Compensatory Mitigation Plan
Proposed Dredging, Filling, and Placement
of Breakwater and Concrete Mat for
Residential Development and Marina for Boat Access from the GIWW
Marina del Mar
SWG-2006-01273
November 24, 2014
Revised: May 11, 2020

Introduction - Avoidance and Minimization

The applicant, Travis Materials Land Port O'Connor (TMLP), has worked closely with their environmental agent, Belaire Environmental, Inc. (BEI), in preparing the project plans. This planning process focused on avoiding impacts to sensitive resources (i.e., seagrass and wetlands) to the maximum extent possible. Where avoidance was not feasible, the applicant minimized impacts to the maximum extent practical. Compensatory mitigation will be provided for unavoidable impacts. Following is a list of avoidance and minimization measures incorporated into the proposed plans:

a. Dredging of seagrass beds adjacent to the GIWW was avoided. The applicant originally preferred to construct lots with bulkhead adjacent to deep water. Dredging of the land seaward of the proposed bulkhead lines would have provided such deep-water frontage. The applicant rejected this dredging option in order to avoid impacts to existing seagrass beds adjacent to the GIWW.
b. Piers on GIWW frontage lots were eliminated from previously permitted plans.
c. To minimize erosion of the entrance channel side slopes, the applicant will install articulated concrete mats on the slopes adjacent to avoided and mitigation wetlands. These mats will prevent erosion and loss of the avoided and mitigation wetlands.
d. The entrance channel location and size was selected to minimize excavation impacts to seagrass and wetlands.
e. To ensure good water quality within the proposed canal development, the applicant has proposed to taper the finished grade of each canal towards the GIWW. The main entrance canal is tapered from a finished grade of --9.0 ft NGVD29 to -10.0 ft NGVD29, sloping downwards towards the GIWW. The remainder of the canals will be tapered from -7.0 ft NGVD29 to -9.0 ft NGVD29, sloping downwards towards the main entrance canal.
f. To ensure good water quality within the proposed canal development, the applicant requested and obtained a hydrologic study from an expert hydraulic engineer, Espey Consultants, Inc. Espey's study concluded that water quality within the canals and marina will be sufficient to support aquatic life. At the request of the agencies during the original permitting process, the applicant added culverts to connect dead-end canals even though the study conducted by

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Espey Consultants, Inc. indicated such culverts were not necessary to assure good water quality.

The April 10, 2008 USACE/EPA Final Mitigation Rule (2008 Mitigation Rule) outlines 12 Fundamental Components to be uniformly addressed in all compensatory mitigation plans (33 CFR 332.4(c)(2) through (c)(14)) for the purposes of developing successful compensatory mitigation projects and facilitating effective compliance measures. According to the 2008 Mitigation Rule, "the level of detail of the mitigation plan should be commensurate with the scale and scope of the impacts." The information below outlines the 12 Fundamental Components of TMLP's proposed compensatory mitigation plan.

I. Objective of the Compensatory Mitigation Plan

A. Method of Compensation

The objective of the compensatory mitigation plan is to provide sufficient, in-kind habitat establishment to assure there is no net loss in the function and values of aquatic resources. TMLP proposes to utilize qualified construction contractors, engineers and consultants to establish, enhance and protect wetlands as mitigation for potential permanent impacts at the project site.

As compensatory mitigation for proposed impacts to approximately 4,270 square feet of smooth cordgrass (*Spartina alterniflora*), approximately 1,849 square feet of tidally-influenced estuarine wetlands and approximately 527 square feet of non-tidal estuarine wetlands, TMLP proposes to utilize qualified construction contractors, engineers and consultants to establish 8,540 sq ft (2:1 replacement ratio) of smooth cordgrass marsh and 2,376 sq ft (1:1 replacement ratio) of estuarine marsh adjacent to existing wetlands on the applicant's shoreline. The proposed mitigation site is located along a currently highly eroding shoreline which the applicant proposes to stabilize and protect with an articulated concrete mat/rock breakwater. The proposed breakwater will also help protect avoided estuarine wetlands (approx. 2,396 sq ft of smooth cordgrass and approx. 2,937 sq ft of tidal estuarine high marsh) on the applicant's shoreline from further erosion and loss.

B. Manner in which the resource functions of the mitigation will address the needs of the watershed or region

The permittee-responsible creation of approximately 8,540 sq ft of smooth cordgrass marsh as well as 2,376 sq ft of estuarine high marsh is in-kind with proposed impacts and is also on-site and within the same watershed as that of which proposed impacts will occur. The proposed mitigation wetlands will also be situated to abut existing smooth cordgrass stands and estuarine marsh and, along with the proposed breakwater, will collectively create and protect 10,936 sq ft (0.25 Ac) of smooth cordgrass marsh and 5,313 sq ft (0.12 Ac) of estuarine high marsh in perpetuity. The proposed breakwater and mitigation wetlands will also help stabilize the existing shoreline and will serve to protect avoided wetlands and landward uplands from continued erosion.

II. Site Selection

The applicant considered mitigation banking and in-lieu fee options but none are available in the area. Also, due to the relatively small nature of the proposed impacts and the likelihood of future loss of remaining wetlands via GIWW erosion, the applicant preferred stabilizing, enhancing and protecting on-site, avoided wetlands with in-kind mitigation wetlands via permittee-responsible mitigation.

III. Site Protection Instrument

The applicant will deed all properties that will be included within any compensatory mitigation area to the homeowners association. The deed restrictions will provide that these areas be preserved as natural areas in perpetuity. Within 60-days of the start of permanent construction in jurisdictional areas, the applicant will consummate and record the deed restriction with the County Clerk of Calhoun County. The USACE shall have the right to enter and go upon the mitigation properties for purposes on inspection, and to take actions including but not limited to scientific or educational observations and studies, and collection of samples.

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IV. Baseline Information (Impact and Compensation Site)

A. Ecological Characteristics of the Impacted Site

As previously mentioned, proposed impacts consist of approximately 4,270 square feet of smooth cordgrass and approximately 1,849 square feet of tidally-influenced estuarine wetlands located along the project shoreline and adjacent to the GIWW. Although the smooth cordgrass and tidally-influenced wetlands are relatively high quality, the applicant's shoreline is subject to constant wind/wake erosion activity from high winds as well as passing vessel traffic in the GIWW and existing wetlands likely would be lost to continued bank erosion, regardless of TMLP's development plans. Existing tidally-influenced estuarine wetlands are typically dominated by coastal salt grass (*Distichlis spicata*), bushy seaside-tansy (*Borrichia frutescens*) and salt-meadow cord grass (*Spartina patens*).

An approximately 527 square foot non-tidal estuarine wetland is also present approximately 600 ft inland from the project shoreline. This wetland is located within a very shallow, isolated depression and is dominated by shoregrass (*Monanthochloe littoralis*).

B. Ecological Characteristics of the Compensation Site

The proposed mitigation site (approx. 10,916 sq ft; 0.25 Ac) currently consists of uplands and unvegetated shallows along the shoreline east of the proposed entrance channel. As previously mentioned, the proposed mitigation wetlands will be situated to abut avoided smooth cordgrass stands (approx. 2,396 sq ft) and tidally-influenced estuarine marsh (approx. 2,937 sq ft) and, along with the proposed breakwater, will collectively create and protect 10,936 sq ft (0.25 Ac) of smooth cordgrass marsh and 5,313 sq ft (0.12 Ac) of tidally-influenced estuarine high marsh in perpetuity.

V. Determination of Credits

The USACE's September 11, 2008 Memorandum titled *SWG-Standard Operating Procedures (SOP); Using HGM to Determine Potential Wetland Functions and the Appropriate Compensatory Mitigation for Unavoidable Wetland Impacts*, "[b]ranch

personnel should use these SWG-iHGM models to assess jurisdictional wetland impacts that exceed 3 acres in cumulative size..." TMLP's proposed estuarine wetland impacts do not exceed 3 acres, thereby negating the need to utilize the SWG's iHGM functional assessment to determine appropriate estuarine mitigation requirements.

As compensatory mitigation for proposed impacts to approximately 4,270 square feet of smooth cordgrass (*Spartina alterniflora*), approximately 1,849 square feet of tidally-influenced estuarine wetlands and approximately 527 square feet of non-tidal estuarine wetlands, TMLP proposes to utilize qualified construction contractors, engineers and consultants to establish 8,540 sq ft (2:1 replacement ratio) of smooth cordgrass marsh and 2,376 sq ft (1:1 replacement ratio) of estuarine marsh adjacent to existing wetlands on the applicant's shoreline. The proposed mitigation site is located along a currently highly eroding shoreline which the applicant proposes to stabilize and protect with an articulated concrete mat/rock breakwater. The proposed breakwater will also help protect avoided estuarine wetlands (approx. 2,396 sq ft of smooth cordgrass and approx. 2,937 sq ft of tidal estuarine high marsh) on the applicant's shoreline from further erosion and loss. Existing wetlands on the applicant's shoreline are subject to constant wind/wake erosion activity from high winds as well as passing vessel traffic in the GIWW and likely would be lost to bank erosion, regardless of TMLP's development plans.

Approximately 34,685 sq ft (approx. 0.80 Ac, 4,000 cu yds) of unvegetated bay bottom will be mechanically excavated below the MHW line. Historically, the USACE has not required compensatory mitigation for this type of aquatic resource. Section 2.2.1 of the Final Environmental Assessment, Finding of No Significant Impact and Regulatory Analysis of the 2008 Mitigation Rule states that "[a]ctivities in open waters and certain other types of waters typically do not require compensatory mitigation." In this case, the unvegetated shallows are being converted to deep water habitat and so there is no loss of aquatic habitat. The proposed mitigation plan will be more than sufficient to compensate for all aquatic resource functions and values, including those of unvegetated shallows.

VI. Mitigation Work Plan

A. Geographic Boundaries

The proposed mitigation site (approx. 10,916 sq ft; 0.25 Ac) consists of current uplands and unvegetated shallows along the shoreline east of the proposed entrance channel.

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B. Construction Methods

Compensatory mitigation at a 2:1 ratio for smooth cordgrass and a 1:1 ratio for estuarine high marsh will be constructed on-site as indicated in the proposed plans. Approximately 400 cu yds of suitable fill material will be hauled and placed within the proposed mitigation site where necessary to achieve desirable grades for planting smooth cordgrass. A breakwater will be constructed to protect these areas. Elevations of the various components of the mitigation effort are detailed in the project plans. The planting areas will be planted on 3-ft centers with appropriate species. Single stems of smooth cordgrass will be planted in their respective planting areas. Plugs or sprigs of species such as seashore saltgrass, marshhay cordgrass and sea ox-eye daisy will be planted within estuarine high marsh planting areas. Damage to adjacent avoided wetlands will be strictly avoided during construction and planting. Plant material will be borrowed from state, federal, or private wetlands. The applicant will obtain the necessary TPWD permit and GLO easement (if needed) prior to conducting transplanting activities.

C. Timing and Sequence

Construction disturbance activities will avoid the peak nesting period of March through August to avoid destruction of individuals, nests or eggs. If project activities must be conducted during this time, surveys for nests will be conducted prior to commencing work. If a nest is found, a buffer will remain around the nest until young have fledged or the nest is abandoned.

Construction will begin within 90 days of impacts to jurisdictional areas at the proposed project site and will be completed within six months of start of construction. All earthwork will be regularly monitored by the applicant's environmental agent and an as-built survey will be performed to verify adherence to prescribed grades. Following sediment conditioning of at least 60 days, the area will be planted on 3-ft centers. If possible, planting will occur in the fall (September-November) to take advantage of typically heavy rainfall.

D. Connections to Existing Waters and Uplands

The proposed compensatory mitigation site will be directly connected to tidal waters of the GIWW and Espiritu Santo Bay.

E. Methods for Establishing Plant Community

The proposed smooth cordgrass planting area will range in elevation from +1.5 ft NGVD29 to +0.8 ft NGVD29 based on the target hydrologic regime, marsh elevations and plant communities identified within reference marshes adjacent to the proposed mitigation site. The proposed estuarine high marsh planting area within the proposed mitigation site will range in elevation from +2.0 ft NGVD29 to +1.7 ft NGVD29 based on the target hydrologic regime, marsh elevations and plant communities identified within reference marshes adjacent to the proposed mitigation site. Reference marsh sites were used as a basis for achieving appropriate hydrological features, marsh elevation and plant community success at the mitigation site. Planting at the proposed mitigation site will be performed generally according to standard GLO guidelines as follows:

a) Agencies will be notified at least two weeks prior to initiation of planting.
b) The smooth cordgrass and estuarine high marsh planting areas will be planted on 3-ft centers. A planting unit will consist of a healthy sprig of smooth cordgrass or a sprig or 3-stem clump of appropriate high marsh species with intact root systems. Each planting unit will be securely embedded in the planting surface.
c) Plant material will be borrowed from state, federal, or private wetlands. The applicant will obtain the necessary TPWD permit and GLO easement (if needed) prior to conducting transplanting activities.
d) No more than one 6" plug of source material per one square yard shall be obtained from the designated borrow areas. Incidental damage to borrow areas shall be strictly avoided.
e) Complete photographic coverage of planting area taken immediately prior to and following transplant activities shall be submitted to the USACE and resource agencies.
f) USACE and resource agencies shall be notified in writing upon completion of the planting effort.

F. Proposed Grading Plan

Approximately 400 cu yds of clean, suitable fill material will be hauled and placed within the proposed mitigation site where necessary to achieve desirable grades for planting smooth cordgrass. Breakwater construction will require approximately 80 cu yds of

articulated concrete matting, approximately 120 cu yds of earthen material and approximately 40 cu yds of rock for construction. The placement of fill in mitigation areas will be achieved with an excavator located either in adjacent uplands or on a shallow draft barge located in deeper water to avoid disturbance to shallow water habitat in the vicinity of the mitigation site. Barges will be lined with silt fence BMP's to filter sediment runoff during construction activities. Breakwater construction will occur first. After placing and shaping the approximately 120 cu yds of earthen material to create the core of the breakwater, the construction contractor will place rock (approx. 40 cu yds) landward of the earthen levee for structural support and then will armor the length of the levee on the bayward side with articulated concrete matting (approx. 80 cu yds).

After construction of the armored breakwater, a land-based and/or barge-mounted excavator will be used to place the approximately 400 cu yds of clean, suitable material within the mitigation site. The fill will be used to bring the bayward side of the mitigation site up to suitable smooth cordgrass elevations.

G. Erosion Control Measures
Best Management Practices (BMPs) for soil erosion and sediment control will be utilized during project construction and mitigation site construction to the maximum extent practical. During breakwater construction and mitigation site filling, silt curtain with floating boom will be placed around and bayward of the construction area to control turbidity and suspended sediments.

VII. Maintenance Plan

The mitigation site will be maintained during monitoring periods, as described in Section IX, below. Any potential invasive species, as listed in Section IX.a.4., below, will be removed. The monitoring schedule and maintenance plans are outlined in Sections VII and IX, respectively.

VIII. Performance Standards

Performance Standards are outlined in Section IX, below. Monitoring studies will be conducted following the initial planting of the mitigation site. Transplant survival will be monitored 60-days after initial transplants are planted. If 50% survival of the initial

transplant material is not achieved during the 60-day monitoring effort, a 2nd planting effort will be made within the next 30 days. Additional mitigation site monitoring events will occur at six-months, then yearly for a period of five years after initial mitigation site planting. The percent coverage will be monitored within the mitigation site. If the mitigation site has not achieved 70% vegetation coverage at the three-year, four-year or five-year monitoring periods, the areas not achieving 70% coverage will be replanted to the original specifications. The mitigation site will be considered to have met performance standards if there are at least two consecutive monitoring events that document 70% vegetative coverage within the site.

IX. Monitoring Requirements

The 2008 Mitigation Rule and the USACE's October 10, 2008 Regulatory Guidance Letter "Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving the Restoration, Establishment, and/or Enhancement of Aquatic Resources" (RGL No. 08-03) govern compensatory mitigation for activities authorized by permits issued by the Department of the Army (33 CFR Parts 325 and 332), including monitoring for success criteria.

The RGL states that "the monitoring period must be sufficient to demonstrate that the compensatory mitigation project has met performance standards, but not less than five years (see 33 CFR 332.6(b)). If a compensatory mitigation project has met its performance standards in less than five years, the monitoring period length can be reduced, if there are at least two consecutive monitoring reports that demonstrate that success. Monitoring requirements may be waived upon a determination that the compensatory mitigation project has achieved its performance standards."

The applicant will implement a monitoring program at the proposed mitigation site for a period of five years, or for at least two consecutive monitoring events that document performance standards (70% vegetative coverage) have been met. Mitigation site monitoring and reporting will be conducted as follows.

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A. Mitigation Site Monitoring and Reporting

1. USACE and resource agencies shall be notified in writing upon completion of the initial planting effort.
2. A monitoring effort will be conducted within 60 days following the initial planting. If 50% survival of the transplant material is not achieved, a 2nd planting effort will be made within the next 30 days following the 60-day monitoring effort. A written report detailing the results of the effort shall be submitted within 30 days following the 60-day monitoring event or within 30 days following the replanting.
3. A monitoring study will be conducted following planting. The percent coverage will be monitored within the mitigation site. Monitoring studies will note any unusual sedimentation variations and will include depth of soft-sediment accumulations throughout the site. Rates of erosion and other observations will also be made. Subsequent progress reports containing the referenced information shall be submitted to the agencies 6-months after the initial planting, then yearly for a period of five years. The mitigation site will be considered to have met performance standards if there are at least two consecutive monitoring events that document 70% vegetative coverage within the site.
4. Undesirable species control for Chinese tallow (*Triadica sebifera*), Brazilian pepper (*Schinus terebinthifolius*), salt cedar (*Tamarix ramosissima*), common reed (*Phragmites australis*) and Australian pine (*Casuarina equisetifolia*) will be conducted during each monitoring event and the status of invasive species will be discussed in each monitoring report. Any invasive species encountered during mitigation site monitoring events will be manually removed.
5. If the mitigation site has not achieved 70% vegetation coverage at the three-year, four-year and/or five-year monitoring period, the areas not achieving 70% coverage will be replanted to the original specifications. The mitigation site will be considered to have met performance standards if there are at least two consecutive monitoring events that document 70% vegetative coverage within the site.
6. Monitoring reports will list the monitoring requirements and performance standards and evaluate the compensatory mitigation site relative to other

landscape features, habitat types, locations of photographic reference points, transects, sampling data points, and/or other pertinent features. A general statement will be included describing the condition of the site. If performance standards are not being met, an explanation of the difficulties and potential remedial actions proposed by the permittee, including a timetable will be provided.

X. Long-term Management Plan

The applicant will provide long-term site protection through deed restrictions of the mitigation site as well as a long-term management plan to insure long-term success of each mitigation site.

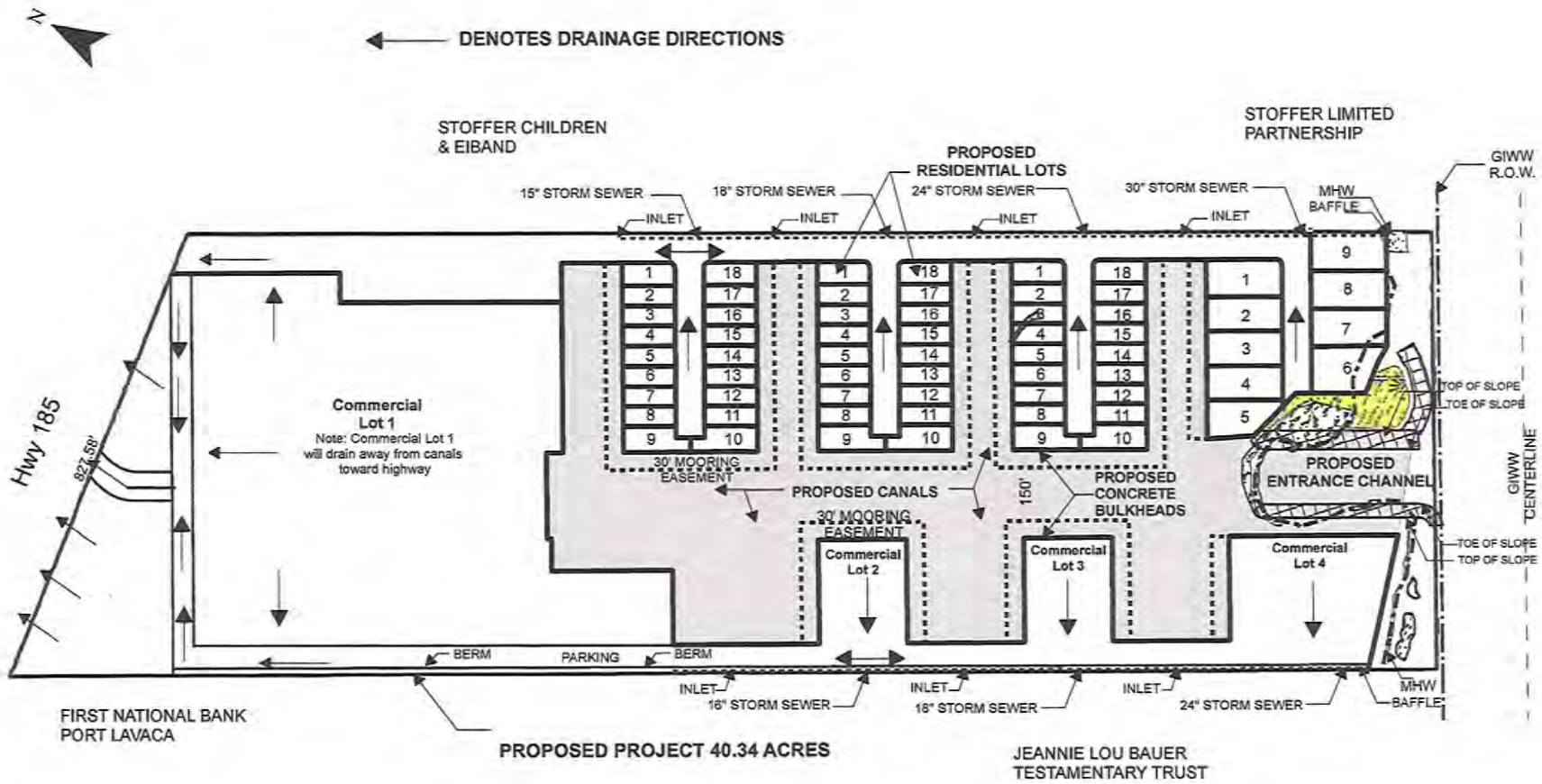
Once the mitigation site has reached long-term success criteria and the USACE has signed-off on the completion of the monitoring effort, it is expected that the planted areas will be self-sustaining.

XI. Adaptive Management

The mitigation success criteria in Section IX, above, must be achieved for the mitigation requirements to be considered completed and successful. Should mitigation be determined to be unsuccessful by USACE personnel at the end of the monitoring period, the applicant will be required to take necessary corrective measures, as approved by the USACE. Once corrective measures are completed, the applicant will notify the USACE and a determination will be made regarding success of the mitigation plan. In the event of a discreet storm event or other "Act of God", the applicant will discuss with the USACE how to best bring the site up to performance standards.

XII. Financial Assurances

Financial Assurances for both mitigation sites as well as the reclamation area will be provided via either an escrow account or bond and will be financially-based off the costs associated with Sections IX and X, above. The applicant will work with USACE personnel and their environmental consultant to determine an appropriate escrow account amount or bond amount to insure the completion of Sections IX and X, above.



NOTE: FOR PERMITTING ONLY, NOT FOR CONSTRUCTION.

Site Plan prepared by G&W Engineers, Inc.

SWG-2006-01273
TRAVIS MATERIAL LAND
PORT O'CONNOR, LP
CANAL SUBDIVISION
Port O'Connor, Texas

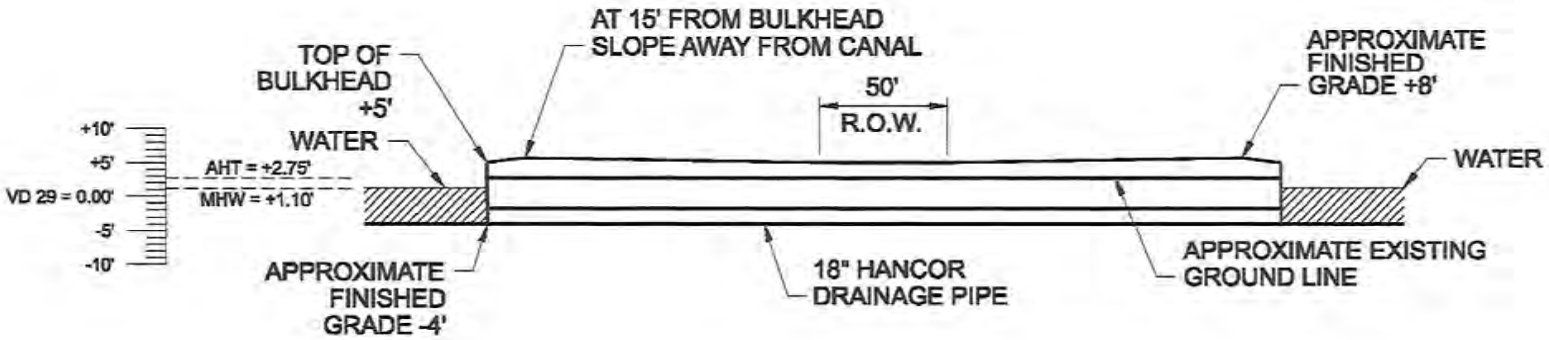
Proposed Site Drainage Plan

Notes:
-Prepared by Belaire Environmental, Inc., April 15, 2020 (LMF)
-For permitting only, not for construction.

0 150 300 600 Feet

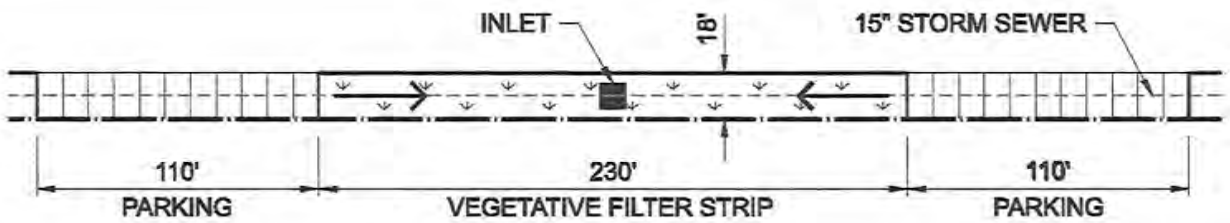
Agent:
BELAIRE ENVIRONMENTAL, INC.
P.O. Box 741 Rockport, TX 78382

May 5, 2020 Sheet ___ of ___



SECTION 1-1

Note by Belaire Environmental, Inc.:
-Vegetated Filter Area will be planted with smooth cordgrass (Spartina alterniflora), marsh-hay cordgrass (Spartina patens), gulf cordgrass (Spartina spartinae) and associated species at the appropriate elevation ranges.



DRAINAGE DETAIL

SWG-2006-01273 **TRAVIS MATERIAL LAND** **PORT O'CONNOR, LP** **CANAL SUBDIVISION** **Port O'Connor, Texas**	Notes: -Prepared by Belaire Environmental, Inc., April 15, 2020 (LMF) -For permitting only, not for construction.	**Proposed Site Drainage Plan** **Detailed Section 1-1**	Agent: BELAIRE ENVIRONMENTAL, INC. P.O. Box 741 Rockport, TX 78382 May 5, 2020 Sheet ___ of ___

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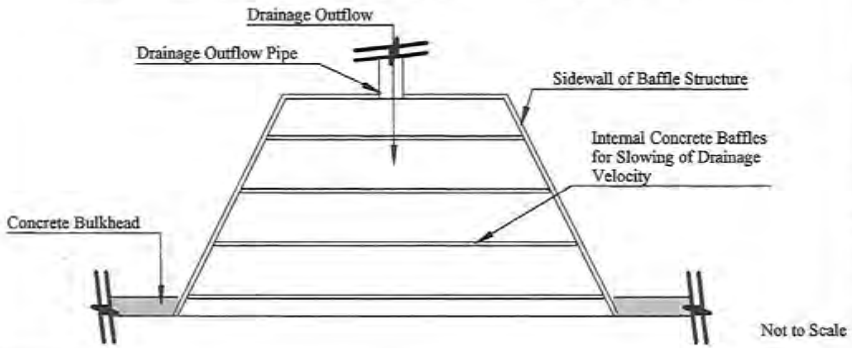
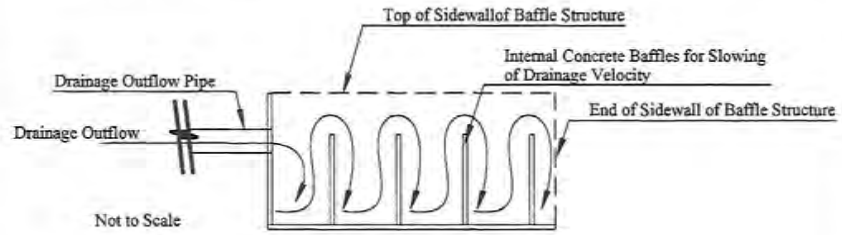
Plan View: Typical Conrete Baffle System Detail

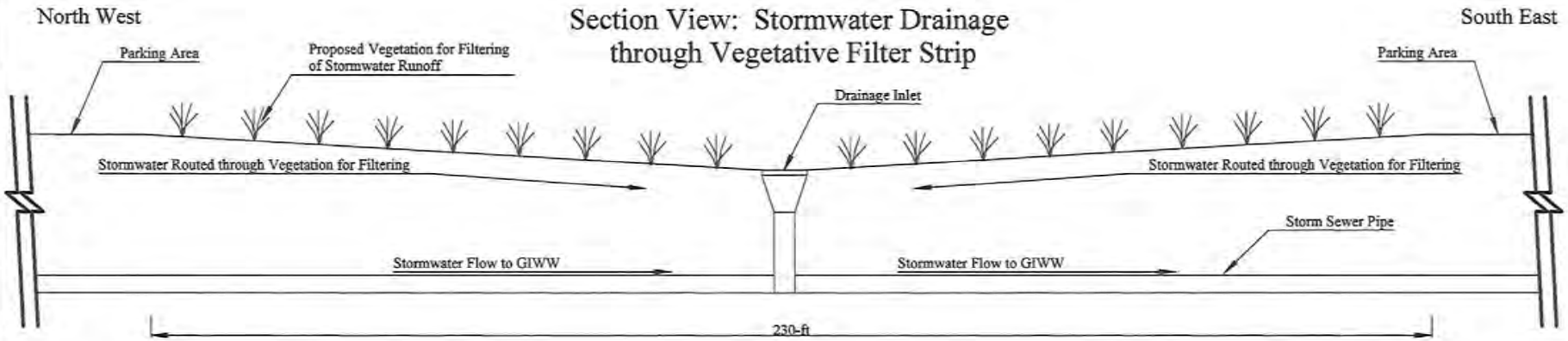


Section View: Typical Conrete Baffle System Detail



Note: Pending contractor final review and selection, the applicant may install an in-line baffle system. Baffle dimensions and location may vary.

Section View: Stormwater Drainage through Vegetative Filter Strip



Not to Scale

Notes:
-For permitting only, not for construction.
-Prepared by Belaire Environmental, Inc., September 20, 2007 (BSG).

SWG-2006-01273 **TRAVIS MATERIAL LAND** **PORT O'CONNOR, LP** **CANAL SUBDIVISION** **Port O'Connor, Texas**	Notes: -Prepared by Belaire Environmental, Inc., April 15, 2020 (LMF) -For permitting only, not for construction.	**Typical Concrete Baffle System Detail & Vegetative Filter Strip**	Agent: BELAIRE ENVIRONMENTAL, INC. P.O. Box 741 Rockport, TX 78382 May 5, 2020 Sheet ___ of ___

MAY 19 2020

Post-Construction Water Quality Monitoring Plan

Proposed Dredging, Filling, Placement of Breakwater

and Concrete Mat for Residential Canal Development and

Marina for Boat Access from the GIWW

Marina del Mar

February 3, 2015

(Rev. May 5, 2020)

1. A dissolved oxygen (D.O.) monitoring plan will be implemented. The D.O. and temperature will be monitored bimonthly from May through October, starting upon completion of the proposed channel and will remain in effect until 90 percent buildout or until 10 years from the start of the monitoring, whichever occurs first.

2. The control site will be in Espiritu Santo Bay at a site similar to that of the impacted area in order to provide data on ambient conditions.

3. Sampling will occur near sunrise, but no later than two hours after sunrise. Samples will be taken one foot from the water's surface.

4. If the minimum D.O. concentration does not meet water quality standards, then the concentration recorded during the monitoring will be compared to the concentrations at the control site in Espiritu Santo Bay to determine if the deviation from the standards was a result of natural conditions or due to lack of circulation in the canals.

5. Monthly results, including a data table containing the monitoring sites, date and time the sample was taken, D.O. and temperature readings, and the calibration data will be sent to the TCEQ, Water Quality Standards Team, 401 Certification Coordinator, Water Quality Division MC-150, at P.O. Box 13087, Austin, Texas, 78711-3087.

6. Any change in monitoring of sites, constituents, or intervals will be coordinated with the TCEQ.

7. After completion of the entire project and if the D.O. levels in the canal have met the minimum water quality standard, the applicant can request the TCEQ to end the monitoring requirement.