



DRAFT Mitigation Plan for US Gulf Coast 2 (USGC 2) Project

SWG-2018-00957

Prepared For
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1. Introduction

This memorandum outlines the proposed compensatory mitigation plan for the US Gulf Coast 2 (USGC 2) project proposed by Chevron Phillips Chemical Company LP (CPChem), referred to as the USGC 2 project for the remainder of this document. This mitigation plan is submitted as part of the Individual Permit (IP) Application Package submitted to the U.S. Army Corps of Engineers (USACE) Galveston District. CPChem proposes mitigation for approximately 246.2 acres of permanent wetland impacts and 24,691 linear feet (LF) of permanent stream impacts to linear Waters of the US.

2. Project Background

CPChem, the applicant, proposes to construct ethane cracking and polyethylene units in Orange, Texas. The proposed CPChem USGC 2 project site is approximately 1,810 acres; which includes a 1,600-acre site bounded by Western Avenue along the northern property line, Foreman Road to the east, State Highway (SH) 87 to the west, and Farm-to-Market Road (FM) 1006 to the south (**Exhibits 1 and 2**). Construction of the USGC 2 project requires the remaining 210 acres of the site for improvements to drainage systems, a borrow pit, roadway improvements, a waste water outfall, and a new barge slip facility. Constructing the proposed USGC 2 project will require the discharge of fill material into wetlands and other Waters of the US. CPChem is requesting authorization for this proposed discharge through an IP application to the USACE Galveston District, under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. As described in the application, CPChem is also seeking after-the-fact authorization to retain approximately 113.95 acres of wetland fill that was placed on site by a previous landowner, prior to the applicant's purchase of the property, and to place new fill on approximately 132.25 acres of wetlands and 24,267 linear feet of other Waters of the US to construct an industrial facility and associated infrastructure. This document outlines the mitigation proposed for unavoidable permanent impacts to wetlands and other Waters of the US.

The proposed project would not increase the base flood elevation level, which would violate the applicable floodplain regulations or ordinances. The hydraulic design practices would be in accordance with current Orange County, Texas design policies and standards.

The USGC 2 project is located within the Lower Sabine Watershed, Hydrologic Unit Code (HUC) 12010005. The Regulatory In-Lieu and Bank Information Tracking System (RIBITS) lists no wetland mitigation banks with service area of the USGC 2 project in the State of Texas, as of November 2019. Several stream mitigation banks are located within adjacent and surrounding watersheds.

CPChem proposes to compensate for the proposed permanent impacts to jurisdictional wetlands and waters through the purchase of stream banking credits from accredited mitigation banks, and the creation of Permittee Responsible Mitigation (PRM) for stream credits and wetland mitigation required. Construction of the USGC 2 project is anticipated to begin in September 2022 and must be completed by the end of third quarter 2024, in order to achieve CPChem's objective and need for the USGC 2 project.

3. Avoidance and Minimization

When evaluating an IP application under Section 404, the USACE must conclude that the proposed discharge complies with the requirements of 40 CFR 230 (the 404(b)(1) Guidelines) and that the permit applicant has taken all appropriate and practicable steps to avoid and minimize adverse impacts to wetlands and other Waters of the United States (US).

Results of the wetland delineation, along with field assessments of the functions and values of the jurisdictional areas within the proposed project site were evaluated during the project-planning phase. The objective of the evaluation process was to design a project that satisfies the recommended sequencing process of avoidance, minimization, and compensation for unavoidable impacts to jurisdictional wetlands and other Waters of the US. As a result of this process it was determined that complete avoidance of impacts resulting from the proposed USGC 2 project is not practicable. However, impacts were minimized where it is practicable to do so by avoiding construction and fill impacts within an existing utility corridor along the southern border of the site, and an area north of the rail yard. In addition, impacts in the barge slip areas to tidally influence wetlands were reduced to the extent practicable. (*Refer to Appendix B of the Individual Permit package for impact exhibits.*)

Consequently, the design of the proposed project satisfies the Clean Water Act (CWA) Section 404(b)(1) guidelines requiring that no discharge of dredged or fill material in Waters of the US be permitted, unless appropriate and practicable steps have been taken to minimize adverse effects associated with the discharge [40 Code of Federal Regulation 230.10(d)]. The proposed project also complies with the mandated mitigation sequence established by Section 404(b)(1) of avoidance, minimization, and compensation for unavoidable losses to the aquatic environment, and the 1989 Federal policy goal of “no net loss” of wetland functions and values.

4. Calculation of Total Impacts

The delineated jurisdictional wetlands and other Waters of the US will be verified by the USACE Galveston District. Delineated and impacted acreages of jurisdictional wetlands and other Waters of the US for the proposed USGC 2 Project area are summarized in **Tables 1** and **2**. A blended Approved Jurisdictional Determination and Preliminary Jurisdictional Determination will be submitted for the proposed project. As proposed under the Preliminary Jurisdictional Determination, all onsite wetlands will be assumed to be jurisdictional under the CWA. As proposed under the submitted request for Approved Jurisdictional Determination, it is anticipated that the USACE may assert jurisdiction over the following water features: SA005, SA007, SC003, SX004, SX005, SX010, SX015, SX016, SX017, SX018 (Hudson Gully), SX029, SX030, SP2OR001 (Cow Bayou), SP1OR005, and SP1OR006.

Table 1: USGC 2 Orange Facility Project – Wetland Impacts Table

Feature #	Feature ID	State	Cowardin Class	HGM Code	Measure Type	Units	Wetlands/ Waters Type	Total Area Within Survey Boundary (acres)	Total Length within Survey Boundary (LF)	Type of Permanent Impact	Temporary Impact (Y/N)	Permanent Impacts (Acres)	Temporary Impacts (Acres)	Total Impact (Acres)	Permanent Impacts - Complete Loss (LF)	Permanent Impacts - Partial Loss (LF)	Temporary Impacts (LF)	Total Impact (LF)
1	WA001_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
2	WA001A_P2_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
3	WA002_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.21	N/A	Excavation / Fill	No	0.21	0	0.21	N/A	N/A	N/A	N/A
4	WA003_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.3	N/A	Excavation / Fill	No	1.30	0	1.30	N/A	N/A	N/A	N/A
5	WA003_P3_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.56	N/A	Excavation / Fill	No	0.39	0	0.39	N/A	N/A	N/A	N/A
6	WA004_P2_P16_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
7	WA004_P2_P16_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
8	WA005_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
9	WA006_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
10	WA007_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
11	WA008_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.39	N/A	Excavation / Fill	No	0.39	0	0.39	N/A	N/A	N/A	N/A
12	WA009_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
13	WA011_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.22	N/A	Excavation / Fill	No	0.22	0	0.22	N/A	N/A	N/A	N/A
14	WA012_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
15	WA013_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
16	WA014_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
17	WA014A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
18	WA014B_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
19	WA015_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
20	WA016_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
21	WA016A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
22	WA017_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
23	WA017A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
24	WA018_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.11	N/A	Excavation / Fill	No	0.11	0	0.11	N/A	N/A	N/A	N/A
25	WA019_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
26	WA019A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
27	WA020_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.66	N/A	Excavation / Fill	No	0.66	0	0.66	N/A	N/A	N/A	N/A
28	WA020A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
29	WA021_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
30	WA021A_P2_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.5	N/A	Excavation / Fill	No	0.50	0	0.50	N/A	N/A	N/A	N/A
31	WA022_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
32	WA022A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
33	WA023_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.17	N/A	Excavation / Fill	No	0.17	0	0.17	N/A	N/A	N/A	N/A
34	WA023A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A

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35	WA024_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
36	WA024A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
37	WA025_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
38	WA025_P2_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.57	N/A	Excavation / Fill	No	0.57	0	0.57	N/A	N/A	N/A	N/A
39	WA026_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.16	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
40	WA026A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
41	WA027_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.46	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
42	WA027A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.4	N/A	Excavation / Fill	No	0.40	0	0.40	N/A	N/A	N/A	N/A
43	WA028_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
44	WA028A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
45	WA029_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
16	WA029A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.08	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
17	WA030_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
18	WA030A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
19	WA031_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
50	WA032_P2_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
51	WA032A_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
52	WA033_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	3.43	N/A	Excavation / Fill	No	3.43	0	3.43	N/A	N/A	N/A	N/A
53	WA033_P2_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	1.9	N/A	Excavation / Fill	No	1.90	0	1.90	N/A	N/A	N/A	N/A
54	WA033A_P1_P2_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.36	N/A	Excavation / Fill	No	0.36	0	0.36	N/A	N/A	N/A	N/A
55	WA034_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
56	WA034_P2_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.08	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
57	WA035_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
58	WA036_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
59	WA037_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
60	WA038_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
61	WA039_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.35	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
62	WA040_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.49	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
63	WA041_P2_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.11	N/A	Excavation / Fill	No	0.11	0	0.11	N/A	N/A	N/A	N/A
64	WA042_P2_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
65	WA043_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
67	WA044_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.44	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
68	WA045_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
69	WA046_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.58	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A

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Feature #	Feature ID	State	Cowardin Class	HGM Code	Measure Type	Units	Wetlands/ Waters Type	Total Area Within Survey Boundary (acres)	Total Length within Survey Boundary (LF)	Type of Permanent Impact	Temporary Impact (Y/N)	Permanent Impacts (Acres)	Temporary Impacts (Acres)	Total Impact (Acres)	Permanent Impacts - Complete Loss (LF)	Permanent Impacts - Partial Loss (LF)	Temporary Impacts (LF)	Total Impact (LF)
70	WA047_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
71	WA048_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.28	N/A	Excavation / Fill	No	0.28	0	0.28	N/A	N/A	N/A	N/A
72	WA049_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.75	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
73	WA050_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	9.63	N/A	Excavation / Fill	No	9.63	0	9.63	N/A	N/A	N/A	N/A
74	WA051_P2_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	5.49	N/A	Excavation / Fill	No	5.49	0	5.49	N/A	N/A	N/A	N/A
75	WA055_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
76	WA056_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.86	N/A	Excavation / Fill	No	0.86	0	0.86	N/A	N/A	N/A	N/A
77	WA057_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.28	N/A	Excavation / Fill	No	0.28	0	0.28	N/A	N/A	N/A	N/A
78	WA058_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
79	WA059_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
80	WA060_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation / Fill	No	0.16	0	0.16	N/A	N/A	N/A	N/A
81	WA061_P2_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.25	N/A	Excavation / Fill	No	1.25	0	1.25	N/A	N/A	N/A	N/A
82	WA062_P2_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.62	N/A	Excavation / Fill	No	0.62	0	0.62	N/A	N/A	N/A	N/A
83	WA063_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.34	N/A	Excavation / Fill	No	0.34	0	0.34	N/A	N/A	N/A	N/A
84	WA064_P2_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
85	WA065_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
86	WA066_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
87	WA068_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
88	WA069_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.11	N/A	Excavation / Fill	No	0.11	0	0.11	N/A	N/A	N/A	N/A
89	WA070_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
90	WA071_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
91	WA072_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.59	N/A	Excavation / Fill	No	0.59	0	0.59	N/A	N/A	N/A	N/A
92	WA072_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.31	N/A	Excavation / Fill	No	0.31	0	0.31	N/A	N/A	N/A	N/A
93	WA073_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
94	WA074_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
95	WA075_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
96	WA076_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.25	N/A	Excavation / Fill	No	0.25	0	0.25	N/A	N/A	N/A	N/A
97	WA076_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
98	WA076_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
99	WA077_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	1.21	N/A	Excavation / Fill	No	1.21	0	1.21	N/A	N/A	N/A	N/A
100	WA078_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.31	N/A	Excavation / Fill	No	0.31	0	0.31	N/A	N/A	N/A	N/A
110	WA078_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.98	N/A	Excavation / Fill	No	0.98	0	0.98	N/A	N/A	N/A	N/A
111	WA080_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation / Fill	No	0.16	0	0.16	N/A	N/A	N/A	N/A
112	WA081_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A

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113	WA082_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.6	N/A	Excavation / Fill	No	0.60	0	0.60	N/A	N/A	N/A	N/A
114	WA082A_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
115	WA084_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.19	N/A	Excavation / Fill	No	0.19	0	0.19	N/A	N/A	N/A	N/A
116	WA084_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
117	WA084_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
118	WA085_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
119	WA086_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.18	N/A	Excavation / Fill	No	0.18	0	0.18	N/A	N/A	N/A	N/A
120	WA087_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
121	WA088_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
122	WA090_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
123	WA092_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.17	N/A	Excavation / Fill	No	0.17	0	0.17	N/A	N/A	N/A	N/A
124	WA092_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.21	N/A	Excavation / Fill	No	0.21	0	0.21	N/A	N/A	N/A	N/A
125	WA093_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
126	WA094_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
127	WA095_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
128	WA096_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
129	WA097_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
130	WA098_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.08	N/A	Excavation / Fill	No	1.08	0	1.08	N/A	N/A	N/A	N/A
131	WA099_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.57	N/A	Excavation / Fill	No	0.57	0	0.57	N/A	N/A	N/A	N/A
132	WB001_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.55	N/A	Excavation / Fill	No	0.55	0	0.55	N/A	N/A	N/A	N/A
134	WB002_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	2.12	N/A	Excavation / Fill	No	2.12	0	2.12	N/A	N/A	N/A	N/A
135	WB003_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
136	WB004_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.08	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
137	WB005_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.34	N/A	Excavation / Fill	No	0.34	0	0.34	N/A	N/A	N/A	N/A
138	WB006_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
139	WB007_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
140	WC001_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
141	WC002_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
142	WC002_P3_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
143	WC002_P3_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.45	N/A	Excavation / Fill	No	0.45	0	0.45	N/A	N/A	N/A	N/A
144	WC003_P3_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
145	WC004_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.18	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
146	WC006_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.15	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
147	WC007_P3_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.98	N/A	Excavation / Fill	No	0.28	0	0.28	N/A	N/A	N/A	N/A

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148	WC008_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.22	N/A	Excavation / Fill	No	0.35	0	0.35	N/A	N/A	N/A	N/A
149	WC008_P3_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
150	WC010_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
151	WC011_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.34	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
152	WC012_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.85	N/A	Excavation / Fill	No	0.83	0	0.83	N/A	N/A	N/A	N/A
153	WC013_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
154	WC014_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
155	WC015_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.05	N/A	Excavation / Fill	No	1.05	0	1.05	N/A	N/A	N/A	N/A
156	WC016_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
157	WC018_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.21	0	0.21	N/A	N/A	N/A	N/A
158	WC018_P15_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.28	N/A	Excavation / Fill	No	0.19	0	0.19	N/A	N/A	N/A	N/A
159	WC019_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
160	WC020_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
161	WC021_P8_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
162	WC022_P8_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	9.1	N/A	Excavation / Fill	No	9.10	0	9.10	N/A	N/A	N/A	N/A
163	WC023_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.19	N/A	Excavation / Fill	No	0.19	0	0.19	N/A	N/A	N/A	N/A
164	WC024_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
165	WC025_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
166	WC026_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.42	N/A	Excavation / Fill	No	0.42	0	0.42	N/A	N/A	N/A	N/A
167	WC027_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.58	N/A	Excavation / Fill	No	0.58	0	0.58	N/A	N/A	N/A	N/A
168	WC030_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.77	N/A	Excavation / Fill	No	0.77	0	0.77	N/A	N/A	N/A	N/A
169	WC031_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.21	N/A	Excavation / Fill	No	0.21	0	0.21	N/A	N/A	N/A	N/A
170	WC032_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
171	WC034_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.2	N/A	Excavation / Fill	No	0.20	0	0.20	N/A	N/A	N/A	N/A
172	WC035_P11_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.84	N/A	Excavation / Fill	No	0.84	0	0.84	N/A	N/A	N/A	N/A
173	WC036_P11_P17_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.03	N/A	Excavation / Fill	No	1.03	0	1.03	N/A	N/A	N/A	N/A
174	WC037_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.27	N/A	Excavation / Fill	No	0.27	0	0.27	N/A	N/A	N/A	N/A
176	WC038_P9_P12_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	4.35	N/A	Excavation / Fill	No	3.59	0	3.59	N/A	N/A	N/A	N/A
177	WC038_P9_P12_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	3.29	N/A	Excavation / Fill	No	2.85	0	2.85	N/A	N/A	N/A	N/A
178	WC039_P11_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
179	WC039_P11_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation / Fill	No	0.16	0	0.16	N/A	N/A	N/A	N/A
180	WC040_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.56	N/A	Excavation / Fill	No	0.56	0	0.56	N/A	N/A	N/A	N/A
181	WC040_P9_P12_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.71	N/A	Excavation / Fill	No	0.71	0	0.71	N/A	N/A	N/A	N/A
182	WC041_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A

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183	WC042_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.47	N/A	Excavation / Fill	No	0.15	0	0.15	N/A	N/A	N/A	N/A
184	WC042_P9_P12_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
185	WC043_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.53	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
186	WC044_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.93	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
187	WC045_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.99	N/A	Excavation / Fill	No	0.99	0	0.99	N/A	N/A	N/A	N/A
188	WC046_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.26	N/A	Excavation / Fill	No	0.26	0	0.26	N/A	N/A	N/A	N/A
189	WC047_P5_P10_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.48	N/A	Excavation / Fill	No	0.48	0	0.48	N/A	N/A	N/A	N/A
190	WC047_P10_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.22	N/A	Excavation / Fill	No	0.22	0	0.22	N/A	N/A	N/A	N/A
191	WC048_P10_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
192	WC048_P10_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.9	N/A	Excavation / Fill	No	0.90	0	0.90	N/A	N/A	N/A	N/A
193	WC049_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.36	N/A	Excavation / Fill	No	0.36	0	0.36	N/A	N/A	N/A	N/A
194	WC049_P9_P10_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	2.69	N/A	Excavation / Fill	No	2.69	0	2.69	N/A	N/A	N/A	N/A
195	WC050_P9_P10_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
196	WC050_P9_P10_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.78	N/A	Excavation / Fill	No	0.78	0	0.78	N/A	N/A	N/A	N/A
197	WC051_P10_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
198	WC053_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.18	N/A	Excavation / Fill	No	0.18	0	0.18	N/A	N/A	N/A	N/A
199	WC054_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A
200	WC055_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.15	N/A	Excavation / Fill	No	0.15	0	0.15	N/A	N/A	N/A	N/A
201	WC056_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
202	WC057_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
203	WC058_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
204	WC059_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	3.76	N/A	Excavation / Fill	No	3.76	0	3.76	N/A	N/A	N/A	N/A
205	WC060_P3_P4_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.7	N/A	Excavation / Fill	No	0.70	0	0.70	N/A	N/A	N/A	N/A
206	WC060_P3_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
207	WC061_P3_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
208	WC061_P3_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	1.92	N/A	Excavation / Fill	No	1.92	0	1.92	N/A	N/A	N/A	N/A
209	WC064_P14_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.17	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
210	WC065_P2_P14_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	15.34	N/A	Excavation / Fill	No	15.11	0	15.11	N/A	N/A	N/A	N/A
211	WC066_P14_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.46	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
212	WD001_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	20.53	N/A	Excavation / Fill	No	20.53	0	20.53	N/A	N/A	N/A	N/A
213	WD001_P5_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.29	N/A	Excavation / Fill	No	0.29	0	0.29	N/A	N/A	N/A	N/A
214	WD003_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
215	WD004_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.11	N/A	Excavation / Fill	No	0.11	0	0.11	N/A	N/A	N/A	N/A
216	WD005_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.09	N/A	Excavation / Fill	No	0.09	0	0.09	N/A	N/A	N/A	N/A

Table 1: USGC 2 Orange Facility Project – Wetland Impacts Table

Feature #	Feature ID	State	Cowardin Class	HGM Code	Measure Type	Units	Wetlands/ Waters Type	Total Area Within Survey Boundary (acres)	Total Length within Survey Boundary (LF)	Type of Permanent Impact	Temporary Impact (Y/N)	Permanent Impacts (Acres)	Temporary Impacts (Acres)	Total Impact (Acres)	Permanent Impacts - Complete Loss (LF)	Permanent Impacts - Partial Loss (LF)	Temporary Impacts (LF)	Total Impact (LF)
217	WD006_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
218	WD007_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.08	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
219	WD008_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
220	WD009_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.84	N/A	Excavation / Fill	No	1.84	0	1.84	N/A	N/A	N/A	N/A
221	WD010_P5_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	23	N/A	Excavation / Fill	No	0.23	0	0.23	N/A	N/A	N/A	N/A
222	WD010_P5_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
223	WD011_P2_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
224	WD0012_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
225	WD0013_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
226	WD0014_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.22	N/A	Excavation / Fill	No	0.22	0	0.22	N/A	N/A	N/A	N/A
227	WD0015_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation / Fill	No	0.08	0	0.08	N/A	N/A	N/A	N/A
228	WD0016_P15_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.29	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
229	WD0017_P15_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
230	WD0018_P15_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
231	WD0019_P15_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
232	WE019_P7_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.49	N/A	Excavation / Fill	No	0.49	0	0.49	N/A	N/A	N/A	N/A
233	WE020_P7_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
234	WE021_P7_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.11	N/A	Excavation / Fill	No	0.11	0	0.11	N/A	N/A	N/A	N/A
235	WE022_P7_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
236	WE023_P7_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
237	WE024_P7_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.1	N/A	Excavation / Fill	No	0.10	0	0.10	N/A	N/A	N/A	N/A
238	WE025_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
239	WE025_P9_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.14	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A
240	WE025_P9_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	No	0.02	0	0.02	N/A	N/A	N/A	N/A
241	WE027_P9_P10_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation / Fill	No	0.06	0	0.06	N/A	N/A	N/A	N/A
242	WE028_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.12	N/A	Excavation / Fill	No	0.12	0	0.12	N/A	N/A	N/A	N/A
243	WE028_P9_P11_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.15	N/A	Excavation / Fill	No	0.15	0	0.15	N/A	N/A	N/A	N/A
244	WE029_P9_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation / Fill	No	0.16	0	0.16	N/A	N/A	N/A	N/A
245	WF001_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.97	N/A	Excavation / Fill	No	0.97	0	0.97	N/A	N/A	N/A	N/A
246	WF002_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	1.07	N/A	Excavation / Fill	No	1.07	0	1.07	N/A	N/A	N/A	N/A
247	WF003_P19_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.52	N/A	Excavation / Fill	No	0.52	0	0.52	N/A	N/A	N/A	N/A
248	WX001_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	4.71	N/A	Excavation / Fill	No	4.71	0	4.71	N/A	N/A	N/A	N/A
249	WX002_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	1.32	N/A	Excavation / Fill	No	1.32	0	1.32	N/A	N/A	N/A	N/A
250	WX003_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	0.144	N/A	Excavation / Fill	No	0.14	0	0.14	N/A	N/A	N/A	N/A

Table 1: USGC 2 Orange Facility Project – Wetland Impacts Table

Feature #	Feature ID	State	Cowardin Class	HGM Code	Measure Type	Units	Wetlands/ Waters Type	Total Area Within Survey Boundary (acres)	Total Length within Survey Boundary (LF)	Type of Permanent Impact	Temporary Impact (Y/N)	Permanent Impacts (Acres)	Temporary Impacts (Acres)	Total Impact (Acres)	Permanent Impacts - Complete Loss (LF)	Permanent Impacts - Partial Loss (LF)	Temporary Impacts (LF)	Total Impact (LF)
251	WX004_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	0.77	N/A	Excavation / Fill	No	0.77	0	0.77	N/A	N/A	N/A	N/A
252	WX005_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	1.91	N/A	Excavation / Fill	No	1.91	0	1.91	N/A	N/A	N/A	N/A
253	WX006_P1_PEM	TX	PEM	RIVERINE	Area	Acre	RPWWD	1.35	N/A	Excavation / Fill	No	1.35	0	1.35	N/A	N/A	N/A	N/A
254	WX007_P1_PFO	TX	PFO	RIVERINE	Area	Acre	RPWWD	89.35	N/A	Excavation / Fill	No	89.35	0	89.35	N/A	N/A	N/A	N/A
255	WX008_P1_PFO	TX	PFO	RIVERINE	Area	Acre	RPWWD	0.33	N/A	Excavation / Fill	No	0.33	0	0.33	N/A	N/A	N/A	N/A
256	WX009_P1_PFO	TX	PFO	RIVERINE	Area	Acre	RPWWD	2.2	N/A	Excavation / Fill	No	2.20	0	2.20	N/A	N/A	N/A	N/A
257	WX010_P1_PFO	TX	PFO	RIVERINE	Area	Acre	RPWWD	0.28	N/A	Excavation / Fill	No	0.28	0	0.28	N/A	N/A	N/A	N/A
258	WX011_P1_PFO	TX	PFO	RIVERINE	Area	Acre	RPWWD	0.69	N/A	Excavation / Fill	No	0.69	0	0.69	N/A	N/A	N/A	N/A
259	WX012_P1_PSS	TX	PSS	RIVERINE	Area	Acre	RPWWD	0.031	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
260	WX013_P1_PSS	TX	PSS	RIVERINE	Area	Acre	RPWWD	6.15	N/A	Excavation / Fill	No	6.15	0	6.15	N/A	N/A	N/A	N/A
261	WX014_P1_PSS	TX	PSS	RIVERINE	Area	Acre	RPWWD	2.68	N/A	Excavation / Fill	No	2.68	0	2.68	N/A	N/A	N/A	N/A
262	WX015_P1_PSS	TX	PSS	RIVERINE	Area	Acre	RPWWD	0.07	N/A	Excavation / Fill	No	0.07	0	0.07	N/A	N/A	N/A	N/A
263	WP1OR001_HH_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.05	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
264	WP1OR001_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.03	N/A	Excavation / Fill	No	0.03	0	0.03	N/A	N/A	N/A	N/A
265	WP1OR002_HH_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.1	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
266	WP1OR002_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.67	N/A	Excavation / Fill	No	0.47	0	0.47	N/A	N/A	N/A	N/A
267	WP1OR003_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
268	WP1OR004_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.13	N/A	Excavation / Fill	No	0.13	0	0.13	N/A	N/A	N/A	N/A
269	WP1OR005_HH_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	No	0.04	0	0.04	N/A	N/A	N/A	N/A
270	WP1OR005_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.29	N/A	None	YES	0.00	0.32	0.32	N/A	N/A	N/A	N/A
271	WP1OR005_HH_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.55	N/A	Excavation / Fill	No	0.55	0	0.55	N/A	N/A	N/A	N/A
272	WP2OR001_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	4.75	N/A	Excavation / Fill	No	1.67	0.37	2.04	N/A	N/A	N/A	N/A
273	WP2OR001_HH_PSS	TX	PSS	RIVERINE	Area	Acre	Delineated	0.04	N/A	Excavation / Fill	YES	0.10	0.04	0.14	N/A	N/A	N/A	N/A
275	WP1OR006_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	None	YES	0.00	0.02	0.02	N/A	N/A	N/A	N/A
276	WP1OR007_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	None	YES	0.00	0.02	0.02	N/A	N/A	N/A	N/A
277	WP1OR008_HH_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.01	N/A	Excavation / Fill	No	0.01	0	0.01	N/A	N/A	N/A	N/A
278	WP1OR008_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.02	N/A	Excavation / Fill	YES	0.00	0.02	0.02	N/A	N/A	N/A	N/A
279	WP1OR009_HH_PEM	TX	PEM	RIVERINE	Area	Acre	Delineated	0.16	N/A	Excavation/Fill	YES	0.07	0.10	0.16	N/A	N/A	N/A	N/A
280	WP1OR009_HH_PFO	TX	PFO	RIVERINE	Area	Acre	Delineated	0.06	N/A	Excavation/Fill	No	0.05	0	0.05	N/A	N/A	N/A	N/A
282	WP1001-F	TX	PFO	RIVERINE	Area	Acre	Delineated	1.24	N/A	Excavation / Fill	No	0.56	0	0.56	N/A	N/A	N/A	N/A
283	WP1001-S	TX	PSS	RIVERINE	Area	Acre	Delineated	0.11	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
284	WP1001	TX	PEM	RIVERINE	Area	Acre	Delineated	0.15	N/A	None	No	0.00	0	0.00	N/A	N/A	N/A	N/A
285	WP1002-F	TX	PFO	RIVERINE	Area	Acre	Delineated	0.8	N/A	Excavation / Fill	No	0.80	0	0.80	N/A	N/A	N/A	N/A

Source: SWCA, 2019a, 2019b; Perennial 2019a, 2019b

Table 2: USGC 2 Orange Facility Project – Linear Waterbody Impacts

	Feature ID	State	Cowardin	HGM Code	Measure Type	Units	Wetlands/ Waters Type	Total Area Within Survey Boundary (acres)	Total Length within Survey Boundary (LF)	Type of Permanent Impact	Temporary Impact (Y/N)	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impact (acres)	Permanent Impacts - Complete Loss (LF)	Permanent Impacts - Partial Loss (LF)	Temporary Impacts (LF)	Total Impact (LF)
1	SP1OR002_HH_Perennial	TX	R2	RIVERINE	Linear	Foot	TNW	N/A	80	None	No	N/A	N/A	N/A	0	0	0	0
2	SA005_P5_Perennial	TX	R2	RIVERINE	Linear	Foot	RPW	N/A	2,217	Excavation / Fill	No	N/A	N/A	N/A	2,127	0	0	2,127
3	SC003_P3_P4_ Intermittent	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	1,767	Excavation / Fill	No	N/A	N/A	N/A	1,767	0	0	1,767
4	SP1OR005	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	1,011	Excavation / Fill	No	N/A	N/A	N/A	1,011	0	0	1,011
5	SP1OR006	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	1,523	Excavation / Fill	No	N/A	N/A	N/A	1,523	0	0	1,523
6	SX004_P2_Ephemeral	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	4,765	Excavation / Fill	No	N/A	N/A	N/A	4,765	0	0	4,765
7	SX005_P2_Ephemeral	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	483	Excavation / Fill	No	N/A	N/A	N/A	440	0	0	440
8	SX010_P2_Ephemeral	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	3,114	Excavation / Fill	No	N/A	N/A	N/A	3,114	0	0	3,114
9	SX018_P5_P9_P10_ P13 Intermittent	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	2,964	Excavation / Fill	No	N/A	N/A	N/A	2,964	0	0	2,964
10	SX029	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	4,553	Excavation / Fill	No	N/A	N/A	N/A	4,172	0	0	4,172
11	SX030	TX	R4	RIVERINE	Linear	Foot	RPW	N/A	2,384	Excavation / Fill	No	N/A	N/A	N/A	2,384	0	0	2,384

Source: SWCA, 2019a, 2019b; Perennial, 2019a, 2019b

5. Determination of Wetland Credits – iHGM Calculation

The interim hydrogeomorphic model (iHGM) is a tool used to measure changes in the function of wetland ecosystems because of proposed project impacts. These impacts can be positive or negative in that they can degrade or enhance the function of the wetlands. There are four wetland classes identified by the USACE Galveston District, including riverine forested, riverine herbaceous/shrub, tidal fringe, and lacustrine wetlands. Wetlands within the USGC 2 project area were identified as either Palustrine Emergent Persistent (PEM), Palustrine Scrub-Shrub Broad-Leaved Deciduous (PSS), or Palustrine Forested Broad-Leaved Deciduous (PFO). Thus, the Riverine Herbaceous/Shrub iHGM, and Riverine Forested iHGM were used to estimate potential impacts.

Wetland functions typically fall into three impact categories: temporary storage and detention of storage water (physical), maintain plant and animal communities (biological), and removal and sequestration of elements and compounds (chemical). A variety of variables are evaluated to determine the total functional capacity index (FCI) for each class of impact. The functional capacity unit (FCU) for each wetland is determined by multiplying the FCI by the total impacted acreage. The total net FCU loss is multiplied by the cost per FCU and the service area multiplier (see note at the bottom of Table 1) to generate mitigation costs per impact category. This calculation can vary by mitigation bank and service area, depending on the terms of the mitigation banking instrument.

Table 3 provides the detail of the specific FCU net loss per impacted PEM wetland feature. **Table 4** provides the detail of the specific FCU net loss per impacted PSS wetland feature. **Table 5** provides the detail of the specific FCU net loss per impacted PFO wetland feature.

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
		Physical		Chemical		Biological	
ID	ACRES	FCI	FCU	FCI	FCU	FCI	FCU
WA001_PEM	0.069	0.57	0.039	0.700	0.048	0.607	0.042
WA001A_PEM	0.061	0.446	0.027	0.617	0.038	0.410	0.025
WA002_PEM	0.214	0.57	0.122	0.617	0.132	0.607	0.130
WA003_PEM	1.3	0.689	0.896	0.617	0.802	0.627	0.815
WA004_PEM	0.036	0.716	0.026	0.667	0.024	0.637	0.023
WA005_PEM	0.049	0.602	0.029	0.667	0.033	0.570	0.028
WA006_PEM	0.047	0.57	0.027	0.617	0.029	0.607	0.029
WA007_PEM	0.1	0.57	0.057	0.617	0.062	0.607	0.061
WA008_PEM	0.386	0.57	0.220	0.700	0.270	0.560	0.216
WA009_PEM	0.087	0.57	0.050	0.617	0.054	0.560	0.049
WA011_PEM	0.215	0.57	0.123	0.617	0.133	0.607	0.131
WA012_PEM	0.062	0.57	0.035	0.617	0.038	0.560	0.035
WA013_PEM	0.142	0.602	0.085	0.667	0.095	0.570	0.081
WA014_PEM	0.056	0.57	0.032	0.617	0.035	0.607	0.034
WA014A_PEM	0.031	0.506	0.016	0.750	0.023	0.467	0.014

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WA014B_PEM	0.026	0.506	0.013	0.750	0.020	0.437	0.011
WA015_PEM	0.056	0.57	0.032	0.617	0.035	0.607	0.034
WA016_PEM	0.073	0.487	0.036	0.700	0.051	0.427	0.031
WA016A_PEM	0.03	0.531	0.016	0.617	0.019	0.510	0.015
WA017_PEM	0.043	0.446	0.019	0.617	0.027	0.457	0.020
WA017A_PEM	0.032	0.57	0.018	0.617	0.020	0.607	0.019
WA018_PEM	0.106	0.403	0.043	0.617	0.065	0.407	0.043
WA019_PEM	0.048	0.403	0.019	0.700	0.034	0.407	0.020
WA019A_PEM	0.058	0.736	0.043	0.617	0.036	0.597	0.035
WA020_PEM	0.658	0.339	0.223	0.617	0.406	0.357	0.235
WA020A_PEM	0.037	0.57	0.021	0.533	0.020	0.607	0.022
WA021_PEM	0.094	0.446	0.042	0.617	0.058	0.457	0.043
WA021A_PEM	0.5	0.446	0.223	0.617	0.309	0.410	0.205
WA022_PEM	0.12	0.446	0.054	0.617	0.074	0.457	0.055
WA022A_PEM	0.047	0.446	0.021	0.617	0.029	0.457	0.021
WA023_PEM	0.168	0.446	0.075	0.617	0.104	0.457	0.077
WA023A_PEM	0.06	0.539	0.032	0.617	0.037	0.477	0.029
WA024_PEM	0.066	0.339	0.022	0.617	0.041	0.357	0.024
WA024A_PEM	0.039	0.57	0.022	0.617	0.024	0.560	0.022
WA025_PEM	0.13	0.689	0.090	0.617	0.080	0.627	0.082
WA026A_PEM	0.094	0.689	0.065	0.617	0.058	0.627	0.059
WA027A_PEM	0.396	0.689	0.273	0.617	0.244	0.627	0.248
WA028A_PEM	0.087	0.57	0.050	0.617	0.054	0.607	0.053
WA029_PEM	0.029	0.57	0.017	0.617	0.018	0.607	0.018
WA030A_PEM	0.051	0.57	0.029	0.617	0.031	0.607	0.031
WA031_PEM	0.031	0.57	0.018	0.617	0.019	0.640	0.020
WA032A_PEM	0.011	0.446	0.005	0.617	0.007	0.457	0.005
WA033_PEM	3.429	0.487	1.670	0.617	2.116	0.380	1.303
WA034_PEM	0.104	0.426	0.044	0.667	0.069	0.417	0.043
WA035_PEM	0.038	0.446	0.017	0.617	0.023	0.410	0.016
WA036_PEM	0.061	0.446	0.027	0.617	0.038	0.410	0.025
WA037_PEM	0.059	0.446	0.026	0.617	0.036	0.457	0.027
WA038_PEM	0.1	0.446	0.045	0.617	0.062	0.457	0.046
WA039_PEM	0.13	0.403	0.052	0.617	0.080	0.407	0.053
WA043_PEM	0.096	0.57	0.055	0.617	0.059	0.593	0.057

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WA044_PEM	0.13	0.689	0.090	0.700	0.091	0.627	0.082
WA045_PEM	0.063	0.57	0.036	0.617	0.039	0.560	0.035
WA048_PEM	0.283	0.487	0.138	0.617	0.175	0.380	0.108
WA050_PEM	9.626	0.576	5.545	0.667	6.421	0.423	4.072
WA051_PEM	5.492	0.576	3.163	0.667	3.663	0.423	2.323
WA055_PEM	0.093	0.339	0.032	0.617	0.057	0.310	0.029
WA056_PEM	0.86	0.619	0.532	0.617	0.531	0.497	0.427
WA057_PEM	0.281	0.471	0.132	0.667	0.187	0.420	0.118
WA058_PEM	0.139	0.339	0.047	0.617	0.086	0.343	0.048
WA059_PEM	0.115	0.403	0.046	0.617	0.071	0.360	0.041
WA060_PEM	0.16	0.403	0.064	0.617	0.099	0.360	0.058
WA061_PEM	1.245	0.487	0.606	0.617	0.768	0.380	0.473
WA062_PEM	0.618	0.403	0.249	0.617	0.381	0.360	0.222
WA064_PEM	0.132	0.446	0.059	0.617	0.081	0.423	0.056
WA065_PEM	0.037	0.403	0.015	0.617	0.023	0.393	0.015
WA066_PEM	0.022	0.339	0.007	0.533	0.012	0.343	0.008
WA068_PEM	0.027	0.446	0.012	0.617	0.017	0.410	0.011
WA069_PEM	0.106	0.407	0.043	0.667	0.071	0.310	0.033
WA070_PEM	0.041	0.285	0.012	0.617	0.025	0.307	0.013
WA071_PEM	0.027	0.256	0.007	0.533	0.014	0.290	0.008
WA072_PEM	0.59	0.454	0.268	0.617	0.364	0.413	0.244
WA074_PEM	0.04	0.285	0.011	0.617	0.025	0.260	0.010
WA075_PEM	0.029	0.285	0.008	0.617	0.018	0.340	0.010
WA076_PEM	0.246	0.47	0.116	0.617	0.152	0.350	0.086
WA078_PEM	0.313	0.285	0.089	0.617	0.193	0.307	0.096
WA084_PEM	0.186	0.441	0.082	0.583	0.108	0.387	0.072
WA086_PEM	0.183	0.375	0.069	0.617	0.113	0.360	0.066
WA087_PEM	0.035	0.375	0.013	0.617	0.022	0.407	0.014
WA088_PEM	0.053	0.375	0.020	0.617	0.033	0.393	0.021
WA090_PEM	0.039	0.375	0.015	0.617	0.024	0.360	0.014
WA092_PEM	0.173	0.375	0.065	0.617	0.107	0.360	0.062
WA093_PEM	0.228	0.446	0.102	0.617	0.141	0.410	0.093
WA094_PEM	0.119	0.375	0.045	0.617	0.073	0.360	0.043
WA095_PEM	0.058	0.446	0.026	0.617	0.036	0.443	0.026
WA097_PEM	0.226	0.446	0.101	0.617	0.139	0.443	0.100

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WA098_PEM	1.079	0.689	0.743	0.700	0.755	0.580	0.626
WA099_PEM	0.566	0.689	0.390	0.700	0.396	0.580	0.328
WB001_PEM	0.554	0.375	0.208	0.617	0.342	0.360	0.199
WB002_PEM	2.123	0.403	0.856	0.617	1.310	0.373	0.792
WB003_PEM	0.052	0.285	0.015	0.617	0.032	0.307	0.016
WB004_PEM	0.075	0.375	0.028	0.617	0.046	0.407	0.031
WB005_PEM	0.34	0.446	0.152	0.617	0.210	0.410	0.139
WB006_PEM	0.027	0.375	0.010	0.617	0.017	0.407	0.011
WB007_PEM	0.044	0.375	0.017	0.617	0.027	0.360	0.016
WC001_PEM	0.232	0.57	0.132	0.700	0.162	0.640	0.148
WC002_PEM	0.036	0.57	0.021	0.700	0.025	0.640	0.023
WC004_PEM	0.03	0.57	0.017	0.617	0.019	0.593	0.018
WC006_PEM	0.081	0.57	0.046	0.617	0.050	0.640	0.052
WC007_PEM	0.28	0.58	0.162	0.617	0.173	0.560	0.157
WC008_PEM	0.35	0.689	0.241	0.617	0.216	0.660	0.231
WC010_PEM	0.028	0.512	0.014	0.533	0.015	0.623	0.017
WC011_PEM	0.09	0.57	0.051	0.617	0.056	0.593	0.053
WC012_PEM	0.83	0.57	0.473	0.617	0.512	0.640	0.531
WC013_PEM	0.045	0.512	0.023	0.533	0.024	0.590	0.027
WC014_PEM	0.23	0.602	0.138	0.750	0.173	0.603	0.139
WC015_PEM	1.054	0.57	0.601	0.700	0.738	0.607	0.640
WC016_PEM	0.024	0.602	0.014	0.750	0.018	0.570	0.014
WC018_PEM	0.209	0.512	0.107	0.533	0.111	0.557	0.116
WC019_PEM	0.123	0.294	0.036	0.450	0.055	0.327	0.040
WC020_PEM	0.227	0.337	0.076	0.533	0.121	0.390	0.089
WC021_PEM	0.052	0.375	0.020	0.617	0.032	0.407	0.021
WC022_PEM	9.098	0.471	4.285	0.667	6.068	0.403	3.666
WC023_PEM	0.185	0.446	0.083	0.700	0.130	0.443	0.082
WC024_PEM	0.127	0.446	0.057	0.700	0.089	0.457	0.058
WC025_PEM	0.132	0.375	0.050	0.617	0.081	0.360	0.048
WC026_PEM	0.419	0.375	0.157	0.617	0.259	0.393	0.165
WC027_PEM	0.578	0.375	0.217	0.617	0.357	0.407	0.235
WC030_PEM	0.772	0.375	0.290	0.617	0.476	0.407	0.314
WC031_PEM	0.21	0.375	0.079	0.617	0.130	0.407	0.085
WC032_PEM	0.061	0.375	0.023	0.617	0.038	0.360	0.022

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WC034_PEM	0.196	0.454	0.089	0.617	0.121	0.427	0.084
WC035_PEM	0.838	0.337	0.282	0.450	0.377	0.390	0.327
WC036_PEM	1.031	0.454	0.468	0.533	0.550	0.460	0.474
WC037_PEM	0.271	0.375	0.102	0.533	0.144	0.440	0.119
WC038_PEM	3.588	0.52	1.866	0.617	2.214	0.480	1.722
WC039_PEM	0.056	0.375	0.021	0.533	0.030	0.440	0.025
WC040_PEM	0.556	0.375	0.209	0.617	0.343	0.440	0.245
WC042_PEM	0.15	0.339	0.051	0.533	0.080	0.390	0.059
WC043_PEM	0.015	0.454	0.007	0.533	0.008	0.460	0.007
WC044_PEM	0.23	0.454	0.104	0.533	0.123	0.460	0.106
WC045_PEM	0.988	0.52	0.514	0.617	0.610	0.480	0.474
WC046_PEM	0.262	0.375	0.098	0.617	0.162	0.440	0.115
WC047_PEM	0.482	0.454	0.219	0.617	0.297	0.413	0.199
WC048_PEM	0.088	0.375	0.033	0.617	0.054	0.440	0.039
WC049_PEM	0.362	0.716	0.259	0.667	0.241	0.623	0.226
WC050_PEM	0.033	0.375	0.012	0.617	0.020	0.440	0.015
WC053_PEM	0.182	0.337	0.061	0.533	0.097	0.423	0.077
WC054_PEM	0.089	0.423	0.038	0.533	0.047	0.443	0.039
WC055_PEM	0.154	0.337	0.052	0.533	0.082	0.423	0.065
WC056_PEM	0.022	0.423	0.009	0.533	0.012	0.443	0.010
WC057_PEM	0.137	0.375	0.051	0.617	0.085	0.440	0.060
WC058_PEM	0.139	0.337	0.047	0.533	0.074	0.423	0.059
WC059_PEM	3.764	0.41	1.543	0.617	2.322	0.377	1.419
WC060_PEM	0.697	0.642	0.447	0.533	0.372	0.643	0.448
WC061_PEM	0.119	0.531	0.063	0.700	0.083	0.510	0.061
WC064_PEM	0.137	0.446	0.061	0.617	0.085	0.443	0.061
WC065_PEM	15.11	0.619	9.353	0.617	9.323	0.497	7.510
WC066_PEM	0.072	0.539	0.039	0.617	0.044	0.477	0.034
WD001_PEM	20.53	0.559	11.476	0.617	12.667	0.413	8.479
WD003_PEM	0.13	0.446	0.058	0.617	0.080	0.457	0.059
WD004_PEM	0.114	0.446	0.051	0.617	0.070	0.457	0.052
WD005_PEM	0.088	0.446	0.039	0.617	0.054	0.410	0.036
WD006_PEM	0.065	0.446	0.029	0.617	0.040	0.410	0.027
WD007_PEM	0.075	0.446	0.033	0.617	0.046	0.457	0.034
WD009_PEM	1.844	0.446	0.822	0.617	1.138	0.410	0.756

Table 3: Net Loss of FCUs for Permanent PEM Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WD010_PEM	0.225	0.446	0.100	0.617	0.139	0.457	0.103
WD0012_PEM	0.126	0.339	0.043	0.617	0.078	0.343	0.043
WD0013_PEM	0.052	0.446	0.023	0.617	0.032	0.470	0.024
WD0014_PEM	0.215	0.446	0.096	0.617	0.133	0.470	0.101
WD0015_PEM	0.08	0.35	0.028	0.450	0.036	0.423	0.034
WE023_PEM	0.025	0.602	0.015	0.750	0.019	0.650	0.016
WE024_PEM	0.096	0.602	0.058	0.750	0.072	0.603	0.058
WE025_PEM	0.016	0.531	0.008	0.617	0.010	0.590	0.009
WE027_PEM	0.061	0.375	0.023	0.617	0.038	0.440	0.027
WE028_PEM	0.122	0.285	0.035	0.617	0.075	0.340	0.041
WE029_PEM	0.157	0.375	0.059	0.617	0.097	0.440	0.069
WF001_PEM	0.969	0.41	0.397	0.617	0.598	0.410	0.397
WF002_PEM	1.073	0.454	0.487	0.617	0.662	0.460	0.494
WF003_PEM	0.517	0.375	0.194	0.617	0.319	0.440	0.227
WP1OR001_HH_PEM	0.03	0.63	0.019	0.670	0.020	0.490	0.015
WP1OR002_HH_PEM	0.47	0.63	0.296	0.670	0.315	0.490	0.230
WP1OR003_HH_PEM	0.04	0.63	0.025	0.670	0.027	0.490	0.020
WP1OR004_HH_PEM	0.1269	0.63	0.080	0.670	0.085	0.490	0.062
WP1OR008_HH_PEM	0.0002	0.63	0.000	0.670	0.000	0.490	0.000
WP1OR009_HH_PEM	0.07	0.63	0.044	0.670	0.047	0.490	0.034
WP2OR001_HH_PEM	1.67	0.63	1.052	0.670	1.119	0.490	0.818
WX001_PEM	4.712	0.7	3.298	1.000	4.712	0.700	3.298
WX002_PEM	1.315	0.7	0.921	1.000	1.315	0.700	0.921
WX003_PEM	0.144	0.7	0.101	1.000	0.144	0.700	0.101
WX004_PEM	0.774	0.7	0.542	1.000	0.774	0.700	0.542
WX005_PEM	1.913	0.7	1.339	1.000	1.913	0.700	1.339
WX006_PEM	1.348	0.7	0.944	1.000	1.348	0.700	0.944
PEM TOTALS*	121.30		65.77		79.62		8.76

Source: USGC 2 Project Team

Table 4: Net Loss of FCUs for Permanent PSS Wetland Impacts

Feature ID	Total Permanent Impact* (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WA004_PSS	0.01	0.548	0.005	0.583	0.005	0.68	0.006
WA033_PSS	1.90	0.565	1.071	0.833	1.579	0.6	1.137
WA033A_PSS	0.36	0.565	0.204	0.833	0.301	0.6	0.217
WA034_PSS	0.10	0.494	0.049	0.833	0.083	0.58	0.058
WA041_PSS	0.11	0.475	0.050	0.833	0.088	0.583	0.062
WA073_PSS	0.04	0.326	0.013	0.75	0.029	0.367	0.014
WA076_PSS	0.06	0.399	0.024	0.833	0.050	0.453	0.027
WA082A_PSS	0.05	0.41	0.020	0.5	0.024	0.437	0.021
WA084_PSS	0.07	0.429	0.030	0.75	0.053	0.513	0.036
WA096_PSS	0.02	0.36	0.008	0.583	0.013	0.48	0.011
WC002_PSS	0.45	0.602	0.271	0.75	0.338	0.73	0.329
WC060_PSS	0.10	0.758	0.076	0.75	0.075	0.77	0.077
WD001_PSS	0.29	0.388	0.111	0.75	0.215	0.563	0.162
WE019_PSS	0.49	0.742	0.366	1	0.493	0.89	0.439
WE020_PSS	0.10	0.698	0.071	0.833	0.085	0.767	0.078
WE021_PSS	0.11	0.742	0.084	1	0.113	0.88	0.099
WE022_PSS	0.05	0.698	0.036	0.917	0.048	0.763	0.040
WE025_PSS	0.02	0.65	0.013	0.833	0.017	0.813	0.016
WX012_PSS	0.03	0.7	0.022	1	0.031	0.7	0.022
WX013_PSS	6.16	0.7	4.309	1	6.155	0.7	4.309
WX014_PSS	2.68	0.7	1.876	1	2.680	0.7	1.876
WX015_PSS	0.07	0.7	0.048	1	0.068	0.7	0.048
WP1OR001_HH_PSS	0.04	0.452	0.018	0.677	0.027	0.387	0.015
WP1OR005_HH_PSS	0.04	0.452	0.016	0.677	0.024	0.387	0.014
WP2OR001_B_HH_PSS	0.10	0.452	0.045	0.677	0.068	0.387	0.039
PSS TOTAL S*	13.44		8.84		12.61		9.20

Source: USGC 2 Project Team

Table 5: Net Loss of FCUs for Permanent PFO Wetland Impacts

Feature ID	Total Permanent Impact (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WA003_PFO	0.39	0.411	0.160	0.583	0.227	0.6	0.234
WA025_PFO	0.57	0.543	0.310	0.6	0.342	0.577	0.329
WA032_PFO	0.06	0.497	0.031	0.688	0.043	0.55	0.034
WA042_PFO	0.14	0.614	0.087	0.658	0.093	0.667	0.094
WA063_PFO	0.34	0.655	0.221	0.679	0.229	0.73	0.246
WA072_PFO	0.31	0.707	0.216	0.579	0.177	0.743	0.227
WA076_PFO	0.06	0.551	0.033	0.683	0.040	0.647	0.038
WA077_PFO	1.21	0.592	0.716	0.7	0.846	0.65	0.786
WA078_PFO	0.98	0.365	0.358	0.633	0.620	0.513	0.503
WA080_PFO	0.16	0.481	0.075	0.533	0.083	0.613	0.096
WA081_PFO	0.23	0.418	0.094	0.788	0.178	0.547	0.124
WA082_PFO	0.60	0.599	0.357	0.7	0.417	0.603	0.359
WA084_PFO	0.05	0.632	0.030	0.7	0.034	0.717	0.034
WA085_PFO	0.02	0.592	0.013	0.7	0.015	0.697	0.015
WA092_PFO	0.21	0.368	0.076	0.496	0.103	0.517	0.107
WC002_PFO	0.12	0.614	0.072	0.592	0.070	0.747	0.088
WC003_PFO	0.12	0.68	0.080	0.567	0.067	0.797	0.094
WC008_PFO	0.01	0.429	0.004	0.658	0.006	0.58	0.005
WC018_PFO	0.19	0.454	0.086	0.588	0.112	0.557	0.106
WC038_PFO	2.85	0.531	1.513	0.588	1.676	0.573	1.633
WC039_PFO	0.16	0.434	0.070	0.558	0.090	0.597	0.097
WC040_PFO	0.71	0.316	0.225	0.567	0.404	0.49	0.349
WC042_PFO	0.07	0.365	0.027	0.546	0.040	0.547	0.040
WC047_PFO	0.22	0.428	0.092	0.646	0.139	0.487	0.105
WC048_PFO	0.90	0.321	0.290	0.579	0.523	0.49	0.443
WC049_PFO	2.69	0.543	1.463	0.654	1.762	0.657	1.770
WC050_PFO	0.78	0.363	0.285	0.688	0.539	0.577	0.452
WC051_PFO	0.09	0.405	0.036	0.579	0.052	0.607	0.055
WC061_PFO	1.92	0.633	1.216	0.517	0.993	0.707	1.358
WD008_PFO	0.08	0.695	0.052	0.521	0.039	0.693	0.052
WD010_PFO	0.02	0.516	0.009	0.642	0.012	0.467	0.008
WD011_PFO	0.05	0.535	0.029	0.575	0.031	0.603	0.033
WD017_PFO	0.01	0.364	0.004	0.567	0.006	0.403	0.004
WD018_PFO	0.01	0.364	0.003	0.55	0.004	0.403	0.003

Table 5: Net Loss of FCUs for Permanent PFO Wetland Impacts

Feature ID	Total Permanent Impact (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)		Maintain Plant and Animal Communities – Biological (Net Loss FCU)		Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)	
ID	ACRES	Physical		Chemical		Biological	
		FCI	FCU	FCI	FCU	FCI	FCU
WD019_PFO	0.01	0.535	0.005	0.546	0.005	0.603	0.005
WE025_PFO	0.14	0.779	0.108	0.683	0.095	0.83	0.115
WE028_PFO	0.15	0.398	0.061	0.546	0.084	0.567	0.087
WX007_PFO	89.35	0.7	62.545	1	89.350	0.7	62.545
WX008_PFO	0.33	0.7	0.232	1	0.332	0.7	0.232
WX009_PFO	2.20	0.7	1.543	1	2.204	0.7	1.543
WX010_PFO	0.28	0.7	0.197	1	0.281	0.7	0.197
WX011_PFO	0.69	0.7	0.485	1	0.693	0.7	0.485
WP1001-F	0.56	0.617	0.346	0.515	0.288	0.593	0.332
WP1002-F	0.80	0.617	0.494	0.515	0.412	0.593	0.474
WP1OR005_HH_PFO	0.55	0.593	0.326	0.491	0.270	0.593	0.326
WP1OR008_HH_PFO	0.01	0.593	0.009	0.491	0.007	0.593	0.009
WP1OR009_B_HH_PFO	0.05	0.593	0.030	0.491	0.025	0.593	0.030
PFO TOTALS	111.35		74.71		104.23		76.13

Source: USGC 2 Project Team

The total anticipated functional credits for permanent impacts to jurisdictional wetlands from the USGC 2 project are summarized below in **Table 6**. All wetlands are within the Lower Sabine Watershed (HUC 12010005). The iHGM wetland mitigation worksheet tables can be seen in **Appendix A**. **Table 6** provides a summary of the estimated for FCUs for compensatory mitigation to offset unavoidable loss of wetland function and value. Given the limited duration (within one growing season) of the anticipated temporary construction impacts from the horizontal directional drilling (HDD) and open trench methods used to install the wastewater treatment plant outfall line, no compensation mitigation is expected to be required, with one exception. The portion of the HDD layout area affecting forested wetlands was considered a permanent loss and added the impact totals for the impacted PFO wetland feature.

Table 6. Total Net Loss of FCUs for Permanent Wetland Impacts

Wetland Type	Total Permanent Impact (acres)	Temporary Storage and Detention of Storage Water – Physical (Net Loss FCU)	Maintain Plant and Animal Communities – Biological (Net Loss FCU)	Removal and Sequestration of Elements and Compounds – Chemical (Net Loss FCU)
PEM	121.3	65.77	80.06	56.53
PSS	13.44	8.84	12.66	9.15
PFO	111.45	74.71	104.06	76.3
Total	246.2	149.32	196.78	141.98

Source: USGC 2 Project Team, 2019

6. Mitigation Approach - Wetlands

For the wetland impacts, CPChem proposes PRM; in accordance with the USACE hierarchy preference outlined in the April 2008 Rule entitled “Compensatory Mitigation for Losses of Aquatic Resources” (33 CFR 325-332) and discussions with the USACE Galveston District in December 2018 and January 2019, it is preferred that mitigation for unavoidable impacts to wetland features are mitigated within the watershed. No currently accredited wetland mitigation banks are located within the Lower Sabine Watershed (HUC 12010005), therefore a PRM is proposed.

CPChem has also contracted Delta Land Services, LLC (DLS) to create a PRM for the compensation of proposed permanent impacts to 111.45 acres of PFO, including compensation for the after-the-fact clearing impacts of 92.85 acres of PFO by a third party, within the Lower Sabine watershed (**Appendix E**). The USGC 2 project’s PFO wetland impacts offset by this PRM are in the Lower Sabine Subbasin (HUC 12010005). Ecologically, the impacts are located within the Western Gulf Coast Plain Level III Ecoregion. More specifically, the center point of the USGC 2 project in the PFO areas being offset by this PRM is located at latitude 30.063865° North and longitude -93.778641° West (North American Datum [NAD83]). The preparation of this PRM was guided by USACE regulations for compensatory mitigation for losses of aquatic resources, codified in 33 CFR § 332. More specifically, the elements of the PRM plan were designed to satisfy the requirements of 33 CFR § 332.4(c)(2)-(14). DLS, acting as the mitigation provider for the Permittee, will implement, monitor, and provide long-term management of the PRM area as described in 33 CFR §332.3(l). A conservation easement would be placed on the site, and the PRM area would be protected in perpetuity.

The assessment of impacts and the proposed PRM area restoration utilized the CESWG Riverine Forested iHGM model (**Appendix E**). The PRM area is located in the Lower Sabine HUC. A 1:1 ratio (i.e., impact function to mitigation function ratio) was utilized to determine the mitigation requirements since impacts and the mitigation solution are located in the same watershed. The proposed wetland mitigation restoration acreage is 245.1; which is more than twice the anticipated PFO credit requirement. Additionally, 33.1 acres of non-mitigation acres (upland buffer) will be planted or preserved, and 1.5 acres of linear Waters of the US will be preserved.

CPChem contracted DLS to create the proposed PEM/PSS PRM (**Appendix F**). The proposed PEM/PSS PRM area consists of two tracts of land located in the Lower Sabine Watershed. The northern tract of land is located approximately 1.75 miles northwest of the Project site, and the southern tract is located approximately 0.70 mile west of the Project site, both are situated in Orange County. The northern PRM tract is 100+ acres and is underlain by Aris-Spindletop complex, 0 to 1 percent slopes soil mapping unit (60% hydric rating). The site is traversed by Coon Bayou and is partially located in the 100-year floodplain. The southern PRM tract is approximately 150 acres and would be used to offset the balance of 121.3 acres of PEM and 13.44 acres of PSS impacts. The tract is underlain by the same soil mapping unit as the northern PEM/PSS mitigation tract, and it is also crossed by Coon Bayou and partially located in the 100-year floodplain. Site restoration at both tracts would be routine in nature and primarily consists of leveling agricultural berms, filling drainage ditches, and restoring native plant communities. DLS, acting as the mitigation provider for the Permittee, will implement, monitor, and provide long-term management of the PRM area as described in 33 CFR §332.3(l) (**Appendix F**). A conservation easement would be placed on the site, and the PRM area would be protected in perpetuity.

7. Determination of Stream Credits – Galveston District Stream Condition Assessment Tool Level 1

The Galveston District Stream Condition Assessment Tool (GDSCAT) Level 1 was used to assess the functional condition of streams proposed to be impacted by the USGC 2 project. The GDSCAT is used to assess ephemeral and intermittent streams, intermittent streams with perennial pools, perennial streams, and wadeable rivers when the proposed impact is less than 500 linear feet.

The GDSCAT assesses stream functions using visual observations of geomorphological variables including visual channel condition (channel geometry, stability, active floodplain connection), riparian buffer, aquatic use, and channel alteration. At least three transects are required per stream segment that will be impacted. Each variable is scored for every transect and averaged to determine the Condition Index (CI). Each CI is averaged to determine the baseline (pre-construction) Reach Condition Index (RCI) for each stream segment. Theoretical (post construction) stream condition assessments are conducted for the same three transects based on proposed project plans (see **Appendices B and C**). In each case, the difference between the RCI (pre-construction) and the theoretical CI (post construction) is calculated and referred to as the RCI Delta, or dRCI.

Impact types are classified using an Impact Factor (IF), with more severe impacts corresponding to higher IFs. The overall IF for each stream reach may be calculated using a weighted average of IFs along each linear foot of stream that is impacted.

To determine the debits required to mitigate impacts for each stream reach, the dRCI is multiplied by the overall IF and linear feet of impact.

Debits can be offset by proposing various stream improvements to generate credits. The credits are subtracted from the debits to calculate the total debits required to fulfill compensatory mitigation. Generating credits can be done using stream enhancement and restoration techniques as well as riparian buffer preservation.

As per the 2013 USACE Galveston District Stream Condition Assessment, the formula used to calculate the potential credits needed for each stream is:

Reach Condition Index Delta (dRCI) x Impact Factor x Linear feet of impacts = Debits; where

dRCI = Existing Reach Condition Index (RCI) – Theoretical Reach Condition Index (tRCI)

Table 7 provides a summary of stream assessment impacts and debits. Stream impact areas and functional assessment descriptions are provided in **Appendices B and C**. **Appendix D** provides the estimated post-construction stream conditions.

Table 7. Net Loss of FCUs for Temporary and Permanent Stream Impacts

Feature ID	Total Linear Feet of Impact	Linear feet of Avoidance	Dredging Required	Total Compensation Requirement (Stream Credits)
SA005	2,127	0	N/A	11,316.00
SC003	1,767	0	N/A	10,160.00
SP1OR005	1,011	0	N/A	6,356.66
SP1OR006	1,523	0	N/A	9,445.29
SX004	4,765	0	N/A	2,229.00
SX005	440	43	N/A	1,870.00
SX010	3,114	0	N/A	19,062.00
SX018 (Hudson Gully)	2,964	0	N/A	21,113.00

Feature ID	Total Linear Feet of Impact	Linear feet of Avoidance	Dredging Required	Total Compensation Requirement (Stream Credits)
SX029	4,172	381	N/A	23,181.00
SX030	2,384	0	N/A	18,181.34
SP2OR001 (Cow Bayou)	N/A	N/A	2.2 acres; 21,298 cubic yards of dredging	N/A
Total	24,267	424		122,914.29
Total Stream Credits				122,914.29

Source: USGC 2 Project Team, 2019

7.1 SA005

The channel was classified as perennial and showed clear signs of widening as a drainage system. Erosional scars and over-widening are present along 50 to 60% of the channel, and vegetation is beginning to recolonize the banks. The channel does not have access to the floodplain and is highly regulated with the presence of culverts located upstream and downstream, impacting flow of the channel. All five transects assessed were given Channel Condition scores of Poor (2.50). The five transects assessed were given an overall Aquatic Use score of Suboptimal (4.00) due to the channel being perennial with some aquatic life potential, with fish and turtles present during field surveys. The channel is altered for use as a drainage system with little to no flow and partial wetland recolonization. All five transects assessed were given overall Channel Alteration scores of Severe (1.00) due to evidence of past alteration and dredging, as well as showing restriction of flow resulting from culverts located upstream and downstream of the channel.

7.2 SC003

The channel was classified as intermittent and, although it has been artificially widened, showed signs of recovery and bank stabilization in some areas due to considerable recolonization of bank vegetation. The channel has access to the floodway and is highly regulated with the presence of culverts located upstream, downstream, and within the channel, impacting flow of the channel. The five transects assessed were given Channel Condition scores of Suboptimal (4.00). The five transects assessed were given an overall Aquatic Use score of Severe (1.00) due to the channel being intermittent exhibiting limited aquatic life potential. The channel is altered for use as a drainage system with little to no flow and partial vegetation recolonization. The riparian buffer of the left bank of transect 1 consisted primarily of herbaceous land maintained by grazing. The riparian buffer of the right bank of transect 1 consisted primarily of herbaceous land maintained by grazing with 30% woody vegetation comprised of less than 30% native species, resulting in an overall Riparian Buffer score of Poor (2.05) for this transect. The riparian buffer of the left and right banks of transects 2 through 4 and the downstream transect consisted entirely of herbaceous land maintained by grazing, resulting in overall Riparian Buffer scores of Poor (2.00) for these three transects.

7.3 SX004

The channel was classified as ephemeral and showed clear signs of widening as a drainage system. Transects one through four showed less signs of erosion and over-widening. Erosional scars and over-widening are present along 50% of the channel in transects five through nine, and a pipeline crossing

located along transect nine seems to have led to additional destabilization and over-widening. Vegetation is beginning to recolonize the banks. The channel has access to the floodplain and is highly regulated with the presence of culverts located downstream, impacting flow of the channel. The ten transects assessed were given Channel Condition scores ranging from Poor (2.00) to Marginal (3.50). All ten transects assessed were given an overall Aquatic Use scores of Severe (1.00) due to the channel being an ephemeral channel some aquatic life potential, with frogs, fish, and turtles, present during field surveys. The channel is altered for use as a drainage system with little to no flow. The riparian buffer of the left and right banks of transects 1 through 4 consisted primarily of herbaceous land maintained by grazing with a thin strip of native woody vegetation covering 20% of the riparian area comprised of less than 30% native species, resulting in overall Riparian Buffer scores of Poor (2.20) for these four transects. The riparian buffers of the left and right banks of transect 5 through 8 consisted primarily of herbaceous land maintained by grazing with a thin strip of native woody vegetation covering 10-40% of the riparian area comprised of 60% native species, resulting in an overall Riparian Buffer score of Poor (2.45 to 2.60) for these four transects. The riparian buffer of the left and right banks of transect 9 consisted entirely of herbaceous land maintained by mowing along the pipeline right-of-way, resulting in an overall Riparian Buffer score of Poor (2.00) for this transect. The riparian buffer of the left bank of downstream transect consisted entirely of herbaceous land maintained by mowing, while the right bank consisted primarily of herbaceous land maintained by mowing with 35% impervious surfaces caused by FM 1006, resulting in an overall Riparian Buffer score of Severe (1.83) for this transect.

7.4 SX005

The channel was classified as ephemeral and showed clear signs of widening as a drainage. Erosional scars and over-widening are present along 40% of the channel, and vegetation is beginning to recolonize the banks. The channel has access to the floodplain and is highly regulated with the presence of culverts located upstream, impacting flow of the channel. The transect was given a Channel Condition score of Marginal (3.00). The riparian buffer of the left bank of the transect consisted primarily of herbaceous land maintained by grazing. The riparian buffer of the right bank of the transect consisted primarily of herbaceous land maintained by grazing with 10-30% native woody vegetation comprised of 40% native species, resulting in an overall Riparian Buffer score of Poor (2.40) for this transect. The transect assessed was given an overall Aquatic Use scores of Severe (1.00) due to the channel being an ephemeral channel some aquatic life potential, with fish present during field surveys. The channel is altered for use as a drainage system.

7.5 SX010

The channel was classified as ephemeral and, although it has been artificially widened, showed signs of recovery and bank stabilization in some areas due to considerable recolonization of bank vegetation. Erosional scars and over-widening are present to varying degrees along the channel. The channel has access to the floodplain and is highly regulated with the presence of culverts located downstream, impacting flow of the channel. The transects assessed were given Channel Condition scores ranging from Marginal (3.00) to Suboptimal (4.00). The riparian buffer of the left and right banks of transect 1 consisted primarily of native woody vegetation comprised of 60% native species and 5% coverage by railroad tracks, resulting in an overall Riparian Buffer score of Marginal (3.85) for this transect. The riparian buffer of the left bank of transects 2 and 3 consisted entirely of native woody vegetation comprised of 60% native species, while the right banks consisted primarily of herbaceous land maintained by grazing with native woody vegetation comprised of 60% native species, resulting in overall Riparian Buffer scores of Marginal (3.40) for these two transects. The riparian buffer of the left bank of transect 4 consisted primarily of herbaceous land maintained by grazing with 20% native woody vegetation comprised of 60% native species. The riparian buffer of the right bank of transect 4 consisted entirely of native woody vegetation comprised of 60% native species, resulting in an overall Riparian Buffer score of Marginal (3.20) for this transect. The riparian buffer of the left bank of transect 5 consisted primarily of herbaceous land maintained

by grazing with 10% native woody vegetation comprised of 60% native species. The riparian buffer of the right bank of transect 5 consisted primarily of native vegetation. All transects assessed were given an overall Aquatic Use scores of Severe (1.00) due to the channel being an ephemeral channel with little aquatic life potential. The channel is altered for use as a drainage system.

7.6 SX018 (Hudson Gully)

The channel was classified as intermittent and, although it has been artificially widened, showed signs of recovery and bank stabilization in some areas due to considerable recolonization of bank vegetation. Erosional scars and over-widening are present at varying degrees along the channel. The channel does not have access to the floodplain and is highly regulated with the presence of culverts located downstream, impacting flow of the channel. The seven transects assessed were given Channel Condition scores ranging from Poor (2.50) to Optimal (5.00). The riparian buffer of the left bank of transect 01 consisted primarily of herbaceous land maintained by grazing with 30% palustrine forested wetland comprised of 70% native species. The riparian buffer of the right bank of transect 1 consisted entirely of native woody vegetation comprised of 60% native species, resulting in an overall Riparian Buffer score of Marginal (3.38) for this transect. The riparian buffer of the left bank of transect 2 consisted primarily of woody vegetation comprised of less than 30% native species with 40% herbaceous land maintained by grazing. The riparian buffer of the right bank of transect 2 consisted primarily of woody vegetation comprised of less than 30% native species with 20% herbaceous land maintained by grazing, resulting in an overall Riparian Buffer score of Poor (2.40) for this transect. The riparian buffer of the left bank of transect 3 consisted primarily of native woody vegetation comprised of 60% native species with 20% herbaceous land maintained by grazing. The riparian buffer of the right bank of transect 3 consisted primarily of herbaceous land maintained by grazing with 40% native woody vegetation comprised of 60% native species, resulting in an overall Riparian Buffer score of Marginal (3.20) for this transect. The riparian buffer of the left bank of transect 4 consisted primarily of native woody vegetation comprised of 70% native species with 40% herbaceous land maintained by grazing and a pond. The riparian buffer of the right bank of transect 4 consisted entirely of native woody vegetation comprised of 80% native species, resulting in an overall Riparian Buffer score of Suboptimal (4.00) for this transect. The riparian buffer of the left bank of transects 5 and 6 consisted primarily of a perennial pond with native woody vegetation comprised of 60% native species. The riparian buffer of the right bank of transects 5 and 6 consisted entirely of native woody vegetation comprised of 60-80% native species. This resulted in overall Riparian Buffer scores of Marginal (3.25 to 3.75) for these two transects. The riparian buffer of the right bank of downstream transect 7 consisted primarily of herbaceous land maintained by mowing with 20% woody vegetation consisting of 30-60% native species, and 5% railroad tracks providing an impervious surface. The left bank consisted primarily of herbaceous land maintained by mowing with approximately 50% denuded surfaces, resulting in an overall Riparian Buffer score of Severe (1.93) for this transect. The seven transects assessed were given an overall Aquatic Use score of Severe (1.00) due to the channel being intermittent with some aquatic life potential, with fish, frogs, and turtles present during field surveys.

7.7 SX029

The channel was classified as intermittent and, although it has been artificially widened, showed signs of recovery in some areas due to considerable recolonization of bank vegetation. Erosional scars and undercut banks are occasionally present at varying degrees along the channel. The eight transects assessed were given Channel Condition scores of Marginal (3.00). The riparian buffer of the left bank of transect 01 consisted primarily of herbaceous land with 25% woody vegetation comprised of greater than 60% native species. The riparian buffer of the right bank of transect 01 consisted primarily of herbaceous land maintained by mowing with a paved parking lot encompassing approximately 10% of the riparian buffer, resulting in an overall score of Poor (2.26) for transect 01. The riparian buffer of the left bank of transect 02 consisted primarily of herbaceous land with an approximately 25% component of woody vegetation comprised of more than 60% native species. The riparian buffer of the right bank of transect 02

consisted entirely of herbaceous vegetation, resulting in an overall score of Poor to Marginal (2.31) for transect 02. The riparian buffer of the left bank of transect 03 consisted of approximately 45% herbaceous vegetation and approximately 55% woody vegetation comprised of more than 60% native woody species. The riparian buffer of the right bank of transect 03 consisted entirely of herbaceous vegetation, resulting in an overall score of Poor to Marginal (2.69) for transect 03. The riparian buffer of the left bank of transect 04 consisted primarily of maintained herbaceous land with an approximately 35% component of woody vegetation comprised of more than 60% native woody species. The riparian buffer of the right bank of transect 04 consisted entirely of maintained herbaceous land, resulting in an overall score between Poor and Marginal (2.44). The riparian buffers of both the left and right banks of transect 05 consisted primarily of maintained herbaceous land with small components of forested land comprised of greater than 60% native woody species, resulting in an overall score between Poor and Marginal (2.50). The riparian buffer of the left bank of transect 06 is comprised entirely of maintained herbaceous land. The riparian buffer of the right bank of transect 06 is comprised primarily of maintained herbaceous land with a small component of forested land comprising of more than 60% native woody species, resulting in an overall score of Poor (2.06). The riparian buffers of the left banks of transects 07 and 08 are comprised entirely of maintained herbaceous land. The riparian buffers of the right banks of both transects 07 and 08 consists primarily of maintained herbaceous land with a small component of forested land comprised of less than 30% native woody vegetation, resulting in Poor scores of 2.10 and 2.13 respectively. Seven of the eight transects assessed were given an overall Aquatic Use score of Severe (1.00) due to the channel being intermittent with some aquatic life potential. Transect 05 was given an overall Aquatic Use score of Poor (2.00) due to the presence of perennial pools. The channel is altered for use as a drainage system. The eight transects assessed were given an overall Channel Alteration score of Poor (2.00) due to evidence of past alteration and dredging.

7.8 SX030

The channel was classified as intermittent with shallow and heavily vegetated banks that appear to be relatively stable. Erosional scars are present at varying degrees along the channel. The six transects assessed were given Channel Condition scores of Suboptimal (4.00). The riparian buffer of the left bank of transect UP consisted primarily of herbaceous land with 45% woody vegetation comprised of less than 30% native species. The riparian buffer of the right bank of transect UP consisted primarily of forested land comprised of 30%-60% native woody vegetation with a small component of herbaceous land maintained by mowing, resulting in an overall Riparian Buffer score of Marginal (3.13) for this transect. The riparian buffers of the left banks of transects 01, 02, 03 and 04 consisted entirely of maintained herbaceous land. The riparian buffers of the right banks of transects 01, 02, 03, and 04 consisted primarily of herbaceous land with a small component of forested land comprised of more than 60% native vegetation, resulting in an overall score of Poor (2.13) for each of these transects. The riparian buffer of the left and right banks of transect 05 consisted entirely of maintained herbaceous land, resulting in an overall score of Poor (2.0). The six transects assessed were given an overall Aquatic Use score of Severe (1.00) due to the channel being intermittent with some aquatic life potential, with fish and frogs present during field surveys. The channel is altered for use as a drainage system. The six transects assessed were given overall Channel Alteration scores ranging from Poor (2.00) to Marginal (3.00), with majority of the channel categorized as Marginal (3.00) due to evidence of recovery from dredging activities.

7.9 SP1OR005

SP1OR005 is a low-quality ephemeral man-made roadside ditch that flows north-south parallel to the existing Roundbunch Road. The feature is located within the 100-year floodplain. The roadside ditch is regularly maintained. Snakes and crayfish potentially could utilize the stream. No odonates present. However, the ephemeral stream holds water only periodically. Approximately 1,011 linear feet be impacted by the proposed roadway widening for the heavy haul road.

7.10 SP1OR006

SP1OR006 is an extension of SP1OR005. The feature is a low-quality ephemeral man-made roadside ditch with a slightly incised channel that flows north-south parallel to the existing Roundbunch Road. The feature is located within the 100-year floodplain. The roadside ditch is regularly maintained. Snakes and crayfish potentially could utilize the stream. No odonates present. However, the ephemeral stream holds water only periodically. A culvert is located north of the delineated feature. Approximately 1,523 linear feet would be impacted by the proposed roadway widening for the heavy haul road.

7.11 SP2OR001 (Cow Bayou)

This segment is an oxbow of Cow Bayou and is tidally influenced. Cow Bayou is surrounded by municipalities and rural development and receives several industrial and domestic wastewater discharges. The historically meandering feature was channelized in the late 1950s for navigational purposes. The USACE Galveston District stream assessment form was not created for analysis of non-wadable features; therefore, it was not formally assessed. No appreciable impacts are anticipated to the feature from the proposed installation of the barge slip or construction-related dredging for the barge movements. The Barge Slip will be installed in the dry/upland area, prior to connecting with Cow Bayou. An area of approximately 2.2 acres (21,298 cubic yards) will be dredged for the proposed Barge Slip. No impacts to the navigable channel of Cow Bayou are anticipated with the proposed USGC 2 project. As a result, there is no compensation requirement for Cow Bayou.

7.12 Other Features Assessed

Additional features were assessed by SWCA (2019b); however, impacts are not calculated within **Table 7** for the purposes of mitigation, as these additional features were either not anticipated to be impacted by the proposed USGC 2 project or determined to be likely non-jurisdictional, as described below. However, only the USACE can make a final jurisdictional determination. These features include: SA006, SD001, SX007, SX008, and SX009, which combined make up the Sabine River Authority Canal onsite. A second Sabine River Water Authority canal is SA007, SX015, SX016, and SX017.

These canal segments are under the jurisdiction of the Sabine River Water Authority. The canal segments do not have access to the floodplain and are highly regulated with the presence of culverts located upstream and downstream, impacting flow of the channel. Impacts are not calculated within **Table 7** for the purposes of mitigation, as the feature is likely non-jurisdictional. However, only the USACE can make a final jurisdictional determination.

7.13 GDSCAT Level 1 Impact Conclusion

The GDSCAT Level 1 was used to assess the functional condition of streams proposed to be impacted by the USGC 2 project and determine compensatory mitigation. A total of 10 linear aquatic features may require mitigation to compensate for the loss of stream functions. A total of 122,914.29 stream credits would be required for the purposes of mitigation for unavoidable impacts to stream features.

8. Mitigation Approach - Streams

Based on the USACE hierarchy preference outlined in the April 2008 Rule entitled "Compensatory Mitigation for Losses of Aquatic Resources" (33 CFR 325-332) to purchase credits at an approved mitigation bank, pay into an existing ILF program, or perform project specific mitigation on-site or off-site via PRM, an analysis was performed to investigate all options available for mitigation of unavoidable impacts to streams.

An evaluation of available mitigation in and near the watershed of the proposed project was completed and identified that there are no banks with available stream credits within the proposed project watershed and within the State of Texas. Although not in the State of Texas, Phillips Creek Mitigation bank is within the adjacent Lower Sabine Watershed, and does have available stream credits. While the proposed USGC 2 project is outside of the Graham Creek, Houston-Conroe/Tarkington and Katy Prairie Stream Mitigation Banks' primary service areas, the relative functions and values of the wetlands at the project site are in kind. Streams in the project area and identified banks possess similar hydrologic regimes and plant community types. Due to the currently available credits on the ledgers identified in March 2019, it is anticipated that only approximately 87,074 credits are available of the 122,914.29 stream credits required. **Table 12** summarizes the available stream credits available outside of the primary service area.

Table 12. Available Stream Credits – Outside Primary Service Area

Stream Mitigation Bank	Location	Current Credits Available
Graham Creek	Secondary Service Area; Adjacent Lower Neches Watershed	33,144.6
Phillips Creek	Secondary Service Area, Lower Sabine Watershed, Louisiana	16,545.6
Houston Conroe/Tarkington	Outside of Service Area	25,284
Katy Prairie	Outside of Service Area	12,100.33
Total Available Stream Credits		87,074.53

Source: USGC 2 Project Team, 2019

Because the anticipated number of stream credits required to mitigate the anticipated unavoidable impacts to stream features is not currently available within the primary watershed/service area (as of November 2019), CPChem is proposing a stream PRM. CPChem will commission the creation of a stream PRM within the watershed to offset the stream credit requirement not mitigated through a stream credit purchase.

Table 13. Proposed Stream Credit Permittee Responsible Mitigation Plans

Stream Permittee Responsible Mitigation (PRM) Plan	Location	Credits Anticipated
Cypress Creek / Nichols Creek Stream PRM	Lower Sabine Subbasin (HUC 1210005) <i>Jasper County, Texas Within Watershed</i>	91,924.99
Big Cow Creek Mitigation Area (BCCMA) Stream PRM	Lower Sabine Subbasin (HUC 1210005) <i>Newton County, Texas Within Watershed</i>	30,898.3
Total PRM Stream Credits		122,914.29

Source: USGC 2 Project Team, 2019

Below is a summary of the Stream PRMs proposed for the USGC 2 project.

Big Cow Creek Stream Permittee Responsible Mitigation Plan

CPChem is proposes to offset 30,898.3 credits of the required 122,914.29 stream credits at the Big Cow Creek Mitigation Area (BCCMA) PRM area. The BCCMA is located in Newton County, Texas and within the Lower Sabine Subbasin (HUC 12010005), the HUC in which the Project impact is also located. Refer to **Figure 1** for a location map of the BCCMA. The stream compensation/credits at the BCCMA are being determined per the 2013 Galveston District Stream Condition Assessment – Determination of Compensation. This brief summary of stream restoration at the BCCMA is a conceptual mitigation plan. The full mitigation plan consisting of the twelve necessary components will be developed and submitted to the USACE–Galveston District.

The BCCMA is a 219.5-acre tract of land largely situated in the floodplain of Big Cow Creek. Historically, the BCCMA was forested and timber was removed to allow for livestock production. Along with the removal of timber, the tract was disked and plowed to help promote the growth of pasture grasses. During the disking, stream channels were altered, and in some instances removed. Currently, cattle grazing is still the dominant land use for the BCCMA. The removal of timber, pasture management activities, and continued livestock grazing have created an excellent opportunity for stream restoration.

In total, CPChem proposes to restore/re-establish and enhance a minimum 13,702 linear feet of stream at the BCCMA, which includes 5,114 feet of ephemeral stream and 8,588 of intermittent stream. **Table 14** below presents a linear foot breakdown by restoration type.

Table 14. Stream Restoration Type and Length at the BCCMA

Stream Type	Linear Feet of Restore/ Re-establishment	Linear Feet of Enhancement	Total
Intermittent	4,264	4,324	8,588
Ephemeral	3,946	1,168	5,114

Source: Delta Land Services, 2019

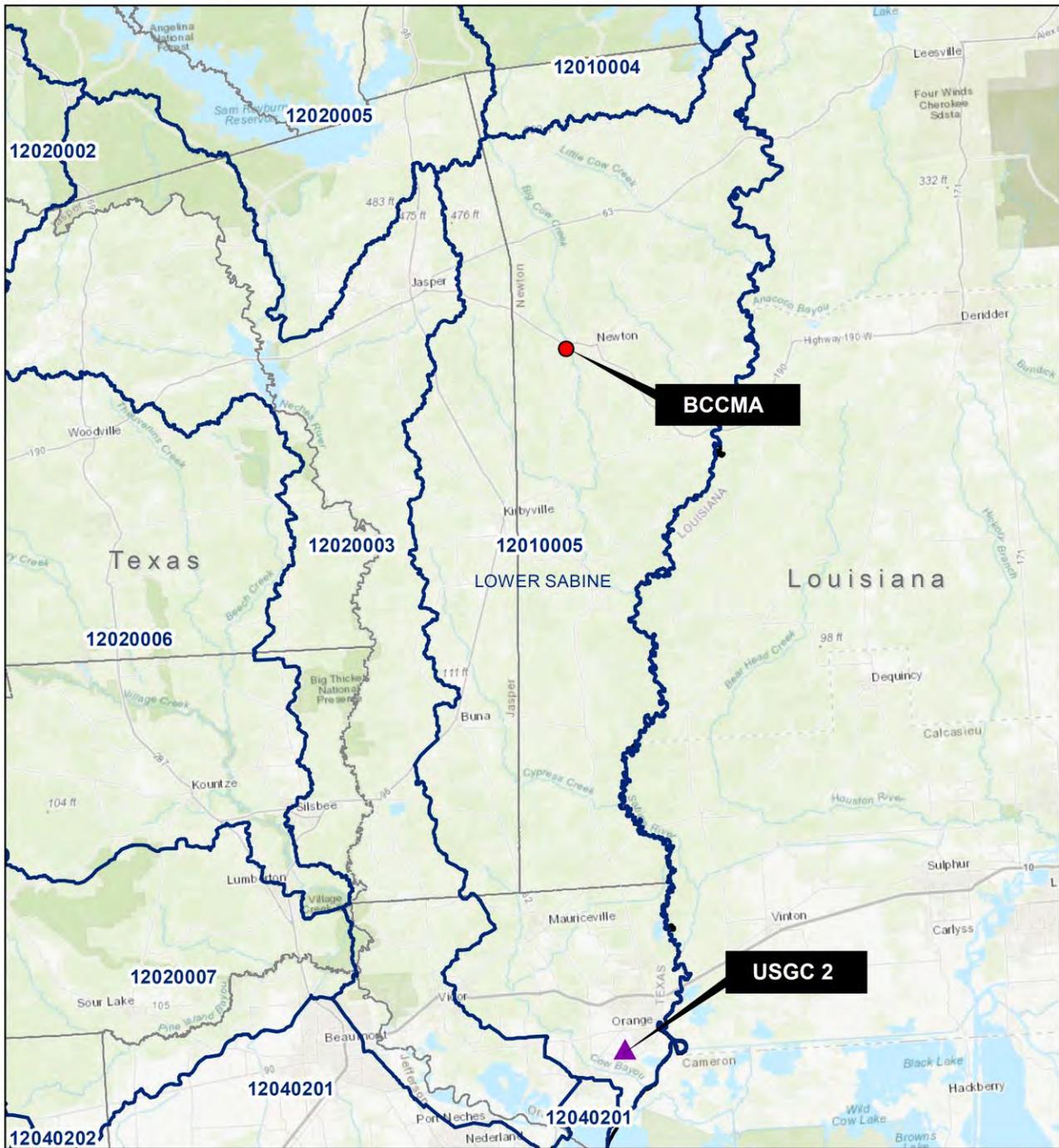
For the restoration/re-establishment of 3,946 linear feet of ephemeral stream and 4,264 linear feet of intermittent stream, the Natural Channel Design approach will be used as developed by Dave Rosgen for stream restoration will be used. An integral part of this method involves the use of local and/or regionalized reference reach data to develop geomorphic design criteria for stable restored channels; we identified preliminary identified streams to provide those reference reaches. Various types of woody structures will be used to achieve stability in restored streams as well as contribute to habitat development and water quality. These structures will also serve to direct water flow downstream while dissipating lateral and vertical energy and allowing flood waters into the riparian wetlands. They will be constructed solely of native materials and include log cross-vanes, log j-hooks, rootwads, and toewood. A plan view drawing of proposed restoration reaches as well as typical structure designs are included. Along with in-channel restoration, a 200-foot riparian buffer on each side of the stream will be re-established.

CPChem also proposes to enhance 1,168 linear feet of ephemeral stream and 4,324 linear feet of intermittent stream at the BCCMA as compensation for the proposed impacts. Site assessment data indicates that existing streams at the BCCMA have become impaired and degraded. In addition, the streams possess degraded riparian buffers and lack in-stream wetlands as well as floodplain wetlands. Livestock have unimpeded access to the streams, which cause erosion leading to poor water quality and severely limits aquatic organism productivity. Existing forested riparian areas were subject to uncontrolled grazing and foraging by livestock leading to a denuded understory and midstory. Enhancement activities will include

removal of cattle and cessation of grazing activities, heavy buffer plantings, and stream bank stabilization through installation of woody structures.

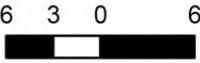
The existing channels have been subdivided into distinct reaches based on valley type, site topography, existing width to depth (W/D) ratios, drainage, and treatment application. Separate morphological criteria will be developed for each distinct reach.

Success criteria and adaptive management will be established for the stream and buffer restoration; these will be consistent with previous USACE approved mitigation sites. Additionally, short and long-term financial assurances will be established for management of the site. Restoration of the approximately 13,702 linear feet of stream on the BCCMA will provide a benefit to the chemical, physical, and biological functions in the Lower Sabine Subbasin.



- Big Cow Creek Mitigation Area (219.5 ac)
- ▲ Impact Site
- USGS 8-Digit HUC





Miles

Big Cow Creek Mitigation Area

VICINITY MAP

Newton County, TX

Created : TSC/ArcView10	
Approved : JMJ	
Date : 11/04/2019	
Map # : F01_VicinityMap.mxd	

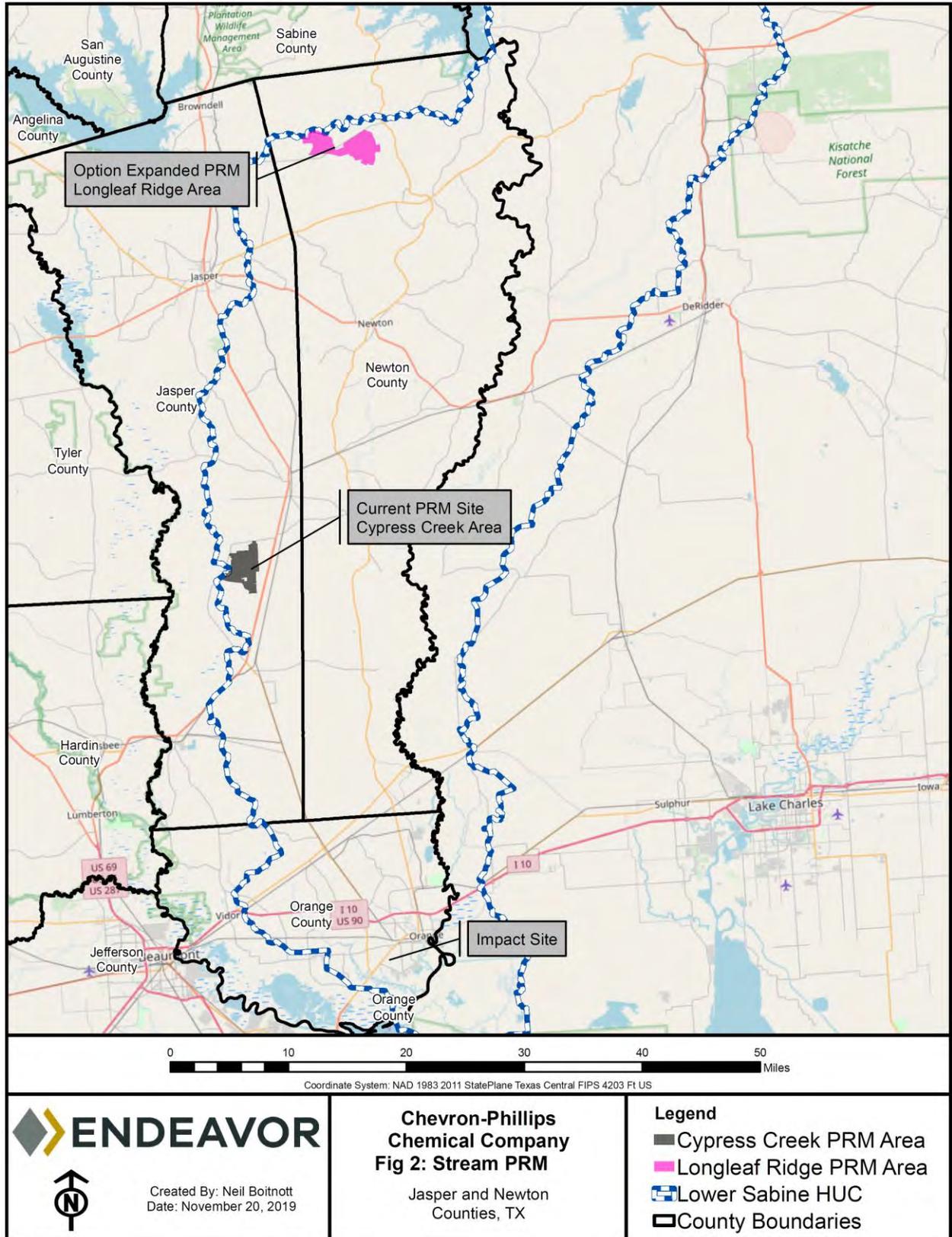
FIGURE 1

Conceptual Cypress Creek / Nichols Creek Stream PRM

CPChem proposes to offset approximately 91,924.99 credits of the required 122,914.29 stream credits at the Cypress and Nichols Creek PRM area. This is a summary of the proposed Cypress and Nichols Creek PRM area is approximately 650 acres of land located 30 miles northeast of the project area in Jasper County, Texas, within the Lower Sabine Subbasin (HUC 1210005). The full proposed mitigation plan consisting of the twelve necessary components will be developed and submitted to the USACE Galveston District. This PRM plan is a landscape/watershed level approach and will follow the Galveston Stream Condition Assessment Standard Operating Procedure (SOP) to restore, enhance, and protect approximately 138,000 feet (26.1 miles) of stream to provide a minimum of 91,924.99 compensatory mitigation stream credits. The proposed stream restoration and enhancement will be implemented on the upper reaches of Cypress Creek and/or Nichols Creeks. Texas Parks and Wildlife considers Cypress Creek an ecologically significant stream segment with high water quality, exceptional aquatic life, and high aesthetic value¹. Approximately 128,000 feet of stream buffer enhancement (light and heavy buffer planting) will occur on the main channels of Cypress and/or Nichols Creeks and associated tributaries while 10,000 feet of in-channel restoration will occur on impaired secondary stream channels of Cypress and Nichols Creeks.

Stream buffer enhancement activities will consist of removal of loblolly pine plantations, control of noxious/invasive species, and increasing species diversity through heavy or light buffer planting in the inner 100 feet, and in some circumstances, the outer 100-foot buffers. Wetlands will also be enhanced and/or restored within the stream buffers through these same techniques. Approximately 10,000 feet of streams will be restored through full Priority 1 stream restoration. The pattern, profile, and dimension of these channels is not currently in-line with reference streams and applicable regional curves due to past land practices. These streams are aggraded (filled in) and not functioning optimally to convey water and sediment within the stream channel, process organic matter and nutrients, or provide aquatic and riparian buffer habitat. These streams will be designed and re-constructed using natural channel design (NCD) techniques, relying on applicable reference streams and regional curves. **Figure 2** shows the location of the Cypress and Nichols Creek stream PRMs.

¹, Norris C. W., and El-Hage, A. (2005, September). Ecologically Significant River & Stream Segments of Region I (East Texas) Regional Water Planning Area.



9. Temporary Impact Restoration Plan

As noted in the Temporary Impact Restoration Plan (**Appendix R of the Individual Permit package**) the proposed construction of the Heavy Haul Road and wastewater treatment plant (WWTP) discharge pipeline will temporarily impact 0.84 acres of PEM wetlands and 0.04 acre of PSS wetlands. After the completion of construction activities, CPChem will restore contours in temporary workspaces to pre-construction conditions to the greatest extent practicable. No reseeding will occur within temporarily disturbed wetlands. To preserve the seed bank and promote natural revegetation, topsoil segregation techniques will be used in non-inundated and unsaturated conditions. Where topsoil segregation is not feasible, mats will be utilized to minimize disturbance of the soil structure. To ensure that wetlands temporarily impacted by construction are adequately restored following the completion of construction activities, CPChem will monitor the progress of restoration and provide documentation of the results. Because the temporarily impacted areas will be affected for less than a growing season, and restored following construction, no mitigation is proposed for these areas at this time. If wetlands are not fully restored following the completion of the first growing season, CPChem will consult with the USACE to determine if additional monitoring, corrective actions, or mitigation is necessary.

10. Summary of Proposed Mitigation

The determination of mitigation is the decision of the USACE and will be determined in conjunction with the approval of the IP. A total of 24,267 linear feet of unavoidable impacts to waters of the US (approximately 122,914.29 stream credits) are anticipated to be mitigated through the creation of two stream PRMs, and approximately 246.2 acres of unavoidable impacts to wetlands (approximately 149.22 Physical FCUs, 196.78 Biological FCUs, and 141.98 Chemical FCUs) would be mitigated through PRMs, for the construction of the proposed USGC 2 project. No mitigation is anticipated at this time for temporary impacts to wetlands. All monitoring reports will be in accordance with Regulatory Guidance Letter Number 08-03.

11. References

- Delta Land Services, LLC. 2019a. *Forested Wetland Lower Sabine (HUC 12010005) Permittee Responsible Mitigation Plan SWG--2018-00957 USGC 2 Orange Facility Project Orange County, Texas*. March 2019.
- Delta Land Services, LLC. 2019b. *Herbaceous/Shrub Wetland Permittee Responsible Mitigation Plan Lower Sabine Watershed (HUC 12010005) SWG-2018-00957 USGC 2 Orange Facility Project Orange County, Texas*. April 18, 2019.
- Perennial Environmental Services LLC. 2019a. *HGM Analysis (PEM, PFO, PSS) data sheets*. February 14, 2019.
- Perennial Environmental Services LLC. 2019b. *Stream Assessment*. February 14, 2019.
- Perennial Environmental Services LLC. 2019c. *Wetland Delineation Report Heavy Haul Road/Barge Berth Project*. February 14, 2019.
- SWCA Environmental Consultants (SWCA). 2019a. *Wetland Delineation Report for the Proposed USGC 2 Orange Facility in Orange County, Texas*. 22 February 2019.
- SWCA Environmental Consultants (SWCA). 2019b. *Interim Hydrogeomorphic Functional Assessment Report for the Proposed USGC 2 Orange Facility, Orange County, Texas*. 27 February 2019.
- SWCA Environmental Consultants (SWCA). 2019c. *Level I Stream Assessment Report for the Proposed USGC 2 Orange Facility in Orange County, Texas*. 27 February 2019. Revised August 2019.