

Permittee-Responsible Mitigation Plan

***SWG-2007-00388
ANCHOR BAY MITIGATION SITE
12540 STEWART ROAD
GALVESTON, TX***

SUBMITTED TO:

U.S. Army Corps of Engineers, Galveston District
U.S. Environmental Protection Agency, Region 6
U.S. Fish and Wildlife Service, Clear Lake Ecological Services
National Oceanic and Atmospheric Administration, National Marine Fisheries Service
US Department of Agriculture, Natural Resource Conservation Service

***PREPARED BY
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SUBMISSION DATE

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1.0 PROJECT DESCRIPTION

1.1 Description of Anchor Bay Project (SWG-2007-0388):

Anchor Bay Project (SWG-2007-0388) is a single-family residential waterfront development with associated support facilities located on the west end of Galveston Island at 12540 Stewart Road Galveston, Texas. The project site is a peninsula that extends into West Bay between the existing Spanish Grant Channel and Mensell Bayou. This project is designed to provide housing on Galveston Island with access to the bay for recreational activities and meet local demand. The site is 46 acres centered at latitude 29.233601 and longitude -94.92479. It was determined that 4.206 acres of wetlands would be filled or altered in the initial construction phase of the 53-lot development.

1.2 Alternatives Analysis for Anchor Bay, Ltd. (SWG-2007-00388)

Purpose: To provide a medium sized single-family residential waterfront development with associated support facilities on Galveston Island, Texas to meet local demand.

Alternative A (preferred): 12540 Stewart Road Galveston, Texas. The site is a peninsula on the west end of Galveston Island near Spanish Grant on the Spanish Grant Channel. Site is 46 acres center latitude 29.233601 longitude -94.92479. Proposed action is a 53-lot residential development with water access on the Spanish Grant Channel. Location is owned by the client and the most desirable for this development because of location and associated cost of the development. This action would require filling or altering approximately 4 acres of wetlands.

Alternative B (A with preserve area): 12540 Stewart Road Galveston, Texas. The site is a peninsula on the west end of Galveston Island near Spanish Grant on the Spanish Grant Channel. Site is 46 acres center latitude 29.233601 longitude -94.92479. This alternative proposed action involves constructing a 50-lot development with a preserve area at proposed lots 46-48 of the plan in Alternative A and altering the access road construction to avoid wetland J, a fresh to brackish water pond and adjacent wetlands.

Alternative C: 12540 Stewart Road Galveston, Texas. This is an inland portion of the land owned by the client Anchor Bay. This site is 60 acres centered at latitude 29.2327 and longitude -94.918404. This would be developed into approximately 50 lots and associated roads and facilities. This plan involves dredging channels out to Spanish Grant Channel to allow for waterfront Bay access. The dredging and associated spoil disposal would escalate the cost of the proposed project to exceed what is reasonable for this size development.

Alternative D (offsite location): The feasibility of acquiring another site of this size in such a desirable location within the desired proximity to Galveston shopping and restaurant locations is unknown at this time.

Alternative E (no action): To avoid all wetland areas would limit the number of lots and access road construction too drastically to meet the proposed need and purpose of the project.

TABLE 1.2-1

	Factor	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Available		Own	Own	Own	Unknown	Own
Logistics	Sufficient size	46 ac lots sufficient	46ac reduced lots not significant	60ac lots sufficient	n/a	Loss of too many available lots to be sufficient
	Zoning	Yes	Yes	Yes	n/a	n/a
	Utilities	Yes	Yes	Yes	n/a	n/a
	Road Access	Yes	Yes	Yes	n/a	n/a
Existing Technology	Topo/ Construction Techniques Feasible	Yes	Yes	Yes with dredging of upland areas	n/a	n/a
Cost	Reasonable Construction cost for size of Project	Yes	Yes	No	n/a	n/a

2.0 AVAILABLE MITIGATION CREDITS

The Gulf Coastal Plains Mitigation Bank is not shown as servicing the area of our project. There are no other suitable banks in this location and the client wants to keep the mitigation in the current watershed as close to the proposed loss as possible, which is why we are requesting permittee-responsible mitigation at the proposed location adjacent to the proposed project Anchor Bay development SWG-2007-00388.

3.0 WATERSHED APPROACH

The goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources through the strategic selection of compensatory mitigation sites. For this reason, we are proposing the following mitigation goals at the adjacent site (see Section 4.2 Site Selection). Fringe wetland planting along the bulkhead for increased shoreline protection and water quality. As well as wetland planting in the storm water runoff basin to improve the water quality of the surrounding bay areas by trapping pollutants before they can reach the adjacent areas (see section 4.1 for more information on the proposed mitigation goals). The conditions are favorable for successful mitigation as evidenced by other created sites along the west end of Galveston Island, the closest being just west of the proposed Anchor Bay development along the north edge of Spanish Grant. (see map of the area in Appendix A).

4.0 PROPOSED COMPENSATORY MITIGATION PLAN

The components of a complete mitigation plan are identified in the Mitigation Rule (33 CFR 332.4(c)). The following sections provide additional local guidance about the information that will be required to review and approve a PRM plan for Anchor Bay, Ltd. SWG-2007-00388.

4.1 Goals and Objectives:

It is the intent of this proposed compensatory mitigation plan to preserve existing intertidal smooth cordgrass marsh adjacent to the proposed development of Anchor Bay and restore an 8-foot-wide linear stretch of smooth cordgrass (*Spartina alterniflora*) fringe wetland buffer along the west edge of the development along the bulkhead as well as in the newly created boat basin and launch area to protect water quality. In addition this plan proposes to create wetlands in the run-off detention basin, along the east edge of the peninsula, and on property adjacent to the development in the Mensell Bayou area of West Bay (as shown in the attached maps see Appendix) as well as enhancing the existing wetland complex by removing any invasive salt cedar (*Tamarix* sp.) in order to mitigate for the fill/ alteration of 4.206 acres of wetlands identified in the permit application #SWG-2007-0388 for Anchor Bay, Ltd.

Preservation Components:

1. Permittee will deed to a charitable environmental entity approved by USACE a minimum of 173.2 acres of intertidal salt marsh.
2. Permittee will also deed an additional 9.4 acres of new created marsh south of existing acreage named in 1 above to the same charitable environmental entity approved by the USACE.
3. A letter from the entity in numbers 1 and 2 above must be submitted to the USACE stating the entity's intent to accept the donation prior to work beginning in the jurisdictional areas.
4. The donation must be transferred, and a letter must be submitted to the USACE with documentation of said transfer, prior to work beginning in jurisdictional areas.
5. Permittee is avoiding impacts to 20 acres of high tidal salt marsh adjacent to Anchor Bay development's north and east extents (as depicted in attached graphics.)

Restoration Components:

1. After the completion of bulkhead installation along the Spanish Grant Canal and construction in jurisdictional areas along the peninsula, the width of the intertidal area will be restored to 8 feet from the bulkhead for the length of the project (approximately 3000 feet). Restoring or creating approximately 0.55 acres of smooth cordgrass wetland fringe marsh habitat.

Creation Components:

1. Goal #1- Successful establishment of a 10-foot-wide smooth cordgrass shelf in front of the bulkhead along the proposed new boat basin. Totaling 0.03 acres of fringe wetland habitat. (Area 3)
2. Goal #2- Successful establishment of wetland plants in the storm water run-off detention basin to protect water quality of the surrounding wetlands and bay system. (Area 4)
3. Goal #3- Successful construction of approximately 9.4 acres of new intertidal marsh on the eastern adjacent property to include a new brackish water pond and wetland system. (Areas 5,6, and 7)

4.2 Site Selection:

The site selected for this mitigation plan was based on the following factors:

- Proximity to the impacted wetlands in the affected watershed
- Amount and type (i.e. fringe wetland, smooth cordgrass, brackish pond, etc.) of feature impacted.
- Habitat needs and water quality

- Success of other created wetlands in the area

- 4.2.1 Hydrology and soil conditions are suitable for planting the prescribed smooth cordgrass to re-establish the fringe marsh habitat. The soil features of the adjacent area 3 are suitable for creation of the new brackish water pond and associated wetland and submerged aquatic features.
- 4.2.2 The proposed plan maintains the habitat diversity of the watershed
- 4.2.3 The size and location of the compensatory mitigation site relative to hydrologic sources and other ecological features;
- 4.2.4 Compatibility with adjacent land uses and watershed management plans;
- 4.2.5 The reasonable effects of this mitigation will be in water quality, shoreline protection and continuity of ecologically important habitat for both aquatic species and migratory waterfowl.
- 4.2.6 Other relevant factors including, but not limited to, development trends, anticipated land use changes, habitat status and trends, water quality goals, and floodplain management goals.

4.3 Site Protection:

Long-term protection of this compensatory mitigation site will be provided through the transfer of title to a local non-profit conservation organization. The areas identified for compensatory mitigation will be transferred to Artist Boat Coastal Heritage Preserve.

4.4 Baseline Conditions:

- 4.1.1 Project Site: See the wetland delineation report performed by Jim Webb for project site conditions and photos of the site. This information was used to determine both the number and type of mitigation credits that will be required to offset adverse impacts associated with the proposed project. The HGM model for initial potential functional capacity unit impacts calculated as worst-case scenario filled or covered by impervious cover prior to any mitigation being completed are as follows:
 Biota: -3.088 net FCU loss
 Botanical: -3.424 net FCU loss
 Physical: -1.237 net FCU loss
 Chemical: -1.284 net FCU loss
 See Appendix B for attached HGM Functional Capacity worksheets and calculations.

4.4.2 Proposed Mitigation Site: The client has owned the property proposed for this mitigation plan for more than 15 years and there have been no significant changes to the condition or use of the property. Boundary and location maps for the proposed mitigation sites are included in Appendix A. See Dr. James Webb delineation for historic aerial photographs of the area. The property consists of intertidal smooth cordgrass marsh, mudflats, vegetated flats, high marsh and uplands. The HGM model for total functional capacity unit for proposed mitigation areas prior to creation are as follows:
 Biota: 332.102
 Botanical: 159.021

Physical: 117.333

Chemical: 78.105

The HGM model change after creation of proposed mitigation shows the following net increase:

Biota: 6.593

Botanical: 2.927

Physical: 2.629

Chemical: 1.118

The final functional capacity impacts determined from the pre-mitigation project loss (section 4.4.1) + the post mitigation change above (4.4.2) are as follows:

Biota: 3.505

Botanical: -0.497

Physical: 1.392

Chemical: -0.166

Two categories show potential gain of function while the other two categories show minor loss of function post mitigation.

4.5 Determination of Credits:

Using the USACOE Determination of Wetland Credit Worksheets it is determined that the required number of mitigation credit for the Anchor Bay Project SWG-2007-00388 is 40.30 credits to offset the filling of 4.206 acres of wetlands. The proposed mitigation provides 138.6 preservation credits and 30.2 restoration and enhancement credits for a total of 168.8 mitigation credits with greater than 50% of the required credits coming from restoration and enhancement. (see Appendix C for attached worksheets)

4.6 Mitigation Work Plan:

Preservation Components:

6. Permittee will deed to a charitable environmental entity approved by USACE a minimum of 173.2 acres of intertidal salt marsh.
7. Permittee will also deed an additional 9.4 acres of new created marsh south of existing acreage named in 1 above to the same charitable environmental entity approved by the USACE.
8. A letter from the entity in numbers 1 and 2 above must be submitted to the USACE stating the entity's intent to accept the donation prior to work beginning in the jurisdictional areas.
9. The donation must be transferred and a letter must be submitted to the USACE with documentation of said transfer, prior to work beginning in jurisdictional areas.
10. Permittee is avoiding impacts to 20 acres of high tidal salt marsh adjacent to Anchor Bay development's north and east extents (as depicted in attached graphics Appendix A)

Enhancement/ Restoration Components:

1. The Permittee will submit a letter to the USACE two weeks before start of construction in jurisdictional areas which states the proposed start date.
2. Prior to the start of construction along the Spanish Grant Canal, the Permittee will conduct a baseline survey of the acreage of existing fringe marsh along the Spanish Grant Canal located within the boundary of the Anchor Bay development, for the length of the project area. The Permittee will submit the baseline vegetation survey with aerial coverage to the USACE within 30 days of the survey date.
3. After the completion of bulkhead installation along the Spanish Grant Canal and construction in

jurisdictional areas along the peninsula, the fringe marsh areas reference in #2 above will be reevaluated and any damage or erosion will be repaired or enhanced.

4. The Permittee will conduct an elevation survey of the bank along the Spanish Grant Canal within the Anchor Bay property boundary, for the length of the project area, to determine the optimum elevation for smooth cordgrass growth along the bank.
5. Where existing water depths are not appropriate for growth the Permittee will re-grade, where feasible, the existing bank landward down to wetland elevation and adjust the bulkhead alignment to provide additional intertidal area. The width of the intertidal area to be enhanced will be 8 feet from the bulkhead for the length of the project (approximately 3000 feet). The Permittee will plant the re-graded areas with smooth cordgrass totaling 0.55 acres of wetland fringe habitat. This is to be done within 12 months of the start of construction in jurisdictional areas.
6. A letter will be submitted to the USACE stating that planting is completed within 13 months of the start date of the construction in jurisdictional areas.
7. A transplant survival survey of the planted mitigation area must be performed within 60 to 90 days of completing the initial planting effort. If at least 50% survival of transplants is not achieved at the time of this survival survey, a second planting effort will be completed within 60 to 90 days of the completion of the initial survey.
8. Written reports detailing the plant survival must be submitted to the USACE within 30 calendar days of completing the initial survival survey and any subsequent replanting effort surveys. Then monitoring reports will be submitted annually from the date of planting effort completion for 5 years.
9. If after 1 year from the initial planting effort (or subsequent planting efforts) the site does not have at least 35% aerial coverage of targeted vegetation, a new elevation survey will be conducted to verify water depth is appropriate for smooth cordgrass growth. If the elevation is not appropriate, the permittee will contact the USACE within 30 days of the survey to coordinate a new mitigation plan.
10. Success criteria for created wetland fringe areas, along Spanish Grant Canal, are 70% coverage of Smooth Cordgrass in planted areas, if this criterion is met before the completion of the 5 years of monitoring permittee with approval from the USACE can discontinue monitoring of fringe habitat once criteria has been met for 2 consecutive monitoring reporting periods.

Creation Components:

Goal #1- Successful establishment of a 10-foot-wide smooth cordgrass shelf in front of the bulkhead along the proposed new boat basin. Totaling 0.03 acres of fringe wetland habitat. (Area 3 on map)

Goal #2- Successful establishment of wetland plants in the storm water run-off detention basin to protect water quality of the surrounding wetlands and bay system. (Area 4 on map)

Goal #3- Successful construction of approximately 9.4 acres total of new emergent wetland marsh and new brackish water pond system in the areas identified as areas 5, 6 and 7 on map in the eastern adjacent property.

1. Submit letter to the USACE 2 weeks before the start of construction in jurisdictional waters or wetlands.
2. A transplant survival survey of the planted mitigation areas must be performed within 60 calendar days following each initial planting effort. If at least 50% survival of transplants is not achieved within 60 calendar days of planting, a second planting effort will be completed within 60 calendar days of completing each initial survey. If optimal seasonal requirements for replanting targeted species are not suitable when replanting would be required, the USACE must approve a replanting schedule.
3. Written reports detailing plant survival in each of the areas listed above must be submitted to the USACE within 30 calendar days of completing the initial survival survey and any

subsequent replanting effort.

4. If after one year from the initial planting effort the site does not have at least 35% aerial coverage of targeted species, those areas that are not vegetated will be replanted using original planting specifications.
5. If after 5 years from the initial planting effort (or subsequent plantings), the site does not have 70% aerial coverage of targeted vegetation, those areas that are not vegetated will be replanted using the original planting specifications.
6. In addition to the initial (60 -90-day post planting) survey report(s), progress reports will be submitted to the USACE at six-month, one year, two year and three year, four year and five year intervals following the initial planting effort or subsequent efforts. Photos of the mitigation site should be included in each report.
7. Success criteria for the creation sites is 70% aerial coverage of targeted species and less than 5% aerial coverage of invasive salt cedar (*Tamarix* sp.). If success criteria are met before the five-year timeframe, permittee can discontinue monitoring, by requesting written permission from the USACE after success criteria have been met for 2 consecutive reporting periods according to the RGL 08-03.

Design drawings of the proposed created areas 2, 3, 4, 5, 6 and 7 as well as proposed planting lists are included in Appendix E.

4.7 Maintenance Plan:

Transects will be established for monitoring success of plantings at a set interval along the length of the bulkhead. Transects will be removed at the completion of the monitoring events. A transplant survival survey of the planted mitigation area must be performed within 60 to 90 days of completing the initial planting effort. If at least 50% survival of transplants is not achieved at the time of this survival survey, a second planting effort will be completed within 60 to 90 days of the completion of the initial survey. If after 1 year from the initial planting effort (or subsequent planting efforts) the site does not have at least 35% aerial coverage of targeted vegetation, a new elevation survey will be conducted to verify water depth is appropriate for smooth cordgrass growth. If the elevation is not appropriate, the permittee will contact the USACE within 30 days of the survey to coordinate a new mitigation plan.

Transects will also be randomly placed in the created areas within the detention basin and adjacent sites to monitor for success criteria of plantings. A transplant survival survey of the planted mitigation areas must be performed within 60 calendar days following each initial planting effort. If at least 50% survival of transplants is not achieved within 60 calendar days of planting, a second planting effort will be completed within 60 calendar days of completing each initial survey. Any invasive species found in the created wetland areas should not total more than 5% of the total cover and should be removed by hand as soon as possible after identification. Monitoring activities should occur at a minimum schedule of 60 days, 6 months, 1 year, 2 year, 3 years, 4 years, and 5 years from initial planting. If necessary replanting should occur 30 days after monitoring reports are completed.

4.8 Performance Standards:

Restoration of fringe wetland habitat will meet performance standards at 60 days post-transplant if there is 50% transplant survival across all designated transects.

Subsequent performance standards are 35 % cover along designated transects after 1 year and the restoration will be considered successful when 70% cover is reached along designated transects in either 5years or 2 consecutive monitoring periods prior

to the 5year minimum.

4.9 Monitoring Requirements:

4.9.1 Monitoring Reports- (5-year minimum) Monitoring reports should be concise and provide information to describe the site conditions and whether the mitigation project is meeting its performance standards. The report should include a narrative that provides an overview of site conditions and function; design drawings, maps, and photographs to illustrate site conditions, and functional assessments used to provide quantitative or qualitative measures of the functions provided by the mitigation project. Photographs should be formatted to print on a standard 8.5 x 11 sheet of paper, dated, and clearly labeled with the direction from which the photo was taken. Maps should show the location of the mitigation site, habitat types, locations of photographic reference points, transects, sampling data points, and/or other features pertinent to the mitigation site. Additional components of the narrative are:

4.9.1.1 Name of party responsible for conducting the monitoring and the date(s) of the inspection.

4.9.1.2 A brief description of the approved compensatory mitigation plan and the dates when specific mitigation activities were commenced and/or were completed.

4.9.1.3 A paragraph describing whether the mitigation site is developing as expected. This summary should be supported by a detailed description of each management unit, and whether each management unit is developing as expected and meeting the necessary performance standards.

4.9.1.4 If one or more management units are not meeting the necessary performance standards, the permit applicant must submit a description of the existing condition, identify the reason(s) that the management unit is not meeting performance standards, and submit a proposal to conduct remedial actions and bring the management unit into compliance with the approved mitigation plan.

4.9.1.5 Dates of any corrective or maintenance activities conducted since the previous report submission.

4.10 Long-term Management Plan:

After successful completion of the proposed mitigation and monitoring period the preservation area and the created areas will be transferred to Artist Boat as part of the Coastal Heritage Preserve for them to manage in perpetuity.

4.11 Adaptive Management:

In the event the approved mitigation plan, one or more mitigation activities, or one or more areas of the mitigation site fails to achieve the necessary performance standards as specified in the mitigation plan, the permit applicant shall notify the Corps immediately. Adaptive management activities may consist of corrective actions and additional monitoring of the approved mitigation site, implementation of an alternate PRM plan, or the purchase of mitigation credits from an approved mitigation bank or in-lieu fee program. Failure to actively pursue and implement an approved mitigation plan or to develop and implement an adaptive management plan may be grounds for modification, suspension or revocation of the associated

Department of the Army authorization.

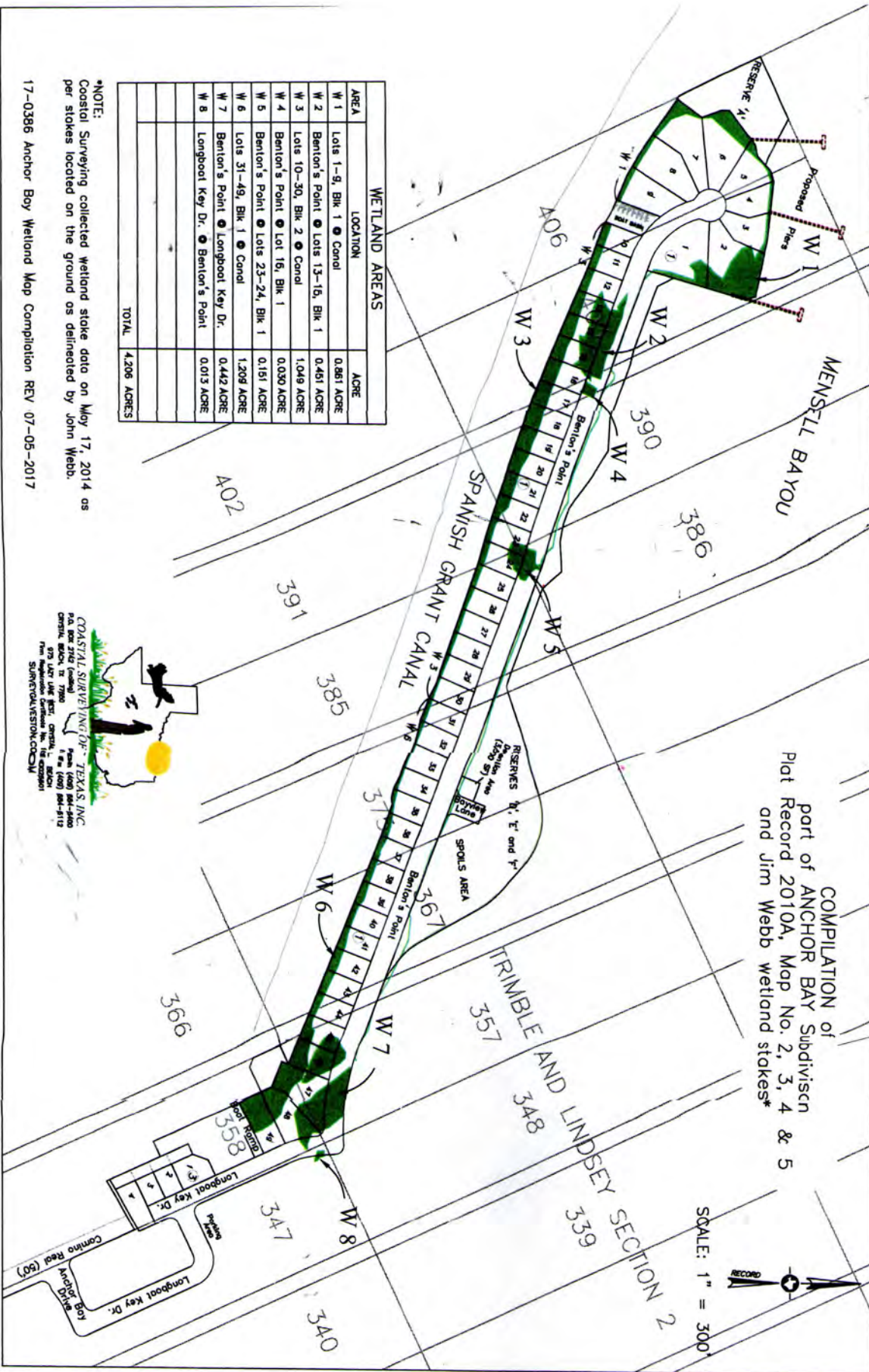
4.12 Financial Assurances:

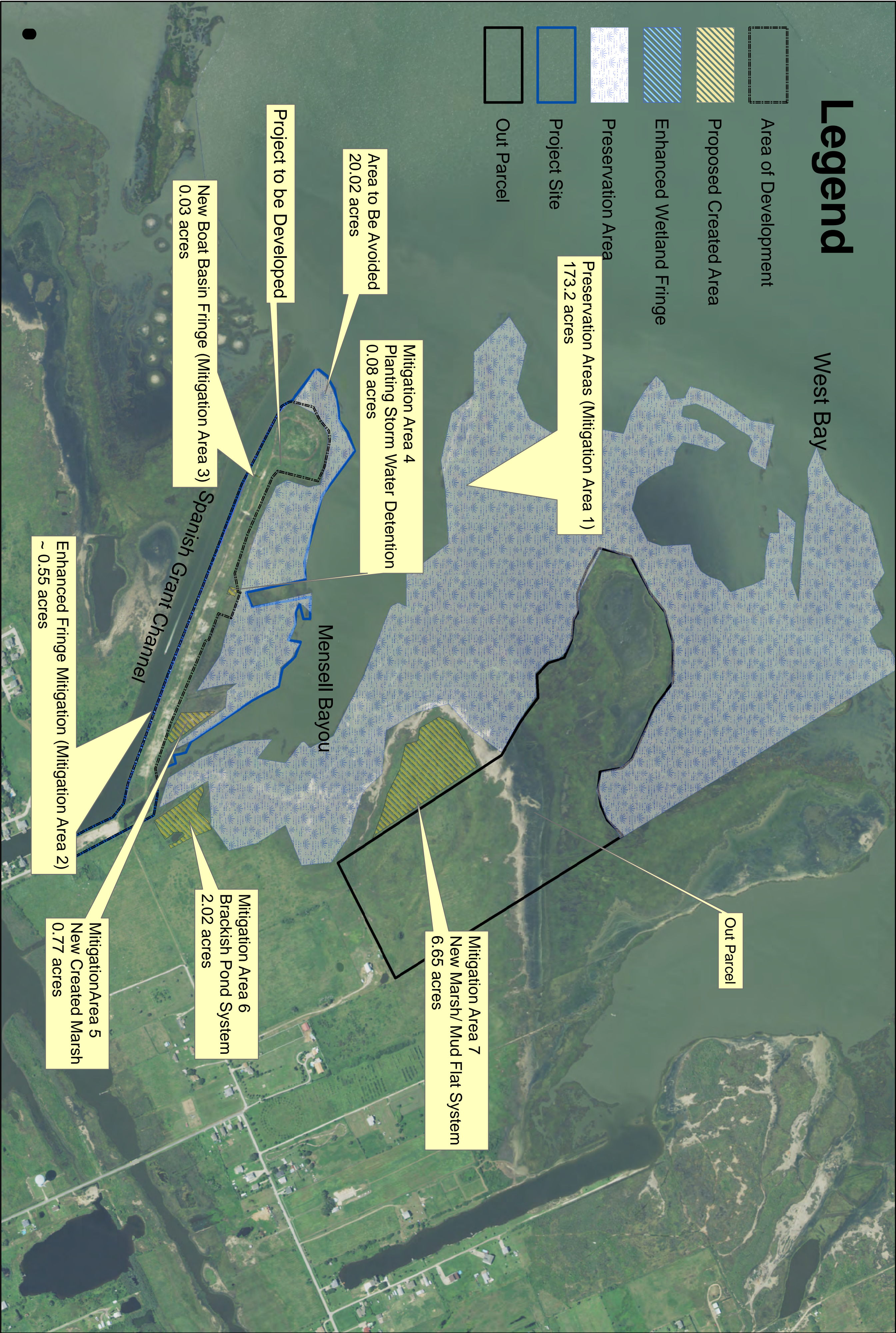
The permit applicant shall provide financial assurances in the form of a Performance Bond or Letter of Credit to ensure funding is available to implement the approved mitigation plan or to implement corrective measures if additional work is required to ensure the success of the mitigation activities. The amount of the bond or letter of credits shall be based on estimated construction costs and the Corps will release these financial assurances after documentation and approval of project success. The permit applicant must notify the Corps 120 days prior to termination of financial assurances.

WETLAND AREAS		
AREA	LOCATION	ACRE
W 1	Lots 1-9, Blk. 1 ● Canal	0.661 ACRE
W 2	Benton's Point ● Lots 13-16, Blk. 1	0.461 ACRE
W 3	Lots 10-30, Blk. 2 ● Canal	1.049 ACRE
W 4	Benton's Point ● Lot 16, Blk. 1	0.030 ACRE
W 5	Benton's Point ● Lots 23-24, Blk. 1	0.151 ACRE
W 6	Lots 31-49, Blk. 1 ● Canal	1.208 ACRE
W 7	Benton's Point ● Longboat Key Dr.	0.442 ACRE
W 8	Longboat Key Dr. ● Benton's Point	0.013 ACRE
TOTAL		4.206 ACRES

NOTE:
Coastal Surveying collected wetland stake data on May 17, 2014 as per stakes located on the ground as delineated by John Webb.

17-0386 Anchor Bay Wetland Map Compilation REV 07-05-2017

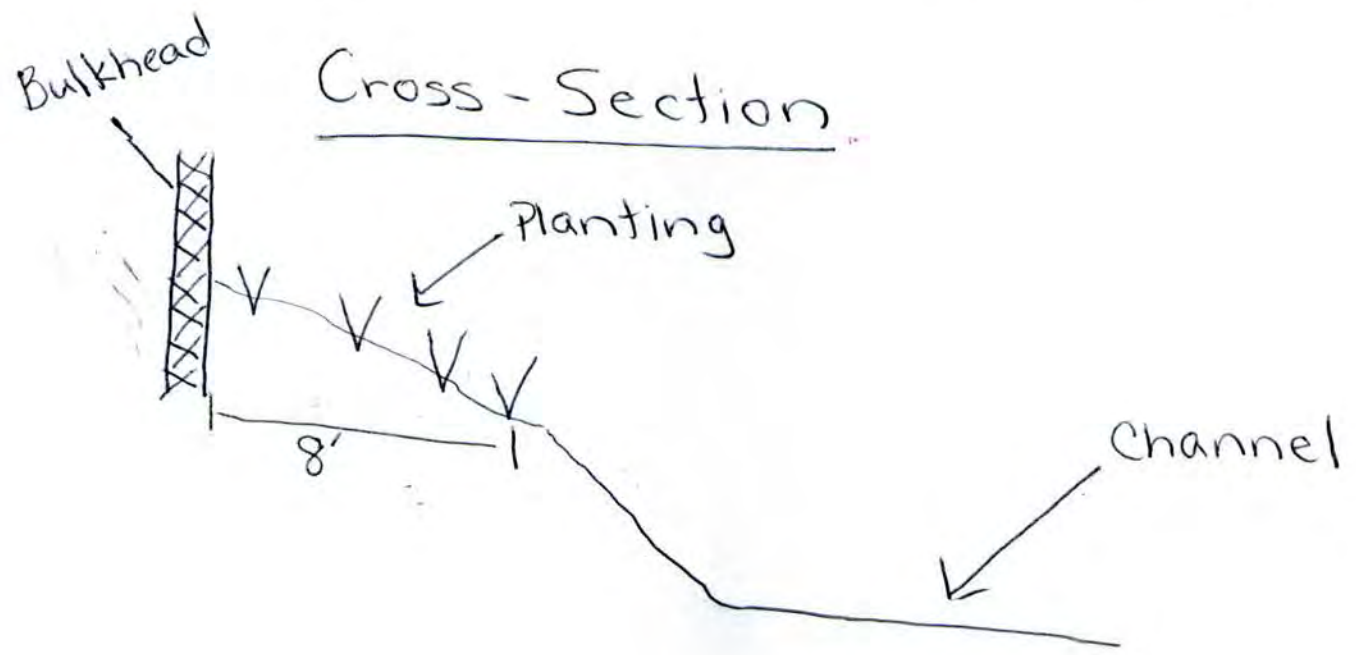
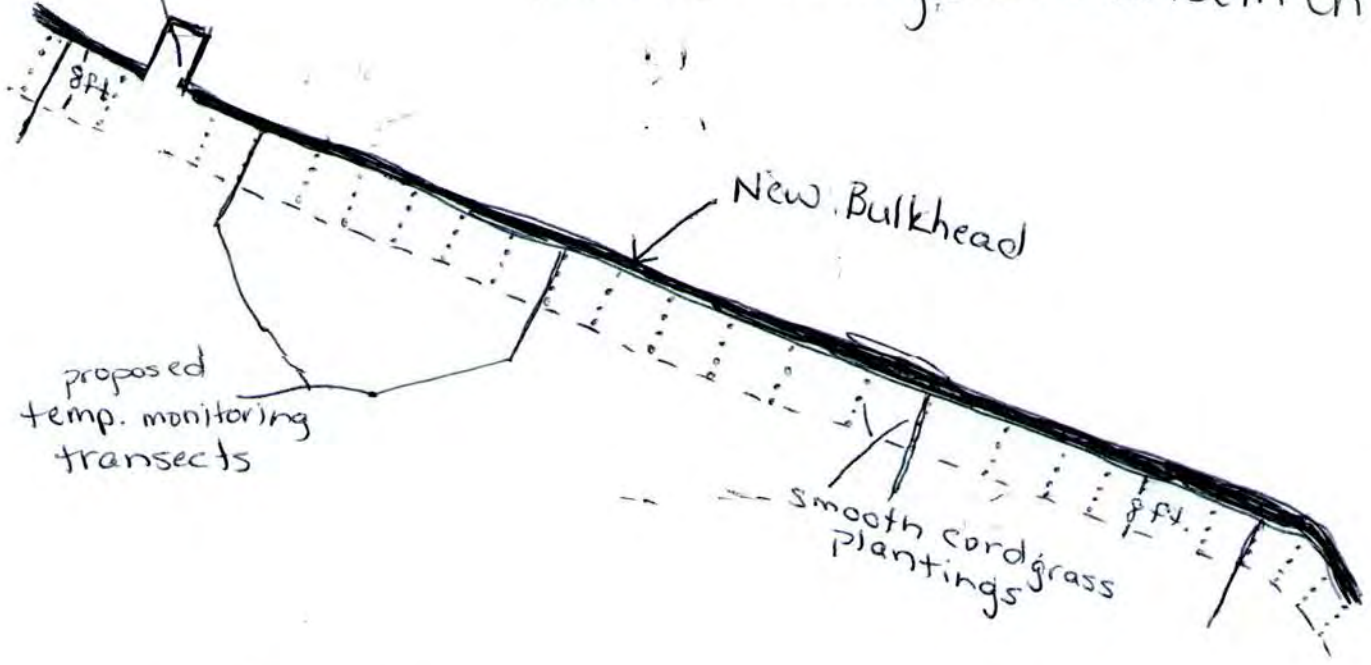




New Boat Basin

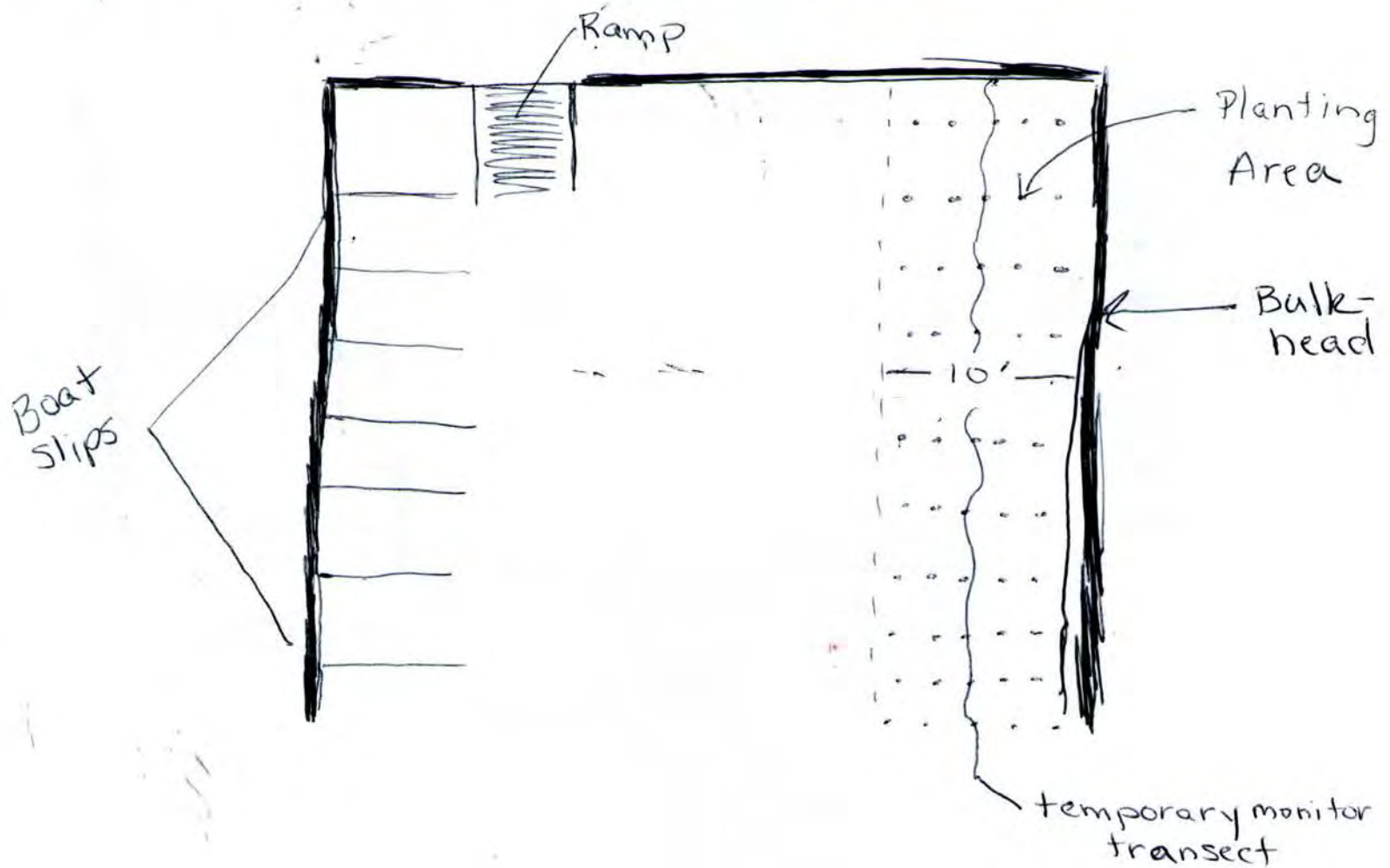
Plan View (not to scale)

Area Z: Fringe Enhancement

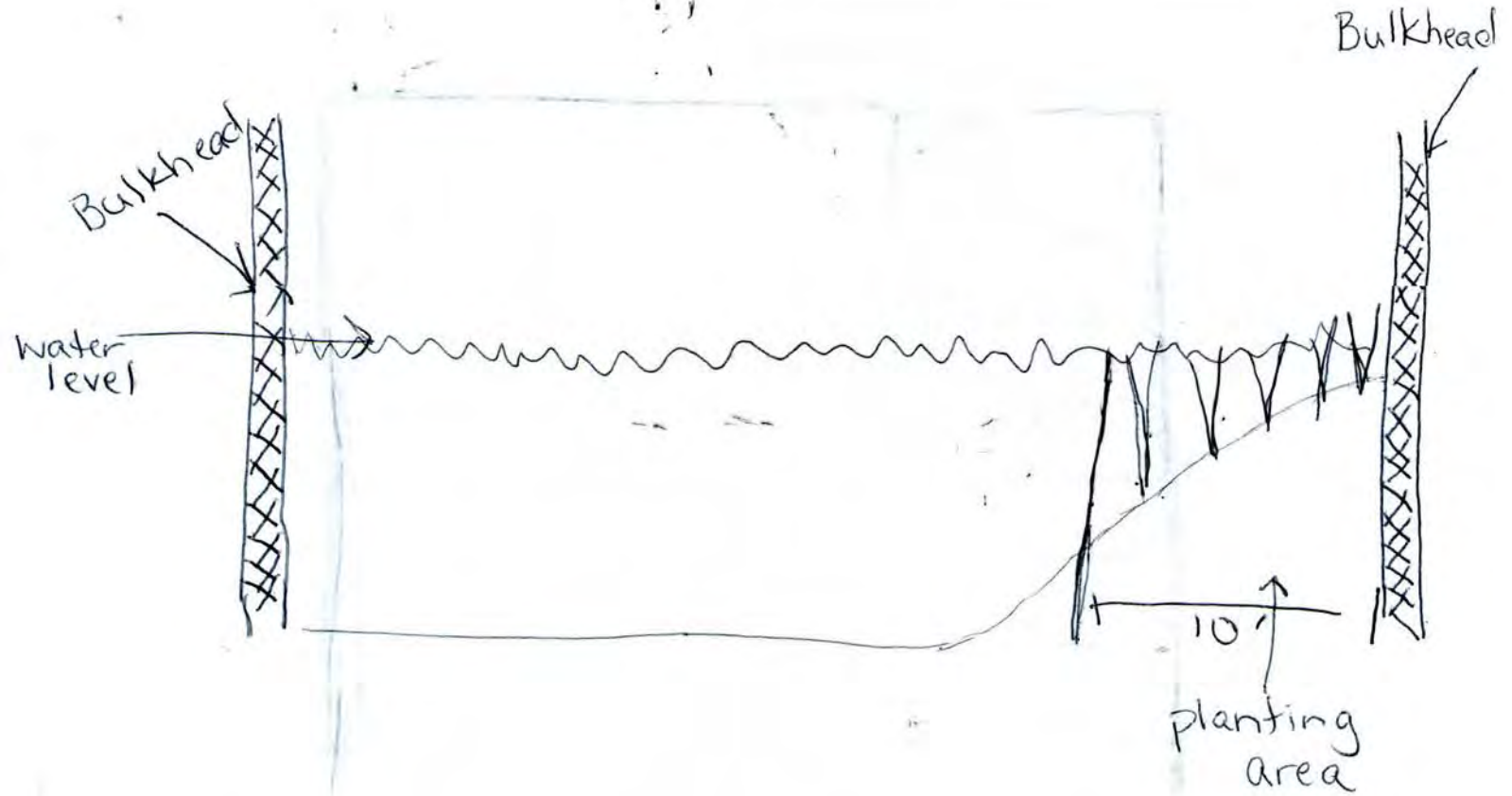


Area 3: New Boat Basin Fringe

Plan View (not to scale)

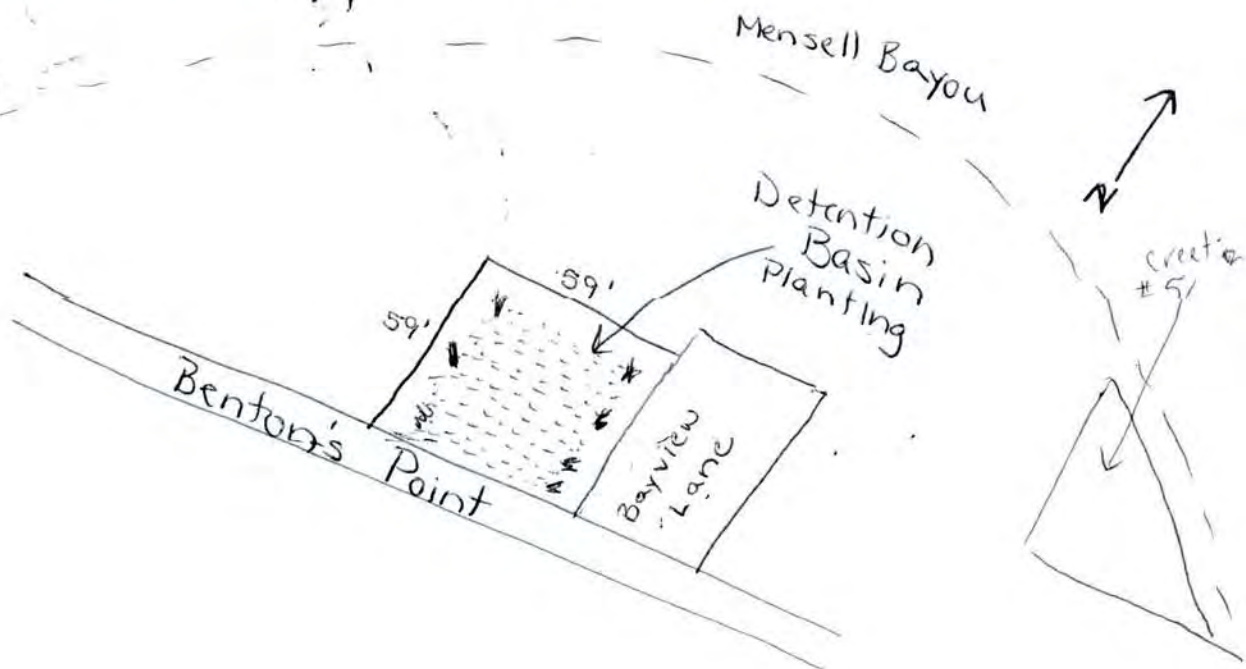


Area 3: New Boat Basin Fringe Cross-Section

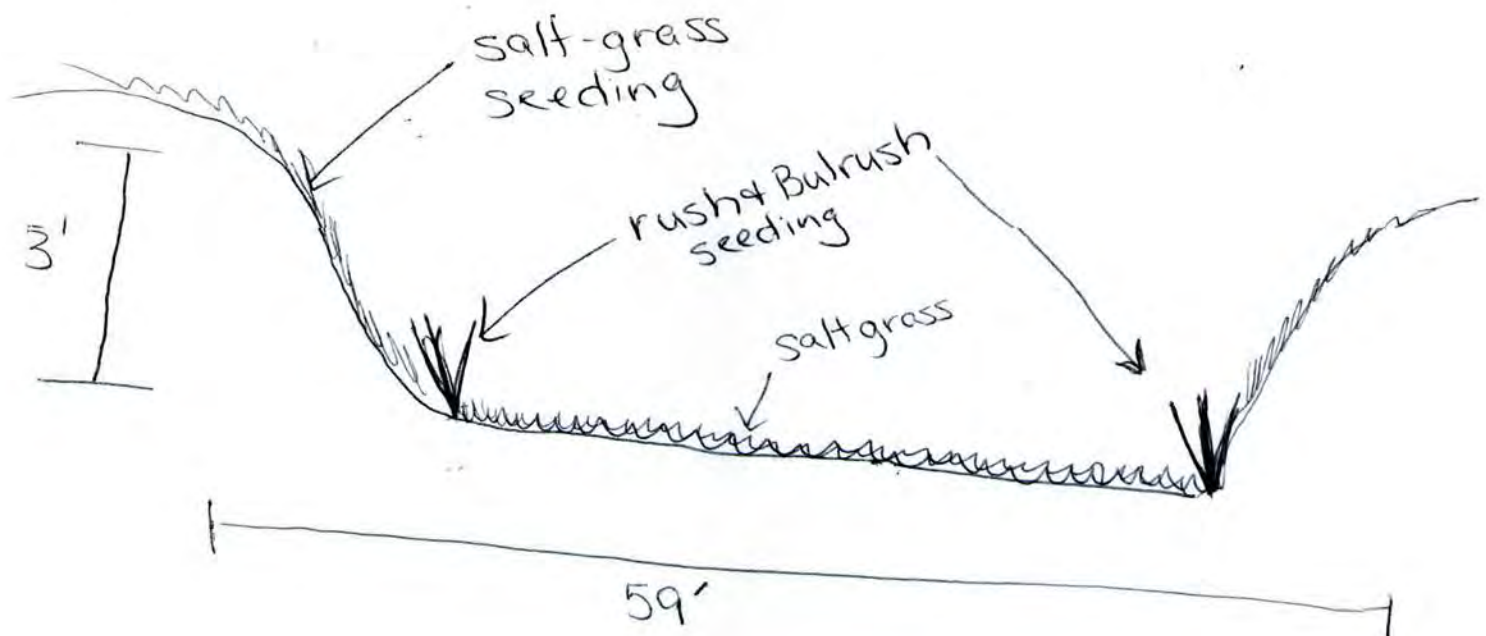


Area 4 : Storm Water Detention

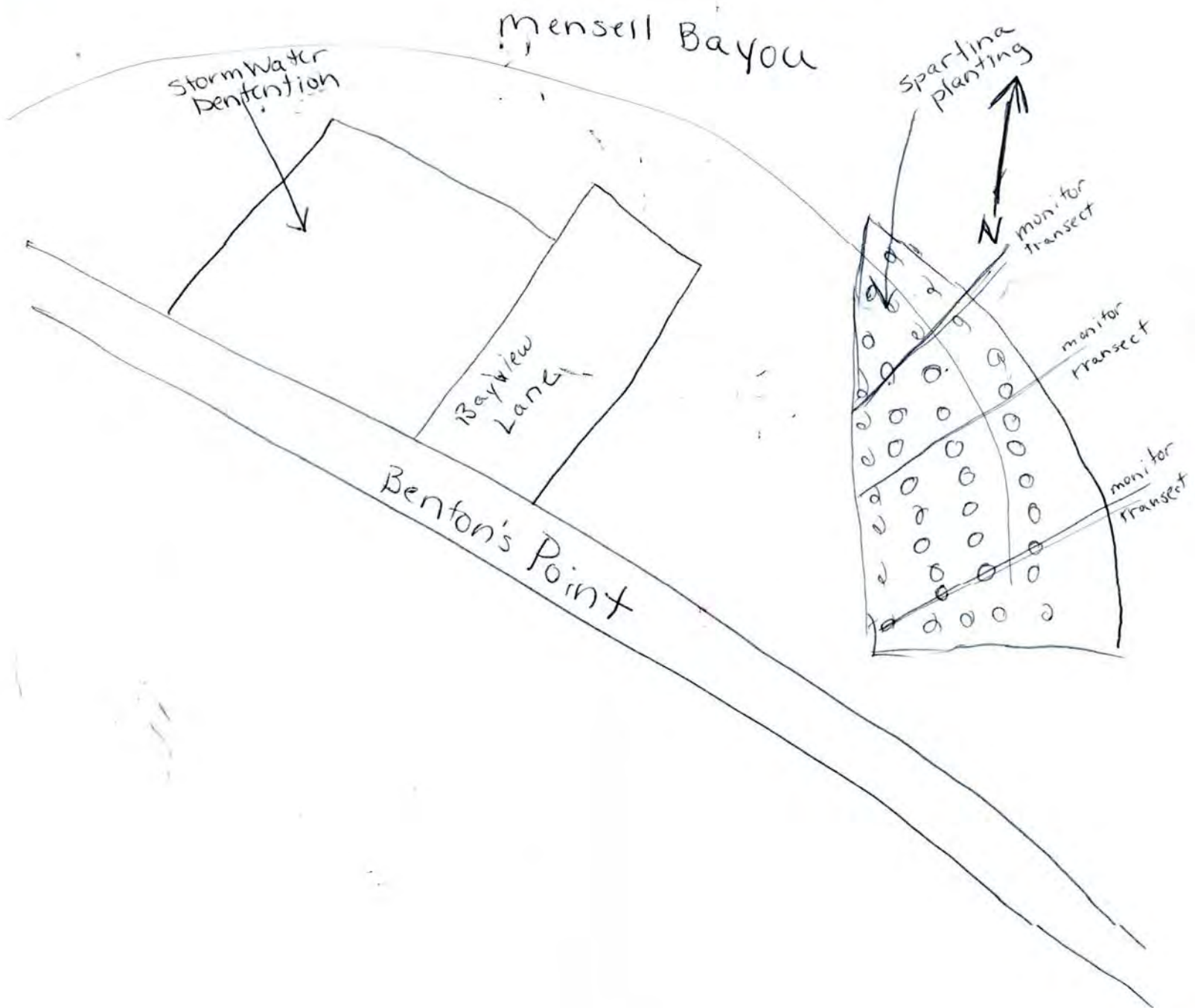
Plan View (not to scale)



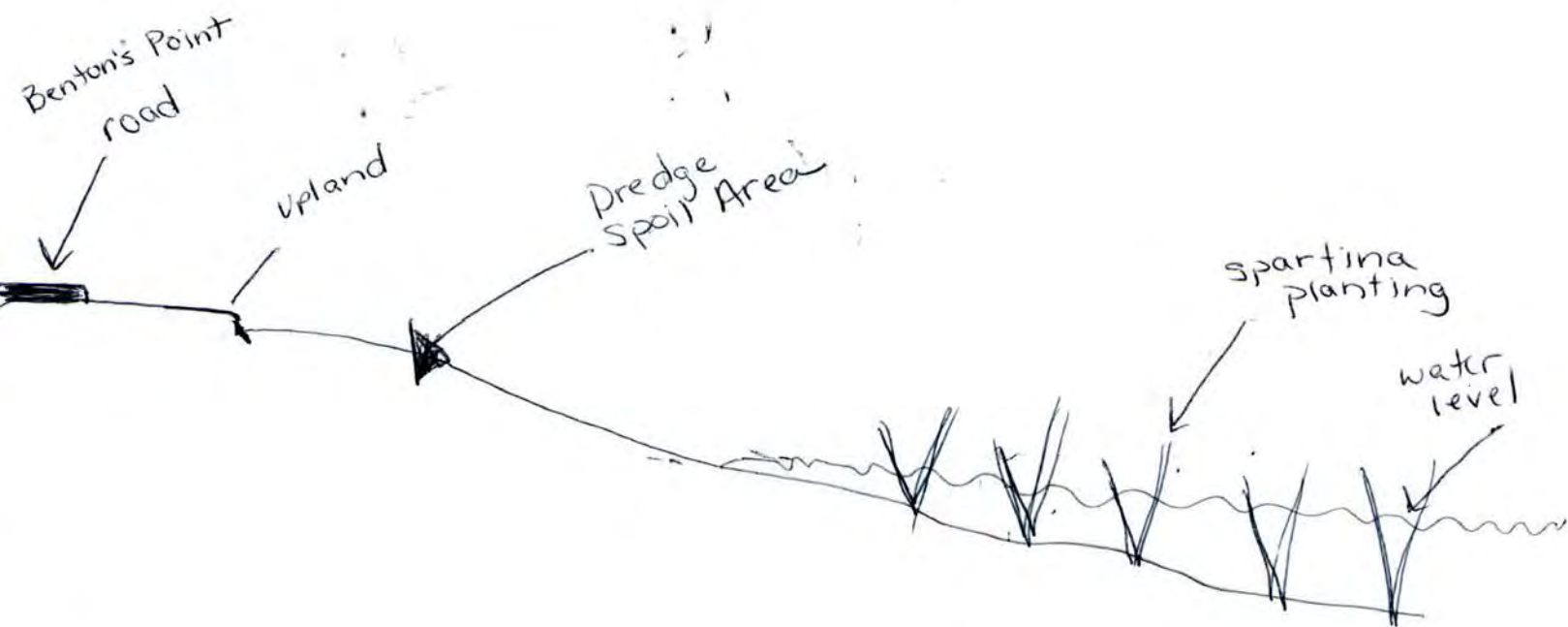
Cross-Section View



Area 5 : Marsh Creation Plan View (not to scale)



Cross-Section View Area 5



Area 6: Brackish Pond Creation (Total Area) 2 acres

Existing wetland area

Fringe salt grass rushes

Ruppia (submerged grasses)

Deeper Water 4' Pond

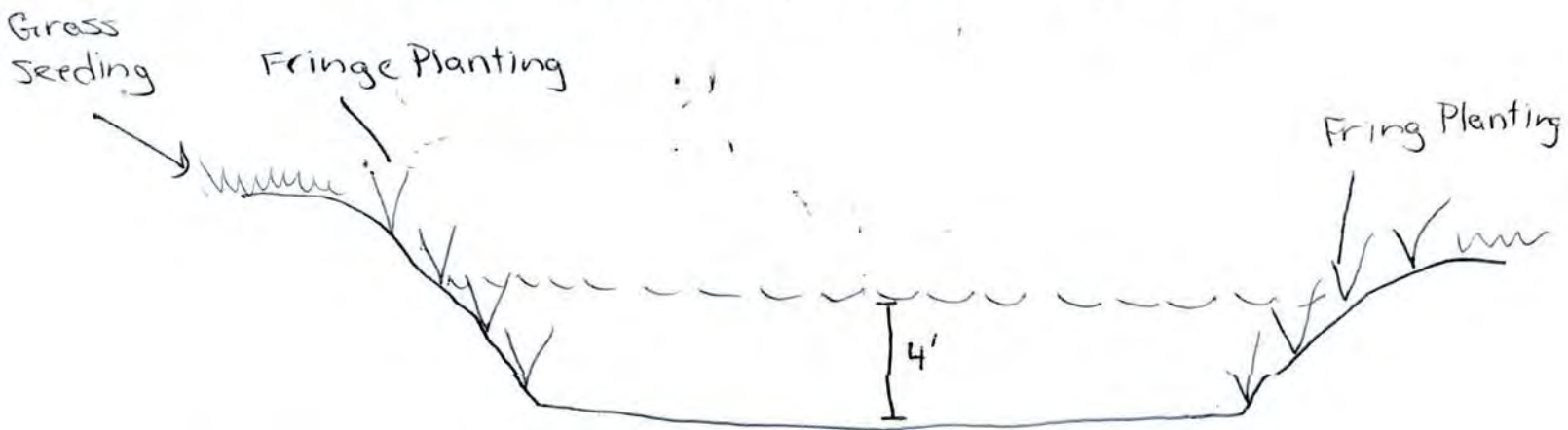
Existing wetland area

Plan View

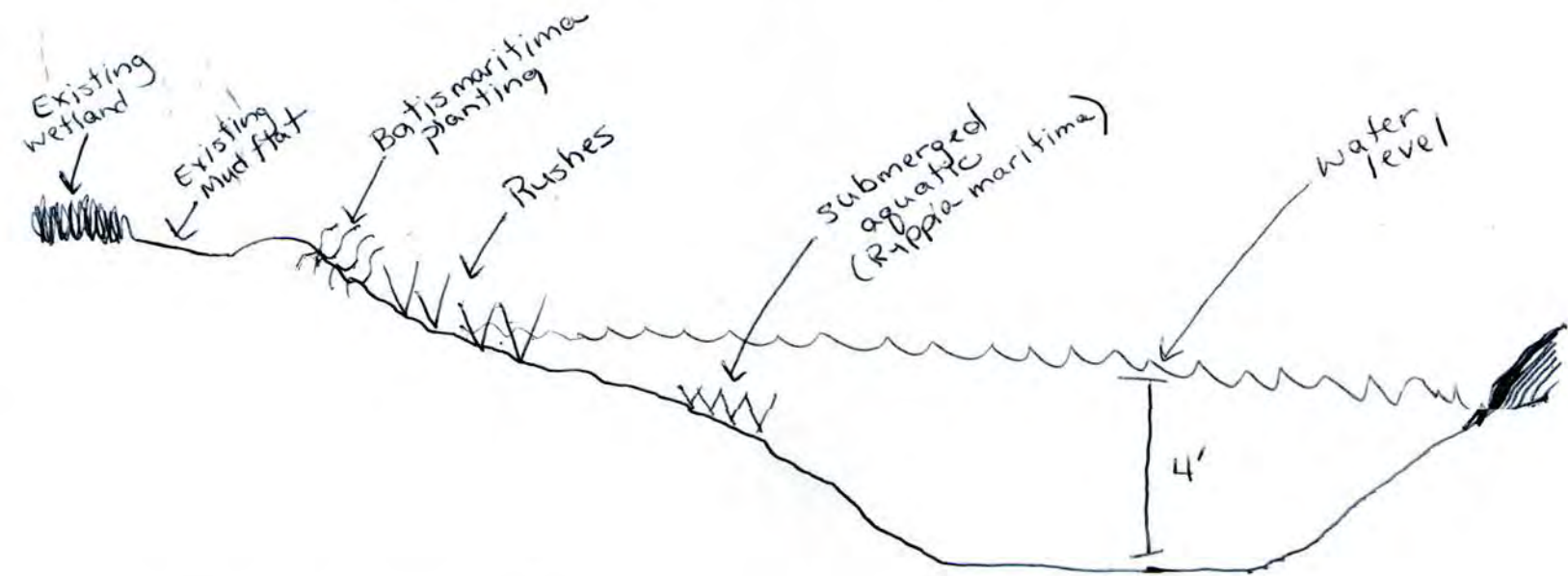
Not to scale

Area 6: Brackish Water Pond

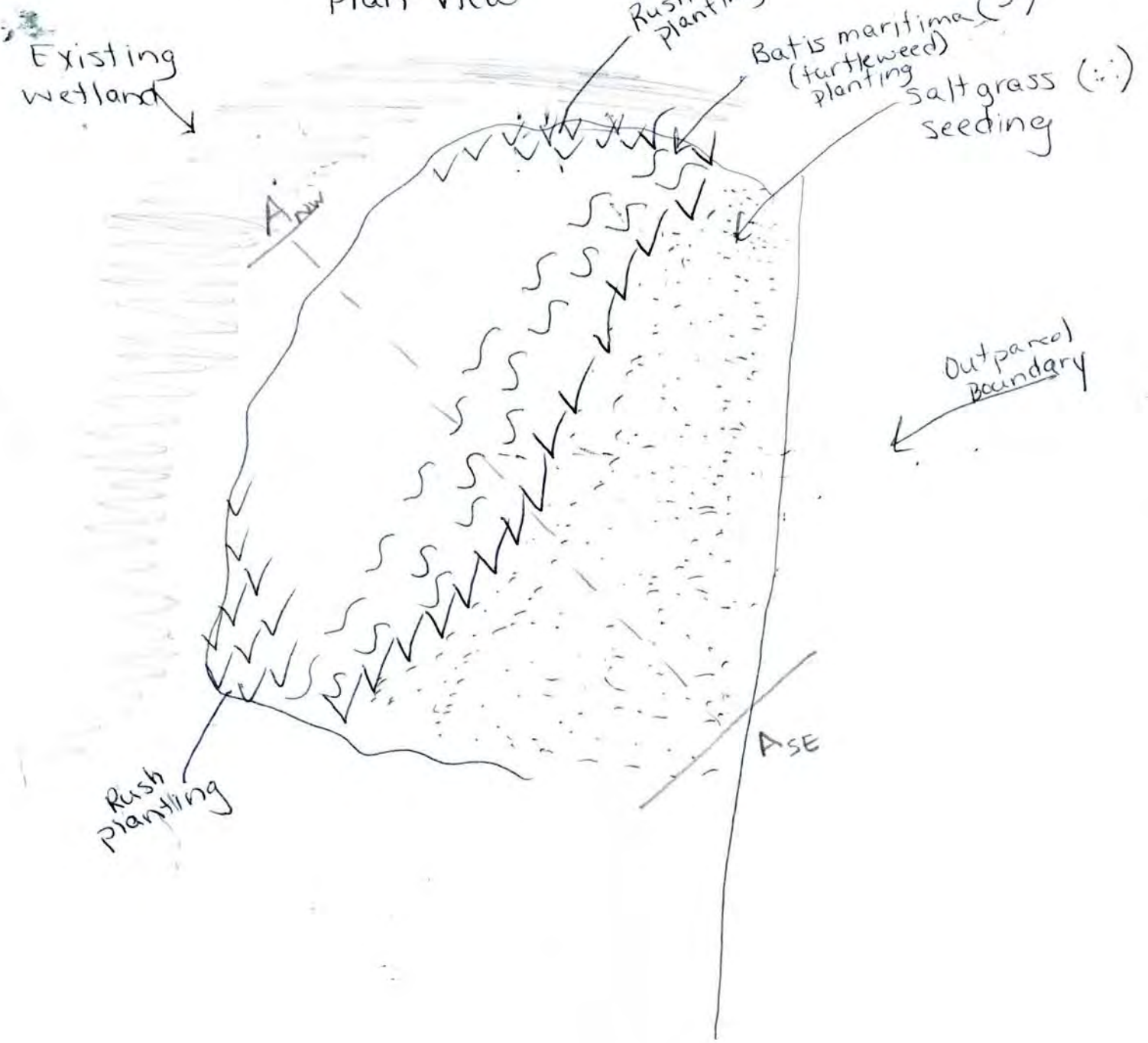
Cross-Section View $A_E - A_W$



Cross-Section View $B_E - B_S$

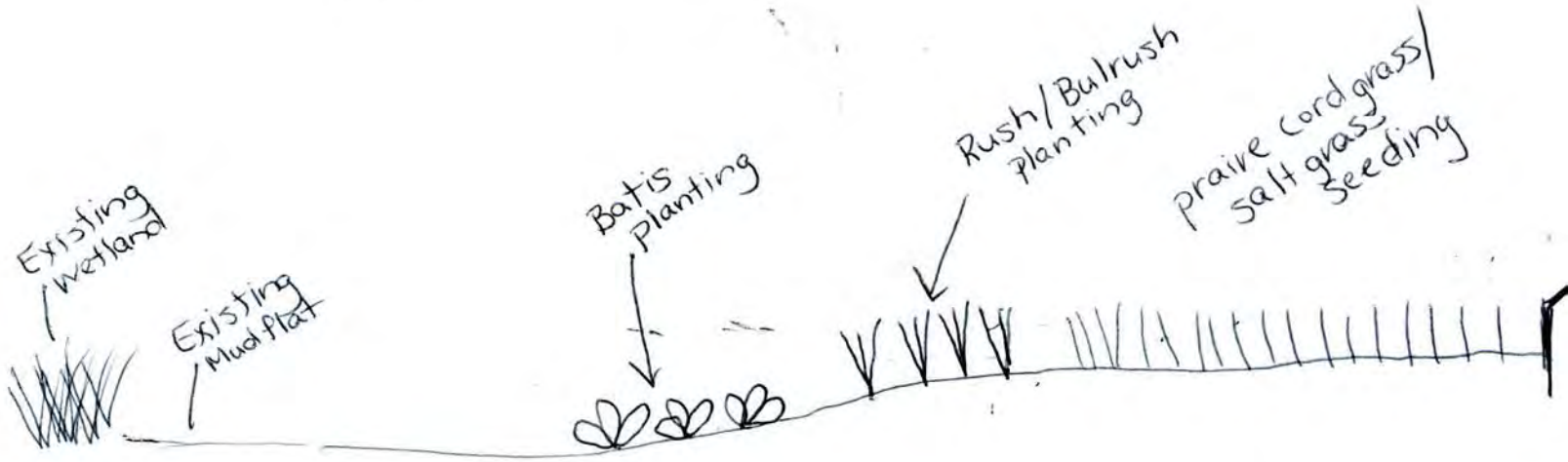


Area 7: Created Area Plan View



Cross-Section View $A_{NW} - A_{SE}$

Created Area 7



Planting List

Fringe Wetland Area 2:

Smooth cordgrass *Spartina alterniflora*

New Boat Basin Fringe Wetland Area 3:

Smooth cordgrass *Spartina alterniflora*

Storm Detention Basin Wetland Area 4:

Saltgrass *Distichlis spicata*

Bulrush *Scirpus sp.*

Spikerush *Eleocharis sp.*

Creation Area 5:

Smooth cordgrass *Spartina alterniflora*

Saltgrass *Distichlis spicata*

Brackish Pond Area 6:

Widgeon grass *Ruppia maritima*

Bulrush *Scirpus sp.*

Spikerush *Eleocharis sp.*

Soft rush *Juncus sp.*

Saltgrass *Distichlis spicata*

Marsh hay cordgrass *Spartina patens*

Prairie cordgrass *Spartina pectinate*

Creation Area 7:

Bulrush *Scirpus sp.*

Spikerush *Eleocharis sp.*

Soft rush *Juncus sp.*

Saltgrass *Distichlis spicata*

Marsh hay cordgrass *Spartina patens*

Prairie cordgrass *Spartina pectinate*

Turtleweed *Batis maritima*