Coordination

Section 408 coordination is required for NHHIP activities that would alter, occupy, or use any USACE civil works project, per Section 14 of the Rivers and Harbors Act of 1899, as codified in 33 U.S. Code §408. The Secretary of the Army may, on the recommendation of the Chief of Engineers, grant permission to temporarily or permanently occupy, use, or alter work that was federally funded, provided that such occupation, use, or alteration is not injurious to the public interest and will not impair the usefulness of the existing federal project. Department of the Army Engineer Circular No. 1165-2-216 states the policy and procedural guidance for processing requests to occupy, use, or alter federally-authorized USACE civil works projects.

The section of White Oak Bayou that is within the NHHIP area is part of a federally-funded project, with HCFCD as the local sponsor. TxDOT would be required to coordinate with the USACE and HCFCD to determine if the occupation or alteration of the White Oak Bayou federal project by the proposed NHHIP would be injurious to the public interest or impair the usefulness of the federal project.



Legend

- Segment 1
- Segment 2
- Segment 3

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North Houston Highway Improvement Project

Vicinity Map

Texas Department of Transportation

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Date: January 2018

Exhibit: 1

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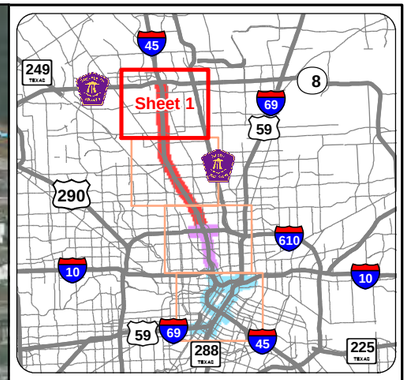

Index Map

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- Existing ROW
- Proposed ROW
- Water Bodies in Project Area
- NHD Streams

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Aerial Source: Word Imagery 2016, ESRI Online

North Houston Highway Improvement Project

Water Bodies in Project Area

Texas Department of Transportation
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Date: January 2018

Exhibit: 2 - Sheet 1

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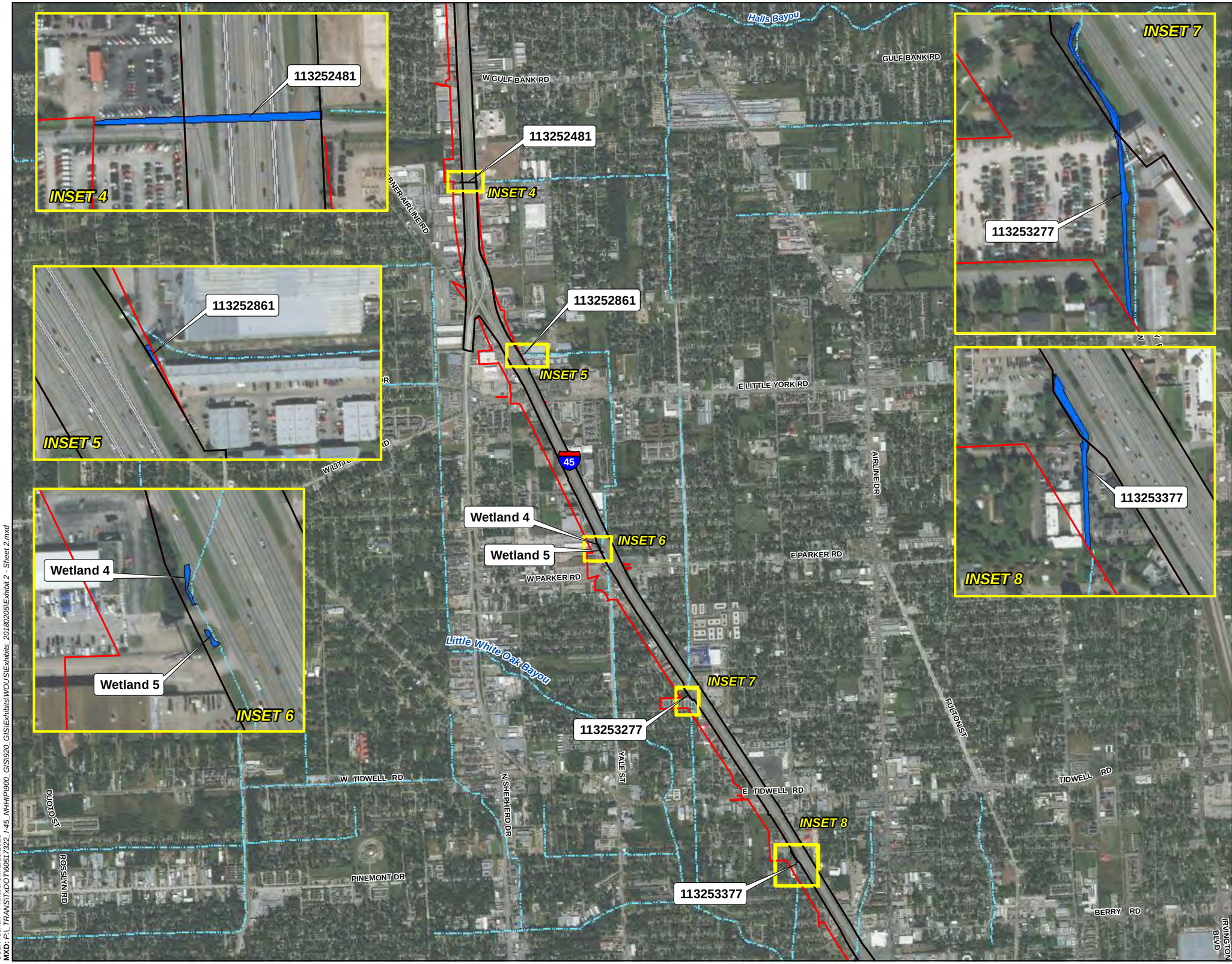

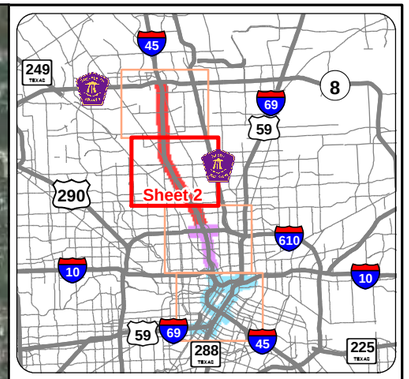

Index Map

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- Existing ROW
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- NHD Streams

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Aerial Source: Word Imagery 2016, ESRI Online

North Houston Highway Improvement Project

Water Bodies in Project Area

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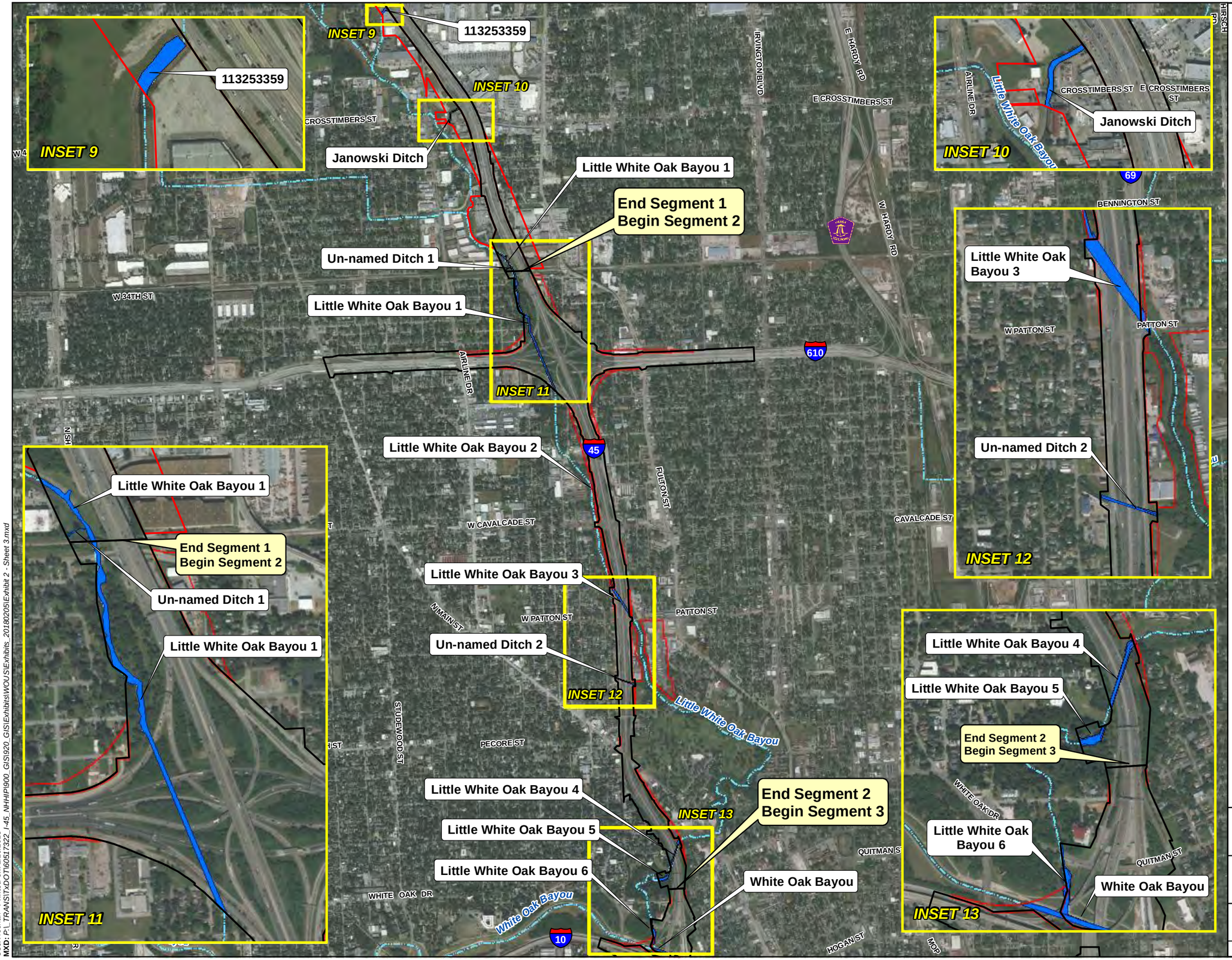

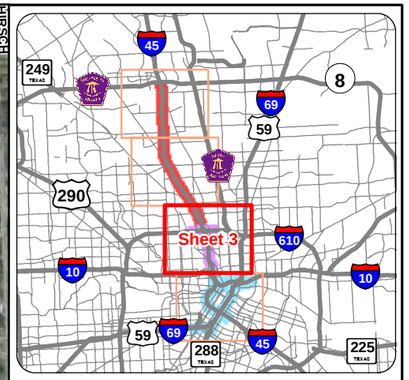

Index Map

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- Existing ROW
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Aerial Source: Word Imagery 2016, ESRI Online

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Water Bodies in Project Area

Texas Department of Transportation

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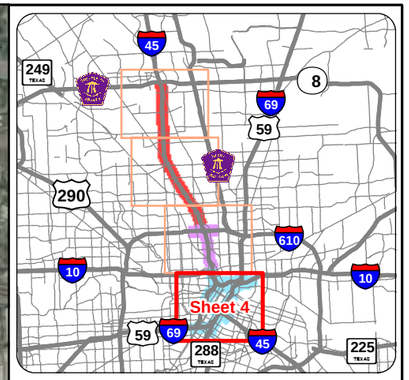

Index Map

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- Existing ROW
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Water Bodies in Project Area

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Exhibit: 2 - Sheet 4

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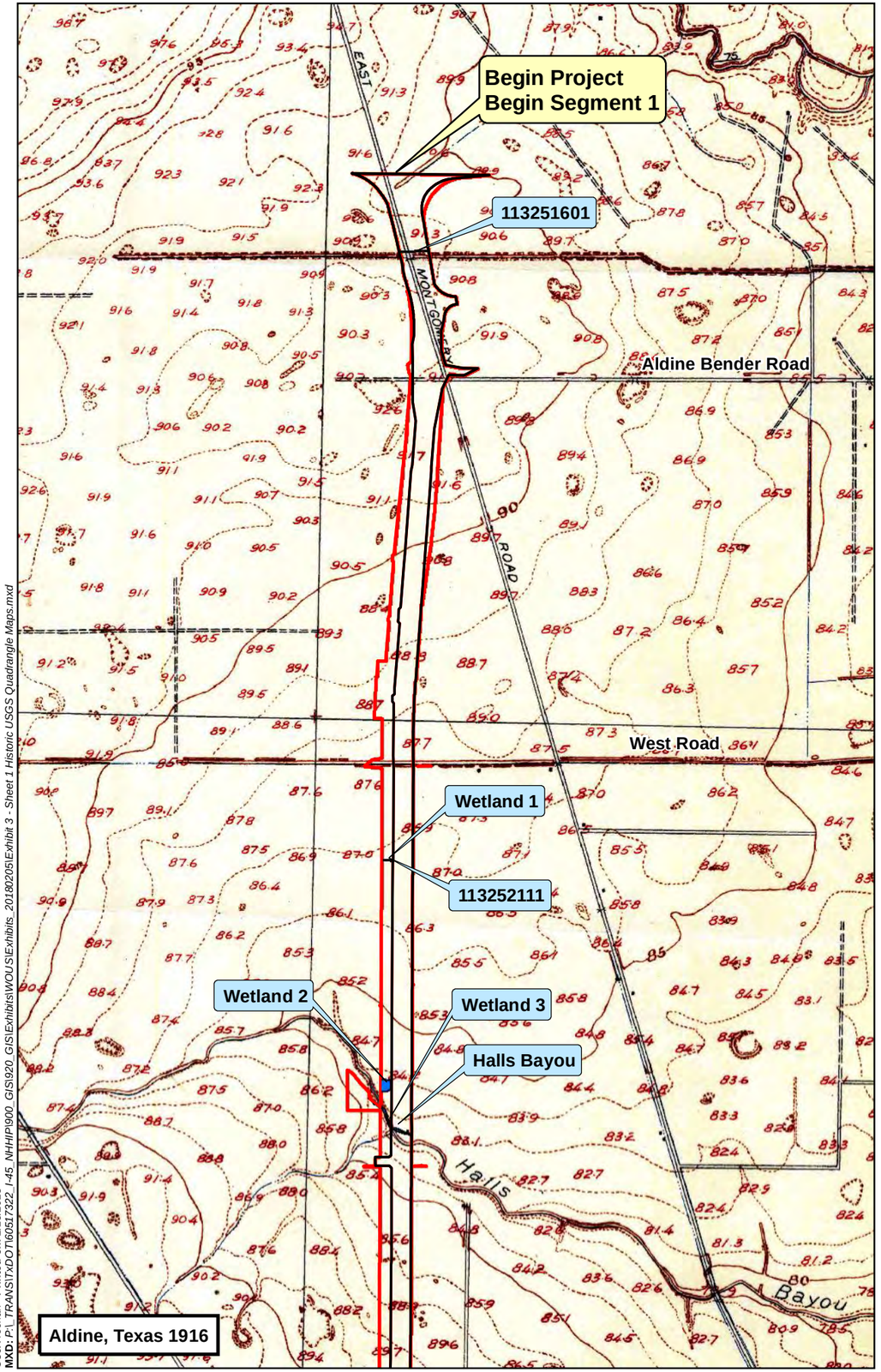

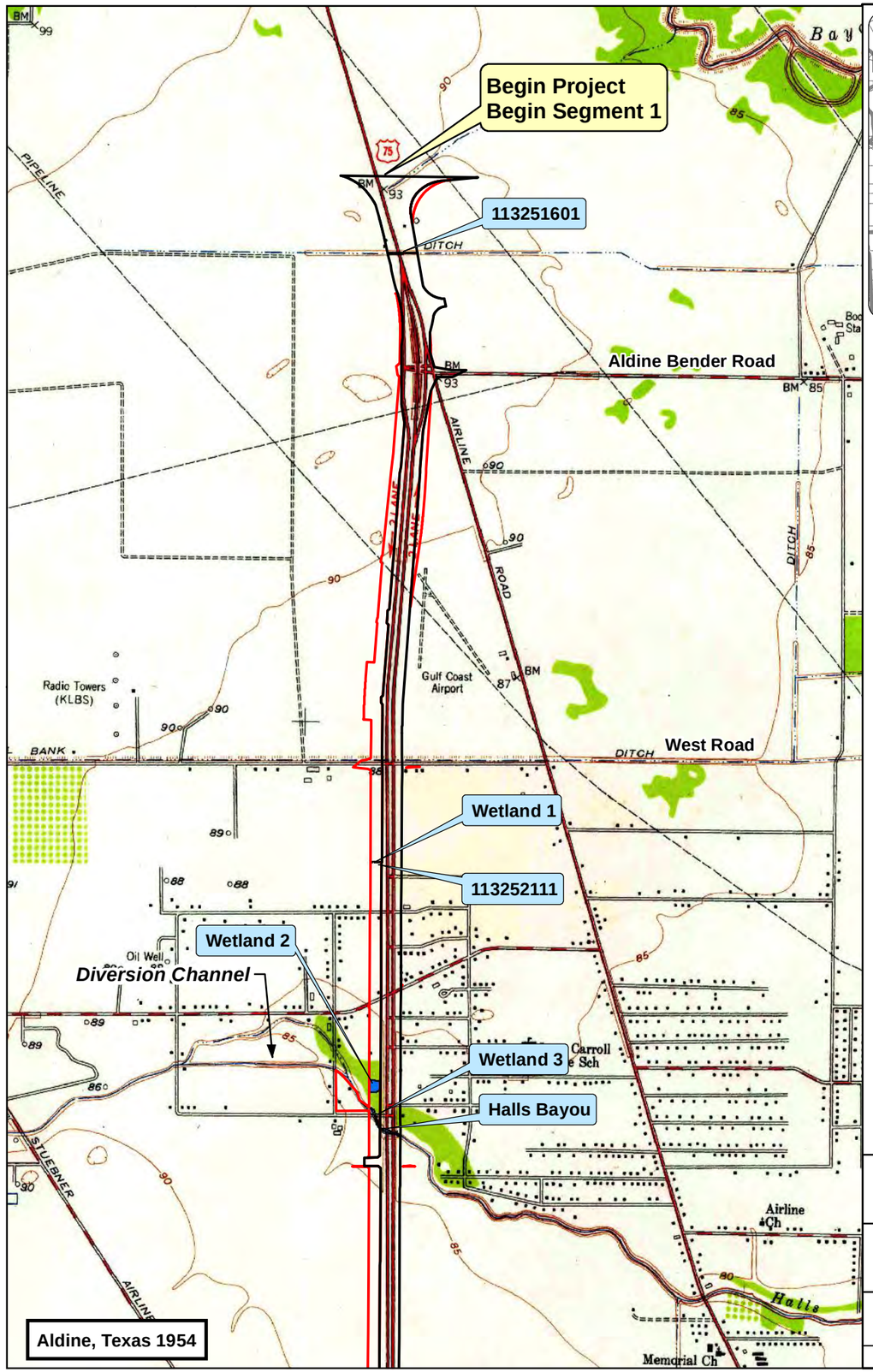

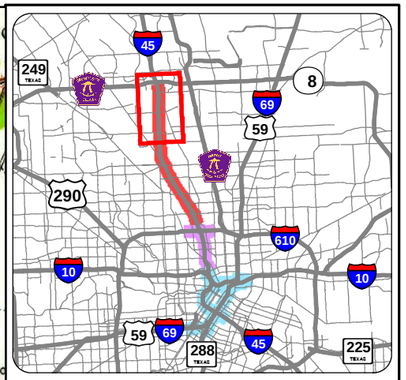

Index Map

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- Existing ROW
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North Houston Highway Improvement Project

Historical USGS Quadrangle Maps

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Exhibit: 3 - Sheet 1

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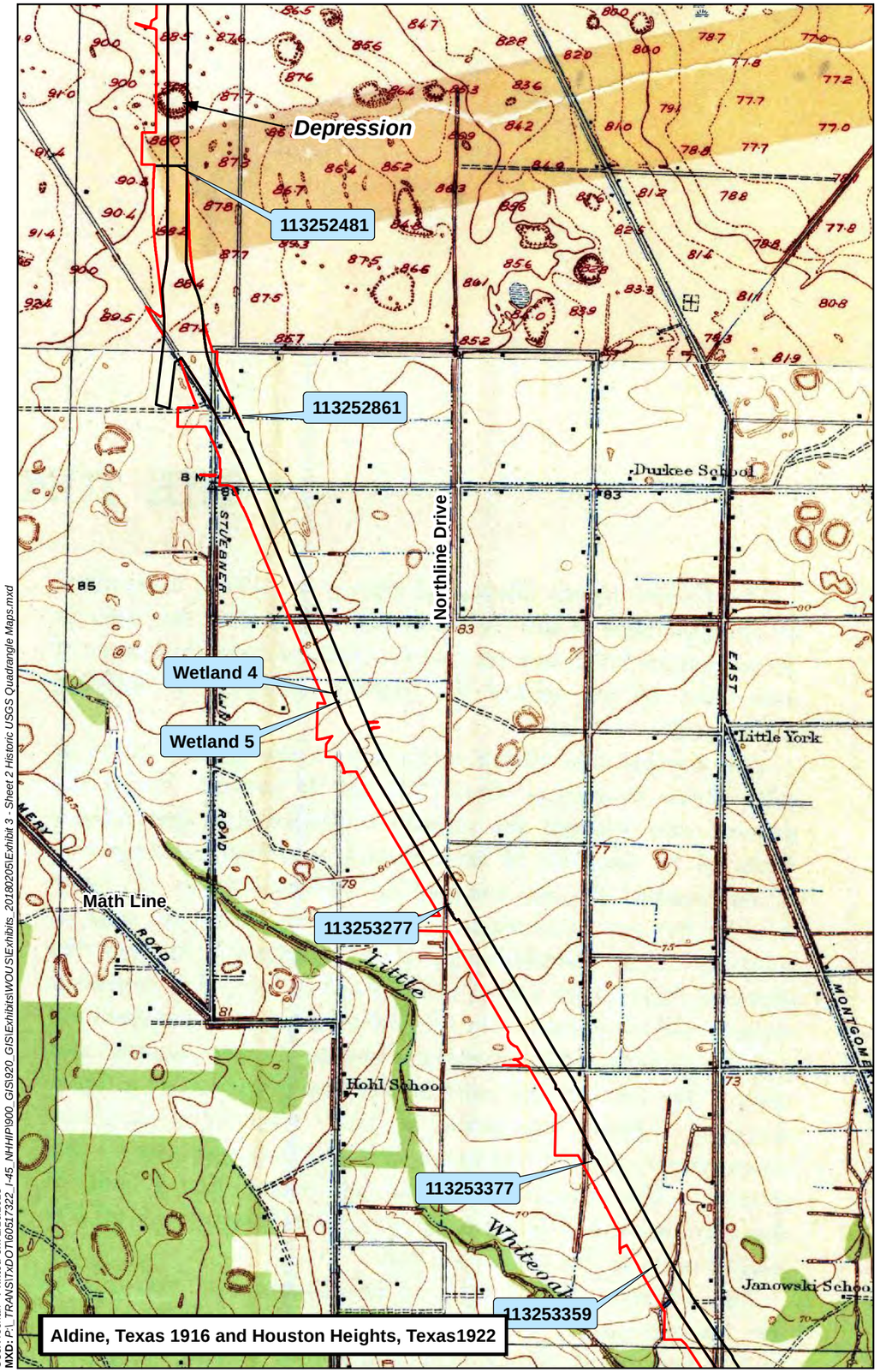

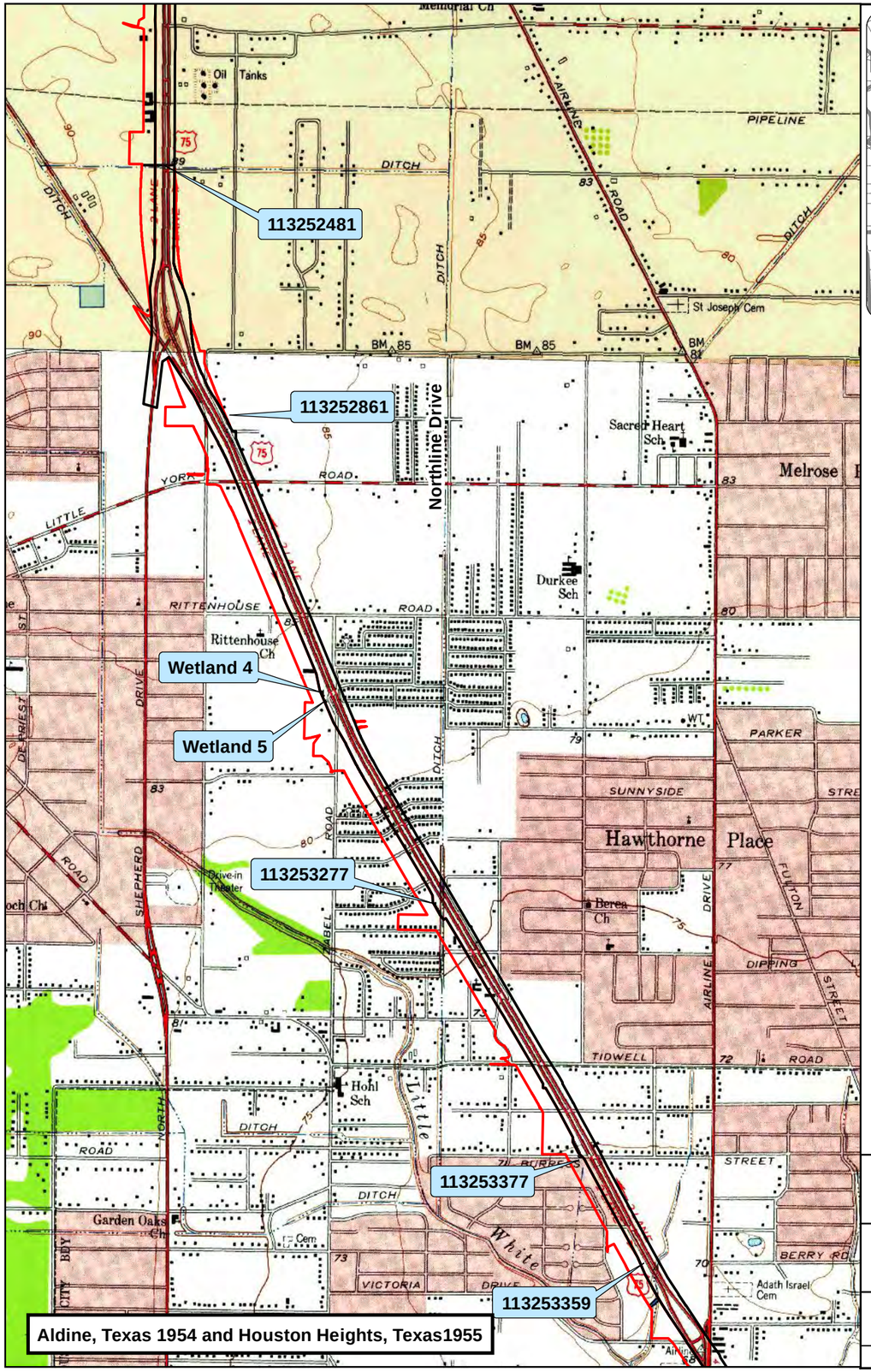

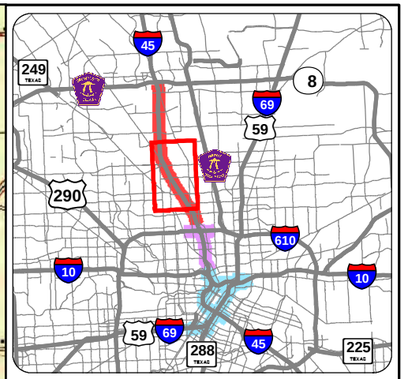

Index Map

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- Existing ROW
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North Houston Highway Improvement Project

Historical USGS Quadrangle Maps

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Houston Heights, Texas 1922
and Settegast, Texas 1922

Janowski Ditch

Little White Oak Bayou 1

End Segment 1
Begin Segment 2

Un-named Ditch 1

Little White Oak Bayou 1

Little White Oak Bayou 2

W Cavalcade Street

Little White Oak Bayou 3

Coronado Street

Patton Street

Un-named Ditch 2

Little White Oak Bayou 4

Little White Oak Bayou 5

End Segment 2
Begin Segment 3

Little White Oak Bayou 6

Houston Heights, Texas 1955
and Settegast, Texas 1955

Janowski Ditch

Little White Oak Bayou 1

End Segment 1
Begin Segment 2

Un-named Ditch 1

Little White Oak Bayou 1

Little White Oak Bayou 2

W Cavalcade Street

Little White Oak Bayou 3

Coronado Street

Patton Street

Un-named Ditch 2

Little White Oak Bayou 4

Little White Oak Bayou 5

End Segment 2
Begin Segment 3

Little White Oak Bayou 6

White Oak Drive

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Legend

- Existing ROW
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North Houston Highway Improvement Project

Historical USGS Quadrangle Maps

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Date: January 2018

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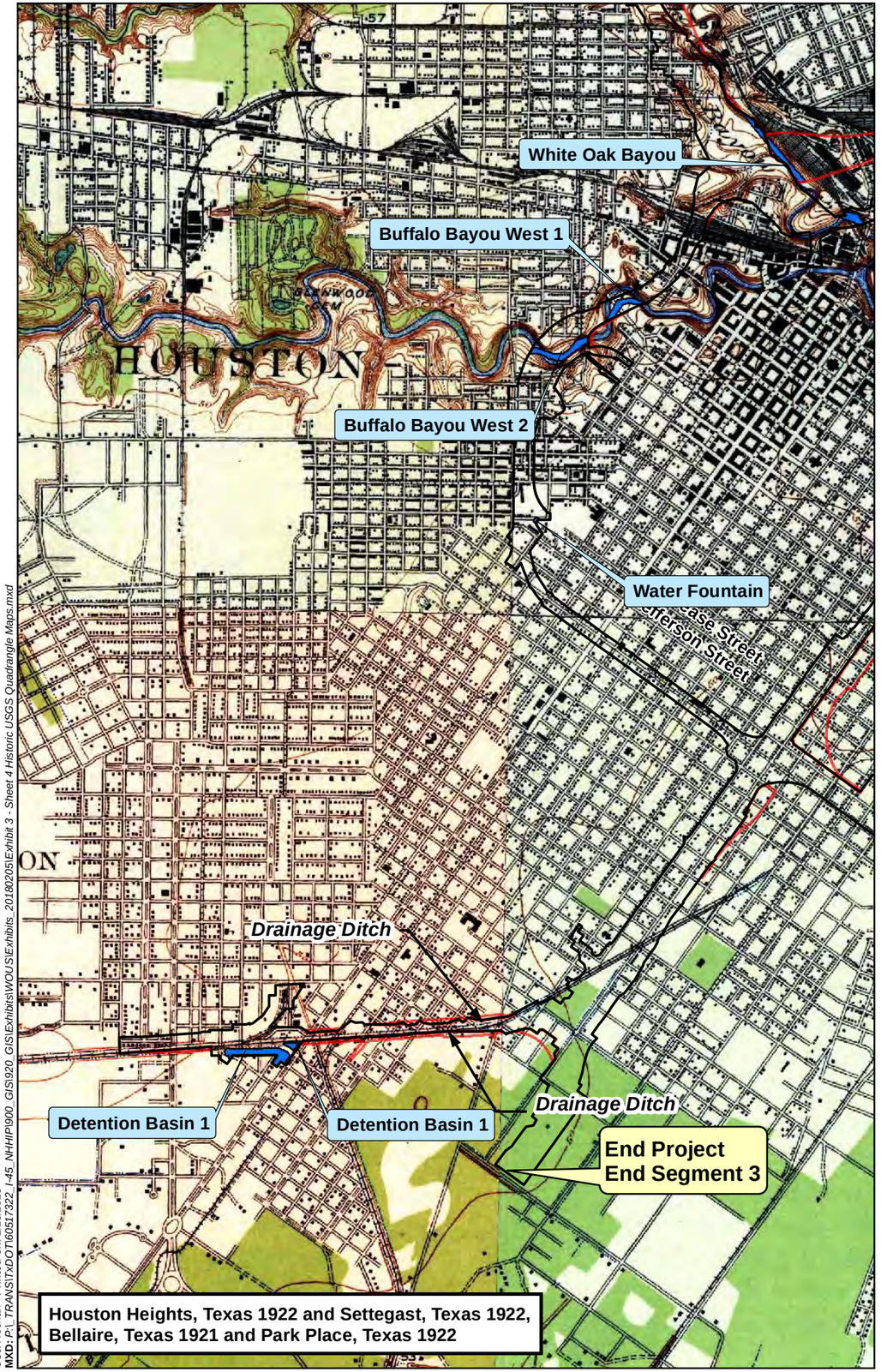
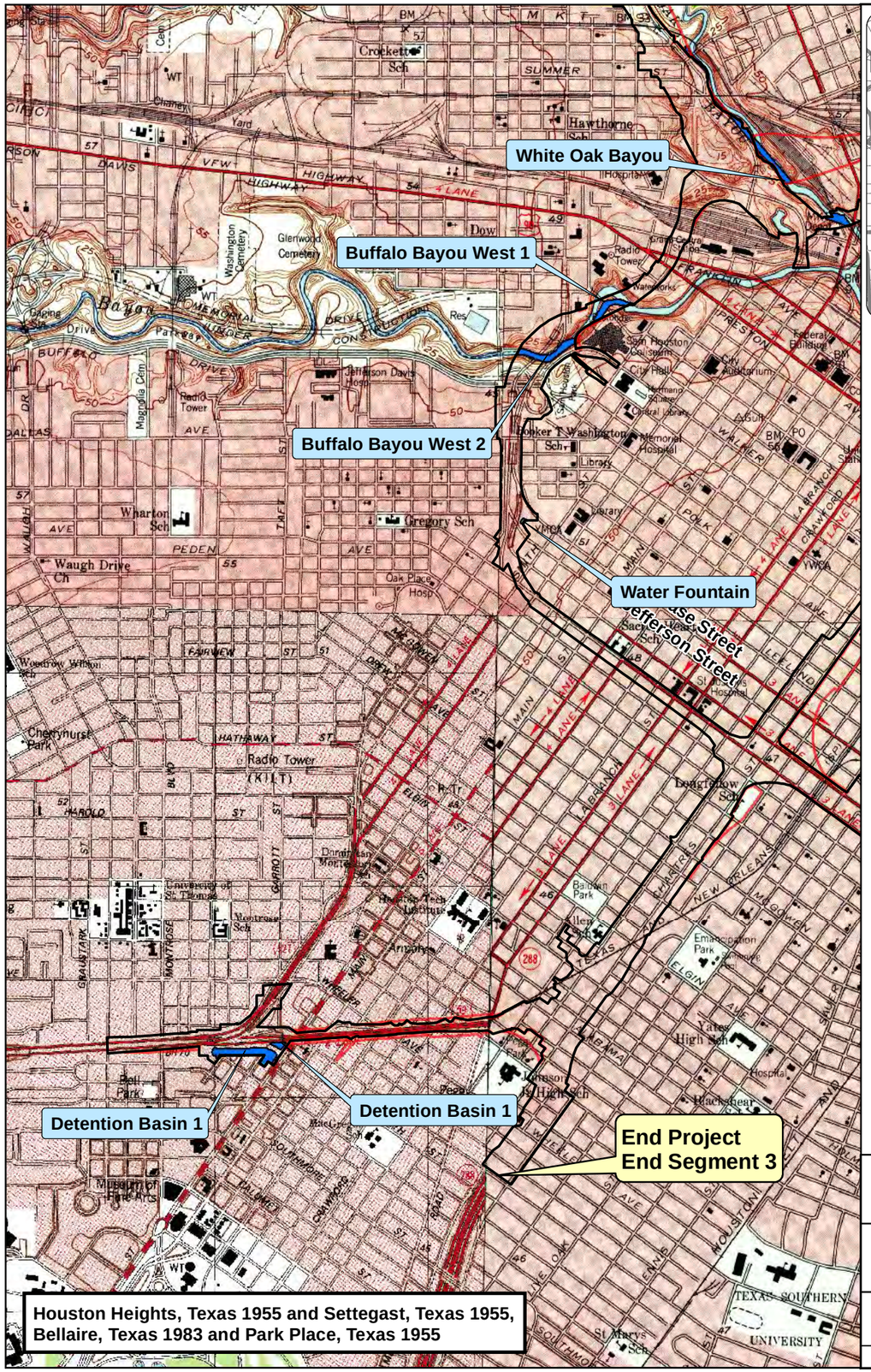
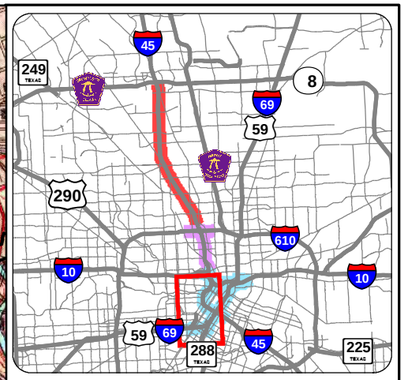


Houston Heights, Texas 1922 and Settegast, Texas 1922, Bellaire, Texas 1921 and Park Place, Texas 1922



Houston Heights, Texas 1955 and Settegast, Texas 1955, Bellaire, Texas 1983 and Park Place, Texas 1955



Vicinity Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

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North Houston Highway Improvement Project

Historical USGS Quadrangle Maps

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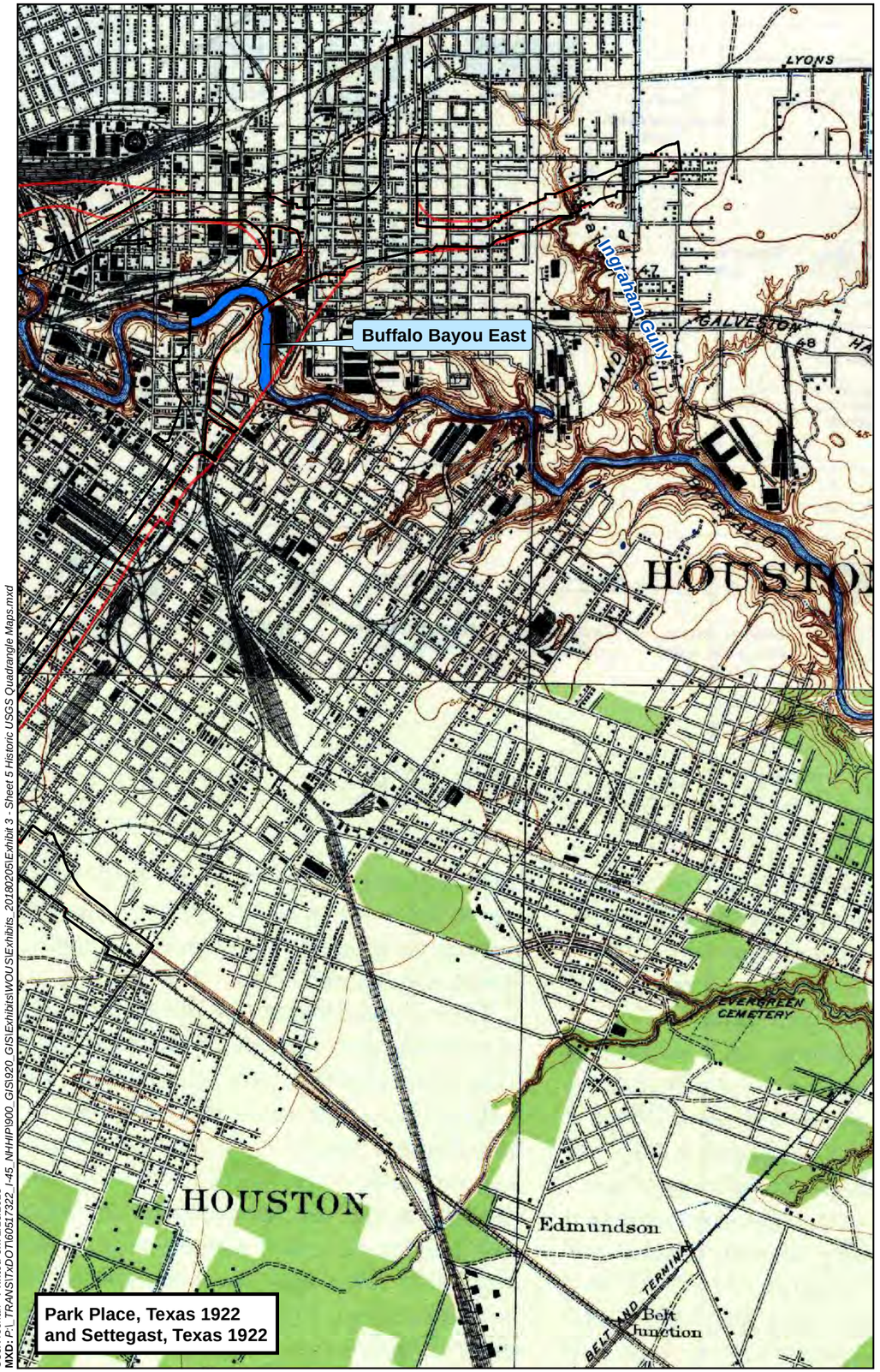
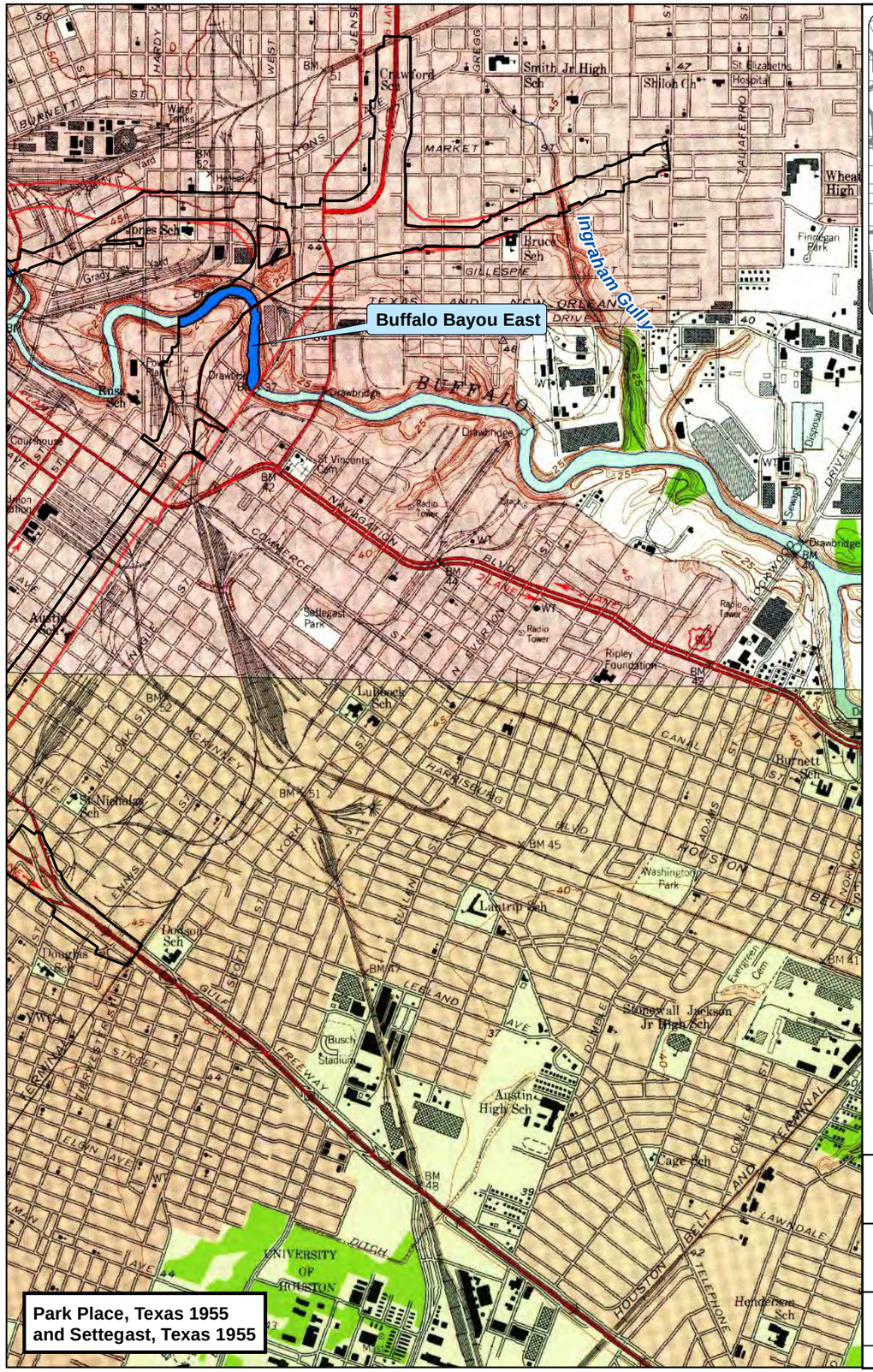


Park Place, Texas 1922
and Settegast, Texas 1922



Park Place, Texas 1955
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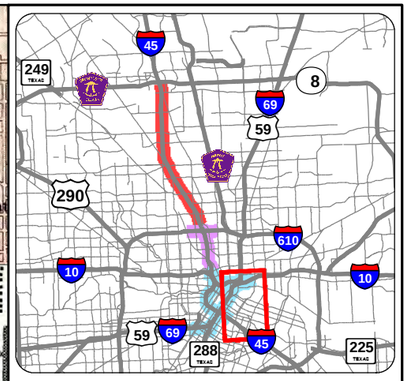

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

N
W E
S

0 1,000 2,000 4,000
Feet

North Houston Highway Improvement Project

Historical USGS Quadrangle Maps

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Date: January 2018 | Exhibit: 3 - Sheet 5

User: rochah **Printed on:** 2/15/2018
MXD: P:_TRANSITXDOT\60517322_I-45_NHHIP900_GIS\920_GIS\Exhibits\WOU SIExhibits_20180205\Exhibit 3 - Sheet 5 Historic USGS Quadrangle Maps.mxd

Begin Project
Begin Segment 1
Soil Station 1
INSET 1
113251601
PANEL 2
WEST RD
Wetland 1
Soil Station 3
Soil Station 4
INSET 3
113252111
AIRLINE DR
Soil Station 2
INSET 2
FALLBROOK DR
GREENSPOINT DR
Wetland 2
Halls Bayou
Wetland 3
Soil Station 5
Soil Station 6
INSET 4
W MOUNT HOUSTON RD
W GULF BANK RD
PANEL 1
INSET 1
INSET 2
INSET 3
INSET 4
PEM1A
PFO1A
PUSCx
PEM1Cx
PSSC
PSS1A
PEMf
PSSf
PFO1C
PUBHx
PUBFx
PEM1C
Ge
Cd
Ad
Ce
W
Gu
Ak

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area
- Sheet Match Line
- NHD Streams
- Soil Boundary
- NWI Wetlands
- Soil Station

FEMA Flood Hazard Zones

- 1% Annual Exceedance Probability Flood Hazard
- Regulatory Floodway

N
W E
S

0 500 1,000 2,000
Feet

TxGoogleImagery - WMS, Texas 2017
Water features from National Hydrography Dataset (NHD),USGS;
Floodplain from Q3 Flood data, FEMA;
NWI Wetlands from USFWS.

North Houston Highway Improvement Project

Floodplain, NWI, and Soils

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MXD: P:_TRANSTXDOT\16051\7322_I-45_NHHIP\900_GIS\920_GIS\Exhibits\WOUS\Exhibits_20180205\Exhibit 4 - Sheet 1 Floodplain_NWI_and Soils_R.mxd

PANEL 3

PANEL 4

INSET 5

INSET 6

INSET 7

INSET 8

Soil Station 7

Soil Station 8

Soil Station 9

Soil Station 10

Soil Station 11

Soil Station 12

Soil Station 13

Soil Station 14

113252481

113252861

113253277

113253377

113253359

Wetland 4

Wetland 5

Little White Oak Bayou

NORTHLINE DR

YALE ST

W TIDWELL RD

N VICTORY DR

BERRY RD

AIRLINE DR

UPLX

PUBF

PUBFx

PFO1A

PFO1C

PSS1A

PEM1A

Ak

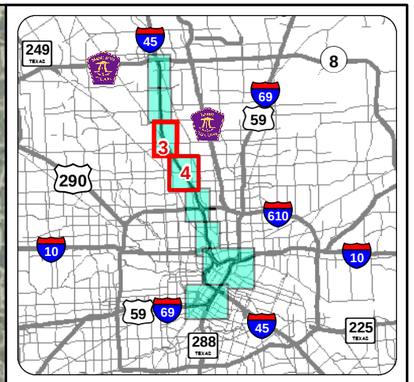
Bg

Ce

Gu

45

Index Map



Legend

- Existing ROW
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- NHD Streams
- Soil Boundary
- NWI Wetlands
- Soil Station

FEMA Flood Hazard Zones

- 1% Annual Exceedance Probability Flood Hazard
- Regulatory Floodway

N
W E
S

0 500 1,000 2,000
Feet

TxGoogleImagery - WMS, Texas 2017
Water features from National Hydrography Dataset (NHD),USGS;
Floodplain from Q3 Flood data, FEMA;
NWI Wetlands from USFWS.

North Houston Highway Improvement Project

Floodplain, NWI, and Soils

Texas Department of Transportation

Date: January 2018

Exhibit 4 - Sheet 2

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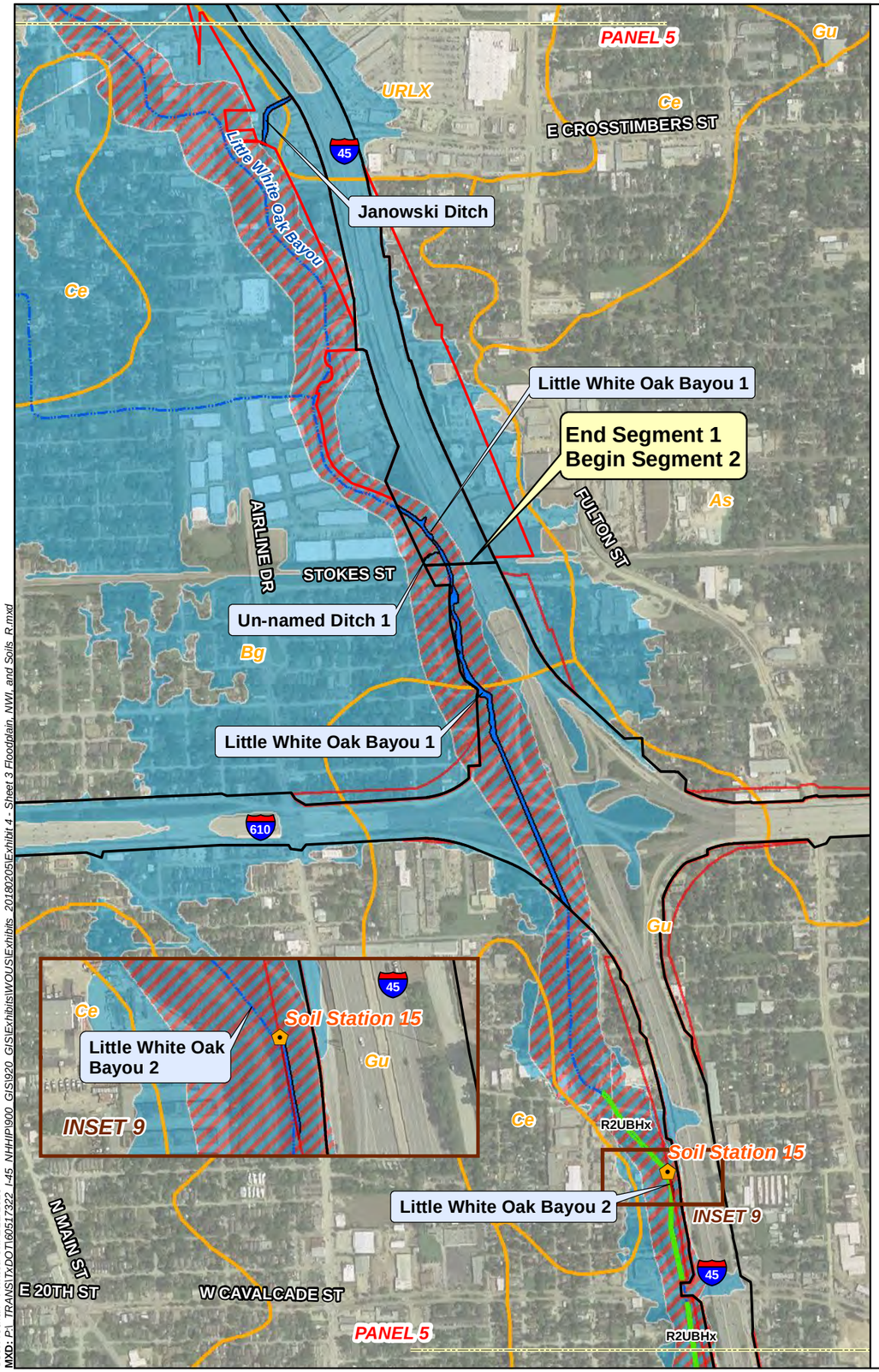

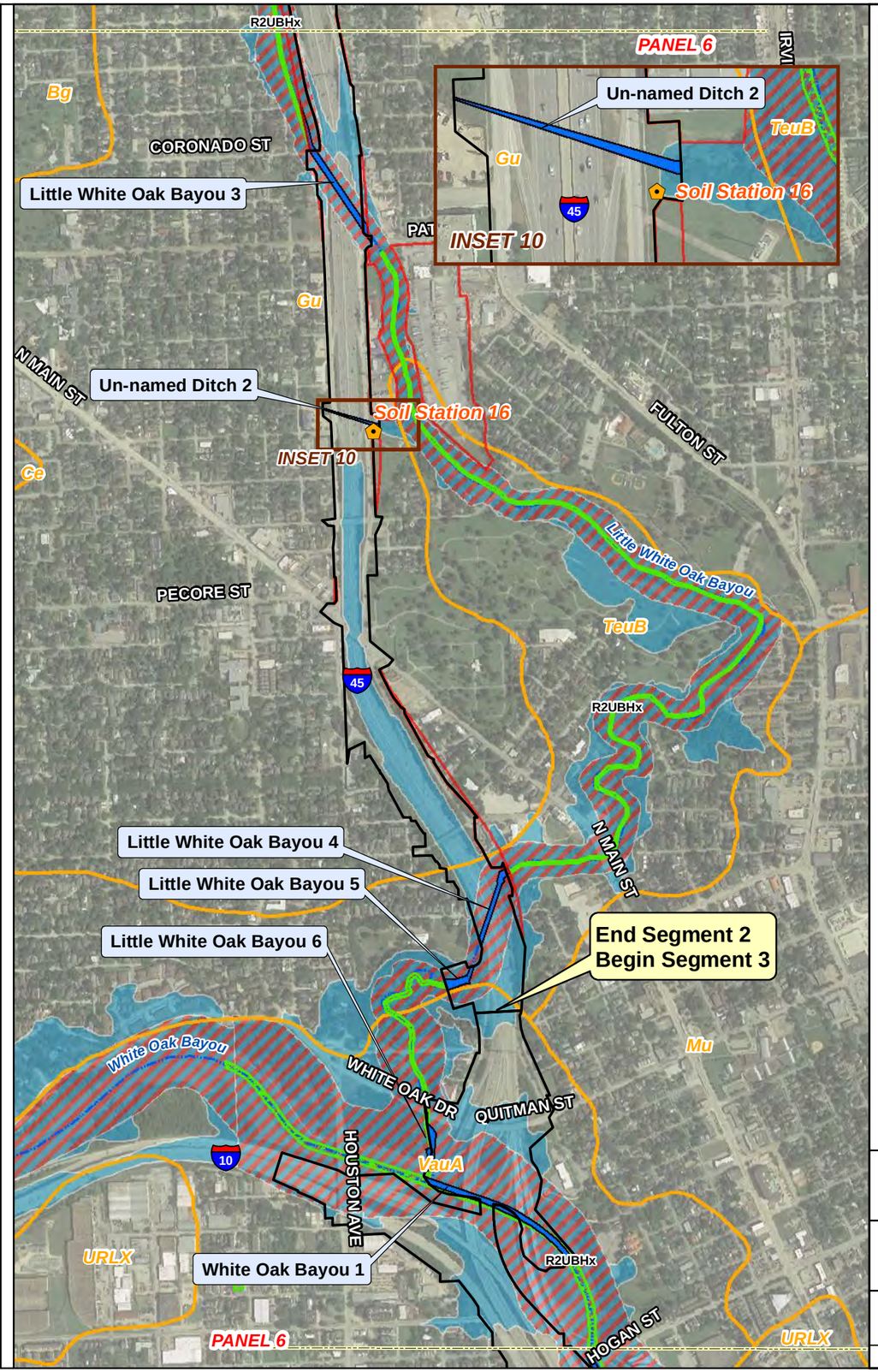

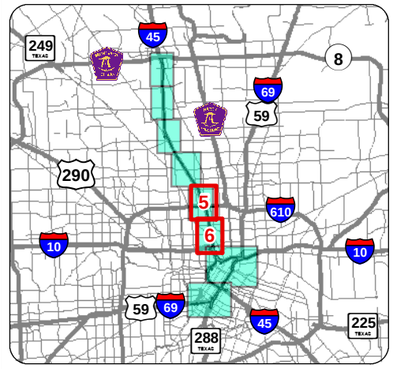

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area
- Sheet Match Line
- NHD Streams
- Soil Boundary
- NWI Wetlands

FEMA Flood Hazard Zones

- 1% Annual Exceedance Probability Flood Hazard
- Regulatory Floodway

N W E S

0 500 1,000 2,000
Feet

TxGoogleImagery - WMS, Texas 2017
Water features from National Hydrography Dataset (NHD),USGS;
Floodplain from Q3 Flood data, FEMA;
NWI Wetlands from USFWS.

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Floodplain, NWI, and Soils

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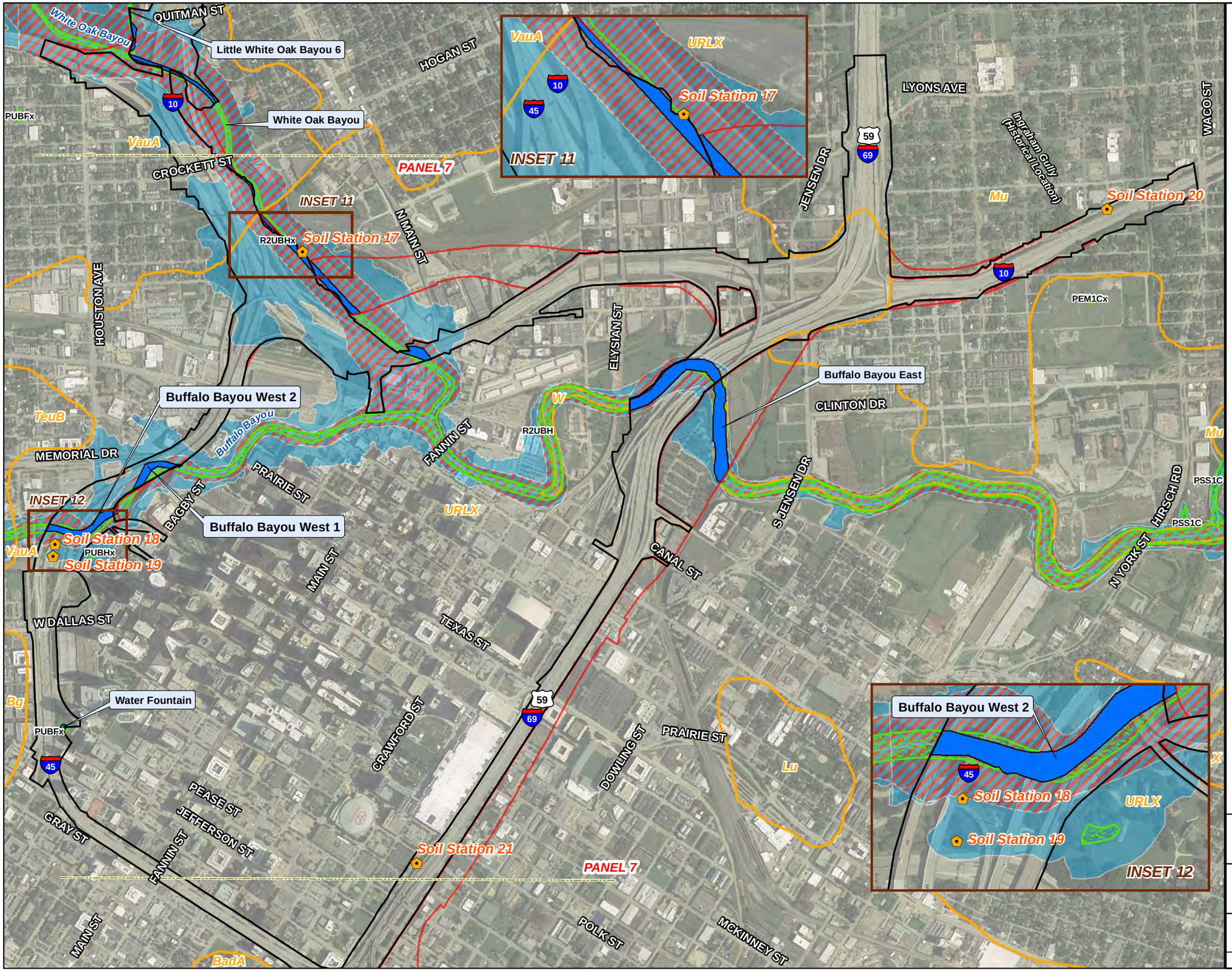

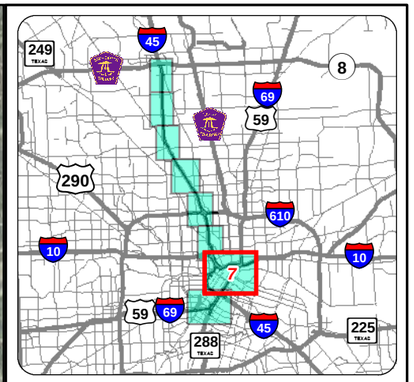

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area
- Sheet Match Line
- NHD Streams
- Soil Boundary
- NWI Wetlands
- Soil Station

FEMA Flood Hazard Zones

- 1% Annual Exceedance Probability Flood Hazard
- Regulatory Floodway

N W E S

0 600 1,200 2,400

Feet

TxGoogleImagery - WMS, Texas 2017
Water features from National Hydrography Dataset (NHD),USGS;
Floodplain from Q3 Flood data, FEMA;
NWI Wetlands from USFWS.

North Houston Highway Improvement Project

Floodplain, NWI, and Soils

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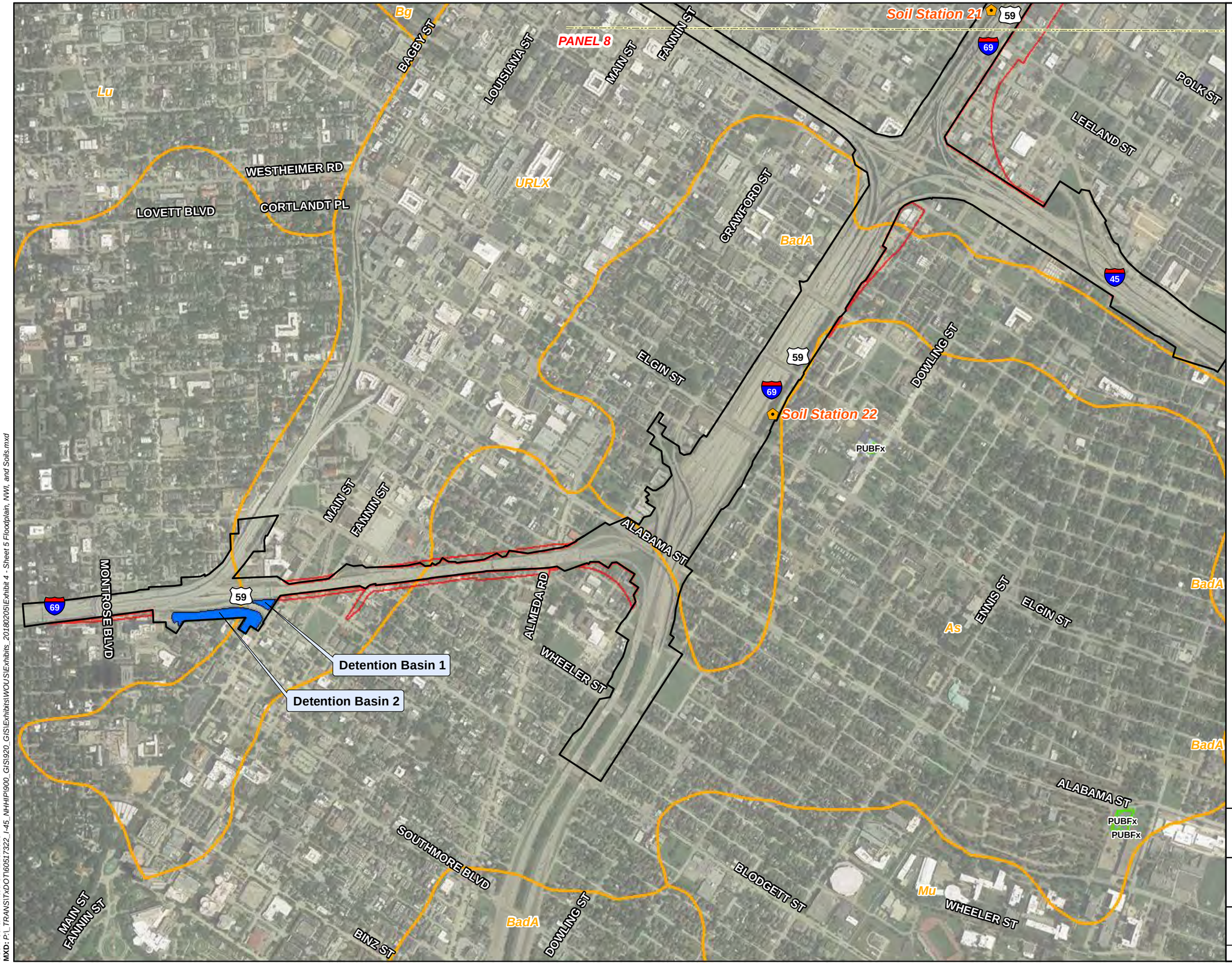

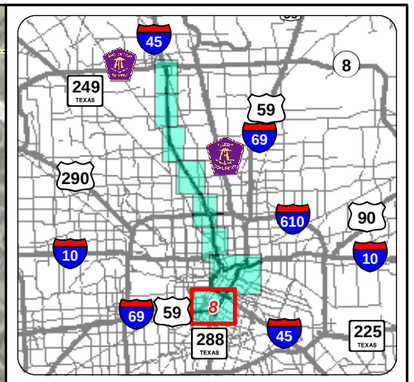

Vicinity Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area
- Sheet Match Line
- NHD Streams
- Soil Boundary
- NWI Wetlands
- Soil Station

FEMA Flood Hazard Zones

- 1% Annual Exceedance Probability Flood Hazard
- Regulatory Floodway

N
W E
S

0 500 1,000 2,000
Feet

TxGoogleImagery - WMS, Texas 2017
Water features from National Hydrography Dataset (NHD),USGS;
Floodplain from Q3 Flood data, FEMA;
NWI Wetlands from USFWS.

North Houston Highway Improvement Project

Floodplain, NWI, and Soils

Texas Department of Transportation

Date: January 2018

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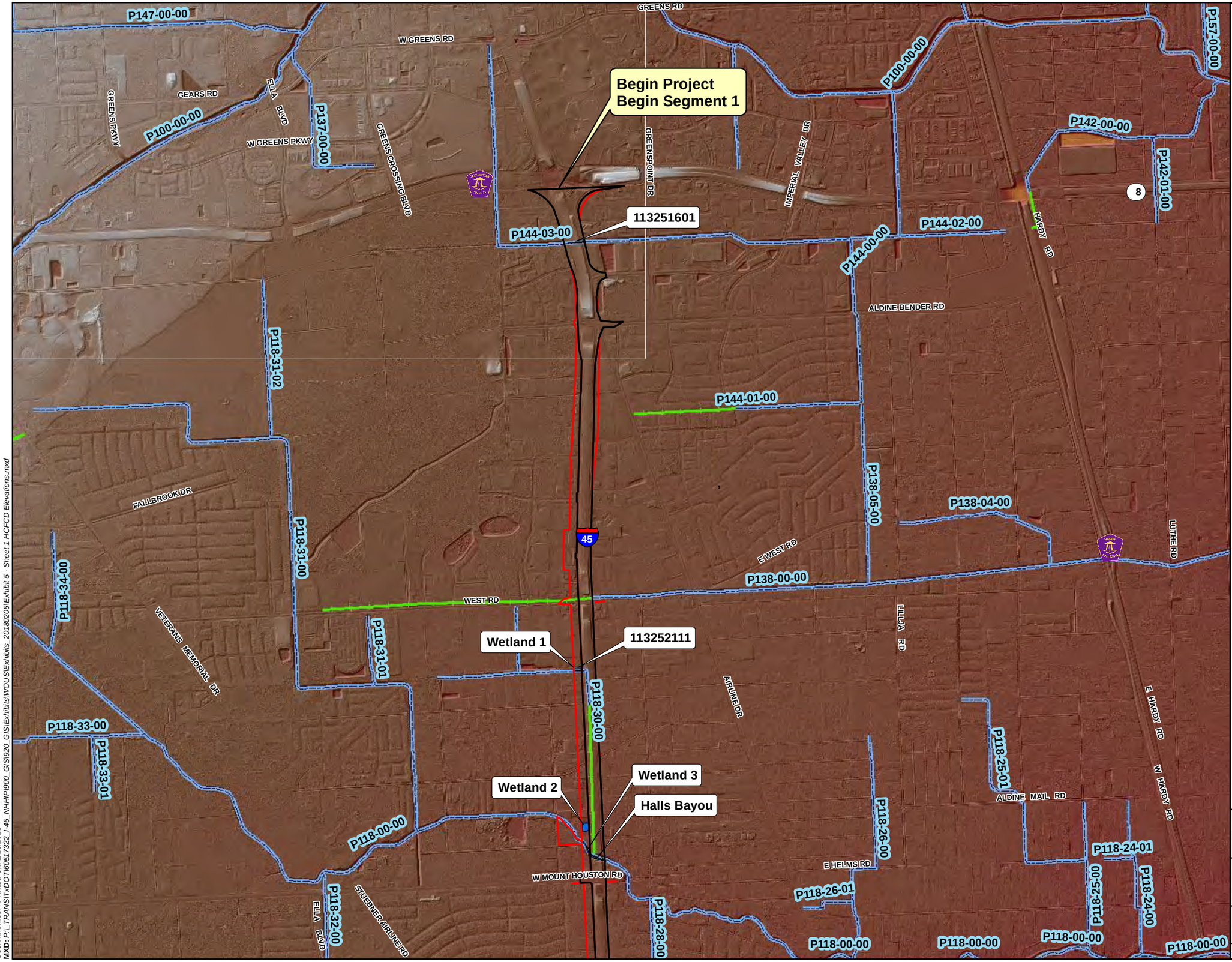

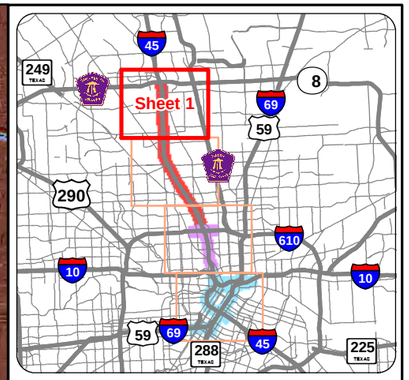

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

Harris County Flood Control Drainage

TYPE

- Historical
- Open
- Storm Sewer

Harris County Flood Control Elevation Data

Value

- High : 120
- Low : 0

N W E S

0 1,000 2,000 4,000

Feet

North Houston Highway Improvement Project

2008 HCFCD Digital Elevation Model

Texas Department of Transportation

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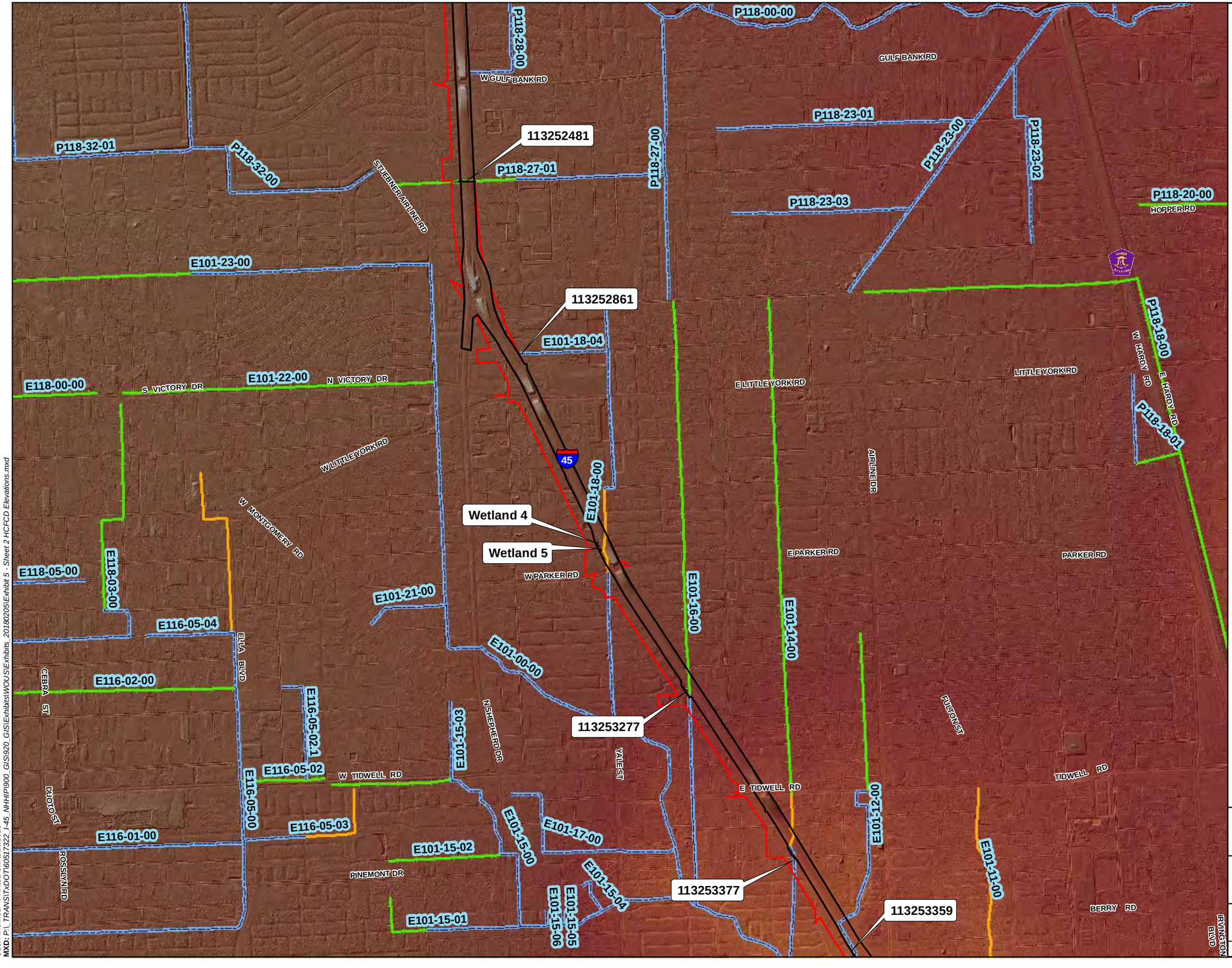

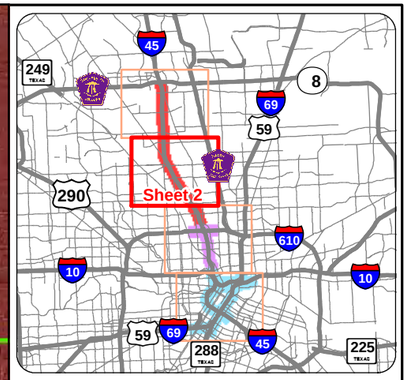

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

Harris County Flood Control Drainage

TYPE

- Historical
- Open
- Storm Sewer

Harris County Flood Control Elevation Data

Value

High : 120

Low : 0

N W E S

0 1,000 2,000 4,000

Feet

North Houston Highway Improvement Project

2008 HCFCD Digital Elevation Model

Texas Department of Transportation

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Exhibit: 5 - Sheet 2

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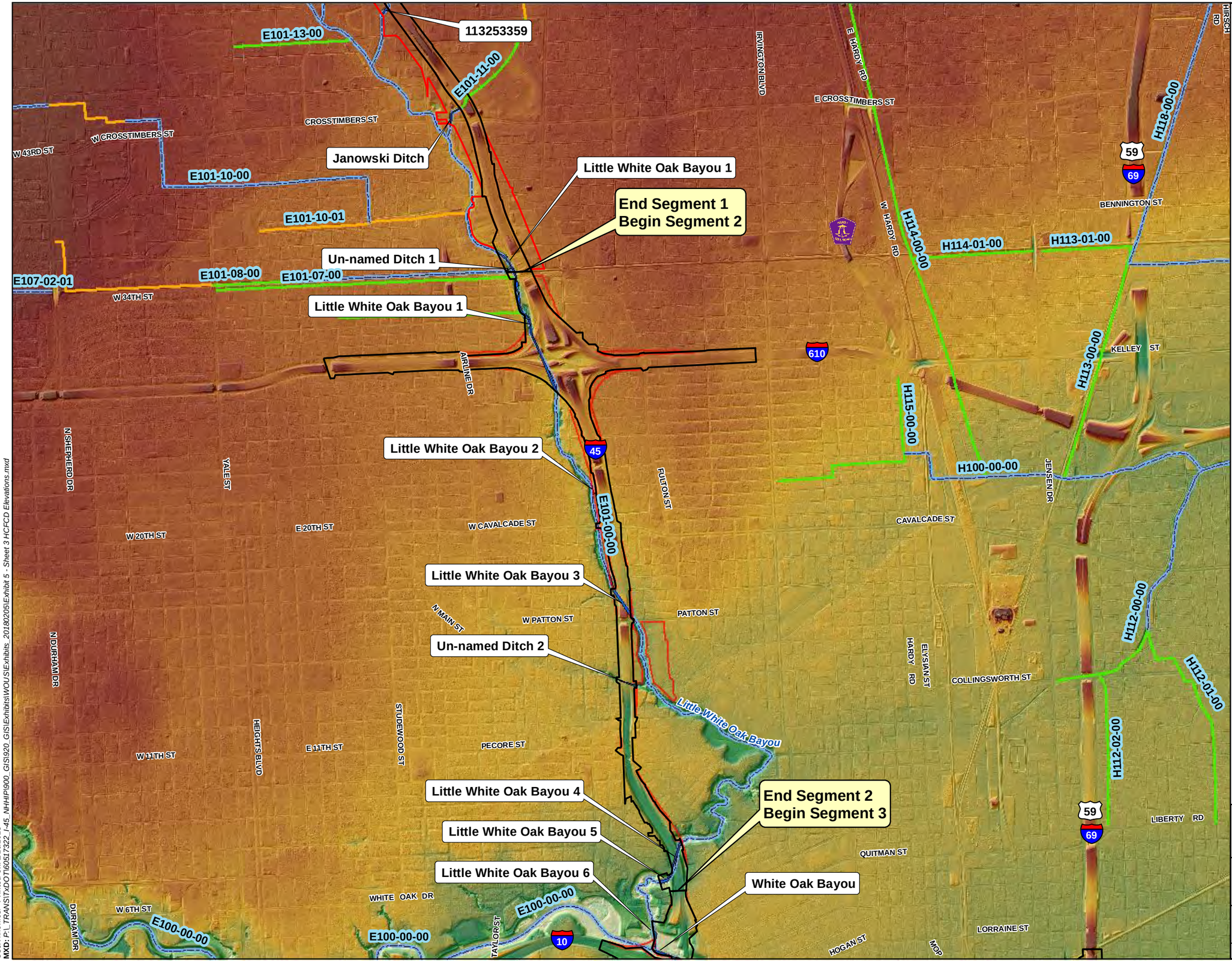

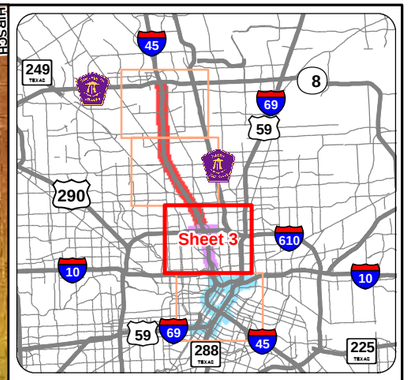

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

Harris County Flood Control Drainage

TYPE

- Historical
- Open
- Storm Sewer

Harris County Flood Control Elevation Data

Value

N W E S

0 1,000 2,000 4,000

Feet

North Houston Highway Improvement Project

2008 HCFCD Digital Elevation Model

Texas Department of Transportation

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Exhibit: 5 - Sheet 3

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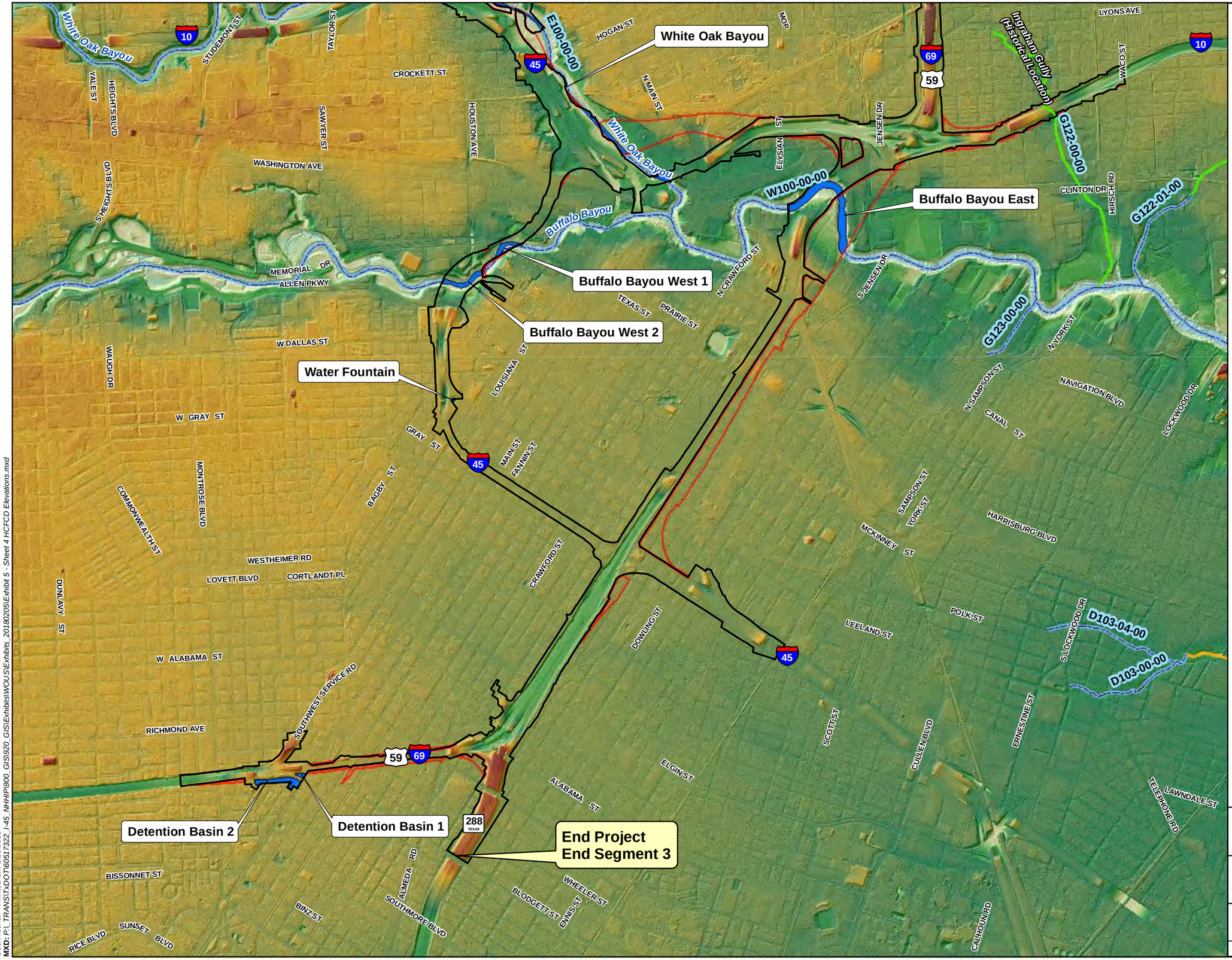

Index Map

Legend

- Existing ROW
- Proposed ROW
- Water Bodies in Project Area

Harris County Flood Control Drainage

TYPE

- Historical
- Open
- Storm Sewer

Harris County Flood Control Elevation Data

Value

High : 120

Low : 0

N W E S

0 1,000 2,000 4,000

Feet

North Houston Highway Improvement Project

2008 HCFCD Digital Elevation Model

Texas Department of Transportation

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Exhibit: 5 - Sheet 4

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Appendix A

Site Photographs

Photo 1 - Looking west at culverts of Drainage Ditch 113251601 at eastern boundary of ROW

Photo 2 - Looking west at Drainage Ditch 113252111 and Wetland 1

Photo 3 - Looking east at Drainage Ditch 113252111

Photo 4 - Looking west within Wetland 2

Photo 5 - Looking southeast at Halls Bayou and Wetland 3 west of existing I-45 frontage road

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018

Appendix A, Exhibit 1

Photo 6 - Looking east under the I-45 roadway at Halls Bayou

Photo 7 - Looking west at Drainage Ditch 113252481 (grass-lined) in the proposed ROW

Photo 8 - Looking east at Drainage Ditch 113252481 west of the existing I-45 frontage road

Photo 9 - Looking west at Drainage Ditch 113252861 (concrete-lined)

Photo 10 - Looking south at Wetland 4 (culverts and sediment deposits in channel)

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018

Appendix A, Exhibit 2

Photo 11 - Looking north at Wetland 5 (culverts and wetland vegetation)

Photo 12 - Looking southeast at Drainage Ditch 113253277

Photo 13 - Looking northwest at Drainage Ditch 113253377 (grass-lined channel) from East Burress Street

Photo 14 - Looking southwest at Drainage Ditch 113253359 (concrete-lined) from I-45 frontage road outfall

Photo 15 - Looking east at Janowski Ditch (riprap in channel bottom)

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018

Appendix A, Exhibit 3

Photo 16 - Looking south from Stokes Road bridge at Little White Oak Bayou 1

Photo 17 - Looking south at Little White Oak Bayou 2

Photo 18 - Looking west at outfall of Un-named Ditch 2

Photo 19 - Looking west at Little Oak Bayou 4 from outfall west of I-45 frontage road

Photo 20 - Looking south at Little White Oak Bayou 5 from White Oak Drive bridge

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018

Appendix A, Exhibit 4

Photo 21 - Looking east at White Oak Bayou (concrete-lined) upstream of the confluence with Little White Oak Bayou 6

Photo 22 - Looking north from bicycle path bridge at White Oak Bayou (riprap-lined banks in foreground to concrete-lined banks in background)

Photo 23 - Looking southeast at I-10 crossing of White Oak Bayou (riprap along banks)

Photo 24 - Looking northwest at I-10 crossing of White Oak Bayou

Photo 25 - Looking northwest at rail crossing of White Oak Bayou; I-45 and I-10 in background

North Houston Highway Improvement Project

Site Photographs

Date: January 2018

Appendix A, Exhibit 5

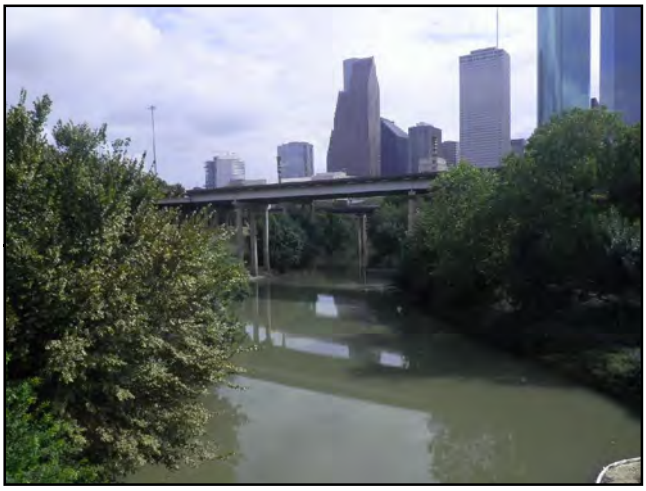

Photo 26 - Looking east at I-45 crossing of Buffalo Bayou West 2 from Sabine Street bridge

Photo 27 - Looking southwest from pedestrian bridge at I-45 crossing of Buffalo Bayou West 2

Photo 28 - Looking northeast from pedestrian bridge at I-45 Crossing of Buffalo Bayou West 1

Photo 29 - Looking east at I-45 crossing of Buffalo Bayou West 1 near Rusk Street and Memorial Drive intersection

Photo 30 - Looking north at Buffalo Bayou East from under US 59/I-69 bridges

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018

Appendix A, Exhibit 6

Photo 31 - Looking northeast at Buffalo Bayou East from under US 59/I-69 bridges

Photo 32 - Looking north at Buffalo Bayou East underneath US 59/I-69 bridges

Photo 33 - Looking northwest at Detention Basin 2 from Main Street

Photo 34 - Looking northeast at water fountain

North Houston Highway Improvement Project

Site Photographs

Texas Department of Transportation

Date: January 2018 | Appendix A, Exhibit 7

Appendix B

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 14, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS01
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR or MLRA): LRR T Lat: 29.939511 Long: -95.412427 Datum: NAD 83
Soil Map Unit Name: Clodine fine sandy loam, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS01**

		Absolute	Dominant	Indicator
Tree Stratum (Plot size: 30 ft.)		% cover	Species?	Status
1. *Pinus taeda*		60	Yes	FAC
2.				
3.				
4.				
5.				
6.				
		60	= Total Cover	
	50% of total cover:	30	20% of total cover:	12
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Stenotaphrum secundatum*		90	Yes	FAC
2. *Paspalum dilatatum*		15	No	FAC
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		105	= Total Cover	
	50% of total cover:	52.5	20% of total cover:	21
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**165**	x 3 =	**495**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**165** (A)		**495** (B)

Prevalence Index = B/A = **3.000**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS01**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	7.5YR 2.5/1	100					Loam	
4-11	7.5YR 4/2	70					Clay	Triple Matrix
	7.5YR 2.5/1	25					Clay	
	2.5YR 4/6	5					Clay	Shovel Restriction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Rock/Gravel

Depth (inches): 11

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 14, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS02
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.931212 Long: -95.412489 Datum: NAD 83
Soil Map Unit Name: Clodine fine sandy loam, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 _____	No **X**	
Hydric Soil Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?** Yes _____ No **X**
Wetland Hydrology Present?	Yes _____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes _____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS02**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Cynodon dactylon*	100	Yes	FACU
2. *Bothriochloa ischaemum*	30	No	UPL
3. *Sida rhombifolia*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	135 = Total Cover		
50% of total cover:	67.5	20% of total cover:	27
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**105**	x 4 =	**420**
UPL species	**30**	x 5 =	**150**
Column Totals:	**135** (A)		**570** (B)

Prevalence Index = B/A = **4.222**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC− or drier).

SOIL

Sampling Point: **SS02**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 2/1	100					Clay Loam	
7-12	10YR 4/1	90					Clay Loam	Dual Matrix
	10YR 8/4	10					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 14, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS03
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.911038 Long: -95.413316 Datum: NAD 83
Soil Map Unit Name: Clodine fine sandy loam, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Data point is the upland complement to Wetland 1 (SS04).

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS03**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Herb Stratum (Plot size: 30 ft.)			
1. *Bothriochloa ischaemum*	60	Yes	UPL
2. *Cynodon dactylon*	50	Yes	FACU
3. *Ambrosia psilostachya*	10	No	FAC
4. *Plantago virginica*	15	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	135 = Total Cover		
50% of total cover:	67.5	20% of total cover:	27

Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**65**	x 4 =	**260**
UPL species	**60**	x 5 =	**300**
Column Totals:	**135** (A)		**590** (B)

Prevalence Index = B/A = **4.370**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS03**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 14, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS04
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.910972 Long: -95.413320 Datum: NAD 83
Soil Map Unit Name: Clodine fine sandy loam, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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:

Wetland 1. Point was taken within a drainage channel. Water was flowing eastward.

HYDROLOGY

Wetland hydrology Indicators:

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

- **X** Surface Water (A1)
- **X** 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes **X**	No ____	Depth (inches): **2**
Water Table Present?	Yes **X**	No ____	Depth (inches): **0**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

A positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS04**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Persicaria hydropiperoides*	85	Yes	OBL
2. *Ludwigia peploides*	20	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	105 = Total Cover		
50% of total cover:	52.5	20% of total cover:	21
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**105**	x 1 =	**105**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**105** (A)		**105** (B)

Prevalence Index = B/A = **1.000**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS04**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/2	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Although no redoximorphic features were observed in the soil, the dominant vegetation, the presence of surface water and a high water table, and location within a drainage channel suggest that, over time, the soil would likely acquire redoximorphic features to meet the hydric soil parameter.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 15, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS05
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.900097 Long: -95.412965 Datum: NAD 83
Soil Map Unit Name: Clodine-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Data point is the upland complement for Wetland 3 (SS07).

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS05**

		Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Cynodon dactylon*		100	Yes	FACU
2. *Bothriochloa ischaemum*		15	No	UPL
3. *Rumex crispus*		5	No	FAC
4. *Persicaria hydropiperoides*		2	No	OBL
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		122	= Total Cover	
	50% of total cover:	61	20% of total cover:	24.4
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**2**	x 1 =	**2**
FACW species	**0**	x 2 =	**0**
FAC species	**5**	x 3 =	**15**
FACU species	**100**	x 4 =	**400**
UPL species	**15**	x 5 =	**75**
Column Totals:	**122** (A)		**492** (B)

Prevalence Index = B/A = **4.033**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **x**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS05**

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]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	85	10YR 5/3	15	C	M	Loam	Disturbed
2-16	10YR 3/2						Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

A positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 15, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS06
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.900022 Long: -95.412922 Datum: NAD 83
Soil Map Unit Name: Clodine-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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:

Wetland 3.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- **X** Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes _____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): **>20**

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

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

Remarks:

A positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS06**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Persicaria hydropiperoides*	100	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**100**	x 1 =	**100**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**100** (A)		**100** (B)

Prevalence Index = B/A = **1.000**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS06**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	7.5YR 4/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Although no redoximorphic features were observed in the soil, the dominant vegetation, oxidized rhizospheres observed on living roots, and depressed topographic position suggest that, over time, the soil would likely acquire redoximorphic features to meet the hydric soil parameter.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 19, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS07
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hilltop Local relief (concave, convex, none): Convex Slope (%): 1
Subregion (LRR or MLRA): LRR T Lat: 29.883122 Long: -95.412259 Datum: NAD 83
Soil Map Unit Name: Clodine-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS07**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Cynodon dactylon*	35	Yes	FACU
2. *Geranium carolinianum*	25	Yes	UPL
3. *Ambrosia psilostachya*	10	No	FAC
4. *Rumex crispus*	5	No	FAC
5. *Bothriochloa ischaemum*	25	Yes	UPL
6. *Paspalum notatum*	30	Yes	FACU
7.			
8.			
9.			
10.			
11.			
	130 = Total Cover		
50% of total cover:	65	20% of total cover:	26
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**	
FACW species	**0**	x 2 =	**0**	
FAC species	**15**	x 3 =	**45**	
FACU species	**65**	x 4 =	**260**	
UPL species	**50**	x 5 =	**250**	
Column Totals:	**130**	(A)	**555**	(B)

Prevalence Index = B/A = **4.269**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS07**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Silt Loam	
6-16	10YR 6/3	97	7.5YR 6/8	3	C	M	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 15, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS08
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.875024 Long: -95.411718 Datum: NAD 83
Soil Map Unit Name: Clodine-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS08**

		Absolute	Dominant	Indicator
Tree Stratum	(Plot size: 30 ft.)	% cover	Species?	Status
1. *Pinus taeda*		5	Yes	FAC
2. *Morus rubra*		2	Yes	FACU
3.				
4.				
5.				
6.				
		7	= Total Cover	
	50% of total cover:	3.5	20% of total cover:	1.4
Sapling Stratum	(Plot size: 30 ft.)			
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum	(Plot size: 30 ft.)			
1. *Fraxinus americana*		2	No	FACU
2.				
3.				
4.				
5.				
6.				
		2	= Total Cover	
	50% of total cover:	1	20% of total cover:	0.4
Herb Stratum	(Plot size: 30 ft.)			
1. *Cynodon dactylon*		100	Yes	FACU
2. *Cyperus entrerianus*		5	No	FACW
3. *Paspalum dilatatum*		7	No	FAC
4. *Bothriochloa ischaemum*		2	No	UPL
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		114	= Total Cover	
	50% of total cover:	57	20% of total cover:	22.8
Woody Vine Stratum	(Plot size: 30 ft.)			
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **33.3%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**5**	x 2 =	**10**
FAC species	**12**	x 3 =	**36**
FACU species	**104**	x 4 =	**416**
UPL species	**2**	x 5 =	**10**
Column Totals:	**123** (A)		**472** (B)

Prevalence Index = B/A = **3.837**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS08**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: City of Houston County: Harris Sampling Date: December 26, 2017
Applicant/Owner: TxDOT Houston District State: Texas Sample Point: SS09
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.872637 Long: -95.408822 Datum: NAD 83
Soil Map Unit Name: Addicks-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

Located within artificial channel. Likely formed from settling debris.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes **X**	No ____	Depth (inches): **0**

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

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

Remarks:

A positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS09**

		Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Rumex crispus*		10	No	FAC
2. *Iva annua*		15	No	FAC
3. *Panicum repens*		80	Yes	FACW
4. *Triadica sebifera*		5	No	FAC
5. *Persicaria hydropiperoides*		5	No	OBL
6. *Setaria parviflora*		5	No	FACW
7. *Paspalum urvillei*		3	No	FAC
8.				
9.				
10.				
11.				
		123	= Total Cover	
	50% of total cover:	61.5	20% of total cover:	24.6
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**5**	x 1 =	**5**
FACW species	**85**	x 2 =	**170**
FAC species	**33**	x 3 =	**99**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**123** (A)		**274** (B)

Prevalence Index = B/A = **2.228**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS09**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 2/1	75					Loam	Dual matrix
	10YR 6/4	25					Sand	
4-8	10YR 2/1	100					Loam	
8-16		100					Gravel	All Gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

Highly disturbed soil.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: City of Houston County: Harris Sampling Date: December 19, 2017
Applicant/Owner: TxDOT Houston District State: Texas Sample Point: SS10
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4
Subregion (LRR or MLRA): LRR T Lat: 29.861104 Long: -95.403836 Datum: NAD 83
Soil Map Unit Name: Addicks-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS10**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *Celtis laevigata*	30	Yes	FACW
2. *Morus rubra*	20	Yes	FACU
3. *Melia azedarach*	20	Yes	UPL
4.			
5.			
6.			
	70 = Total Cover		
	50% of total cover: 35	20% of total cover:	14
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Oxalis debilis*	5	Yes	UPL
2. *Carex cherokeensis*	5	Yes	FACW
3. *Lygodium japonicum*	2	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	12 = Total Cover		
	50% of total cover: 6	20% of total cover:	2.4
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **40.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**0**	x 1 =	**0**
FACW species	**35**	x 2 =	**70**
FAC species	**2**	x 3 =	**6**
FACU species	**20**	x 4 =	**80**
UPL species	**25**	x 5 =	**125**
Column Totals:	**82** (A)		**281** (B)

Prevalence Index = B/A = **3.427**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS10**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 3/1	100					Silty Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 15, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS11
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 30
Subregion (LRR or MLRA): LRR T Lat: 29.860615 Long: -95.403593 Datum: NAD 83
Soil Map Unit Name: Addicks-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____		
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** **X**
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

Data point recorded along side of channel. Upland complement for Wetland 5 (SS 12).

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS11**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Herb Stratum (Plot size: 30 ft.)			
1. *Stenotaphrum secundatum*	100	Yes	FAC
2. *Dichondra carolinensis*	3	No	FAC
3. *Acmella repens*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	108 = Total Cover		
50% of total cover:	54	20% of total cover:	21.6

Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**5**	x 2 =	**10**
FAC species	**103**	x 3 =	**309**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**108** (A)		**319** (B)

Prevalence Index = B/A = **2.954**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS11**

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]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					Clay	Disturbed
6-16	10YR 6/3	70	10YR 6/8	30	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 15, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS12
Investigator(s): T. Love and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.860592 Long: -95.403591 Datum: NAD 83
Soil Map Unit Name: Addicks-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____		
Hydric Soil Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?**	**Yes X** **No** ____
Wetland Hydrology Present?	Yes **X**	No ____		

Remarks:

Wetland 5. Data point recorded at the lower portion of a drainage channel.

HYDROLOGY

Wetland hydrology Indicators:

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

- ____ Surface Water (A1)
- **X** High Water Table (A2)
- **X** 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes **X**	No ____	Depth (inches): **6**
Saturation Present? (includes capillary fringe)	Yes **X**	No ____	Depth (inches): **0**

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

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

Remarks:

A positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS12**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Persicaria hydropiperoides*	100	Yes	OBL
2. *Stenotaphrum secundatum*	5	No	FAC
3. *Cyperus entrerianus*	2	No	FACW
4. *Cerastium fontanum*	40	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	147 = Total Cover		
50% of total cover:	73.5	20% of total cover:	29.4
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **100.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**100**	x 1 =	**100**
FACW species	**2**	x 2 =	**4**
FAC species	**45**	x 3 =	**135**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**147** (A)		**239** (B)

Prevalence Index = B/A = **1.626**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS12**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Although no redoximorphic features were observed in the soil, the dominant vegetation, the presence of a high water table and saturation, and location within a drainage channel suggest that, over time, the soil would likely acquire redoximorphic features to meet the hydric soil parameter.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 18, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS13
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.851963 Long: -95.397914 Datum: NAD 83
Soil Map Unit Name: Addicks-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No _____
Are Vegetation **No**, Soil **No**, or Hydrology **No** (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 _____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** _____ **No** **X**
Hydric Soil Present?	Yes _____	No **X**		
Wetland Hydrology Present?	Yes _____	No **X**		

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes _____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes _____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS13**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Cynodon dactylon*	60	Yes	FACU
2. *Paspalum notatum*	15	No	FACU
3. *Bothriochloa ischaemum*	10	No	UPL
4. *Oxalis corniculata*	15	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**0**	x 3 =	**0**
FACU species	**75**	x 4 =	**300**
UPL species	**25**	x 5 =	**125**
Column Totals:	**100** (A)		**425** (B)

Prevalence Index = B/A = **4.250**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS13**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 2/1	100	None	—	—	—	Clay Loam	
4-16	10YR 3/2	100	None	—	—	—	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 18, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS14
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.841694 Long: -95.390751 Datum: NAD 83
Soil Map Unit Name: Clodine-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Associated with DPA01_PEM.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS14**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Herb Stratum (Plot size: 30 ft.)			
1. *Vicia ludoviciana*	10	No	FACU
2. *Cynodon dactylon*	45	Yes	FACU
3. *Stenotaphrum secundatum*	35	Yes	FAC
4. *Paspalum notatum*	15	No	FACU
5. *Taraxacum officinale*	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	110 = Total Cover		
50% of total cover:	55	20% of total cover:	22

Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **50.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**35**	x 3 =	**105**
FACU species	**75**	x 4 =	**300**
UPL species	**0**	x 5 =	**0**
Column Totals:	**110** (A)		**405** (B)

Prevalence Index = B/A = **3.682**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS14**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Clay Loam	
6-16	10YR 4/1	100					Silty Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS15
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.806143 Long: -95.373547 Datum: NAD 83
Soil Map Unit Name: Gessner occasionally ponded-Urban land complex, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS15**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *Celtis laevigata*	20	Yes	FACW
2. *Ulmus americana*	15	Yes	FAC
3. *Fraxinus pennsylvanica*	20	Yes	FACW
4. *Carpinus caroliniana*	15	Yes	FAC
5.			
6.			
	70 = Total Cover		
	50% of total cover: 35	20% of total cover:	14
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Paspalum notatum*	20	Yes	FACU
2. *Campsis radicans*	5	No	FAC
3. *Oxalis corniculata*	5	No	UPL
4. *Cynodon dactylon*	20	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50 = Total Cover		
	50% of total cover: 25	20% of total cover:	10
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: **6** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **66.7%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**40**	x 2 =	**80**
FAC species	**35**	x 3 =	**105**
FACU species	**40**	x 4 =	**160**
UPL species	**5**	x 5 =	**25**
Column Totals:	**120** (A)		**370** (B)

Prevalence Index = B/A = **3.083**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS15**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 3/1	100					Clay Loam	
7-15	10YR 4/3	100					Clay	
15-20	7.5YR 5/4	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS16
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.794117 Long: -95.371156 Datum: NAD 83
Soil Map Unit Name: Gessner occasionally ponded-Urban land complex, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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	No **X**	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? Yes No **X**

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS16**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Rumex crispus*	5	No	FAC
2. *Paspalum notatum*	25	Yes	FACU
3. *Geranium carolinianum*	5	No	UPL
4. *Calyptocarpus vialis*	20	No	FAC
5. *Vicia ludoviciana*	5	No	FACU
6. *Cynodon dactylon*	50	Yes	FACU
7. *Plantago lanceolata*	5	No	FACU
8.			
9.			
10.			
11.			
	115 = Total Cover		
50% of total cover:	57.5	20% of total cover:	23
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**	
FACW species	**0**	x 2 =	**0**	
FAC species	**25**	x 3 =	**75**	
FACU species	**85**	x 4 =	**340**	
UPL species	**5**	x 5 =	**25**	
Column Totals:	**115**	(A)	**440**	(B)

Prevalence Index = B/A = **3.826**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS16**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Clay Loam	
4-16	10YR 5/3	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 19, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS17
Investigator(s): T. Love and L. Knowles Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.771027 Long: -95.363574 Datum: NAD 83
Soil Map Unit Name: Urban land NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Point recorded at top of White Oak bank.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS17**

		Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Ampelopsis arborea*		45	Yes	FAC
2. *Trifolium repens*		50	Yes	FACU
3. *Rudbeckia hirta*		15	No	FACU
4. *Melilotus officinalis*		1	No	FACU
5. *Astragalus leptocarpus*		1	No	UPL
6.				
7.				
8.				
9.				
10.				
11.				
		112	= Total Cover	
	50% of total cover:	56	20% of total cover:	22.4
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **50.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**45**	x 3 =	**135**
FACU species	**66**	x 4 =	**264**
UPL species	**1**	x 5 =	**5**
Column Totals:	**112** (A)		**404** (B)

Prevalence Index = B/A = **3.607**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS17**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 3/3						Sandy Loam	
8-16	10YR 3/3						Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS18
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR or MLRA): LRR T Lat: 29.760834 Long: -95.374154 Datum: NAD 83
Soil Map Unit Name: Urban land NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS18**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)			
1. *Cynodon dactylon*	50	Yes	FACU
2. *Calyptocarpus vialis*	20	No	FAC
3. *Oxalis corniculata*	35	Yes	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	105 = Total Cover		
50% of total cover:	52.5	20% of total cover:	21
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

	Total % Cover of:		Multiply by:
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**20**	x 3 =	**60**
FACU species	**50**	x 4 =	**200**
UPL species	**35**	x 5 =	**175**
Column Totals:	**105** (A)		**435** (B)

Prevalence Index = B/A = **4.143**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS18**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Clay Loam	
4-16	10YR 3/4	65					Sandy Loam	Dual matrix
	2.5YR 8/3	35					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

Disturbed Soils.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS19
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR or MLRA): LRR T Lat: 29.760389 Long: -95.374238 Datum: NAD 83
Soil Map Unit Name: Urban land NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS19**

		Absolute	Dominant	Indicator
Tree Stratum (Plot size: 30 ft.)		% cover	Species?	Status
1. *Quercus virginiana*		70	Yes	FACU
2. *Lagerstroemia indica*		12	No	UPL
3.				
4.				
5.				
6.				
		82	= Total Cover	
	50% of total cover:	41	20% of total cover:	16.4
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Calyptocarpus vialis*		10	Yes	FAC
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		10	= Total Cover	
	50% of total cover:	5	20% of total cover:	2
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: **50.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**10**	x 3 =	**30**
FACU species	**70**	x 4 =	**280**
UPL species	**12**	x 5 =	**60**
Column Totals:	**92** (A)		**370** (B)

Prevalence Index = B/A = **4.022**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS19**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Clay Loam	
4-16	10YR 2/1	50					Clay Loam	
		50					Gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS20
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4
Subregion (LRR or MLRA): LRR T Lat: 29.771646 Long: -95.330378 Datum: NAD 83
Soil Map Unit Name: Verland-Urban land complex NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS20**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *Quercus virginiana*	30	Yes	FACU
2. *Ulmus crassifolia*	5	No	FAC
3.			
4.			
5.			
6.			
	35 = Total Cover		
	50% of total cover: 17.5	20% of total cover:	7
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *Ilex vomitoria*	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	15 = Total Cover		
	50% of total cover: 7.5	20% of total cover:	3
Herb Stratum (Plot size: 30 ft.)			
1. *Melia azedarach*	2	No	UPL
2. *Celtis laevigata*	3	No	FACW
3. *Galium aparine*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
	50% of total cover: 5	20% of total cover:	2
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
	50% of total cover: 0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **33.3%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**3**	x 2 =	**6**
FAC species	**20**	x 3 =	**60**
FACU species	**35**	x 4 =	**140**
UPL species	**2**	x 5 =	**10**
Column Totals:	**60** (A)		**216** (B)

Prevalence Index = B/A = **3.600**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS20**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 2/1	100					Loam	
7-16	10YR 3/2	100					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS21
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1
Subregion (LRR or MLRA): LRR T Lat: 29.748971 Long: -95.359561 Datum: NAD 83
Soil Map Unit Name: Urban land NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____	No **X**	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**		
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS21**

		Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Cynodon dactylon*		90	Yes	FACU
2. *Stenotaphrum secundatum*		20	No	FAC
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		110	= Total Cover	
	50% of total cover:	55	20% of total cover:	22
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0.0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**0**	x 2 =	**0**
FAC species	**20**	x 3 =	**60**
FACU species	**90**	x 4 =	**360**
UPL species	**0**	x 5 =	**0**
Column Totals:	**110** (A)		**420** (B)

Prevalence Index = B/A = **3.818**

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤ 3.0[1]

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (if observed, list morphological adaptations below).

No positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS21**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/1	90					Clay	Dual Matrix
	2YR 4/6	10					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: North Houston Highway Improvement Project County: Harris Sampling Date: December 20, 2017
Applicant/Owner: Texas Department of Transportation - Houston District State: Texas Sample Point: SS22
Investigator(s): S. Arnold and P. Frasier Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
Subregion (LRR or MLRA): LRR T Lat: 29.737038 Long: -95.367659 Datum: NAD 83
Soil Map Unit Name: Bacliff-Urban land complex, 0 to 1 percent slopes NWI Classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **Yes**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____
Are Vegetation **No**, Soil **No**, or Hydrology **No** 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 ____		
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?**	Yes ____ No **X**
Wetland Hydrology Present?	Yes ____	No **X**		

Remarks:

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) **(LRR U)**
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots(C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ 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)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes ____	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes ____	No **X**	Depth (inches): **>20**

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

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

Remarks:

No positive indication of wetland hydrology was observed.

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **SS22**

		Absolute	Dominant	Indicator
Tree Stratum (Plot size: 30 ft.)		% cover	Species?	Status
1. *Celtis laevigata*		25	Yes	FACW
2. *Ulmus americana*		40	Yes	FAC
3. *Pinus taeda*		10	No	FAC
4. *Quercus falcata*		10	No	FACU
5.				
6.				
		85	= Total Cover	
	50% of total cover:	42.5	20% of total cover:	17
Sapling Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
6.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0
Herb Stratum (Plot size: 30 ft.)				
1. *Oxalis debilis*		5	Yes	UPL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		5	= Total Cover	
	50% of total cover:	2.5	20% of total cover:	1
Woody Vine Stratum (Plot size: 30 ft.)				
1. *None Observed*				
2.				
3.				
4.				
5.				
		0	= Total Cover	
	50% of total cover:	0	20% of total cover:	0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **66.7%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**25**	x 2 =	**50**
FAC species	**50**	x 3 =	**150**
FACU species	**10**	x 4 =	**40**
UPL species	**5**	x 5 =	**25**
Column Totals:	**90** (A)		**265** (B)

Prevalence Index = B/A = **2.944**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed.

SOIL

Sampling Point: **SS22**

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Loam	
6-16	10YR 3/1	90					Clay	Dual matrix
	2.5YR 4/6	10					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ Organic Bodies (A6) **(LRR P, T, U)**
- ____ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ____ Muck Presence (A8) **(LRR U)**
- ____ 1 cm Muck (A9) **(LRR P, T)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Coast Prairie Redox (A16) **(MLRA 150A)**
- ____ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7) **(LRR P, S, T, U)**
- ____ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ____ Thin Dark Surface (S9) **(LRR S, T, U)**
- ____ Loamy Mucky Mineral (F1) **(LRR O)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Marl (F10) **(LRR U)**
- ____ Depleted Ochric (F11) **(MLRA 151)**
- ____ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ____ Umbric Surface (F13) **(LRR P, T, U)**
- ____ Delta Ochric (F17) **(MLRA 151)**
- ____ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR O)**
- ____ 2 cm Muck (A10) **(LRR S)**
- ____ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ____ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ____ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ____ Red Parent Material (TF2)
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

No positive indication of hydric soils was observed.

This report was written on behalf of the Texas Department of Transportation by

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