
JOINT APPLICATION FOR INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT/ AUTHORIZATION TO USE STATE-OWNED SUBMERGED LANDS/ FEDERAL DREDGE AND FILL PERMIT

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION/
WATER MANAGEMENT DISTRICTS/
U.S. ARMY CORPS OF ENGINEERS

Effective October 1, 2013



INSTRUCTIONS FOR USE OF THIS FORM:

This form is designed to assist you in submitting a complete application. All applications must include Section A- General Information for All Activities. Sections B through H list typical information that is needed based on the proposed activities, and are only required as applicable. Part 1-C of Section A will guide you to the correct sections needed based on your proposed activities. Applicants are advised to consult Chapter 62-330, F.A.C., and the Environmental Resource Permit Applicant's Handbook Volumes I and II for information regarding the ERP permitting process and requirements while preparing their application. Internet addresses for Chapter 62-330, F.A.C. and the Applicant's Handbook, Agency contact information, and additional instructions for this form can be found in Attachment 1.

What Sections of the Application Must I Fill Out?

Does the project involve....	Section						
	A- General Information	B- Single Family Projects	C- Wetlands and other Surface Waters	D- Structures or Works in Surface Waters	E- Stormwater Management System	F- State-owned Submerged Lands	G- Mitigation Banks
Fill in wetlands or waters for a single family residence?	X	X					
Docks, shoreline stabilization, seawalls associated with a single family residence?	X	X				X, if applicable	
Wetland impacts (other than associated with an individual residence)?	X		X				
Boating facilities, a marina, jetty, reef, or dredging?	X		X	X		X if applicable	
Any work on state owned submerged land?	X		X			X	
Construction of a stormwater management system?	X		X, if applicable		X		
Constructing a mitigation bank?	X		X		X, if applicable		X
Creating a mine?	X		X, if applicable				X

Note- if you are required to provide Section B, then you do not have to provide any other Sections, unless the activities are on state-owned submerged lands. In that case, Section F will also be required.

If you have any questions, or would like assistance completing this form, please contact the staff of the nearest office of either the Florida Department of Environmental Protection (DEP) or a Water Management District (WMD) (see Attachment 2).

Section A: General Information for All Activities

PART 1: NAME, APPLICATION TYPE, LOCATION, AND DESCRIPTION OF ACTIVITY

A. Name of project, including phase if applicable: **Turtle Point and Barge Canal/Basin Water Quality Improvement Projects**

B. This is for (check all that apply):

- Construction or operation of ***new*** works, activities and/ or a stormwater management system
- Conceptual Approval*** of proposed works, activities and/ or a stormwater management system
- Modification or Alteration of ***existing*** works activities and / or a stormwater management system. Provide the existing DEP or WMD permit #, if known: _____ Note: Minor modifications do not require completion of this form, and may instead be requested by letter.
- Maintenance or repair*** of works, activities and/ or stormwater management system previously permitted by the DEP or WMD. Provide existing permit #, if known: _____
- Abandonment or removal of works, activities and/ or stormwater management system. Provide existing DEP or WMD permit #, if known: _____
- Operation of an ***existing unpermitted*** stormwater management system.
- Construction of additional phases of a permitted work, activity and/ or stormwater management system.

Provide the existing DEP or WMD permit #, if known: _____

C. ***List the type of activities proposed. Check all that apply, and provide the supplemental information requested in each of the referenced application sections. Please also reference Applicant's Handbooks I and II for the type of information that may be needed.***

- Activities associated with one single-family residence, duplex, triplex, or quadruplex that do not qualify for an exemption or a General Permit: ***Provide the information requested in Section B. Do not complete Section C.***
- Activities within wetlands or surface waters, or within 25 feet of a wetland or surface water, (not including the activities associated with an individual residence). ***Examples include dredging, filling, outfall structures, docks, piers, over-water structures, shoreline stabilization, mitigation, reclamation, restoration/enhancement. Provide the information requested in Section C.***
- Activities within navigable or flowing surface waters such as a multi-slip dock or marina, dry storage facility, dredging, bridge, breakwaters, reefs, or other offshore structures: ***In addition to Section C, also provide the information requested in Section D.***
- Activities that are (or may be) located within, on or over state-owned submerged lands (See Chapter 18-21, F.A.C. <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=18-21>): ***In addition to Section B or C, also provide the information requested in Section F***

- Construction or alteration of a stormwater management system serving residential, commercial, transportation, industrial, agricultural, or other land uses, or a solid waste facility (excluding mines that are regulated by DEP). **Provide the information requested in Section E.**
- Creation or modification of Mitigation Bank (refer to Chapter 62-342, F.A.C. <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-342>): **Provide the information requested in Section G.**
- Mines (as defined in Section 2.0 of Applicant's Handbook Volume I) that are regulated by the DEP: **Provide the information requested in Section H.**
- Other, describe: Please contact the Agency to determine which additional sections of the application are needed. See Attachment 1 for Agency contacts.

D. Describe in general terms the proposed project, system, works, or other activities. For permit modifications, please briefly describe the changes requested to the permit:

The Turtle Point and Barge Canal/Basin Water Quality Improvement Projects (Project), located at the Turkey Point Power Plant in Homestead, Miami-Dade County. The Project is intended to improve water quality within approximately 1.9 acres of remnant canal and 5.6 acres of barge basin immediately adjacent to the Turkey Point Cooling Canal System (CCS) and within Biscayne Bay.

The Project site was previously the outflow point from the Grand Canal for the Turkey Point Fossil Plant Units 1 & 2. The canal was dredged to approximately -20 to -28 feet NAVD during the initial construction of the Plant in order to allow once through cooling water to be discharged into Biscayne Bay. The canal has since been plugged and is no longer in use or necessary due to the construction of the CCS system. The remnant canal and adjacent area of scour from outflows is proposed to be backfilled in order to improve water quality within Biscayne Bay. The Project site is adjacent to the fuel tanks within the existing Turkey Point Nuclear Power Plant and the basin is used to dock barges. The canal was dredged to approximately -30 feet NAVD during the initial construction of the Plant in order to allow deeper draft vessels and fuel barges to access the site. The Barge Canal is proposed to be backfilled (restored) to -15 NAVD in order to improve water quality within Biscayne Bay.

E. For activities in, on, or over wetlands or other surface waters, check the type of federal dredge and fill permit requested (if known): Individual Programmatic General permit #: SAJ
 General Nationwide permit #: NWP 27 Not Applicable Not sure

F. Project/Activity Street/Road Address or other location (if applicable): **9760 SW 344 Street**
City: Homestead County(ies): Miami Dade Zip: 33035

Note: For utility, road, or ditch/canal activities, provide a starting and ending point using street names and nearest house numbers or provide length of project in miles along named streets or highways.

G. Project location map and Section, Township, and Range information (use additional sheets if needed):
Please attach a location map showing the location and boundaries of the proposed activity in relation to major intersections or other landmarks. The map should also contain a north arrow and a graphic scale; show Section(s), Township(s), and Range(s); and must be of sufficient detail to allow a person unfamiliar with the site to find it.

Section(s): 34 Township: 57 Range: 60E Land Grant name, if applicable:

Section(s): Township: Range:
Section(s): Township: Range:

H. Latitude (DMS) **25° 25' 09"** Longitude (DMS) **80° 19' 42"** (Taken from central location of the activity). Explain source for obtaining latitude and longitude (i.e. U.S.G.S. Quadrangle Map, GPS, online resource):

I. Tax Parcel Identification Number(s):
[Number may be obtained from property tax bill or from the county property appraiser's office; if on multiple parcels, provide multiple Tax Parcel Identification Numbers]

J. Directions to Site (from major roads; include distances and landmarks as applicable): **Florida Turnpike south to Exit 2. Turn left onto Campbell Drive, turn left onto SW 162nd Ave, turn left onto SW 344 St, head east to Turkey Point Power Plant.**

K. Project area or phase area: **7.5 acres**

L. Name of waterbody(ies) (if known) in which activities will occur or into which the system will discharge: **Biscayne Bay**

The following questions (M-O) are not applicable to activities related to a single-family residence, including private single-family residential docks, piers, seawalls or boat ramps.

M. Is it part of a larger plan of development or sale? yes no

N. Impervious or semi-impervious area excluding wetlands and other surface waters (if applicable):
acres or square feet

O. Volume of water the system is capable of impounding (if applicable): acre-feet.

PART 2: SUPPLEMENTAL INFORMATION, AND PERMIT HISTORY

A. Is this an application to modify an existing Environmental Resource Permit, or to construct or implement part of a multi-phase project, such as a project with a Conceptual Approval permit? Yes No *If you answered "yes", please provide permit numbers below:*

AGENCY	DATE	PERMIT/APPLICATION NO.	PROJECT NAME

B. Indicate if there have been any *pre-application meeting(s)* or other discussions about the proposed project, system or activity. If so, please provide the date(s), location(s) of the meeting, and the name(s) of Agency staff that attended the meeting(s):

AGENCY	DATE	LOCATION	MEETING ATTENDEES

C. **Attach a depiction (plan and section views), which clearly shows the works or other activities proposed to be constructed.** Use multiple sheets, if necessary, a scale sufficient to show the location and type of works, and include a north arrow and a key to any symbols used. **Specific information to be included in the plans is based on the activities proposed and is further described in Sections B-H.** However, supplemental information may be required based on the specific circumstances or location of the proposed works or other activities.

D. **Processing Fee: Please submit the application processing fee along with this application form and supplemental information.** Processing fees vary based on the size of the activity, the type of permit applied for, and the reviewing Agency. Please reference Attachment 3 to determine the appropriate fee.

PART 3: APPLICANT AND ASSOCIATED PARTIES INFORMATION

Instructions: Permits are only issued to entities having sufficient real property interest as described in Section 4.2.3 (d) of Applicant's Handbook Volume I. Please attach evidence of sufficient real property interest over the land upon which the activities subject to the application will be conducted, including mitigation (if applicable). Refer to Section 4.2.3 (d) for acceptable ownership or real property interest documentation. For corporations, list a person who is a registered agent or officer of the corporation who has the legal authority to bind the corporation.

A. APPLICANT (ENTITY MUST HAVE SUFFICIENT REAL PROPERTY INTEREST) <input type="checkbox"/> THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION			
Name: Last: Raffenber	First: Matthew	Middle:	
Title:	Company: Florida Power & Light		
Address: 700 Universe Boulevard JB/JES			
City: Juno Beach	State: FL	Zip: 33408	
Home Telephone:	Work Telephone: 561-691-2808		
Cell Phone:	Fax:		
E-mail Address: matthew.raffenberg@fpl.com			
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>			
B. LAND OWNER(S) (IF DIFFERENT OR IN ADDITION TO APPLICANT) <input type="checkbox"/> CHECK HERE IF LAND OWNER IS ALSO A CO-APPLICANT			
Name: Last:	First:	Middle:	
Title:	Company:		
Address:			
City:	State:	Zip:	
Home Telephone:	Work Telephone:		
Cell Phone:	Fax:		
E-mail Address:			
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>			
C. OPERATION AND MAINTENANCE ENTITY (see Applicant's Handbook I, Section 12.3)			
Entity Name:	Contact: Last:	First:	Middle:
Title:	Company:		
Address:			
City:	State:	Zip:	
Home Telephone:	Work Telephone:		
Cell Phone:	Fax:		
E-mail Address:			
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>			

D. CO-APPLICANT (IF DIFFERENT OR IN ADDITION TO APPLICANT AND OWNER)

Name: Last:	First:	Middle:
Title:	Company:	
Address:		
City:	State:	Zip:
Home Telephone:	Work Telephone:	
Cell Phone:	Fax:	
E-mail Address:		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>		

E. ENGINEERING CONSULTANT THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION

Name: Last:	First:	Middle:
Title:	Company:	
Address:		
City:	State:	Zip:
Home Telephone:	Work Telephone:	
Cell Phone:	Fax:	
E-mail Address:		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>		

F. ENVIRONMENTAL CONSULTANT THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION

Name: Last: Vince	First: Georgia	Middle:
Title: Project Manager	Company: Tetra Tech, Inc.	
Address: 759 S. Federal Highway		
City: Stuart	State: FL	Zip: 34994
Home Telephone:	Work Telephone: 772-781-3441	
Cell Phone: 561-236-8692	Fax:	
E-mail Address: Georgia.vince@tetratech.com		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>		

**G. AGENT AUTHORIZED TO SECURE PERMIT (IF DIFFERENT FROM CONSULTANT)
 THIS IS A CONTACT PERSON FOR ADDITIONAL INFORMATION**

Name: Last: Shea	First: Eric	Middle: M
Title:	Company: Florida Power & Light	
Address: 700 Universe Boulevard JB/JES		
City: Juno Beach	State: FL	Zip: 33408
Home Telephone:	Work Telephone: 561-691-2993	
Cell Phone:	Fax:	
E-mail Address: eric.m.shea@fpl.com		
Correspondence will be sent via email. Check here to receive correspondence via US Mail: <input type="checkbox"/>		

If necessary, please add additional pages for other contacts and property owners related to this project.

PART 4: SIGNATURES AND AUTHORIZATION TO ACCESS PROPERTY

Instructions: For multiple applicants please provide a separate Part 4 for each applicant. For corporations, the application must be signed by a person authorized to bind the corporation. A person who has sufficient real property interest (see Section 4.2.3 (d) of Applicant's Handbook Volume I) is required in (B) to authorize access to the property, except when the applicant has the power of eminent domain.

A. By signing this application form, I am applying for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application and represent that such information is true, complete and accurate. I understand this is an application and not a permit, and that work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relieve of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a different responsible operation and maintenance entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Matthew J. Raffenberg
Typed/Printed Name of Applicant or
Applicant's Authorized Agent

Matthew J. Raffenberg
Signature of Applicant or Applicant's
Authorized Agent

Date

8/2/16

Sr. Director, Environmental Services
(Corporate Title if applicable)

B. CERTIFICATION OF SUFFICIENT REAL PROPERTY INTEREST AND AUTHORIZATION FOR STAFF TO ACCESS THE PROPERTY:

I certify that:

I possess sufficient real property interest in or control, as defined in Section 4.2.3 (d) of Applicant's Handbook Volume I, over the land upon which the activities described in this application are proposed and I have legal authority to grant permission to access those lands. I hereby grant permission, evidenced by my signature below, for staff of the Agency and the U.S. Army Corps of Engineers to access, inspect, and sample the lands and waters of the property as necessary for the review of the proposed works and other activities specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review, inspection, and/ or sampling. Further, I agree to provide entry to the project site for such agents or personnel to monitor and inspect permitted work if a permit is granted.

OR

I represent an entity having the power of eminent domain and condemnation authority, and I/we shall make appropriate arrangements to enable staff of the Agency and the U.S. Army Corps of Engineers to access, inspect, and sample the property as described above.

Matthew J. Raffenberg
Typed/Printed Name

Matthew J. Raffenberg
Signature

8/2/16
Date

Sr. Director, Environmental Services
(Corporate Title if applicable)

C. DESIGNATION OF AUTHORIZED AGENT (IF APPLICABLE):

I hereby designate and authorize _____ to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I authorize the above-listed agent to bind me, or my corporation, to perform any requirements which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Typed/Printed Name of Applicant

Signature of Applicant

Date

(Corporate Title if applicable)

SECTION C: SUPPLEMENTAL INFORMATION FOR WORKS OR OTHER ACTIVITIES IN, ON, OR OVER WETLANDS AND/OR OTHER SURFACE WATERS

(Note: This section is not required if all the proposed activities are covered in Section B.)

Instructions: This section is for ERP applications that do not involve activities associated with an individual single-family residence, duplex, triplex or quadruplex. For those activities, please use Section B. This form is to be completed if the proposed work or activity will occur in, on, over, or within 25 feet of a wetland or other surface water. The supplemental information required by this section is in addition to the information required by Section A of the ERP application.

PART 1: WETLAND OR OTHER SURFACE WATER IMPACT SUMMARY

1. Describe the basic purpose of the project or activity:

The Turtle Point and Barge Canal/Basin Water Quality Improvement Projects (Project), located at the Turkey Point Power Plant in Homestead, Miami-Dade County. The Project is intended to improve water quality within approximately 1.9 acres of remnant canal and 5.6 acres of active barge basin immediately adjacent to the Turkey Point Cooling Canal System (CCS) and within Biscayne Bay.

The Project site was previously the outflow point from the Grand Canal for the Turkey Point Fossil Plant Units 1 & 2. The canal was dredged to approximately -20 to -28 feet NAVD during the initial construction of the Plant in order to allow once through cooling water to be discharged into Biscayne Bay. The canal has since been plugged and is no longer in use or necessary due to the construction of the CCS system. The remnant canal and adjacent area of scour from outflows is proposed to be backfilled in order to improve water quality within Biscayne Bay. The barge basin is adjacent to the fuel tanks within the existing Turkey Point Plant and is used to turn and dock barges. The canal was dredged to approximately -30 feet NAVD during the initial construction of the Plant in order to allow deeper draft vessels and fuel barges to access the site.

2. Total area of work (dredging, filling, construction, alteration, or removal) in, on, or over wetlands or other surface waters: sq. ft.; 7.5 ac.
3. Total volume of material in wetlands or other surface waters:
 - a. to be dredged: cubic yards,
 - b. to be filled: 181,000 cubic yards.
4. Identify the seasonal high water level (SHWL) and wetland normal pool elevations for each wetland or surface water within the project site. For tidal wetlands and/or surface waters provide the elevation of mean high and mean low water. Include an aerial photograph showing the location of each sampling location, dates, datum, and methods used to determine these elevations.
5. Name of waterbody(ies) (if applicable & if known) in which work will occur? **Biscayne Bay**
6. Is the activity proposed in an Outstanding Florida Water or Aquatic Preserve?



yes, name: **Biscayne Bay AP** no I don't know

7. Has there ever been a formal or informal wetland determination for the project site? If yes, provide the identifying number and/ or a copy of the jurisdictional map. **N/A**
8. Provide a map(s) of the project area and vicinity delineating USDA/NRCS soil types. **N/A**
9. Provide recent aerials, legible for photointerpretation (no photocopies) with a scale of 1" = 400 ft, or more detailed, with project boundaries and wetland boundaries delineated on the aerial. See attached **Turtle Point and Barge Canal/Basin Water Quality Improvement Plans**
10. Provide existing and proposed maps indicating vegetative community types based on Florida Land Use and Cover Classification System (FLUCCS) (FDOT 1999). For vegetated areas dominated by exotic vegetation, use the FLUCCS code representative of the native community type that was present prior to exotic infestation. See attached **Turtle Point and Barge Canal/Basin Water Quality Improvement Plans**



11. Provide existing and proposed maps indicating vegetative community types based on the Florida Natural Areas Inventory Guide to the Natural Communities of Florida. **See attached Turtle Point and Barge Canal/Basin Water Quality Improvement Plans**
12. Impact Summary Tables (located at the end of this section):
 - a. For all projects, complete Table 1, 2 and 3 as applicable.
 - b. For shoreline stabilization projects, provide the information requested in Table 4.
13. Adjacent property owners. The following information is required only for projects proposed to occur in, on or over wetlands that need a federal dredge and fill permit and/or authorization to use state owned submerged lands and is not necessary when applying solely for an Environmental Resource Permit. If the activity is located on state owned submerged lands and requires a lease or easement, provide a list of names and addresses from the latest county tax assessment roll of all property owners located within a 500 ft. radius of the proposed lease or easement boundary in mailing label format, or you may elect to send notice to those persons by certified mail, with the return-receipt card addressed to the DEP or water management district, as applicable, in accordance with subsection 18-21.005(3), F.A.C., and Section 253.115, F.S. For projects that need a federal dredge and fill permit, please provide the names, addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Attach additional sheets if necessary.

1. N/A	2.
3.	4.
5.	6.

PART 2: ENVIRONMENTAL CONSIDERATIONS

Note: for many questions, a state rule/Applicant's Handbook Volume I (AH I) section is cited to assist the applicant in addressing these questions. However, additional Federal criteria may apply.

1. Elimination or Reduction of Impacts (Avoidance and Minimization). Describe measures taken to eliminate or reduce impacts to wetlands and other surface waters (Refer to AH I Section 10.2.1). **See attached Turtle Point and Barge Canal/Basin Water Quality Improvement Plans**
2. Fish, Wildlife, Listed Species and their Habitats. Provide results of any wildlife assessments that have been conducted on the project site and provide any comments pertaining to the project from the Florida Fish and Wildlife Conservation Commission and/or the U.S. Fish and Wildlife Service (Refer to AH I Section 10.2.2). **See attached Turtle Point and Barge Canal/Basin Water Quality Improvement Plans**

3. Water quantity impacts to wetlands and other surface waters (Refer to AH I Section 10.2.2.4 and AH II).
 - a. Does the activity include a proposed stormwater water management system with a control elevation different than the wetland normal pool elevation(s) of existing or proposed created wetlands or other surface waters? **No**
 - b. If yes to (a), provide documentation (e.g. drawdown assessment or other methods) that shows the proposed surface water management system will not change the hydroperiod of the existing or created wetland or other surface water.
4. Public Interest Test. Please describe how the proposed activity **will not be contrary** to the public interest, OR if such an activity significantly degrades or is located within an Outstanding Florida Water (OFW), that the regulated activity **will be clearly in** the public interest (Refer to AH I Section 10.2.3).
 - a. Please describe how the project **will** be designed to avoid adverse affects to public health, safety, or the welfare or the property of others. **The proposed project is a water quality improvement project**
 - b. Please describe how the project **will** be designed to avoid adverse affects to the conservation of fish and wildlife, including endangered or threatened species, or their habitats. **The project is backfilling of a remnant canal and active barge basin and will improve water quality and habitat.**
 - c. Please describe how the project **will** be designed to avoid adverse affects to navigation or the flow of water or cause harmful erosion or shoaling. **The Turtle Point canal is to be restored to -7 NAVD with the west 1/3 of the canal to +1 NAVD and therefore will not affect navigation. The Barge Canal/Basin is to be restored to -15 NAVD allowing for continued use for vessel access. The backfilling will not cause erosion or shoaling as this area does not have a large tidal range and minimal current.**
 - d. Please describe how the project **will** be designed to avoid adverse affects to the fishing or recreational values or marine productivity in the vicinity of the activity. **The project will improve water quality and therefore improve marine productivity in the vicinity.**
 - e. Will the project be of a temporary or permanent nature? **Permanent**
 - f. Please describe how the project **will** be designed to avoid adverse impacts to significant historical and archaeological resources, under the provisions of section 267.061, F.S. **Historical and archaeological resources would have been previously dredged during the construction of the canal and basin and CCS system.**
 - g. Please describe how the project **will** be designed to avoid adverse affects to the current condition and relative value of functions being performed by areas affected by the proposed regulated activity. **The project will improve water quality and therefore improve the current condition.**
5. Water Quality. Provide a description of how water quality will be maintained in wetlands and other surface waters that will be preserved or will remain undisturbed, both on and offsite. Please address both short-term (such as during construction) and long-term water quality considerations (Refer to

projects in order to contain any suspended materials. Turbidity monitoring will be performed to ensure water quality criteria are maintained.

6. Class II Waters; Waters approved for shellfish harvesting (*Refer to AH I Section 10.2.5*).
 - a. Will the project occur in Class II that are NOT approved for shellfish harvesting? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of AH I Section 10.2.5(a). No
 - b. Is the project located adjacent to or in close proximity to Class II waters? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of AH I Section 10.2.5(b). No
 - c. Is the project located in Class II or Class III waters that are classified as "approved", "restricted", "conditionally approved", or "conditionally restricted"? If yes, demonstrate that the project meets the requirements of AH I Section 10.2.5(c). No
7. Vertical seawalls. Are vertical seawalls proposed in an estuary or lagoon as part of the project? If yes, please describe how the project meets the requirements of AH I Section 10.2.6. No
8. Secondary Impacts (*AH I Section 10.2.7*).
 - a. Will an upland buffer, with a minimum width of 15' and an average width of 25', be provided between the proposed activities and existing wetlands or wetlands to be preserved, enhanced, restored, or created? Provide the location and dimension of all buffers on the plans. If not, demonstrate that secondary impacts will not occur or how they will be offset. **Secondary impacts will not occur during construction activities. All mangroves will be avoided.**
 - b. If listed species are present or may be present then coordination with wildlife agencies is needed. Have you coordinated with the FFWCC and/or USFWS? If so, please provide correspondence from the wildlife agencies indicating concurrence with the species management plan(s). **Wildlife agencies have not been contacted.**
 - c. What measures will be taken to avoid impacts to wetland-dependent wildlife and/or listed species that use uplands for nesting or denning? **Endangered and Threatened species training will be provided to all construction personnel. Manatee observers will be stationed on-site during all in-water construction activities. Standard Manatee Construction Conditions and Standard Smalltooth Sawfish Construction Conditions will be implemented.**
 - d. Describe whether there are any other relevant activities that are very closely linked and causally related to any proposed dredging or filling in wetlands or other surface waters that have the potential to cause impacts to significant historical and archaeological resources. No.
 - e. Are there additional future phases or extensions of the proposed activities that are not shown? If yes, please describe. No
9. Cumulative Impacts. Is the proposed mitigation located within the same drainage basin (*Refer to AH I Figures 10.2.8.1 – 10.2.8.5*) as the proposed wetland impacts? If not, please submit a Cumulative Impact Evaluation in accordance with AH I Section 10.2.8.

10. Mitigation Plan (Refer to AH I Section 10.3).

- a. If a mitigation bank is proposed to offset wetland/other surface water impacts, provide:
 - i. the name of the bank: _____. A letter of reservation from the banker will be required once the application has been evaluated.
 - ii. If the mitigation bank was assessed using UMAM, provide UMAM worksheets for impact area(s). If the bank was assessed using a method other than UMAM, then prepare the impact assessment using the same method.
- b. If mitigation is proposed to offset wetland/other surface water impacts, please provide a mitigation plan that includes, at a minimum, the following:
 - i. Proposed mitigation narrative:
 - (1) Describe the current and proposed condition for each type of mitigation component (restoration, enhancement, creation, preservation), including:
 - (a) Describe current and proposed vegetation
 - (b) Describe current and proposed hydrologic conditions for the proposed mitigation.
 - (c) Describe the soil types from NRCS maps and confirm if actual soil conditions appear to match.
 - (2) Provide details of the proposed construction/mitigation activities including phasing and timing, as appropriate.
 - (3) Identify measures that will be implemented during and after construction to avoid adverse impacts related to the proposed activities.
 - (4) A mitigation implementation and monitoring schedule with dates.
 - (5) Identify the success criteria.
 - (6) Describe the anticipated site conditions in and around the mitigation area after the mitigation plan is successfully implemented.
 - (7) Provide a comparison of current fish and wildlife habitat to expected habitat after the mitigation plan is successfully implemented.
 - ii. Provide a Management Plan that includes, as appropriate, aspects of operation and maintenance, including water management practices, vegetation establishment, exotic and nuisance species control, fire management, and control of access.
 - iii. Maps:
 - (1) Soil map (include soil names/codes, hydrologic soil groups and hydric soil types).
 - (2) Topographic map of the mitigation area and adjacent contributing and receiving areas.
 - (3) Hydrologic features map of the mitigation area and adjacent contributing and receiving areas.
 - (4) Vegetative communities map (using FLUCCS or other appropriate classification system).
 - (5) For all maps, identify source.
 - iv. Provide the necessary supporting information for the application of sections 62-345.400 - .600 (Uniform Mitigation Assessment Method (UMAM)). To meet this requirement, submittal of UMAM worksheets is acceptable for impact and mitigation areas.

- v. If onsite and/or offsite applicant-responsible mitigation is proposed, submit a draft Conservation Easement document or other form of restrictive covenant that provides for protection of the mitigation area in perpetuity. Standard forms, as described in subsection 62-330.301(6), F.A.C., are available from the Agency or on its website.
- vi. If onsite and/or offsite applicant-responsible mitigation is proposed, submit a cost estimate for completing the mitigation, including monitoring and maintenance.
- vii. If onsite and/or offsite applicant-responsible mitigation is proposed and the proposed mitigation exceeds \$25,000, please provide a draft financial assurance document.
- viii. Identify the entity responsible for monitoring, maintenance and long-term stewardship of the mitigation area (i.e. the landowner or homeowner association, not the consultant or contractor that will do the work).

PART 3: PLANS

PLANS: The information listed in the checklist below represent the typical information required on the submitted project plans. The Plans checklists in each application section are cumulative unless otherwise noted. Separate plans for each application section are not required.

1. Include the following on the construction plans and cross sections:
 - a. An Existing Conditions sheet showing the entire project and wetland/other surface water boundaries. Include the following: Acreage and type (herbaceous, forested or other surface water) of each wetland/other surface water.
 - b. A Proposed Conditions sheet showing the entire project and wetland/other surface water boundaries with construction plan overlay.
 - c. A Proposed Wetland Impact sheet that include the following:
 - i. Acreage and type (herbaceous, forested or other surface water) of each wetland/other surface water to be impacted.
 - ii. Proposed upland buffers with dimensions.
 - iii. Identify the seasonal high water and wetland normal pool elevations on the plans.
 - iv. Separately identify WMD/FDEP and USACE wetland/other surface water impacts if different.
 - d. Include wetland boundaries on all construction plan sheets.
2. If onsite and/or offsite applicant-responsible mitigation is proposed, submit mitigation permit plans and cross sections including, at a minimum:
 - a. existing conditions plan sheet identifying upland and wetland communities and acreage of each, topography, drainage patterns, and location of cross-section detail.
 - b. proposed conditions plan sheet identifying proposed improvements by type (restoration, enhancement, creation, preservation), acreage of each, topography, drainage patterns, and location of cross-section detail.
 - c. monitoring plan sheet including proposed improvements, monitoring transects, photostations, and mitigation signage (if applicable).
 - d. cross-section and/or profile detail(s) sheet(s) including representative section of each type of mitigation component. Include existing and proposed conditions and representative elevations.
 - e. planting schedule, plant species including common and scientific names divided into three sections (canopy, shrub, herbaceous) by mitigation component, quantity, spacing, size, and elevation range.

TABLE 1 - PROJECT WETLAND (WL) AND OTHER SURFACE WATER (SW) AND IMPACT SUMMARY

Comments:

Codes (multiple entries per cell not allowed):

- Wetland & Surface Water ID: Include ID on submitted wetland and surface water impact maps
- Wetland Type: from an established wetland classification system
- Impact Type: D=dredge; F=fill; H=change hydrology; S=shading; C=clearing; O=other

TABLE 2 - PROJECT ON-SITE MITIGATION SUMMARY

COMMENTS:

Codes (multiple entries per cell not allowed):

- Target Type or Type=target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

TABLE 3 - PROJECT OFF-SITE MITIGATION SUMMARY

COMMENTS:

Codes (multiple entries per cell not allowed):

- Target Type or Type=target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

TABLE 4 - SHORELINE STABILIZATION

Stabilization	Linear Ft. New	Linear Ft. Replaced	Linear Ft. Repaired	Linear Ft. Removed	Slope H: V:	Toe Width (Ft.)
Natural Vegetation (living shoreline)					N/A	N/A
Rip Rap + Vegetation						
Rip Rap						
Seawall + Rip Rap						
Vertical Seawall						
Other Shoreline Stabilization						
Type						

Size of Rip Rap

Type of Rip Rap

SECTION F: APPLICATION FOR AUTHORIZATION TO USE STATE-OWNED SUBMERGED LANDS

Instructions: If you were referred to this section from Section A, please provide the following additional information. Please note that if your proposed project is on state-owned submerged lands and the below requested information is not provided, your application will be considered incomplete. All items required under this section are in addition to those required under other sections, as applicable.

PART 1: TYPE OF AUTHORIZATION REQUESTED

Please check the most applicable activity that applies to your project(s):

A. Exceptions: The following activities do not require authorization to use state-owned submerged lands. *If you are certain that your project (including all components/phases thereof) qualifies, please indicate accordingly, below, and no further action is required to complete this section.*

- Construction or maintenance of a county water or sewer system under Section 153.04 F.S.
- Removal of material from the area adjacent to an intake or discharge structure under 403.813(1)(f), F.S.
- Removal of organic detrital material under Section 403.813(1)(r) or (u), F.S.
- Construction of floating vessel platforms under Section 403.813(1)(s), F.S.
- Trimming or alteration of mangroves under Sections 403.9321 through 403.9334, F.S.

B. Consent by Rule: Except for activities authorized under Section 253.77(4), F.S., no application or written authorization for the use of state-owned submerged lands is required for an activity that complies with the criteria listed in subparagraphs 18-21.005(1)(b)1. through 5., F.A.C., and that is exempt from the requirements of obtaining a permit under the provisions of:

- Section 403.813(1), F.S., paragraphs (a); (b), provided that the structure is the only dock or pier on a parcel and it is not a private residential multi-family dock with three or more slips.
- Section 403.813(1), F.S., paragraphs (c); (d); (e); (f), provided that no severance fee is required under Rule 18-21.011, F.A.C., and the existing activity has a valid Board of Trustees authorization.
- Section 403.813(1), F.S., paragraphs (g); (h); (i), provided that no private residential multi-family dock or pier is constructed.
- Section 403.813(1), F.S., paragraph (k), provided that any channel markers delineate existing and authorized or permitted navigation channels.

Such activities must still comply with the General Conditions for Authorizations under subsection 18-21.004(7), F.A.C. Agency staff will determine whether the proposed project qualifies for Consent by Rule. Be advised that if your project does not qualify for an Exception or Consent by Rule for one of the reasons listed above, then it will require one of the forms of authorization listed below.

C. Letter of Consent: Written authorization is required for each of the following activities:

- One minimum-size private residential single-family dock (see definition in Rule 18-21.003, F.A.C.).
- Private residential single-family or multi-family docks, piers, boat ramps, and similar existing and proposed activities that cumulatively preempt no more than 10 square feet of sovereignty submerged land for each linear foot of the applicant's riparian shoreline, along sovereignty submerged land on the affected waterbody within a single plan of development (see

"preempted area" definition in Rule 18-21.003, F.A.C.).

Private channels that provide access to an upland single-family or multi-family residential parcel and that measures no more than 10 square feet of sovereignty submerged land for each linear foot of the applicant's riparian shoreline along sovereignty submerged land on the affected waterbody within a single plan of development.

Seawalls, bulkheads, or other shoreline stabilization structures no more than three feet waterward of mean or ordinary high water.

Placement, replacement, or repair of riprap, groins, breakwaters, or intake and discharge structures no more than ten feet waterward of the line of mean or ordinary high water.

Restoration and nourishment of naturally occurring sandy beaches, including borrow areas to be used for five years or less.

Artificial reefs or fish attractors that are constructed for public use.

Public docks or piers that are exempt from permit requirements under Section 403.813(1), F.S., or that qualify as minimum-size docks or piers or are less than or equal to the 10:1 preempted area to shoreline ratio; public boat ramps; public channels; or public swimming areas, provided that all such structures or activities are owned and operated by governmental entities and any revenues collected are used solely for operation and maintenance of the structure or adjacent public recreational facilities.

Ski course buoys and ski jumps not associated with revenue-generating water skiing activities.

Removal of wrecked, abandoned or derelict vessels or structures.

Habitat restoration.

D. Lease: A state-owned submerged land lease is required for the following activities.

Private residential single-family or multi-family docks or piers, other docks or piers, boat ramps, or other similar activities that do not qualify for a letter of consent.

Private residential multi-family docks designed or used to moor three or more vessels within aquatic preserves.

Docks designed or used to moor ten or more vessels in Monroe County.

Commercial/industrial docks, as defined in Rule 18-18.004, F.A.C., in Biscayne Bay Aquatic Preserve, as required by paragraph 18-18.006(3)(c), F.A.C.

All revenue-generating activities.

Oil and gas exploration and development.

Open-water mooring fields.

Mining.

E. Easement: A state-owned submerged land easement is required for the following public or private activities.

Utility crossings and rights of way.

Road and bridge crossings and rights of way, including such structures built prior to the need to obtain an easement when proposed for modification or repair.

Groins, breakwaters, and shoreline protection structures, except when constructed as part of a docking facility that requires a lease.

Public navigation projects other than public channels.

Private residential channels that do not qualify for a letter of consent, and channels that provide access to revenue-generating facilities in uplands.

Oil, gas and other pipelines.

Intake and discharge structures more than 10 feet waterward of the mean or ordinary high

water line.

- Spoil disposal sites.
- Borrow areas that will be used for longer than five years for beach nourishment.
- Public water management projects other than public channels.
- Treasure salvage (Cultural Resource Recovery).

PART 2: SUBMITTAL REQUIREMENTS

If state-owned submerged lands will be affected by your project, we will notify you in writing, and the items in this section will also be required. For expediency, if you acknowledge or believe that your project affects state-owned submerged lands you may submit the items in the appropriate section of Part 2 prior to receiving written confirmation of state ownership. This will not jeopardize any future claim of ownership.

Unless your proposed project qualifies for an Exception or Consent by Rule, as described in Part 1 A or B, then your application to use state-owned submerged lands must include the following items, as applicable to your project.

A. All applications for Letter of Consent, Lease or Easement must include the following:

- Satisfactory evidence of sufficient upland interest to the extent required by paragraph 18-21.004(3)(b), F.A.C.
- Detailed statement of the proposed activity.
- If dredging is proposed, an estimate of the number of cubic yards of sovereignty materials to be removed showing how the amount was calculated.

B. Applications for a Letter of Consent shall also include the following:

- Multiple boat slip facilities may require an affidavit certifying that the facility will not be a revenue generating/income producing facility.
- Two copies of a dimensioned site plan drawing(s) with the following requirements:
 - a. Utilizing an appropriate scale on 8 1/2" x 11" size paper;
 - b. Showing the approximate location of the mean high/ordinary high/or safe upland line;
 - c. Showing the location of the shoreline vegetation, if existing;
 - d. Showing the location of the proposed structures and any existing structures;
 - e. Showing the applicant's upland parcel property lines;
 - f. Showing the riparian lines; and
 - g. Showing the primary navigation channels or direction to the center of the affected waterbody.

C. Applications for Leases shall also include the following:

- Lease processing fee as specified in subparagraph 18-21.008(1)(a)8, F.A.C.
- Location of the proposed activity including: county; section, township and range; affected waterbody; and a vicinity map, preferably a reproduction of the appropriate portion of United States Geological Survey quadrangle map.
- Two prints of a survey prepared, signed, and sealed by a person properly licensed by the Board of Professional Surveyors and Mappers.
 - a. Use an appropriate scale on 8 1/2" x 11" size paper;
 - b. Show the location of ordinary or mean high water;
 - c. Show the location of the shoreline vegetation, if existing;

- d. Show the location of the proposed structures and any existing structures;
- e. Show the applicant's upland parcel property lines;
- f. Show the primary navigation channels or direction to the center of the affected waterbody
- g. Show the riparian lines;
- h. Include a legal description of the preempted area to be leased; and
- i. For those lease applications in the Florida Keys, indicate the water depths referenced to mean low water within the lease area and out to the navigation channel.

- Noticing information as required by subsection 18-21.005(3), F.A.C.
- Billing Information Form, which provides billing information; sales tax information; and other data required in accordance with Section 24.115(4), F.S.
- Computation of the total square footage of preempted sovereignty land to be leased.

D. Applications for **Easements** shall also include the following:

- Easement processing fee as specified in either (for public easements) paragraph 18-21.009(1)(g), or (for private easements) paragraph 18-21.010(1)(i), F.A.C.
- Vicinity map.
- Detailed statement of proposed use and satisfactory evidence of need for installation of telecommunication lines and associated conduits that are subject to the provisions of paragraph 18-21.004(2)(l), F.A.C. If the applicant is a local governing body, the request shall be by official resolution or minutes.
- Two prints of a survey prepared by a Licensed Florida Surveyor and Mapper in accordance with Chapter 61G17, F.A.C., (see attachment X for survey checklist) and meeting the following requirements:
 - a. Utilizing an appropriate scale on 8 1/2" x 11" size paper;
 - b. Showing boundaries of the parcel sought;
 - c. Showing ownership lines of the riparian uplands;
 - d. Showing the line of ordinary or mean high water;
 - e. Showing the location of the shoreline vegetation, if existing;
 - f. Showing the location of any proposed or existing structures;
 - g. Showing the riparian lines; and
 - h. Legal description and acreage of the parcel sought.
- Noticing information as required by subsection 18-21.005(3), F.A.C.

FLORIDA POWER & LIGHT

**TURTLE POINT WATER QUALITY IMPROVEMENT
PROJECT BIOLOGICAL EVALUATION AND
RESTORATION PLAN**

MIAMI-DADE COUNTY, FLORIDA

Prepared for:
Florida Power & Light
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Juno Beach, Florida 33408

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July 2016

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Acronyms and Abbreviations

AP	Aquatic Preserve
CCS	Cooling Canal System
cy	Cubic yard
DGPS	Differential Global Positioning System
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FLUCCS	Florida Land Use and Cover Classification System
FPL	Florida Power & Light
fsw	Feet of seawater
ft	foot/feet
ft ²	square feet
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish & Wildlife Service
in.	inch/inches
Kg	kilogram
m	Meter
m ²	square meters
NAVD	North American Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NTU	nephelometric turbidity unit
Project	Turtle Point Water Quality Improvement Project
SAV	Submerged Aquatic Vegetation
TPC	Turtle Point Canal
WGS84	World Geodetic System 1984

1. INTRODUCTION

Tetra Tech Inc., (Tetra Tech) was contracted by Florida Power & Light (FPL) to provide a restoration alternative that would provide additional ecological benefits to the Turtle Point Water Quality Improvement Project (Project), located at the Turkey Point Nuclear Power Plant in Homestead, Miami-Dade County. Per the Florida Department of Environmental Protection (FDEP) issued Consent Order (OGC No. 16-0241) FPL committed to the objective of restoring the Turtle Point Canal (TPC). The Project is intended to improve hydrology and water quality within the TPC by backfilling to -7 NAVD, and create mangrove habitat by backfilling a portion of the canal to approximately +1 NAVD. Figure 1-1 presents the project location graphically.

FPL Turkey Point Power Plant utilizes a closed loop shallow radiant cooling canal system (CCS) in the operation of a fossil fuel and two nuclear (Units 3 and 4) generating systems. In addition to cooling, the CCS is an industrial wastewater facility receiving runoff from the Plant site, processing water backwash/concentrate and boiler blowdown from a natural gas combined cycle generation system (Unit 5).

Tetra Tech performed a site survey on May 23, 2016. The purpose of the survey was to conduct a biological evaluation of the TPC and the surrounding areas to assist in the development of the restoration plan. The survey identified protected species and sensitive biological resources within the Project area. The findings presented herein will supply the regulatory agencies with the most up-to-date resource data for the project site. Further, data collected from this survey were used in the restoration design and planning phase to minimize and avoid impacts to resources during project implementation. This report provides a biological evaluation of the project area as well as restoration planning for implementation of the proposed restoration.

1.1 Purpose and Need

The purpose of the proposed Project is to fill (restore) the historic Turtle Point discharge canal that is no longer in use, and to improve habitat and water quality adjacent to the plant. The TPC was previously the discharge point from the Grand Canal for the Turkey Point Fossil Plant Units 1 & 2. The canal was dredged to approximately -20 to -28 feet NAVD during the initial construction of the Plant in order to allow once thru cooling water to be discharged into Biscayne Bay. The canal has since been plugged and is no longer in use or necessary due to the construction of the CCS system. The remnant canal and adjacent area of scour from outflows is proposed to be backfilled in order to provide for water quality and habitat restoration within Biscayne Bay.

Water quality parameters within the historic discharge canal adjacent to the CCS berm have been monitored as a condition of Miami-Dade County Department of Environmental Resource Management (MDC DERM) Class I permit No. CLI-2014-0312 since May 2015. A sample collected on September 14, 2015 contained ammonia at a level which exceeded the County's water quality standard of 0.5 mg/L (Standard). Ammonia concentrations have intermittently been above MDC DERM standards. FPL performed a feasibility study and has determined that restoration of the remnant canal to a depth of -7ft NAVD will effectively improve the water quality within TPC and subsequently Biscayne Bay.

FPL will be backfilling the TPC to -7 NAVD in order to provide for water quality improvements to Biscayne Bay. Additionally, FPL has requested an analysis of obtaining additional environmental lift by restoring a portion of the TPC footprint to mangrove and American crocodile habitat. This habitat creation would be accomplished by backfilling a portion of the canal (western one-third of the TPC) to approximately +1ft. NAVD. The following provides a detailed description of the restoration being proposed.



Figure 1-1. Project vicinity map

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2. BIOLOGICAL EVALUATION

A biological evaluation (survey) was conducted of the TPC to document on-site and surrounding ecological communities, identify environmental concerns, define restoration goals and objectives, and to make specific recommendations concerning construction activities associated with the restoration actions. The survey reviewed access routes and environmental precautions. Data gathered during the survey provided the information to develop the restoration prescription and design criteria.

A land and submerged water survey was conducted by a professional land surveyor. The topographic survey provided by FPL was used to assist the restoration team in planning, conceptual design, and assessing restoration actions, as well as providing a basis for volumetric calculations of the TPC to yield an estimate of fill quantities.

2.1 Methods

Tetra Tech biologists with experience in benthic and mangrove habitat assessments performed a biological evaluation of the TPC and surrounding areas. Figure 2-1 provides the extent of the assessment area. The evaluation included reconnaissance of the TPC and the confluence of the TPC and Biscayne Bay. Submerged aquatic vegetation (SAV) communities were mapped and presence of marine fauna were noted. Mangrove and terrestrial communities were assessed and an inventory of common species and wildlife utilization were documented. Representative images of resources were captured during the assessment.

SAV survey activities were performed using scientific divers, Trimble® DGPS, and Hypack® 2013 to catalog the distribution and abundance of SAV. The survey was conducted by Tetra Tech scientific divers trained in marine biological resource identification and quantification. Seagrass species and coverage data were collected along evenly-spaced transects. Divers cataloged each transect at a rate of less than 1 knot. Mapping data were transmitted back to the work platform via Pacific Crest® Environmental Data Link® (EDL II) telemetry. Positioning data were collected in WGS84 (World Geodetic System 1984) datum and transmitted back to the work platform at a rate of 1 data point per second. The Trimble® DGPS receives differential corrections from U.S. Coast Guard Continuously Operating Reference Stations and provides sub-meter horizontal accuracy.

Data were processed with Hypack® Target Editor and subsequently exported in a .txt format. The raw data were imported into ArcGIS® 9 (ArcMap™ 9.3) where shapefiles were created and analyzed. Georeferenced maps of seagrass species distribution and abundance were produced. Seagrass cover was interpolated using the 3D Analyst, Spatial Analyst extensions in ArcMap™ and Xtools Pro (independent [Data East, LLC.] ArcGIS extension). Planar area calculations were performed using Xtools Pro.

Percent coverage was estimated by visually assessing the benthos at regular intervals (approximately every meter) along each transect and assigning a cover value from 0-5. The cover values were assigned based on the observed seagrass/macroalgae percent cover. Greater than 1,000 data points were recorded during field operations and used in the analysis. The SAV cover scale with respective cover ranges is presented in Table 2-1, below.

Table 2-1. SAV Cover Scale

Cover Scale Value	Percent Coverage
0	0%
1	<5%
2	5-25%
3	25-50%
4	50-75%
5	75-100%

2.2 Findings

Underwater visibility during dive operations was variable, ranging from 5 to 20 feet (ft.) (1.5 to 6 meters). Currents within the survey areas were minimal and generally wind driven. Surface water depths ranged from approximately 4 to 10 ft.

Bottom topography is relatively flat outside of the TPC. The interior of the TPC can be characterized as a steep slope from top of bank to the dredge depth of approximately 28 ft. The bottom of the TPC can be classified as barren mud and detritus with no vegetative cover. The sediment outside of the TPC is characterized as a calcareous mixture of silt, sand, shell fragments, and organic material.

In general, the in-water survey area was characterized by three benthic community types; barren mud and detritus, macroalgae, and seagrass. Epibenthic functional groups such as stony corals, sponges, and gorgonians were not encountered during the survey. Other community types within the greater project area include mangrove and upland levees and roadways. A list of marine and terrestrial species observed during the survey is presented in Table 2-2.

2.2.1 Submerged Aquatic Vegetation

No SAV cover was documented within the TPC. In general, barren substrate or epibenthic cover (macroalgae) of less than 1% was encountered deeper than -7-ft. Macroalgae cover was persistent in the -5 to -7-ft. elevation range, while seagrasses were generally encountered in -5-ft. or less elevation.

Two species of seagrass (*Thalassia testudinum* and *Halodule wrightii*) were recorded during the survey. *Thalassia testudinum* is the dominant seagrass species within the survey area; percent cover ranged from <5 to >75%. Minimal coverage of *Halodule wrightii* (<5% cover) was recorded along the fringe of the seagrass community. Figures 2-1 and 2-2 provide SAV coverage by species and percent cover (seagrass by species and macroalgae as a functional group) within the survey area. Table 2-2 provides a list of SAV documented during the survey.

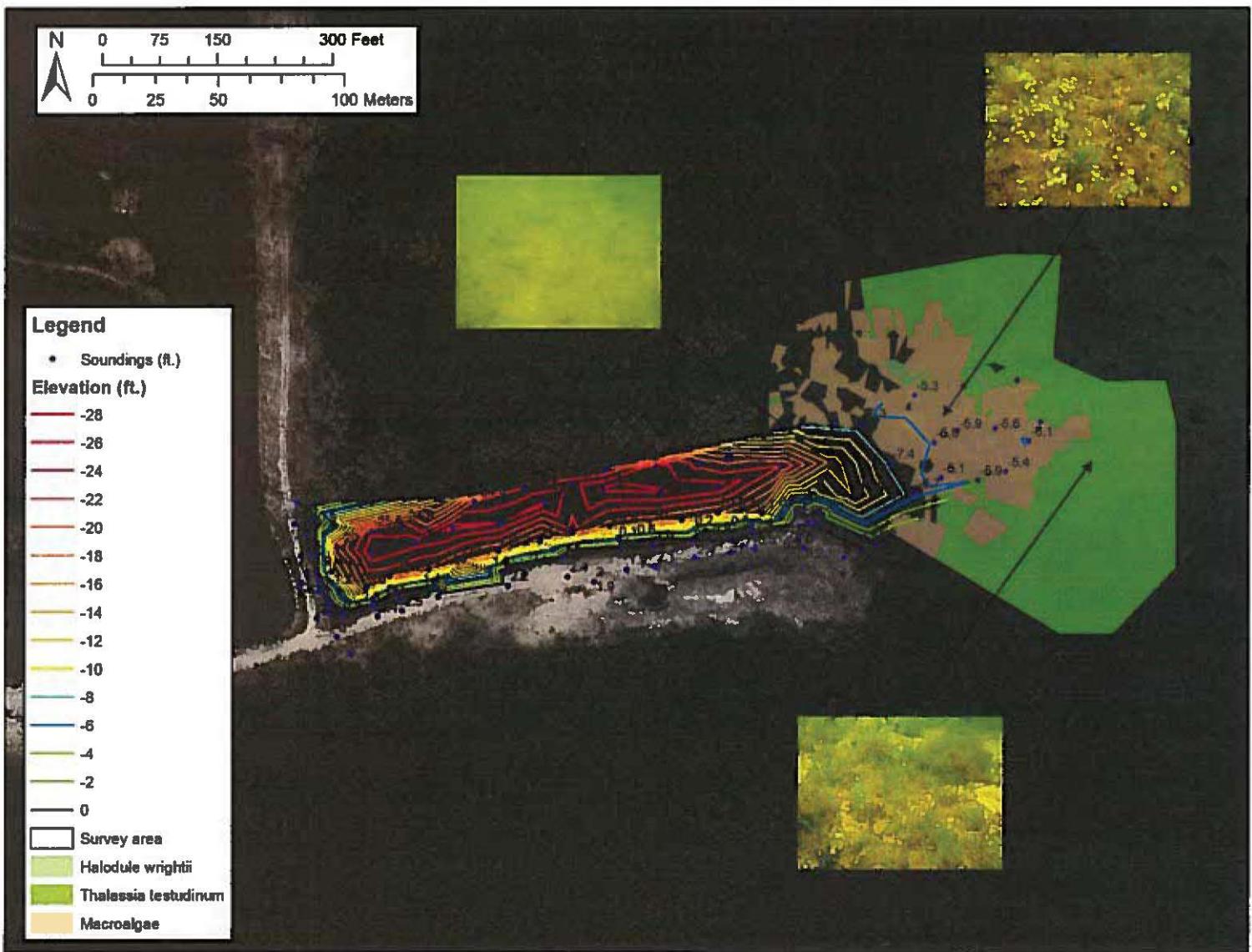


Figure 2-1. SAV cover by species for seagrass and macroalgae as a group

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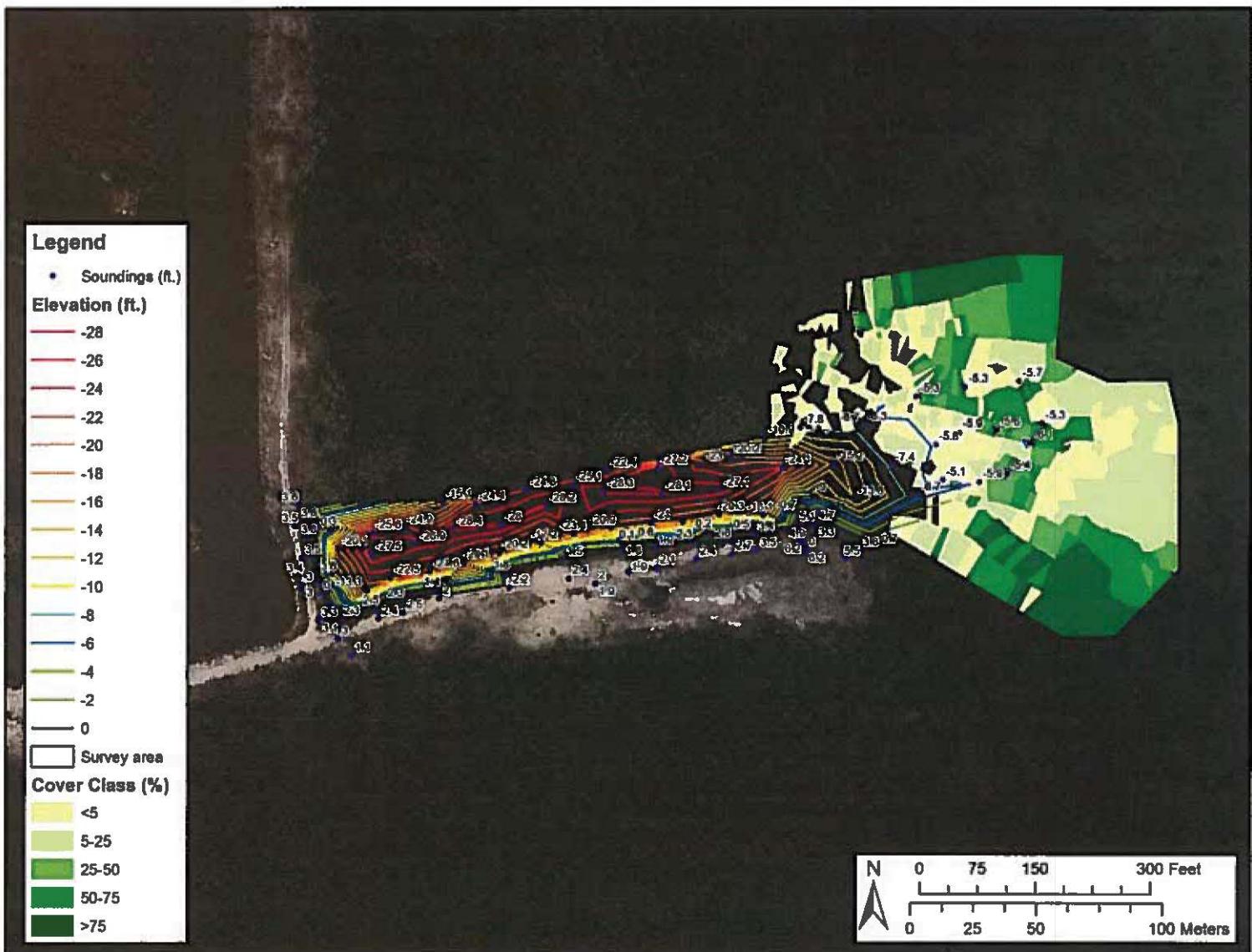


Figure 2-2. SAV cover by percent cover class

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2.2.2 *Mangroves*

Mature mangroves are present along the three banks of the TPC. Coverage is generally uninterrupted and is characterized by a narrow zone of red mangroves (*Rhizophora mangle*). Several narrow canopy openings were noted along the south and west banks allowing for access to the TPC. White mangrove (*Laguncularia racemosa*), black mangrove (*Avicennia germinans*), and buttonwood (*Conocarpus erectus*) were also noted along the narrow mangrove fringe.

Mangrove habitat provides a detrital base for organic food webs and significant habitat for arboreal, intertidal, and subtidal organisms, including shellfish, crustaceans, fish, and birds. Additionally, red mangrove prop roots can provide substrate for a diverse epifaunal assemblage. Although important habitat for a variety of species, the narrow fringe of available habitat and the steep slope along the seaward edge provide low quality mangrove habitat. Red mangrove prop roots had little to no epifaunal colonization and the detrital base and associated organisms were generally absent due to the narrow fringe and steep slope of the of the TPC. Although the majority of mangroves within the proposed Project construction areas are on lands disturbed and previously impacted by the construction and operation of the Turkey Point complex, it is probable that they still provide structural habitat for mangrove community wildlife.

2.2.3 *Uplands*

The uplands adjacent to the project site consist of shell rock roads constructed to provide access to the CCS. The uplands are historically filled lands that provide minimal habitat for native species. The roads will provide access to the project site for construction, but will remain unaffected by the project. Table 2-2 provides a list of vegetation noted during the pedestrian survey.

2.3 Land Cover

The FDOT land use, vegetation cover, and landform classification system (FLUCCS) is arranged in hierarchical levels with each level containing information of increasing detail. The system uses four levels (I–IV) within classification categories; however, for the level of detail required for the analysis presented in this report, categories were limited to level III specificity. A total of four categories are represented within the project boundary. Figure 2-3 presents the land use, cover, and forms classification system (FLUCCS) graphically. Below is a description of each land cover category.

Channelized Waterway (512) – This category includes the TPC and the cooling canal system (CCS) associated with the Turkey Point Facility

Embayments Opening D (541) - This category includes the greater Biscayne Bay area.

Mangrove swamp (612) – This Category describes the mangrove communities that fringe the TPC and are adjacent to the project area.

Dikes and levees (747) – This category describes the levees and roadways that surround the CCS and the proposed staging area south of the TPC.

Table 2-2. Marine, Terrestrial, and Avian Species Documented in Turtle Point Canal and Adjacent Upland Area

Common Name	Scientific Name
Birds	
Common nighthawk	<i>Chordeiles minor</i>
Brown pelican	<i>Pelecanus occidentalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Anhinga	<i>Anhinga</i>
Mockingbird	<i>Mimus polyglottis</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Fish	
Sheepshead	<i>Archosargus probatocephalus</i>
Flagfin Mojarra	<i>Eucinostomus melanopterus</i>
Tarpon	<i>Megalops atlanticus</i>
Mullet	<i>Mugil</i> sp.
Mangrove snapper	<i>Lutjanus griseus</i>
Reptiles^a	
American crocodile	<i>Crocodylus acutus</i>
Submerged Aquatic Vegetation	
Mermaid's wineglass (green algae)	<i>Acetabularia</i> sp.
Green algae	<i>Batophora</i> sp.
Green algae	<i>Caulerpa</i> sp.
Green algae	<i>Halimeda</i> spp.
Shaving brush alga (green algae)	<i>Penicillius</i> sp.
Turtle grass (seagrass)	<i>Thalassia testudinum</i>
Shoal grass (seagrass)	<i>Halodule wrightii</i>
Terrestrial Vegetation	
Black mangrove	<i>Avicennia germinans</i>
Tree seaside oxeye	<i>Borrichia arborescens</i>
Australian pine	<i>Casuarina equisetifolia</i>
Sea grape	<i>Coccoloba uvifera</i>
Buttonwood	<i>Conocarpus erectus</i>
White mangrove	<i>Laguncularia racemosa</i>
Buttonsage	<i>Lantana involucrata</i>
Red mangrove	<i>Rhizophora mangle</i>
Beach Naupaka	<i>Scaevola taccada</i>
Bay cedar	<i>Suriana maritima</i>

^a Indirect observation (slide)

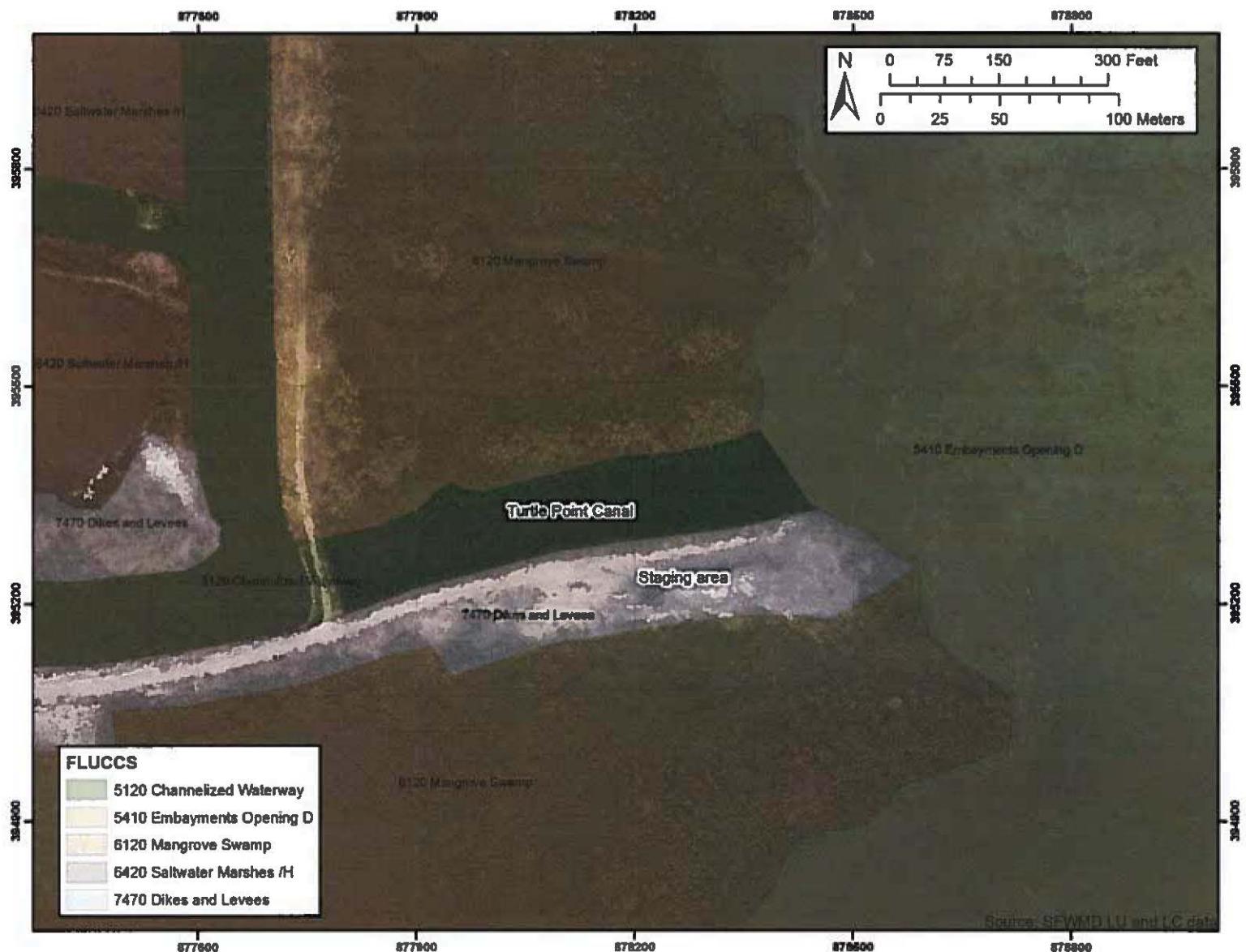


Figure 2-3. Land use and land cover classification

Back of figure

July 2016

2-10

2.4 Protected Species

The Florida Fish and Wildlife Conservation Commission (FWC) publication Florida's Endangered and Threatened Species (Updated January 2016) was used to determine the status of listed species with the potential to utilize the proposed Project site. Listed species observations during the May 23 site visit resulted in a single Federally listed species observation (indirect) on the property. An American crocodile (*Crocodylus acutus*) slide was observed at the western end of the TPC. No other sightings of or evidence of other listed species were noted during the survey; however, based on geographic range, several listed species have the potential to utilize the TPC area (Table 2-3).

There are 11 aquatic species known to occur within Biscayne Bay that are protected under the Endangered Species Act or are candidates for listing. These are the American crocodile (*Crocodylus acutus*), Johnson's seagrass (*Halophila johnsonii*), the mangrove rivulus (*Rivulus marmoratus*), the small-toothed sawfish (*Pristis pectinata*), five species of sea turtle, the American alligator (*Alligator mississippiensis*), and the Florida manatee (*Trichechus manatus*). Additionally, a variety of protected avian species are known to occur within the southern Biscayne Bay and the Turkey Point Facility. Table 2-3 includes a list of protected avian species that have been known to utilize the TPC area. Although these species were not documented during the survey, brief discussions of potentially occurring protected species are provided below.

American crocodile (Crocodylus acutus)

The American crocodile is federally threatened and state listed as endangered and the TPC is within an area classified by the U.S. Fish & Wildlife Service as critical habitat for the American crocodile. Most crocodile nesting occurs in the southwestern corner of the industrial wastewater facility; however, a limited number of nests have been observed on berms within the northern portion of the return canals. Crocodiles are known to utilize the TPC as evidenced by the well-worn slide mark on the western shore noted during the survey.

Eastern Indigo snake (Drymarchon couperi)

The eastern indigo snake is federally threatened and can be found in almost any habitat throughout the state of Florida. Although eastern indigo snakes were not observed during the survey, they are known to occur on site. These snakes may occur in wetland or uplands and may be seen along the shell rock roads located throughout the CCS area at Turkey Point.

Johnson's seagrass (Halophila johnsonii)

Johnson's seagrass, federally listed as a threatened species, occurs along the Florida coast from Sebastian Inlet to central Biscayne Bay at Virginia Key, Key Biscayne. This seagrass species was not observed during the survey and is not known to occur as far south as the Turkey Point plant property.

Mangrove rivulus (Rivulus marmoratus)

The mangrove rivulus, a fish that inhabits crab burrows in mangrove areas, is federally listed as a NOAA Species of Concern and listed by the state as a Florida species of concern. It could be present in mangrove areas fringing the plant site, but is unlikely to be present in the Turtle Point canal due to lack of habitat (no crabs or crab burrows were observed in mangrove habitat during the survey).

Small-toothed sawfish (Pristis pectinata)

The small-toothed sawfish is a state and federally endangered species that inhabits inshore bars, seagrass beds, and mangrove areas. Due to its preference for these habitat types, the small-toothed sawfish could potentially utilize the Turtle Point canal; however it is unlikely due to the poor habitat quality of the TPC.

Florida manatee (Trichechus manatus)

The manatee is a state and federally endangered species that frequents warm water estuarine habitats including rivers, marshes, bays, and sounds in Florida. They use warm water refuges in the cooler months, including freshwater springs and heated effluent from power plants (No such discharge exists from the CCS). Their critical habitat includes Biscayne Bay and Card Sound adjacent to the Turkey Point plant property and the canals entering these water bodies. Manatees have been observed in the barge turning basin and nearby state canals (NRC 2016), and are likely to utilize the Bay area east of the TPC where seagrasses are prevalent.

American alligator (Alligator mississippiensis)

The alligator is federally listed as Threatened due to similarity of appearance and state listed as a Florida species of special concern. The species is federally listed as threatened due to its physical resemblance to the American crocodile, which is endangered. Alligators live in swampy areas, rivers, streams, lakes and ponds. Although they are primarily freshwater animals, alligators will also venture into brackish water. Although alligators have been observed and relocated off site from the Turkey Point facility, there are no reports of alligators utilizing the TPC.

Sea turtles

Sea turtles (4 species with protection status of Endangered or Threatened) are found in marine habitats that open to the sea, such as Biscayne Bay and Card Sound. The Turtle Point canal does not provide suitable habitat, and the shoreline adjacent to the canal lacks the beach habitat preferred by sea turtles for nesting.

Wood stork (Mycteria americana)

The wood stork is classified as endangered by the FWC and the FWS. This species could potentially use the site as short-term foraging grounds. Wetlands and the perimeter of the TPC could offer limited forage for this species during the wet season. Long term use of the site is limited due to low quantity and quality of the foraging habitat as well the flashy and short duration of inundation on site.

Wading Birds

Several wading birds (herons and egrets) are classified by the FWC as species of special concern. The snowy egret (*Egretta thula*), reddish egret (*Egretta rubescens*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), Roseate spoonbill (*Platalea ajaja*), and white ibis (*Endocimus albus*) were not observed on site during the survey; however, limited utilization throughout the year is likely to occur. As described for the wood stork, seasonal utilization is likely when the ditches are inundated during the wet season. The ponds offer limited and poor quality year-round forage.

Brown pelican (Pelecanus occidentalis)

The brown pelican is a state species of special concern that thrives near coasts and on islands. Brown pelicans rely in part on the actions of marine predators such as large fish, sharks and

dolphins to force schools of fish to the surface where the pelicans can catch them. Pelicans will breed only in areas with enough food to support the breeding colony. Roosting and resting sites where brown pelicans can dry their feathers and rest without disturbance are also important. (USFWS 2016). This is the only listed species to be observed during the May 23, 2016 survey.

Least tern (Sternula antillarum)

The least tern is a state threatened species that inhabits areas along the coasts of Florida including estuaries and bays. The least tern's diet primarily consists of fish, but they will also feed on small invertebrates. They build nests in shallow depressions in bare beach sand and on gravel berms and rooftops (FWC 2016). Seasonal utilization of the berm adjacent to the TPC is possible during nesting season.

White-crowned pigeon (Patagioenas leucocephala)

The white-crowned pigeon is not federally listed however is protected by the U.S. Migratory Bird treaty Act and as a State-designated threatened species. White crowned pigeons inhabit low-lying forest habitats including mangroves around Biscayne Bay, Florida Bay and the Florida Keys. The diet of the white-crowned pigeon consists of tropical hardwood tree fruits. White crowned pigeons were not observed during the survey.

Table 2-3. Federally Listed and Florida-State Listed Species Potentially Existing near Turtle Point Canal

Common Name	Scientific Name	Federal Status ^(a)	State Status ^(a)	Observed during survey
Birds				
Roseate spoonbill	<i>Ajaia ajaja</i>	—	S	N
Little blue heron	<i>Egretta caerulea</i>	—	S	N
Reddish egret	<i>Egretta rufescens</i>	—	S	N
Snowy egret	<i>Egretta thula</i>	—	S	N
Tricolor heron	<i>Egretta tricolor</i>	—	S	N
White ibis	<i>Eudocimus albus</i>	—	S	N
American kestrel	<i>Falco sparverius</i>	—	T	N
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	T	N
Wood stork	<i>Mycteria americana</i>	E	E	N
Brown pelican	<i>Pelecanus occidentalis</i>	—	S	Y
White-crowned pigeon	<i>Patagioenas leucocephala</i>	—	T	N
Least tern	<i>Sterna antillarum</i>	—	T	N
Fish				
Mangrove rivulus	<i>Rivulus marmoratus</i>	SOC	S	N
Small-toothed sawfish	<i>Pristis pectinata</i>	E	—	N
Common snook	<i>Centropomus undecimalis</i>	—	S	N
Mammals				
Florida manatee	<i>Trichechus latirostris</i>	E	E	N
Plants				
Johnson's seagrass	<i>Halophila johnsonii</i>	T	—	N
Reptiles				
Green sea turtle	<i>Chelonia mydas</i>	E	E	N
Eastern Indigo snake	<i>Drymarchon couperi</i>	T	T	N
Hawksbill sea turtle	<i>Erymochelys imbricata</i>	E	E	N
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E	N
Kemp's ridley sea turtle	<i>Lepidochelys kempi</i>	E	E	N
Loggerhead sea turtle	<i>Caretta</i>	T	T	N
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	S	N
American crocodile	<i>Crocodylus acutus</i>	T	E	N

(a) E = Endangered; T = Threatened; T(S/A) = Threatened due to similarity of appearance; C = Candidate for federal listing; S = Florida species of special concern; SOC = NOAA species of concern; — = No listing

3. RESTORATION PLAN

This section describes the methods and techniques for restoration implementation of the TPC. The proposed restoration consists of filling approximately one-third the length of the TPC to a grade of +0.7 to +0.9 ft. NAVD for creation of mangrove habitat, then sloping to -7 ft. at 3:1 slope, and filling the rest (two-thirds) of the TPC to -7 ft. out to the bay bottom. The proposed plan will require placing approximately 57,000 cy of raw fill material (approximately 17,100 cy of bottom fill and 39,900 cy of select top fill) to fill the canal to proposed specification. Figure 3-1 provides an illustration of proposed alternative. A set of conceptual restoration plan drawings have been prepared under a separate cover.

Fill grade elevations for mangrove habitat were determined by similar successful mangrove restoration projects in south Miami/Dade County. The fill volume was calculated using topographic survey data provided by FPL, an estimated boundary (approximately 235 ft.), and a 3:1 slope to a -7 ft. final grade elevation. The volume includes an additional 25% of material to account for inadvertent loss due to compaction, material handling, loss of fines, etc.

The proposed restoration plan will meet the project objective of restoring water quality within the TPC with an additional result of habitat creation. The project schedule should avoid periods of extreme high tides, bird and crocodile nesting seasons, and tropical storm systems. Restoration will consist of a combination of specific activities that include material staging, sediment placement, grading, shoreline stabilization, and mangrove planting. The approach for implementation of the proposed plan is presented below.

3.1 Fill Specifications, Transport, and Staging

The fill specification for Turkey Point requires two types of fill: Type – E (bottom fill) and Type – A (select top fill). The bottom fill is a calcium carbonate coarse grain sand with a grain size of less than 10% passing through a range 12 inch to #200 sieve. Bottom fill will be placed from the canal bottom to an elevation of -15.8 ft NAVD along the length of the canal. The select top fill is a calcium carbonate coarse grain sand with a grain size of less than 5% passing through a range #4 to #200 sieve. Top fill will be placed in layer from -15.8 ft to +1 ft NAVD along the western third and to -7 ft NAVD along eastern two thirds of the TPC to the opening at Biscayne Bay (see Figure 3-1).

Select top fill and bottom fill should be obtained from local quarries. Fill material meeting the gradation specifications are readily available from local quarries in the quantity needed to fulfill the project needs. There may also be appropriate available fill from on-site sources.



Photo 3-1. Proposed staging area

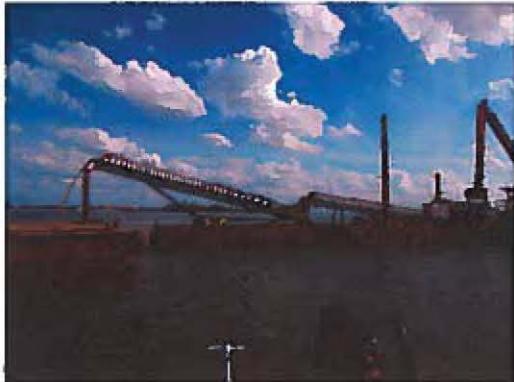


Photo 3-2. Example of covered fill conveyor system

Staging areas are available near the project site. Photo 3-1 provides an example of a potential staging area; however, the staging area will be identified by the contractor. Fill material will be delivered via truck directly to the staging area along existing roads on the project site. Fill material will be stored on site. Fill material will be staged in a contained environment to avoid loss of material to adjacent aquatic resources. The staging area will be returned to pre-project conditions following project completion, with final cleanup notification provided to the FPL representative.

Loose fill may be transferred using a long-reach excavator and conveyor system or other suitable transfer

machinery from the staging area to a material placement barge. Photo 3-2 provides an example of equipment used to efficiently transfer fill material. Typically, the use of a conveyor system (preferred method) provides a low-to no-impact fill material transfer route through the mangroves. Mangrove canopy openings sufficient for installation of the conveyor system were identified during the site assessment. Figure 3-2 identifies a potential location for installation of the conveyor system. All sections of the conveyor system that cross mangrove habitat or any other sensitive habitat will be covered from above and below to limit wind loss of material and to catch any material that may drop from the conveyor system. The covers are generally constructed of half sectioned corrugated style pipe installed above and below the conveyor belt (see Photo 3-2). Once selected the contractor may propose comparable alternative methods.

A turbidity containment system will be installed prior to construction and will remain throughout the fill operations. At no time will the turbidity containment be breached during the fill operations.

3.2 Turbidity Containment

During fill placement activities, turbidity curtains and/or other barriers will enclose the north shoreline and mouth of the TPC to minimize potential siltation and turbidity of surrounding mangrove and seagrass communities.

Turbidity curtains at the mouth of the TPC will be placed such that the bottom edge of the material is in contact with the bay bottom. Turbidity curtains will be anchored securely for use in high current/dynamic conditions. Piles (12- in. diameter or greater) will be used across the mouth of the TPC to secure the turbidity

curtain. All possible turbidity leak points (seams, bottom of curtain, etc.) will be secured and monitored during filling operations. Turbidity curtains shall be furnished with excess material (flaps) at each end so they may be rolled together to seal the seam created by securing two sections together. Additionally, curtains will have a 3-ft. barrier above the water line to inhibit manatees from entering the fill zone. The turbidity curtains will be highly visible and manufactured from entanglement-free material that is safe to use in the presence of marine mammals, sea turtles, and



Photo 3-3. Fill conveyor loading placement barge

other marine fauna. Curtains will be removed from the TPC post-filling once turbidity within the feature reaches an acceptable level.

3.3 Habitat Grading and Shoreline and Slope Stabilization

As described above, approximately 235 linear ft. of the TPC will be filled to a maximum elevation of +0.73 to +0.93 ft. NAVD. The goal of habitat grading is to create a mosaic of habitat types that may be utilized by reptiles, avifauna, and invertebrates. Additionally, the proposed grading plan will promote drainage of the TPC and will provide access for crocodiles to Biscayne Bay. A conceptual habitat map of the TPC is presented in Figure 3-3.

On-site physical conditions (i.e., high energy environments) may require the use of a temporary and/or permanent protective barrier to protect the slope from erosion and the planted mangroves from wave action and floating debris. The unconsolidated fill shoreline and slope to 7-ft NAVD will be stabilized using natural limerock boulders (30 cm to 90 cm [1 ft. – 3 ft.]). Providing shoreline stabilization in this manner will abate wave action, which will reduce erosion and re-suspension of sediments and related turbidity allowing the red mangroves to establish prop roots that will provide feeding, refuge, and nursery habitat for a variety of attached and motile sub-tidal and inter-tidal marine fauna.

The limestone protective barrier will begin at the toe of slope at -7 ft. NAVD and will extend to an elevation of 60 cm (2 ft.) above mean high water, with a 3:1 slope below the water line and no greater than 2:1 slope for the limestone above mean low water. Filter fabric should be used beneath the lime-rock boulders to limit the loss of unconsolidated fill material. The limestone barrier should be installed in a uniform and interlocking manner so there are voids between the larger pieces. The protective barrier should be placed a minimum of 1 ft. from existing mangrove trunks and prop roots. It is estimated that approximately 400 cy of limestone boulders will be required to provide the shoreline and slope stabilization.

3.4 Mangrove planting

Red mangroves (*Rhizophora mangle*) will be planted in an approximately 0.35 acres (15,449 ft²) of the filled TPC. Figure 3-3 presents the mangrove planting area graphically. The mangrove planting area will be graded flat to an elevation of +0.73 ft. to +0.93 ft. NAVD. Approximately 1,725 Red mangrove plants with a minimum height of 18 inches (in.) will be planted 5-ft. on center.

3.5 Threatened and Endangered Species Signage

All staff involved with filling operations will be instructed and trained as per Florida Fish and Wildlife Conservation Commission (FWC) Standard Manatee Conditions for In-Water Work as well as the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA-NMFS) Marine Sea Turtle and Smalltooth Sawfish Construction Conditions. Idle speed/manatee protection signage will be maintained on board during all restoration activities. One sign which reads Caution: Boaters shall be posted in a location where it is prominently visible to



Figure 3-5. FWC manatee signage

all staff. A second sign measuring at least 8.5 by 11-in. explaining the requirements for “Idle Speed/No Wake” and the shutdown of in-water operations (Figure 3-5) will be posted in a location prominently visible to all personnel engaged in water-related activities (www.myfwc.com). Signage will be maintained at both the location of the materials barge and the restoration site. If any Threatened and Endangered Species comes within 50 feet of the work zone, filling operations will cease until the protected species has left the work zone on its own accord.

During the permitting process, the level of observer will be determined: 1) observer approved by Florida Fish & Wildlife Conservation Commission at least 2 weeks prior to starting construction; 2) observer adequately trained and equipped with proper glasses; or 3) all on-site personnel are responsible for observer in-water activities for possible manatee presence. If a dedicated manatee observer will be required, that person(s) is expected to be on-site at all times during in-water construction.

3.6 Water Quality Monitoring

Using a portable turbidimeter (Hach 2100Q), turbidity measurements will be collected at 6-hour intervals from upstream, downstream, and within the work area. Samples will be collected outside the turbidity containment from no further than 50 ft. from the point of discharge within the densest portion of any visible plume if such an event occurs. If the turbidity exceeds the state water quality standards (DEP 62-302.530) for an Outstanding Florida Water (zero NTU's above background) then backfill operations will cease until water quality standards are returned to background levels. If water quality standards are exceeded more than twice a day, the backfill operations will be stopped and then evaluated for implementation of mitigation measures.

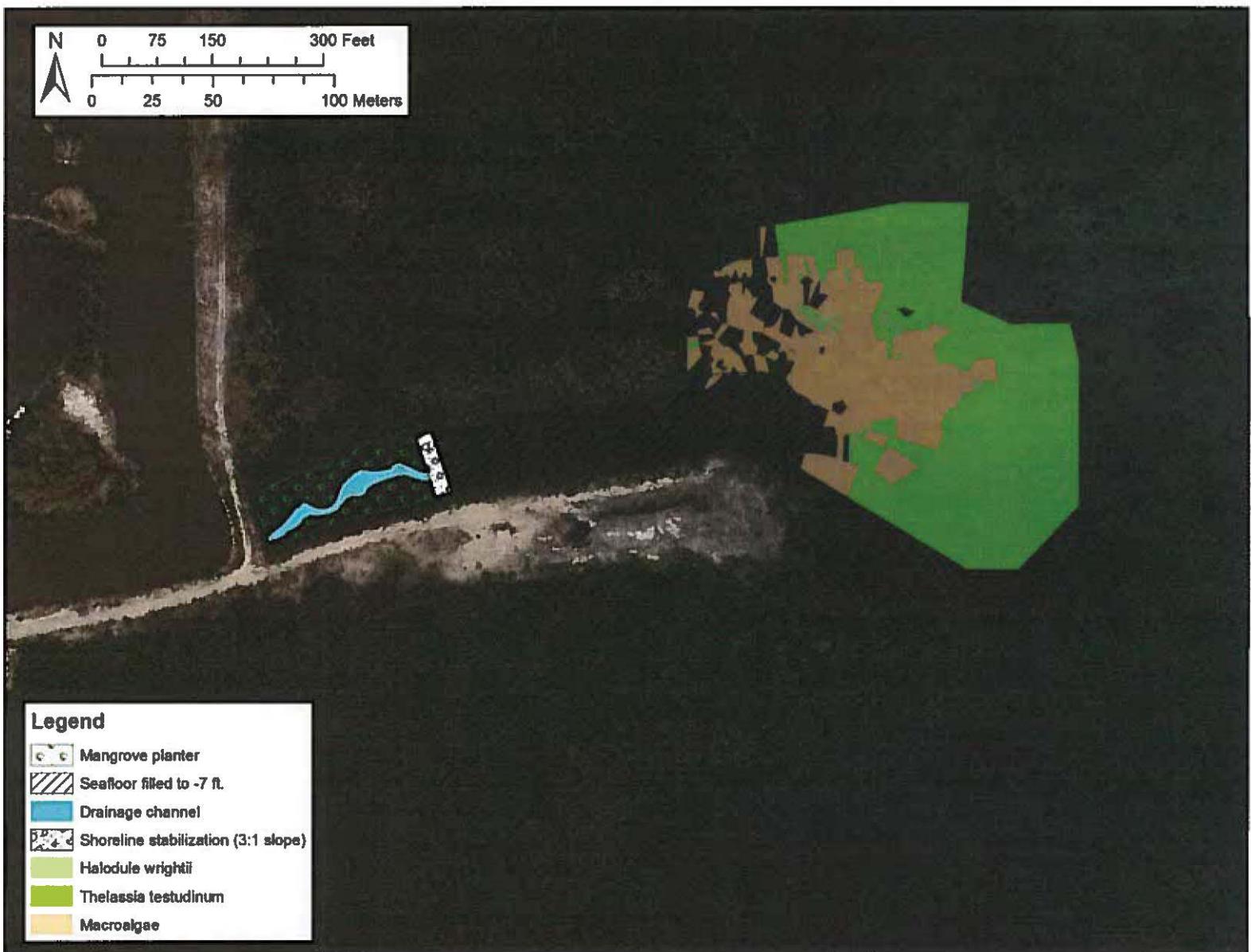


Figure 3-1. Proposed restoration conceptual plan for filling one third of the TPC

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July 2016

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Figure 3-2. Proposed staging area and conveyor placement area

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July 2016

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4. SUMMARY

Currently the TPC is a channelized waterway with sparse to no epibenthic floral or faunal coverage. The vertically cut banks along with poor water quality currently provides suboptimal marine habitat. Filling of the TPC is expected to improve benthic habitat both within the TPC and adjacent areas. The overall intent of the project is to improve water quality and hydrology by backfilling the TPC to a minimum depth of -7 NGVD and restoring a third of the system to mangrove habitat, thereby, providing ecological improvements to Biscayne Bay. Additionally, indirect benefits to marine habitats are expected as a result of the overall improvements to water quality.

Based on the site survey, direct impacts to benthic resources are not expected as a result of the project. Indirect impacts such as shading, sedimentation, turbidity, and mechanical injury are expected to be negligible. The use of specialized turbidity containment and equipment and the methods specified herein will avoid and minimize both direct and indirect impacts to both sessile and motile biota. Accessing the remnant canal from the land side, with the exception of the construction barge with excavator to be mobilized to the canal, will minimize barge traffic compared to a water based operation and therefore avoid impacts from prop dredging, vessel groundings, and any potential for vessel strikes to protected marine species. All standard construction conditions for manatees and smalltooth sawfish will be abided by during construction to avoid any potential affects. Additionally, an observer will be on-site during all in-water construction to observe for any protected species within the project vicinity and provide awareness so actions to avoid harm or harassment to protected species can be taken.

5. REFERENCES

US Fish and Wildlife Service. <http://www.fws.gov/oregonfwo/Species/Data/BrownPelican/>. Accessed May 25, 2016.

Florida Fish and Wildlife Conservation Commission.

<http://myfwc.com/wildlifehabitats/imperiled/profiles/birds/least-tern/>. Accessed May 25, 2016.

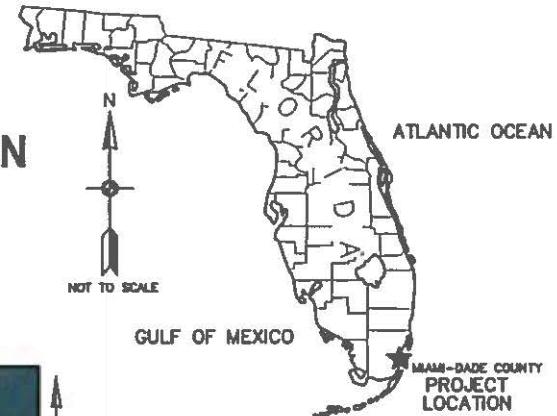
United States Nuclear Regulatory Commission.

<http://www.nrc.gov/docs/ML1036/ML103630163.pdf>. Accessed May 25, 2016.

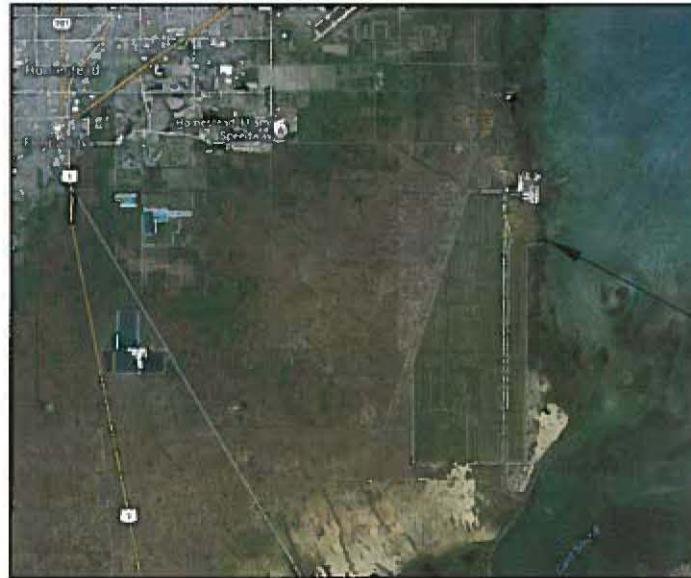


FLORIDA POWER AND LIGHT TURTLE POINT CANAL RESTORATION

MIAMI-DADE COUNTY



NOT TO SCALE



PROJECT
LOCATION

INDEX OF SHEETS

SHEET #	TITLE	LATEST UPDATE	REV.
G-001	COVER SHEET AND VICINITY MAP	7/29/16	0
G-002	LIMITS OF CONSTRUCTION	7/29/16	0
P-101	TURTLE POINT PLAN VIEW AND SURVEY	7/29/16	0
P-102	TURTLE POINT ELEVATIONS	7/29/16	0
P-103	TURTLE POINT CROSS-SECTIONS	7/29/16	0
P-104	TURTLE POINT FILL AREA	7/29/16	0

VICINITY MAP

TURTLE POINT CANAL, MIAMI-DADE COUNTY, FLORIDA

FOR PERMITTING ONLY
NOT FOR CONSTRUCTION



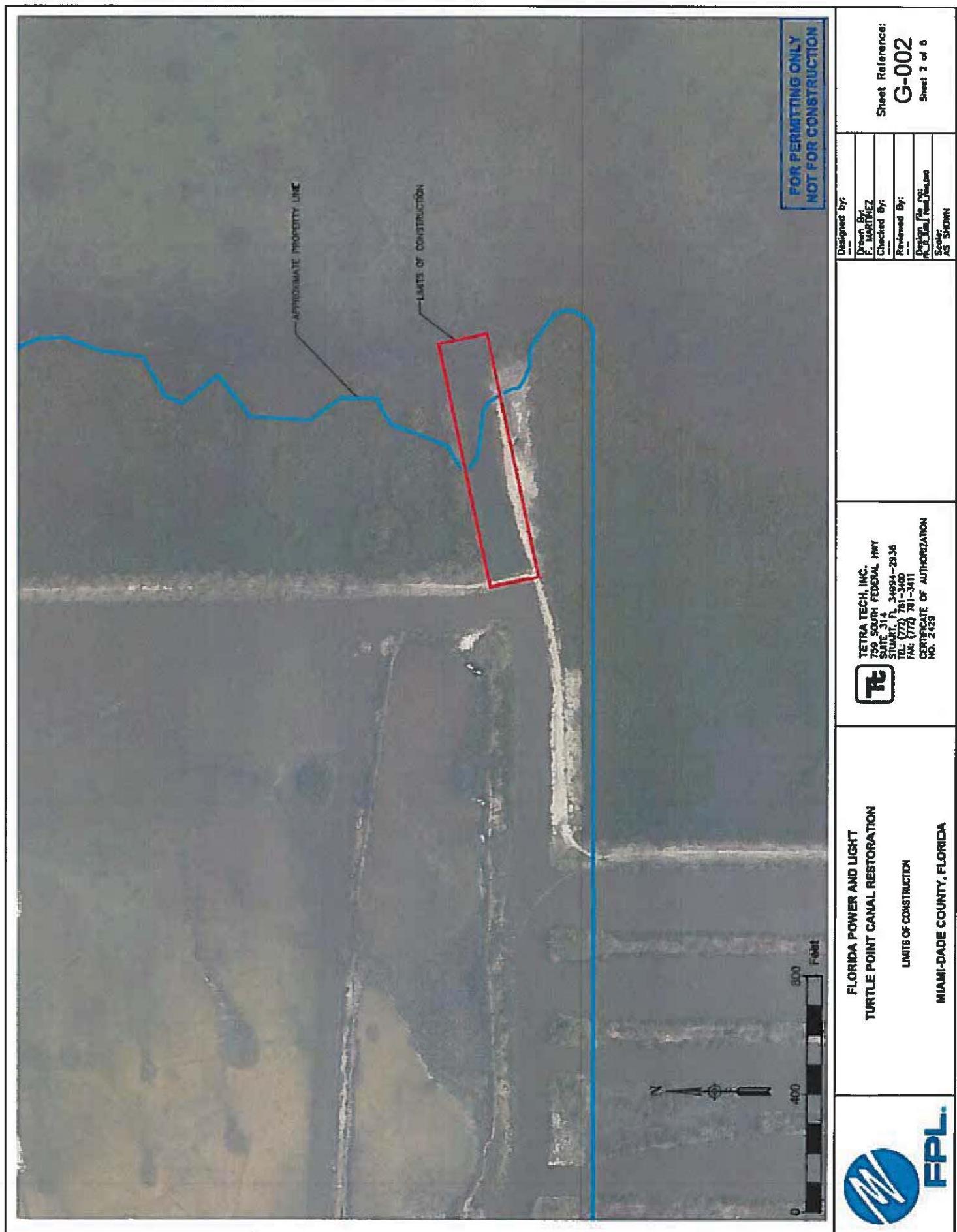
FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION
COVER SHEET AND VICINITY MAP
MIAMI-DADE COUNTY, FLORIDA

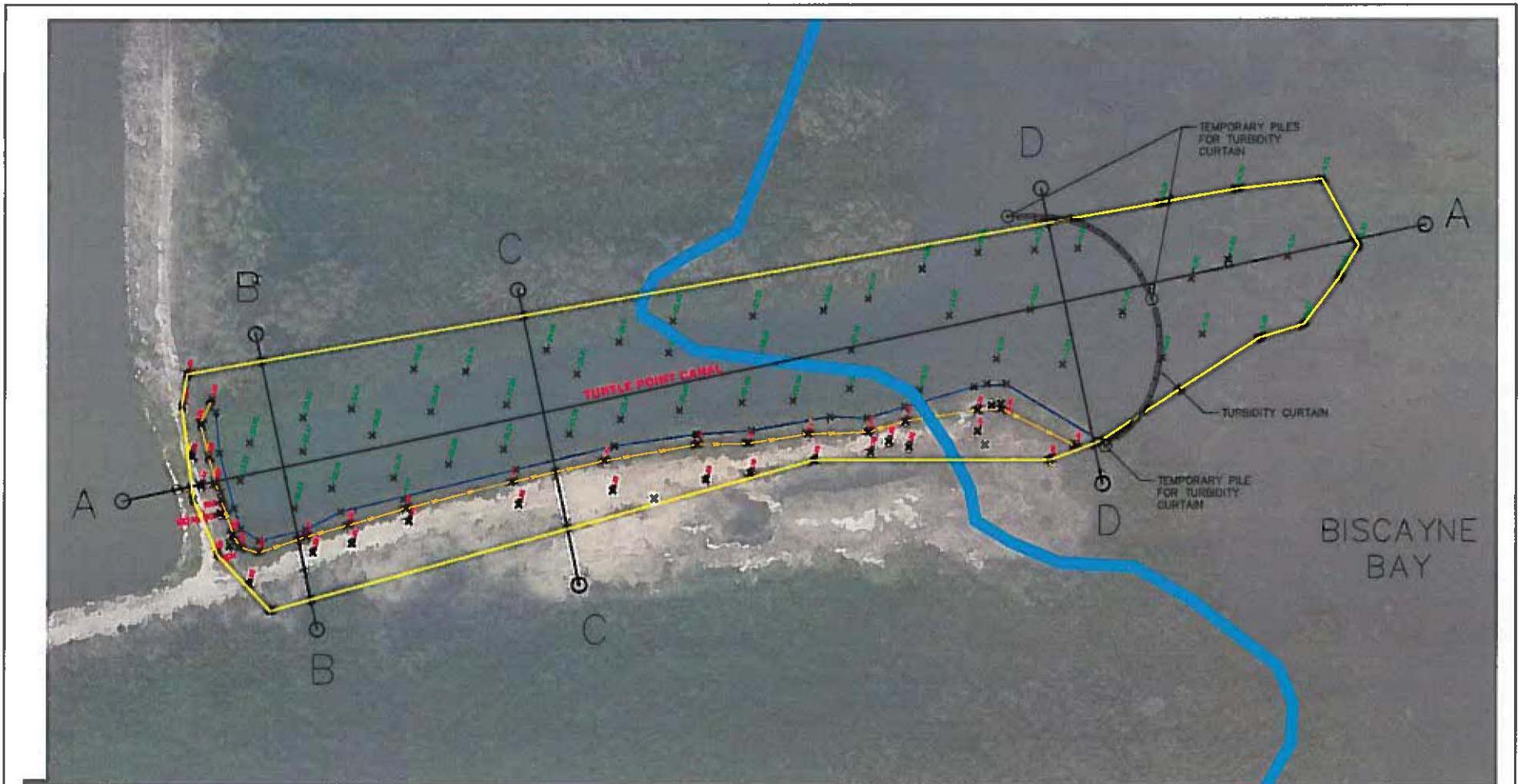


TETRA TECH, INC.
750 SOUTH FEDERAL HWY
SUITE 314
STUART, FL 34994-2936
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429

Designed by: _____
Drawn By: F. MARTINEZ
Checked By: _____
Reviewed By: _____
Design file no.: MI-16-002-FPL-TURTLE
Scale: AS SHOWN

Sheet Reference:
G-001
Sheet 1 of 6





0 120 240
Feet

NOTES:

1. ALL SURVEY DATA WAS PROVIDED BY FORD, ARMENTEROS & FERNANDEZ, INC. AND SURVEYED ON 4/15/16.
2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE SURFACES USED FOR ANALYSIS WERE DEVELOPED FROM THE LIMITED SURVEY DATA, WITH SOME ELEVATIONS INTERPOLATED BASED ON SURROUNDING SURVEY POINTS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL FILL VOLUMES REQUIRED FOR COMPLETION OF THIS PROJECT.
4. A TURBIDITY CURTAIN SHALL BE UTILIZED TO PREVENT ANY SUSPENDED MATERIAL FROM ESCAPING OUTSIDE OF THE CONSTRUCTION ZONE. THREE TEMPORARY PILES SHALL BE DRIVEN AT THE LOCATIONS SHOWN TO ANCHOR THE TURBIDITY CURTAIN.
5. CROSS-SECTIONS A-A THROUGH D-D ARE SHOWN ON SHEET P-103.

LEGEND:

- X SURVEY POINT
- SURVEY BOUNDARY
- CROSS-SECTION
- TEMPORARY PILES
- TURBIDITY CURTAIN
- APPROX. PROPERTY LINE

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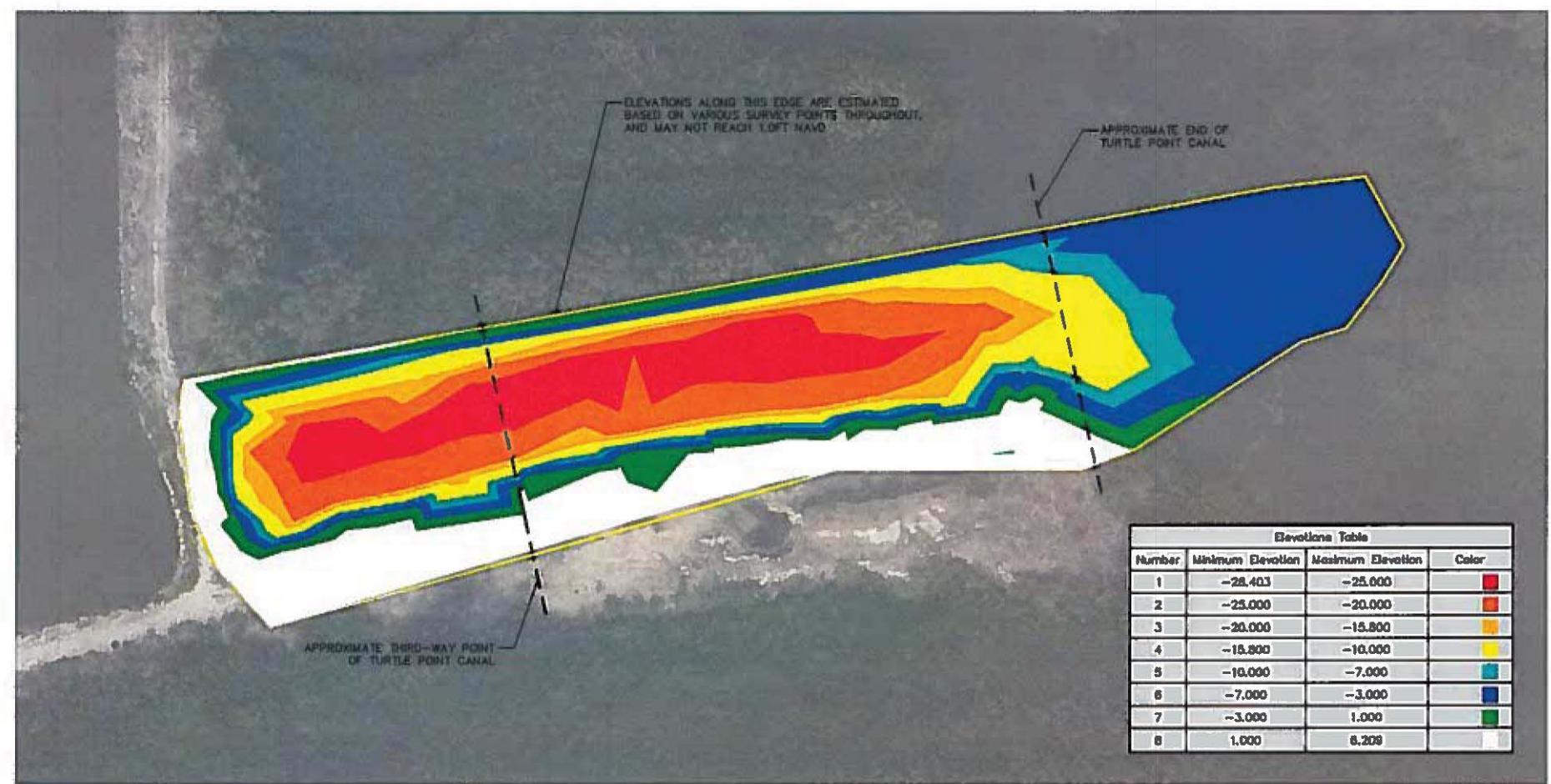
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TURTLE POINT PLAN VIEW AND SURVEY
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F. MARTINEZ
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Reviewed By:
Design File no:
FPL-2018-0001
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Sheet Reference:
P-101
Sheet 3 of 6



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NOTES:

1. ALL SURVEY DATA WAS PROVIDED BY FORD, ARMENTEROS & FERNANDEZ, INC. AND SURVEYED ON 4/15/18.
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4. THE RESTORATION PLAN INVOLVES FILLING THE FIRST THIRD OF THE TURTLE POINT CANAL TO EL 1.0FT NAVD, THEN THE BASIN WILL SLOPE DOWN (AT 3H:1V SLOPE) TO -7.0FT NAVD ALL THE WAY TO THE END OF THE CANAL.

LEGEND:

- Survey Boundary
- Approx. Canal Boundaries



FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION
TURTLE POINT ELEVATIONS
MIAMI-DADE COUNTY, FLORIDA



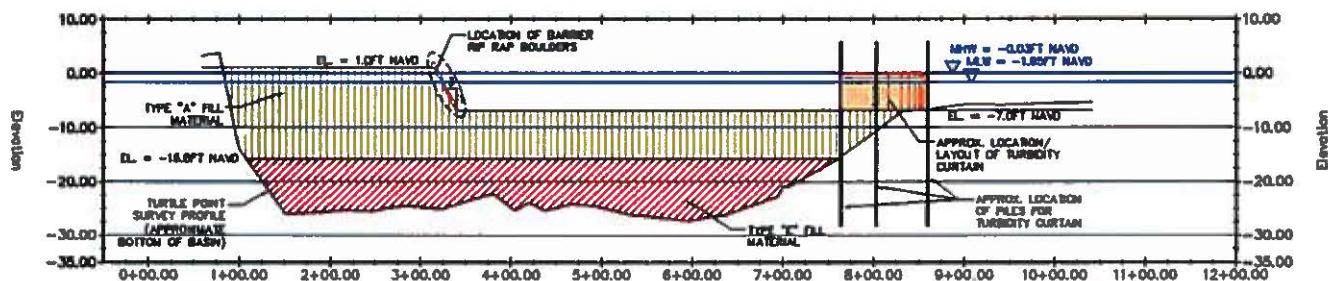
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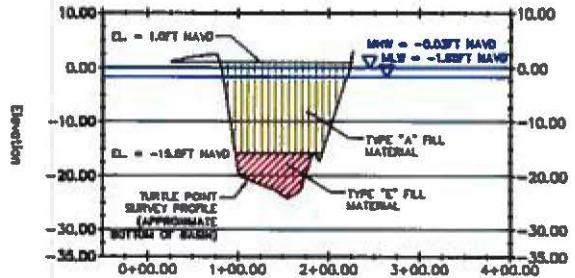
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Sheet Reference:
P-102
Sheet 4 of 8

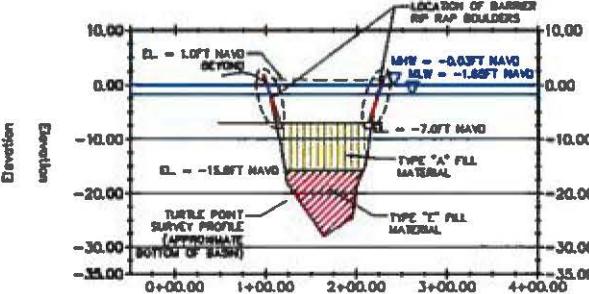
Profile View of A-A



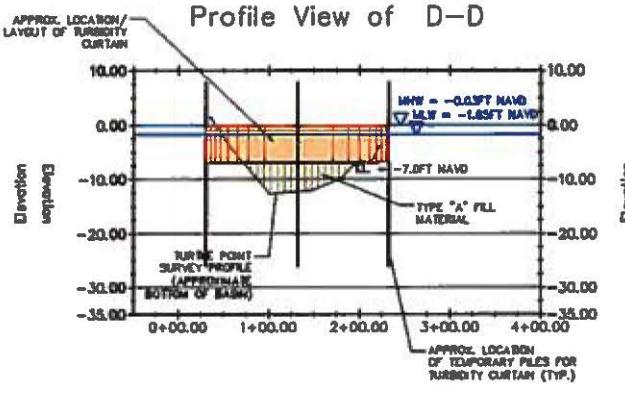
Profile View of B-B



Profile View of C-C



Profile View of D-D



NOTES:

1. ALL SURVEY DATA WAS PROVIDED BY FORD, ARBENTEROS & FERNANDEZ, INC. AND SURVEYED ON 4/15/16.
2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN Vertical DARM OF 1988 (NAVD 88).
3. THE SURFACES USED FOR ANALYSIS WERE DEVELOPED FROM THE LIMITED SURVEY DATA, WITH SOME ELEVATIONS INTERPOLATED BASED ON SURROUNDING SURVEY POINTS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL FILL VOLUMES REQUIRED FOR COMPLETION OF THIS PROJECT.
4. RESTORATION PLAN: ONE-THIRD OF TURTLE POINT CANAL WILL BE FILLED TO EL. 1.0FT NAVD, THEN THE BASIN WILL SLOPE DOWN (AT 3H:1V SLOPE) TO -7.0FT NAVD DOWN TO THE END OF THE CANAL.
5. APPROXIMATE FILL VOLUME TO RESTORE CANAL: 57,000 C.Y. OVER AN AREA OF 2.1 ACRES (NOTE: VOLUMES INCLUDE AN ADDITIONAL 25% OF MATERIAL TO ACCOUNT FOR INADVERTENT LOSS OF MATERIAL). TWO TYPES OF FILL WILL BE USED:
 - 5.1. FILL TYPE "A": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 5% PASSING THROUGH A RANGE #4 TO #200 SIEVE IS UTILIZED FOR THE FILL. TYPE "A" FILL QUANTITY IS 39,800 CY IN LAYER +1FT TO -15.0FT NAVD TO OPENING AT BISCAYNE BAY.
 - 5.2. FILL TYPE "E": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 10% PASSING THROUGH A RANGE 12 INCH TO #200 SIEVE IS UTILIZED FOR THE FILL. TYPE "E" FILL QUANTITY IS 17,100 CY IN LAYER -15.0FT NAVD TO CANAL BOTTOM FULL LENGTH OF CANAL.
6. A RIP RAP BARRIER WITH APPROXIMATELY 2FT. DIAMETER LIMESTONE BOULDERS IS TO BE PLACED ALONG THE FILL SLOPE TO PROTECT MANGROVE PLANTINGS ON THE 1.0FT NAVD RESTORATION FILL AREA.
7. MEAN HIGH WATER (MHW) ELEVATION AND MEAN LOW WATER ELEVATION (MLW) WERE DETERMINED FROM NOAA TIDAL STATION 8723423, TURKEY POINT, BISCAYNE BAY, FL.

LEGEND:

■	TYPE "A" FILL
■	TYPE "E" FILL
■	LOCATION OF RIP RAP

0 200 400
Feet

HORIZONTAL SCALE: 1" = 200'
VERTICAL EXAGGERATION: 6.0
VERTICAL SCALE: 1" = 33.3'

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NOT FOR CONSTRUCTION



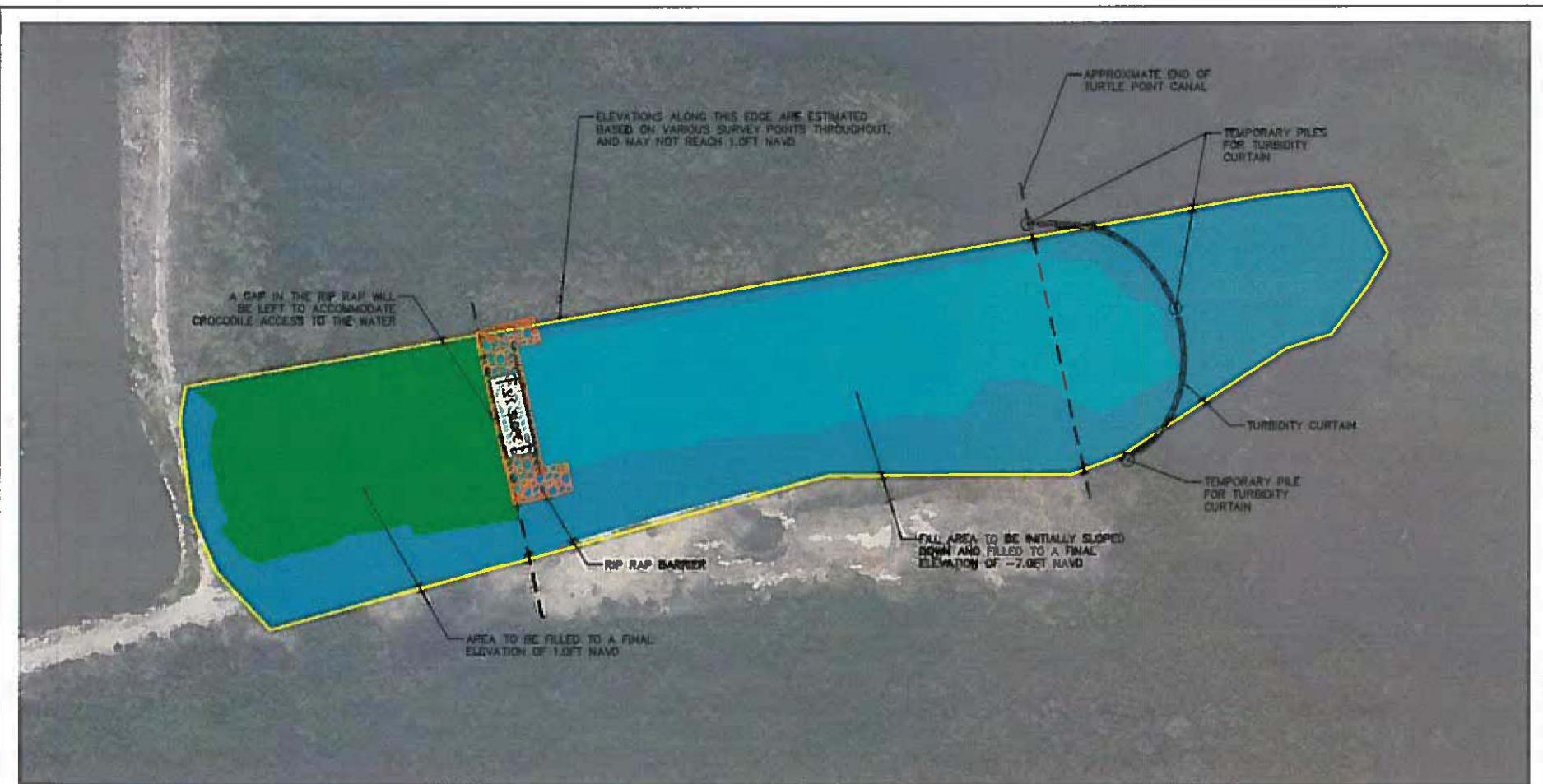
FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION
TURTLE POINT FILL CROSS-SECTIONS
MIAMI-DADE COUNTY, FLORIDA



TETRA TECH, INC.
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CERTIFICATE OF AUTHORIZATION
NO. 2429

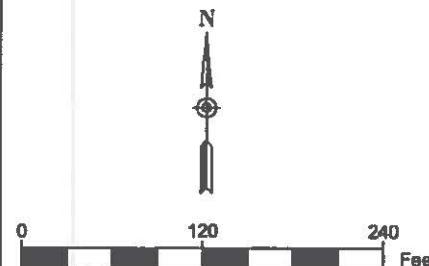
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Drawn By:
F. MARTINEZ
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Reviewed By:
Design File No.:
PL-73423-Rev-000
Scale: AS SHOWN

Sheet Reference:
P-103
Sheet 5 of 8



NOTES:

1. ALL SURVEY DATA WAS PROVIDED BY FORD, ARMENTEROS & FERNANDEZ, INC. AND SURVEYED ON 4/15/16.
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5. APPROXIMATE FILL VOLUME TO RESTORE CANAL: 57,000 CY OVER AN AREA OF 2.1 ACRES (NOTE: VOLUMES INCLUDE AN ADDITIONAL 25% OF MATERIAL TO ACCOUNT FOR INADVERTENT LOSS OF MATERIAL). TWO TYPES OF FILL WILL BE USED:
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 - 3.2. FILL TYPE "E": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 10% PASSING THROUGH A RANGE #12 INCH TO #200 SIEVE IS UTILIZED FOR THE FILL TYPE "E" FILL QUANTITY IS 17,100 CY IN LAYER -15.8FT NAVO TO CANAL BOTTOM FULL LENGTH OF CANAL.
6. A RIP RAP BARRIER WITH APPROXIMATELY 2FT. DIAMETER LIMESTONE BOULDERS IS TO BE PLACED ALONG THE FILL SLOPE TO PROTECT MANGROVE PLANTINGS ON THE 1.0FT NAVO RESTORATION FILL AREA.



LEGEND:
SURVEY BOUNDARY
APPROX. CANAL BOUNDARIES
1.0FT NAVO FILL AREA
-7.0FT NAVO FILL AREA
EXISTING GROUND ELEVATION
LOCATION OF RIP RAP

FOR PERMITTING ONLY
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FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION
TURTLE POINT FILL AREA
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Checked by:
Reviewed by:
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FPL-2018-136
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Sheet Reference:
P-104
Sheet 6 of 6

FLORIDA POWER & LIGHT

BARGE CANAL WATER QUALITY IMPROVEMENT PROJECT BIOLOGICAL EVALUATION AND RESTORATION PLAN

MIAMI-DADE COUNTY, FLORIDA

Prepared for:
Florida Power & Light
700 Universe Boulevard
Juno Beach, Florida 33408

Prepared By:
Tetra Tech, Inc.
759 South Federal Highway
Stuart, FL 34994

July 2016

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Acronyms and Abbreviations

AP	Aquatic Preserve
BC	Barge Canal
CCS	Cooling Canal System
cy	Cubic yard
DGPS	Differential Global Positioning System
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FLUCCS	Florida Land Use and Cover Classification System
FPL	Florida Power & Light
fsw	Feet of seawater
ft	foot/feet
ft ²	square feet
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish & Wildlife Service
in.	inch/inches
Kg	kilogram
m	meter
m ²	square meters
NAVD	North American Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NTU	nephelometric turbidity unit
Project	Barge Canal Water Quality Improvement Project
SAV	Submerged Aquatic Vegetation
TPC	Turtle Point Canal
WGS84	World Geodetic System 1984

1. INTRODUCTION

Tetra Tech Inc., (Tetra Tech) was contracted by Florida Power & Light (FPL) to provide an ecological evaluation and restoration plan for the Barge Canal/Basin Water Quality Improvement Project (Project), located at the Turkey Point Nuclear Power Plant in Homestead, Miami-Dade County. The Project is intended to restore water quality within the active Barge Canal/Basin (BC) by backfilling to -15 NAVD. Figure 1-1 presents the project location graphically.

FPL Turkey Point Power Plant utilizes a closed loop shallow radiant cooling canal system in the operation of a fossil fuel and two nuclear (Units 3 and 4) generating systems. In addition to cooling, the CCS is an industrial wastewater facility receiving runoff from the Plant site, processing water backwash/concentrate and boiler blowdown from a natural gas combined cycle generation system (Unit 5).

Per the Florida Department of Environmental Protection issued Consent Order (OGC No. 16-0241) FPL committed to the objective of restoring the BC. Partially backfilling the BC to a level of approximately ~15ft. NAVD will improve hydrology, water quality, and fringe habitat.

Tetra Tech performed a site survey on May 23, 2016. The purpose of the survey was to conduct a biological evaluation of the BC and the surrounding areas (hereinafter cumulatively referred to as Project area) to assist in the development of restoration alternatives. The survey identified protected species and sensitive biological resources within the Project area. The findings presented herein will supply the regulatory agencies with the most up-to-date resource data for the project site. Further, data collected from this survey were used in the restoration design and planning phase to minimize and avoid impacts to resources during project implementation.

1.1 Purpose and Need

The purpose of the proposed Project is fill the BC to elevation -15 ft. NAVD to improve water quality adjacent to the Plant and Biscayne Bay. The BC is an active basin currently used for delivery of fossil fuel for operation of the Turkey Point Plant. The BC was dredged to approximately -30 feet NAVD during the initial construction of the Plant.

Water quality parameters within the BC have been monitored as a condition of Miami-Dade County Department of Environmental Resource Management (MDC DERM) Class I permit No. CLI-2014-0312 since May 2015. A sample collected on September 14, 2015 contained ammonia at a level which exceeded the County's water quality standard of 0.5 mg/L (Standard). Ammonia concentrations have intermittently been above MDC DERM standards since that time. FPL performed a feasibility study and has determined that filling the BC to a depth of -15 ft. NAVD will effectively improve the water quality within the BC and subsequently Biscayne Bay.



Figure 1-1. Project vicinity map

Back of figure

2. BIOLOGICAL EVALUATION

A biological evaluation (survey) was conducted of the BC to document on-site and surrounding ecological communities, identify environmental concerns, and make specific recommendations concerning construction activities associated with the restoration actions. The survey reviewed access routes and environmental precautions. Data gathered during the survey provided the basis for development of the restoration prescription and design criteria.

A land and submerged water survey was conducted by a professional land surveyor. The topographic survey provided by FPL was used to assist the restoration team in planning, conceptual design, and planning for restoration actions, as well as provide a basis for volumetric calculations of the BC to yield an estimate of fill quantities.

2.1 Methods

Tetra Tech biologists with experience in benthic and mangrove habitat assessments performed a biological evaluation of the BC and surrounding areas. Figure 2-1 provides the extent of the assessment area. The evaluation included reconnaissance of the BC, the confluence of the BC and Biscayne Bay, and the immediately adjacent mangrove and terrestrial communities. All observations were made from the surface aboard a vessel. The entire boundary of the BC was surveyed. During the survey submerged aquatic vegetation (SAV) communities and presence of marine fauna were noted. Mangrove and terrestrial communities were also assessed and an inventory of common species and wildlife utilization were documented. Representative images including underwater video of resources were captured during the assessment.

2.2 Findings

With the exception of the barge channel, the bottom topography is relatively flat outside of the BC. The BC can be characterized as hardened shoreline basin with a steep slope from top of bank to the dredge depth of approximately -30 ft. The bottom (seafloor) of the BC can be classified as barren mud and detritus with no vegetative cover. The sediment outside of the BC is characterized as a calcareous mixture of silt, sand, shell fragments, and organic material.

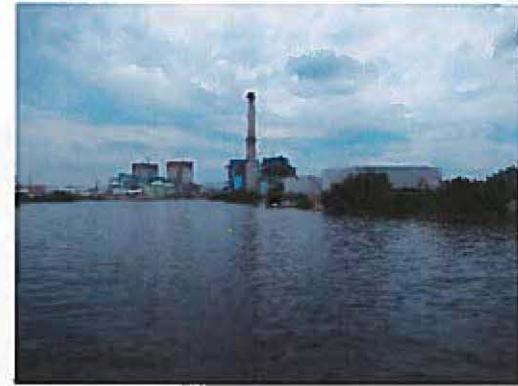
In general, the in-water survey area was characterized by three benthic community types; barren mud and detritus, macroalgae, and hard substrate (bulkhead, rubble, and rip rap). Epibenthic functional groups such as stony corals, sponges, and gorgonians were not encountered during the survey. Other community types within the greater project area include mangrove and upland levees and roadways. A list of marine and terrestrial species observed during the survey is presented in Table 2-2.



Photo 2-1. Hardened shoreline of barge canal

2.2.1 ***Submerged Aquatic Vegetation***

No epibenthic cover was documented within the BC at depths greater than 15 fsw. In general, barren substrate or epibenthic cover (macroalgae) of less than <5% was encountered to the proposed fill depth of -15 ft. NAVD. Silt-covered filamentous diatoms makes up the dominant vegetative cover along the hard substrate (wall and rubble and/or concrete). Macroalgae cover was occasionally observed in areas of gently sloping unconsolidated substrate predominantly in the -4 to -7ft. elevation range. Table 2-2 provides a list of SAV documented during the survey.



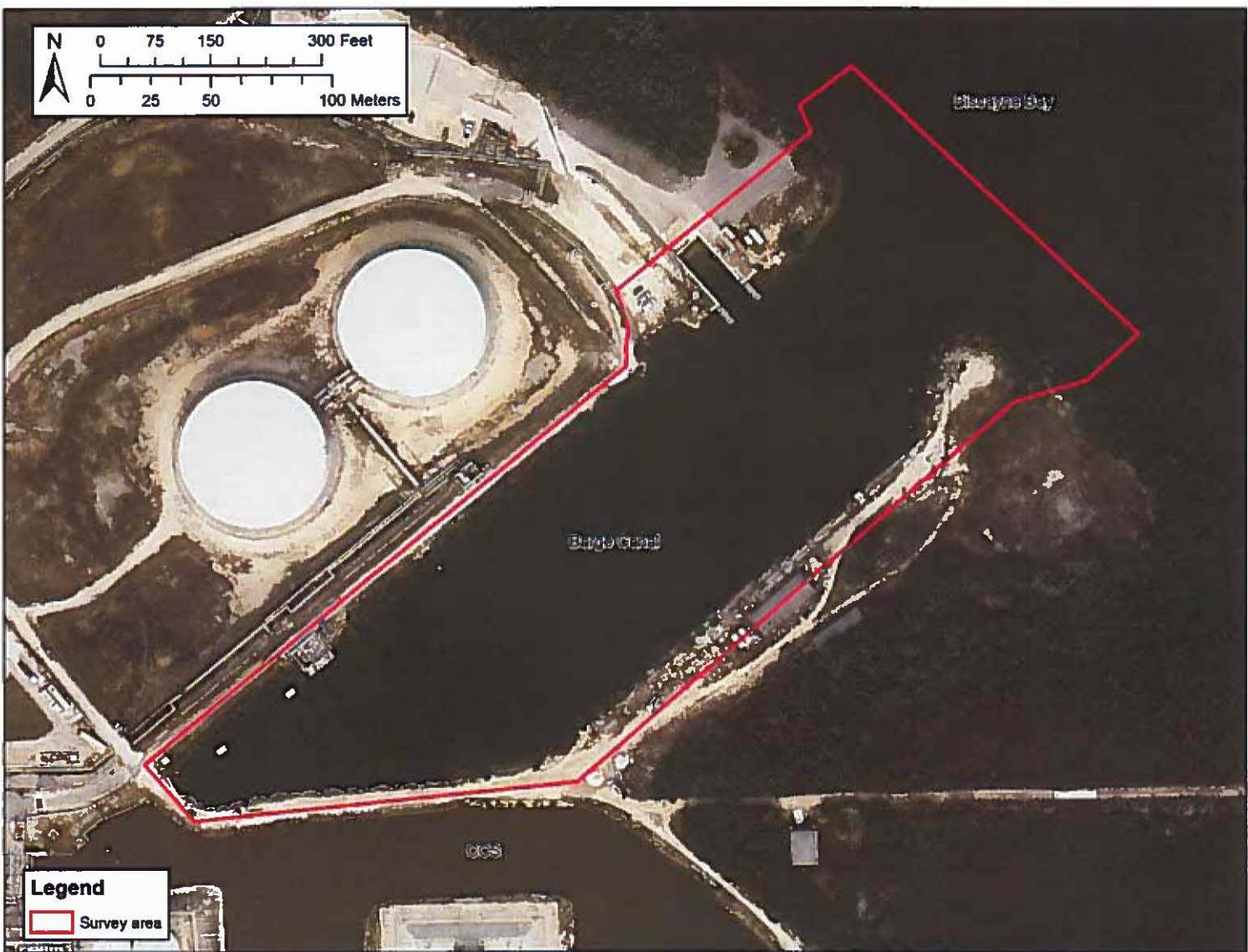


Figure 2-1. Extent of survey

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2.2.2 **Mangroves**

Mature mangroves are present along approximately 50 percent of the BC shoreline. The northwest shoreline (see Photo 2-1) is generally uninterrupted and is characterized by a narrow zone of red mangroves (*Rhizophora mangle*). White mangrove (*Laguncularia racemosa*), black mangrove (*Avicennia germinans*), and buttonwood (*Conocarpus erectus*) were also noted along the narrow mangrove fringe. The southern shoreline (see Photo 2-2) is characterized by a discontinuous

narrow fringe of mature mangroves and young recruits with small (< 5 ft.) to large (>100 ft.) open areas.

Mangrove habitat provides a detrital base for organic food webs and significant habitat for arboreal, intertidal, and subtidal organisms, including shellfish, crustaceans, fish, and birds. Additionally, red mangrove prop roots can provide substrate for a diverse epifaunal assemblage. Although important habitat for a variety of species, the narrow fringe of available habitat and the steep slope along the edge of the edge of the BC provide marginal mangrove habitat. Red mangrove prop roots had little to no epifaunal colonization and the detrital base and associated organisms were marginal due to the narrow fringe, hard substrate, and steep slope of the BC. Although the mangroves within the BC are on lands disturbed and previously impacted by the construction and operation of the Turkey Point complex, they provide structural habitat for a variety of mangrove habitat associated fauna.

2.2.3 **Uplands**

The uplands adjacent to the project site consist of the Turkey Point Power Plant facility and pervious (shell rock) roads and levees constructed for operations of the electrical power facility. The uplands are historically filled lands that currently provide minimal habitat for native species. Due to the active use of the uplands, the potential for wildlife utilization is low.

The roadways and levees surrounding the BC will provide access to the staging area and project site during construction. These roadways and levees will be under heavy use during project implementation. Table 2-2 provides a list of vegetation noted during the pedestrian survey.

2.3 **Land Cover**

The FDOT land use, vegetation cover, and landform classification system (FLUCCS) is arranged in hierarchical levels with each level containing information of increasing detail. The system uses four levels (I–IV) within classification categories; however, for the level of detail required for the analysis presented in this report, categories were limited to level III specificity. Five categories are



Photo 2-1. Northwest shoreline



Photo 2-2. Southern shoreline

represented within the project boundary. Figure 2-2 presents the land use, cover, and forms classification system (FLUCCS) graphically. Below is a description of each land cover category.

Channelized Waterway (512) – This category includes the TPC and the cooling canal system (CCS) associated with the Turkey Point Facility

Embayments Opening D (541) - This category includes the greater Biscayne Bay area.

Mangrove swamp (612) – This Category describes the mangrove communities that fringe the TPC and are adjacent to the project area.

Dikes and levees (747) – This category describes the levees and roadways that surround the CCS and the proposed staging area south of the TPC.

Electrical Power Facility (931) – This category describes the grounds associated with the Turkey Point Power Plant facility.

Table 2-2. Marine, Terrestrial, and Avian Species Documented in Barge Canal and Adjacent Upland Area

Common Name	Scientific Name
Birds	
Common nighthawk	<i>Chordeiles minor</i>
Brown pelican	<i>Pelecanus occidentalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Anhinga	<i>Anhinga anhinga</i>
Mockingbird	<i>Mimus polyglottis</i>
Great White Heron	<i>Ardea herodias occidentalis</i>
Common grackle	<i>Quiscalus quiscula</i>
Fish	
Sheepshead	<i>Archosargus probatocephalus</i>
Flagfin Mojarra	<i>Eucinostomus melanopterus</i>
Tarpon	<i>Megalops atlanticus</i>
Common snook	<i>Centropomus undecimalis</i>
Parrot fish	<i>Scarus spp.</i>
Sergeant major	<i>Abudefduf saxatilis</i>
Mullet	<i>Mugil sp.</i>
Mangrove snapper	<i>Lutjanus griseus</i>
Silversides	<i>Menidia</i>
Submerged Aquatic Vegetation	
Mermaid's wineglass (green algae)	<i>Acetabularia sp.</i>
Green algae	<i>Caulerpa sp.</i>
Shaving brush alga (green algae)	<i>Penicillus sp.</i>
Turtle grass (seagrass)	<i>Thalassia testudinum</i>
Shoal grass (seagrass)	<i>Halodule wrightii</i>
Manatee grass	<i>Syringodium filiforme</i>
Terrestrial Vegetation	
Black mangrove	<i>Avicennia germinans</i>
Tree seaside oxeye	<i>Borrichia arborescens</i>
Australian pine	<i>Casuarina equisetifolia</i>
Sea grape	<i>Coccoloba uvifera</i>
Buttonwood	<i>Conocarpus erectus</i>
White mangrove	<i>Laguncularia racemosa</i>
Red mangrove	<i>Rhizophora mangle</i>
Beach Naupaka	<i>Scaevola taccada</i>
Bay cedar	<i>Suriana maritima</i>
Brazilian pepper	<i>Schinus terebinthifolius</i>

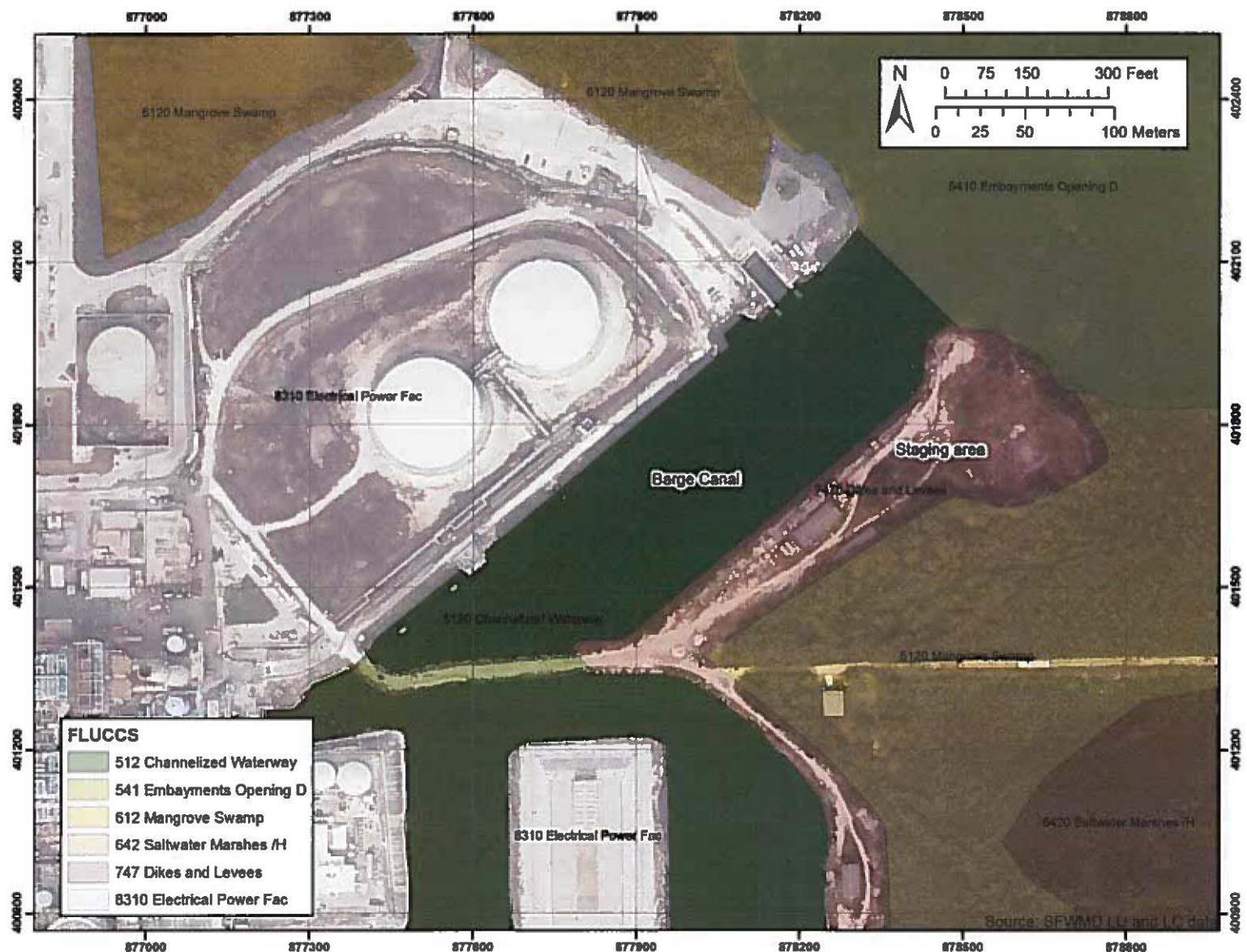


Figure 2-2. Land use and land cover classification

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July 2016

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2.4 Protected Species

The Florida Fish and Wildlife Conservation Commission (FWC) publication Florida's Endangered and Threatened Species (Updated January 2016) was used to determine the status of listed species with the potential to utilize the proposed Project site. No sightings of or evidence of listed species were noted during the survey; however, based on geographic range, several listed species have the potential to utilize the TPC area (Table 2-3).

There are 11 aquatic species known to occur within Biscayne Bay that are protected under the Endangered Species Act or are candidates for listing. These are the American crocodile (*Crocodylus acutus*), Johnson's seagrass (*Halophila johnsonii*), the mangrove rivulus (*Rivulus marmoratus*), the small-toothed sawfish (*Pristis pectinata*), five species of sea turtle, the American alligator (*Alligator mississippiensis*), and the Florida manatee (*Trichechus manatus*). Additionally, a variety of protected avian species are known to occur within the southern Biscayne Bay and the Turkey Point Facility. Table 2-3 includes a list of protected avian species that have been known to utilize the BC area. Although these species were not documented during the survey, brief discussions of potentially occurring protected species are provided below.

American crocodile (Crocodylus acutus)

The American crocodile is federally threatened and state listed as endangered. Most crocodile nesting occurs in the southwestern corner of the industrial wastewater facility; however, a limited number of nests have been observed on berms within the northern portion of the return canals.

Johnson's seagrass (Halophila johnsonii)

Johnson's seagrass, federally listed as a threatened species, occurs along the Florida coast from Sebastian Inlet to central Biscayne Bay at Virginia Key, Key Biscayne. This seagrass species was not observed during the survey and is not known to occur as far south as the Turkey Point plant property.

Mangrove rivulus (Rivulus marmoratus)

The mangrove rivulus, a fish that inhabits crab burrows in mangrove areas, is federally listed as a NOAA Species of Concern and listed by the state as a Florida species of concern. It could be present in mangrove areas fringing the plant site, but is unlikely to be present in the BC due to lack of habitat (no crabs or crab burrows were observed in mangrove habitat during the survey).

Small-toothed sawfish (Pristis pectinata)

The small-toothed sawfish is a state and federally endangered species that inhabits inshore bars, seagrass beds, and mangrove areas. Due to its preference for these habitat types, the small-toothed sawfish could potentially utilize the BC.

Florida manatee (Trichechus manatus)

The manatee is a state and federally endangered species that frequents warm water estuarine habitats including rivers, marshes, bays, and sounds in Florida. They use warm water refuges in the cooler months, including freshwater springs and heated effluent from power plants. Manatees are federal- and state-listed as endangered, and their critical habitat includes Biscayne Bay and Card Sound adjacent to the Turkey Point plant property and the canals entering these water bodies. Manatees have been observed in the barge turning basin and nearby state canals (NRC 2016).

American alligator (Alligator mississippiensis)

The alligator is federally listed as Threatened due to similarity of appearance and state listed as a Florida species of special concern. The species is federally listed as threatened due to its physical resemblance to the American crocodile, which is endangered. Alligators live in swampy areas, rivers, streams, lakes and ponds. Although they are primarily freshwater animals, alligators will also venture into brackish salt water. Although alligators have been observed and relocated off site from the Turkey Point facility, there are no reports of alligators utilizing the BC.

Eastern Indigo snake (Drymarchon couperi)

The eastern indigo snake is federally threatened and can be found in almost any habitat throughout the state of Florida. Although eastern indigo snakes were not observed during the survey, they are known to occur on site. These snakes may occur in wetland or uplands and may be seen along the shell rock roads located throughout the CCS area at Turkey Point.

Sea turtles

Sea turtles (4 species with protection status of Endangered or Threatened) are found in marine habitats that open to the sea, such as Biscayne Bay and Card Sound. The BC does not provide suitable habitat, and the shoreline adjacent to the canal lacks the beach habitat preferred by sea turtles for nesting.

Wood stork

The wood stork (*Mycteria americana*) is classified as endangered by the FWC and the FWS. This species could potentially use the site as short-term foraging grounds. Wetlands and the perimeter of the TPC could offer limited forage for this species during the wet season. Long term use of the site is limited due to low quantity and quality of the foraging habitat as well the flashy and short duration of inundation on site.

Wading Birds

Several wading birds (herons and egrets) are classified by the FWC as species of special concern. The snowy egret (*Egretta thula*), reddish egret (*Egretta rubescens*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), Roseate spoonbill (*Platalea ajaja*), and white ibis (*Endocimus albus*) were not observed on site during the survey; however, limited utilization throughout the year is likely to occur. As described for the wood stork, seasonal utilization is likely when the ditches are inundated during the wet season. The ponds offer limited and poor quality year-round forage.

Brown pelican

The brown pelican is a state species of special concern that thrives near coasts and on islands. Brown pelicans rely in part on the actions of marine predators such as large fish, sharks and dolphins to force schools of fish to the surface where the pelicans can catch them. Pelicans will breed only in areas with enough food to support the breeding colony. Roosting and resting sites where brown pelicans can dry their feathers and rest without disturbance are also important. (USFWS 2016). This is the only listed species to be observed during the May 23, 2016 survey.

White-crowned pigeon (Patagioenas leucocephala)

The white-crowned pigeon is not federally listed however is protected by the U.S. Migratory Bird treaty Act and as a State-designated threatened species. White crowned pigeons inhabit low-lying forest habitats including mangroves around Biscayne Bay, Florida Bay and the Florida Keys. The

diet of the white-crowned pigeon consists of tropical hardwood tree fruits. White crowned pigeons were not observed during the survey.

Least tern

The least tern is a state threatened species that inhabits areas along the coasts of Florida including estuaries and bays. The least tern's diet primarily consists of fish, but they will also feed on small invertebrates. They build nests in shallow depressions in bare beach sand and on gravel berms and rooftops (FWC 2016).

Table 2-3. Federally Listed and Florida-State Listed Species Potentially Existing near Barge Canal

Common Name	Scientific Name	Federal Status ^(a)	State Status ^(a)	Observed during survey
Birds				
Roseate spoonbill	<i>Ajaia ajaja</i>	—	S	N
Little blue heron	<i>Egretta caerulea</i>	—	S	N
Reddish egret	<i>Egretta rufescens</i>	—	S	N
Snowy egret	<i>Egretta thula</i>	—	S	N
Tricolor heron	<i>Egretta tricolor</i>	—	S	N
White ibis	<i>Eudocimus albus</i>	—	S	N
American kestrel	<i>Falco sparverius</i>	—	T	N
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	T	N
Wood stork	<i>Mycteria americana</i>	E	E	N
Brown pelican	<i>Pelecanus occidentalis</i>	—	S	Y
Least tern	<i>Sterna antillarum</i>	—	T	N
White-crowned Pigeon	<i>Patagioenas leucocephala</i>	—	T	N
Fish				
Mangrove rivulus	<i>Rivulus marmoratus</i>	SOC	S	N
Small-toothed sawfish	<i>Pristis pectinata</i>	E	—	N
Common snook	<i>Centropomus undecimalis</i>	—	S	N
Mammals				
Florida manatee	<i>Trichechus latirostris</i>	E	E	N
Plants				
Johnson's seagrass	<i>Halophila johnsonii</i>	T	—	N
Reptiles				
Green sea turtle	<i>Chelonia mydas</i>	E	E	N
Hawksbill sea turtle	<i>Erymochelys imbricata</i>	E	E	N
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E	N
Kemp's ridley sea turtle	<i>Lepidochelys kempi</i>	E	E	N
Loggerhead sea turtle	<i>Caretta</i>	T	T	N
American alligator	<i>Alligator mississippiensis</i>	T (S/A)	S	N
American crocodile	<i>Crocodylus acutus</i>	T	E	N
Eastern Indigo snake	<i>Drymarchon couperi</i>	T	T	N

(a) E = Endangered; T = Threatened; T(S/A) = Threatened due to similarity of appearance; C = Candidate for federal listing; S = Florida species of special concern; SOC = NOAA species of concern; — = No listing

3. RESTORATION PLAN

This section describes the methods and techniques planned for restoration implementation of the BC. The proposed restoration action involves topographically restoring the BC to an elevation of -15 ft. NAVD. The proposed restoration will consist of a combination of specific activities that include material staging, sediment placement, and grading. The approach to restoration activities is presented below.

3.1 Topographic Restoration

Topographic restoration will be achieved by placing approximately 124,000 cubic yards (cy) of loose (raw) sediment fill material (approximately 55,779 cy of bottom fill and 68,175 cy of select top fill), within the BC. The fill volume was calculated using topographic survey data provided by FPL. The volume includes an additional 25% of material to account for inadvertent loss due to compaction, material handling, loss of fines, etc. The 25% factor is an estimate based on past experience with similar projects.

The BC was evaluated to determine the work zone, vessel access corridor, the appropriate methods for delivery and transfer of fill material, placement of the fill material, and turbidity containment. The proposed fill elevation was determined by a separate study for water quality improvement planning. Figure 3-1 illustrates the fill area planned to -15 NAVD. The proposed approach and methods for topographic restoration are described below. A set of conceptual restoration plan drawings have been prepared under a separate cover.

3.1.1 *Fill Specifications, Transport, and Staging*

The fill specification for the Barge Canal requires two types of fill: Type – E (bottom fill) and Type – A (select top fill). The bottom fill is a calcium carbonate coarse grain sand with a grain size of less than 10% passing through a range 12 inch to #200 sieve. Bottom fill will be placed from the canal bottom to an elevation of -22 NAVD along the length of the canal. The select top fill is a calcium carbonate coarse grain sand with a grain size of less than 5% passing through a range #4 to #200 sieve. The top fill will be placed from -22 to -15 NAVD.

Select top fill and bottom fill should be obtained from local quarries. Fill material meeting the gradation specifications are readily available from local quarries in the quantity needed to fulfill the project needs.

Staging areas are available near the project site. The staging area will be identified by the contractor. Fill material will be delivered via truck directly to the staging area along existing roads on the project site. Fill material will be stored on site. Fill material will be staged in a contained environment to avoid loss of material to adjacent aquatic resources. The staging area will be returned to pre-project conditions following project completion, with final cleanup notification provided to the FPL representative.

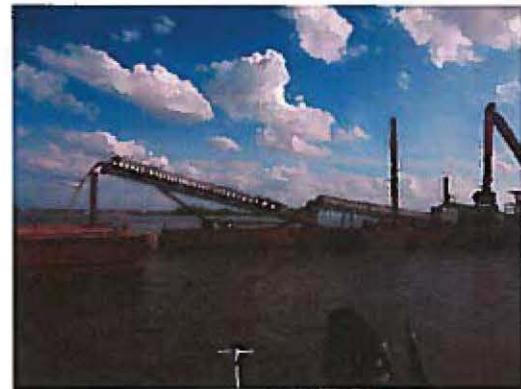


Photo 3-1. Example of covered fill conveyor system

Loose fill may be transferred using a long-reach excavator and conveyor system or other suitable transfer machinery from the staging area to a material placement barge. Photo 3-2 provides an example of equipment used to efficiently transfer fill material. Typically, the use of a conveyor system provides a low-to no-impact fill material transfer route through the mangroves. Mangrove canopy openings sufficient for installation of the conveyor system were identified during the site assessment. Figure 3-2 identifies a potential location for installation of the conveyor system. All sections of the conveyor system that cross mangrove habitat or any other sensitive habitat will be covered from above and below to limit wind loss of material and to catch any material that may drop from the conveyor system. The covers are generally constructed of half sectioned corrugated style pipe installed above and below the conveyor belt (see Photo 3-2). Once selected the contractor may propose comparable alternative methods.

A turbidity containment system will be installed prior to construction and will remain throughout the fill operations. At no time will the turbidity containment be breached during the fill operations.

3.2 Turbidity Containment

During fill placement activities, turbidity curtains and/or other barriers will enclose the mouth of the BC to minimize potential siltation and turbidity of surrounding mangrove and seagrass communities. Turbidity curtains at the mouth of the BC will be placed such that the bottom edge of the material is in contact with the bay bottom. Turbidity curtains will be anchored securely for use in high current/dynamic conditions. Piles (12- in. diameter or greater) will be used across the mouth of the BC to secure the turbidity curtain. All possible turbidity leak points (seams, bottom of curtain, etc.) will be secured and monitored during filling operations. Turbidity curtains shall be furnished with excess material (flaps) at each end so they may be rolled together to seal the seam created by securing two sections together. Additionally, curtains will have a 3-ft. barrier above the water line to inhibit manatees from entering the fill zone. The turbidity curtains will be highly visible and manufactured from entanglement-free material that is safe to use in the presence of marine mammals, sea turtles, and other marine fauna. Curtains will be removed from the BC post-filling once turbidity within the feature reaches an acceptable level

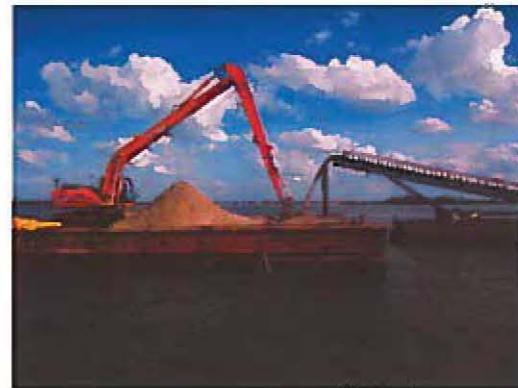


Photo 3-2. Fill conveyor loading placement barge

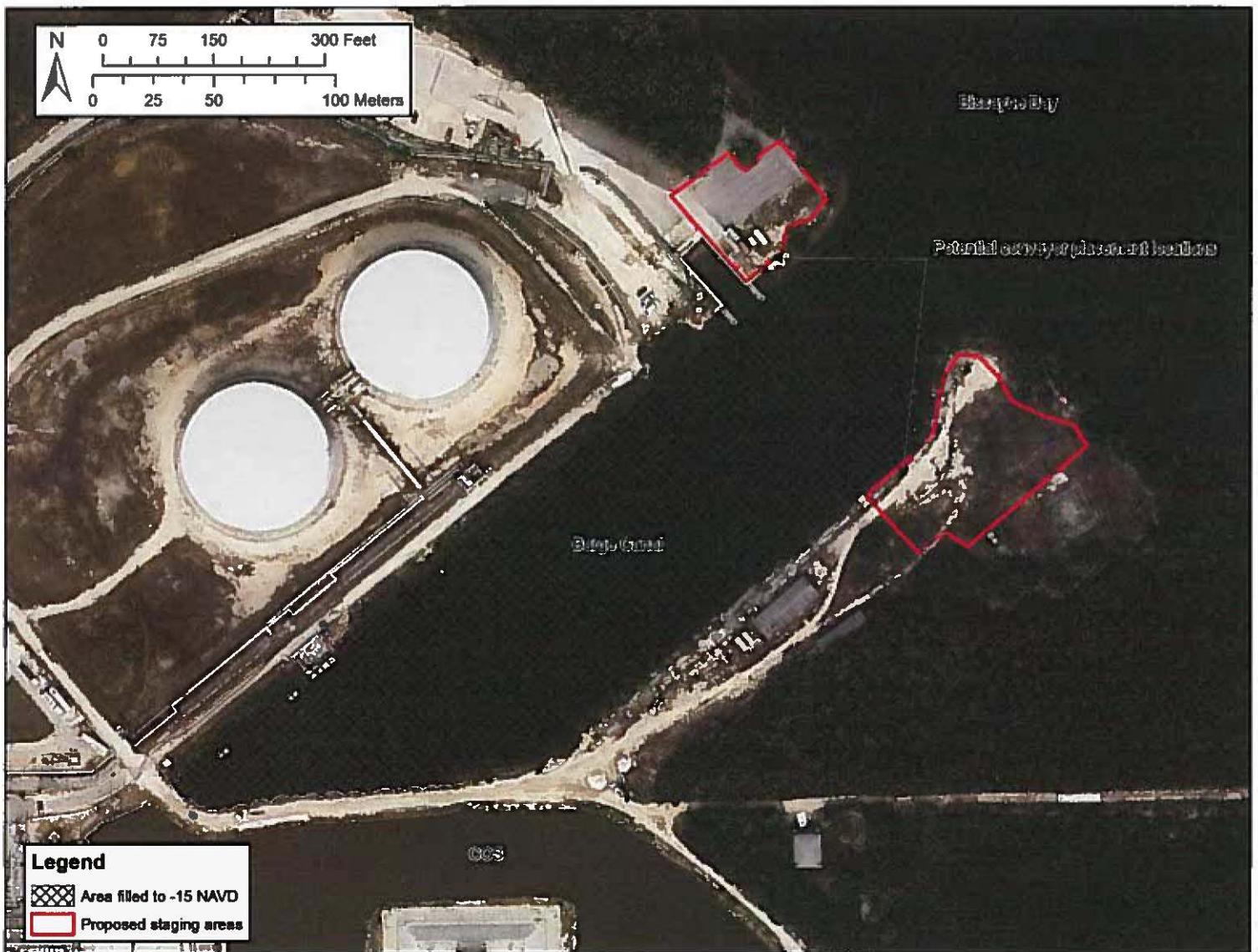


Figure 3-1. Fill area and proposed staging area and conveyor placement area

Back of figure

July 2016

3-4

3.3 Threatened and Endangered Species Signage

All staff involved with filling operations will be instructed and trained as per Florida Fish and Wildlife Conservation Commission (FWC) Standard Manatee Conditions for In-Water Work as well as the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA-NMFS) Marine Sea Turtle and Smalltooth Sawfish Construction Conditions. Idle speed/manatee protection signage will be maintained on board during all restoration activities. One sign which reads Caution: Boaters shall be posted in a location where it is prominently visible to all staff. A second sign measuring at least 8.5 by 11-in. explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations (Figure 3-3) will be posted in a location prominently visible to all personnel engaged in water-related activities (www.myfwc.com). Signage will be maintained at both the location of the materials barge and the restoration site. If any Threatened and Endangered Species comes within 50 feet of the work zone, filling operations will cease until the protected species has left the work zone on its own accord.

During the permitting process, the level of observer will be determined: 1) observer approved by Florida Fish & Wildlife Conservation Commission at least 2 weeks prior to starting construction; 2) observer adequately trained and equipped with proper glasses; or 3) all on-site personnel are responsible for observer in-water activities for possible manatee presence. If a dedicated manatee observer will be required, that person(s) is expected to be on-site at all times during in-water construction.

3.4 Water Quality Monitoring

Using a portable turbidimeter (Hach 2100Q), turbidity measurements will be collected at 6-hour intervals from upstream, downstream, and within the work area. Samples will be collected outside the turbidity containment from no further than 50 ft. from the point of discharge within the densest portion of any visible plume. If the turbidity exceeds the state water quality standards (DEP 62-302.530) for an Outstanding Florida Water (zero NTU's above background) then backfill operations will cease until water quality standards are returned to background levels. If water quality standards are exceeded more than twice a day, the backfill operations will be stopped and then evaluated for implementation of mitigation measures.



Figure 3-3. FWC manatee signage

4. SUMMARY

Currently the BC is a channelized waterway with sparse to no epibenthic floral or faunal coverage. The vertically cut banks along with poor water quality currently provides suboptimal marine habitat. Filling of the BC to a minimum depth of -15 NGVD, is expected to improve benthic habitat and hydrology, thereby, providing water quality improvements to Biscayne Bay. Additionally, indirect benefits to marine habitats are expected as a result of the overall improvements to water quality.

Based on the site survey, direct impacts to benthic resources are not expected as a result of the project. Indirect impacts such as shading, sedimentation, turbidity, and mechanical injury are expected to be negligible. The use of specialized turbidity containment and equipment and the methods specified in herein will avoid and minimize both direct and indirect impacts to both sessile and motile biota. Accessing the BC from the land side, with the exception of the placement barge, will minimize barge traffic compared to a water based operation and therefore avoid impacts from prop dredging, vessel groundings, and any potential for vessel strikes to protected marine species. All standard construction conditions for manatees and smalltooth sawfish will be abided by during construction to avoid any potential affects. Additionally, an observer will be on-site during all construction to observe any protected species within the project vicinity and advise any additional measures needed to avoid harm or harassment to protected species.

5. REFERENCES

US Fish and Wildlife Service. <http://www.fws.gov/oregonfwo/Species/Data/BrownPelican/>.

Accessed May 25, 2016.

Florida Fish and Wildlife Conservation Commission.

<http://myfwc.com/wildlifehabitats/imperiled/profiles/birds/least-tern/>. Accessed May 25, 2016.

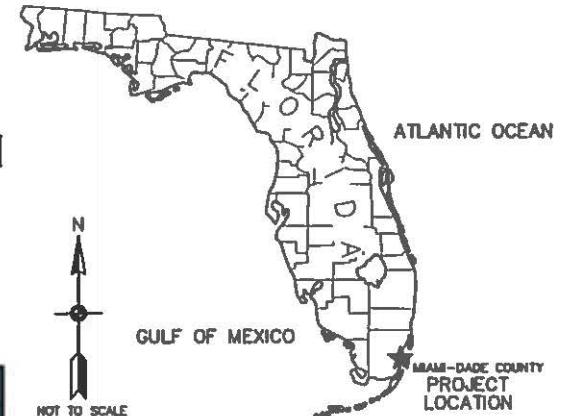
United States Nuclear Regulatory Commission.

<http://www.nrc.gov/docs/ML1036/ML103630163.pdf>. Accessed May 25, 2016.

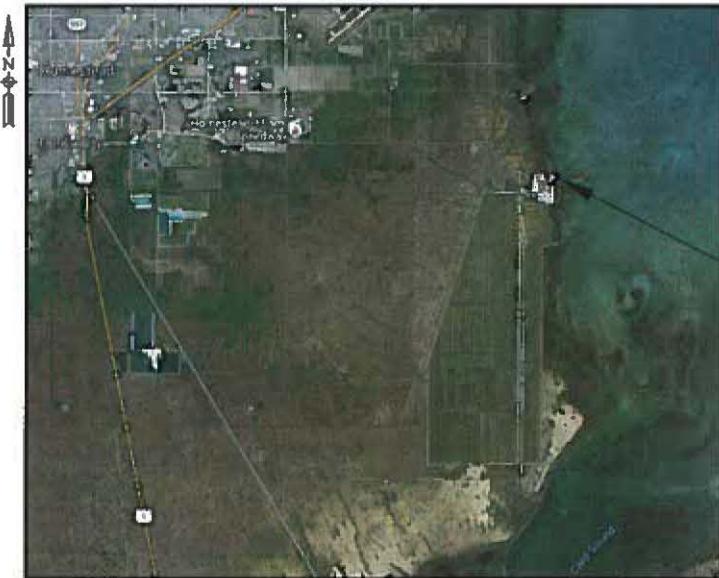


FLORIDA POWER AND LIGHT BARGE SLIP CANAL RESTORATION

MIAMI-DADE COUNTY



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INDEX OF SHEETS

Sheet #	Title	Latest Update	Rev.
G-001	COVER SHEET AND VICINITY MAP	7/26/16	0
G-002	LIMITS OF CONSTRUCTION	7/26/16	0
P-101	BARGE SLIP PLAN VIEW AND SURVEY	7/26/16	0
P-102	BARGE SLIP FILL CROSS-SECTIONS	7/26/16	0
P-103	BARGE SLIP ELEVATIONS	7/26/16	0

VICINITY MAP

BARGE SLIP CANAL, MIAMI-DADE COUNTY, FLORIDA

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FLORIDA POWER AND LIGHT
BARGE SLIP CANAL RESTORATION
COVER SHEET AND VICINITY MAP
MIAMI-DADE COUNTY, FLORIDA



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Reviewed By: _____
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Sheet Reference:
G-001
Sheet 1 of 5



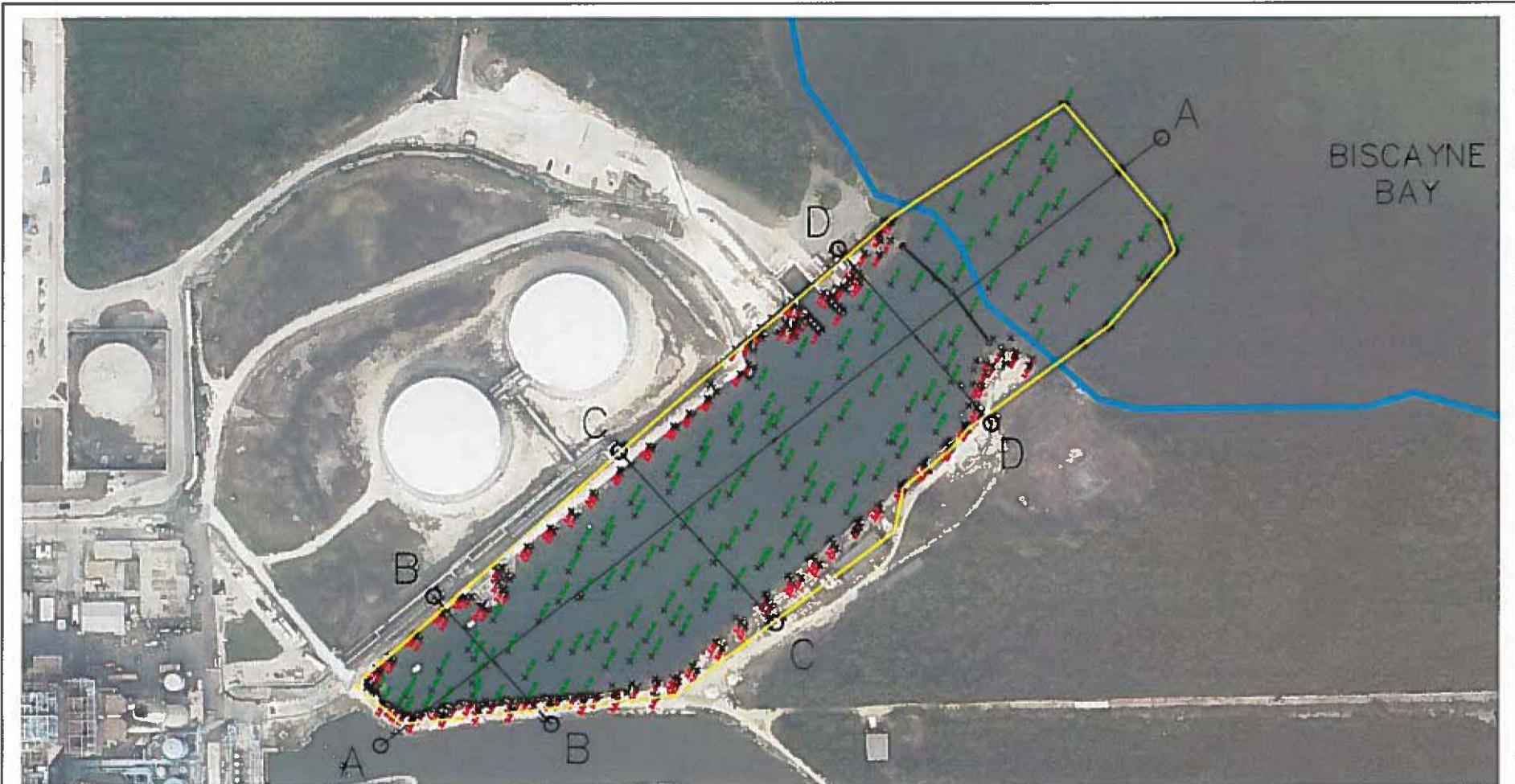
FLORIDA POWER AND LIGHT
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LIMITS OF CONSTRUCTION
MIAMI-DADE COUNTY, FLORIDA



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G-002
Sheet 2 of 5



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NOTES:

1. ALL SURVEY DATA WAS PROVIDED BY FORD, ARMENTEROS & FERNANDEZ, INC. AND SURVEYED ON 4/15/16.
2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. THE SURFACES USED FOR ANALYSIS WERE DEVELOPED FROM THE LIMITED SURVEY DATA, WITH SOME ELEVATIONS INTERPOLATED BASED ON SURROUNDING SURVEY POINTS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL FILL VOLUMES REQUIRED FOR COMPLETION OF THIS PROJECT.
4. A TURBIDITY CURTAIN SHALL BE UTILIZED TO PREVENT ANY SUSPENDED MATERIAL FROM ESCAPING OUTSIDE OF THE CONSTRUCTION ZONE. THREE TEMPORARY PILES SHALL BE DRIVEN AT THE LOCATIONS SHOWN TO ANCHOR THE TURBIDITY CURTAIN.
5. CROSS-SECTIONS A-A THROUGH D-D ARE SHOWN ON SHEET P-102.

LEGEND:

- X SURVEY POINT
- SURVEY BOUNDARY
- CROSS-SECTION
- TEMPORARY PILES
- TURBIDITY CURTAIN
- APPROX. PROPERTY LINE

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FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION
BARGE SLIP PLAN VIEW AND SURVEY
MIAMI-DADE COUNTY, FLORIDA

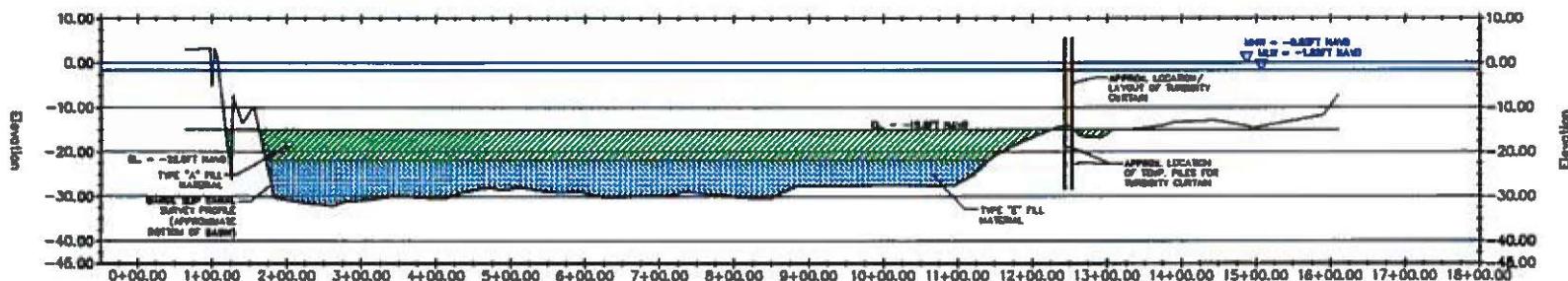


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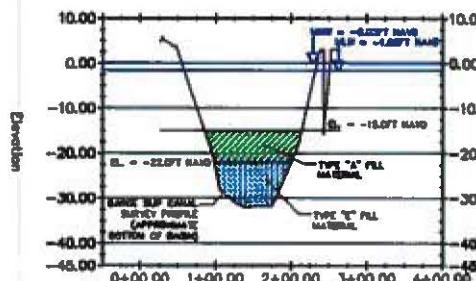
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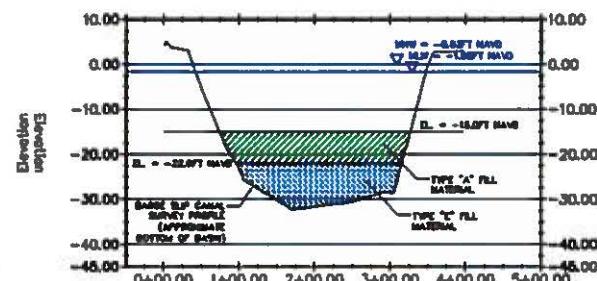
Profile View of BSC-A



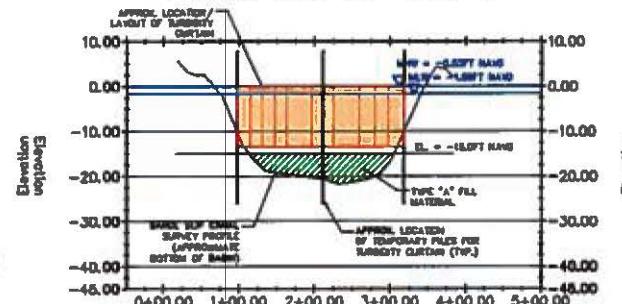
Profile View of BSC-B



Profile View of BSC-C



Profile View of BSC-D



NOTES:

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4. APPROXIMATE FILL VOLUME TO RESTORE BASIN TO -15.0FT NAVD = 124,000 CY. (NOTE: VOLUMES INCLUDE AN ADDITIONAL 25% OF MATERIAL TO ACCOUNT FOR INADVERTENT LOSS OF MATERIAL. TWO TYPES OF FILL WILL BE USED:
 - 4.1. FILL TYPE "A": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 5% PASSING THROUGH A RANGE #4 TO #200 SIEVE IS UTILIZED FOR THE FILL. TYPE "A" FILL QUANTITY IS 86,175 CY IN LAYER -22FT TO -15FT NAVD FULL LENGTH OF CANAL.
 - 4.2. FILL TYPE "E": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 10% PASSING THROUGH A RANGE 1/2 INCH TO #200 SIEVE IS UTILIZED FOR THE FILL. TYPE "E" FILL QUANTITY IS 58,779 CY IN LAYER -22FT NAVD TO CANAL BOTTOM FULL LENGTH OF CANAL.
5. APPROXIMATE AREA OF BASIN TO BE FILLED = 5.6 ACRES
6. MEAN HIGH WATER (MHW) ELEVATION AND MEAN LOW WATER ELEVATION (MLW) WERE DETERMINED FROM NOAA TIDAL STATION 8723421, TURKEY POINT, BISCAY BAY, FL

LEGEND:

VERTICAL EXAGGERATION: 6.0
VERTICAL SCALE: 1" = 40'

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FLORIDA POWER AND LIGHT
TURTLE POINT CANAL RESTORATION

BARGE SLIP FILL CROSS-SECTIONS

MIAMI-DADE COUNTY, FLORIDA



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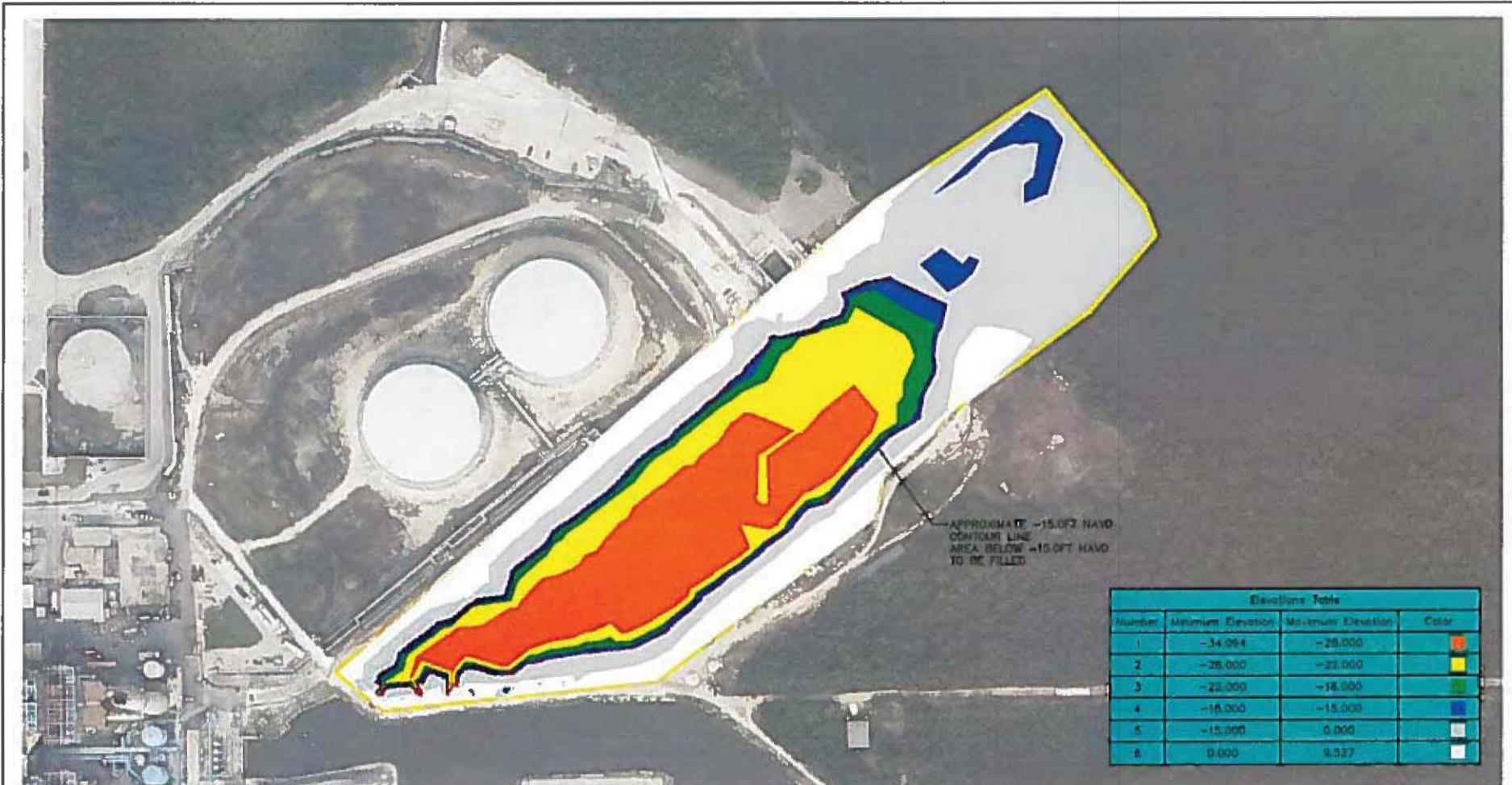
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 - 4.2. FILL TYPE "E": CALCIUM CARBONATE COARSE GRAIN SAND WITH A GRAIN SIZE OF LESS THAN 10% PASSING THROUGH A RANGE #12 INCH TO #200 SIEVE IS UTILIZED FOR THE FILL TYPE "E" FILL QUANTITY IS 55,779 CY IN LAYER -22FT NAVD TO CANAL BOTTOM FULL LENGTH OF CANAL.
5. APPROXIMATE AREA OF BASIN TO BE FILLED = 5.8 ACRES

LEGEND:

----- SURVEY BOUNDARY
----- APPROX. FILL BOUNDARY

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P-103
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