Dredged Material Management Plan

Chevron Phillips Chemical Company LP

USGC II OSBL
Project No. 116058

60-EVPL-00001
Revision CC
11/15/2019

Issued for Permitting (IFPM)

REVISION CONTROL

REV	Date	Issued For	Prepared By	Reviewed By	Approved By
AA	11/11/2019	Permitting	ST		ST
BB	11/12/2019	Permitting	ST	DG	ST
CC	11/15/2019	Permitting	ST	DG	ST

REVISION HISTORY

REV	Brief Description of Reason for Changes
CC	Revised Figure 4
BB	Updates for USACE Permit inclusion
AA	Initial draft, review and issue.

Dredged Material Management Plan

prepared for

Chevron Phillips Chemical Company LP
USGC II OSBL
Gulf Coast Area

Project No. 116058

Revision CC
11/15/2019

prepared by

Burns & McDonnell/Zachry
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
BMZ	Burns & McDonnell/Zachry Joint Venture
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CPChem	Chevron Phillips Chemical Company, LLC
CWA	Clean Water Act
CY	Cubic yard
DMMP	Dredged Material Management Plan
DMPA	Dredged Material Placement Area
DO	Dissolved oxygen
EPA	United States Environmental Protection Agency
MLLW	Mean low low water
MLT	Mean low tide
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
OSBL	Outside Battery Limits
PCBs	Polychlorinated Biphenols
PID	Photoionization detector
QA/QC	Quality Assurance/Quality Control
SAP	Sampling and Analysis Plan
SVOCs	Semi-volatile Organic Compounds
TCEQ	Texas Commission on Environmental Quality
TMDL	Total maximum daily load

Abbreviation	Term/Phrase/Name
TPH	Total Petroleum Hydrocarbons
TBT	Tributyltin
TxDOT	Texas Department of Transportation
USACE	United States Army Corp of Engineers
USGS	United States Geological Society

1.0 INTRODUCTION

Chevron Phillips Chemical Company LLC (CPChem) has selected a location in Orange County, Texas as the preferred site for development of the U.S. Gulf Coast II (USGC II) Project (see Appendix A, Figure 1 – Vicinity Map). BMZ, a joint venture between Burns & McDonnell Engineering Company, Inc. and Zachry Industrial, Incorporated, has been contracted to finalize design and manage construction for the outside battery limits (OSBL) portion of the project which includes a barge slip at Cow Bayou that will be used for delivery of equipment and materials during project construction. Construction of the barge slip will require offshore dredging and onshore excavation of existing soils and sediment.

BMZ developed this Draft Dredged Material Management Plan (DMMP) to document the proposed strategies and procedures for managing material from offshore dredging and onshore excavation activities for barge slip construction. This DMMP governs the management of soils and sediment following excavation, including stockpiling, dewatering, transport, on-site placement, and off-site disposal (if needed). This DMMP also includes a Draft Sampling and Analysis Plan (SAP) in Section 3.0 which outlines sampling and analysis activities, quality assurance (QA)/quality control (QC) requirements, laboratory analytical methods, and procedures for sampling equipment decontamination, documentation, and sample preparation and shipment.

1.1 Barge Slip

The proposed barge slip is located in Orange County, Texas within an oxbow on the east bank of Cow Bayou approximately 1.8 miles downstream of State Highway 87 (see Appendix A, Figure 1 – Vicinity Map). Construction of the barge slip is anticipated to begin mid-2021 and be completed by Q1 2022. The barge slip will be used to mobilize equipment and materials during post-Early Works project construction between Q1 2022 and Q2 2024.

The barge slip has been designed to safely facilitate the mooring of barges 75-foot wide and 260-foot long and offloading of oversized equipment weighing in excess of 1 million pounds. The barge slip will consist of an approximately 500-linear foot (lf) U-shaped AZ40 type sheet pile bulkhead 50-feet tall with a 6-foot reveal above the mean low low water (MLLW) level. Engineered granular material will be used for backfill. Diagonal soil tie-back anchors will be constructed from the top of the bulkhead wall to brace the bulkhead and sheet pile from rotation. Buried threaded steel rods and whaler beams will be utilized to secure the bulkhead wall to the tieback anchors. Three mooring dolphins will be installed on each side of the barge slip (6 total) using 18” square precast piles.

1.2 Cow Bayou

Cow Bayou is a perennial stream that flows into the Sabine River (USGS Hydrologic Unit Code 12010005) just upstream of Sabine Lake in Orange County, Texas[1]. The lower portion of the bayou has been channelized, straightened, and dredged for navigation, creating numerous oxbows. Cow Bayou is under tidal influence below and a short distance above Interstate Highway (IH)-10. The tidal portion of Cow Bayou extends approximately 20 miles above the confluence with the Sabine River.

Cow Bayou is an impaired waterbody that does not meet surface water quality standards for bacteria, pH, and dissolved oxygen (DO), and the Texas Commission on Environmental Quality (TCEQ) has developed total maximum daily loads (TMDLs) which were approved for implementation at the federal level by the Environmental Protection Agency (EPA) in August 2007. The TMDLs serve as a "pollution budget" established for specified parameters identifying the maximum amount of a pollutant that the waterbody can assimilate and continue to meet the surface water quality standards.

1.3 Surrounding Areas

The property where the barge slip is located was previously owned by Firestone Polymers (Firestone) until August 2019 when it announced that Lion Elastomers (Lion) had completed acquisition of the neighboring Firestone Orange Plant[2]. According to a Phase I Environmental Site Assessment (ESA) conducted at the barge slip property by Perennial on behalf of CPChem in January 2019, there is an abandoned facility that was previously utilized by Firestone for recreational activities. The facility was abandoned by Firestone following the flooding that occurred during Hurricane Harvey in 2017.

The Cow Bayou oxbow contains several businesses including a marina used by shrimp boats, a restaurant, and Inland Boat Works, a boat building and repair company (Appendix A, Figure 2 – Surrounding Area). The TCEQ Central Registry lists the primary business for Inland Boat Works (2682 East Roundbunch Road) as "shipbuilding"[3]. Two active air permits are listed for Inland Boat Works, one for sand blasting and one for painting operations. In 2009, a complaint was received and investigated by TCEQ which stated that sand blasting was taking place and creating dust at the complainant's property.

The Texas Department of Transportation (TxDOT) has been working to repair the swing bridge on East Roundbunch Road over Cow Bayou less than 0.2 miles upstream from the proposed barge slip. The swing bridge has served the community since the 1940s. TxDOT replaced all the concrete components of the

[1] https://www.tceq.texas.gov/assets/public/waterquality/tmdl/37orangecounty/37-waterqualitymodel.pdf
[2] https://www.lionelastomers.com/news/lion-elastomers-completes-acquisition
[3] https://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.showSingleRN&re_id=663743692002095

bridge, added new electronics, and renovated the swing part of the bridge[4]. The swing bridge project has faced continued delays and East Roundbunch Road remains closed at this time.

1.4 Regulatory Overview

CPChem is seeking an Individual Permit (SWG-2018-00957) from the U.S. Army Corps of Engineers (USACE) for the USGC II Project under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. The Individual Permit application includes a request for authorization for unavoidable impacts to wetlands and other waters of the U.S. resulting from construction of the barge slip including the proposed offshore dredging and onshore excavation.

Aerial extents of the proposed dredge area are outside of the Federal Navigation Channel.

The project is not seeking the use of a USACE dredged material placement area (DMPA) for placement of the excavated material.

[4] https://www.12newsnow.com/article/news/local/orange-county-restaurant-owners-hope-to-hold-on-until-re-opening-of-east-roundbunch-bridge/502-91bf8598-659e-4506-8687-93872968fb3b

2.0 DREDGED MATERIAL

The initial dredging is referred to as "new work" dredging where previously undisturbed materials are removed from the project area. Following construction, periodic "maintenance" dredging may be conducted to remove sediments that accumulate above the depth required to navigate the area.

2.1 Initial Dredging (New Work)

BMZ plans to excavate a submerged area within the Cow Bayou oxbow (offshore dredging) and a portion of the shoreline (onshore excavation) to construct the barge slip.

Offshore dredging has been designed to a depth of approximately 10 feet below the lowest observed tide of elevation -2.89' NAVD 88 within the area of the barge turning movement. The overall dredge depth includes approximately 2-feet of overcut. Tidal data was sourced from the National Oceanic and Atmospheric Administration (NOAA) tidal station at the Rainbow Bridge (Station ID 8770520).

Approximately 8-feet of material must be dredged below the existing mud line within the barge turning movement area to meet the target depth. From the boundaries of the barge turning movement area a 3H:1V side slopes will be excavated to natural grade.

Volume calculations for the initial dredging in Table 2-1 are based on the aforementioned dimensions including the overcut requirements.

Table 2-1: Estimated Excavation Volumes, Initial Dredging

Location	Excavation Volume cubic yards (CY)	Aerial Extents of Excavation (Acres)
Offshore Dredging	21,298	2.2
Onshore Excavation	10,914	0.4

2.2 Maintenance Dredging

Maintenance dredging is not anticipated during the time period between estimated completion of barge slip construction (Q1 2022) and operational startup of the USGC II Project (Q2 2024).

3.0 SAMPLING AND ANALYSIS PLAN (SAP)

This Sampling and Analysis Plan (SAP) has been designed to characterize the material prior to excavation in order to evaluate placement options. Initial sampling and analysis activities are tentatively scheduled for Q1 2020.

3.1 Sample Collection

Soil, sediment, and water samples will be collected from offshore and onshore sample locations within the proposed barge slip excavation area. A total of 16 samples are proposed to be sent to an approved third-party laboratory for analysis, five (5) sediment samples, seven (7) soil samples, (2) water samples and two (2) elutriate testing samples. Proposed samples have been designed to characterize a volume of approximately 5,000 CY of dredged or excavated material.

3.1.1 Offshore Sample Collection

3.1.1.1 Full-depth Core Sample Collection

The protocol of sampling for initial "new work" dredging rather than maintenance dredging calls for full-depth core samples that represent the entire 3-dimensional volume of dredging. A conventional drill rig will be mounted on a spud barge or other suitable fixed/floating platform to collect samples from the offshore dredging sample locations. The maximum depth needed is 11-feet below lowest observed tide from the Rainbow Bridge NOAA data. The cores will be continuously logged in 5-foot intervals, with an aliquot of material taken from each interval until the full core can be blended and composite sampled using a lined bucket for mixing. In this manner, each sample will be a composite of the entire full-depth core. If suspicious material (from a contamination standpoint) is encountered, a discrete (grab) sample will be collected to represent the affected interval and sample will be retained by the laboratory for future consideration of analysis.

Five (5) proposed sample locations have been selected to be representative of the aerial extents of the proposed dredging area considering bayou flow and sediment depositional patterns within existing traffic lanes (see Appendix A, Figure 3 – Sample Location Map). The locations will be GPS-recorded and approximate distance measured from fixed objects, if practicable, for future reference.

3.1.1.2 Sediment Sample Collection

Sediment samples will be collected from each of the 5 offshore sample locations using a Ponar grab sampler. At each sample location, the water depth to the top of the sediment will be measured and recorded. This may be done using a fathometer, lead line, or other depth-measuring device. Depths

recorded will be corrected to MLT or applicable local datum either through the use of a tide gauge or tide table.

Prior to collection at each sample location, the Ponar shall be decontaminated. The sample shall be placed in a clean stainless-steel pan and characterized. Field notes shall include the date, time, adjusted water depth, sample appearance, odor, stratification, texture, salinity, water temperature, pH, and GPS location.

3.1.1.3 Water Sample Collection

Water samples will be collected from two (2) sample locations within the proposed dredging area. One sample location will be chosen along the shoreline and the second sample location shall be collected in the bayou consistent with boat traffic patterns.

3.1.1.4 Elutriate Sample Collection

Sufficient water and sediment sample volumes will be collected from two (2) sample locations within the proposed dredging area to perform elutriate testing. The samples will be collected at the same 2 sample locations selected for the water samples (Section 3.1.1.3), one near the shoreline and one consistent with boat traffic patterns.

3.1.2 Onshore Soil Sample Collection

Two (2) soil sample locations are proposed within the onshore barge slip excavation area. Two (2) grab samples will be collected from each location at different intervals for a total of four (4) samples. The intervals collected will be at depths of 0 – 6 inches bgs and 18 – 24 inches bgs. A hand auger will be used to excavate the soil. Each sample will be placed in a clean sample jar. The soil samples will be screened in the field with a photoionization detector (PID) prior to being placed in a sample jar.

3.1.3 Samples for Quality Control

Quality assurance/quality control (QA/QC) samples will generally be collected as follows:

- Field replicates/duplicates (soil and elutriate): One duplicate sample will collected from both the onshore and offshore sampling activities. Duplicate samples will be obtained at the same time and analyzed for the same set of parameters as the project sample it is intended to duplicate. The original and duplicate samples will be placed in identical containers and preserved in the same manner. Duplicate samples will be identified with unique sample identification numbers so as to be blind to the analytical laboratory. Project samples where duplicates are collected will be documented in the field logbook.

- Trip blanks (soil and water): Trip blanks are only needed if VOCs are being sampled. Trip blanks are prepared in the laboratory, shipped to the field, and returned to the laboratory with the field samples. Trip blanks typically consist of reagent grade water. These blanks are used to evaluate potential contamination associated with sample handling/shipment and laboratory handling/analysis. At a minimum, a trip blank is included in each cooler used to transport aqueous VOC samples to the laboratory.

- Matrix spike/matrix spike duplicate (MS/MSD) (soil and water): MS and MSDs are used to assess the accuracy and precision of analytical results in the presence of potential sample matrix interference. Samples are collected in triplicate and designated as field, MS, and MSD samples. The laboratory spikes the MS and MSD portions with known concentrations of target analytes. Recovery of the analytes is used to assess accuracy. Precision is assessed by comparison of MS and MSD to each other. For a statistical assessment of precision, at least 8 MS replicates should be analyzed, and the standard deviation and coefficient of variation should be determined. Laboratory methods generally require the analysis of a MS/MSD pair in each analytical batch, up to a maximum of 20 samples. Collection of MS/MSD samples is recommended at a minimum frequency of 10 percent of samples per method per matrix.

Collection of the listed QA/QC samples may need to be changed or varied based on field observations and interim data analysis. The QA/QC samples collected will be documented in the field logbooks and laboratory reports. Results of the QA/QC samples will be evaluated for achievement of project-specific and method-specific requirements. Data qualification, if appropriate, will generally conform to criteria outlined in the *U.S. EPA National Functional Guidelines for Organic Superfund Methods Data Review* (2017).

3.2 Sample Analysis

Samples will be sent to an off-site TCEQ National Environmental Laboratory Accreditation Program (NELAP) certified commercial laboratory for analysis. Sample analyses were selected based on site characteristics and proposed handling and placement practices. Soil, sediment, and water samples will be submitted for laboratory analysis as outlined in Table 3-1.

Table 3-1: Sample Analyses – Soil, Sediment, and Water

No.	COCs	Analysis Method, Soil/Sediment
1	Total petroleum hydrocarbons (TPH)	TCEQ Test Method TX-1005
2	Benzene, toluene, ethylene, and xylene (BTEX)	EPA SW-846 Test Method 5035/8260
3	Semi-volatile organic compounds (SVOCs)	EPA SW-846 Test Method 8270
4	Metals	EPA SW-846 Test Method 6020
5	Polychlorinated biphenyls (PCBs)	EPA SW-846 Test Method 8082
6	Organochlorine pesticides	EPA SW-846 Test Method 8081B
7	Dioxins	EPA SW-846 Test Method 8290A
8	Tributyltin (TBT)	EPA Test Method 8323

4.0 DREDGING METHODOLOGIES

4.1 Onshore Excavation

Prior to commencing offshore dredging, the sheet pile will be installed using vibratory methods and the associated tieback wall will be constructed. An onshore excavator utilizing timber mats will be used to excavate as much dry material as possible between the sheet pile and the shoreline and load the material directly into dump trucks. A section of shoreline, or "plug", will be left in place at the entrance to the barge slip to prevent surface water from Cow Bayou from flooding the barge slip until onshore excavation activities are complete. Wet material excavated from the onshore area will be placed in a bermed decanting area adjacent to the barge slip. The Onshore Decanting Area is further discussed in Section 4.3.

4.2 Mechanical Dredging

Mechanical dredging methods will be used to excavate the submerged area. Mechanical dredging excavates in-situ sediments with a grab or bucket from land or water-based structure such as a barge. The dredging process consists of lowering the bucket to the seafloor, closing the bucket and raising it back to the water surface, and depositing the dredged material into a scow, pen barge or, if appropriate, directly into an adjoining placement/decanting site.

Material from Cow Bayou will be removed using a clamshell bucket dredger stationed from a barge. Where possible, dredged material will be collected in the clamshell bucket and deposited on land within the Onshore Decanting Area. Where the barge crane is not within reach of the Onshore Decanting Area, the material will be deposited in a pen barge where it is allowed to settle and dewater. The pen barge will utilize silt curtains on the barge deck and/or in the water surrounding the barge to contain silt.

4.3 Onshore Decanting Area

Wet material will be placed within a temporary containment berm allowing material to settle and dewater (Onshore Decanting Area, see Appendix A, Figure 4 – Onshore Decanting Area). The berm will be constructed using existing on-site material initially, followed by incoming dredge material. At the lowest ground surface point facing Cow Bayou, the berm would consist of staked hay bales and appropriate silt curtain to filter sediment while allowing water to drain.

5.0 TRANSPORT AND PLACEMENT

Excavated material will be placed on CPChem property at the USGC II Site if results of the Sampling and Analysis Plan (SAP) outlined in Section 3.0 indicate that the material is suitable for on-site placement. If analytical results indicate that the material is not suitable for on-site placement, it will be transported to an authorized disposal facility.

5.1 On-site Dredged Material Placement Area

Material that is deemed to be suitable for on-site placement will be transported from the barge slip via dump trucks to the Dredged Material Placement Area located in the central southern portion of the USGC II Site as identified in Appendix A, Figure 5 – Dredged Material Placement Area. The Dredged Material Placement Area will have a temporary containment berm constructed from existing on-site material to prevent discharge of sediment during rain events before final stabilization is achieved.

5.1.1 Transportation

5.1.1.1 Dry Material

Dry material will be excavated from the onshore barge slip area, placed directly into dump trucks and hauled to the Dredged Material Placement Area.

5.1.1.2 Wet Material

Wet material will be decanted in the Onshore Decanting Area or on-barge, transferred to dump trucks with a backhoe, and then hauled to the bermed Dredged Material Placement Area.

5.1.2 Final Stabilization

Dredged material will be tilled with other materials to make it suitable for use as engineered fill material as applicable. Material will be placed and compacted to meet project specifications. Stormwater controls will be utilized until final stabilization has been achieved.

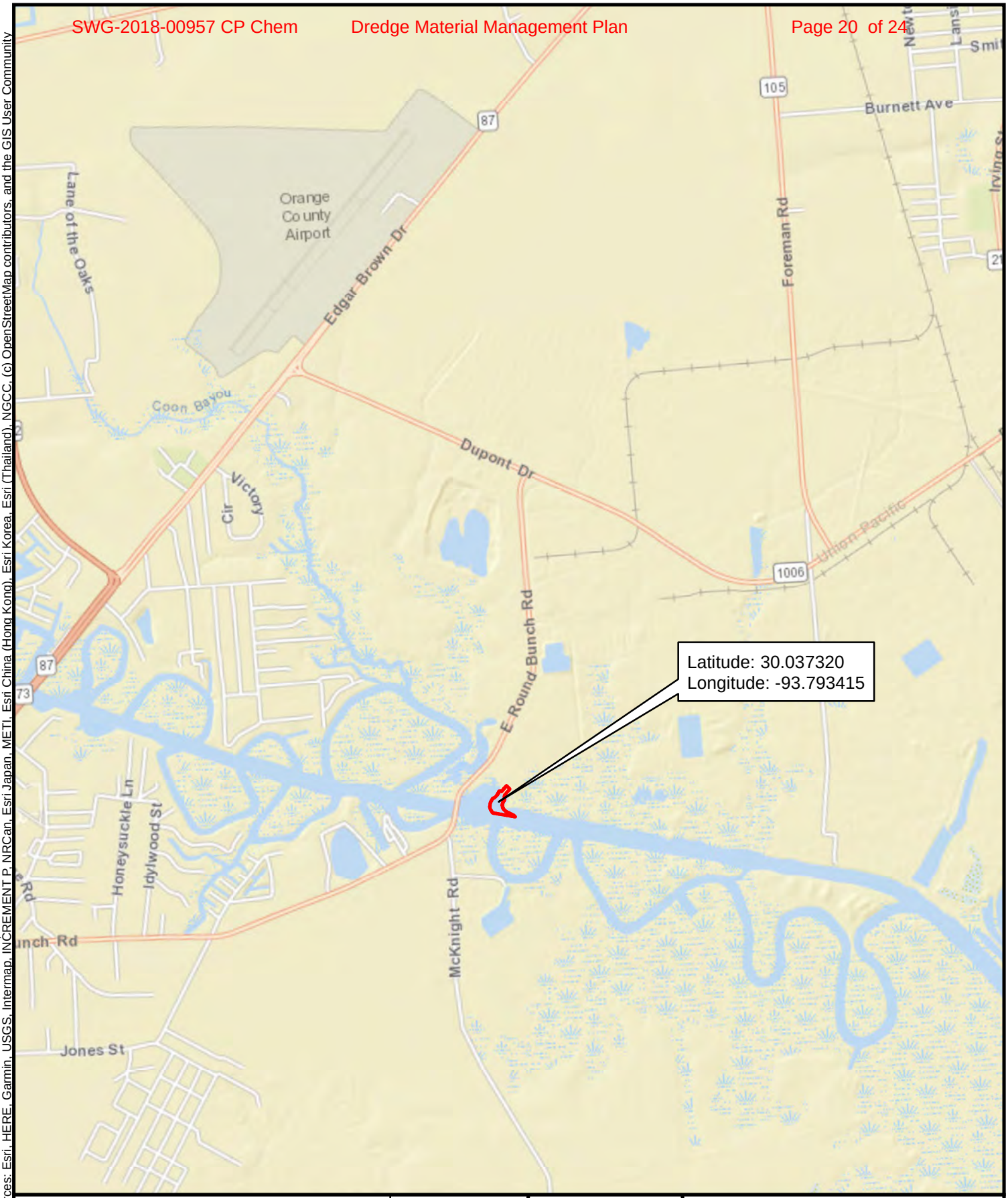
5.2 Off-site Disposal (If Needed)

If needed, unsuitable material will be disposed at one of the facilities listed in Table 5-1. Depending on the disposal facility criteria and the material characteristics, the material may be decanted and/or stabilized prior to transport. Options would be evaluated in detail once the analytical results are available.

Table 5-1: Potential Off-site Disposal Facilities for Excavated Material

No.	Facility Name	Facility Address
1	Waste Management (WM) Resource Recovery & Recycling Center	7505 State Highway 65 Anahuac, TX 77514
2	Houston Products Processing (HPP)	2655 South FM 565 Baytown, TX 77523
3	Newton County Landfill	2372 County Road 3870 Deweyville, TX 77614
4	Republic McCarty Road	5757 A Oates Road Houston, TX 77078
5	Republic Golden Triangle Beaumont	6433 Labelle Road Beaumont, TX 77705
6	Waste Management – CWM Lake Charles	7170 John Brannon Road Sulphur, LA 70665

APPENDIX A – FIGURES



USGC II Barge Slip Excavation Area

NORTH

2,000 1,000 0 2,000

Scale in Feet

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Figure 1: Vicinity Map
Barge Slip Dredge and Excavation
Chevron Phillips Chemical Company
Orange County, TX

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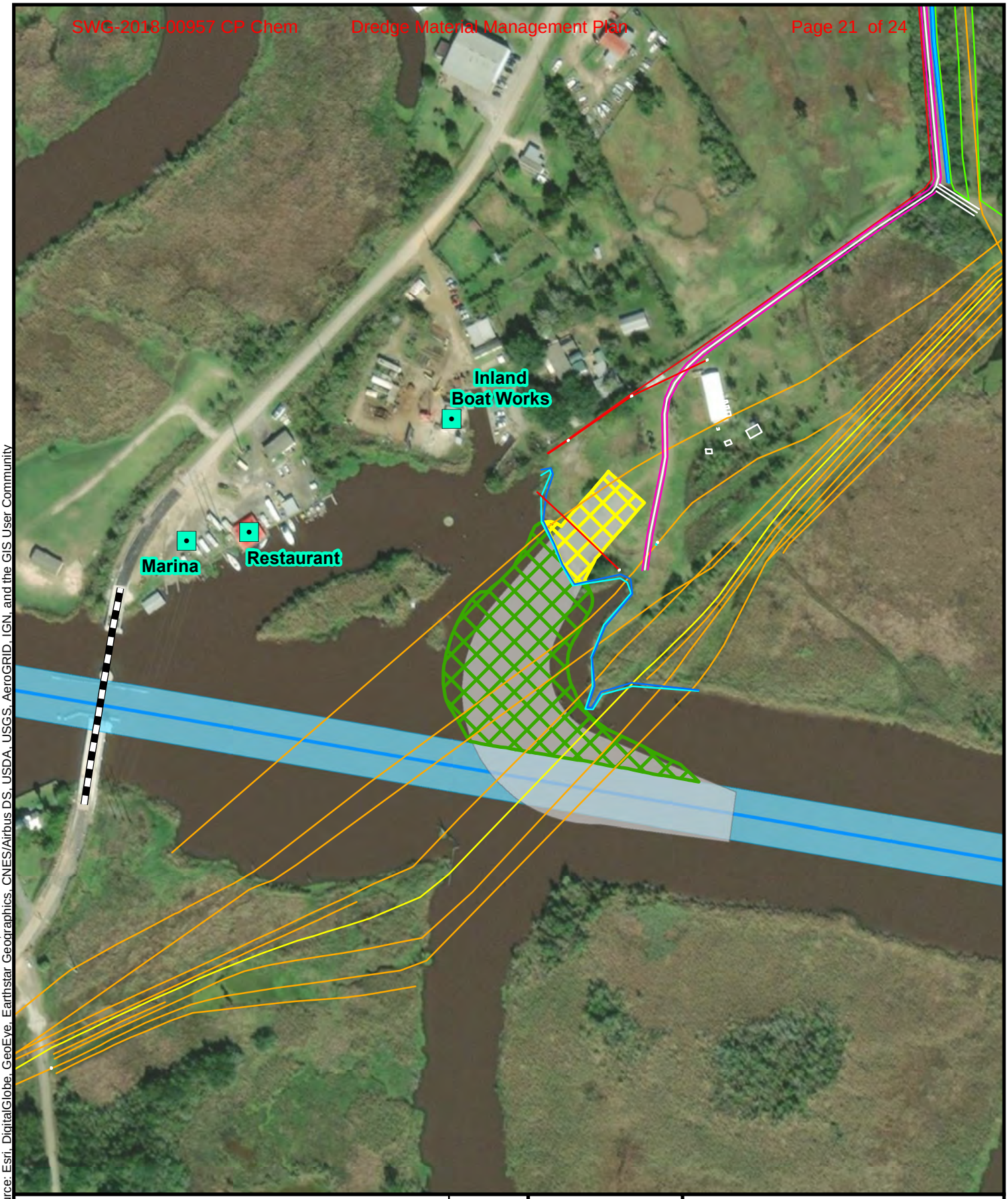
Source: ESRI; Burns & McDonnell Engineering, Inc.

Issued: 11/11/2019



Surrounding Features
East Roundbunch Road Swing Bridge
Proposed Offshore Excavation Area
Proposed Onshore Excavation Area
Barge Turning Movement Area
Federal Navigation Channel

Excavation Linework
Fence Line
Existing Ethylene Pipeline
Foreign Pipeline
Topo Bank TOEB
Topo Bank TOPB

Topo Tree
Access Edge
Access and Driveways
Power Overhead
Power Pole
Water Ditch

NORTH

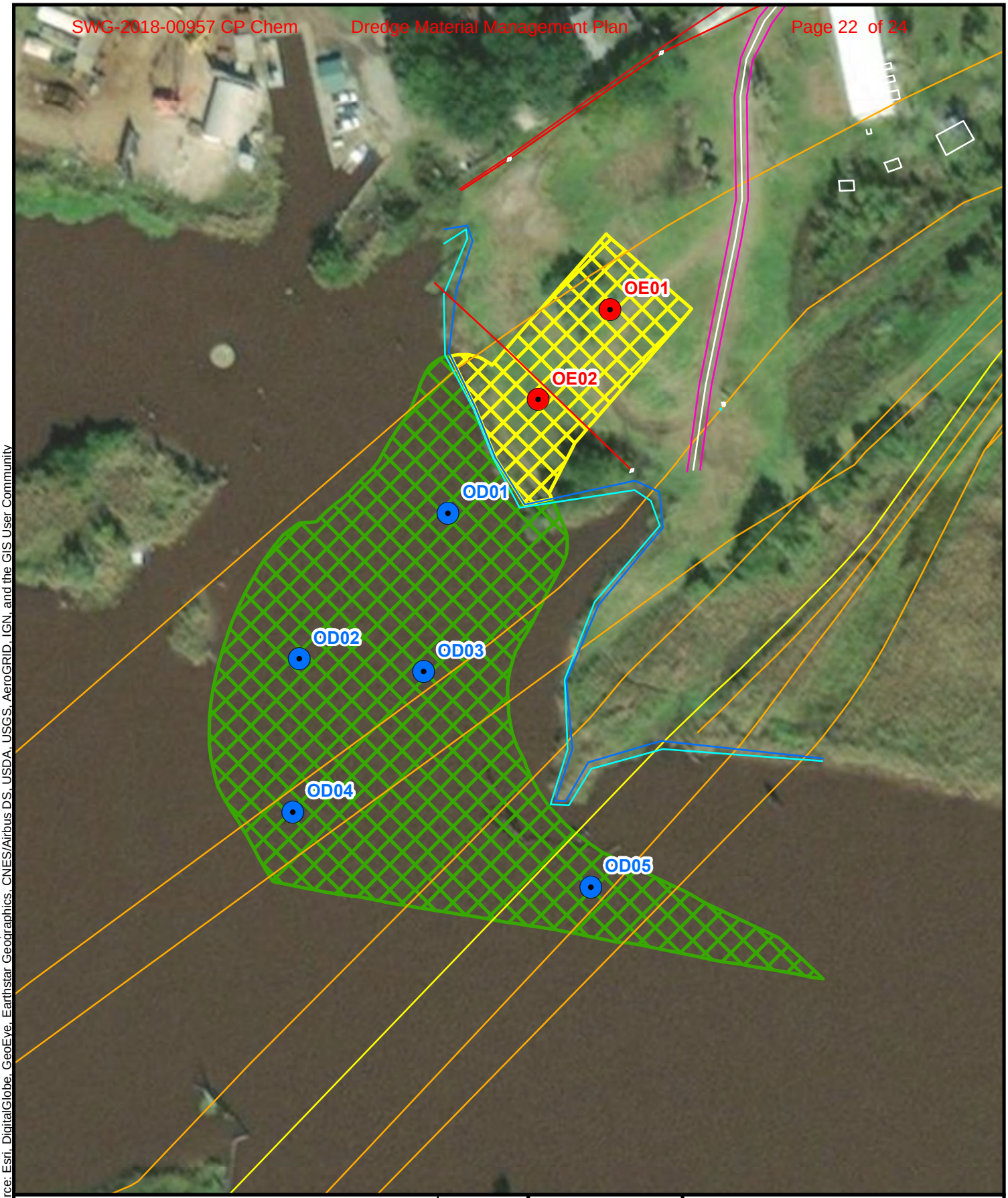
0 100 200
Scale in Feet

BURNS McDONNELL

Figure 2: Surrounding Areas
Barge Slip Dredge and Excavation
Chevron Phillips Chemical Company
U.S. Gulf Coast II
Orange County, Texas

Source: ESRI; Burns & McDonnell Engineering, Inc.

Issued: 11/11/2019



Offshore Dredging Sample Location
Onshore Excavation Sample Location
Proposed Offshore Excavation Area
Proposed Onshore Excavation Area
Excavation Linework
Fence Line
Existing Ethylene Pipeline
Foreign Pipeline
Topo Bank TOEB
Topo Bank TOPB
Access Edge
Access and Driveways
Power Overhead
Power Pole

NORTH

50 25 0 50
Scale in Feet

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Figure 3: Sample Locations
Barge Slip Dredge and Excavation
Chevron Phillips Chemical Company
U.S. Gulf Coast II
Orange County, Texas

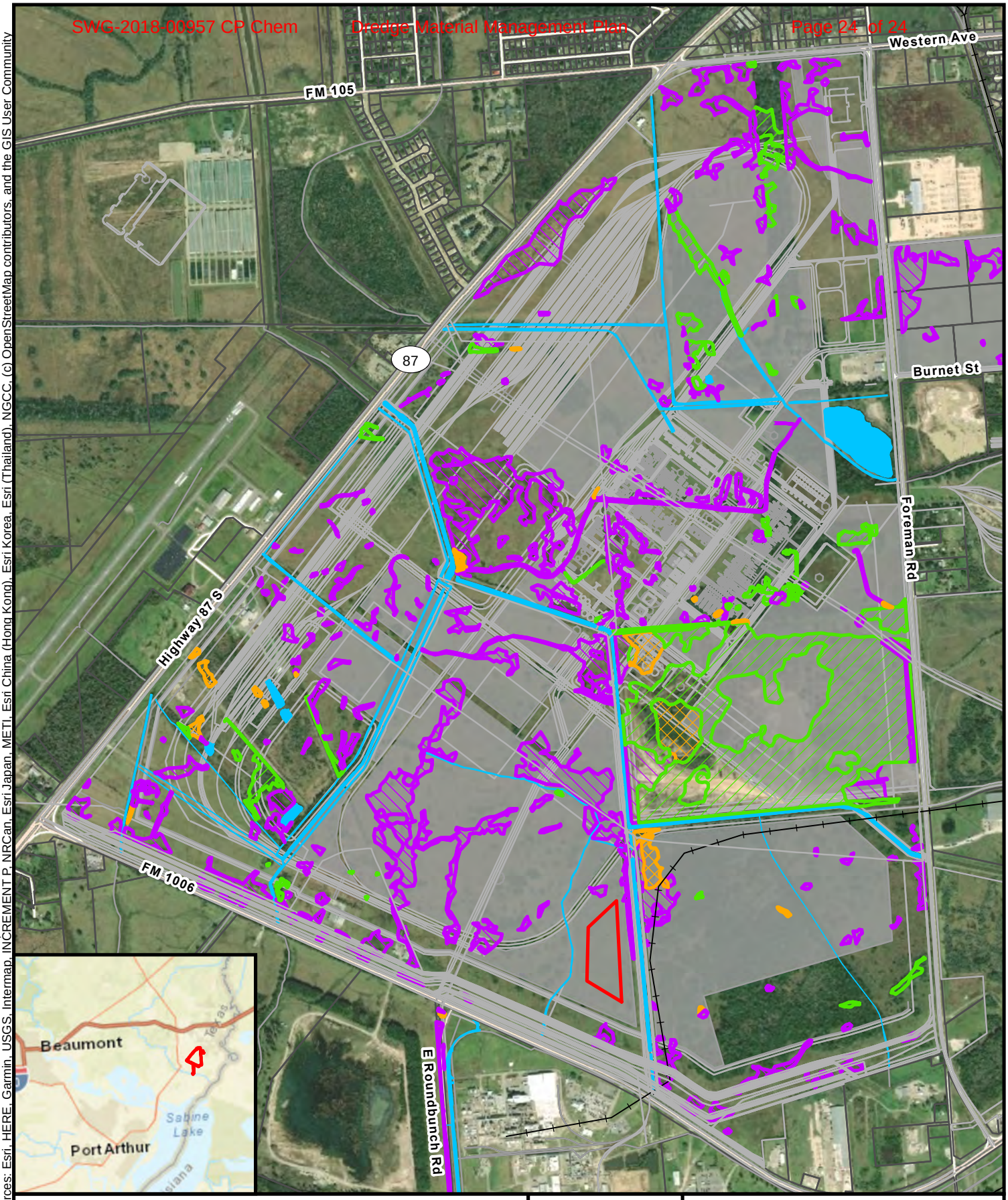
Source: ESRI; Burns & McDonnell Engineering, Inc.

Issued: 11/11/2019

Figure 4: Onshore Decanting Areas
Barge Slip Dredge and Excavation
Chevron Phillips Chemical Company
U.S. Gulf Coast II
Orange County, Texas

Source: ESRI; Burns & McDonnell Engineering, Inc.

Issued: 11/13/2019



Dredged Material Placement Area

Waterbody

Wetland Type

PEM

PFO

PSS

NORTH

0 1,000 2,000

Scale in Feet

BURNS McDONNELL

Figure 5: Dredged Material Placement Area
Aerial Overview Map
Chevron Phillips Chemical Company
U.S. Gulf Coast II
Orange County, Texas

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Source: ESRI; Burns & McDonnell Engineering, Inc.

Issued: 11/11/2019