



**US Army Corps
of Engineers** ®
Galveston District

HUNTING BAYOU FLOOD RISK MANAGEMENT, HARRIS COUNTY, TEXAS

DRAFT GENERAL REEVALUATION REPORT AND INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX 6 REAL ESTATE PLAN

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HARRIS COUNTY FLOOD CONTROL DISTRICT

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- Exhibit A6-6 Hunting Bayou River Station Map

Acronyms

COH	City of Houston
EA	Environmental Assessment
ERRY	Englewood Railroad Yard
FRM	Flood Risk Management
GRR	General Reevaluation Report
HCAD	Harris County Appraisal District
HCFCDD	Harris County Flood Control District
HTRW	Hazardous, Toxic and Radioactive Waste
IH	Interstate Highway
ID	Identification
LERRD	Land, Easements, Rights-of-Way, Relocations and Disposal Areas
NED	National Economic Development (Plan)
PAOC	Preliminary Attorney's Opinion of Compensability
PED	Preconstruction Engineering and Design
PPA	Project Partnership Agreement
PST	Petroleum Storage Tank
REP	Real Estate Plan
ROW	Right-of-Way
SFR	Single-Family Residential
SP	Southern Pacific
SWBT	Southwestern Bell Telephone
TSP	Tentatively Selected Plan
TxDOT	Texas Department of Transportation
UPRR	Union Pacific Railroad
US	U.S. Highway
USACE	U.S. Army Corps of Engineers
VL	Vacant Land
WRDA	Water Resource Development Act

1.0 INTRODUCTION

1.1 General

This Real Estate Plan (REP) documents the real estate considerations for the Tentatively Selected Plan (TSP) to support the Draft General Reevaluation Report and Integrated Environmental Assessment (GRR/EA) on Hunting Bayou. This appendix identifies real estate requirements including Land, Easements, Rights-of-Way (ROW), Relocations and Disposal Areas (LERRD) and the estimated cost for LERRD acquisition, severance damages, utility relocations and other items. The land values contained herein are supported by an estimate of costs for LERRD completed in November 2012 and an updated cost estimate for utility relocations dated February 2013.

1.2 Project Location and Description

The project authorities applicable to the Hunting Bayou project are numerous. The initial summary of the authorization order of occurrence can be found in the draft GRR/EA. A brief summary of the current project authorization for Hunting Bayou is as follows.

Water Resource Development Act (WRDA) 1996 Section 211 (Public Law 104-303) as amended by Section 223, WRDA of 1999 (Public Law 106-53), authorized non-federal interests to undertake major flood risk management (FRM) projects with federal funding assistance (subject to federal funding availability) or credit for the non-federal interest for its portion of the work subject to Secretary of the Army approval. Section 211(e)(2), WRDA 1996, as amended, states the Secretary may also reimburse any non-federal sponsor an amount equal to the estimate of the federal share, without interest, of the cost of any authorized flood control project, or separable element of a flood control project, constructed pursuant to this section or provide credit for the non-federal share of the project with certain stipulations.

Even though the non-federal sponsor, Harris County Flood Control District (HCFCD) is in the lead, the planning, design and construction are implemented in accordance with established U.S. Army Corps of Engineers (USACE) regulations, guidance and requirements for federal participation. The primary advantage for non-federal sponsor's, HCFCD, taking the lead is the project can be constructed and benefits realized sooner based on the potential for federal share reimbursement for previously constructed project components, as stated below in WRDA 1996, Section 211(e)(2)(A), *as amended*:

“(e) REIMBURSEMENT—

(2) SPECIAL RULES—

(A) REIMBURSEMENT *OR CREDIT*.— For work (including work associated with studies, planning, design, and construction) carried out by a non-federal interest with respect to a project described in subsection (f), the Secretary shall, *subject to the availability of appropriations, reimburse, without interest, the non-federal interest an amount equal to the estimated federal share of the cost of such work, or provide credit (depending on the request of the non-federal interest) for the non-federal share of such work*, if such work is later recommended by the Chief of Engineers and approved by the Secretary [of the Army].”

Section 211(f) authorized the non-federal sponsor’s, HCFCD, to develop a FRM plan for Hunting Bayou:

“(f) SPECIFIC PROJECTS—For the purposes of demonstration the potential advantages and effectiveness of non-federal implementation of flood control projects, the Secretary shall enter into agreement pursuant to this section with non-federal interests for development of the following flood control projects by such interest:

(7) Hunting Bayou, Texas—The Hunting Bayou element of the project for flood control, Buffalo Bayou and tributaries, Texas, authorized by such section; except that, subject to the approval of the Secretary as provided by this section, the non-federal interest may design and construct an alternative to such element.”

The non-federal sponsor, HCFCD, started implementing the proposed Hunting Bayou project to reduce future flood damage as soon as possible. Because Hunting Bayou was included in the 211(f) authorization, non-federal sponsor, HCFCD, may be reimbursed or receive credit for the efforts taken to reduce flood damages in the Hunting Bayou watershed as approved by the Secretary of the Army.

1.3 Project Location and Description

The Hunting Bayou watershed is about 5 miles northeast of downtown Houston. Hunting Bayou watershed is divided into the upper, middle and lower stream reaches. The upper stream reach extends from U.S. Highway (US) 59 approximately 3.2 miles downstream, immediately past the Englewood Railroad Yard (ERRY). The middle stream reach extends from past EERRY to downstream from Herman Brown Park, and the lower stream reach from Herman Brown Park to a confluence with the Houston Ship Channel at the Turning Basin. The watershed comprises approximately 30 square miles in Harris County and is highly developed with a mix of residential, commercial and industrial land use. A watershed map is included as *Exhibit A6-1*. The project’s purpose is to reduce the flooding along Hunting Bayou’s main stem.

Through the plan formulation process, a National Economic Development (NED) Plan was developed for Hunting Bayou. NED Plan alternative scale which reasonably maximizes net excess benefits at the least cost, B50-A25, was identified as the NED Plan. The NED Plan

alternative scale which reasonably maximizes NED net benefits while best meeting study objectives, B60-A75, was identified by the non-federal sponsor as the Locally Preferred Plan and is named the TSP. The TSP is the NED Plan scale B60-A75 identified in the Draft GRR/EA's plan formulation chapter. The REP focuses on the real estate requirements for the TSP.

The TSP consists of approximately 3.8 miles of channel modifications from just downstream from US 59 to just downstream from the ERRY. Except for one reach, the design section for the channel is earthen trapezoidal. Concrete lining is proposed for about 0.2 mile through ERRY. Offline detention is also proposed downstream from Homestead Road to Interstate Highway (IH) 610. Deepening and widening the existing channel results in 17 bridge modifications and 96 utility, storm sewer and pipeline relocations, and removing a few inactive utilities and street segments. *Exhibit A6-2* shows a layout for the TSP. Details on formulating the plan to be implemented are provided in Chapter 4 in the Draft GRR/EA.

1.4 Project Approach

Information gathered and developed as part of the economic and engineering analyses (see *Appendix 3 – Engineering Analysis* and *Appendix 5 – Economic Analysis*) for FRM components was used to support the REP. The following steps were performed to identify real estate requirements for the recommended FRM project components.

1. Harris County Appraisal District (HCAD) data and field investigations were used to determine the feasibility for developing properties for flood water detention storage, or constructing channel modifications to improve conveyance during early plan formulation.
2. The location, size and layout for each component was determined by using existing topographic maps, aerial photographs, HCAD and other geospatial data and ROW maps. Geospatial data was developed to produce ROW lines used to define the HCAD parcels required for the project.
3. ROW owned by Harris County was summarized for each component. There are no federally owned lands within the proposed project area.
4. Preliminary real estate acquisition maps were prepared to delineate the real estate acquisition lines and parcels needed using the ROW geospatial data. For disposal property requirements, a disposal site use analysis based on excavation and placement amounts and using available parcel information (e.g., acreage) required for each component was performed during engineering alternatives analysis to provide the amount of disposal lands needed.
5. A displacement and relocation cost estimate was developed for each component.
6. A summary for land required and an estimated cost were determined for each component. Detailed information on the cost estimates is in *Appendix 4 – Cost Estimates*.
7. HCAD records were reviewed to obtain information on the estimated value, size and ownership for identified tracts.
8. A cost estimate for LERRD was performed for the tracts to be acquired as part of the TSP and B50-A25.

9. Utility information was compiled and summarized for all components. For those components requiring utility relocations or modifications, quantities were summarized and construction costs were estimated. A Preliminary Attorney's Opinion of Compensability (PAOC) was conducted, and a summary is included as *Attachment 6-5*.
10. Environmental considerations were reviewed for each component. The detailed environmental review is summarized in the GRR/EA.

2.0 REAL ESTATE CONSIDERATIONS

2.1 Description for Tentatively Selected Plan (TSP)

The TSP consists of channel modifications including maintenance ROW on both sides of the channel, an offline detention basin and disposal sites. The channel modifications begin in Hunting Bayou's upper reaches just east of US 59, and end just downstream from ERRY on Wayside Drive. Channel modifications necessitate acquiring 55 residential structures (single-family and multi-family) in Hunting Bayou's upper reaches from just east of US 59 to Lockwood Street. The offline detention basin is between Homestead Road and Loop 610 (IH 610). Deepening and widening the existing channel requires 17 bridge modifications, 96 utility, storm sewer and pipeline relocations, and removing a few inactive utilities and street segments.

B50-A25 and B60-A75 are two different scales of the same alternative and are nearly identical. B50 has the same geometry as B60 through approximately three quarters of the project length and will have the same ROW requirements through this length. The only difference is the widest section downstream of Homestead Road where the difference in width is approximately 5 feet on each side of the channel, resulting in a difference of only one less residential displacement. Therefore, the LERRD costs for the channel portion of the NED Plan are essentially identical to the LERRD costs of the TSP, with only slight adjustments to the channel related LERRDS costs determined for the TSP. In addition, bridge modifications and utility relocations are the same for both the NED Plan and the TSP as the channel modifications are nearly identical. For the basin component, A25 is merely one third of the size of A75 in the same offline detention property; therefore LERRD costs were scaled proportionately. Similarly, disposal related LERRD costs for the NED Plan were scaled proportionately from disposal related LERRD costs calculated for the TSP, based on volumes and resultant acreages needed. The resulting difference in LERRD cost between the TSP and the NED Plan, due to differences in channel ROW, detention basin, and disposal ROW required, is approximately \$6M, not including contingencies. As the alternatives are nearly identical, the Gross Appraisal conducted for the TSP was also utilized to develop the estimated LERRDs cost for the NED Plan. The major TSP (and NED Plan) features are described as follows:

1. Channel modifications

a. 3.8 miles of trapezoidal channel modifications

- 1) 1.6 miles of trapezoidal channel modifications – from 0.3 mile downstream from ERRY (Station 549+50) to Homestead Road (Station 632+50). All of the modifications are earthen except for a 0.2-mile reach of concrete lining through ERRY (Station 560+00 to Station 572+50).
- 2) 2.2 miles of earthen trapezoidal channel modifications – from Homestead Road (Station 632+50) to just downstream from US 59 (Station 748+50).

b. Channel width

- 1) The TSP channel configuration is referred to in the Draft GRR/EA as B60 and consists of 30 to 60 feet bottom width cross sections in the upstream portion, transitioning to 10 feet bottom width cross sections downstream from the offline detention.

- 2) The B50-A25 channel configuration is referred to in the Draft GRR/EA as B50 and consists of 30 to 50 feet bottom width cross sections in the upstream portion, transitioning to 10 feet bottom width cross sections downstream from the offline detention.
 - c. Erosion protection at transitions
 - 1) Erosion protection will be designed at all channel transition areas during preliminary engineering and design.
2. Offline detention east of Homestead Road.
3. 17 bridge modifications consisting of either replacement or extension.
4. No environmental mitigation features will be built in the offline detention basin, and no LERRD is required for banking credits used for mitigation. Environmental mitigation is being addressed by purchasing credits in the Greens Bayou Wetlands Mitigation Bank.
5. Disposal areas – non-federal sponsor, HCFCD, has successfully disposed excavated soils in past projects through reuse in local road, development and other project types, and intends to do so for this project. However, sufficient disposal sites have been identified as a planning contingency, assuming at least 25 percent of the required placement volume can be reused in other projects.
6. Utility Relocations – 96 utilities adjustments will either be removed and abandoned or relocated.
7. Street Impacts – 13 local area streets will be abandoned or changed. Due to the channel widening, certain street segments are no longer needed to access occupied structures and will be removed as part of a dead end existing street.

2.2 Induced Flooding

The TSP does not result in increased flood risks or flood hazards, and does not create new flood hazard areas for events up to and including the 1% AEP storm event. An Attorney's Taking Opinion for the TSP has been completed, assessing the character of induced damages with regard to frequency, extent, flooding depth, and damages incurred. The Attorney's Takings Opinion concluded that no additional property is required to be acquired by law for the TSP due to induced flooding. Furthermore, it was determined that there is no policy reason to acquire additional land, as there is no induced flooding due to the TSP for events up to and including the 1% AEP storm event.

2.3 Existing Federal Projects

No federal projects exist for Hunting Bayou except for the current project for which this REP is a part. There are no federally owned lands within the proposed project area.

2.4 Estimate of Costs for LERRD

A cost estimate for LERRD was initially performed in June 2002, then updated in June 2006 and November 2012 for the TSP's required LERRD. The most recent cost estimate for LERRD was

prepared by Cervenka & Associates, Inc. The gross appraisal conducted for the project was reviewed and approved by the Corp Review Appraiser on March 26, 2014. LERRD costs for the NED Plan were determined based on the gross appraisal conducted for the TSP, as the alternatives are nearly identical and determination of LERRD cost for the NED Plan required only minor adjustments to the LERRD costs determined for the TSP.

2.5 Land, Easements, and Rights-of-Way, Relocations and Disposal Areas (LERRD) Required

Paragraph E-21.a in ER 1105-2-100, *Planning Guidance Notebook*, outlines the basic non-federal participation requirements for federal structural FRM projects. The non-federal sponsor, HCFCD, is required to furnish the LERRD for cost-shared projects. These real estate requirements must support the project's construction and operation and maintenance. To satisfy the minimum real estate requirements for the project, the non-federal sponsor, HCFCD, will acquire "Standard Estates." Each proposed TSP work feature will be identified with the specific standard estate associated with that feature (e.g., if the remaining eight tracts to be acquired will be for the channel modification, the estate to be acquired will be a Channel Improvement Easement or a Fee Estate. The proposed perpetual estates are fee excluding minerals, which is a limited form of the fee simple estate. The costs associated with the various real estate requirements are summarized below.

Descriptions of Estates are as follows.

- Channel Improvement Easement
 - A perpetual and assignable right and easement to construct, operate, and maintain channel improvement works on, over and across (the land described in Schedule A) (Tracts Nos. _____, _____ and _____) for the purposes as authorized by the Act of Congress approved _____, including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, buildings, improvements and/or other obstructions therefrom; to excavate: dredge, cut away and remove any or all of said land and to place thereon dredge or spoil material; and for such other purposes as may be required in connection with said work of improvement; reserving; however, to the owners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject; however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

- Fee Excluding Minerals (With Restriction on Use of the Surface)
 - The fee simple title to (the land described in Schedule A) (Tracts Nos. _____, _____ and _____), subject; however, to existing easements for public roads and highways, public utilities, railroads and pipelines; excepting and excluding from the taking all (coal) (oil and gas), in and under said land and all appurtenant rights for the exploration, development, production and removal therefrom of said (coal) (oil and gas), but without the right to enter upon or over the surface of said land for the purpose of exploration, development, production and removal therefrom of said (coal)(oil and gas).

The TSP is not expected to induce flooding by constructing or operating and maintaining the projects. As a result, no additional LERRD acquisitions, other than those described below, are

needed for actual project construction and maintenance. Temporary access and staging areas for construction and maintenance will be within the channel ROW. Table A6-1 has a complete property list for all lands required for channel and detention components. Exhibits A6-3a through A6-3e are parcel maps showing the identification (ID) numbers from Table A6-1. The LERRD acquisitions in Table A6-1 do not include any federally owned lands. Excavation disposal areas are discussed separately in Section 2.9. By letter dated May 23, 2002, the non-federal sponsor, HCFCD, received from the USACE, Real Estate Division, Galveston District, notification about the risks associated with acquiring LER prior to executing the Project Partnership Agreement (PPA), Attachment 6-1.

2.6 LERRD Crediting

Based on WRDA 1999, Section 211(e)(2)(A), the non-federal sponsor, HCFCD, will be entitled to LERRD credit for real estate acquired for the project, if such work is later recommended by the Chief of Engineers and approved by the Secretary of the Army. Prior to credit determination, advanced acquisition and relocation documents will have to be reviewed and considered by USACE. As construction has already been initiated by the non-federal sponsor at their own risk, and a significant portion of the LER required has already been acquired by the non-federal sponsor, for the purpose of providing the estimated total real estate costs for the project, the total real estate costs is calculated as the actual real estate acquisition costs to date plus the estimated cost of remaining acquisitions. Once the PPA has been signed, the value for the LER eligible for credit will be based on the estimate of costs for LER at that time.

ER 405-1-12 provides guidance on special value considerations and crediting principles that may apply. ER 405-1-12 paragraph 12-37 c. (1) requires federal appraisal for LER acquired to date, which has been completed. In addition, ER 405-1-12 paragraph 12-36 a. states that credit potentially available should be based on fair market value as of the date of construction, not the date of acquisition. As the non-federal sponsor has already completed the majority of acquisitions, potential crediting issues may arise if the actual acquisition cost is greater than the fair market value as of the date of construction. However, issues are expected to be minimal as the actual acquisition for parcels acquired to date is less than the appraised value as of November, 2013, adjusted to include improvements present at the time of acquisition. Regardless, credit available to the non-federal sponsor may not equal the cost of acquisition for LER acquired prior to authorization, due to the staggered timeline between acquisition and crediting. ER 405-1-12 paragraph 12-38 b. details the restriction on receiving credit for the value of LER provided using federal funds. Crediting issues are not anticipated as the limited number acquisitions supported by Federal grants are not considered part of the project, are not reflected in costs to date, and the non-federal sponsor does not intend to seek credit for these properties. ER 405-1-12 paragraph 12-38 d. details the restriction on receiving credit for excess interests purchased. Potential crediting issues may arise as the non-federal sponsor proposes fee acquisition as the preferred estate for certain parcels where a channel improvement easement may be acceptable. However, it is the non-federal sponsor's experience that obtaining an easement interest often incurs additional delays and costs associated with litigation compared to fee acquisition. Furthermore, it is the Appraiser's opinion that the valuation of lands and damages for an easement would be essentially the same as for fee acquisition. The non-federal sponsor understands their obligations and requirements for providing LERRDs under the items of local cooperation and is acquainted with the method by which the value of LERRDs is determined by the USACE. Once the PPA is signed and the construction project has commenced,

the non-federal sponsor, HCFCD, can begin submitting a credit package for lands acquired and necessary for the project plus incidental costs expended in acquiring these lands for review. USACE will at that time determine what credit the non-federal sponsor, HCFCD, is entitled to receive.

2.7 Tentatively Selected Plan (TSP) Parcels and Acquisition Costs

The TSP requires deepening and widening the existing channel from just downstream from US 59 to just downstream from ERRY. The non-federal sponsor, HCFCD, will be responsible for maintaining the modified channel and overbank areas within the ROW to preserve the channel's hydraulic conveyance capacity. The following summarizes the real estate requirements for the TSP channel modifications and detention.

The total ROW needed for the TSP was determined to be 285.60 acres, requiring relocations affecting 60 residences, religious use structures, two businesses and a garage. This total includes property already owned by the non-federal sponsor, HCFCD. *Table A6-1* provides information on the 177 property acquisitions needed to be obtained to construct and maintain the channel modification, 176 parcels, and offline detention, 1 parcel, for the TSP. All parcels in *Table A6-1* are in the upper stream segment. The non-federal sponsor, HCFCD, has purchased 102 of the parcels identified for the TSP, including the offline detention parcel, and 56 parcels remain for acquisition. The non-federal sponsor, HCFCD, previously owned 19 of the parcels including most of the required channel property. These parcels are identified in *Table A6-1*. In accordance with practice and guidance from the USACE Civil Works Cost Engineering and Agency Technical Review Mandatory Center of Expertise, costs incurred to date are used to identify project implementation costs. Credit available for LERRDs, however, will be determined based on the fair market value of the property at the time of construction, as is discussed in *Section 2.6*. Therefore, the costs-to-date are presented for parcels already acquired in the Baseline Cost Estimate presented later in this appendix. HCAD tract areas may vary slightly due to minor variations between areas obtained from the data sources used in the plan formulation process and the areas listed in the HCAD records used for this appendix. The few variations found are typically less than 1 percent of the area involved. The areas discussed in this appendix are consistent with the areas presented in the exhibits and tables. The following summarizes the acquisitions required for the channel modifications and offline detention. *Table A6-1* also lists the specific estates and how they will be acquired. Temporary access and staging areas for construction and maintenance will be within the channel ROW. Excavation disposal areas are discussed separately in *Section 2.9*. Parcels previously owned by the non-federal sponsor, several of which were acquired with the assistance of FEMA grants, are not reflected in costs to date. LERRD credit will not be sought for parcels acquired with the assistance of FEMA grants.

**Table A6-1:
Hunting Bayou Project Lands Required for Channel and Detention Components**

Map ID	Estate Type	Estate Type Notes ¹	Property Type	Whole Size (acre)	Partial Taking Size (acre)
1	Fee excluding minerals	b	Public land – Texas Department of Transportation (TxDOT)	0.22	0.04
2	Fee excluding minerals	b	Public land - TxDOT	0.23	0.06
3	Fee excluding minerals	b	Public land - TxDOT	0.23	0.05
4	Fee excluding minerals	b	Public land - TxDOT	0.21	0.04
5	Fee excluding minerals	b	Public land - TxDOT	0.15	0.03
6	Fee excluding minerals	b	Public land - TxDOT	0.13	0.02
7	Fee excluding minerals	b	Public land - TxDOT	0.12	0.02
8	Fee excluding minerals	b	Public land - TxDOT	0.11	0.01
9	Fee excluding minerals	c	Public land - TxDOT	0.20	0.01
10*	Fee excluding minerals	a	Vacant Land (VL) - residential	0.24	0.06
11*	Fee excluding minerals	a	VL - residential	0.27	0.13
12	Fee excluding minerals	c	Single-family resident (SFR)	0.34	0.01
13*	Fee excluding minerals	a	VL - residential	0.40	0.33
14*	Fee excluding minerals	a	VL - residential	0.27	0.17
15*	Fee excluding minerals	a	VL - residential	0.18	0.13
16*	Fee excluding minerals	a	VL - residential	0.20	0.12
17*	Fee excluding minerals	a	VL - residential	0.21	0.15
18*	Fee excluding minerals	a	VL - residential	0.21	0.15
19*	Fee excluding minerals	a	VL - residential	0.22	0.14
20*	Fee excluding minerals	a	VL - residential	0.23	0.14
21*	Fee excluding minerals	a	VL - residential	0.23	0.14
22*	Fee excluding minerals	a	VL - residential	0.23	0.13
23*	Fee excluding minerals	a	VL - residential	0.29	0.19
24	Fee excluding minerals	c	VL - residential	0.17	0.00
25*	Fee excluding minerals	a	VL - residential	0.17	0.10
26*	Fee excluding minerals	a	VL - residential	0.29	0.29
27*	Fee excluding minerals	a	VL - residential	0.24	0.05
28*	Fee excluding minerals	a	VL - residential	0.11	0.00
29**	Fee excluding minerals	a	VL - residential	0.23	0.16
30**	Fee excluding minerals	a	Public land - HCFCD	0.48	0.43
31**	Fee excluding minerals	a	VL - residential	0.34	0.00
32**	Fee excluding minerals	a	Public land - HCFCD	0.11	0.07
33**	Fee excluding minerals	a	Public land - HCFCD	0.11	0.11
34**	Fee excluding minerals	a	VL - residential	0.11	0.11
35*	Fee excluding minerals	a	VL - residential	0.11	0.11
36*	Fee excluding minerals	a	VL - residential	0.11	0.10
37	Fee excluding minerals	c	SFR	0.23	0.01
38*	Fee excluding minerals	a	VL - residential	0.11	0.08
39*	Fee excluding minerals	a	VL - residential	0.11	0.11
40*	Fee excluding minerals	a	VL - residential	0.11	0.11
41*	Fee excluding minerals	a	Public land - HCFCD	0.11	0.11
42*	Fee excluding minerals	a	Public land - HCFCD	0.11	0.07
43*	Fee excluding minerals	a	VL - residential	0.11	0.07

Map ID	Estate Type	Estate Type Notes ¹	Property Type	Whole Size (acre)	Partial Taking Size (acre)
44*	Fee excluding minerals	a	Public land - HCFCF	0.11	0.11
45*	Fee excluding minerals	a	VL - residential	0.11	0.11
46*	Fee excluding minerals	a	VL - residential	0.11	0.11
47*	Fee excluding minerals	a	VL - residential	0.11	0.10
48**	Fee excluding minerals	a	VL - residential	0.11	0.00
49*	Fee excluding minerals	a	VL - residential	0.27	0.06
50*	Fee excluding minerals	a	VL - residential	0.30	0.30
51*	Fee excluding minerals	a	VL - residential	0.21	0.15
52*	Fee excluding minerals	a	VL - residential	0.25	0.00
53*	Fee excluding minerals	a	SFR	0.64	0.21
54*	Fee excluding minerals	a	VL - residential	0.40	0.36
55	Fee excluding minerals	c	VL - residential	0.28	0.02
56	Fee excluding minerals	c	Public land - TxDOT	0.07	0.01
57	Fee excluding minerals	b	Public land - TxDOT	0.06	0.06
58**	Fee excluding minerals	a	VL - residential	0.30	0.14
59*	Fee excluding minerals	a	VL - residential	0.31	0.31
60	Fee excluding minerals	a	Religious	0.23	0.01
61*	Fee excluding minerals	a	VL - residential	0.19	0.12
62*	Fee excluding minerals	a	VL - residential	0.19	0.19
63*	Fee excluding minerals	a	VL - residential	0.14	0.04
64*	Fee excluding minerals	a	VL - residential	0.12	0.03
65*	Fee excluding minerals	a	VL - residential	0.22	0.11
66*	Fee excluding minerals	a	VL - residential	0.18	0.18
67*	Fee excluding minerals	a	VL - residential	0.19	0.13
68	Fee excluding minerals	c	SFR	0.19	0.00
69	Fee excluding minerals	b	SFR	0.22	0.07
70*	Fee excluding minerals	a	VL - residential	0.15	0.15
71*	Fee excluding minerals	a	VL - residential	0.19	0.19
72	Fee excluding minerals	b	SFR	0.21	0.02
73*	Fee excluding minerals	a	VL - residential	0.52	0.40
74*	Fee excluding minerals	a	VL - residential	0.73	0.14
75	Fee excluding minerals	c	SFR	0.44	0.06
76*	Fee excluding minerals	a	VL - residential	1.12	0.94
77*	Fee excluding minerals	a	VL - residential	0.28	0.09
78*	Fee excluding minerals	a	VL - residential	0.28	0.26
79*	Fee excluding minerals	a	VL - residential	0.27	0.27
80	Fee excluding minerals	c	Multi-family	0.33	0.04
81	Fee excluding minerals	c	SFR	0.12	0.02
82	Fee excluding minerals	c	SFR	0.11	0.02
83**	Fee excluding minerals	a	VL - residential	0.33	0.01
84*	Fee excluding minerals	a	VL - residential	0.87	0.73
85	Fee excluding minerals	c	SFR	0.34	0.001
86*	Fee excluding minerals	a	VL - residential	1.09	0.79
87	Fee excluding minerals	c	SFR	0.06	0.01
88	Fee excluding minerals	c	VL - residential	0.07	0.01
89	Fee excluding minerals	c	SFR	0.10	0.02

Map ID	Estate Type	Estate Type Notes ¹	Property Type	Whole Size (acre)	Partial Taking Size (acre)
90	Fee excluding minerals	c	SFR	0.14	0.02
91*	Fee excluding minerals	a	VL - residential	0.50	0.50
92*	Fee excluding minerals	a	VL - residential	0.36	0.36
93	Fee excluding minerals	c	SFR	0.17	0.00
94*	Fee excluding minerals	a	Multi-family	2.55	0.02
95*	Fee excluding minerals	a	VL - residential	0.86	0.84
96	Fee excluding minerals	c	SFR	0.34	0.03
97*	Fee excluding minerals	a	VL - residential	0.69	0.45
98*	Fee excluding minerals	a	VL - residential	0.36	0.36
99	Fee excluding minerals	c	SFR	0.51	0.03
100*	Fee excluding minerals	a	SFR	0.72	0.08
101**	Fee excluding minerals	a	VL - residential	0.41	0.39
102*	Fee excluding minerals	a	VL - residential	0.34	0.29
103	Fee excluding minerals	c	SFR	0.34	0.00
104*	Fee excluding minerals	a	VL - residential	0.48	0.31
105*	Fee excluding minerals	a	VL - residential	0.47	0.09
106	Fee excluding minerals	c	SFR	0.34	0.00
107	Fee excluding minerals	a	Commercial	0.76	0.10
108	Fee excluding minerals	c	Religious	0.97	0.002
109	Fee excluding minerals	c	Public land City of Houston (COH)	3.50	0.07
110*	Fee excluding minerals	a	VL - commercial	0.14	0.04
111*	Fee excluding minerals	a	VL - commercial	0.13	0.08
112*	Fee excluding minerals	a	VL - commercial	0.27	0.22
113*	Fee excluding minerals	a	VL - residential	0.09	0.09
114*	Fee excluding minerals	a	VL - residential	0.10	0.10
115*	Fee excluding minerals	a	VL - residential	0.28	0.27
116*	Fee excluding minerals	a	VL - residential	0.29	0.29
117*	Fee excluding minerals	a	VL - residential	0.33	0.31
118*	Fee excluding minerals	a	VL - residential	0.33	0.29
119*	Fee excluding minerals	a	VL - residential	0.33	0.25
120*	Fee excluding minerals	a	VL - residential	0.35	0.25
121*	Fee excluding minerals	a	VL - residential	0.37	0.225
122*	Fee excluding minerals	a	VL - residential	0.40	0.210
123*	Fee excluding minerals	a	VL - residential	0.42	0.160
124**	Fee excluding minerals	a	Public land - HCFC	0.05	0.050
125**	Fee excluding minerals	a	Public land - HCFC	0.93	0.572
126*	Fee excluding minerals	a	VL - residential	0.35	0.027
127*	Fee excluding minerals	a	VL - residential	0.16	0.129
128*	Fee excluding minerals	a	VL - residential	0.16	0.114
129*	Fee excluding minerals	a	VL - residential	0.16	0.106
130*	Fee excluding minerals	a	VL - residential	0.16	0.101
131*	Fee excluding minerals	a	VL - residential	0.16	0.104
132*	Fee excluding minerals	a	VL - residential	0.16	0.090
133*	Fee excluding minerals	a	VL - residential	0.16	0.088
134*	Fee excluding minerals	a	VL - residential	0.16	0.085
135**	Fee excluding minerals	a	VL - residential	0.16	0.082

Map ID	Estate Type	Estate Type Notes ¹	Property Type	Whole Size (acre)	Partial Taking Size (acre)
136*	Fee excluding minerals	a	VL - residential	0.16	0.077
137*	Fee excluding minerals	a	VL - residential	0.16	0.075
138*	Fee excluding minerals	a	VL - residential	0.17	0.068
139*	Fee excluding minerals	a	VL - residential	0.19	0.075
140*	Fee excluding minerals	a	Religious	13.22	2.10
141*	Fee excluding minerals	a	Public land - HCFCFCD	0.24	0.24
142	Fee excluding minerals	a	Industrial	11.69	0.11
143*	Fee excluding minerals	a	Public land - HCFCFCD	1.84	1.84
144**	Fee excluding minerals	a	Public land - HCFCFCD	3.32	3.32
145*	Fee excluding minerals	a	Industrial	3.50	0.86
146*	Fee excluding minerals	a	Industrial	5.25	0.99
147	Fee excluding minerals	c	VL - commercial	1.50	0.63
148	Fee excluding minerals	c	Industrial	6.03	0.01
149*	Fee excluding minerals	a	VL - commercial	6.62	6.56
150***	Easement or less	a	Public land COH	21.21	6.03
151***	Easement or less	c	Public land COH	0.26	0.00
152**	Fee excluding minerals	a	Public land - HCFCFCD	8.05	7.52
153*	Fee excluding minerals	a	Industrial	7.99	0.66
154	Fee excluding minerals	c	Industrial	4.69	0.23
155	Fee excluding minerals	c	Industrial	3.26	0.36
156*	Fee excluding minerals	a	Public land - HCFCFCD	4.07	0.58
157*	Fee excluding minerals	a	Industrial	11.65	0.32
158	Fee excluding minerals	a	VL - industrial	3.45	1.39
159	Fee excluding minerals	b	VL - commercial	0.47	0.40
160	Fee excluding minerals	b	VL - commercial	1.68	0.66
161*	Fee excluding minerals	a	VL - industrial	17.72	6.74
162	Fee excluding minerals	a	VL - industrial	2.97	1.26
163*	Fee excluding minerals	a	Railroad land	4.01	2.88
164	Channel improvement easement	c	Railroad land	0.83	0.00
165	Channel improvement easement	d	Railroad land	2.02	0.46
166	Channel improvement easement	d	Railroad land	26.54	2.91
167	Channel improvement easement	d	Public land – COH	4.82	0.78
168	Channel improvement easement	c	Railroad land	13.51	0.60
169	Channel improvement easement	d	Industrial	45.06	0.63
170**	Fee excluding minerals	a	Public land - HCFCFCD	5.28	3.40
171	Fee excluding minerals	a	Utility (e/c trans.)	2.53	0.61
172	Channel improvement easement	d	Railroad land	16.18	0.11
173	Channel improvement easement	d	VL - industrial	212.25	0.57
174**	Fee excluding minerals	a	Public land - HCFCFCD	13.38	12.74
175**	Fee excluding minerals	a	Public land - HCFCFCD	2.87	2.68
176**	Fee excluding minerals	a	Public land - HCFCFCD	5.63	0.24
177*	Fee excluding minerals	a	Public land - HCFCFCD	75.00	75.00
					166.45

*Parcel already purchased for project by non-federal sponsor, HCFCFCD

**Parcel previously owned by non-federal sponsor, HCFCFCD

*** More information on these parcels is provided in Section 2.7.2

Note: All parcels in Table A6-1 are located in the upper stream segment.

¹ Letter indicated further detail on proposed interest/estate as follows:

- a. Proposed for or already acquired in fee interest due to 1) full take involving full or majority parcel acquisition, structure displacement, or uneconomic remnant, or 2) partial take involving excavation impacts to level undeveloped or paved property.
- b. Lesser interest possible – Channel Improvement Easement. Fee interest conservatively estimated for planning purposes. Amount and impact involved to be finalized during PED. Final assessment may indicate lesser interest is possible. Impact may involve excavation within existing channel slopes, and minimal impact to existing level undeveloped property.
- c. Lesser interest possible – Maintenance Easement. Fee interest conservatively estimated for planning purposes. Amount and impact involved to be finalized during PED. Final assessment may indicate lesser interest is possible. Impact may only require maintenance access within maintenance berm with no excavation or issues of channel slope proximity to structures involved.
- d. Proposed for acquisition of channel improvement easement.

2.7.1 General Land, Easements, Rights-of-Way, Relocations and Disposal Areas (LERRD) Requirements for Channel Modifications

Channel modifications for the TSP will require approximately 905,882 cubic yards of excavation. For the earthen channel section, non-federal sponsor, HCFCD, requires a 30-foot maintenance berm on each side of the channel, making the ROW requirement equal to the top width plus 60 feet. For the concrete channel section, the required maintenance berm width is 20 feet on one side and 10 feet on the other. Therefore, the ROW requirement for the short concrete channel section through ERRY is the top width plus 30 feet. Table A6-2 lists the existing ROW widths and the proposed channel bottom widths and ROW widths for the project reaches. The cross sections between Station 561+00 and Station 570+50 will have concrete-lined side slopes at the 2.5 horizontal:1 vertical ratio and the remaining channel bottom will be grass-lined.

**Table A6-2:
Existing and Proposed ROW Widths**

Trapezoidal Design Section					
Station		Proposed Width (feet)		ROW Width (feet)	
From	To	Bottom	Top*	Existing	Proposed
595+00	End of Project	10	172	0-150	150-310
705+00	600+00	60	205	0-150	240-300
715+00	710+00	40	170	100-150	220-240
743+00	720+00	30	160	100-200	210-260

*Average top width

Typically, the lands needed have already been or will be acquired in fee interest, specifically “fee excluding minerals”, due to either a full take involving full or majority parcel acquisition, structure displacement, or an uneconomic remnant, or a partial take involving excavation impacts to level undeveloped or paved properties. Perpetual easement is generally not a viable option for these areas, since much of the obtained property will be excavated and turned into channel bottom or side slope leaving no real value for the present landowner. In certain circumstances, fee interest was conservatively estimated for planning purposes, but a lesser interest, such as a channel improvement easement or a maintenance easement, may be possible. The amount and impact involved will be finalized during PED, and final assessment may indicate a lesser interest is possible. Table A6-1 includes notes denoting which parcels may be applicable for a lesser interest than “fee excluding minerals”. However, it is the non-federal sponsor’s experience that obtaining an easement interest often incurs additional delays and costs associated with litigation

compared to fee acquisition. Furthermore, it is the Appraiser's opinion that the valuation of lands and damages for an easement would be essentially the same as for fee acquisition. The "fee excluding minerals" is a standard estate and is explained in Section 2.5.

2.7.2 Considerations for Property between IH 610 and Homestead Road

Between IH 610 and Homestead Road (Station 630+60 to Station 600+00), the channel will have the same width as the segment immediately upstream, which is the widest geometry planned for the TSP. *Exhibit A6-3d* indicates the required ROW limits for the reach. Three properties are within this segment's proposed limits. COH owns two (Parcel ID numbers 150 and 151) and Cypress Industrial Company owns the other (Parcel ID number 149). As discussed in Section 2.23, the COH property on Parcels 150 and 151 contain a 1970s-era unregistered municipal landfill covering most of the area on the high north bank. The planned widening was nominally configured to avoid impacting the waste layer, but will require more detailed delineation of the waste layer closer to the current top of slope edges, and possible adjustments to the proposed ROW line along this bank during the Preconstruction Engineering and Design (PED) phase to ensure avoidance.

However, the need to extend the planned channel cross section slope, convey the modified channel flow (which would be modified to the south of the existing channel), or to contain the 30-foot maintenance berm may require acquiring some COH property. The final slope would be designed to avoid modifying the landfill cover layer which would require permitting actions or replacing covering layers compliant with Texas landfill permitting, design and operation laws. Parcels 150 and 151 would not be used to excavate an FRM component such as an inline basin or widened channel section. Any required widening would be done to the south of the channel. However these parcels currently extend into the existing channel side slope and bed. Site investigation information used to evaluate the benefit and cost for the previously proposed inline detention on these parcels does not currently indicate the landfill is a concern for offsite contamination release, and indicates the waste is municipal in nature. However, due to the landfill's presence and associated liabilities, the final real estate acquisition process should include evaluating the minimum interest level needed to accommodate the planned channel cross section slope or maintenance berm needs, and to convey the modified channel flow to limit the liability to the non-federal sponsor. It is recommended a lesser interest than fee ownership, such as an easement, be acquired for this property. The specific form of easement will be determined during the PED phase when final details for the slope design and cover requirements are available. It is assumed that a standard estate will be employed, with a non-standard estate used only as a last resort. As a conservative estimate for acquiring this property, the cost has been determined as a fee simple interest for the current ROW line proposed. The Cypress Industrial Company parcel would be considered for full acquisition as "fee excluding minerals" for 6.62 total acres. Again, a perpetual easement is not recommended for this property, because it will be excavated, and flow water will perpetually exist in the channel's bottom. The estimated cost is \$1,164,540 for these properties, Parcel ID numbers 149, 150 and 151.

2.8 Offline Detention Basin

The proposed offline detention basin is shown in *Exhibit A6-4*. The offline detention will provide complementary flood damage reduction in combination with the channel modifications, and detail flows provided by the modified channel to reduce peak downstream water surface elevations. A hydraulic control structure connected to four existing 96-inch culverts and

one new 72-inch culvert will allow flow into the basin during high stages in Hunting Bayou and out of the basin as the water level in the bayou recedes. Existing drainage easements, not shown in *Exhibit A6-4*, accommodate the four existing culverts, one new culvert, and hydraulic control structure.

Approximately 1,640,000 cubic yards of excavation is required to construct the proposed 1,016 acre-feet of offline storage. The basin includes a 50-foot maintenance berm on the northern, eastern, western and southern sides.

All the area required for the offline detention basin (ID number 177) was owned by one entity, Union Pacific Railroad (UPRR), and was purchased by the non-federal sponsor, HCFCD. The 75-acre area was part of a larger 170-acre tract UPRR is using to expand its intermodal transport facilities. The acquisition cost was \$4,885,664 at approximately \$1.49/square foot. The offline detention basin is not located in the channel and is not currently conveying existing flows, which would make channel or flood control easement inappropriate. The proposed use for an excavated basin, up to 18 feet deep, would limit the value to the current property owner. Therefore, the non-federal sponsor, HCFCD, purchased this property as “fee excluding minerals.” Even though the basin is proposed to be dry most of the time, a flowage easement estate was not recommended for the same reason.

2.9 Excavation Disposal Sites

Multiple options were considered in the planning stage for disposal of excavated materials for purposes of cost estimation. These included 1) re-use of materials in local projects, 2) disposal of materials in a landfill, or 3) disposal of materials on acquired disposal sites. Re-use of all material was not considered feasible for cost estimation as sufficient local projects requiring fill could not be immediately identified, and disposal of material in a landfill was determined to be cost-prohibitive when compared to acquisition of property for disposal of excavated material. A temporary work area easement could be employed, should alternative destinations, either re-use or permanent disposal, be available by the end of the agreed-upon easement term limit. However, it was determined that it was speculative to assume that sufficient re-use opportunities would arise, and re-loading and hauling materials to a permanent disposal location would be cost-prohibitive when considering temporary easements. Therefore, “fee excluding minerals” acquisition of property for permanent disposal was estimated as the least cost scenario, under the assumption that re-use in local projects or price-comparable excavation contractor responsibility could not be achieved. However, it is the intent of the non-federal sponsor to pursue re-use of excavated materials to the maximum extent possible. Therefore, “fee excluding minerals” is considered a conservative contingency, not the minimum estate preferred.

Preliminary calculations indicated that approximately 114 acres are required for disposing the excavated material under the TSP, assuming an approximate 12-foot fill height and 3 horizontal:1 vertical side slopes. Including a required 30-foot maintenance berm around each disposal site’s perimeter increases the required area to nearly 155 acres. Assuming approximately 25 percent of the total project excavation volume will be reused in local projects, the acres required is reduced to approximately 119 acres, and 12 parcels (Sites D4-1 through D4-5, D5a and D6-1 through D6-6) currently meet this need as shown on *Exhibits A6-5a-5c*. The non-federal sponsor, HCFCD, has successfully disposed excavated soils in past projects through reuse in local road development, and intends to do so for this project to the extent possible.

Sufficient disposal sites have been identified as a planning contingency, assuming 25 percent of the required placement volume can be reused in other projects. *Table A6-3* provides descriptions for the proposed sites including lot area, number of parcels and estimated value for the available site.

These properties are proposed to be purchased for “fee excluding minerals.” Ideally, the non-federal sponsor, HCFCD, will attempt to negotiate contracts with the excavation contractors to take responsibility for disposing the excavation material or coordinate with other local road and development projects to reuse these materials as fill as mechanisms for reusing excavated soils. However, the disposal sites identified in this REP exist as a contingency in the event contractors are unable to reuse the material. The acquisitions required for the disposal sites are summarized as follows.

Disposal Site Parcels

Land: 119.15 acres or 5,189,597square feet	\$ 8,084,577
Improvements in Part Taken.....	\$ 0
Severance Damages	\$ 412,893
Total Market Value – Disposal Sites	\$ 8,497,470

**Table A6-3:
Hunting Bayou Project Lands Required for Disposal Sites**

Parcel ID	Location	Property Type	Whole Size (acre)	Partial Taking Size (acre)	Severance Damages	Acquisition Cost
D4-1	7501 Liberty Road	VL - industrial	25.25	21.80	\$225,279	\$1,649,703
D4-2	7501 Liberty Road	VL - industrial	1.35	1.25	\$6,834	\$88,470
D4-3	7501 Liberty Road	Industrial	9.99	2.26	\$0	\$147,431
D4-4	Liberty Road	VL - industrial	2.97	2.32	\$0	\$0
D4-5	N. Loop East/ Liberty Road	VL - industrial	17.72	13.53	(Acquisition Cost = Remainder after value of Parcel ID 161)	\$717,348
D5a	Oates Road	VL - industrial	65.40	65.40	\$0	\$4,273,497
D6-1	Attwater Street	VL - industrial	2.27	2.27	\$0	\$247,203
D6-2	Mesa Drive	VL - industrial	1.96	1.96	\$0	\$277,378
D6-3	Kenton Street	VL - industrial	0.18	0.18	\$0	\$19,590
D6-4	Mesa Drive	Public land	0.41	0.41	\$0	\$44,605
D6-5	Mesa Drive	VL - industrial	1.37	1.37	\$0	\$148,735
D6-6	Knute Street	VL - industrial	7.88	6.82	\$180,780	\$857,598
D6-7	Mesa Drive	VL - industrial	0.18	0.18	\$0	\$25,912
				119.15	\$412,893	\$8,497,470

2.10 Land, Easements, Rights-of-Way, Relocations and Disposal Areas (LERRD) Owned by the Non-Federal Sponsor, Harris County Flood Control District (HCFCD)

The non-federal sponsor, HCFCD, owns property within TSP's proposed ROW; the real estate interest in 19 parcels was obtained prior to acquisition for this project. These lands are necessary to the project as the existing channel is being deepened. These properties shall be considered for credit to the non-federal sponsor, HCFCD, as part of its share of LERRD costs in determining cost-sharing between the federal government and the non-federal sponsor, HCFCD. The value for these properties has been estimated according to the methods used in the estimate of costs for LERRD Report as follows.

LERRD previously owned by non-federal sponsor, HCFCD, (19 parcels) \$130,948

The non-federal sponsor, HCFCD, also purchased 102 parcels for the project beginning on February 1, 2007, including property for most of the channel ROW and the required offline detention basin parcel as discussed in Section 2.8. Residential improvements were found on 52 parcels and other improvements were found on two parcels. Parcels 13-23, 26, 35-36, 40, 47, 63, 65-67, 70, 73-74, 76, 79, 84, 88, 92, 95, 97, 105, 113-116, 118, 120, 122-123, 126 and 128-139 contained previously purchased residential improvements and most have subsequently been removed. Parcels 104 and 110 included a metal building and an auto garage. The value for lands and improvements for these 102 parcels is given in the Baseline Cost Estimate provided in *Table A6-5*, and was based on actual acquisition costs provided by the non-federal sponsor, HCFCD.

2.11 Risks Associated with Acquiring Land, Easements, Rights-of-Way, Relocations and Disposal Areas (LERRD)

The non-federal sponsor, HCFCD, has initiated and completed purchasing required property for many TSP components. The non-federal sponsor, HCFCD, knows the risks involved in acquiring property to implement the TSP prior to a formal federal government notice-to-proceed with the project. The non-federal sponsor, HCFCD, has been advised in writing about the risks associated with acquiring land prior to the PPA execution.

2.12 Non-Federal Sponsor Acquisition Capability Assessment

As a public entity, the non-federal sponsor, HCFCD, has condemnation authority and has adequate financial capability and experience in real estate acquisition. When a buyout plan is implemented, the non-federal sponsor, HCFCD, provides tract appraisals for all lands acquired for project purposes. On similar projects, the non-federal sponsor, HCFCD, has contracted out the required tract appraisals, and it is assumed the same procedure will be followed when this buyout plan is implemented. Federal government appraisers will review and approve the appraisals for compliance with appraisal standards and for crediting purposes. Depending on workload and available personnel, the non-federal sponsor, HCFCD, may also choose to contract out the real estate acquisition. In any case, the federal government will monitor all real estate activities associated with the project to ensure compliance with PL 91-646, as amended. A Non-Federal Sponsor Capability Assessment Checklist is included in *Attachment 6-2*. *Attachment 6-3* includes the Non-Federal Sponsor's Self-Certification of Financial Capability for Decision Documents.

2.13 Land Acquisition Schedule

The non-federal sponsor, HCFCD, proposes to proceed with the property acquisition prior to the Draft GRR/EA approval. The non-federal sponsor, HCFCD, is aware no federal funds will be made available for this project prior to executing the PPA. Furthermore, the non-federal sponsor, HCFCD, understands in the event a plan is not adopted for implementation, no credit for land acquisition will be provided by the federal government. The non-federal sponsor, HCFCD, issued a Letter of Intent to the USACE, Galveston District dated December 5, 2012, supporting implementation and construction in accordance with the model PPA. A copy of the letter is included as *Attachment 6-4*.

Table A6-4 is preliminary acquisition schedule developed to show acquisition milestones. The acquisition schedule begins in 2007, as that is the date when the non-federal sponsor began acquiring property at risk.

**Table A6-4:
Preliminary Acquisition Schedule**

LERRD	Components	Acquisition Period
Contract A	Offline Detention and Disposal Areas 4 & 5	1/2007 – 9/2016
	Maps to Sponsor	1/2007 – 11/2015
	Survey	1/2007 – 1/2016
	Title	1/2007 – 3/2016
	Appraisals	1/2007 – 4/2016
	Closings	1/2007 – 6/2016
	Possession	1/2007 – 7/2016
	LER Certification	9/2016
Contract B	Channel modifications	1/2007 - 12/2017
	Maps to Sponsor	1/2007 – 2/2017
	Survey	1/2007 – 4/2017
	Title	1/2007 – 6/2017
	Appraisals	1/2007 – 7/2017
	Closings	1/2007 – 9/2017
	Possession	1/2007 – 10/2017
	LER Certification	12/2017
Contract C	Channel modifications	1/2007 – 9/2018
	Maps to Sponsor	1/2007 – 11/2017
	Survey	1/2007 – 1/2018
	Title	1/2007 – 3/2018
	Appraisals	1/2007 – 4/2018
	Closings	1/2007 – 6/2018
	Possession	1/2007 – 7/2018
	LER Certification	9/2018
Contract D	Channel modifications and Disposal Areas 6	1/2007 – 7/2019
	Maps to Sponsor	1/2007 – 11/2018
	Survey	1/2007 – 1/2019
	Title	1/2007 – 3/2019
	Appraisals	1/2007 – 4/2019
	Closings	1/2007 – 6/2019
	Possession	1/2007 – 7/2019
	LER Certification	9/2019
Contract E	Channel modifications	1/1/07 - 8/14/18
	Maps to Sponsor	1/2007 – 7/2019
	Survey	1/2007 – 9/2019
	Title	1/2007 – 11/2019
	Appraisals	1/2007 – 12/2019
	Closings	1/2007 – 2/2020
	Possession	1/2007 – 3/2020
	LER Certification	5/2020

2.14 Federally Owned Land

There are no federally owned lands, or existing federal projects, within the proposed project area. However, federal grants have supported local flood risk management efforts. The non-federal sponsor, HCFCD, supports using the LERRD required for the project. Public involvement and agency coordination are detailed in Section 8.0 of the Main Report.

2.15 Consistency with County and City Regulations

The project is not subject to zoning regulations, as there are no zoning regulations in Houston's city limits or extraterritorial jurisdiction. The non-federal sponsor, HCFCD, may be required to secure local municipal permits as part of a LERRD requirement. Examples of these permit types could include general construction permit, construction notification in ROW, 48-hour pre-construction notice and a development permit.

2.16 Baseline Cost Estimate

Table A6-5 summarizes the TSP's baseline real estate costs and includes LERRD/Improvement costs and other associated real estate costs for the structural measures. The table is based on actual LERRD costs which have already been acquired, and estimated costs for LERRDs remaining to be acquired. The estimated real estate values for LERRDs remaining to be acquired are based on lands, severance damages and improvements of the LERRD's costs. The estimated cost is based on November 2012 dollar values. Because project cost contingency is determined and accounted for in the Cost and Schedule Risk Analysis, the 20 percent valuation contingency initially used in the estimate of costs for LERRD is omitted from the values used from this source. The total estimated non-federal real estate cost for the TSP, including utility and bridge relocations, is \$72,976,521 without contingency, and \$86,479,100 with contingency.

**Table A6-5:
Baseline Cost Estimate for Real Estate ***

Account	Description	LERRDs	Contingencies	Sub-Total LERRD's ONLY	Non-Creditable Costs
01.00.00.00	Real Estate Planning Documents				
	Planning by Non Federal Sponsor				\$139,600**
	Real Estate Acquisition Documents				
	Acquisitions by Sponsor	\$697,550	\$131,238	\$828,788	
	Review of Sponsor				\$63,600
	Real Estate Condemnation Documents				
	Condemnations by Sponsor	\$145,150	\$25,990	\$171,140	
	Review of Sponsor				\$11,500
	Real Estate Appraisal Documents				
	Appraisals by Sponsor	\$351,000	\$27,007	\$378,007	
	Review of Sponsor				\$72,800
	Real Estate PL 91-646 Asst. Documents				
	PL 91-646 Asst. by Sponsor	\$52,923	\$5,181	\$58,104	
	Review of Sponsor				\$25,600
	Real Estate Payment Documents				
	Payments by Local Sponsor (Fee Simple)	\$22,943,900	\$2,607,226	\$25,551,126	
	Payments by Sponsor (PL 91-646)	\$1,249,200	\$59,551	\$1,308,751	
	Review of Sponsor				\$72,800
	Real Estate LERRD Credit Documents				\$72,800
02.00.00.00	Real Estate Facility/Utility Relocations				
	Payment by Sponsor ***	\$9,467,497	\$2,042,723	\$11,510,220	
	Review of Sponsor				\$64,400
	Real Estate Bridge Removal & Replacement				
	Payment by Sponsor	\$38,069,301	\$8,603,662	\$46,672,963	
	Review of Sponsor				\$12,000
08.00.00.00	Real Estate Railroad Bridge Modification				\$259,643
	Total Admin & Payments	\$72,976,521	\$13,502,578		\$794,743
	Total LERRDS + Contingencies			\$86,479,100	
	GRAND TOTAL	\$87,273,843			

* Costs incurred to date based on actual acquisition costs provided by non-federal sponsor, HCFCD. Future costs based on estimate of costs for LERRD values, administrative, appraisal, relocation, and federal review costs. Contingencies applied only to future costs to complete, not actual costs to date. Estimates reflect 2014 revisions to LERRDs costs.

** Real estate planning by the non-federal sponsor is estimated as a portion of the GRR/EA cost allocated for preparation of the Real Estate Plan. For cost estimating purposes, this cost is carried inside the GRR/EA cost and not as a part of LERRDs.

*** Real Estate Facility/Utility Relocation payments include utility relocation, demolition, and traffic control.

2.17 Federal Labor Costs

The incidental federal labor costs associated with overseeing the non-federal sponsor, HCFCD, have been included in the Baseline Cost Estimate included in *Table A6-5*.

2.18 Land Acquisition Costs

Land acquisition costs shown as Land, Damages and Improvements in *Table A6-5* include the cost for LERRD acquisition and the Fair Market Value for the building and costs for relocating businesses and homes. Administrative fees include appraisal costs, closing costs and consultant fees associated with the property acquisition and are shown in *Table A6-5*. Closing costs which include the title and negotiating costs were set at 1.5 percent of the property value. Actual costs are shown for the LERRDs already acquired.

2.19 Severance Damages

Severance damages apply to the value for several subject parcels. Severance damages are attributable to an improved subject parcel when the proposed acquisition or ROW line is next to building improvements. In most cases, if the acquisition or ROW line bisects a building improvement, the entire building improvement value was applied as an acquisition cost. Severance damages are applied to remainders where the land area is limited in use due to size, shape or overall functional ability. Severance damages are quantified and applied to those affected parcels using the same market value information as presented in previous paragraphs. Three disposal site parcels and 79 channel modification parcels will suffer from severance damages. The severance damages were based on the estimated severance damages in the estimate of costs for LERRD.

2.20 Condemnation Costs

Condemnation proceedings will be initiated for parcels which cannot be purchased through negotiations. Costs associated with condemnations are fees for Special Commissioners, appraiser's update, preparation and testimony fees and other court related costs.

2.21 Displacements

The TSP is anticipated to require 60 residential relocations including two small apartment structures with four living units and 58 SFRs. Other structure relocations required include two businesses, one religious use structure and a small former industrial use structure (garage). The displacements will occur by acquiring easements or fee purchase for the channel modification. The estates to be acquired are standard estates.

Under Public Law 91-646, relocation assistance is required. Per PL 91-646 requirements, appropriate notification timeframes to the occupants will be allotted before obtaining property possession. The non-federal sponsor, HCFCD, will comply with the applicable provision of the Uniform Relocation and Real Property Acquisition Policies Act of 1970 in acquiring lands. The non-federal sponsor, HCFCD, has extensive experience relocating persons and providing assistance for those persons. It also has legal authority to do so in accordance with the Uniform Relocation and Real Property Acquisition Policies Act of 1970. Regarding relocation assistance for residences, invoking "last resort housing authority" will not be required.

Table A6-6 shows the residential and business relocation-associated costs estimated to be required for the TSP. This table shows the anticipated amount for moving expenses and not the real estate cost to acquire the property. Each landowner will be eligible for moving and related expenses as stipulated in Section 202 of PL 91-646. A reasonable \$22,500 cost was estimated for each residential relocation. Apartment relocation costs are estimated to be \$5,250 for each displaced living unit. Non-residential relocation costs are estimated at \$20,000. The estimated remaining relocation cost total shown below does not include contingency. It should be noted that PL 91-646 was amended in 2012, slightly raising the limits for payments. The estimate provided for remaining relocation costs was not updated to reflect the new limits, as the difference would be nominal and there are only a limited number of anticipated future relocations. The increased limit is only applicable to future relocation payments, and does not impact relocation payments processed prior to the amendment.

**Table A6-6:
Estimated Total Relocation Costs for the TSP**

Description	Cost
Actual Relocation Costs to Date	\$985,700
Estimated Remaining Relocation Costs	\$263,500
Total	\$1,249,200

2.22 Mineral Activity

There is and will not be any mineral activity occurring within the right-of-way of this project area.

Historically, subsidence concerns in Harris County were associated with groundwater usage, not with coal, oil or gas. This concern has been addressed by a county-wide shift from groundwater to surface water. The study area is also highly developed and there are no known coal resources within the project area. The oil well spacing requirements in Chapter 31 of the City of Houston Ordinances generally preclude any oil and gas activity along the channel and most of the offline basin footprint.

Acquiring mineral rights is not desirable because 1) a fee excluding minerals estate would be a sufficient lesser estate necessary for project lands which require widening, 2) difficulty tracking down mineral interest owners as these rights are largely severed from surface rights in Texas, 3) the unlikelihood of mineral activity and 4) because it is the standard fee estate NFS has successfully used on the majority of its channel modification projects.

There is no current oil or gas development in the immediate area and City of Houston ordinances generally prohibit erection of oil wells within a dense residential and commercial community such as that found along Hunting Bayou. If owners were to exercise mineral rights, it would be oil extraction done on property not in the channel ROW to tap into deep underground reserves which may overlap the project footprint. This activity, typically conducted using directional drilling, would not interfere with the function or preclude the implementation of the widened and deepened channel as well as the detention basin.

2.23 Hazardous, Toxic and Radioactive Waste (HTRW)

In addition to a former landfill site, six potential sites with environmental concerns exist within a 100-ft buffer of the project ROW and are shown in *Exhibit A6-2*. One is the Kirkpatrick Road Landfill; two are Voluntary Cleanup Program sites at 5880 Kelley Road and 6701 North Loop East (this address is also assigned to other registered petroleum storage tank [PST] facilities); one is a PST/leaking PST at the former Humble Oil 99 Land Waste Disposal facility at 5118 Lockwood Drive; one is a PST owned by UPRR at 7000 Liberty Street; and one is a Resource Conservation and Recovery Act treatment, storage and disposal facility at 5202 Lockwood (identified as a new facility formerly identified as an Exxon Mobil PST/leaking PST site).

The cleanup activities at 5880 Kelley Road are estimated to be completed in the next 3 years. Therefore, at the time of purchase there will be no impact to the surrounding land's value attributed to the contamination. However, no portion of this lot is proposed to be acquired.

An unregistered, closed Type I landfill is north of the bayou in the Homestead Road vicinity throughout Parcel ID numbers 150 and 151. This Type I landfill was operated as the Homestead Road Sanitary Landfill sometime during the 1960s and 70's to receive household wastes. The facility is included in the Texas Commission on Environmental Quality required *Inventory of Closed Municipal Solid Waste Landfills* but no additional information was available from the inventory. An April 2007 Phase I Environmental Site Assessment for this property identified several recognized environmental conditions associated with unburied/partially buried miscellaneous debris, tires, and labeled and unlabeled paint buckets, drums and cans in several isolated areas of the property. The report recommended evaluation and proper disposal of the debris. Considering the isolation and extent of the debris, and results of later investigations, it is likely this debris is associated with illegal dumping occurring after the landfill ceased operation.

Considerations for acquiring the property needed are discussed in Section 2.7.2. However, the Type I landfill site is no longer being considered for an FRM component as inline detention. A portion of the property will still be impacted as the current property boundaries extend into the current channel configuration. Current information has not indicated it is acting as a release site for contaminants into the bayou. More description on HTRW can be found in the GRR Main Report, Sections 2.7 and 5.10.

2.24 Landowner Support/Opposition

Fourteen public meetings have been held to discuss the project, gather input and gauge the community's preference for any particular plan. The local community has expressed support for the TSP. The area has historically had many flooding issues, and the community is eager to have the problems addressed.

During the meetings, certain individuals expressed concerns the project may adversely affect flood levels in areas which do not currently have flooding problems. It was made clear to the public this project would not result in increased flood hazard risks.

A substantial flooding event occurred due to Tropical Storm Allison in June 2001. The non-federal sponsor, HCFCD, believes public support for a project proposed on Hunting Bayou has grown. The public will strongly support a structural remedy which

minimizes residential relocations (as the TSP does), compared to other remedies developed in the plan formulation activities.

2.25 Navigation Servitude

Navigation servitude is the government's dominant right under the Commerce Clause in the U.S. Constitution to use, control and regulate the navigable waters of the United States and the submerged lands thereunder for various commerce-related purposes including navigation and flood control.

Hunting Bayou is considered a navigable watercourse for its lower 3.3 miles only. The proposed channel modifications are 10 miles upstream from the mouth; therefore, navigation servitude does not apply.

3.0 RELOCATING UTILITIES AND FACILITIES

Many existing utility crossings within the project area will need to be relocated. A PAOC, prepared by the Harris County Attorney's Office, addresses which existing crossings have a legal right to exist across Hunting Bayou and, therefore, must be relocated at no expense to the facility owners. The PAOC was reviewed by the USACE District Counsel and approved on March 11, 2014. The PAOC identified 96 utilities that may need to be relocated, removed, or altered, including 16 compensable relocations that may exceed \$250,000. In addition, 17 bridges were identified which may need to be extended or replaced. Final opinions and final relocation determinations will be determined later per ER 405-1-12.

Any conclusion or categorization contained in this report that an item is a utility or facility relocation to be performed by the non-federal sponsor, HCFCD, as part of its LEERD responsibilities is preliminary only. The government will make a final determination about the relocations necessary to construct, operate or maintain the project after further analysis and completion and approval of final attorney's opinions of compensability for each of the impacted utilities and facilities.

The estimated cost for utility relocations was prepared by Atkins North America, Inc. with supporting information. *Table A6-7* lists the utility crossings to be relocated along with their approximate channel station location and estimated relocation cost. *Exhibit A6-6* provides a river station map by which each pipeline crossing location can be referenced. No extra real estate is anticipated to be required, outside of the current easements and channel ROW being acquired, to accommodate anticipated utility relocations.

Bridge replacement and modification costs contribute significantly to overall project cost and total approximately \$38M. These bridge replacement costs are associated with the optimized channel modification length and are identical for the NED Plan and the TSP. Therefore, these costs apply to both plan scales. Rail bridge modifications that are cost-shared as construction costs based on Section 3 of the 1946 Flood Control Act are less than one-half of one percent of all bridge modifications and total approximately \$260,000. No extra real estate is anticipated to be required, outside of the current easements and channel ROW being acquired, to accommodate

**Table A6-7:
Identified Utility and Bridge Adjustments**

Station	Pipeline Description	Pipeline Owner	Utility Adjustment	Estimated Cost
PRE-TSARP	*Bridges in bold italics as reference points			
551+50	Public Storm Utility Drainage Piping, corrugated metal pipe, 24-inch diameter	COH	Remove and replace	\$7,000
553+40	Gas Pipeline 12-inch diameter	Chevron	Remove and replace	\$17,050
554+50	Gas Pipeline, 6-inch	Howard Energy Partners	Remove and replace	\$11,067
555+45	Gas Pipeline 16-inch diameter	Howard Energy Partners	Remove and replace	\$18,675
558+60	Gas Pipeline 12-inch diameter	Shell Pipeline Company LP	Remove and replace	\$17,050
559+50	Public Storm Utility Drainage Piping, corrugated metal pipe, 30-inch diameter	COH	Remove and replace	\$9,800
561+50	Public Storm Utility Drainage Piping, corrugated metal pipe, 24-inch diameter	COH	Remove and replace	\$6,500
562+00	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$5,800
563+05	Public Storm Utility Drainage Piping, 137-inch x 84-inch Outfall pipe	COH	Remove and replace	\$525,888
564+05	Public Water Utility Distribution Piping 36-inch diameter	COH	Remove and replace	\$7,500
564+35	Public Water Utility Distribution Piping 12-inch diameter	COH	Remove and replace	\$7,700
566+20	Gas Pipeline 36-inch diameter	Energy Transfer Company	Remove and replace	\$18,300
566+25	Public Water Utility Distribution Piping 36-inch diameter	COH	Remove and replace	\$9,000
566+50	Public Storm Utility Drainage Piping, corrugated metal pipe, 36-inch diameter	COH	Remove and replace	\$10,990
566+60	Public Sanitary Sewer Force Main, Aboveground/On-Bridge, 10-inch	COH	Remove and replace	\$7,500
570+30	Public Water Utility Distribution Piping 12-inch diameter	COH	Remove and replace	\$9,240
570+60	Southern Pacific Pipe (Size Unknown)	UPRR	Remove and replace	\$17,050
572+25	Public Sanitary Sewer Force Main, Aboveground/On-Bridge	COH	Remove and replace	\$7,500
572+25	Gas Pipeline, 6-inch	Howard Energy Partners	Remove and replace	\$11,067
572+40	Gas Pipeline 36-inch diameter	Howard Energy Partners	Remove and replace	\$18,300
574+30	Southwestern Bell Telephone (SWBT) Communication Conduit	SWBT	Remove and replace	\$200,000
575+00	SWBT Communication Conduit	SWBT	Remove and replace	\$200,000
575+70	SWBT Communication Conduit	SWBT	Remove and replace	\$200,000
576+50	SWBT Communication Conduit	SWBT	Remove and replace	\$200,000

Station	Pipeline Description	Pipeline Owner	Utility Adjustment	Estimated Cost
578+90	Gas Pipeline, 4-inch	CenterPoint	Remove and replace	\$11,067
580+00	Public Storm Utility Drainage Piping, corrugated metal pipe, 36-inch diameter	COH	Remove and replace	\$10,990
587+00	Public Storm Utility Drainage Piping, corrugated metal pipe, 24-inch diameter	COH	Remove and replace	\$6,500
590+40	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$9,860
596+00	Public Water Utility Distribution Piping 36-inch diameter	COH	Remove and replace	\$45,000
600+50	Public Storm Utility Drainage Piping, corrugated metal pipe, 24-inch diameter	COH	Remove and replace	\$6,500
611+75	Pubic Sanitary Sewer Siphon, 8-inch and 10-inch	COH	Remove and replace	\$1,008
623+80	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 96-inch diameter	COH	Remove and replace	\$73,450
634+20	SWBT Communication Conduit	SWBT	Remove and replace	\$347,693
634+50	Public Sanitary Sewer Collector, 8-inch	COH	Remove and replace	\$13,038
634+65	Public Sanitary Sewerage Piping (Force main)	COH	Remove and replace	\$13,038
635+10	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 120-inch diameter	COH	Remove and replace	\$101,700
635+10	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 96-inch diameter	COH	Remove and replace	\$73,450
635+40	Gas Pipeline, 4-inch	Boardwalk Pipeline Partners	Remove and replace	\$31,334
635+99	Public Sanitary Sewerage Piping (Forcemain)	COH	Remove and replace	\$13,038
635+99	Public Sanitary Sewerage Piping (Sludge)	COH	Remove and replace	\$13,038
636+00	Public Water Utility Distribution Piping 16-inch diameter	COH	Remove and replace	\$47,981
638+50	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 12-inch diameter	COH	Remove and replace	\$8,023
645+90	SWBT Communication Conduit	SWBT	Remove and replace	\$347,693
647+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 42-inch diameter	COH	Remove and replace	\$20,861
648+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 30-inch diameter	COH	Remove and replace	\$15,820
649+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$11,300
649+80	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$11,300

Station	Pipeline Description	Pipeline Owner	Utility Adjustment	Estimated Cost
650+60	Public Water Utility Distribution Piping 48-inch diameter	COH	Remove and replace	\$118,650
652+80	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$11,300
652+81	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$11,300
654+20	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 30-inch diameter	COH	Remove and replace	\$15,820
661+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 30-inch diameter	COH	Remove and replace	\$14,603
673+15	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 60-inch diameter	COH	Remove and replace	\$46,938
685+85	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 54-inch diameter	COH	Remove and replace	\$31,501
686+30	Sanitary Sewer Piping 84-inch diameter	COH	Remove and replace	\$28,685
687+20	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$18,149
687+20	Gas Pipeline, 4-inch	Boardwalk Pipeline Partners	Remove and replace	\$31,334
692+50	Sanitary Sewer Piping 60-inch diameter,	COH	Remove and replace	\$26,077
693+10	Public Water Utility Distribution Piping 2-inch diameter	COH	Remove and replace	\$12,516
697+85	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 90-inch diameter	COH	Remove and replace	\$57,369
698+30	Gas Pipeline, 2-inch	Boardwalk Pipeline Partners	Remove and replace	\$24,105
698+50	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$20,166
703+60	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$9,561
704+20	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 42-inch diameter	COH	Remove and replace	\$20,861
704+60	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$17,141
710+55	Public Water Utility Distribution Piping 2-inch diameter	COH	Remove and replace	\$7,200
710+60	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 18-inch diameter	COH	Remove and replace	\$4,620
713+20	Public Water Utility Distribution Piping 84-inch diameter	COH	Remove and replace	\$135,000
715+80	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 96-inch diameter	COH	Remove and replace	\$35,750

Station	Pipeline Description	Pipeline Owner	Utility Adjustment	Estimated Cost
716+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 96-inch diameter	COH	Remove and replace	\$35,750
716+00	Gas Pipeline, 2-inch	Boardwalk Pipeline Partners	Remove and replace	\$12,479
716+45	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$10,440
716+55	Public Water Utility Distribution Piping 2-inch diameter	COH	Remove and replace	\$6,000
717+00	Sanitary Sewer Piping 42-inch diameter	COH	Remove and replace	\$12,499
717+00	Gas Pipeline, 2-inch	CenterPoint	Remove and replace	\$12,479
720+95	Gas Pipeline, 2-inch	CenterPoint	Remove and replace	\$12,479
720+96	Public Water Utility Distribution Piping 6-inch diameter	COH	Remove and replace	\$8,460
722+63	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$5,500
722+63	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 66-inch diameter	COH	Remove and replace	\$24,750
724+30	Public Water Utility Distribution Piping 36-inch diameter	COH	Remove and replace	\$37,500
728+55	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$5,500
728+70	Gas Pipeline, 2-inch	Boardwalk Pipeline Partners	Remove and replace	\$12,479
728+73	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 48-inch diameter	COH	Remove and replace	\$13,750
728+90	Public Water Utility Distribution Piping 6-inch diameter,	COH	Remove and replace	\$7,050
729+25	Public Sanitary Sewerage Piping, 8-inch diameter	COH	Remove and replace	\$7,500
729+75	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$5,500
732+20	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$5,500
732+20	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 24-inch diameter	COH	Remove and replace	\$5,500
732+50	Public Sanitary Sewerage Piping, 8-inch diameter	COH	Remove and replace	\$7,500
732+50	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$8,700
732+59	Gas Pipeline, 2-inch	CenterPoint	Remove and replace	\$10,399
735+75	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$7,990

Station	Pipeline Description	Pipeline Owner	Utility Adjustment	Estimated Cost
737+00	Public Water Utility Distribution Piping 8-inch diameter	COH	Remove and replace	\$7,990
742+00	Public Storm Utility Drainage Piping, corrugated metal pipe, galvanized and bituminous coated with standard outfall structure, 20-foot lengths, 14-gauge, 42-inch diameter	COH	Remove and replace	\$11,000
Offline Detention Basin Utility Impacts (basin will be north of railroad tracks and east of Homestead road)				
	Public Sanitary Sewer Lift Stations, packaged sewage lift station, 2 million GPD	COH	Remove and replace	\$2,500,000
	Public Sanitary Sewerage Manhole, complete	COH	Remove and replace	\$4,506
			TOTAL	\$6,274,505

Station	Bridge Description	Bridge Owner	Bridge Adjustment	Estimated Cost
Bridges to be Impacted (extended or replaced)				
564+09	Bridge Modification - Wayside	COH	Remove and replace	\$4,491,900
564+09	Bridge Approaches - Wayside	COH	Remove and replace	\$742,365
566+44	Rail Bridge Modification - Southern Pacific (SP) ERRY ²	Railroad	Remove and replace	\$42,800
566+44	Rail Bridge Approaches - SP ERRY ²	Railroad	Remove and replace	\$80,798
566+99	Rail Bridge Modification - SP ERRY ²	Railroad	Remove and replace	\$38,520
566+99	Rail Bridge Approaches - SP ERRY ²	Railroad	Remove and replace	\$54,068
568+49	Rail Bridge Modification - SP ERRY ²	Railroad	Remove and replace	\$37,450
568+49	Rail Bridge Approaches - SP ERRY ²	Railroad	Remove and replace	\$6,008
599+52	Bridge Modification - Loop 610 2nd Crossing	Texas Department of Transportation (TxDOT)	Remove and replace	\$14,718,180
599+52	Bridge Approaches - Loop 610 2nd Crossing	TxDOT	Remove and replace	\$2,191,860
635+97	Bridge Modification - Homestead Road	COH	Extend	\$624,960
635+97	Bridge Approaches - Homestead Road	COH	Remove and replace	\$121,500
648+92	Bridge Modification - Kelley Street Westbound	COH	Remove and replace	\$1,755,468
648+92	Bridge Approaches - Kelley Street Westbound	COH	Remove and replace	\$42,525
658+96	Bridge Modification - Loop 610 3rd Crossing	TxDOT	Extend	\$4,255,680
661+53	Walkway Bridge Modification - Hutcheson	COH	Remove and replace	\$189,720
661+53	Walkway Approaches - Hutcheson	COH	Remove and replace	\$6,683
672+94	Walkway Bridge Modification - Hutcheson	COH	Remove and replace	\$189,720
672+94	Walkway Approaches - Hutcheson	COH	Remove and replace	\$4,860
692+95	Walkway Bridge Modification - Pickfair	COH	Remove and replace	\$223,200
692+95	Walkway Approaches - Pickfair	COH	Remove and replace	\$5,468
704+55	Bridge Modification - Wipprecht	COH	Remove and replace	\$1,487,070
704+55	Bridge Approaches - Wipprecht	COH	Remove and replace	\$43,740
716+69	Bridge Modification - Wayne Street	COH	Remove and replace	\$1,522,968
716+69	Bridge Approaches - Wayne Street	COH	Remove and replace	\$161,595
724+66	Bridge Modification - Hirsch Street	COH	Remove and replace	\$2,529,600
724+66	Bridge Approaches - Hirsch Street	COH	Remove and replace	\$18,360
729+22	Bridge Modification - Leffingwell Street	COH	Remove and replace	\$1,182,030
729+22	Bridge Approaches - Leffingwell Street	COH	Remove and replace	\$88,695
732+67	Bridge Modification - Falls Street	COH	Remove and replace	\$1,210,860
732+67	Bridge Approaches - Falls Street	COH	Remove and replace	\$105,705

739+35	Walkway Bridge Modification - Russell	COH	Remove and replace	\$149,730
739+35	Walkway Approaches - Russell	COH	Remove and replace	\$4,860
			TOTAL – Roadway Bridges	\$38,069,302
			TOTAL – Railroad Bridges	\$259,644

Street Name	Ownership	Estimated Cost
Streets to be Impacted		
N George Street (Street segment no longer needed)	COH	\$26,319
Russell Street (W. Hunting St) (Street segment no longer needed)	COH	\$4,487
Sayers Street (Remove non-crossing dead end)	COH	\$3,087
Los Angeles Street (Remove non-crossing dead end)	COH	\$1,733
Los Angeles Street (Remove non-crossing dead end)	COH	\$2,613
Kashmere Street (Remove non-crossing dead end)	COH	\$3,559
Kashmere Street (Remove non-crossing dead end)	COH	\$309
Lavender Street (Remove non-crossing dead end)	COH	\$7,778
Pickfair Street (Remove non-crossing dead end)	COH	\$5,344
Hoffman Street (Street segment no longer needed)	COH	\$5,679
Hickman Street (Street segment no longer needed)	COH	\$32,300
Dabney Street (Street segment no longer needed)	COH	\$2,819
Loop 610 WB Feeder-Kelley Street EB Connector (Realign)	TxDOT	\$68,767
	TOTAL	\$164,800

1. Any conclusion or categorization of a utility or facility relocation to be performed by the non-federal sponsor, HCFCD, as part of its LEERD responsibilities is preliminary only. The government will make a final determination of the relocations necessary for the construction, operation or maintenance of the project after further analysis and completion and approval of final attorney's opinions of compensability for each of the impacted utilities and facilities.
2. Railroad relocation costs are considered Federal construction costs for the purposes of cost share, in accordance with Section 3, 1946 Flood Control Act
3. For more information on the bridges to be impacted, see Appendix 3 – Engineering Analysis.

4.0 REFERENCES

The following reports or publications served as technical references related to REP conducted as part of the feasibility study.

1. U.S. Army Corps of Engineers, December 1998, *Real Estate Handbook*, ER 405-1-12.
2. U.S. Army Corps of Engineers, September 1, 2000 (tables revised 30 March 2007), *Civil Works Construction Cost Index System*, EM 1110-2-1304.
3. U.S. Army Corps of Engineers, Revised April 22, 2000 (December 28, 1990), *Guidance for Conducting Civil Works Planning Studies*, ER 1105-2-100.
4. U.S. Water Resources Council, March 10, 1983. *Economic and Environmental Principles and Guidelines for Water Resources and Related Land Resources Implementation Studies*.

4.1 Supporting Documentation

1. Atkins, February 2013, Micro-Computer Aided Cost Estimating System, Version 4.1 for the Hunting Bayou Flood Risk Management Project.



ATTACHMENT 6-1
DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF:

May 23 2002

Real Estate Division

Subject: Proposed Hunting Bayou Flood Control Project, Harris County, Texas

Mr. Mike Talbot
Director
Harris County Flood Control District
9900 Northwest Freeway, Suite 220
Houston, Texas 77092

Dear Mr. Talbot:

It is our understanding that you may begin acquiring homes and relocating families in portions of the Hunting Bayou Floodplain prior to execution of the Project Cooperation Agreement (PCA) with the Federal Government. We appreciate your support for this proposed project, but our regulations require us to inform you that, **IF FOR ANY REASON, THE PCA IS NEVER SIGNED OR IF CONGRESS FAILS TO AUTHORIZE OR FUND THE PROJECT, ANY LAND YOU ACQUIRED OR ANY MONEY YOU SPEND IN YOUR EFFORTS TO ACQUIRE LAND WILL BE AT THE SOLE RISK OF THE HARRIS COUNTY FLOOD CONTROL DISTRICT.** Furthermore, for any property that qualifies for Federal participation in the project, your acquisition efforts must be in compliance with all of the provisions of P.L. 91-646, the Federal Relocation Assistance Law.

Please ensure that good records are kept regarding appraisals, administrative expenses, purchase price and all relocation assistance or supplemental housing allowance payments. This is necessary for you to receive credit in the event of Federal Authorization. Be advised that regulations dictate that credit will not be given for real estate administrative costs for properties acquired 5 years prior to execution of a PCA.

ATTACHMENT 6-1

-2-

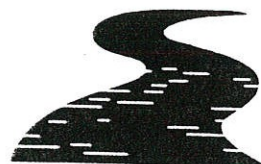
If you have any questions on any of the above please, call Mr. Don Hester of my staff at (409) 766-3811.

Sincerely,

Richard W. Harrison
Chief, Real Estate Division

CF: ✓ Mr. Owen Ralston
Tuner Collie & Braden Inc.
P.O. Box 130089
Houston, Texas 77219-0089

ATTACHMENT 6-1



Harris County
Flood Control District

9900 Northwest Freeway
Houston, Texas 77092
713-684-1000

June 7, 2002

Mr. Richard W. Harrison
Chief, Real Estate Division
U.S. Army Corps of Engineers
P. O. Box 1229
Galveston, TX 77553-1229

Reference: Proposed Hunting Bayou Flood Control Project

Dear Mr. Harrison:

We are in receipt of your letter dated May 23, 2002 informing us the property we're purchasing under our current house acquisition program in Hunting Bayou may not qualify for future Federal project. We understand the risks and appreciate your reminder.

For your information, most of the houses are being acquired under the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program funded by the Tropical Storm Allison disaster declaration. FEMA has their own Federal rules and regulations which can be in conflict with the Corps of Engineers rules and regulations for property acquisition. As a local entity, we utilize federal assistance when it is available and we qualify for it.

We are actually purchasing homes under the FEMA Mitigation Grant Program in several watersheds with existing and possible future Corps projects. They are Clear Creek, Sims Bayou, White Oak Bayou, Brays Bayou, Greens Bayou, Halls Bayou, and Buffalo Bayou.

Thank you for keeping us informed of the Corps of Engineers rules and regulations and your interests in our flood damage reduction projects in Harris County.

Sincerely,

Michael D. Talbott, P.E.
Director

MDT:

cc: Mr. Owen Ralston, P.E.
Mr. Wayne Crull, P.E.
Mr. Steve Fitzgerald, P.E.
Mr. Burton Johnson, P.E.

ATTACHMENT 6-2

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY

I. Legal Authority:

- a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? (**Yes/No**)
- b. Does the sponsor have the power of eminent domain for this project? (**Yes/No**)
- c. Does the sponsor have "quick-take" authority for this project? (**Yes/No**)*
**The non-federal sponsor does not have quick take authority but does possess condemnation authority. Typical time for a condemnation proceeding is six months from filing to possession.*
- d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? (**Yes/No**)
- e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? (**Yes/No**)

II. Human Resource Requirements:

- a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including P.L. 91-646, as amended? (**Yes/No**)
- b. If the answer to II.a. is "Yes," has a reasonable plan been developed to provide such training? (**Yes/No**)
- c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? (**Yes/No**)
- d. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule? (**Yes/No**)
- e. Can the sponsor obtain contractor support, if required in a timely fashion? (**Yes/No**)
- f. Will the sponsor likely request USACE assistance in acquiring real estate? (**Yes/No**) (If "Yes," provide description)

III. Other Project Variables:

- a. Will the sponsor's staff be located within reasonable proximity to the project site? (**Yes/No**)
- b. Has the sponsor approved the project/real estate schedule/milestones? (**Yes/No**)

IV. Overall Assessment:

- a. Has the sponsor performed satisfactorily on other USACE projects? (**Yes/No/Not applicable**)
- b. With regard to this project, the sponsor is anticipated to be: Highly Capable/**Fully Capable**/Moderately Capable/Marginally Capable/ Insufficiently Capable. (If sponsor is believed to be "Insufficiently Capable," provide explanation.)

ATTACHMENT 6-2

V. Coordination:

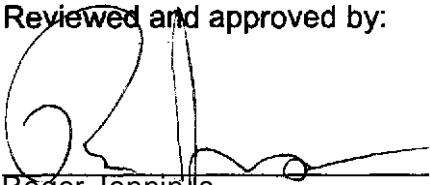
- a. Has this assessment been coordinated with the sponsor? (**Yes**/No)
- b. Does the sponsor concur with this assessment? (**Yes**/No) (If "no," provide explanation)

Prepared by:



Alan J. Potok, P.E.
Assistant Director
Harris County Flood Control District

Reviewed and approved by:



Roger Jennin's
Chief, Planning and Appraisal Branch
U.S. Army Corps of Engineers
Fort Worth District
Real Estate Division

ATTACHMENT 6-3

**NON-FEDERAL SPONSOR'S
SELF-CERTIFICATION OF FINANCIAL CAPABILITY
FOR DECISION DOCUMENTS**

I, Michael D. Talbott, do hereby certify that I am the Director of the Harris County Flood Control District (the "Non-Federal Sponsor"); that I am aware of the financial obligations of the Non-Federal Sponsor for the HUNTING BAYOU FLOOD RISK MANAGEMENT, HARRIS COUNTY, TEXAS PROJECT; and that the Non-Federal Sponsor will have the financial capability to satisfy the Non-Federal Sponsor's obligations for that project. I understand that the Government's acceptance of this self-certification shall not be construed as obligating either the Government or the Non-Federal Sponsor to implement the project.

IN WITNESS WHEREOF, I have made and executed this certification this 6th day of DECEMBER 2012.

BY: 
Michael D. Talbott

Title: Director

DATE: 12/6/12

ATTACHMENT 6-4



Harris County
Flood Control District

9900 Northwest Freeway
Houston, Texas 77092
713-684-4000
www.hcfd.org

December 5, 2012

Colonel Christopher W. Sallese
District Engineer and Commanding Officer
U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Reference: Letter of Intent for the Hunting Bayou Flood Risk Management Project
HCFCD Project ID# H100-00-00-Y001

Dear Colonel Sallese:

This letter is written to provide assurances to you that the Harris County Flood Control District ("HCFCD"), as the designated Local Sponsor for the Hunting Bayou Flood Risk Management, Harris County, Texas Project, supports the identified flood damage reduction plan for the upper Hunting Bayou watershed. Section 211(f) of the Federal Water Resources Development Act of 1996 (WRDA 1996, Public Law 104-303) authorized HCFCD to take the lead in developing a flood damage reduction plan for Hunting Bayou. The plan developed by HCFCD with the assistance of the U.S. Army Corps of Engineers, Galveston District, consists of the following elements:

1. Channel modifications along 3.8 miles of Hunting Bayou, which would begin approximately 1,500 feet downstream of the Englewood Railroad Yard and end just downstream of United States Highway 59 North.
2. Stormwater detention located east of Homestead Road and north of Hunting Bayou on up to 75-acres of land.

HCFCD intends to support implementation of the required design and construction of the project as well as fund the non-federal share of the project. The project will be implemented in accordance with all applicable federal, state, and local laws and regulations, and in accordance with the applicable provisions of the model Project Partnership Agreement (PPA), subject to any mutually agreeable revisions that may be made prior to formal acceptance and signing of the PPA.

We look forward to continuing our partnership with your office as we proceed with the implementation and funding of the project.

Sincerely,

Michael D. Talbott, P.E.
Director

MDT:JMD:abr

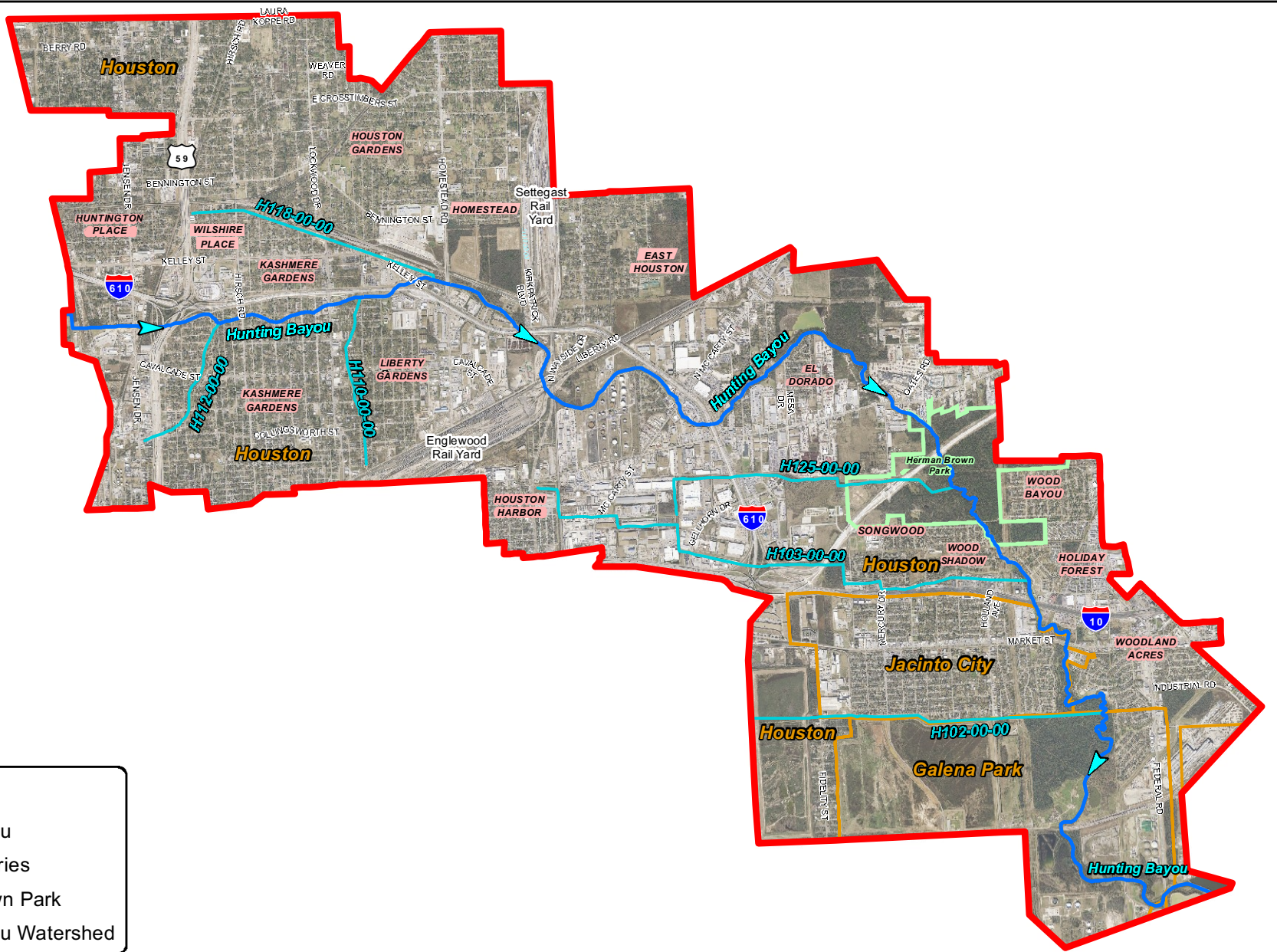
cc: Jennifer Dyke, CFM

ltr1205dec_LtrofIntentFederalProjH100-Y001.doc

Attachment 6-5

Preliminary Attorney's Opinion of Compensability

Placeholder



Legend

- Hunting Bayou
- Major Tributaries
- Herman Brown Park
- Hunting Bayou Watershed

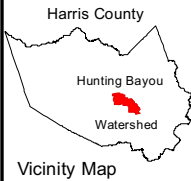
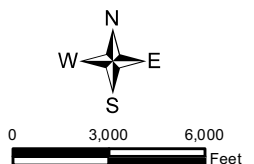


Exhibit A6-1: Vicinity Map

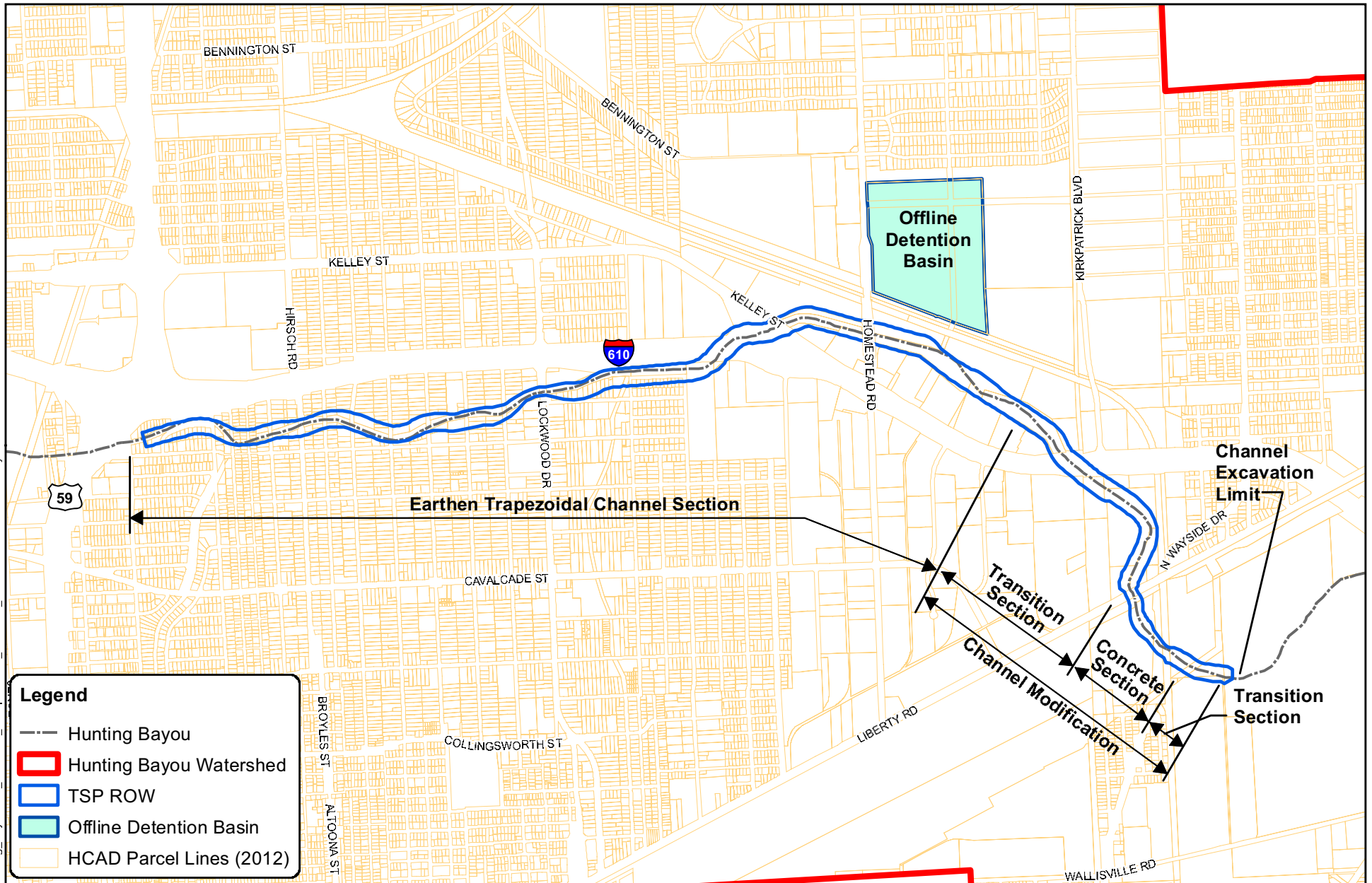
DRAFT

Hunting Bayou Flood Risk Management Project

Sources:
 Hunting Bayou - HCFCD
 Park - H-GAC
 Aerials - H-GAC (2012)



Path: P:\PWP\60184937_Hunting_Bayou\400_Technical_Discipline\444_GIS\Real_Estate\Exhibit A6-2 Plan Layout.mxd



Legend

- Hunting Bayou
- Hunting Bayou Watershed
- TSP ROW
- Offline Detention Basin
- HCAD Parcel Lines (2012)

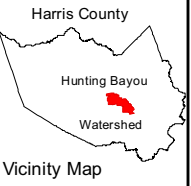
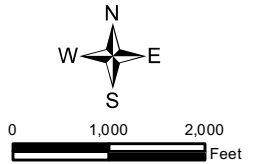
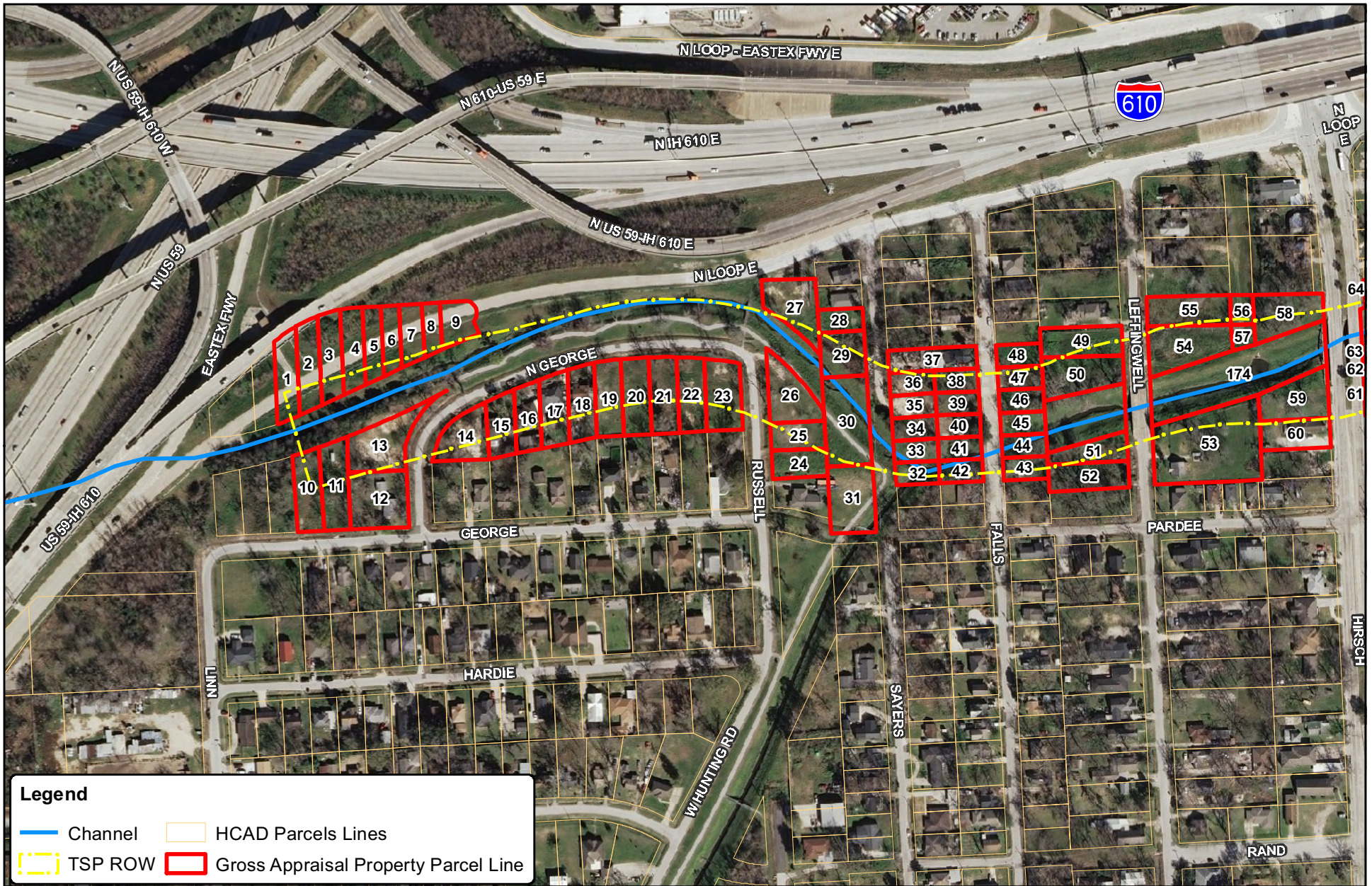


Exhibit A6-2: Plan Layout
Hunting Bayou Flood Risk Management Project

DRAFT

Sources:
 Hunting Bayou - HCFCD
 Parcels - HCAD (2012)





Legend

- Channel
- TSP ROW
- HCAD Parcels Lines
- Gross Appraisal Property Parcel Line

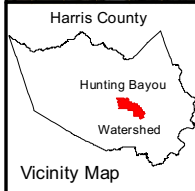
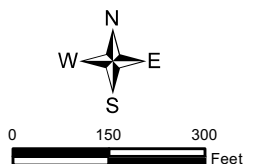
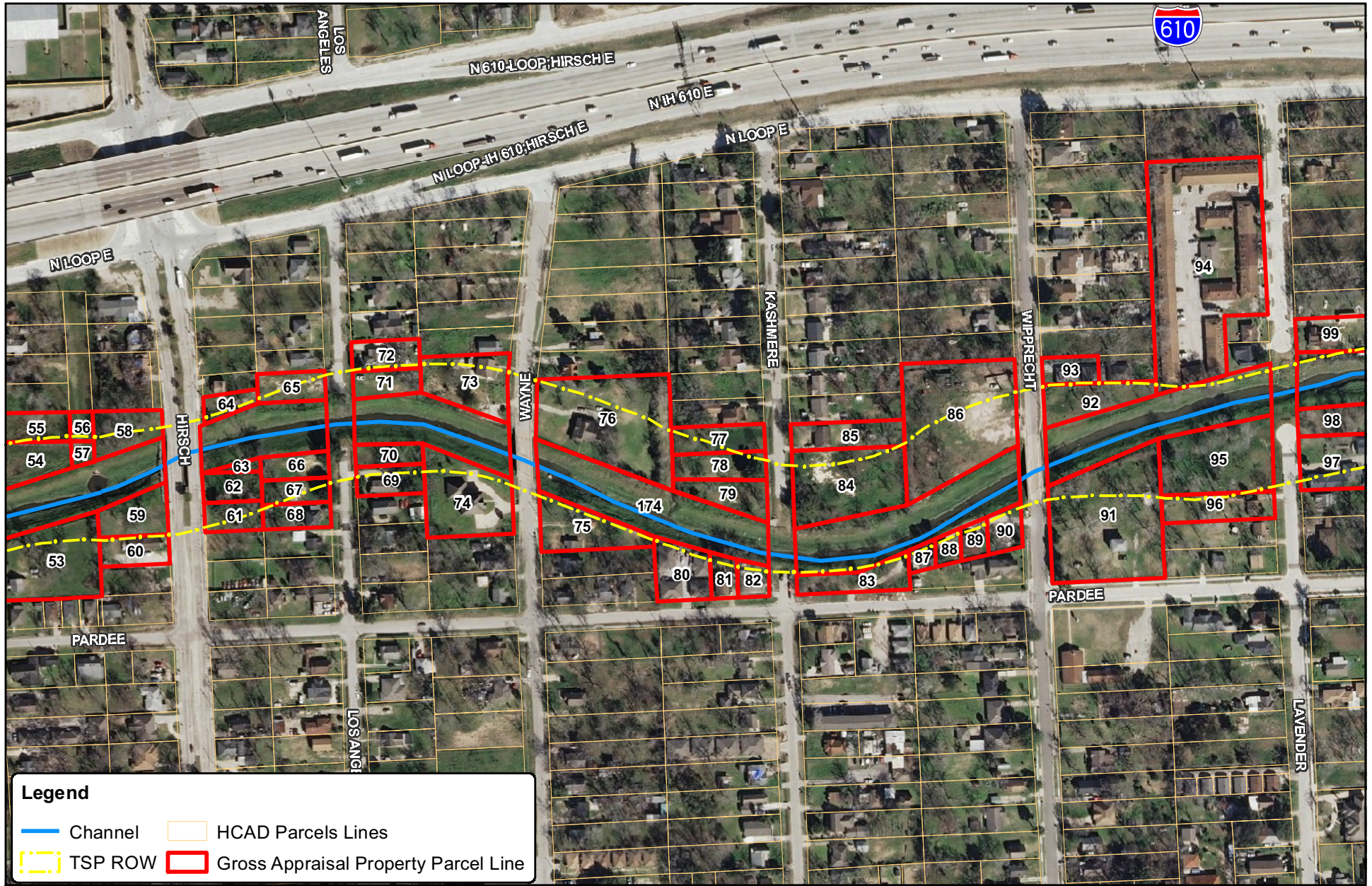


Exhibit A6-3a: Parcel ID Maps
Hunting Bayou Flood Risk Management Project

DRAFT

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

- Channel
- TSP ROW
- HCAD Parcels Lines
- Gross Appraisal Property Parcel Line

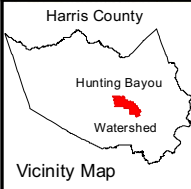
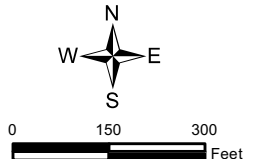
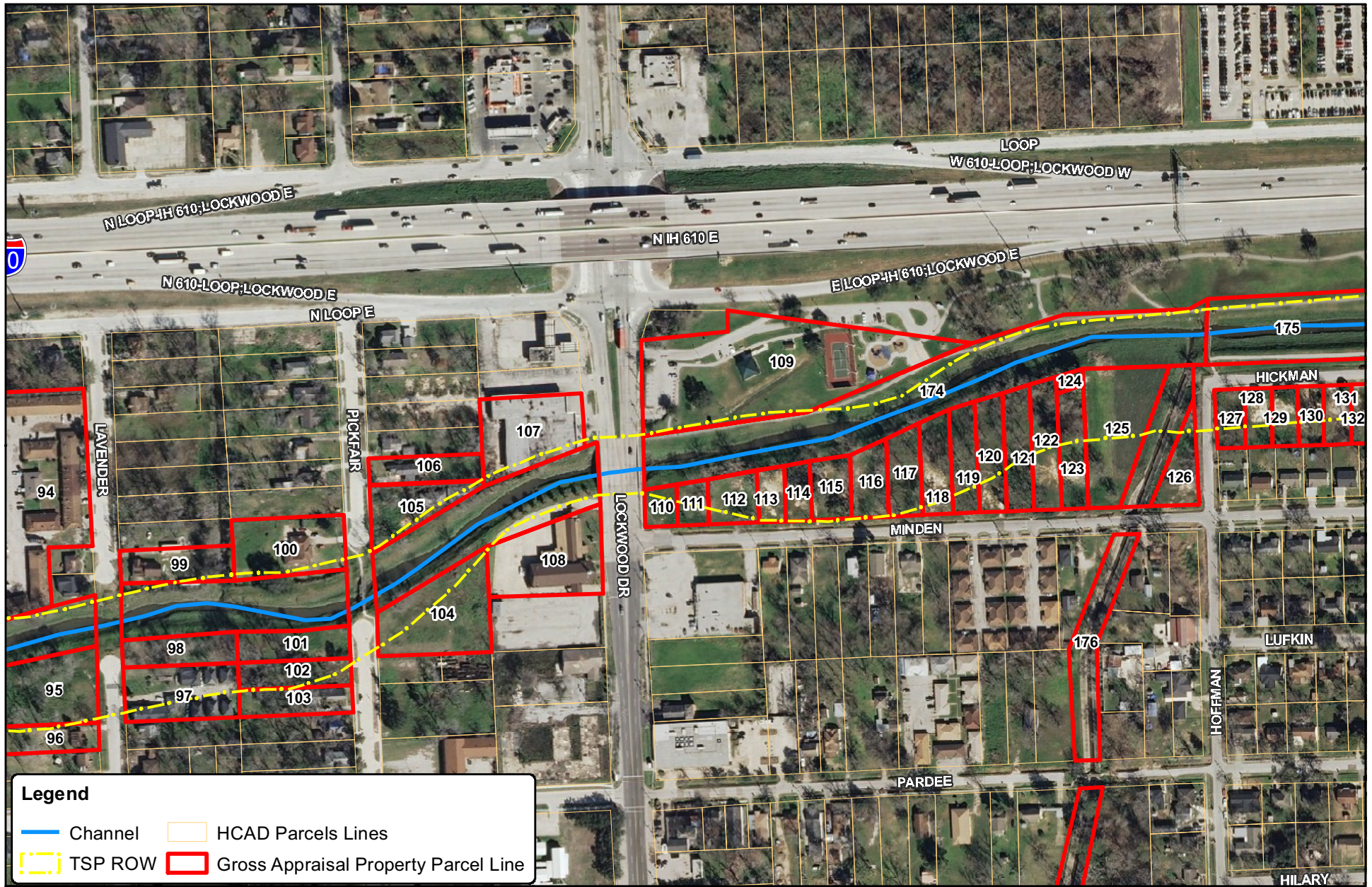


Exhibit A6-3b: Parcel ID Maps
DRAFT
 Hunting Bayou Flood Risk Management Project

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

- Channel
- TSP ROW
- HCAD Parcels Lines
- Gross Appraisal Property Parcel Line

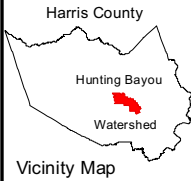
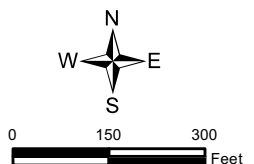


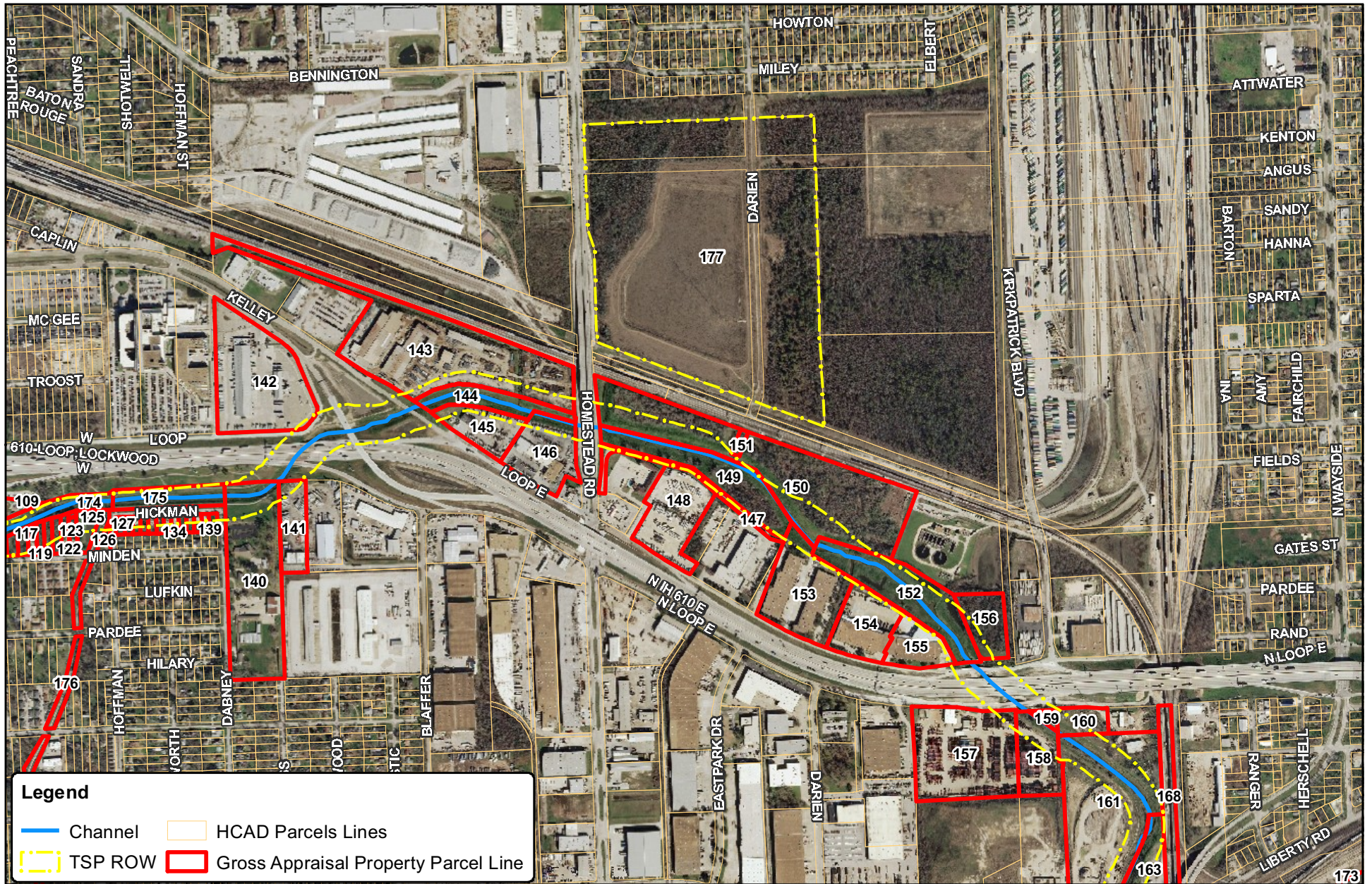
Exhibit A6-3c: Parcel ID Maps

DRAFT

Hunting Bayou Flood Risk Management Project

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

- Channel
- TSP ROW
- HCAD Parcels Lines
- Gross Appraisal Property Parcel Line

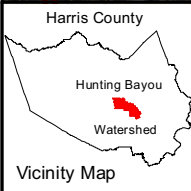
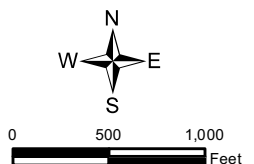


Exhibit A6-3d: Parcel ID Maps
DRAFT
Hunting Bayou Flood Risk Management Project

Sources:
Hunting Bayou - HCFC
Parcels - HCAD (2009)
Aerials - H-GAC (2012)





Legend

- Channel
- TSP ROW
- Gross Appraisal Property Parcel Line
- HCAD Parcels Lines

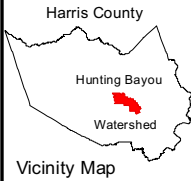
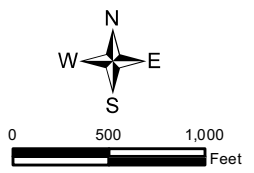


Exhibit A6-3e: Parcel ID Maps

DRAFT




Hunting Bayou Flood Risk Management Project

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

-  Hunting Bayou
-  Offline Detention Basin
-  HCAD Parcel Lines (2012)

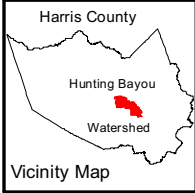
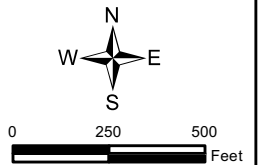


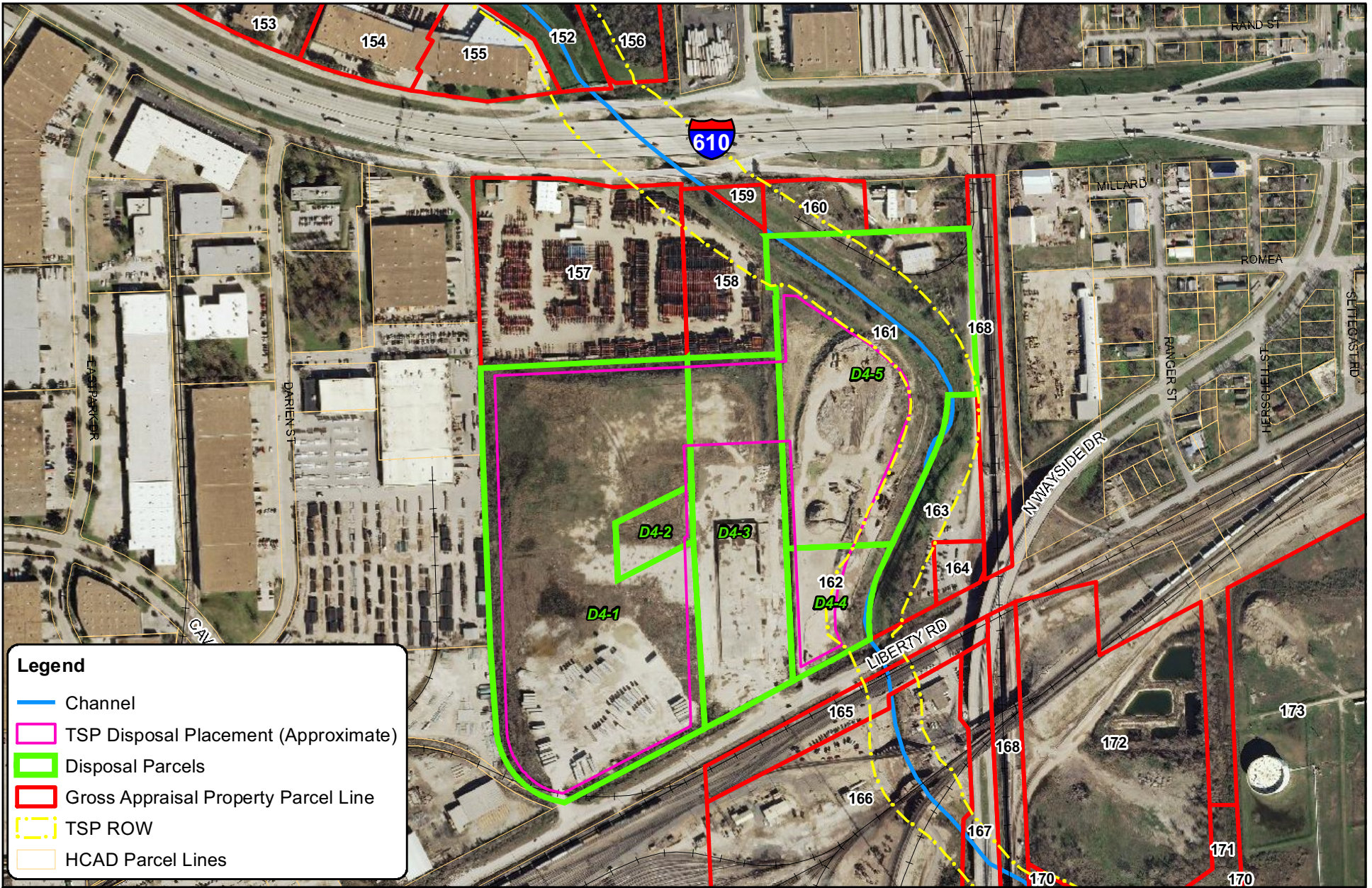
Exhibit A6-4: Offline Detention Basin Layout

Hunting Bayou Flood Risk Management Project

DRAFT

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

- Channel
- TSP Disposal Placement (Approximate)
- Disposal Parcels
- Gross Appraisal Property Parcel Line
- TSP ROW
- HCAD Parcel Lines

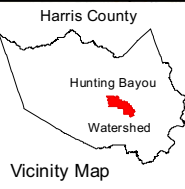
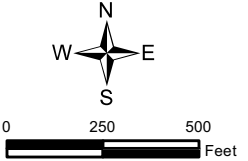
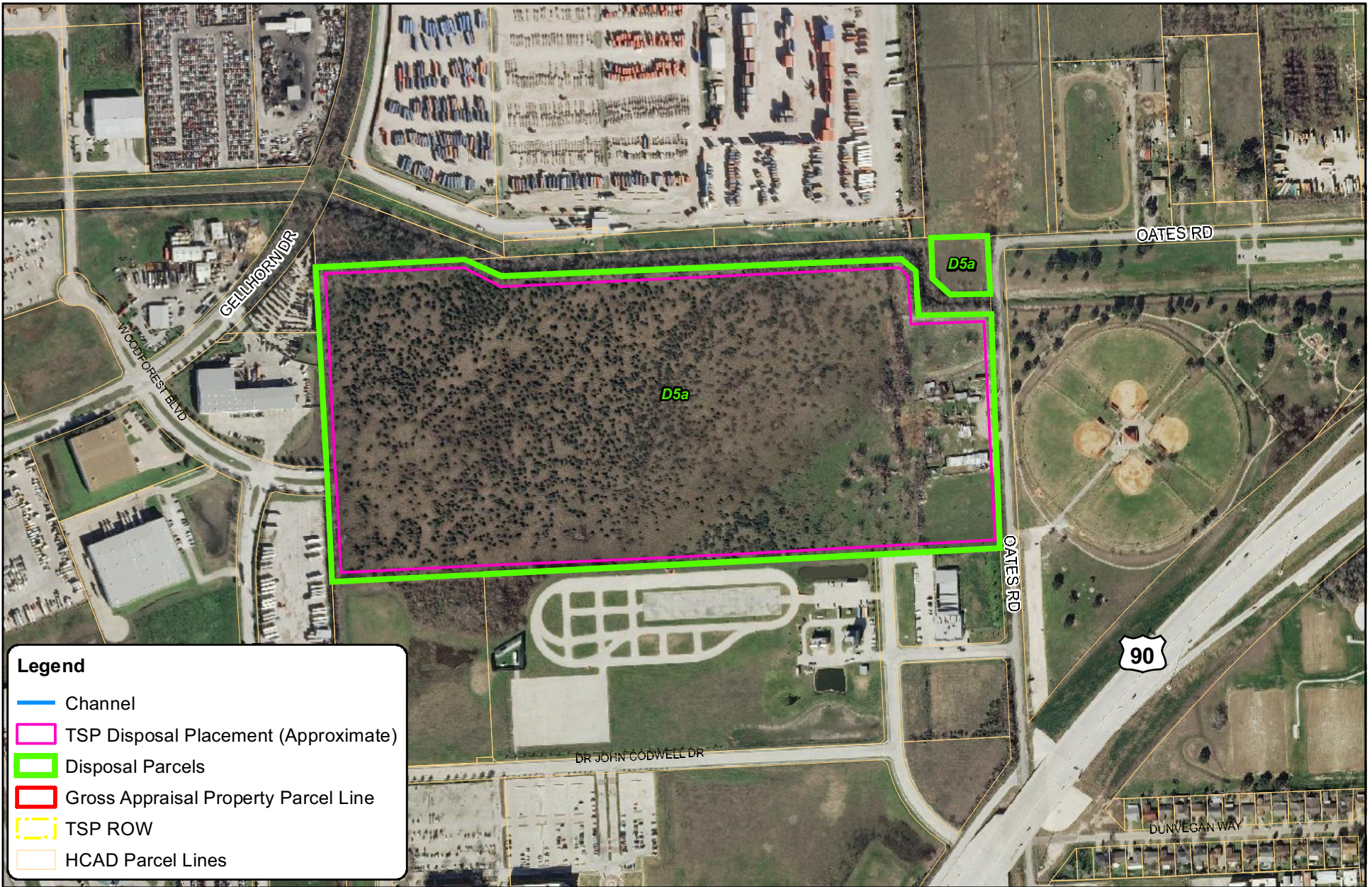








Exhibit A6-5a: Available Disposal Areas for Excavated Material
Hunting Bayou Flood Risk Management Project
DRAFT

Sources:
 Hunting Bayou - HCFCD
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

-  Channel
-  TSP Disposal Placement (Approximate)
-  Disposal Parcels
-  Gross Appraisal Property Parcel Line
-  TSP ROW
-  HCAD Parcel Lines

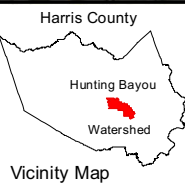
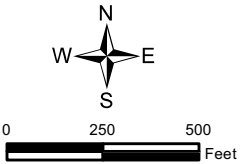


Exhibit A6-5b: Available Disposal Areas for Excavated Material

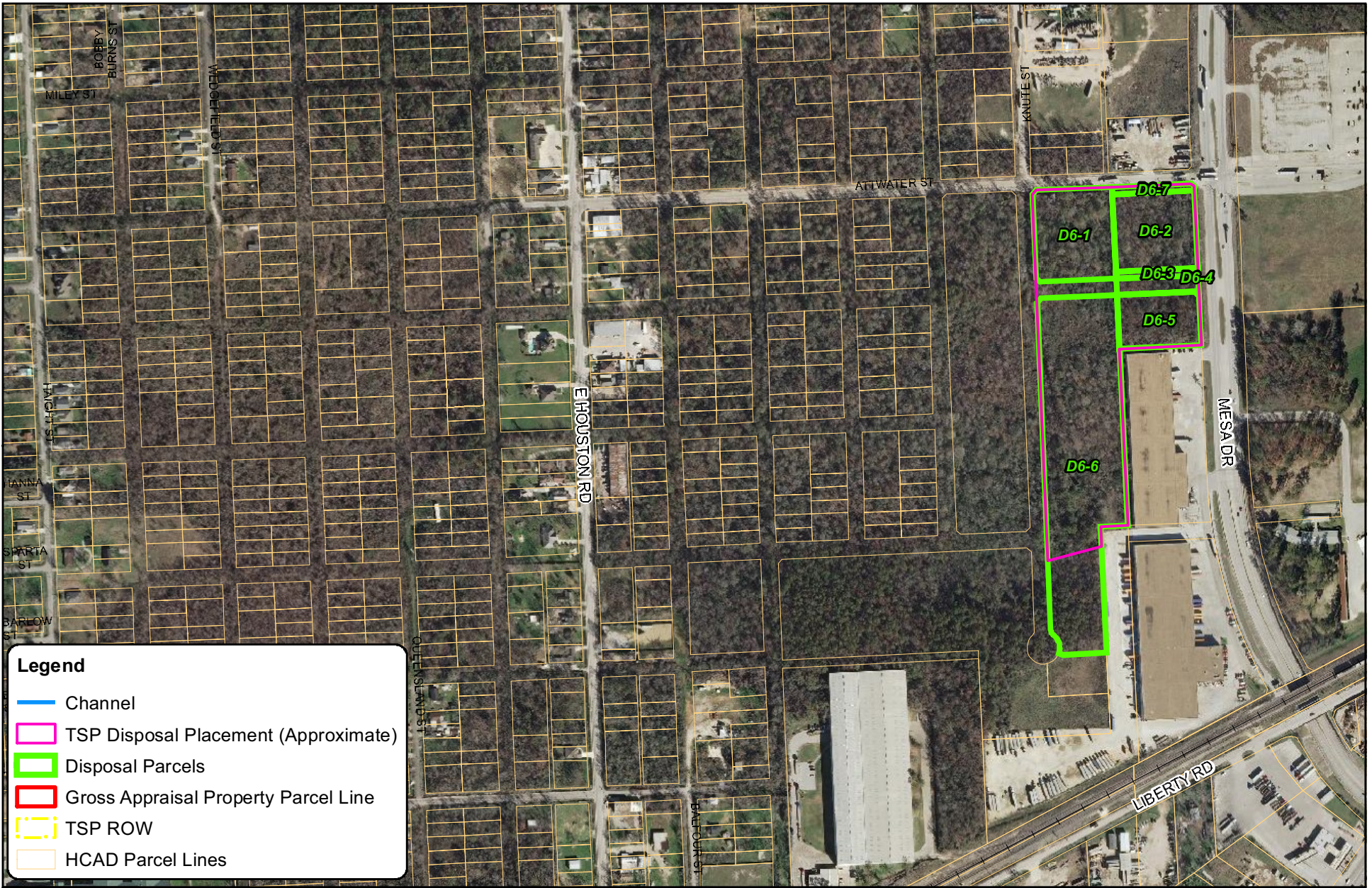
Hunting Bayou Flood Risk Management Project

DRAFT







Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)



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Legend

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-  TSP Disposal Placement (Approximate)
-  Disposal Parcels
-  Gross Appraisal Property Parcel Line
-  TSP ROW
-  HCAD Parcel Lines

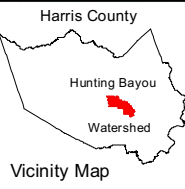
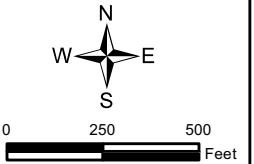
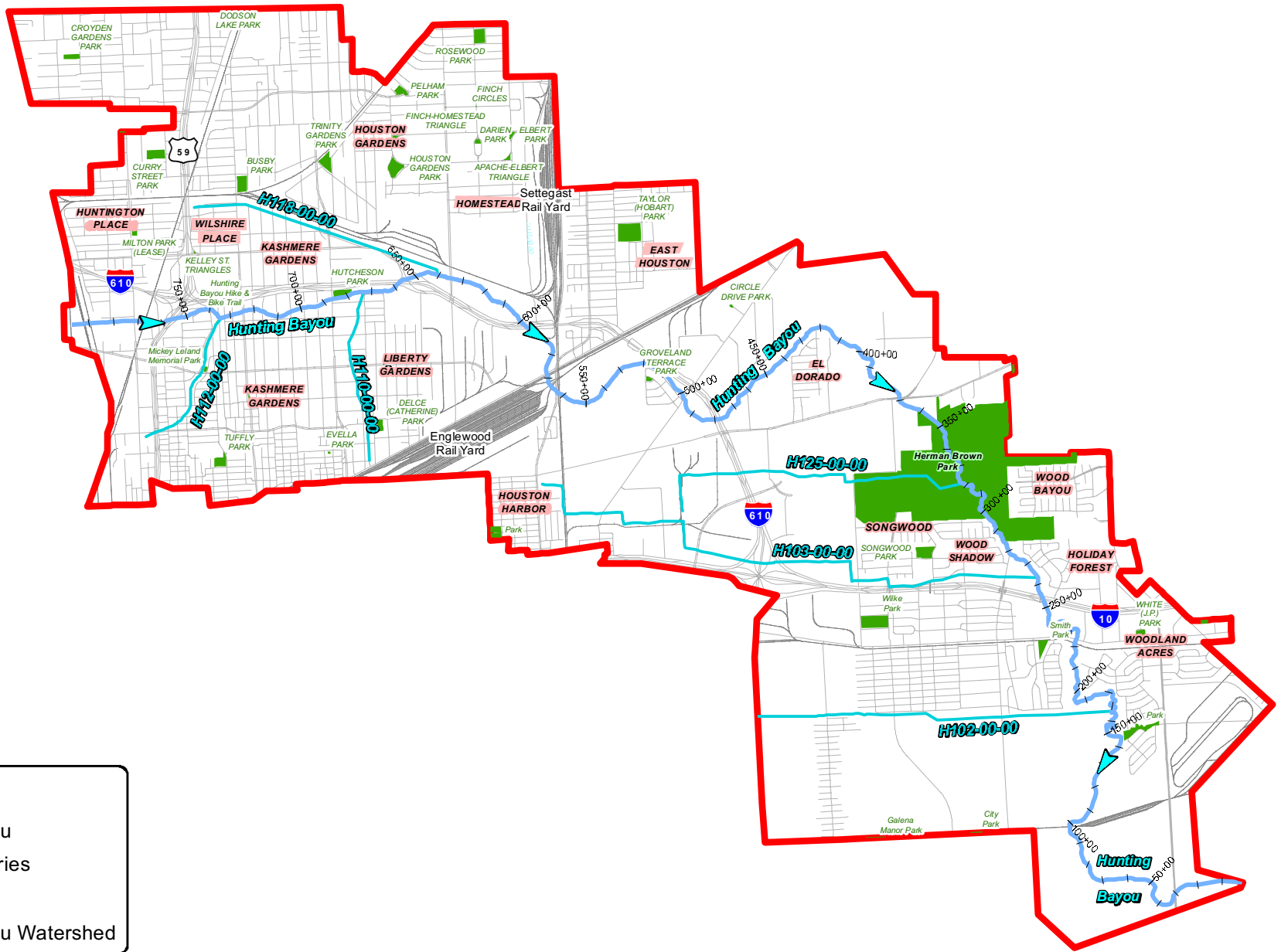


Exhibit A6-5c: Available Disposal Areas for Excavated Material
Hunting Bayou Flood Risk Management Project
DRAFT

Sources:
 Hunting Bayou - HCFC
 Parcels - HCAD (2009)
 Aerials - H-GAC (2012)





Legend

- Hunting Bayou
- Major Tributaries
- Parks
- Hunting Bayou Watershed

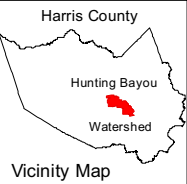


Exhibit A6-6: Hunting Bayou River Station Map

Hunting Bayou Flood Risk Management Project

DRAFT

Sources:
 Hunting Bayou - HCFCD
 Major Tributaries - HCFCD
 Parks - H-GAC

