APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 24 January 2018

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Galveston District, SWG-2016-00478, City of Pearland, Wetlands 5 to 15, Pond 5 and 6

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: Texas County/Parish: Brazoria City: Pearland
Center coordinates of site (lat/long in degree decimal format, NAD-83): Lat. see attached table° N, Long. see attached table° W;
Universal Transverse Mercator: UTM: 15, see attached table N., see attached table E.,NAD: 83
Name of nearest water body: Hickory Slough
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Clear Creek
Name of watershed or Hydrologic Unit Code (HUC): West Galveston Bay - 12040204
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 24 January 2018
☒ Field Determination. Date(s): 29 Spetember 2017

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. **[*Required*]**
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. **[*Required*]**

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or **0.14** acres
      Wetlands: **Approximately 3.83** acres

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain:

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, fill out Section III.D.2 and Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the water body[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the water body has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **401,106 acres**
Drainage area: **Pick List**
Average annual rainfall: **57.03** inches
Average annual snowfall: **0** inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **10-15** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **5-10** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: **N/A**

Identify flow route to TNW[5]: **Hickory Slough (RPW) flows directly into Clear Creek (RPW), which becomes a TNW downstream of the confluence.**

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: **1**

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☒ Manipulated (man-altered). Explain: **Based upon review of historic aerial imagery it appears this tributary has been channelized.**

Tributary properties with respect to top of bank (estimate):
Average width: **100** feet
Average depth: **1-3** feet
Average side slopes: **2:1**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover: **3**	
☐ Other. Explain:		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: **Fairly stable. Feature has been channelized and the banks appear to be mowed and maintained.**
Presence of run/riffle/pool complexes. Explain: **N/A**
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): **1-2** %

(c) Flow:
Tributary provides for: **Seasonal flow**
Estimate average number of flow events in review area/year: **11-20**
Describe flow regime:
Other information on duration and volume: **Tributary is relatively permanent and appears to have perennial flow in based upon review of aerial imagery.**
Surface flow is: **Confined**. Characteristics:
Subsurface flow: **Unknown**. Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☒ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☒ shelving	☐ the presence of wrack line
☒ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☒ scour
☒ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: **Water is generally discolored, carries agricultural runoff and suspended sediments.**
Identify specific pollutants, if known: **Pollutants are unknown.**

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the water body's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): **100 average width. Riparian corridor is predominantly herbacious vegetation.**

☐ Wetland fringe. Characteristics:

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: **See attached table** acres

Wetland type. Explain: **Palustrine**

Wetland quality. Explain: **There are 12 wetlands and 1 open water feature excavated from a wetland within the project boundary associated with this Significant Nexus Test of adjacent wetlands of Hickory Slough (see attached table). The wetlands contain a predominance of FAC, FACW, and OBL vegetation. Some of the wetlands within the project site are mapped outside/above the 100-year floodplain of Hickory Slough; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands are actually within or below the anticipated 100-year floodplain elevations of Hickory Slough.**

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain:

Surface flow is**: Overland sheetflow**

Characteristics: **Some of the wetlands within the project site are mapped outside/above the 100-year floodplain of Clear Creek; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections revealed that the wetlands are actually within or below the anticipated 100-year floodplain elevations of Clear Creek. As such, all wetlands and open water pond are within the anticipated 100-year floodplain of Hickory Slough.**

Subsurface flow: **Unknown**. Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☒ Not directly abutting

☒ Discrete wetland hydrologic connection. Explain: **Based upon review of available information and review of LiDAR elevation data, Wetlands 5 to 15 and Pond 5 and Pond 6 are located within the 100-year floodplain of Hickory Slough and, therefore, are neighboring and adjacent to an RPW.**

☐ Ecological connection. Explain:

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **10-15** river miles from TNW.

Project waters are **1 (or less)** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **100 - 500-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: **No surface hydrology was exhibited within the wetlands**

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☒ Vegetation type/percent cover. Explain: **herbaceous , 100 percent cover**

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **25-30**

Approximately (**35**) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
See attached table	**see attached table**		**see attached table**

Summarize overall biological, chemical and physical functions being performed:

Hickory Slough for this significant nexus evaluation is a 1st order stream and is a relatively permanent water. The relevant reach is approximately 6 river miles long. The relevant reach of Hickory Slough extends from the limit of the detailed floodplain study to the intersection of Hickory Slough and Clear Creek. The project site is surrounded residential/commercial development and undeveloped land.

There are 12 wetlands and 1 open water feature (0.14-acre) excavated from a wetland (see attached table), totaling approximately 3.97 acres, within the project site associated with the relevant reach of Hickory Slough. Some of these wetlands/waters within the project site are mapped outside/above the 100-year floodplain of Hickory Slough; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands/waters are actually within or below the anticipated 100-year floodplain elevations of Hickory Slouh. Additional wetlands are located within the project site but are included in the significant nexus evaluation for Clear Creek, which is documented on a separate Approved Jurisdictional Determination form. In addition to the project site wetlands/waters, there are 13 adjacent wetlands along the relevant reach that total approximately 31 acres, based on the NWI and FEMA Flood Insurance Rate Maps. The majority of the wetlands are herbaceous. Of the 35 acres of wetlands/waters being evaluated along this relevant reach, zero acres are abutting the relevant reach of History Slough. These wetlands are located from 5 to 9 aerial miles from the nearest TNW (Clear Creek). The relevant reach of Hickory Slough flows indirectly into the TNW portion of Clear Creek (Hickory Slough to Clear Creek (RPW) to Clear Creek (TNW)).

A search of the Texas Commission on Environmental Quality 303(d) list of impaired waters revealed that the tributary within this reach is not impaired. In addition, a search within EPA MyWaters dataset did not indicate any impairment within this reach as well. However, Hickory Slough flows directly into Clear Creek (RPW), which is listed as an impaired water for PCB's. As such, the 35 acres of wetlands/waters being evaluated provide important chemical sequestration effect upon water as it fows through the adjacent wetlands to Hickory Slough and eventually to Clear Creek, an impaired water, and then on to the TNW portion of Clear Creek. This aids in reduction and/or elimination of bacteria, thermal, and chemical pollutants flowing into the TNW portion of Clear Creek. These adjacent wetlands sequester sediment and pollutants from runnoff and prevent them from entering the TNW, which is especially important as Clear Creek is listed as a 3-3(d) impaired water for PCB's. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to the chemical intergrity of the downstream TNW.

The retention of water and retardation of overbank flooding associated with the 35 acres of adjacent wetlands/waters and located within the relevant reach of Hickory Slough has effect upon the physical attributes of the downstream TNW. These wetlands/waters provide floodplain storage and have a direct effect upon the velocity and flow of waters into the downstream TNW. Increased and intense flow results in increased flooding and scouring, resulting in loss of property and the physical attributes of the TNW. The effects of removing approximately 35 acres of neighboring wetlands would increase the velocity and flow into the downstream TNW, resulting in more than a speculative or insubstantial effect upon the physical attributes of the downstream TNW. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to maintain the physical integrity of the downstream TNW.

There are no known aquatic biological species found in this reach (the tributary and the adjacent wetlands) that require these aquatic resources to fulfill their lifecycle requirements. None of the wetlands are abutting but they are neighboring and as such the majority of the time they lack any surface hydrologic connection. These neighboring wetlands typically aid

in provinding detritus as a food source to aquatic species in the TNW. However, there is not sufficient evidence to identify a species that requires both the aquatic resources within this reach and the waters of the TNW to fulfill life cycle requirements.

In conclusion, we have determined that there is sufficient evidence to support the statement that the aquatic resources within this approximate 7-mile relevant reach of Hickory Slough and its 35 acres of adjacent wetlands/waters provide a significant nexus (more than speculative or insubstanial effect) to the chemical, physical and/or biological integrity of the downstream TNW (Clear Creek). In conclusion, it is our opinion that this relevant reach of Hickory Slough and its adjacent wetlands are waters of the United States subject to Section 404 of the Clean Water Act.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: **This relevant reach of Hickory Slough is a 1st order stream and a relatively permanent water. Hickory Slough flows indirectly into the downstream TNW portion of Clear Creek. There are approximately 35 acres of neighboring wetlands/waters. The system retains flood waters and reduces overbank flooding downstream, thereby decreasing the velocity and amount of water flowing downstream into Hickory Slough and ultimately to Clear Creek (TNW). Retaining flood waters also reduces scouring and the loss of property as well as preserving the physical attributes of the downstream TNW. Based on this information, we determined that this relevant reach of Hickory Slough and its adjacent wetlands provide more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of the downstream TNW (Bastrop Bayou).**

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

☐ Tributary waters: linear feet width (ft)

☐ Other non-wetland waters: acres

Identify type(s) of waters:

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Water body that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: Approximately 3.97acres

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

[8]See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft)
☐ Other non-wetland waters: acres
Identify type(s) of waters:
☐ Wetlands: acres

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **Freese and Nichols, Inc.**
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report
☒ Data sheets prepared by the Corps: **Site visit 29 September 2017**
☐ Corps navigable waters' study:
☒ U.S. Geological Survey Hydrologic Atlas: **West Galveston Bay -- 12040204**
☐ USGS NHD data
☒ USGS 8 and 12 digit HUC maps
☐ Galveston District's Approved List of Navigable Waters
☒ U.S. Geological Survey map(s). Cite scale & quad name: **1982 Pearland, Texas.**
☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
☒ National wetlands inventory map(s). Cite name: **USFWS NWI Google Earth, see maps provided by consultant in AR**
☐ State/Local wetland inventory map(s):
☒ FEMA/FIRM maps: **Brazoria County, Texas 48039C0030I and 48039C0035I, see maps provided by consultant in AR**
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): **2043 to 2017 Google Earth**
or ☐ Other (Name & Date): **2009, 2015 Infrared; 2006, 2008 TWDB LiDAR Data**
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:
☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Hickory Slough for this significant nexus evaluation is a 1st order stream and is a relatively permanent water. The relevant reach is approximately 6 river miles long. The relevant reach of Hickory Slough extends from the limit of the detailed floodplain study to the intersection of Hickory Slough and Clear Creek. The project site is surrounded residential/commercial development and undeveloped land.

There are 12 wetlands and 1 open water feature (0.14-acre) excavated from a wetland (see attached table), totaling approximately 3.97 acres, within the project site associated with the relevant reach of Hickory Slough. Some of these wetlands/waters within the project site are mapped outside/above the 100-year floodplain of Hickory Slough; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands/waters are actually within or below the anticipated 100-year floodplain elevations of Hickory Slouh. Additional wetlands are located within the project site but are included in the significant nexus evaluation for Clear Creek, which is documented on a separate Approved Jurisdictional Determination form. In addition to the project site wetlands/waters, there are 13 adjacent wetlands along the relevant reach that total approximately 31 acres, based on the NWI and FEMA Flood Insurance Rate Maps. The majority of the wetlands are herbaceous. Of the 35 acres of wetlands/waters being evaluated along this relevant reach, zero acres are abutting the relevant reach of History Slough. These wetlands are located from 5 to 9 aerial miles from the nearest TNW (Clear Creek). The relevant reach of Hickory Slough flows indirectly into the TNW portion of Clear Creek (Hickory Slough to Clear Creek (RPW) to Clear Creek (TNW)).

A search of the Texas Commission on Environmental Quality 303(d) list of impaired waters revealed that the tributary within this reach is not impaired. In addition, a search within EPA MyWaters dataset did not indicate any impairment within this reach as well. However, Hickory Slough flows directly into Clear Creek (RPW), which is listed as an impaired water for PCB's. As such, the 35 acres of wetlands/waters being evaluated provide important chemical sequestration effect upon water as it fows through the adjacent wetlands to Hickory Slough and eventually to Clear Creek, an impaired water, and then on to the TNW portion of Clear Creek. This aids in reduction and/or elimination of bacteria, thermal, and chemical pollutants flowing into the TNW portion of Clear Creek. These adjacent wetlands sequester sediment and pollutants from runnoff and prevent them from entering the TNW, which is especially important as Clear Creek is listed as a 3-3(d) impaired water for PCB's. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to the chemical intergrity of the downstream TNW.

The retention of water and retardation of overbank flooding associated with the 35 acres of adjacent wetlands/waters and located within the relevant reach of Hickory Slough has effect upon the physical attributes of the downstream TNW. These wetlands/waters provide floodplain storage and have a direct effect upon the velocity and flow of waters into the downstream TNW. Increased and intense flow results in increased flooding and scouring, resulting in loss of property and the physical attributes of the TNW. The effects of removing approximately 35 acres of neighboring wetlands would increase the velocity and flow into the downstream TNW, resulting in more than a speculative or insubstantial effect upon the physical attributes of the downstream TNW. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to maintain the physical integrity of the downstream TNW.

There are no known aquatic biological species found in this reach (the tributary and the adjacent wetlands) that require these aquatic resources to fulfill their lifecycle requirements. None of the wetlands are abutting but they are neighboring and as such the majority of the time they lack any surface hydrologic connection. These neighboring wetlands typically aid in provinding detritus as a food source to aquatic species in the TNW. However, there is not sufficient evidence to identify a species that requires both the aquatic resources within this reach and the waters of the TNW to fulfill life cycle requirements.

In conclusion, we have determined that there is sufficient evidence to support the statement that the aquatic resources within this approximate 7-mile relevant reach of Hickory Slough and its 35 acres of adjacent wetlands/waters provide a significant nexus (more than speculative or insubstanial effect) to the chemical, physical and/or biological integrity of the downstream TNW (Clear Creek). In conclusion, it is our opinion that this relevant reach of Hickory Slough and its adjacent wetlands are waters of the United States subject to Section 404 of the Clean Water Act.

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 24 January 2018

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Galveston District, SWG-2016-00478, City of Pearland, Wetlands 1 to 4,

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: Texas County/Parish: Brazoria City: Pearland
Center coordinates of site (lat/long in degree decimal format, NAD-83): Lat. see attached table° N, Long. see attached table° W;
Universal Transverse Mercator: UTM: 15, see attached table N., see attached table E.,NAD: 83
Name of nearest water body: Clear Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Clear Creek
Name of watershed or Hydrologic Unit Code (HUC): West Galvston Bay - 12040204
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 24 January 2018
☒ Field Determination. Date(s): 29 September 2017

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. **[*Required*]**
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. **[*Required*]**

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres
      Wetlands: **Approximately 0.51** acres

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain:

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, fill out Section III.D.2 and Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the water body[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the water body has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **401,106 acres**
Drainage area: **Pick List**
Average annual rainfall: **57.03** inches
Average annual snowfall: **0** inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☒ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **10-15** river miles from TNW.
Project waters are **1 (or less)** river miles from RPW.
Project waters are **5-10** aerial (straight) miles from TNW.
Project waters are **1 (or less)** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: **N/A**

Identify flow route to TNW[5]: **Clear Creek (RPW) flows directly into the downstream TNW portion of Clear Creek**
Tributary stream order, if known: **2**

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: **125** feet
Average depth: **1-5** feet
Average side slopes: **2:1**

Primary tributary substrate composition (check all that apply):

☒ Silts	☒ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain:		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: **Fairly stable. Slopes appear to be maintained, and scrub shrub or tree canopy buffer are evident in some areas . Several outfall structures and culverted road crossings exist.**

Presence of run/riffle/pool complexes. Explain: **N/A**
Tributary geometry: **Meandering**
Tributary gradient (approximate average slope): **1-2** %

(c) Flow:

Tributary provides for: **Seasonal flow**
Estimate average number of flow events in review area/year: **20 (or greater)**
Describe flow regime:
Other information on duration and volume: **Tributary is relatively permanent and appears to have perennial flow.**
Surface flow is: **Confined**. Characteristics:
Subsurface flow: **Unknown**. Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):

☒ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☒ shelving	☐ the presence of wrack line
☒ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☒ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: **Water is generally discolored, carries surfacewater runoff and suspended sediments.**
Identify specific pollutants, if known: **This portion of Clear Creek has been identified as an impaired waterway and is listed on the Texas 303(d) list for PCB's.**

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the water body's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): **125 average width. Riparian corridor is predominantly herbacious vegetation in the with scrub/shrub or forested vegetation community in portions of the reach reach.**

☐ Wetland fringe. Characteristics:

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: **See attached table** acres

Wetland type. Explain: **Palustrine**

Wetland quality. Explain: **There are 4 wetlands within the project boundary associated with this Significant Nexus Test of wetlands adjacent to Clear Creek (see attached table). The wetlands contain a predominance of FAC, FACW, and OBL vegetation. These wetlands within the project site are mapped outside/above the 100-year floodplain of Clear Creek; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands are actually within or below the anticipated 100-year floodplain elevations of Clear Creek.**

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain:

Surface flow is**: Overland sheetflow**

Characteristics:

Subsurface flow: **Unknown**. Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☒ Not directly abutting

☒ Discrete wetland hydrologic connection. Explain: **The wetlands within the project site are mapped outside/above the 100-year floodplain of Clear Creek; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections revealed that these wetlands are actually within or below of anticipated 100-year floodplain elevations of Clear Creek.**

☐ Ecological connection. Explain:

☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **10-15** river miles from TNW.

Project waters are **5-10** aerial (straight) miles from TNW.

Flow is from: **Wetland to navigable waters.**

Estimate approximate location of wetland as within the **100 - 500-year** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: **No surface hydrology was exhibited within the wetlands**

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):

☒ Vegetation type/percent cover. Explain: **herbaceous, scrub-shrub, and forested, 100 percent cover**

☐ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **30 (or more)**

Approximately (**346.3**) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
See attached table	**see attached table**	**see attached table**	

Summarize overall biological, chemical and physical functions being performed:

Clear Creek for this significant nexus evaluation is a 2nd order stream and is a relatively permanent water. The relevant reach is approximately 18 miles long. The relevant reach of Clear Creek orginates near the intersection of Shadow Creek Ranch Parkway and Highway 288 and terminates south of the intersection of Dixie Farm Road and Beamer Road, in Cities of Friendswood and Pearland, Texas.

There are 4 herbaceous wetlands (see attached table), totaling approximately 0.51-acre, within the project site associated with the relevant reach of Clear Creek. These wetlands within the project site are mapped outside/above the 100-year floodplain of Clear Creek; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands are actually within or below the anticipated 100-year floodplain elevations of Clear Creek. Additional wetlands are located within the project site but are included in the significant nexus evaluation for Hickory Slough, which are documented on a separate Approved Jurisdictional Determination form. In addition to the project site wetlands, there are 88 adjacent wetlands along the relevant reach that total approximately 346.30 acres, based on the NWI and FEMA Flood Insurance Rate Maps. The majority of the wetlands are forested. Of the 346.30 acres of wetlands being evaluated along this relevant reach, zero acres are abutting the relevant reach of Clear Creek. These wetlands are located from 1 to 12 aerial miles from the nearest TNW (Clear Creek). The relevant reach of Clear Creek flows directly into the TNW portion of Clear Creek.

Based on our analysis, the Corps did find evidence/data to support the statement that these waters (the relevant reach of Clear Creek as well as all similarly situated adjacent wetlands with this reach) provide more than a speculative or insubstantial effect upon the chemical integrity of the downstream TNW. There is a direct surface hydrologic connection between this approximate 18-mile relevant reach of Clear Creek and the nearest TNW, Clear Creek. The approximate 346.30 acres of adjacent wetlands provide important chemical sequestration impact/effect upon the waters as they flow through the adjacent wetlands and connect to the downstream TNW. This aids in the reduction and/or elimination of bacteria, thermal and chemical pollutants flowing into the TNW portion of Clear Creek. The adjacent wetlands are situated in an area experiencing ongoing residential development. These wetlands sequester sediment and pollutants from stormwater runoff and prevent them from entering the TNW. This is especially important as Clear Creek is listed as a 303(d) impaired water for PCB's. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubtantial effects that are inseperably bound to the chemical integrity of the downstream TNW.

The retention of water and retardation of overbank flooding associated with the 346.30 acres of adjacent wetlands and located within the relevant reach of Clear Creek has an effect upon the physical attributes of the downstream TNW. These wetlands provide floodplain storage and have a direct effect upon the velocity and flow of waters into the downstream TNW. Increased and intense flow results in increased flooding and scouring, resulting in loss of property and the physical attributes of the TNW. The effects of removing approximately 346.30 acres of neighboring wetlands would increase the velocity and flow into the downstream TNW, resulting in more than a speculative or insubstantial effect upon the physical attributes of the downstream TNW. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to maintain the physical integrity of the downstream TNW.

There are no known aquatic biological species found in this reach (the tributary and the adjacent wetlands) that require these aquatic resources to fulfill their lifecycle requirements. It is noted that the tributary within this reach (Clear Creek) has a direct surface hydrologic connection with the downstream TNW (Clear Creek). None of the wetlands are abutting but they are neighboring and as such the majority of the time they lack any surface hydrologic connection. These neighboring wetlands typically aid in provinding detritus as a food source to aquatic species in the TNW. However, there is not sufficient evidence to identify a species that requires both the aquatic resources within this reach and the waters of the TNW to fulfill life cycle requirements.

In conclusion, we have determined that there is sufficient evidence to support the statement that the aquatic resources within this approximate 18-mile relevant reach of Clear Creek and its 346.30 acres of adjacent wetlands provide a significant nexus (more than speculative or insubstanial effect) to the chemical, physical and/or biological integrity of the downstream TNW (Clear Creek). In conclusion, it is our opinion that this relevant reach of Clear Creek and its adjacent wetlands are waters of the United States subject to Section 404 of the Clean Water Act.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: **This relevant reach of Clear Creek is a 2nd order stream and a relatively permanent water. Clear Creek flows directly into the downstream TNW portion of Clear Creek. There are approximately 346.30 acres of neighboring wetlands, most of which are forested. The system retains flood waters and reduces overbank flooding downstream, thereby decreasing the velocity and amount of water flowing downstream into Bastrop Bayou. Retaining flood waters also reduces scouring and the loss of property as well as preserving the physical attributes of the downstream TNW. Based on this information, we determined that this relevant reach of Clear Creek and its adjacent wetlands provide more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of the downstream TNW (Clear Creek).**

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft)
- ☐ Other non-wetland waters: acres
  Identify type(s) of waters:

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Water body that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres
  Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: Approximately 0.51 acres

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
- ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain:
- ☐ Other factors. Explain:

[8] See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft)
☐ Other non-wetland waters: acres
Identify type(s) of waters:
☐ Wetlands: acres

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **Frees and Nichols, Inc.**
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report
☒ Data sheets prepared by the Corps: **Site visit 29 September 2017**
☐ Corps navigable waters' study:
☒ U.S. Geological Survey Hydrologic Atlas: **West Galveston Bay - 12040204**
☐ USGS NHD data
☒ USGS 8 and 12 digit HUC maps
☐ Galveston District's Approved List of Navigable Waters
☒ U.S. Geological Survey map(s). Cite scale & quad name: **1982 Pearland, Texas**
☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
☒ National wetlands inventory map(s). Cite name: **USFWS NWI Google Earth, see maps provided by consultant in AR**
☐ State/Local wetland inventory map(s):
☒ FEMA/FIRM maps: **Brazoria County, Texas 48039C0030I and 48039C0035I, see maps provided by consultant in AR**
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): **1943 to 2017 Google Earth**
or ☐ Other (Name & Date): **2009, 2015 Infrared; 2006, 2008 TWDB LiDAR Data**
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:
☐ Applicable/supporting scientific literature:
☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Clear Creek for this significant nexus evaluation is a 2nd order stream and is a relatively permanent water. The relevant reach is approximately 18 miles long. The relevant reach of Clear Creek orginates near the

intersection of Shadow Creek Ranch Parkway and Highway 288 and terminates south of the intersection of Dixie Farm Road and Beamer Road, in Cities of Friendswood and Pearland, Texas.

There are 4 herbaceous wetlands (see attached table), totaling approximately 0.51-acre, within the project site associated with the relevant reach of Clear Creek. These wetlands within the project site are mapped outside/above the 100-year floodplain of Clear Creek; however, a more thorough review of offsite data, including LiDAR data and FEMA 100-year floodplain elevation cross sections, revealed that these wetlands are actually within or below the anticipated 100-year floodplain elevations of Clear Creek. Additional wetlands are located within the project site but are included in the significant nexus evaluation for Hickory Slough, which are documented on a separate Approved Jurisdictional Determination form. In addition to the project site wetlands, there are 88 adjacent wetlands along the relevant reach that total approximately 346.30 acres, based on the NWI and FEMA Flood Insurance Rate Maps. The majority of the wetlands are forested. Of the 346.30 acres of wetlands being evaluated along this relevant reach, zero acres are abutting the relevant reach of Clear Creek. These wetlands are located from 1 to 12 aerial miles from the nearest TNW (Clear Creek). The relevant reach of Clear Creek flows directly into the TNW portion of Clear Creek.

Based on our analysis, the Corps did find evidence/data to support the statement that these waters (the relevant reach of Clear Creek as well as all similarly situated adjacent wetlands with this reach) provide more than a speculative or insubstantial effect upon the chemical integrity of the downstream TNW. There is a direct surface hydrologic connection between this approximate 18-mile relevant reach of Clear Creek and the nearest TNW, Clear Creek. The approximate 346.30 acres of adjacent wetlands provide important chemical sequestration impact/effect upon the waters as they flow through the adjacent wetlands and connect to the downstream TNW. This aids in the reduction and/or elimination of bacteria, thermal and chemical pollutants flowing into the TNW portion of Clear Creek. The adjacent wetlands are situated in an area experiencing ongoing residential development. These wetlands sequester sediment and pollutants from stormwater runoff and prevent them from entering the TNW. This is especially important as Clear Creek is listed as a 303(d) impaired water for PCB's. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubtantial effects that are inseperably bound to the chemical integrity of the downstream TNW.

The retention of water and retardation of overbank flooding associated with the 346.30 acres of adjacent wetlands and located within the relevant reach of Clear Creek has an effect upon the physical attributes of the downstream TNW. These wetlands provide floodplain storage and have a direct effect upon the velocity and flow of waters into the downstream TNW. Increased and intense flow results in increased flooding and scouring, resulting in loss of property and the physical attributes of the TNW. The effects of removing approximately 346.30 acres of neighboring wetlands would increase the velocity and flow into the downstream TNW, resulting in more than a speculative or insubstantial effect upon the physical attributes of the downstream TNW. Therefore, the aquatic resources within this relevant reach provide more than speculative or insubstantial effects that are inseperably bound to maintain the physical integrity of the downstream TNW.

There are no known aquatic biological species found in this reach (the tributary and the adjacent wetlands) that require these aquatic resources to fulfill their lifecycle requirements. It is noted that the tributary within this reach (Clear Creek) has a direct surface hydrologic connection with the downstream TNW (Clear Creek). None of the wetlands are abutting but they are neighboring and as such the majority of the time they lack any surface hydrologic connection. These neighboring wetlands typically aid in provinding detritus as a food source to aquatic species in the TNW. However, there is not sufficient evidence to identify a species that requires both the aquatic resources within this reach and the waters of the TNW to fulfill life cycle requirements.

In conclusion, we have determined that there is sufficient evidence to support the statement that the aquatic resources within this approximate 18-mile relevant reach of Clear Creek and its 346.30 acres of adjacent wetlands provide a significant nexus (more than speculative or insubstanial effect) to the chemical, physical and/or biological integrity of the downstream TNW (Clear Creek). In conclusion, it is our opinion that this relevant reach of Clear Creek and its adjacent wetlands are waters of the United States subject to Section 404 of the Clean Water Act.