Freeport LNG

Permit Modification Application
Confined Dredged Material Placement Area Project

Alternatives Analysis Summary

SWG-2013-00147

September 2021

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APPENDICES

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Galveston District issued Permit No. SWG-2013-00147 under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA) to Freeport LNG (FLNG) for the Liquefaction Project and Phase II Developments on September 23, 2014. The USACE issued an amendment to Permit No. SWG-2013-00147 on September 9, 2015 adding the Freeport New Work Offshore Dredged Material Disposal Site (ODMDS) as a placement area. Under the original permit and subsequent amendment, 1,188,000 cubic yards (CY) of new work material was dredged from the Phase II LNG Berthing area for placement into the New Work ODMDS. On February 14, 2018, the USACE issued an amendment to Permit No. SWG-2013-00147 for the addition of the Freeport Maintenance ODMDS as a placement area for the disposal of maintenance material dredged from the FLNG Basin to allow for the safe and efficient operations. Additional disposal and reporting requirements were added to this permit amendment on October 25, 2018. On January 19, 2021, the USACE issued an amendment to Permit No. SWG-2013-00147 authorizing maintenance dredging of the FLNG Basin and offshore disposal of the material for a 3-year period. The FLNG Basin encompasses the Phase II LNG Berthing area (authorized under SWG-2013-00147) and the Phase I LNG Berthing area (authorized under SWG-2003-02110). The authorized depth of the FLNG Basin is 46.5 feet North American Vertical Datum 1988 plus 2 feet over dredge. Refer to Appendix A, Figure 1 for a vicinity map depicting the FLNG Basin.

Pursuant to Section 404 of the CWA and Section 10 of the RHA, FLNG is requesting a modification to the existing permit (SWG-2013-00147) for the construction and operation of a confined dredged material placement area (CDMPA). The CDMPA will provide for the placement of maintenance material dredged from within the FLNG Basin as required for the continuation of operations of the FLNG Basin and associated Liquefaction Terminal (LQF Terminal) supporting infrastructure.

FLNG originally submitted a request for a modification to the existing permit (SWG-2013-00147) for the construction and operation of a long term DMPA in June 2018. Based on the comments received during the public notice comment period, action by the EPA and USACE to lift the timing restrictions for using the ODMDS, and withdrawal of the original permit modification request, FLNG revised the proposed project, including significantly reducing the footprint, project purpose and need revision and extensive engineering and feasibility study. FLNG submitted a revised request for modification in September 2019 and a public notice was issued in November 2019. Since that time, FLNG has revised the proposed mitigation plan to address feedback received from the USACE as well as agency comments received during both previous public notice periods.

As part of the USACE application for the CDMPA, FLNG submitted a detailed alternatives analysis document. The purpose of this Alternatives Analysis Summary document is to provide summary of the detailed and lengthy information FLNG included in that detailed alternatives analysis document.

2.0 PROJECT PURPOSE AND NEED

Safe navigation and operation of vessels within the FLNG Basin is required to support existing FLNG infrastructure and fulfillment of contract commitments to export LNG products to international markets. As such, the basic purpose of the proposed Confined Dredged Material Placement Area Project (Project) is to authorize a location for the placement of maintenance material dredged from the FLNG Basin. The overall purpose of the proposed Project is to provide authorized confined placement location(s) within 5 miles of the FLNG Basin capable of receiving dredged material over a long-term period from the FLNG Basin via pipeline. This would allow for the utilization of smaller and more widely available dredging equipment,

compared to offshore disposal, to create stability for future operations and navigation of vessels within the FLNG Basin.

3.0 ALTERNATIVES ANALYSIS FOR PLACEMENT OF MAINTENANCE MATERIAL

FLNG analyzed 5 potential alternatives, including 1) the no action alternative, 2) beneficial use of dredged material, 3) disposing into an existing or undeveloped Federal DMPA, 4) sediment diversion, and 5) development of a private DMPA for disposal. Each alternative was evaluated against a specific set of selection criteria to determine their ability to fulfill the Project purpose and need. The selection criteria used as part of the analysis and the results of the alternatives analysis conducted is discussed in the following sections.

in order to be considered as a practicable disposal option, FLNG considered the alternatives detailed in the previous sections with the following selection criteria:

1. Fulfillment of the Project Purpose and Need to allow for the confined placement of maintenance material transported by pipeline from the FLNG Basin that allows for the utilization of smaller and more widely available dredging equipment, compared to offshore disposal, to create stability for future operations and navigation of vessels within the FLNG Basin;
2. Located within 5 miles of the FLNG Basin, and preferably near other DMPAs (similar land-use) to minimize environmental impacts of transporting material to the site via pipeline.
3. Dredged material is suitable for placement at a given location;
4. Provides adequate capacity to accommodate at least 10 dredging events, estimated to be approximately 250,000 cubic yards each based on an observed annual siltation rate (for a total minimum capacity of 2,500,000 cubic yards);
5. Proposed industrial use compatible with existing surrounding land use(s) and aesthetics;
6. Minimizes impacts to properties of Federal interest;
7. Minimizes environmental impacts to the maximum extent practicable; and
8. Provides year-round availability to allow for periodic maintenance dredge disposal following possible natural disasters or other large-scale shoaling events.

The alternatives screening process was used to reduce the number of alternatives considered during more-detailed evaluations based on their ability to fulfill the requirements set forth in the selection criteria. FLNG analyzed 5 potential alternatives which also included potential site alternatives for each:

1) The No Action Alternative
2) Beneficial Use of Dredged Material
    a) Beneficial Use Site A
    b) Beneficial Use Site B
    c) Beneficial Use Site C
    d) Beneficial Use Site D
    e) Beneficial Use Site E
    f) Beneficial Use Site F
    g) Combined BU Site Alternative
3) Existing or Undeveloped Federal DMPAs
    a) Developed DMPA
        i) Numbers 1, 7, 78, 79, 80, 81, 82, 84, 85, 86, 87, 88
    b) Undeveloped DMPA
        i) Numbers 8, 9

4) Sediment Diversion
    a) Southern Dredging Option
    b) Locks Alternative
5) Development of Private DMPA for Disposal
    a) Private DMPA Site A
    b) Private DMPA Site B
    c) Private DMPA Site C
    d) Private DMPA Site D
    e) Private DMPA Site E
    f) Private DMPA Site F

3.1 NO ACTION ALTERNATIVE

The no action alternative consists of the continuation of operations at the FLNG Basin without the identification of options for future long-term confined placement of maintenance material via pipeline. Currently, FLNG's authorizations for the disposal of maintenance material includes the utilization of the Maintenance ODMDS for offshore disposal, the opportunity to apply for continued use of offshore disposal in the future, and a small (~250,000 cubic yard total capacity) confined upland disposal area located on site at the LQF Terminal that is reserved for small-scale emergency dredging purposes conducted by equipment with limited material transport/pumping capabilities. Other than accommodating a single small-scale emergency dredging event, FLNG would not have any reliable confined disposal options capable of receiving material via pipeline to support future maintenance dredging events under the no action alternative. Based on this analysis, the no action alternative does not fulfill the Project's purpose and need (selection criteria 1) and therefore was not considered a practicable alternative.

3.2 BENEFICIAL USE

Discussions with the various agencies and organizations failed to identify any specific BU sites with immediate/short-term material needs with enough detail to assess the material volume requirements or assess schedule timeframe for potential development. Therefore, FLNG conducted an independent analysis of six potential sites to use dredged material beneficially by creating/restoring wetlands as well as the combined use of these sites. Refer to Appendix A, Figures 3-4 for a depiction of each BU site evaluated. FLNG conducted a screening-level assessment of the identified potential wetland creation/restoration site to determine their ability to meet the established screening criteria and fulfill the Project purpose and need. Provided as Table 1 are the results of the analysis conducted of the identified potential BU sites.

Table 1:
Selection Criteria Potential Beneficial Use Sites - Summary

Selection Criteria	Potential Beneficial Use Site						
	A	B	C	D	E	F	Combined Alternative
1. Fulfillment of the Project Purpose and Need to allow for the confined placement of maintenance material transported by pipeline from the FLNG Basin that allows for the utilization of smaller and more widely available dredging equipment, compared to offshore disposal, to create stability for future operations and navigation of vessels within the FLNG Basin;	X	X	X	X	X	X	X
2. Located within 5 miles of the FLNG Basin, and preferably near other DMPAs (similar land-use) to minimize environmental impacts of transporting material to the site via pipeline.	M	M	M	M	M	M	M
3. Dredged material is suitable for placement at a given location;	M	M	M	M	M	M	M
4. Provides an annual dredged material capacity of 250,000 CY for at least 10 anticipated annual dredging events;	X	X	X	X	X	X	P
5. Proposed industrial use compatible with existing surrounding land use(s) and aesthetics;	M	M	M	M	M	M	M
6. Minimizes impacts to properties of Federal interest;	M	M	X	M	M	M	P
7. Minimizes environmental impacts to the maximum extent practicable; and	M	M	M	M	M	M	M
8. Provides year-round availability to allow for periodic maintenance dredge disposal following possible natural disasters or other large-scale shoaling events.	X	X	X	X	X	X	X

M = Meets
P = Partially Meets
X = Does Not Meet

Based on the screening-level assessment conducted, none of the BU sites either individually or combined allowed for the year-round availability to place dredge material (selection criteria 8). Furthermore, no individual site provided the required annual dredge capacity for a period of 10 years (selection criteria 4).

As such, the utilization of the identified BU sites, or a combination thereof, would not fulfill the Project's purpose and need (selection criteria 1) and therefore was not considered a practicable alternative for further evaluation.

3.3 EXISTING AND UNDEVELOPED FEDERAL DMPA

FLNG conducted a screening level analysis of a total of 13 existing federal DMPA's, including 11 that are currently developed and two that are currently undeveloped. Refer to Appendix A, Figures 5-6 for a depiction of each existing and undeveloped federal DMPA evaluated. FLNG conducted a screening-level assessment of the identified existing and undeveloped federal DMPAs to determine their ability to meet the established screening criteria and fulfill the Project purpose and need. Provided as Table 2 are the results of the analysis conducted for the existing and undeveloped federal DMPAs.

Table 2:
Selection Criteria Summary for Existing Federal DMPA Site Alternatives - Summary

Selection Criteria	Developed DMPA No.											Undev. DMPA No.	
	1	7	78	79	80	81	82	84	85	86/ 87	88	8	9
1. Fulfillment of the Project Purpose and Need to allow for the confined placement of maintenance material transported by pipeline from the FLNG Basin to create stability for future operations and navigation of vessels within the FLNG Basin;	X	X	X	X	X	X	X	X	X	X	X	X	X
2. Located within 5 miles of the FLNG Basin, and preferably near other DMPAs (similar land-use) to minimize environmental impacts of transporting material to the site via pipeline.	M	P	P	P	P	P	M	M	M	M	M	P	P
3. Dredged material is suitable for placement at a given location;	M	M	M	M	M	M	M	M	M	M	M	M	M
4. Provides an annual dredged material capacity of 250,000 CY for at least 10 anticipated annual dredging events;	X	X	X	X	X	X	X	X	X	X	X	M	M
5. Proposed industrial use compatible with existing surrounding land use(s) and aesthetics;	X	M	P	P	P	P	P	X	M	M	M	X	X
6. Minimizes impacts to properties of Federal interest;	X	X	X	X	X	X	X	X	X	X	X	X	X
7. Minimizes environmental impacts to the maximum extent practicable; and	M	M	M	M	M	M	M	M	M	M	M	M	X
8. Provides year-round availability to allow for periodic maintenance dredge disposal following possible natural disasters or other large-scale shoaling events.	P	P	P	P	P	P	P	P	P	P	P	P	P

M = Meets
P = Partially Meets
X = Does Not Meet

Based on the screening-level assessment conducted, no existing federal land-based DMPAs have disposal availability for the placement of maintenance material dredged at the FLNG Basin (selection criteria 4). Additionally, the utilization of either developed or undeveloped federal DMPA alternatives would require increased impacts to properties of federal interest, and therefore would not meet selection criteria 6. As such, the utilization of either developed or undeveloped federal DMPAs would not fulfill the Project's

purpose and need (selection criteria 1) and therefore were not considered practicable alternatives for further evaluation.

3.4 SEDIMENT DIVERSION

FLNG conducted a screening-level assessment of two sediment diversion alternatives (southern dredging option and locks) to reduce the volume of sediment accumulation within the FLNG Basin. As part of this analysis, diversion structures located in the Gulf Intracoastal Waterway (GIWW) and Lower Turning Basin as well as alternative dredging and maintenance procedures were analyzed as potential sediment reduction features. FLNG conducted a screening-level assessment of these sediment diversion alternatives to determine their ability to meet the established screening criteria and fulfill the Project purpose and need. Provided as Table 3 are the results of the analysis conducted for the identified sediment diversion alternatives.

Table 3:
Selection Criteria Summary for Sediment Diversion Alternatives - Summary

Selection Criteria	Southern Dredging Option	Locks
1. Fulfillment of the Project Purpose and Need to allow for the confined placement of maintenance material transported by pipeline from the FLNG Basin to create stability for future operations and navigation of vessels within the FLNG Basin;	X	X
2. Located within 5 miles of the FLNG Basin, and preferably near other DMPAs (similar land-use) to minimize environmental impacts of transporting material to the site via pipeline.	M	M
3. Dredged material is suitable for placement at a given location;	N/A	N/A
4. Provides an annual dredged material capacity of 250,000 CY for at least 10 anticipated annual dredging events;	X	X
5. Proposed industrial use compatible with existing surrounding land use(s) and aesthetics	M	M
6. Minimizes impacts to properties of Federal interest;	X	X
7. Minimizes environmental impacts to the maximum extent practicable; and	M	M
8. Provides year-round availability to allow for periodic maintenance dredge disposal following possible natural disasters or other large-scale shoaling events.	N/A	N/A

M = Meets
X = Does not meet
N/A = Not Applicable

Based on the screening-level assessment conducted, neither sediment diversion alternative allowed for the required annual dredge capacity for a period of 10 years (selection criteria 4) or minimized impacts to properties of federal interest. Ultimately, neither alternative analyzed adequately fulfilled the Project's purpose and need (selection criteria 1) to allow for the confined placement of maintenance material dredged

from within the FLNG Basin to create stability for future operations and navigation of vessels.. As such, the utilization of sediment diversion alternatives was not considered a practicable alternative for further evaluation.

3.5 PRIVATE DMPA DEVELOPMENT

FLNG conducted an independent analysis of six potential sites for the development of a private DMPA. Refer to Appendix A, Figures 7-8 for a depiction of each potential private DMPA site evaluated. FLNG conducted a screening-level assessment of the potential private DMPA sites to determine their ability to meet the established screening criteria and fulfill the Project's purpose and need. In addition to the established screening criteria, FLNG also evaluated the anticipated cost for the development and maintenance of each private DMPA site. Provided as Table 4 are the results of the analysis conducted for each potential private DMPA site.

Table 4:
Selection Criteria Summary for Private DMPA Development Site Alternatives - Summary

Selection Criteria	Private DMPA Site					
	A	B	C	D	E	F
1. Fulfillment of the Project Purpose and Need to allow for the confined placement of maintenance material transported by pipeline from the FLNG Basin that allows for the utilization of smaller and more widely available dredging equipment, compared to offshore disposal, to create stability for future operations and navigation of vessels within the FLNG Basin;	P	P	M	X	P	P
2. Located within 5 miles of the FLNG Basin, and preferably near other DMPAs (similar land-use) to minimize environmental impacts of transporting material to the site via pipeline.	M	M	M	P	P	P
3. Dredged material is suitable for placement at a given location;	M	M	M	M	M	M
4. Provides adequate to accommodate at least 10 dredging events, estimated to be approximately 250,000 CY each based on an observed annual siltation rate;	P	M	M	X	M	M
5. Proposed industrial use compatible with existing surrounding land use(s) and aesthetics;	X	M	M	M	X	X
6. Minimizes impacts to properties of Federal interest	X	X	M	M	X	X
7. Minimizes environmental impacts to the maximum extent practicable; and	P	M	M	M	P	M
8. Provides year-round availability to allow for periodic maintenance dredge disposal following possible natural disasters or other large-scale shoaling events.	M	M	M	M	M	M
Cost of development and maintenance [a]	M	P	M	P	P	M

M = Meets
P = Partially Meets
X = Does Not Meet

[a] Additional consideration above those listed as selection criteria that FLNG has taken into account when evaluating potential private DMPA sites provided for reference.

The results of the screening-level assessment as presented in Table 4 indicate that the establishment of a private DMPA best fulfills the established screening criteria therefore the overall Project purpose and need in comparison to the no-action alternative, beneficial use alternatives, existing and undeveloped federal DMPA alternatives, and sediment diversion alternatives. Of the private DMPA sites analyzed, Private DMPA Site C was the only site that fully met all selection criteria and Project purpose and need (selection criteria 1). As such, Private DMPA Site C was selected for further evaluation as part of an Environmental Evaluation completed for the proposed Project. While none of the other sites fully met every selection criteria, Private DMPA Sites A and B allowed for the transport of material via pipeline while minimizing environmental impacts (selection criteria 2) and therefore also selected for further evaluation.

As part of their detailed alternatives analysis document provided to the USACE as part of their application, FLNG conducted a detailed Environmental Evaluation of potential impacts associated with the development and operation of a private DMPA at Sites A, B, and C to determine which is the preferred practicable alternative based on FLNG's Environmental Evaluation that fulfills the Project purpose and need for the confined placement of maintenance material via pipeline dredged from the FLNG Basin. Provided in the following sections is a summary of the methods and results of the Environmental Evaluation FLNG conducted for Private DMPA Sites A, B, and C.

4.0 PRIVATE DMPA SITE A, B, AND C ENVIRONMENTAL EVALUATION SUMMARY

FLNG conducted a detailed Environmental Evaluation to determine the potential impacts as a result of the construction and operation at Private DMPA Sites A, B, and C to determine the preferred practicable alternative for advancement as the proposed Project. The Environmental Evaluation considered potential environmental impacts as a result of the development of the Project at Private DMPA Site A, B, and C for the following resources:

1) Historic and Cultural Resources
2) Wetlands and Special Aquatic Sites
3) Sediment and Water Quality
4) State and Federally Listed Threatened and Endangered Species
5) Fish and Wildlife Values
6) Floodplain
7) Shoreline Erosion and Accretion
8) Recreation and Aesthetics
9) Socioeconomics
10) Navigation and Safety
11) Federal Projects
12) Air Quality
13) Mineral Needs
14) Other Federal, State, or Local Requirements
15) Other Factors
16) Cumulative and Secondary Impacts

Based on the Environmental Evaluation conducted by FLNG, the development of the Private DMPA Site C as the proposed FLNG CDMPA is the preferred practicable alternative that fulfills the Project purpose and need for the confined placement of maintenance material via pipeline that is dredged from the FLNG Basin.

5.0 CONCLUSION

The alternative screening process and Environmental Evaluation was completed based on comprehensive knowledge of the requirements to complete a project in this environment. The development of the Private DMPA Site C and as the proposed FLNG CDMPA is considered the preferred practicable alternative that fulfills the Project purpose and need for the confined placement of maintenance material dredged from the FLNG Basin and transported by pipeline. FLNG may utilize its existing small upland confined placement area at the LQF Terminal for the one-time use for emergency dredging purposes, and pending receipt of appropriate approvals, the Freeport Maintenance ODMDS will still be utilized for the disposal of dredged material from the FLNG Basin in the event that the volume or timing of the dredging activity becomes consequently feasible and beneficial for the overall project to do so. With current lack of availability of large-scale confined dredged material placement area capacity in the Freeport area as well as the potential for sedimentation rates to increase above current values once the Brazos River floodgates are modified as outlined in the USACE Feasibility Study, a privately operated CDMPA that can accept emergency and routine maintenance dredging volumes is vital to ensure long-term operations of the FLNG Basin.

Appendix A

Project Figures

Legend

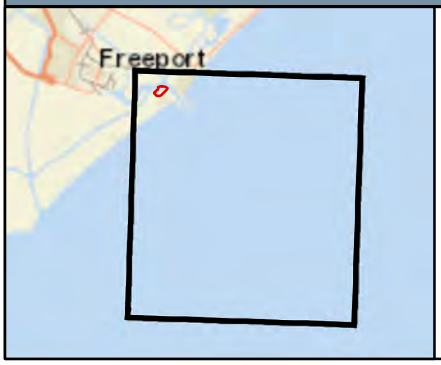
FLNG Basin

N

Figure 1:
Vicintiy Map
USACE Permit Application
SWG-2013-00147
FLNG CDMPA Freeport, Texas

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	

LLOYD ENGINEERING, INC.



Legend

ODMDS Boundary

FLNG Basin

N

0 2,600 5,200 10,400 Feet

Figure 2:
Offshore Dredge Material Placement Sites
USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 02, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 5,280 feet	

LLOYD ENGINEERING, INC.

Potential BU Site ID	Latitude	Longitude
Potential BU Site A	28.919654°	-95.338020°
Potential BU Site B	28.918244°	-95.358135°
Potential BU Site C	28.925005°	-95.377752°
Potential BU Site D	28.985533°	-95.296876°
Potential BU Site E	28.962637°	-95.302284°
Potential BU Site F	28.969460°	-95.275770°

Legend

- FLNG Basin
- Potential BU Sites
- Critical Habitat Area

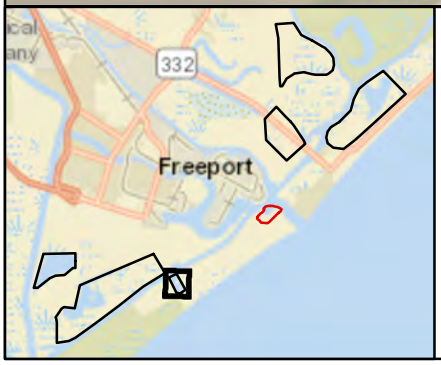
N

0 2,650 5,300 10,600 Feet

Figure 3:
Potential Beneficial Use Sites
USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019
Prepared By: CG
Project: FLNG CDMPA
1 inch = 5,404 feet

LLOYD ENGINEERING, INC.



Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

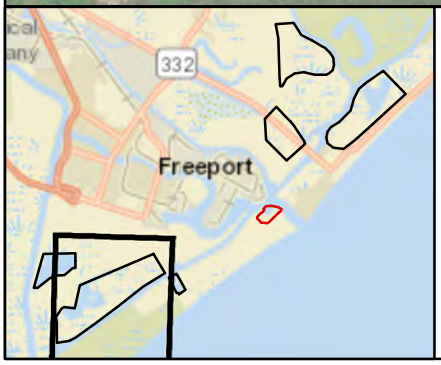
0 145 290 580 Feet

Figure 4A:
Potential Beneficial Use Site A

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 300 feet	

LLOYD ENGINEERING, INC.



Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 750 1,500 3,000 Feet

Figure 4B:
Potential Beneficial Use Site B

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 1,500 feet	

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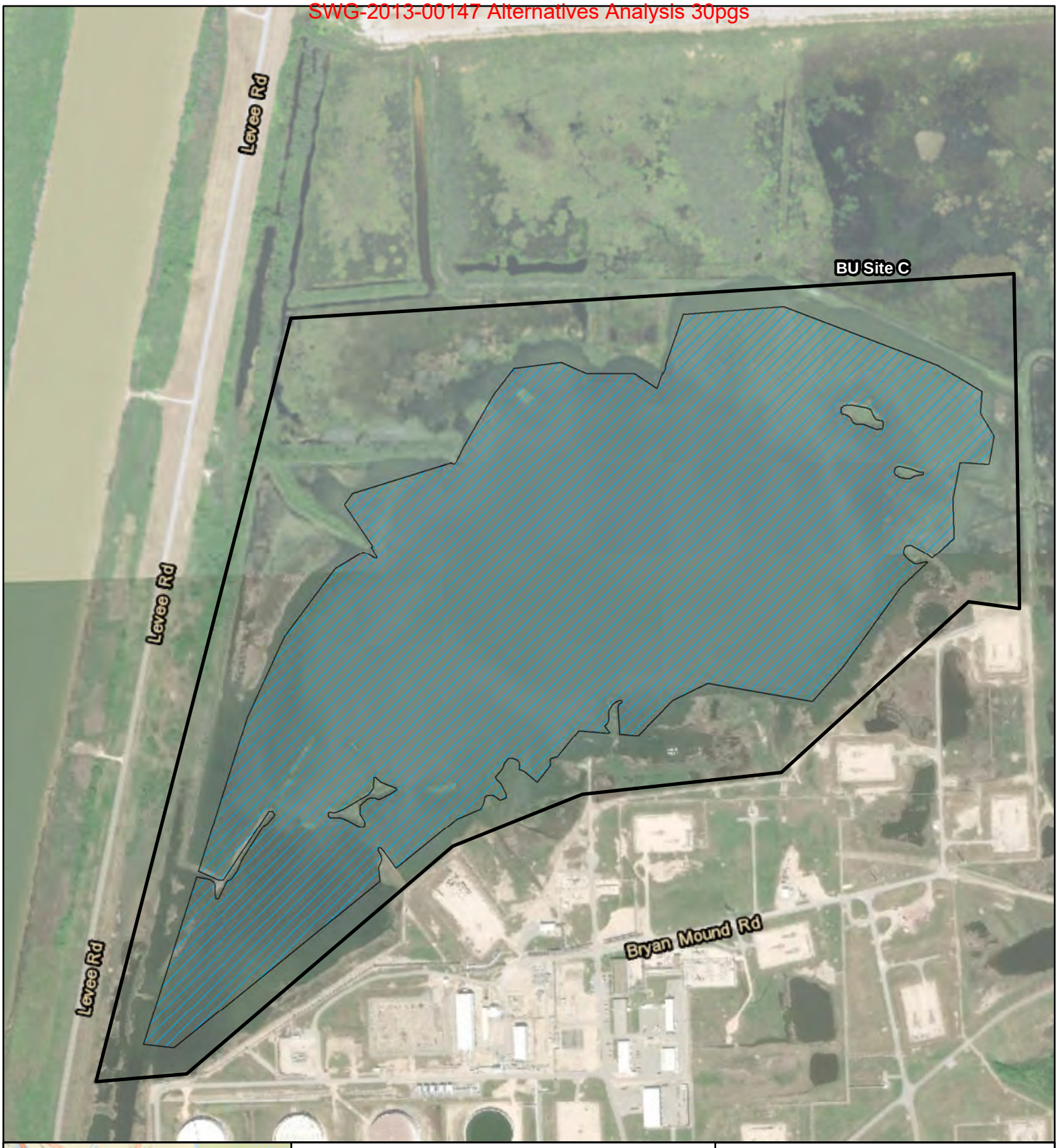

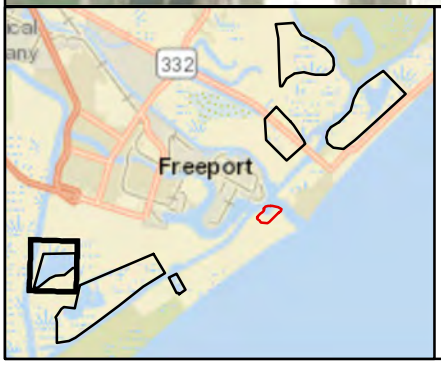

Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 305 610 1,220 Feet

Figure 4C:
Potential Beneficial Use Site C

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 600 feet	

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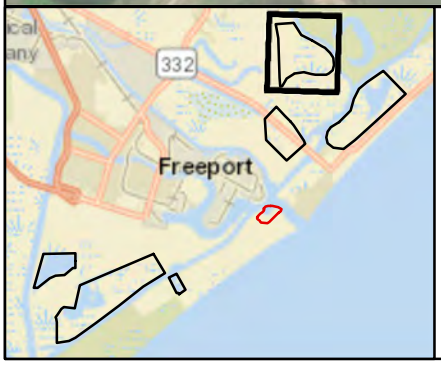

Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 455 910 1,820 Feet

Figure 4D:
Potential Beneficial Use Site D

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 900 feet	

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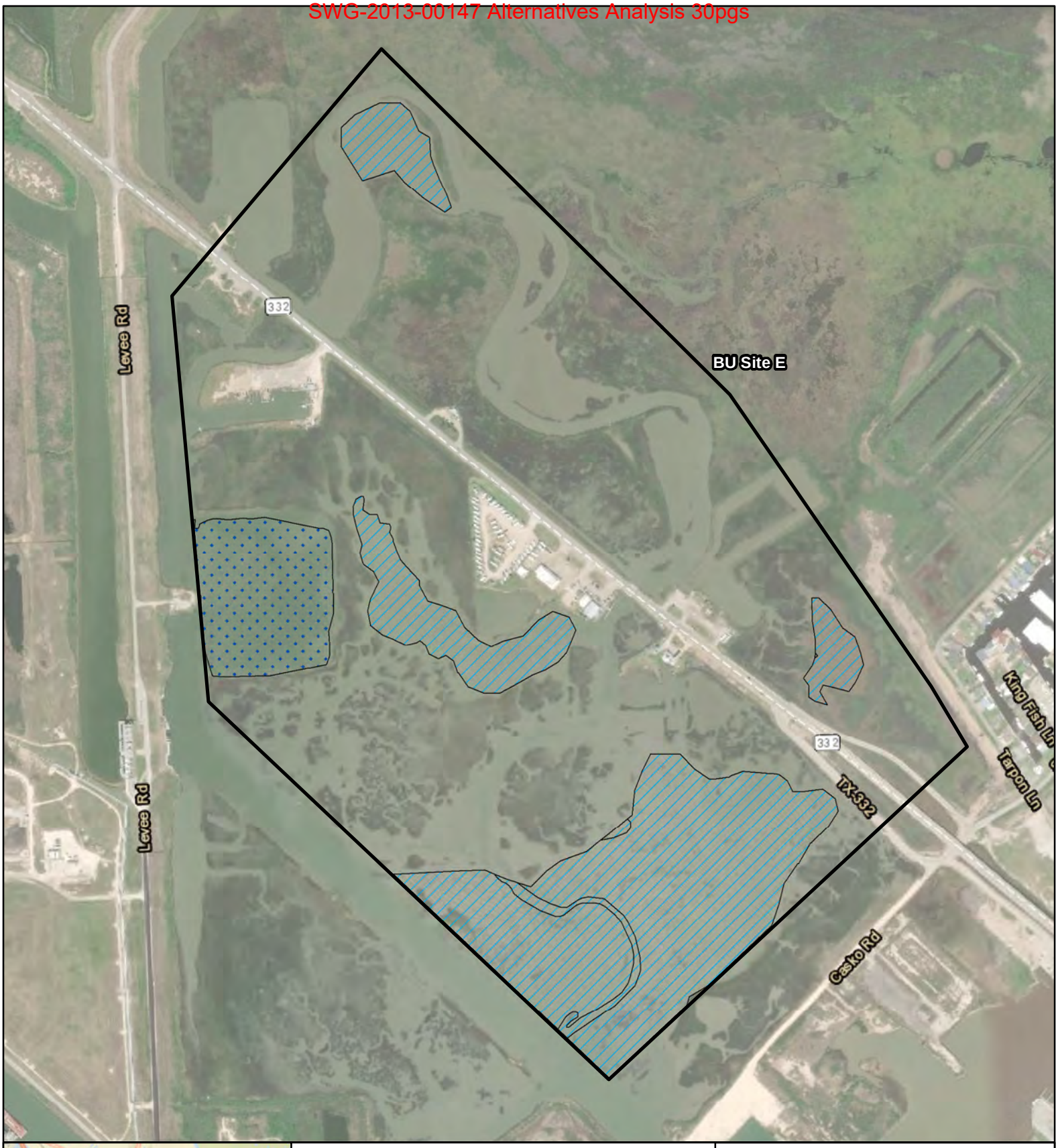

Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 355 710 1,420 Feet

Figure 4E:
Potential Beneficial Use Site E

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 700 feet	

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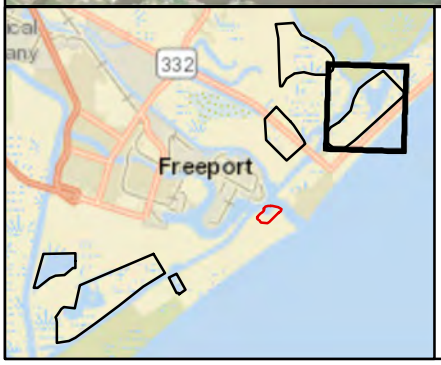


Legend

- Potential BU Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

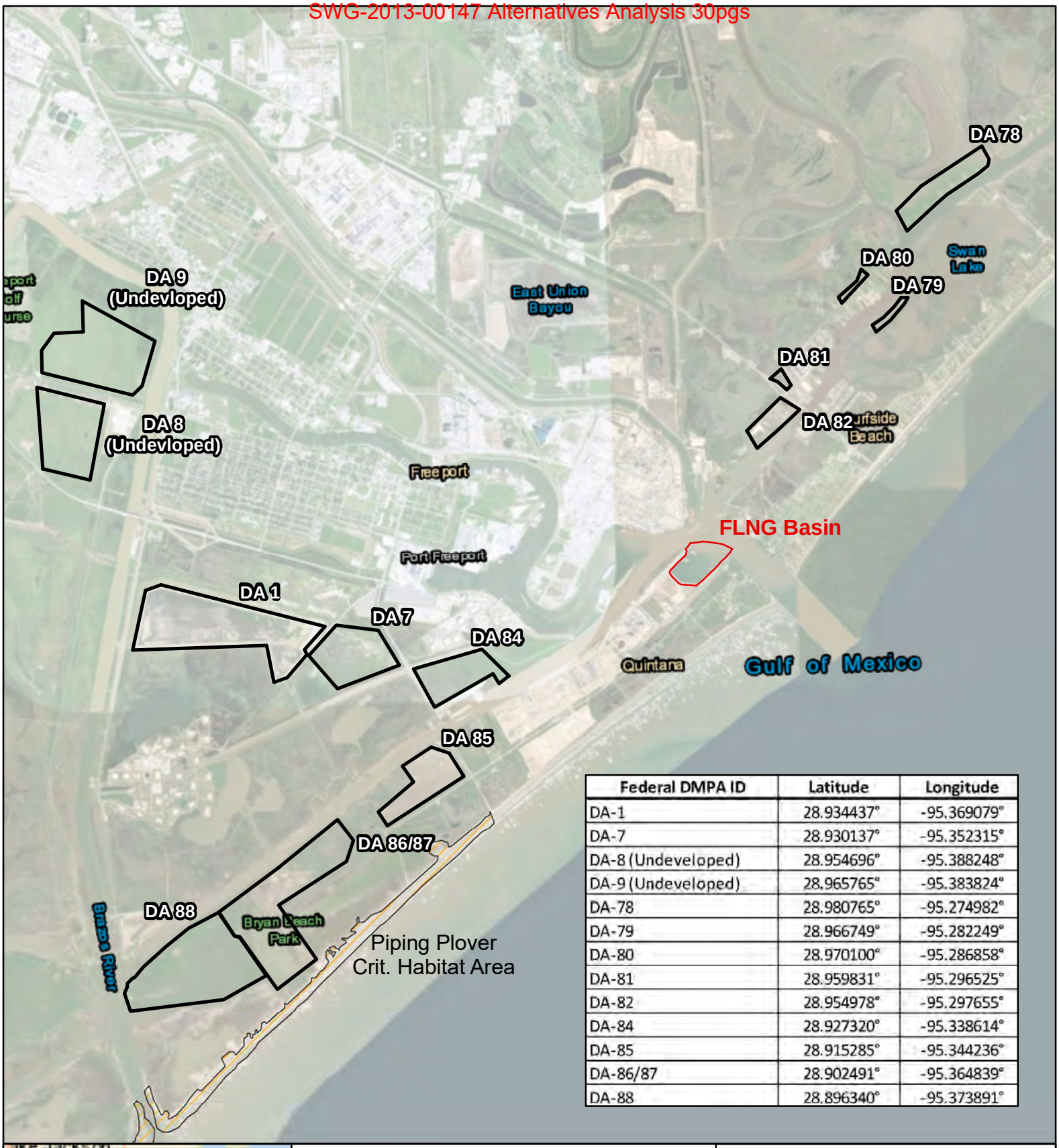
0 500 1,000 2,000 Feet

Figure 4F:
Potential Beneficial Use Site F

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 1,000 feet	

LLOYD ENGINEERING, INC.



Federal DMPA ID	Latitude	Longitude
DA-1	28.934437°	-95.369079°
DA-7	28.930137°	-95.352315°
DA-8 (Undeveloped)	28.954696°	-95.388248°
DA-9 (Undeveloped)	28.965765°	-95.383824°
DA-78	28.980765°	-95.274982°
DA-79	28.966749°	-95.282249°
DA-80	28.970100°	-95.286858°
DA-81	28.959831°	-95.296525°
DA-82	28.954978°	-95.297655°
DA-84	28.927320°	-95.338614°
DA-85	28.915285°	-95.344236°
DA-86/87	28.902491°	-95.364839°
DA-88	28.896340°	-95.373891°

Legend

- FLNG Basin
- Federal DMPAs
- Critical Habitat Area

N

0 2,600 5,200 10,400 Feet

Figure 5:
Federal DMPA Sites

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 02, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 5,280 feet	

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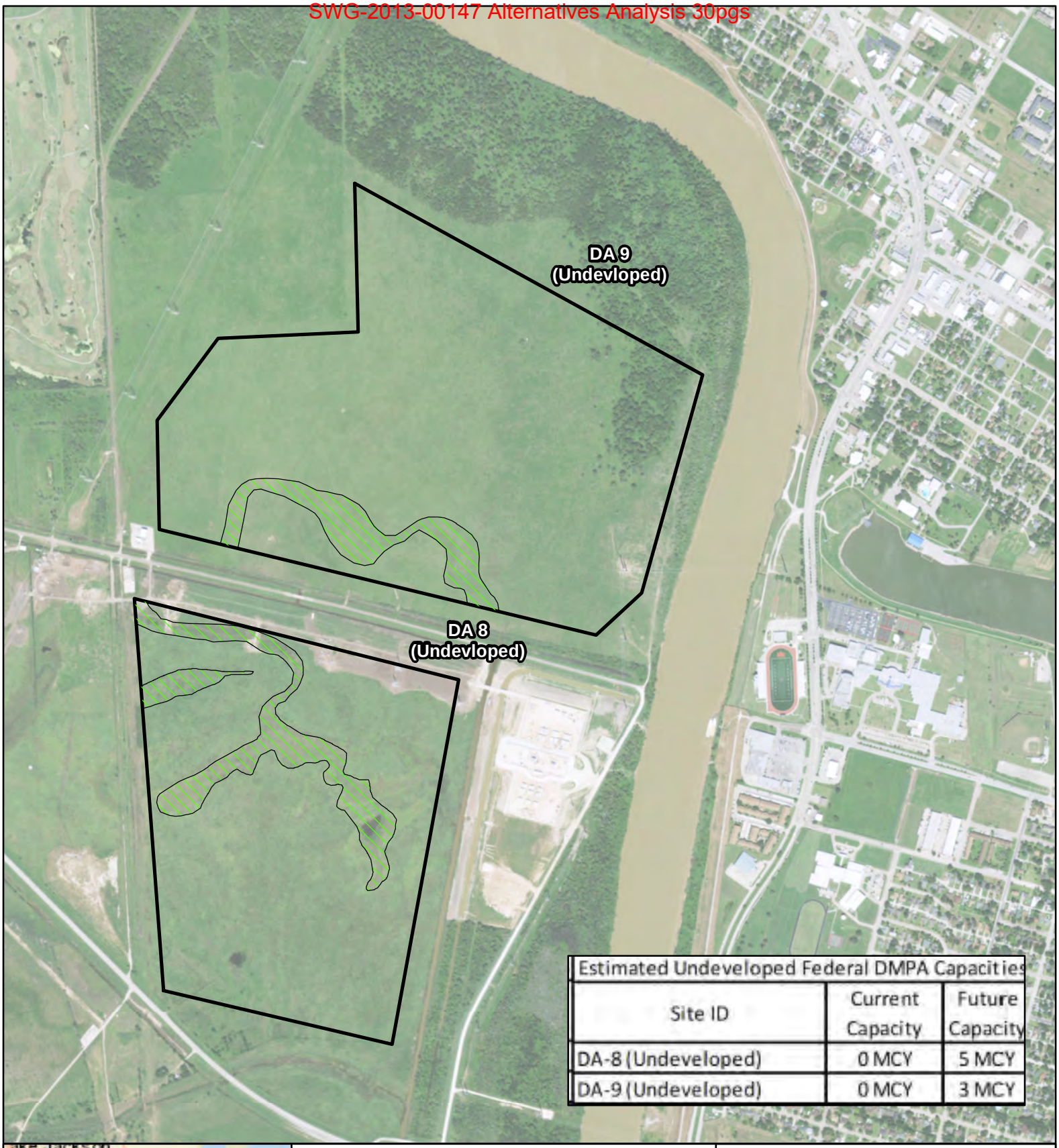

Estimated Undeveloped Federal DMPA Capacities		
Site ID	Current Capacity	Future Capacity
DA-8 (Undeveloped)	0 MCY	5 MCY
DA-9 (Undeveloped)	0 MCY	3 MCY

Legend

- Federal DMPAs
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

0 500 1,000 2,000 Feet

N

Figure 6:
Undeveloped Federal DMPA Sites

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 1,097 feet	

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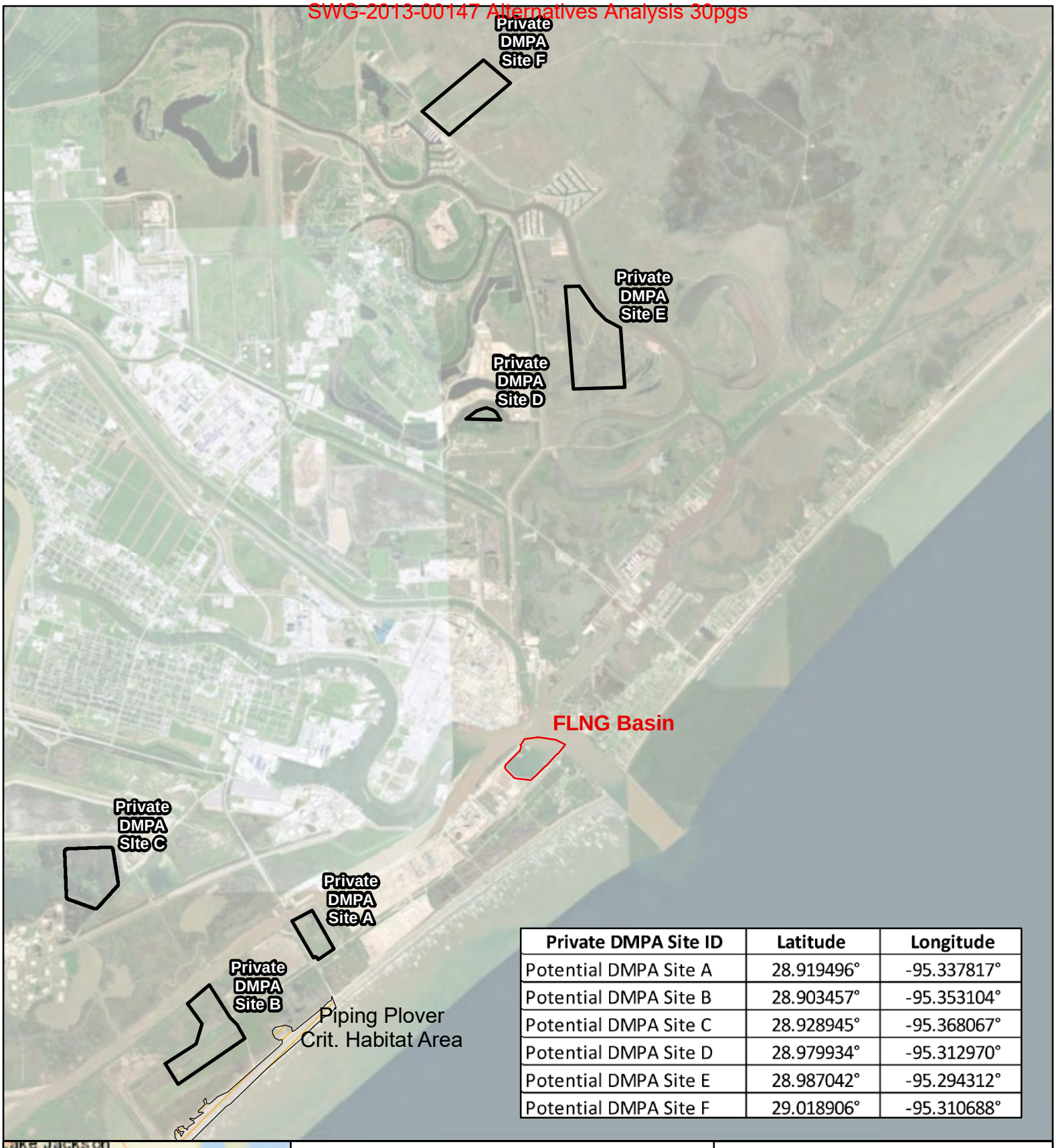

Private DMPA Site ID	Latitude	Longitude
Potential DMPA Site A	28.919496°	-95.337817°
Potential DMPA Site B	28.903457°	-95.353104°
Potential DMPA Site C	28.928945°	-95.368067°
Potential DMPA Site D	28.979934°	-95.312970°
Potential DMPA Site E	28.987042°	-95.294312°
Potential DMPA Site F	29.018906°	-95.310688°

Legend

- FLNG Basin
- Potential Private DMPA Sites
- Critical Habitat Area

N

0 2,700 5,400 10,800 Feet

Figure 7:
Potential Private DMPA Sites

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 5,479 feet	

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Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 150 300 600 Feet

Figure 8A:
Potential Private DMPA Site A

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 300 feet	

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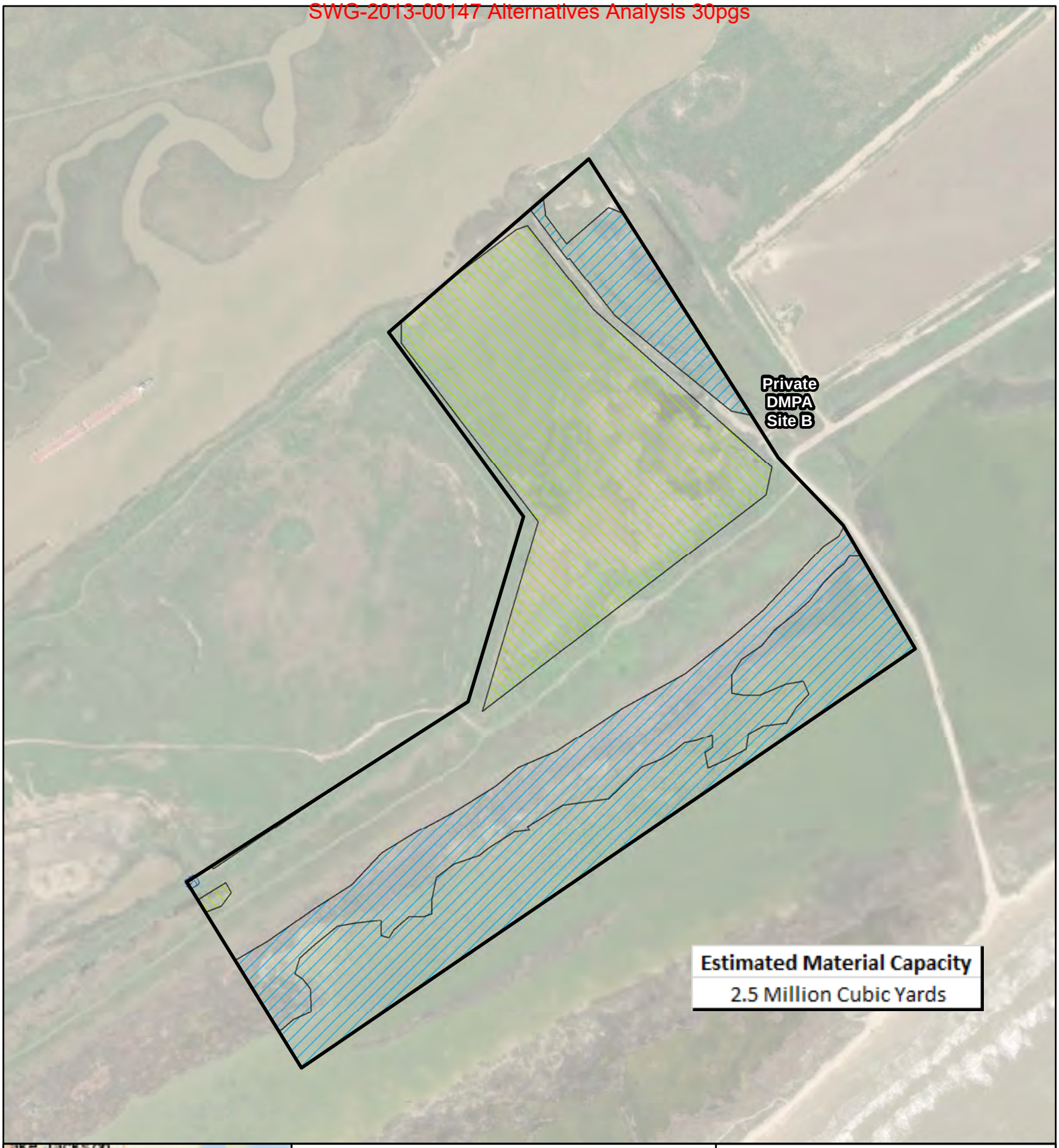

Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

0 300 600 1,200 Feet

N

Figure 8B:
Potential Private DMPA Site B

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 600 feet	

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Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake/Open Water

N

0 210 420 840 Feet

Figure 8C:
Potential Private DMPA Site C

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 420 feet	

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Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 175 350 700 Feet

Figure 8D:
Potential Private DMPA Site D

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 350 feet	

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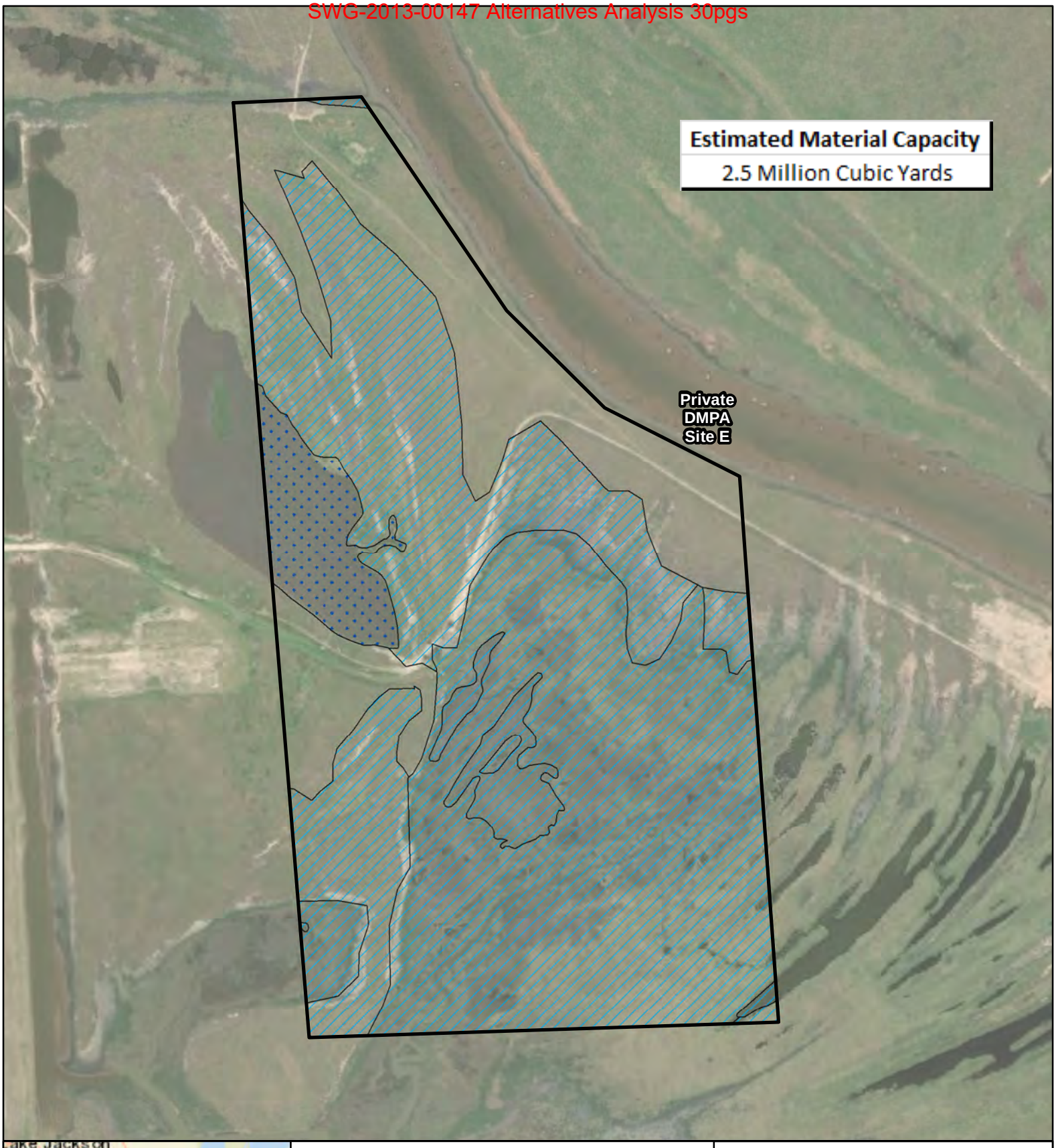


Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

0 300 600 1,200 Feet

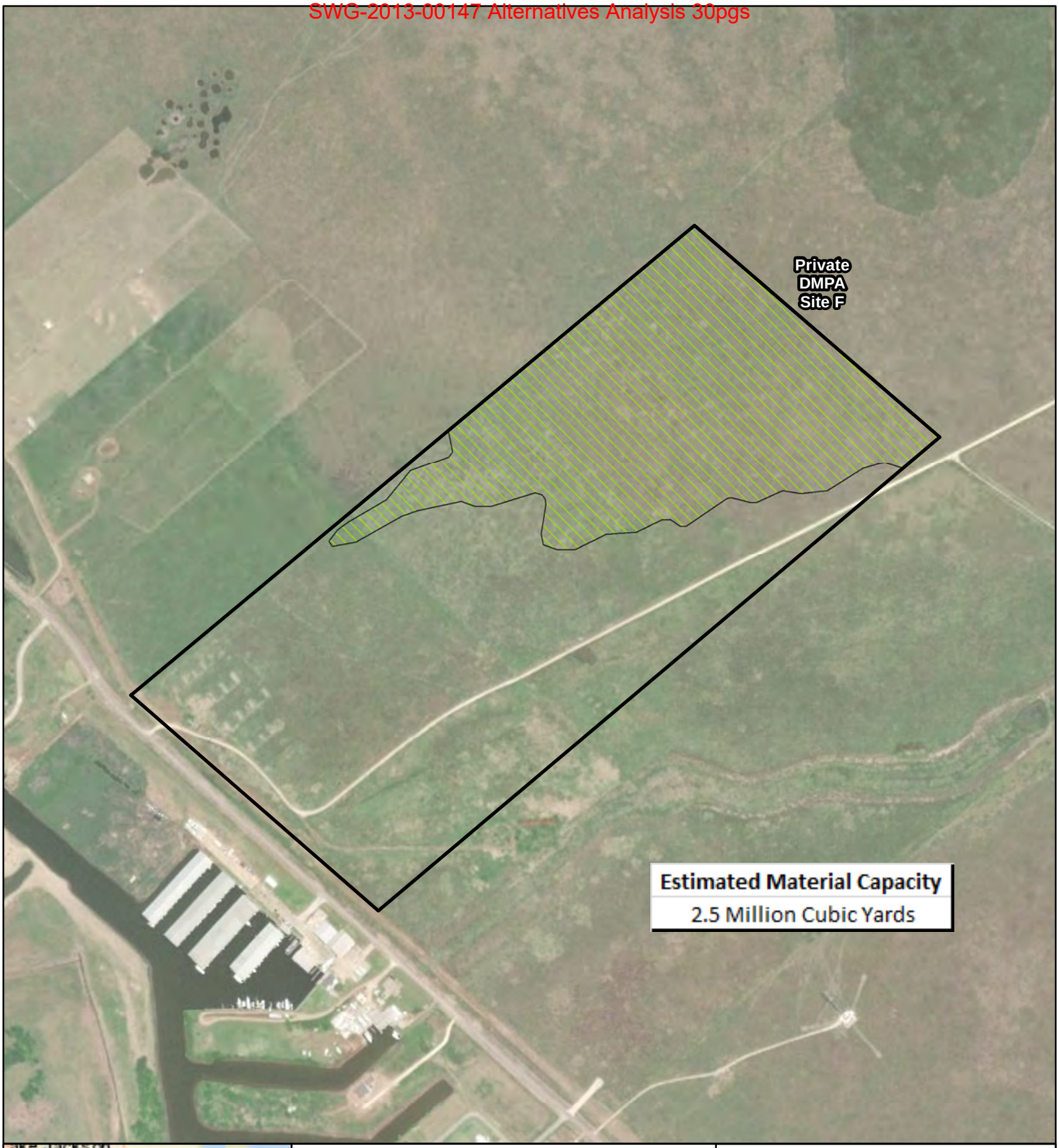
N

Figure 8E:
Potential Private DMPA Site E

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 600 feet	

LLOYD ENGINEERING, INC.



Legend

- Potential Private DMPA Sites
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

N

0 300 600 1,200 Feet

Figure 8F:
Potential Private DMPA Site F

USACE Permit Application
SWG-2013-00147
FLNG CDMPA

Date: Jul 03, 2019	
Prepared By: CG	
Project: FLNG CDMPA	
1 inch = 600 feet	

LLOYD ENGINEERING, INC.