

**NOTES:**

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- COORDINATES AND ELEVATIONS ARE BASED ON NGS MONUMENTS & ON OPUS SOLUTIONS. VERTICAL DATUM: NAVD88
 

NGS MONUMENT "FADEN"	NGS MONUMENT "877 0923 E"
N:13,818,416.50	N:13,765,402.04
E: 3,519,789.40	E: 3,411,293.73
EL: 2.4' NAVD88	EL: 4.8' NAVD88
- ALL POSITIONS AND ELEVATIONS RECORDED USING SURVEY GRADE, RTK GPS. EQUIPMENT: HEMISPHERE S320 OR TRIMBLE R8.
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- EROSION RESPONSE WORK: DUNE RESTORATION AND BEACH NOURISHMENT, UNDER AUTHORITY OF COASTAL EROSION PLANNING AND RESPONSE ACT (CEPRA) PROJECT NO. 1658
- REFERENCE ACCOMPANYING REPORT CONTAINING FIELD NOTES DATED DECEMBER, 2020 FOR ADDITIONAL INFORMATION.

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

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THERE ARE TWO AREAS OF FILL OR BUILDUP LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

SURVEYED: MAY 1-3 & 23-24, 2019  
SURVEY PERSONNEL: JAMES M. NAISMITH, J. ZAC GIESSELE

5/21/2021  
JAMES M. NAISMITH  
LICENSED STATE LAND SURVEYOR

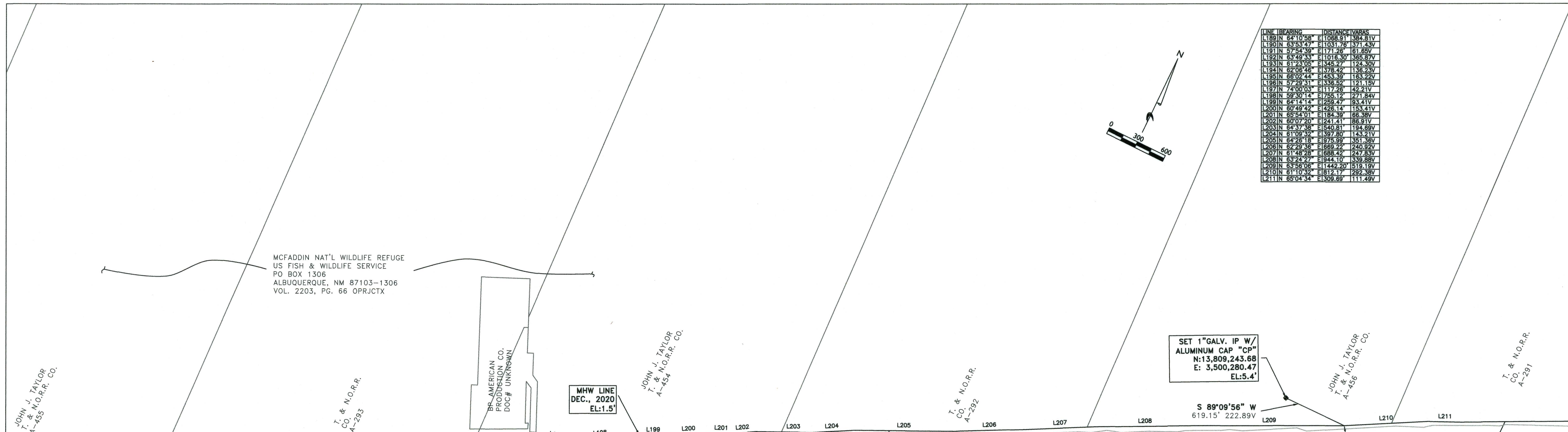
THIS DOCUMENT IS RECORDED IN:  
 GALVESTON COUNTY - SURVEYOR'S RECORDS - BOOK 1 PAGE 259  
 JEFFERSON COUNTY - FILING # 2021012094  
 CHAMBERS COUNTY - DOC # 167341 & SURVEYOR'S RECORDS - VOLUME 4 PAGE 206

TEXAS GENERAL LAND OFFICE  
 Art 33.136, Natural Resources Code  
 Co. Jefferson, Sec. No. 14  
 File Date 03/26/2021 by K. Seibert

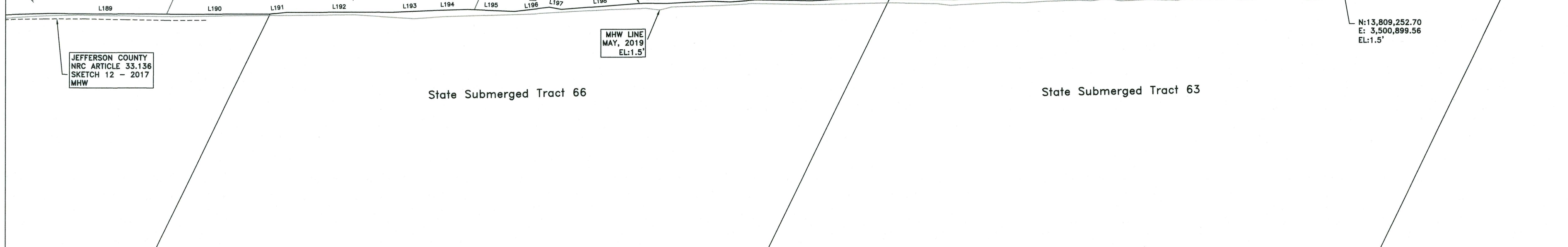
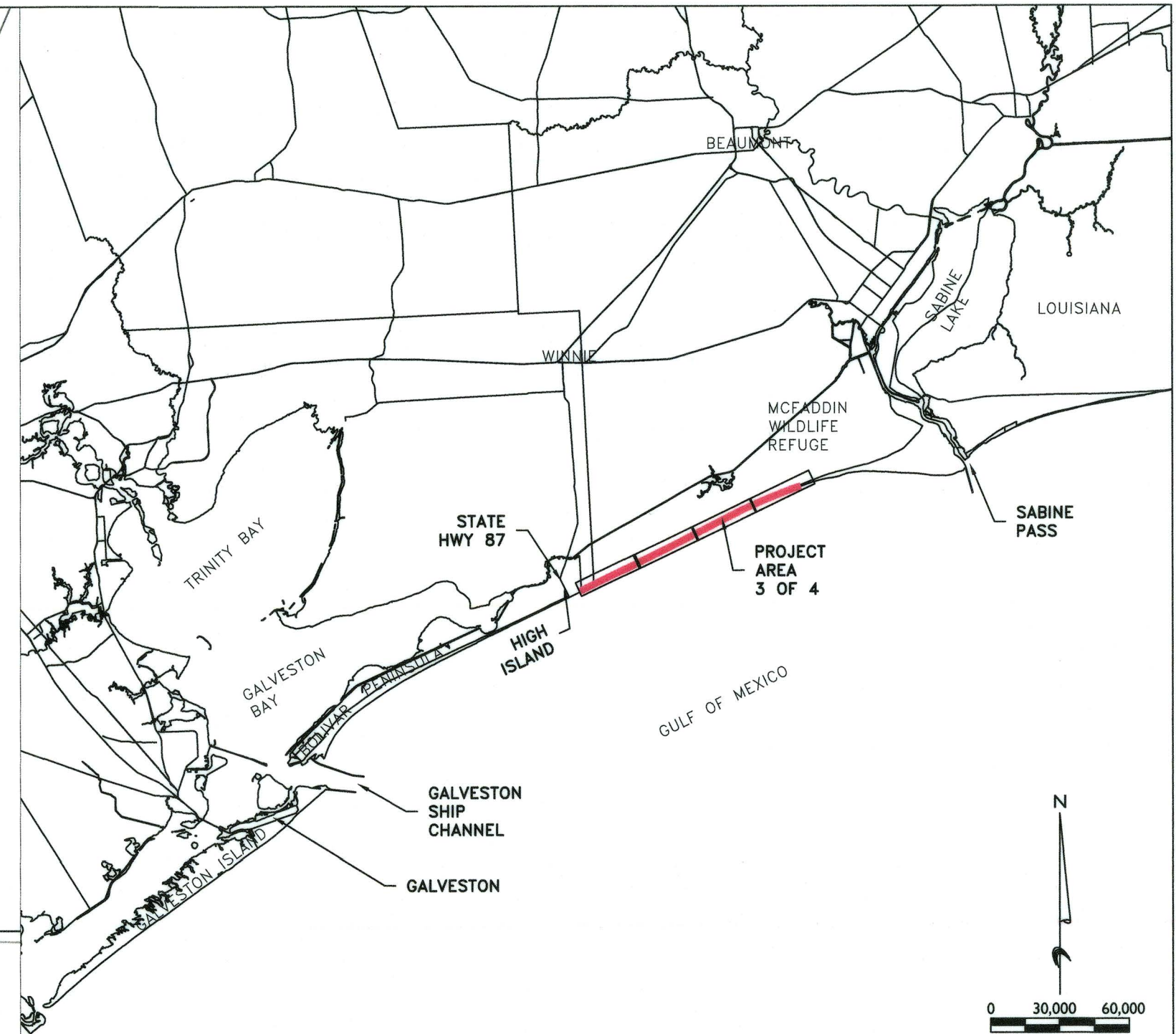
Naismith Marine  
 now a part of BAKER-SMITH  
 2007 FM 3036, ROCKPORT, TX 78382

CONTR: HDR ENGINEERING, INC  
 COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDIN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACTS 14, 48-51, 62-66, 80-82, & 98-101  
 FROM HIGH ISLAND TO SEA RIM STATE PARK, GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX  
 SCALE: 1"= 600'  
 DWN. BY: JTR  
 SHEET 1 OF 4  
 DATE: MAY 2021





LINE BEARING	DISTANCE	ELEVATION
L189	241.06	1106.31
L190	342.56	1171.26
L191	342.56	1171.26
L192	342.56	1171.26
L193	342.56	1171.26
L194	342.56	1171.26
L195	342.56	1171.26
L196	342.56	1171.26
L197	342.56	1171.26
L198	342.56	1171.26
L199	342.56	1171.26
L200	342.56	1171.26
L201	342.56	1171.26
L202	342.56	1171.26
L203	342.56	1171.26
L204	342.56	1171.26
L205	342.56	1171.26
L206	342.56	1171.26
L207	342.56	1171.26
L208	342.56	1171.26
L209	342.56	1171.26
L210	342.56	1171.26
L211	342.56	1171.26



LINE BEARING	DISTANCE	ELEVATION
L212	342.56	1171.26
L213	342.56	1171.26
L214	342.56	1171.26
L215	342.56	1171.26
L216	342.56	1171.26
L217	342.56	1171.26
L218	342.56	1171.26
L219	342.56	1171.26
L220	342.56	1171.26
L221	342.56	1171.26
L222	342.56	1171.26
L223	342.56	1171.26
L224	342.56	1171.26
L225	342.56	1171.26
L226	342.56	1171.26
L227	342.56	1171.26
L228	342.56	1171.26
L229	342.56	1171.26
L230	342.56	1171.26
L231	342.56	1171.26
L232	342.56	1171.26
L233	342.56	1171.26
L234	342.56	1171.26
L235	342.56	1171.26

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SURVEYED: MAY 1-3 & 23-24, 2019 SURVEY PERSONNEL:  
 SURVEY UPDATED: DEC. 21-23, 2020 JAMES M. NAISMITH  
 J. ZAC GIESSEL

*[Signature]* 5/21/2021  
 JAMES M. NAISMITH  
 LICENSED STATE LAND SURVEYOR

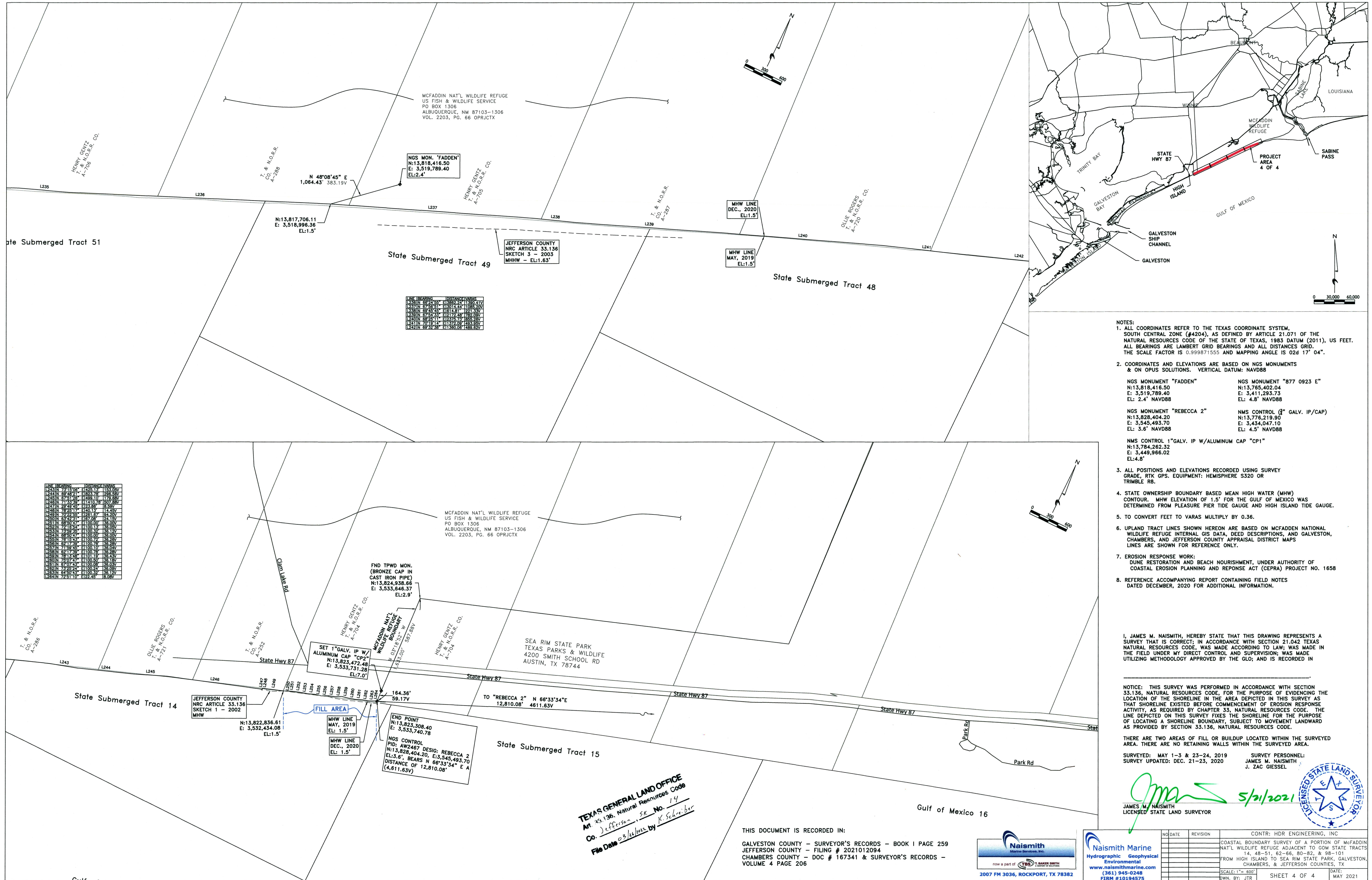
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TEXAS GENERAL LAND OFFICE  
 At: Jefferson, Tex. No. 14  
 Co. Chambers by R. Scherba  
 File Date 5/21/2021

**Naismith**  
 Marine Services, Inc.  
 now a part of TBS T. BARNER SMITH  
 Environmental  
 2007 FM 3036, ROCKPORT, TX 78382

**Naismith Marine**  
 Hydrographic Geophysical  
 Environmental  
 www.naismithmarine.com  
 (361) 945-0248  
 FIRM #10194575

NO	DATE	REVISION	CONTR: HDR ENGINEERING, INC
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			SCALE: 1" = 800'
			DATE: MAY 2021
			DWN. BY: JTR SHEET 3 OF 4



LINE BEARING	DISTANCE	COORDINATES
L235N 72°19'08"	1142.13	1133.89
L235E 97°48'21"	1826.78	286.28
L235S 67°13'41"	1494.10	179.88
L235W 11°33'59"	11410.78	1507.88
L236N 72°29'48"	1133.89	1133.89
L236E 97°48'21"	1826.78	1133.89
L236S 67°13'41"	1494.10	1133.89
L236W 11°33'59"	11410.78	1133.89
L237N 72°29'48"	1133.89	1133.89
L237E 97°48'21"	1826.78	1133.89
L237S 67°13'41"	1494.10	1133.89
L237W 11°33'59"	11410.78	1133.89
L238N 72°29'48"	1133.89	1133.89
L238E 97°48'21"	1826.78	1133.89
L238S 67°13'41"	1494.10	1133.89
L238W 11°33'59"	11410.78	1133.89
L239N 72°29'48"	1133.89	1133.89
L239E 97°48'21"	1826.78	1133.89
L239S 67°13'41"	1494.10	1133.89
L239W 11°33'59"	11410.78	1133.89
L240N 72°29'48"	1133.89	1133.89
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L241W 11°33'59"	11410.78	1133.89
L242N 72°29'48"	1133.89	1133.89
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L242S 67°13'41"	1494.10	1133.89
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LINE BEARING	DISTANCE	COORDINATES
L243N 72°29'48"	1133.89	1133.89
L243E 97°48'21"	1826.78	1133.89
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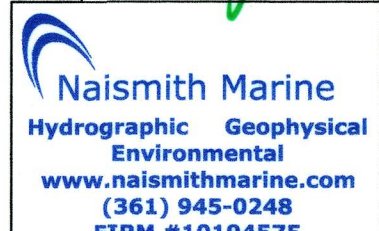
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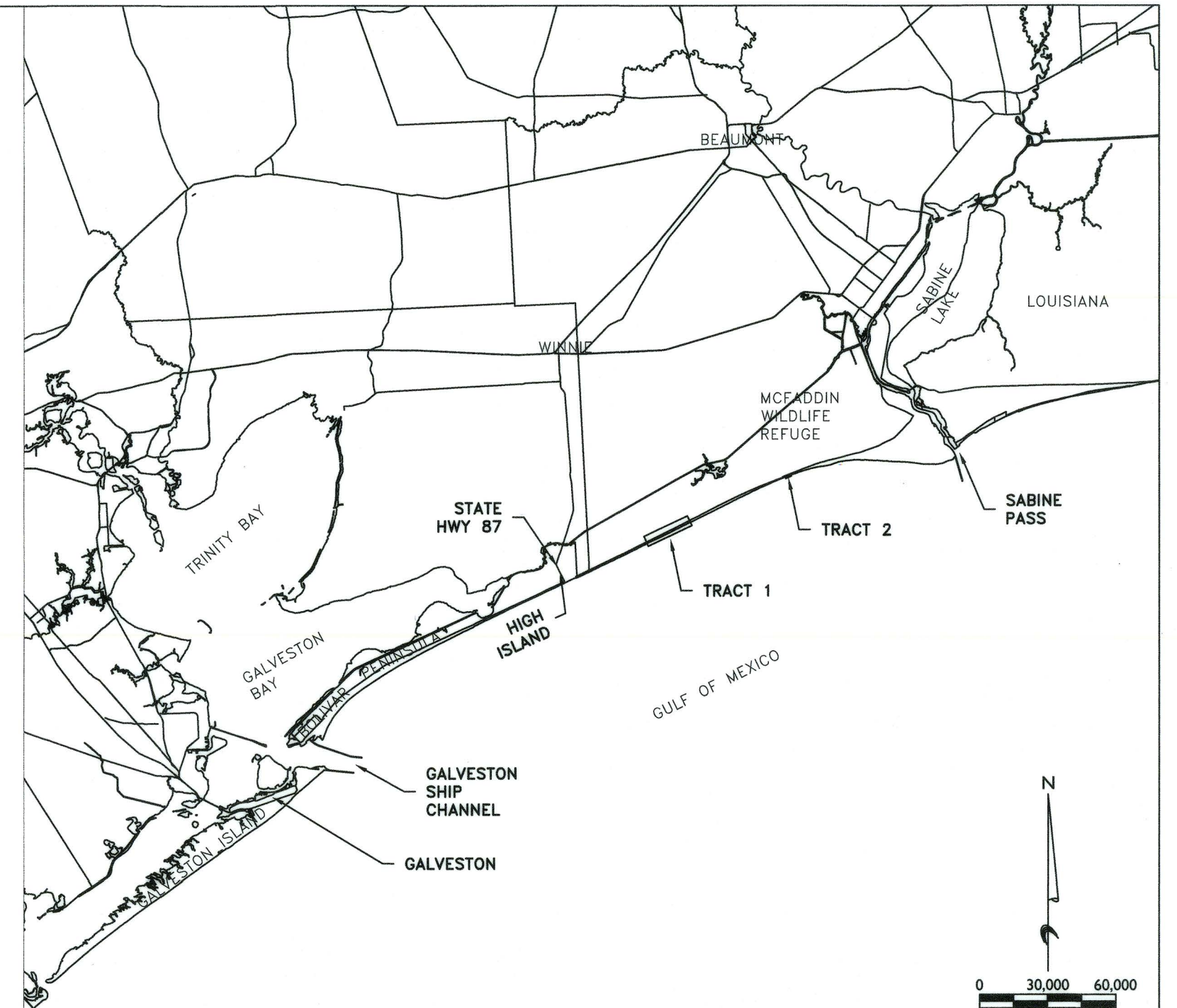
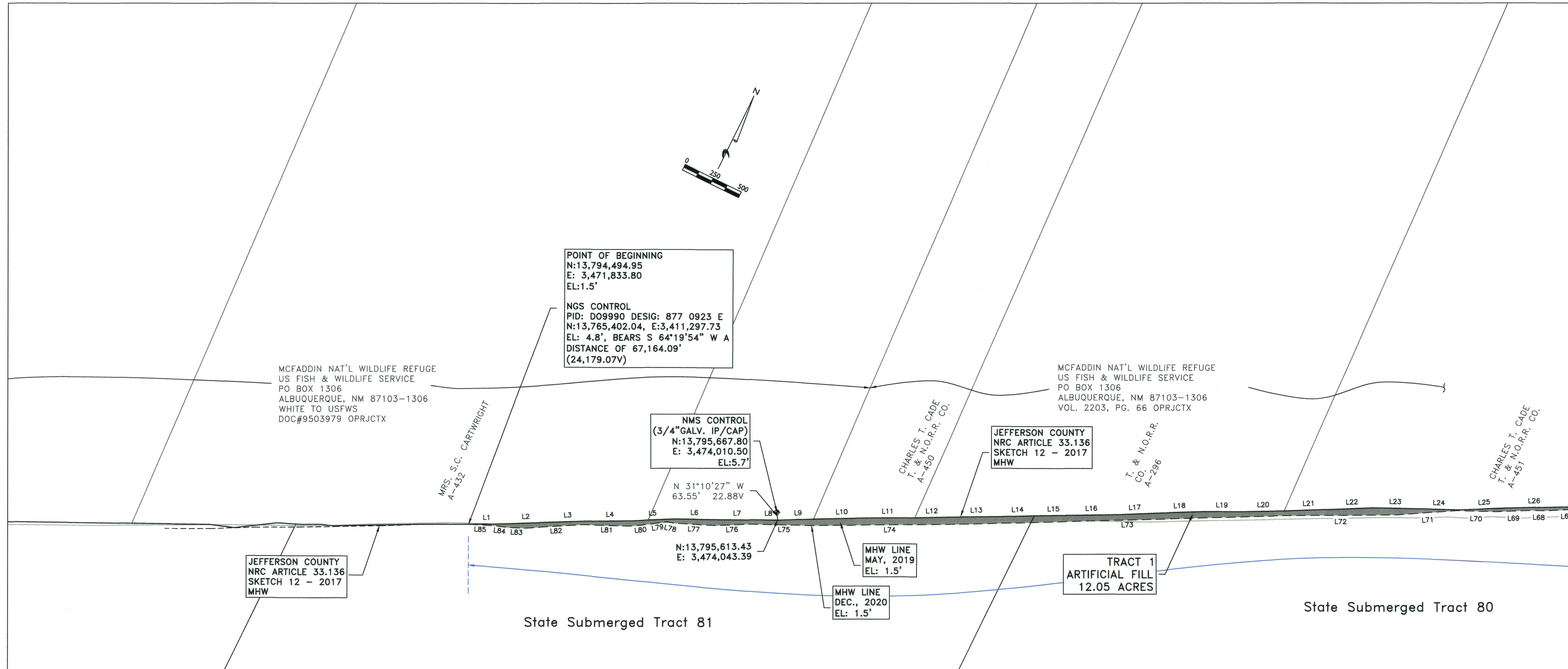
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10. ON THE DATE OF THIS SURVEY THERE WAS NO APPARENT RETAINING WALL OR STRUCTURE UPON OR ADJACENT TO THE MEAN HIGH WATER LINE.

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

**NOTICE:** THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH SECTION 33.136, NATURAL RESOURCES CODE, FOR THE PURPOSE OF EVIDENCING THE LOCATION OF THE SHORELINE IN THE AREA DEPICTED IN THIS SURVEY AS THAT SHORELINE EXISTED BEFORE COMMENCEMENT OF EROSION RESPONSE ACTIVITY, AS REQUIRED BY CHAPTER 33, NATURAL RESOURCES CODE. THE LINE DEPICTED ON THIS SURVEY FIXES THE SHORELINE FOR THE PURPOSE OF LOCATING A SHORELINE BOUNDARY, SUBJECT TO MOVEMENT LANDWARD AS PROVIDED BY SECTION 33.136, NATURAL RESOURCES CODE.

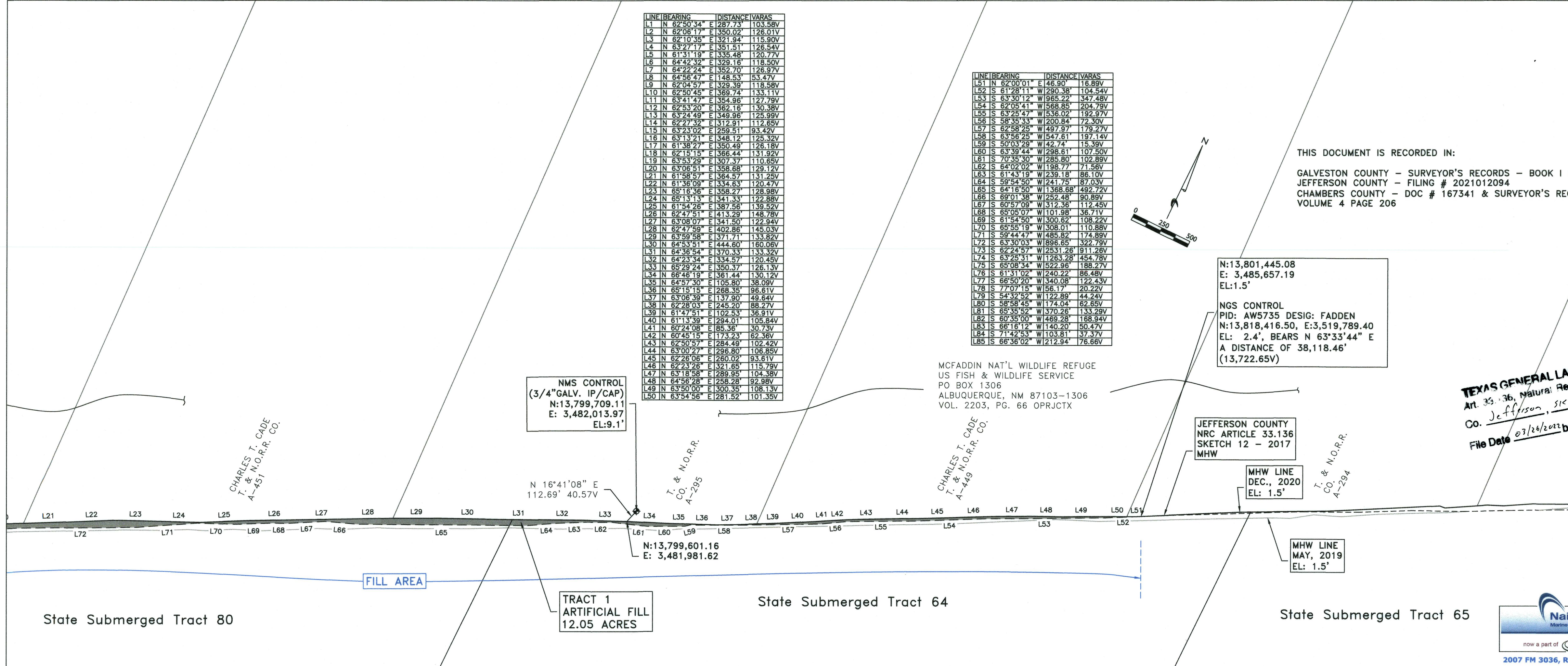
THERE ARE TWO AREAS OF FILL OR BUILDUP LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

**SURVEYED:** MAY 1-3 & 23-24, 2019  
**SURVEY PERSONNEL:** JAMES M. NAISMITH, J. ZAC GIESSEL

**SURVEY UPDATED:** DEC. 21-23, 2020

*[Signature]* 5/21/2021  
**JAMES M. NAISMITH**  
 LICENSED STATE LAND SURVEYOR

**TEXAS GENERAL LAND OFFICE**  
 Art. 33.36, Natural Resources Code  
 Co. Jefferson, sic No. 14  
 File Date 07/16/2021 by K.S. Leiber



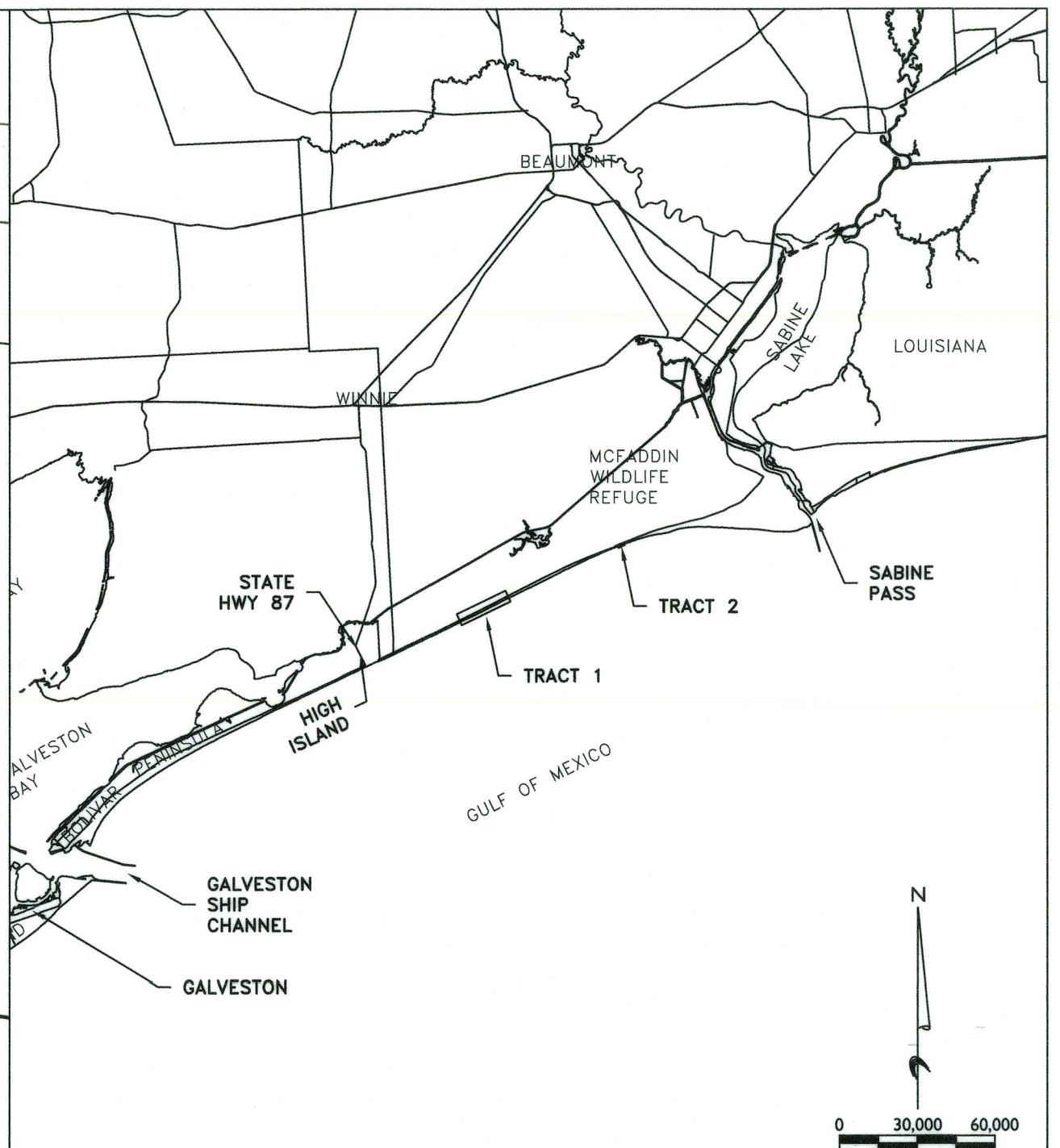
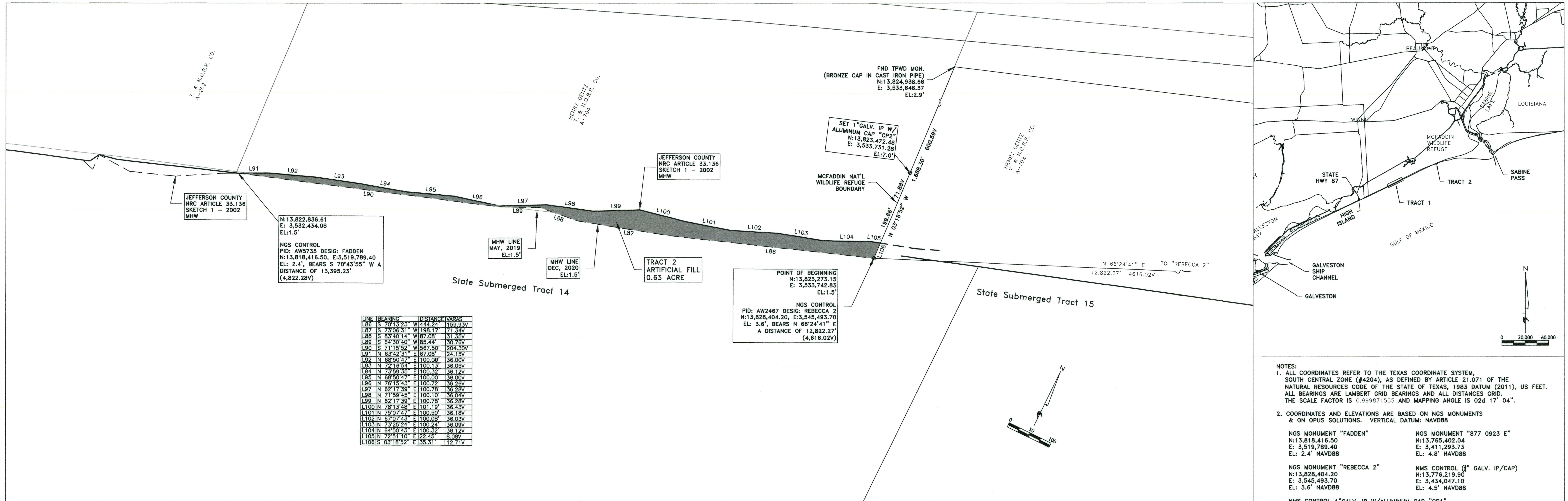
**Naismith Marine Services, Inc.**  
 now a part of T&S SURVEYING & MAPPING  
 2007 FM 3036, ROCKPORT, TX 78382

**Naismith Marine**  
 Hydrographic Geospatial Environmental  
 www.naismithmarine.com  
 (361) 945-0248  
 FIRM #10194575

**CONTR: HDR ENGINEERING, INC.**  
 BUILD UP/ FILL MAP TO ACCOMPANY COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDIN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACTS 64, 80 & 81, JEFFERSON COUNTY, TX

SCALE: 1"= 500'  
 DWN. BY: JTR

SHEET 1 OF 2  
 DATE: MAY 2021



**NOTES:**

- ALL COORDINATES REFER TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (#4204), AS DEFINED BY ARTICLE 21.071 OF THE NATURAL RESOURCES CODE OF THE STATE OF TEXAS, 1983 DATUM (2011), US FEET. ALL BEARINGS ARE LAMBERT GRID BEARINGS AND ALL DISTANCES GRID. THE SCALE FACTOR IS 0.999871555 AND MAPPING ANGLE IS 02d 17' 04".
- COORDINATES AND ELEVATIONS ARE BASED ON NGS MONUMENTS & ON OPUS SOLUTIONS. VERTICAL DATUM: NAVD88
 

NGS MONUMENT "FADDEN" N:13,818,416.50 E: 3,519,789.40 EL: 2.4' NAVD88	NGS MONUMENT "877 0923 E" N:13,765,402.04 E: 3,411,293.73 EL: 4.8' NAVD88
NGS MONUMENT "REBECCA 2" N:13,828,404.20 E: 3,545,493.70 EL: 3.6' NAVD88	NMS CONTROL (3" GALV. IP/CAP) N:13,776,219.90 E: 3,434,047.10 EL: 4.5' NAVD88
NMS CONTROL 1" GALV. IP W/ALUMINUM CAP "CP1" N:13,784,262.32 E: 3,449,966.02 EL: 4.8'	
- ALL POSITIONS AND ELEVATIONS RECORDED USING SURVEY GRADE, RTK GPS. EQUIPMENT: HEMISPHERE S320 OR TRIMBLE R8.
- STATE OWNERSHIP BOUNDARY BASED MEAN HIGH WATER (MHW) CONTOUR. MHW ELEVATION OF 1.5' FOR THE GULF OF MEXICO WAS DETERMINED FROM PLEASURE PIER TIDE GAUGE AND HIGH ISLAND TIDE GAUGE.
- TO CONVERT FEET TO VARAS MULTIPLY BY 0.36.
- UPLAND TRACT LINES SHOWN HEREON ARE BASED ON MCFADDEN NATIONAL WILDLIFE REFUGE INTERNAL GIS DATA, DEED DESCRIPTIONS, AND GALVESTON, CHAMBERS, AND JEFFERSON COUNTY APPRAISAL DISTRICT MAPS. LINES ARE SHOWN FOR REFERENCE ONLY.
- EROSION RESPONSE WORK: DUNE RESTORATION AND BEACH NOURISHMENT, UNDER AUTHORITY OF COASTAL EROSION PLANNING AND RESPONSE ACT (CEPRA) PROJECT NO. 1658
- REFERENCE ACCOMPANYING REPORT CONTAINING FIELD NOTES DATED DECEMBER, 2020 FOR ADDITIONAL INFORMATION.
- ON THE DATE OF THIS SURVEY THERE WAS NO APPARENT FILL OR BUILD UP UPON OR ADJACENT TO THE MEAN HIGH WATER LINE EXCEPT AS SHOWN HEREON.
- ON THE DATE OF THIS SURVEY THERE WAS NO APPARENT RETAINING WALL OR STRUCTURE UPON OR ADJACENT TO THE MEAN HIGH WATER LINE.

I, JAMES M. NAISMITH, HEREBY STATE THAT THIS DRAWING REPRESENTS A SURVEY THAT IS CORRECT; IN ACCORDANCE WITH SECTION 21.042 TEXAS NATURAL RESOURCES CODE, WAS MADE ACCORDING TO LAW; WAS MADE IN THE FIELD UNDER MY DIRECT CONTROL AND SUPERVISION; WAS MADE UTILIZING METHODOLOGY APPROVED BY THE GLO; AND IS RECORDED IN

NOTICE: THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH SECTION 33.136, NATURAL RESOURCES CODE, FOR THE PURPOSE OF EVIDENCING THE LOCATION OF THE SHORELINE IN THE AREA DEPICTED IN THIS SURVEY AS THAT SHORELINE EXISTED BEFORE COMMENCEMENT OF EROSION RESPONSE ACTIVITY, AS REQUIRED BY CHAPTER 33, NATURAL RESOURCES CODE. THE LINE DEPICTED ON THIS SURVEY FIXES THE SHORELINE FOR THE PURPOSE OF LOCATING A SHORELINE BOUNDARY, SUBJECT TO MOVEMENT LANDWARD AS PROVIDED BY SECTION 33.136, NATURAL RESOURCES CODE.

THERE ARE TWO AREAS OF FILL OR BUILDUP LOCATED WITHIN THE SURVEYED AREA. THERE ARE NO RETAINING WALLS WITHIN THE SURVEYED AREA.

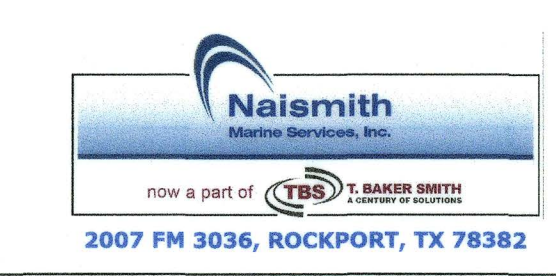
SURVEYED: MAY 1-3 & 23-24, 2019  
SURVEY PERSONNEL: JAMES M. NAISMITH, J. ZAC GIESSEL

SURVEY UPDATED: DEC. 21-23, 2020

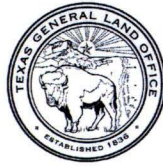
JAMES M. NAISMITH  
LICENSED STATE LAND SURVEYOR

TEXAS GENERAL LAND OFFICE  
An Equal Opportunity Office  
Co. Jefferson, No. 14  
File Date 03/16/2021 by K. Seiber

THIS DOCUMENT IS RECORDED IN:  
GALVESTON COUNTY - SURVEYOR'S RECORDS - BOOK I PAGE 259  
JEFFERSON COUNTY - FILING # 2021012094  
CHAMBERS COUNTY - DOC # 167341 & SURVEYOR'S RECORDS - VOLUME 4 PAGE 206



NO	DATE	REVISION	CONTR: HDR ENGINEERING, INC
			BUILD UP / FILL MAP TO ACCOMPANY COASTAL BOUNDARY SURVEY OF A PORTION OF MCFADDIN NAT'L WILDLIFE REFUGE ADJACENT TO GOM STATE TRACT 14, JEFFERSON COUNTY, TX
			SCALE: 1"= 100'
			DATE: MAY 2021
			DWN. BY: JTR



TEXAS GENERAL LAND OFFICE  
GEORGE P. BUSH, COMMISSIONER

Surveying Division  
Coastal Boundary Survey Approval

**Project:** McFaddin National Wildlife Refuge adjacent to Gulf of Mexico State Tracts 14, 48-51, 62-66, 80-82, & 98-101 from High Island to Sea Rim State Park, Galveston, Chambers, & Jefferson Counties, Tx

**Project No:** Coastal Erosion Planning and Response Act (CPERA) Project # 1658

**Project Manager:** Kelly Brooks, Coastal Resources

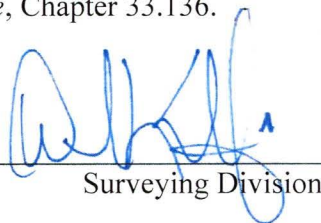
**Surveyor:** James M. Naismith, Licensed State Land Surveyor

**Description:** Coastal Boundary Survey, dated May 1-3 & 23-24, 2019, **Updated December 21-23, 2020**, delineating the littoral boundary along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge adjacent to Gulf of Mexico & State Tracts 14, 48-51, 62-66, 80-82, & 98-101 in Galveston, Chambers, & Jefferson Counties, Texas in connection with planned Coastal Erosion Planning and Response Act (CEPRA) Project # 1658, Dune Restoration and Beach Nourishment. Centroid coordinates N 29°37'22", W 94°12'01", WGS84. A copy of the survey has been filed in Book 1, Page 259, Surveyor's Records of Galveston County, Texas, Volume 4, Page 206, Surveyor's Records, File Number 167341, Official Public Records of Chambers County, and Instrument Number 2021012094, Official Public Records of Jefferson County, Texas.

A Coastal Boundary Survey for the above-referenced project has been reviewed and accepted; upon completion of public notice requirements, the survey will be filed in the Texas General Land Office, Archives and Records, in accordance with provisions of the *Texas Natural Resources Code*, Chapter 33.136.

Approved:

Signed:

  
Surveying Division

3/15/2022

Date

Approval Filed as:

*Tex.Nat.Res.Code* Article 33.136, Jefferson County, Sketch No. 14

TEXAS GENERAL LAND OFFICE

Art. 33.136, Natural Resources Code

Co. Jefferson, SK No. 14

File Date 03/24/2022 by K. Schreiber

**Naismith Marine Services, Inc.**

www.naismithmarine.com

(361) 945-0248

FIRM #10194575



MAY 2021

COASTAL BOUNDARY SURVEY OF A PORTION OF  
McFADDIN NATIONAL WILDLIFE REFUGE ADJACENT TO GULF OF MEXICO  
STATE TRACTS 14, 48-51, 62-66, 80-82, & 98-101  
FROM HIGH ISLAND TO SEA RIM STATE PARK,  
GALVESTON, CHAMBERS, & JEFFERSON COUNTIES, TX

This report accompanies a map of survey dated MAY 2021.



**Figure 1:** Typical shoreline along the Gulf of Mexico Shoreline of the McFaddin National Wildlife Refuge.

A coastal boundary survey was conducted along the Gulf of Mexico shoreline from the west end of the McFaddin Wildlife Refuge (the refuge) near High Island, Galveston County, Texas to the east boundary of the refuge at the border with Sea Rim State Park in Jefferson County, Texas. All survey work was performed using survey grade RTK GPS base and rover: Hemisphere S320 receivers. The survey was conducted May 1-3 & 23-24, 2019, & updated December 21-23, 2020.

**SURVEY CONTROL:** Three NGS survey markers were used as primary control: "FADDEN" (AW5735, N:13,818,416.50, E: 3,519,789.40, EL: 2.4' NAVD88), "REBECCA 2" (AW2467, N:13,828,404.20, E:3,545,493.70, EL: 3.6' NAVD88), and "877 0923 E" (DO9990, N: 13,765,402.04, E: 3,411,297.73, EL: 4.8'). In addition to published NGS control, local temporary benchmarks were set in order to establish elevations on site. Positions were based on OPUS solutions.

**TEXAS GENERAL LAND OFFICE**

Art. 33.136, Natural Resources Code

County Jefferson, SK No. 14 McFaddin National Wildlife Refuge, Page 1

Effective Date 03/24/2022 by K. Schreiber



**Table 1:** NGS benchmarks were used as primary control for the survey. Temporary benchmarks were set along the length of the project in order to accurately transfer and establish tidal datums during the littoral boundary survey.

	Northing	Easting	Elevation
<b>NGS BENCHMARKS</b>			
NGS 'FADDEN'	13,818,416.50	3,519,789.40	2.4'
NGS 'REBECCA 2'	13,828,404.20	3,545,493.70	3.6'
NGS '877 0923 E'	13,765,402.04	3,411,297.73	4.8'
<b>LOCAL CONTROL (TEMPORARY BENCHMARKS)</b>			
NMS CONTROL (3/4" GALV. IP/CAP)	13,776,219.90	3,434,047.10	4.5'
NMS CONTROL 1"GALV. IP W/ALUMINUM CAP "CP1"	13,784,262.32	3,449,966.02	4.8'
NMS TBM (3/4"GALV. IP/CAP)	13,795,667.80	3,474,010.50	5.7'
NMS TBM (3/4"GALV. IP/CAP)	13,799,709.11	3,482,013.97	9.1'
SET 1"GALV. IP W/ALUMINUM CAP "CP"	13,809,243.68	3,500,280.47	5.4'
SET 1"GALV. IP W/ALUMINUM CAP "CP2"	13,823,472.48	3,533,731.28	7.0'

Datum is NAD 83 (2011), South Central Zone of the Texas Coordinate System (US Feet). Orthometric height was calculated using geoid 2012b and is referenced to NAVD88 datum.



**Figure 2:** NGS benchmark "REBECCA 2" (N:13,828,404.20, E: 3,545,493.70, EL: 3.6')



**Figure 3:** Typical TBM set during the survey was a 3/4" galvanized iron pipe with an aluminum cap stamped "NAISMITH MARINE SVCS CONTROL". "CP2" was set at the east end of the project (N:13,823,472.48, E: 3,533,731.28, EL: 7.0')



**Figure 4:** The west point of beginning of the MHW line (littoral boundary was tied to a refuge corner which was marked by a round concrete monument (N:13,779,691.27, E: 3,438,951.82, EL: 3.0')



**Figure 5:** The east end point of the MHW line (littoral boundary) was tied to a refuge corner which was marked with a bronze TPWD monument in a cast iron pipe (N:13,824,938.66, E: 3,533,646.37, EL: 2.9')

**STATE OWNERSHIP BOUNDARY:** As referenced to this survey, the elevation of MHW on the Gulf of Mexico shoreline is 1.5 feet (datum is NAVD88) as reported in a 2011 Coastal Boundary Survey of Rollover Pass by Naismith Marine Services. The tide gauge "Pleasure Pier" on Galveston Island and the, now removed, tide gauge "High Island" were used to establish MHW along the Gulf of Mexico beach.

**EXISTING FILL:** Apparent existing artificial fill remains in two places (Jefferson County Article 33.132 Sketch 1, 2002, and Sketch 12, 2017) within the survey area. In those portions of the current survey area the previously established MHW lines are landward of the current MHW line and are described and followed in this description. In all other portions of the survey area the MHW line has migrated landward as a result of normal erosion, including that portion where the MHW line was previously surveyed (Jefferson County Article 33.132 Sketch 3, 2003). Pavement from destroyed State Highway 87 lies along portions of the McFaddin Gulf of Mexico shoreline.

**FIELD NOTES** for a portion of the littoral boundary along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge) adjacent to Gulf of Mexico state tracts 14, 48-51, 62-66, 80-82, & 98-101 in Galveston, Chambers, & Jefferson Counties, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

**Beginning** at a point, (N:13,778,687.61, E: 3,439,439.10, EL. 1.5') on a west line of the refuge and the MHW (Mean High Water) line on the Gulf of Mexico shoreline; from which NMS TBM (3/4" galvanized iron pipe and cap, N:13,776,219.90, E: 3,434,047.10, EL: 4.5'), bears S 65°24'30" W a distance of 5,929.87 feet (2,134.75V), a concrete monument found for a refuge corner (N:13,779,691.27, E: 3,438,951.82, EL: 3.0') bears N 25°53'50" W a distance of 1,115.70 feet (401.65V) and NGS monument "877 0923 E" (N:13,765,402.04, E: 3,411,297.73, EL: 4.8'), bears S 64°43'41" W a distance of 31,119.83 feet (11,203.14V).

Thence along the current (December, 2020) MHW line the following courses:

N 65°52'14" E a distance of 643.81'(231.77V);  
N 68°43'36" E a distance of 294.67'(106.08V);  
N 63°11'31" E a distance of 580.11'(208.84V);  
N 64°30'08" E a distance of 350.01'(126.00V);  
N 65°58'52" E a distance of 465.41'(167.55V);  
N 59°07'30" E a distance of 203.17'(73.14V);  
N 66°13'35" E a distance of 363.24'(130.77V);  
N 61°19'19" E a distance of 301.92'(108.69V);  
N 70°03'30" E a distance of 165.69'(59.65V);  
N 60°16'34" E a distance of 159.49'(57.42V);  
N 62°33'30" E a distance of 405.91'(146.13V);  
N 65°13'23" E a distance of 437.16'(157.38V);  
N 53°28'44" E a distance of 56.26'(20.25V);  
N 65°52'08" E a distance of 336.82'(121.25V);  
N 57°59'30" E a distance of 69.81'(25.13V);  
N 63°07'13" E a distance of 332.96'(119.87V);  
N 58°50'58" E a distance of 204.88'(73.76V);  
N 66°25'50" E a distance of 217.85'(78.43V);  
N 62°14'30" E a distance of 311.46'(112.12V);  
N 79°10'56" E a distance of 43.32'(15.59V);  
N 63°35'02" E a distance of 288.77'(103.96V);  
S 82°38'50" E a distance of 17.66'(6.36V);  
N 62°43'58" E a distance of 941.07'(338.78V);  
N 83°39'23" E a distance of 49.87'(17.95V);  
N 66°09'51" E a distance of 548.72'(197.54V);  
N 62°54'49" E a distance of 445.41'(160.35V);  
N 64°26'28" E a distance of 137.75'(49.59V);  
N 73°45'08" E a distance of 69.44'(25.00V);  
N 63°29'51" E a distance of 427.40'(153.86V);  
N 81°39'25" E a distance of 48.73'(17.54V);

N 62°16'52" E a distance of 898.32'(323.40V);  
N 67°01'16" E a distance of 331.44'(119.32V);  
N 61°23'32" E a distance of 425.28'(153.10V);  
N 63°53'24" E a distance of 569.67'(205.08V);  
N 66°26'22" E a distance of 400.48'(144.17V);  
N 62°37'59" E a distance of 165.39'(59.54V) to a point on the MHW line (N:13,783,767.64, E: 3,449,966.64, EL: 1.5') from which a set 1" galvanized iron pipe w/ aluminum cap marked "CP1" (N:13,784,262.32, E: 3,449,966.02, EL: 4.8') bears N 00°04'17" W a distance of 494.68 feet (178.08V);

N 63°32'53" E a distance of 396.88'(142.88V);  
N 64°15'22" E a distance of 1297.55'(467.12V);  
N 61°20'21" E a distance of 189.75'(68.31V);  
N 64°11'26" E a distance of 412.60'(148.54V);  
N 71°00'20" E a distance of 68.36'(24.61V);  
N 63°58'23" E a distance of 592.88'(213.44V);  
N 80°09'59" E a distance of 62.47'(22.49V);  
N 61°02'42" E a distance of 140.29'(50.51V);  
N 50°04'28" E a distance of 100.47'(36.17V);  
N 65°10'06" E a distance of 260.05'(93.62V);  
N 84°30'09" E a distance of 61.48'(22.13V);  
N 60°27'46" E a distance of 226.60'(81.57V);  
N 75°51'53" E a distance of 118.01'(42.48V);  
N 58°30'34" E a distance of 251.51'(90.54V);  
N 74°26'24" E a distance of 82.95'(29.86V);  
N 60°26'29" E a distance of 140.38'(50.54V);  
N 60°35'12" E a distance of 98.78'(35.56V);  
N 77°29'35" E a distance of 102.84'(37.02V);  
N 28°44'43" E a distance of 20.29'(7.30V);  
N 64°21'56" E a distance of 281.10'(101.19V);  
N 58°57'44" E a distance of 191.78'(69.04V);  
S 68°45'27" E a distance of 24.98'(8.99V);  
N 58°56'54" E a distance of 96.70'(34.81V);  
N 86°05'06" E a distance of 57.56'(20.72V);  
N 43°23'45" E a distance of 59.59'(21.45V);  
N 64°04'03" E a distance of 143.63'(51.71V);  
S 72°37'42" E a distance of 22.34'(8.04V);  
N 48°54'18" E a distance of 80.31'(28.91V);  
N 81°54'01" E a distance of 79.28'(28.54V);  
N 51°58'39" E a distance of 87.52'(31.51V);  
N 76°07'05" E a distance of 56.39'(20.30V);  
N 64°24'04" E a distance of 159.97'(57.59V);  
N 26°37'09" E a distance of 29.33'(10.56V);  
N 84°46'51" E a distance of 31.55'(11.36V);  
N 61°17'05" E a distance of 120.55'(43.40V);  
N 68°31'12" E a distance of 120.87'(43.51V);

N 56°20'21" E a distance of 92.70'(33.37V);  
N 63°36'09" E a distance of 247.59'(89.13V);  
S 88°37'47" E a distance of 23.42'(8.43V);  
N 66°04'42" E a distance of 249.06'(89.66V);  
N 53°30'08" E a distance of 106.81'(38.45V);  
S 88°01'03" E a distance of 52.90'(19.04V);  
N 63°02'14" E a distance of 760.39'(273.74V);  
S 84°00'02" E a distance of 31.57'(11.37V);  
N 59°59'12" E a distance of 116.07'(41.79V);  
N 71°59'00" E a distance of 118.11'(42.52V);  
N 50°52'52" E a distance of 93.91'(33.81V);  
N 64°51'48" E a distance of 413.53'(148.87V);  
S 86°44'03" E a distance of 20.19'(7.27V);  
N 64°38'51" E a distance of 205.19'(73.87V);  
N 41°46'59" E a distance of 32.74'(11.78V);  
N 84°29'03" E a distance of 33.08'(11.91V);  
N 64°25'15" E a distance of 557.93'(200.85V);  
N 45°22'30" E a distance of 29.40'(10.58V);  
N 63°45'24" E a distance of 562.57'(202.53V);  
N 28°53'16" E a distance of 26.73'(9.62V);  
N 57°03'23" E a distance of 95.51'(34.38V);  
N 78°00'57" E a distance of 107.64'(38.75V);  
N 63°16'13" E a distance of 395.01'(142.21V);  
N 66°09'51" E a distance of 284.82'(102.53V);  
N 64°29'34" E a distance of 1120.32'(403.32V);  
N 61°25'16" E a distance of 393.19'(141.55V);  
N 69°41'39" E a distance of 134.11'(48.28V);  
N 50°24'25" E a distance of 56.12'(20.20V);  
N 73°25'43" E a distance of 61.18'(22.03V);  
N 59°40'59" E a distance of 214.83'(77.34V);  
N 62°53'36" E a distance of 735.76'(264.88V);  
N 55°15'18" E a distance of 132.81'(47.81V);  
S 82°48'01" E a distance of 23.14'(8.33V);  
N 60°49'47" E a distance of 296.02'(106.57V);  
N 64°25'38" E a distance of 740.20'(266.47V);  
N 46°12'16" E a distance of 35.56'(12.80V);  
N 63°21'28" E a distance of 205.54'(74.00V);  
N 76°13'30" E a distance of 59.22'(21.32V);  
N 57°03'30" E a distance of 144.25'(51.93V);  
N 67°57'25" E a distance of 190.57'(68.60V);  
N 63°28'52" E a distance of 2565.94'(923.74V);  
N 71°53'46" E a distance of 56.06'(20.18V);  
N 64°19'17" E a distance of 422.71'(152.18V);  
N 59°00'48" E a distance of 173.18'(62.35V);  
N 62°57'08" E a distance of 1310.92'(471.93V);  
N 64°39'48" E a distance of 478.55'(172.28V);

N 62°08'55" E a distance of 314.01'(113.04V);  
N 64°38'01" E a distance of 1613.21'(580.76V);  
N 71°49'42" E a distance of 198.13'(71.33V);  
N 57°31'03" E a distance of 352.21'(126.79V);  
N 67°32'49" E a distance of 195.95'(70.54V);  
N 63°31'44" E a distance of 152.08'(54.75V);  
N 72°12'57" E a distance of 94.82'(34.13V);  
N 62°43'43" E a distance of 697.77'(251.20V);  
N 63°58'54" E a distance of 375.18'(135.06V);  
N 66°36'02" E a distance of 13.23'(4.76V) to a point where the current MHW line crosses the MHW line established by Jefferson County NRC Article 33.136 Sketch 12 coastal boundary survey performed in 2017 (N: 13,794,494.95, E: 3,471,833.80, EL: 1.5');

Thence along the MHW line as established in 2017 the following courses:

N 62°50'34" E a distance of 287.73'(103.58V);  
N 62°06'17" E a distance of 350.02'(126.01V);  
N 62°10'35" E a distance of 321.94'(115.90V);  
N 63°27'17" E a distance of 351.51'(126.54V);  
N 61°31'19" E a distance of 335.48'(120.77V);  
N 64°42'32" E a distance of 329.16'(118.50V);  
N 64°22'24" E a distance of 352.70'(126.97V);  
N 64°56'47" E a distance of 148.53'(53.47V) to a point on the MHW line established in 2017 (N:13,795,613.43, E: 3,474,043.39) from which a NMS TBM (3/4" galvanized iron pipe and cap, N:13,795,667.80, E: 3,474,010.50, EL: 5.7') bears N 31°10'27" W a distance of 63.55 feet (22.88V);

N 62°04'57" E a distance of 329.39'(118.58V);  
N 62°50'45" E a distance of 369.74'(133.11V);  
N 63°41'47" E a distance of 354.96'(127.79V);  
N 62°53'20" E a distance of 362.16'(130.38V);  
N 63°24'49" E a distance of 349.96'(125.99V);  
N 62°27'32" E a distance of 312.91'(112.65V);  
N 63°23'02" E a distance of 259.51'(93.42V);  
N 63°13'21" E a distance of 348.12'(125.32V);  
N 61°38'27" E a distance of 350.49'(126.18V);  
N 62°15'15" E a distance of 366.44'(131.92V);  
N 63°53'29" E a distance of 307.37'(110.65V);  
N 63°06'51" E a distance of 358.68'(129.12V);  
N 61°58'57" E a distance of 364.57'(131.25V);  
N 61°36'09" E a distance of 334.63'(120.47V);  
N 65°16'36" E a distance of 358.27'(128.98V);  
N 65°13'13" E a distance of 341.33'(122.88V);  
N 61°54'26" E a distance of 387.56'(139.52V);  
N 62°47'51" E a distance of 413.29'(148.78V);  
N 63°08'07" E a distance of 341.50'(122.94V);

N 62°47'59" E a distance of 402.86'(145.03V);  
N 63°59'58" E a distance of 371.71'(133.82V);  
N 64°53'51" E a distance of 444.60'(160.06V);  
N 64°36'54" E a distance of 370.33'(133.32V);  
N 64°23'34" E a distance of 334.57'(120.45V);  
N 65°29'24" E a distance of 350.37'(126.13V) to a point on the MHW line established in 2017 (N:13,799,601.16, E: 3,481,981.62) from which a NMS TBM (3/4"galvanized iron pipe and cap, N:13,799,709.11, E: 3,482,013.97, EL: 9.1') bears N 16°41'08" E a distance of 112.69 feet (40.57V);

N 66°46'19" E a distance of 361.44'(130.12V);  
N 64°57'30" E a distance of 105.80'(38.09V);  
N 65°15'15" E a distance of 268.35'(96.61V);  
N 63°06'39" E a distance of 137.90'(49.64V);  
N 62°28'03" E a distance of 245.20'(88.27V);  
N 61°47'51" E a distance of 102.53'(36.91V);  
N 61°13'39" E a distance of 294.01'(105.84V);  
N 60°24'08" E a distance of 85.36'(30.73V);  
N 60°45'15" E a distance of 173.23'(62.36V);  
N 62°50'57" E a distance of 284.49'(102.42V);  
N 63°00'27" E a distance of 296.80'(106.85V);  
N 62°26'06" E a distance of 260.02'(93.61V);  
N 62°23'26" E a distance of 321.65'(115.79V);  
N 63°18'58" E a distance of 289.95'(104.38V);  
N 64°56'28" E a distance of 258.28'(92.98V);  
N 63°50'00" E a distance of 300.35'(108.13V);  
N 63°54'56" E a distance of 281.52'(101.35V);  
N 62°00'01" E a distance of 46.90'(16.89V) to a point where the MHW line established in 2017 crosses the current MHW line (N: 13,801,445.08, E: 3,485,657.19, EL: 1.5');

Thence along the current (December, 2020) MHW line the following courses:

N 61°28'11" E a distance of 793.81'(285.77V);  
N 63°19'52" E a distance of 684.53'(246.43V);  
N 61°15'50" E a distance of 918.18'(330.54V);  
N 84°32'31" E a distance of 44.16'(15.90V);  
N 60°14'13" E a distance of 337.18'(121.38V);  
N 66°33'21" E a distance of 134.25'(48.33V);  
N 60°03'59" E a distance of 230.72'(83.06V);  
N 64°16'30" E a distance of 523.76'(188.55V);  
N 62°14'03" E a distance of 1028.98'(370.43V);  
N 64°10'58" E a distance of 1068.91'(384.81V);  
N 63°53'47" E a distance of 1031.76'(371.43V);  
N 57°54'39" E a distance of 171.26'(61.65V);  
N 63°49'33" E a distance of 1016.30'(365.87V);  
N 61°23'05" E a distance of 345.27'(124.30V);



N 62°06'46" E a distance of 378.42'(136.23V);  
N 66°02'44" E a distance of 453.39'(163.22V);  
N 57°29'31" E a distance of 336.52'(121.15V);  
N 74°00'03" E a distance of 117.26'(42.21V);  
N 59°30'14" E a distance of 755.12'(271.84V);  
N 64°14'14" E a distance of 259.47'(93.41V);  
N 60°49'42" E a distance of 426.14'(153.41V);  
N 65°54'01" E a distance of 184.39'(66.38V);  
N 60°07'20" E a distance of 241.41'(86.91V);  
N 64°37'38" E a distance of 540.81'(194.69V);  
N 61°09'32" E a distance of 397.80'(143.21V);  
N 64°26'18" E a distance of 975.99'(351.36V);  
N 62°29'36" E a distance of 669.22'(240.92V);  
N 61°48'28" E a distance of 688.42'(247.83V);  
N 63°24'27" E a distance of 944.10'(339.88V);  
N 63°56'06" E a distance of 1442.20'(519.19V) to a point on the MHW line (N:13,809,252.70,  
E: 3,500,899.56, EL: 1.5') from which a set 1" galvanized iron pipe with aluminum cap  
marked "CP" (N:13,809,243.68, E: 3,500,280.47, EL: 5.4') bears S 89°09'56" W a distance of  
619.15 feet (222.89V);

N 61°10'32" E a distance of 812.17'(292.38V);  
N 65°04'34" E a distance of 309.69'(111.49V);  
N 63°32'41" E a distance of 3560.31'(1281.71V)  
N 64°24'05" E a distance of 1589.20'(572.11V);  
N 62°49'29" E a distance of 486.39'(175.10V);  
N 64°48'44" E a distance of 3460.74'(1245.87V)  
N 67°09'11" E a distance of 514.85'(185.35V);  
N 61°47'31" E a distance of 214.38'(77.18V);  
N 68°04'16" E a distance of 245.33'(88.32V);  
N 64°13'13" E a distance of 1101.57'(396.57V);  
N 72°19'46" E a distance of 73.79'(26.57V);  
N 63°57'47" E a distance of 352.79'(127.01V);  
N 46°20'32" E a distance of 115.04'(41.42V);  
N 68°35'28" E a distance of 79.09'(28.47V);  
S 28°24'06" E a distance of 23.75'(8.55V);  
N 64°01'15" E a distance of 266.94'(96.10V);  
N 21°11'58" E a distance of 57.17'(20.58V);  
N 54°38'33" E a distance of 66.34'(23.88V);  
S 73°00'07" E a distance of 90.82'(32.69V);  
N 66°35'40" E a distance of 865.38'(311.54V);  
S 85°38'47" E a distance of 27.80'(10.01V);  
N 28°44'15" E a distance of 32.87'(11.83V);  
N 64°13'05" E a distance of 392.05'(141.14V);  
N 70°19'47" E a distance of 131.93'(47.50V);  
N 65°27'21" E a distance of 585.73'(210.86V);  
N 68°37'16" E a distance of 743.14'(267.53V);

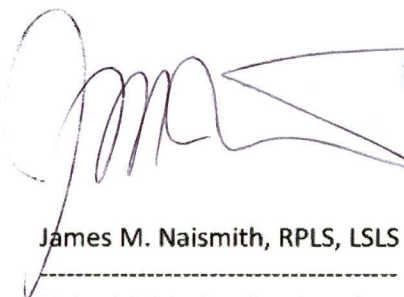
N 66°24'55" E a distance of 3862.24'(1390.41V) to a point on the MHW line (N:13,817,706.11, E: 3,518,996.36, EL: 1.5') from which NGS monument "FADDEN" (N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears N 48°08'45" E a distance of 1,064.43 feet (383.19V);


N 67°56'51" E a distance of 3014.44'(1085.20V);  
N 69°45'45" E a distance of 614.81'(221.33V);  
N 67°54'33" E a distance of 2172.48'(782.09V);  
N 68°25'11" E a distance of 2375.73'(855.26V);  
N 70°19'14" E a distance of 1372.09'(493.95V);  
N 69°32'38" E a distance of 1360.06'(489.62V);  
N 73°15'06" E a distance of 425.13'(153.05V);  
N 69°48'21" E a distance of 823.78'(296.56V);  
N 67°51'26" E a distance of 499.10'(179.68V);  
N 71°33'39" E a distance of 1410.78'(507.88V);  
N 29°49'45" E a distance of 23.86'(8.59V);  
N 78°25'17" E a distance of 40.13'(14.45V);  
N 70°22'55" E a distance of 261.67'(94.20V) to a point where the current MHW line crosses the MHW line established by Jefferson County NRC Article 33.136 Sketch 1 coastal boundary survey performed in 2002 (N: 13,822,836.61, E: 3,532,434.08, EL: 1.5');

Thence along the MHW line as established in 2002 the following courses:

N 63°42'31" E a distance of 67.08'(24.15V);  
N 68°50'47" E a distance of 100.00'(36.00V);  
N 72°16'54" E a distance of 100.13'(36.05V);  
N 73°59'35" E a distance of 100.32'(36.12V);  
N 68°50'47" E a distance of 100.00'(36.00V);  
N 76°15'43" E a distance of 100.72'(36.26V);  
N 62°17'39" E a distance of 100.78'(36.28V);  
N 71°59'45" E a distance of 100.10'(36.04V);  
N 62°17'39" E a distance of 100.78'(36.28V);  
N 78°13'48" E a distance of 101.19'(36.43V);  
N 75°07'47" E a distance of 100.50'(36.18V);  
N 67°07'43" E a distance of 100.08'(36.03V);  
N 73°25'24" E a distance of 100.24'(36.09V);  
N 64°50'43" E a distance of 100.32'(36.12V);

Thence N 72°51'10" E a distance of 22.45 feet (8.08V) to the **end point** (N:13,823,308.40 E: 3,533,740.78) on an east line of the refuge and on the MHW line of the Gulf of Mexico as established in 2002, from which a set 1" galvanized iron pipe with aluminum cap marked "CP2" (N:13,823,472.48, E: 3,533,731.28, EL:7.0') bears N 03°18'52" W a distance of 164.36 feet (59.17V), a bronze TPWD monument in cast iron pipe found (N:13,824,938.66, E:3,533,646.37, EL: 2.9') for a corner of the refuge bears N 03°18'52" W a distance of 1,633.00 feet (587.88V) and NGS monument "REBECCA 2" (N:13,828,404.20, E:3,545,493.70, EL: 3.6') bears N 66°33'34" E a distance of 12,810.08 feet (4611.63V).

  
James M. Naismith, RPLS, LSLS  
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Naismith Marine Services, Inc.



THIS DOCUMENT IS RECORDED IN:

GALVESTON COUNTY - SURVEYOR'S RECORDS - BOOK I PAGE 259  
JEFFERSON COUNTY - FILING # 2021012094  
CHAMBERS COUNTY - DOC # 167341 & SURVEYOR'S RECORDS - VOLUME 4 PAGE 206

**Naismith Marine Services, Inc.**

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FIRM #10194575



MAY 2021

**BUILD UP/FILL AREA REPORT TO ACCOMPANY  
COASTAL BOUNDARY SURVEY OF A PORTION OF  
McFADDIN NATIONAL WILDLIFE REFUGE ADJACENT TO GULF OF MEXICO  
STATE TRACTS 14, 64, 80 & 81  
JEFFERSON COUNTY, TX**

This report accompanies a map of survey dated MAY 2021.



**Figure 1:** Typical shoreline along the Gulf of Mexico Shoreline of the McFaddin National Wildlife Refuge.

A coastal boundary survey was conducted along the Gulf of Mexico shoreline from the west end of the McFaddin Wildlife Refuge (the refuge) near High Island, Galveston County, Texas to the east boundary of the refuge at the border with Sea Rim State Park in Jefferson County, Texas. All survey work was performed using survey grade RTK GPS base and rover: Hemisphere S320 receivers. The survey was conducted May 1-3 & 23-24, 2019, & updated December 21-23, 2020.

**SURVEY CONTROL:** Three NGS survey markers were used as primary control: "FADDEN" (AW5735, N:13,818,416.50, E: 3,519,789.40, EL: 2.4' NAVD88), "REBECCA 2" (AW2467, N:13,828,404.20, E:3,545,493.70, EL: 3.6' NAVD88 .and "877 0923 E" (DO9990, N: 13,765,402.04, E: 3,411,297.73, EL: 4.8') In addition to published NGS control, local temporary benchmarks were set in order to establish elevations on site. Positions were based on OPUS solutions.

**TEXAS GENERAL LAND OFFICE**  
Art. 33.136, Natural Resources Code

Co. Jefferson, SK No. 14 McFaddin National Wildlife Refuge, Page 1

File Date 03/24/2022 by K. Schreiber

**Table 1:** NGS benchmarks were used as primary control for the survey. Temporary benchmarks were set along the length of the project in order to accurately transfer and establish tidal datums during the littoral boundary survey.

	Northing	Easting	Elevation
<b>NGS BENCHMARKS</b>			
NGS 'FADDEN'	13,818,416.50	3,519,789.40	2.4'
NGS 'REBECCA 2'	13,828,404.20	3,545,493.70	3.6'
NGS '877 0923 E'	13,765,402.04	3,411,297.73	4.8'
<b>LOCAL CONTROL (TEMPORARY BENCHMARKS)</b>			
NMS CONTROL (3/4" GALV. IP/CAP)	13,776,219.90	3,434,047.10	4.5'
NMS CONTROL 1"GALV. IP W/ALUMINUM CAP "CP1"	13,784,262.32	3,449,966.02	4.8'
NMS TBM (3/4"GALV. IP/CAP)	13,795,667.80	3,474,010.50	5.7'
NMS TBM (3/4"GALV. IP/CAP)	13,799,709.11	3,482,013.97	9.1'
SET 1"GALV. IP W/ALUMINUM CAP "CP"	13,809,243.68	3,500,280.47	5.4'
SET 1"GALV. IP W/ALUMINUM CAP "CP2"	13,823,472.48	3,533,731.28	7.0'

Datum is NAD 83 (2011), South Central Zone of the Texas Coordinate System (US Feet). Orthometric height was calculated using geoid 2012b and is referenced to NAVD88 datum.



**Figure 2:** NGS benchmark "REBECCA 2" (N:13,828,404.20, E: 3,545,493.70, EL: 3.6')



**Figure 3:** Typical TBM set during the survey was a 3/4" galvanized iron pipe with an aluminum cap stamped "NAISMITH MARINE SVCS CONTROL". "CP2" was set at the east end of the project (N:13,823,472.48, E: 3,533,731.28, EL: 7.0')



**Figure 4:** The west point of beginning of the MHW line (littoral boundary) was tied to a refuge corner which was marked by a round concrete monument (N:13,779,691.27, E: 3,438,951.82, EL: 3.0')



**Figure 5:** The east end point of the MHW line (littoral boundary) was tied to a refuge corner which was marked with a bronze TPWD monument in a cast iron pipe (N:13,824,938.66, E: 3,533,646.37, EL: 2.9')

**STATE OWNERSHIP BOUNDARY:** As referenced to this survey, the elevation of MHW on the Gulf of Mexico shoreline is 1.5 feet (datum is NAVD88) as reported in a 2011 Coastal Boundary Survey of Rollover Pass by Naismith Marine Services. The tide gauge "Pleasure Pier" on Galveston Island and the, now removed, tide gauge "High Island" were used to establish MHW along the Gulf of Mexico beach.

**EXISTING FILL:** Apparent existing artificial fill remains in two places (Jefferson County Article 33.132 Sketch 1, 2002, and Sketch 12, 2017) within the survey area. In those portions of the current survey area the previously established MHW/littoral boundary lines are landward of the current (December, 2020) MHW line and these areas of artificial fill are described in this description. In all other portions of the survey area the MHW line has migrated landward as a result of normal erosion, including that portion where the MHHW line was previously surveyed (Jefferson County Article 33.132 Sketch 3, 2003). Pavement from destroyed State Highway 87 lies along portions of the McFaddin Gulf of Mexico shoreline. Artificial fill tracts are described herein below.

## TRACT 1 - BUILD UP / ARTIFICIAL FILL

**FIELD NOTES** for the boundary of a 12.05 acre tract of land, being an area of Build Up / Artificial Fill lying between the current (December, 2020) MHW line and the MHW line/littoral boundary established by Jefferson County NRC Article 33.136 Sketch 12 coastal boundary survey performed in 2017, along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge), and being a part of Gulf of Mexico state tracts 64, 80 & 81 in Jefferson County, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

**Beginning** at a point on the southeast littoral boundary of the refuge where the current (December, 2020) MHW line intersects the MHW line established in 2017 (N: 13,794,494.95, E: 3,471,833.80, EL: 1.5'), for the southwest corner of this tract, from which NGS monument "877 0923 E" (N:13,765,402.04, E: 3,411,297.73, EL: 4.8'), bears S 64°19'54" W a distance of 67,164.09 feet (24,179.07V);

Thence along the MHW line as established in 2017, the southeast littoral boundary of the refuge and the northwest line of this tract the following courses:

N 62°50'34" E a distance of 287.73 feet (103.58V);  
N 62°06'17" E a distance of 350.02 feet (126.01V);  
N 62°10'35" E a distance of 321.94 feet (115.90V);  
N 63°27'17" E a distance of 351.51 feet (126.54V);  
N 61°31'19" E a distance of 335.48 feet (120.77V);  
N 64°42'32" E a distance of 329.16 feet (118.50V);  
N 64°22'24" E a distance of 352.70 feet (126.97V);  
N 64°56'47" E a distance of 148.53 feet (53.47V) to a point on the MHW line established in 2017 (N:13,795,613.43, E: 3,474,043.39) from which a NMS TBM (3/4" galvanized iron pipe and cap, N:13,795,667.80, E: 3,474,010.50, EL: 5.7') bears N 31°10'27" E a distance of 63.55 feet (22.88V);

N 62°04'57" E a distance of 329.39 feet (118.58V);  
N 62°50'45" E a distance of 369.74 feet (133.11V);  
N 63°41'47" E a distance of 354.96 feet (127.79V);  
N 62°53'20" E a distance of 362.16 feet (130.38V);  
N 63°24'49" E a distance of 349.96 feet (125.99V);  
N 62°27'32" E a distance of 312.91 feet (112.65V);  
N 63°23'02" E a distance of 259.51 feet (93.42V);  
N 63°13'21" E a distance of 348.12 feet (125.32V);  
N 61°38'27" E a distance of 350.49 feet (126.18V);  
N 62°15'15" E a distance of 366.44 feet (131.92V);  
N 63°53'29" E a distance of 307.37 feet (110.65V);  
N 63°06'51" E a distance of 358.68 feet (129.12V);  
N 61°58'57" E a distance of 364.57 feet (131.25V);  
N 61°36'09" E a distance of 334.63 feet (120.47V);



N 65°16'36" E a distance of 358.27 feet (128.98V);  
N 65°13'13" E a distance of 341.33 feet (122.88V);  
N 61°54'26" E a distance of 387.56 feet (139.52V);  
N 62°47'51" E a distance of 413.29 feet (148.78V);  
N 63°08'07" E a distance of 341.50 feet (122.94V);  
N 62°47'59" E a distance of 402.86 feet (145.03V);  
N 63°59'58" E a distance of 371.71 feet (133.82V);  
N 64°53'51" E a distance of 444.60 feet (160.06V);  
N 64°36'54" E a distance of 370.33 feet (133.32V);  
N 64°23'34" E a distance of 334.57 feet (120.45V);  
N 65°29'24" E a distance of 350.37 feet (126.13V) to a point on the MHW line established in 2017 (N:13,799,601.16, E: 3,481,981.62) from which a NMS TBM (3/4"galvanized iron pipe and cap, N:13,799,709.11, E: 3,482,013.97, EL: 9.1') bears N 16°41'08" E a distance of 112.69 feet (40.57V);

N 66°46'19" E a distance of 361.44 feet (130.12V);  
N 64°57'30" E a distance of 105.80 feet (38.09V);  
N 65°15'15" E a distance of 268.35 feet (96.61V);  
N 63°06'39" E a distance of 137.90 feet (49.64V);  
N 62°28'03" E a distance of 245.20 feet (88.27V);  
N 61°47'51" E a distance of 102.53 feet (36.91V);  
N 61°13'39" E a distance of 294.01 feet (105.84V);  
N 60°24'08" E a distance of 85.36 feet (30.73V);  
N 60°45'15" E a distance of 173.23 feet (62.36V);  
N 62°50'57" E a distance of 284.49 feet (102.42V);  
N 63°00'27" E a distance of 296.80 feet (106.85V);  
N 62°26'06" E a distance of 260.02 feet (93.61V);  
N 62°23'26" E a distance of 321.65 feet (115.79V);  
N 63°18'58" E a distance of 289.95 feet (104.38V);  
N 64°56'28" E a distance of 258.28 feet (92.98V);  
N 63°50'00" E a distance of 300.35 feet (108.13V);  
N 63°54'56" E a distance of 281.52 feet (101.35V);  
N 62°00'01" E a distance of 46.90 feet (16.89V) to a point where the MHW line established in 2017 intersects the current (December, 2020) MHW line (N:13,801,445.08, E:3,485,657.19, EL: 1.5'), for the northeast corner of this tract, from which NGS monument "FADDEN" (N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears N 63°33'44" E a distance of 38,118.46 feet (13,722.65V);

Thence along the current (December, 2020) MHW line, the southeast limit of the artificial fill and the southeast line of this tract the following courses:

S 61°28'11" W a distance of 290.38 feet (104.54V);  
S 63°30'12" W a distance of 965.22 feet (347.48V);  
S 62°05'41" W a distance of 568.85 feet (204.79V);  
S 63°25'47" W a distance of 536.02 feet (192.97V);  
S 58°35'33" W a distance of 200.84 feet (72.30V);

S 62°58'25" W a distance of 497.97 feet (179.27V);  
S 63°56'25" W a distance of 547.61 feet (197.14V);  
S 50°03'29" W a distance of 42.74 feet (15.39V);  
S 63°39'44" W a distance of 298.61 feet (107.50V);  
S 70°35'30" W a distance of 285.80 feet (102.89V);  
S 64°02'02" W a distance of 198.77 feet (71.56V);  
S 61°43'19" W a distance of 239.18 feet (86.10V);  
S 59°54'50" W a distance of 241.75 feet (87.03V);  
S 64°16'50" W a distance of 1368.68 feet (492.72V);  
S 69°01'38" W a distance of 252.48 feet (90.89V);  
S 60°57'09" W a distance of 312.36 feet (112.45V);  
S 65°05'07" W a distance of 101.98 feet (36.71V);  
S 61°54'50" W a distance of 300.62 feet (108.22V);  
S 65°55'19" W a distance of 308.01 feet (110.88V);  
S 59°44'47" W a distance of 485.82 feet (174.89V);  
S 63°30'03" W a distance of 896.65 feet (322.79V);  
S 62°24'57" W a distance of 2531.26 feet (911.26V);  
S 63°25'31" W a distance of 1263.28 feet (454.78V);  
S 65°08'34" W a distance of 522.96 feet (188.27V);  
S 61°31'02" W a distance of 240.22 feet (86.48V);  
S 66°50'20" W a distance of 340.08 feet (122.43V);  
S 77°07'15" W a distance of 56.17 feet (20.22V);  
S 54°32'52" W a distance of 122.89 feet (44.24V);  
S 58°58'45" W a distance of 174.04 feet (62.65V);  
S 65°35'52" W a distance of 370.26 feet (133.29V);  
S 60°35'00" W a distance of 469.28 feet (168.94V);  
S 66°16'12" W a distance of 140.20 feet (50.47V);  
S 71°42'53" W a distance of 103.81 feet (37.37V);  
S 66°36'02" W a distance of 212.94 feet (76.66V) to the **Place of Beginning**, containing 12.05 acres of land, more or less.

## TRACT 2 - BUILD UP / ARTIFICIAL FILL

**FIELD NOTES** for the boundary of a 0.63 acre tract of land, being an area of Build Up / Artificial Fill lying between the current (December, 2020) MHW line and the MHW line/littoral boundary established by Jefferson County NRC Article 33.136 Sketch 1 coastal boundary survey performed in 2002, along the Gulf of Mexico shoreline of McFaddin National Wildlife Refuge (the refuge), and being a part of Gulf of Mexico state tract 14 in Jefferson County, Texas. Distances, bearings, and Coordinates are grid, North American Datum of 1983 (2011), South Central zone of the Texas coordinate system;

**Beginning** at a point (N:13,823,273.15 E: 3,533,742.83) on a southerly extension of the east line of the refuge, on the current MHW line of the Gulf of Mexico as established in 2020 and on the southeast limit of the artificial fill, for the southeast corner of this tract, from which a set 1" galvanized iron pipe with aluminum cap marked "CP2" (N:13,823,472.48, E: 3,533,731.28, EL:7.0') bears N 03°18'52" W a distance of 199.66 feet (71.88V), a bronze TPWD monument in cast iron pipe found (N:13,824,938.66, E:3,533,646.37, EL: 2.9') for a corner of the refuge bears N 03°18'52" W a distance of 1,668.30 feet (600.59V) and NGS monument "REBECCA 2" (N:13,828,404.20, E:3,545,493.70, EL: 3.6') bears N 66°24'41" E a distance of 12,822.27 feet (4,616.02V).

Thence along the current (December, 2020) MHW line, the southeast limit of the artificial fill and the southeast line of this tract the following courses:

S 70°13'23" W a distance of 444.24 feet (159.93V);  
S 73°06'31" W a distance of 198.17 feet (71.34V);  
S 83°40'14" W a distance of 87.08 feet (31.35V);  
S 64°30'40" W a distance of 85.44 feet (30.76V);  
S 71°15'52" W a distance of 567.50 feet (204.30V) to a point on the southeast littoral boundary of the refuge where the current (December, 2020) MHW line intersects the MHW line established in 2002 (N: 13,822,836.61, E: 3,532,434.08, EL: 1.5') for the southwest corner of this tract, from which NGS monument "FADDEN" (N:13,818,416.50, E: 3,519,789.40, EL: 2.4') bears S 70°43'55" W a distance of 13,395.23 feet (4,822.28V);


Thence along the MHW line as established in 2002, the southeast littoral boundary of the refuge and the northwest line of this tract the following courses:

N 63°42'31" E a distance of 67.08 feet (24.15V);  
N 68°50'47" E a distance of 100.00 feet (36.00V);  
N 72°16'54" E a distance of 100.13 feet (36.05V);  
N 73°59'35" E a distance of 100.32 feet (36.12V);  
N 68°50'47" E a distance of 100.00 feet (36.00V);  
N 76°15'43" E a distance of 100.72 feet (36.26V);  
N 62°17'39" E a distance of 100.78 feet (36.28V);  
N 71°59'45" E a distance of 100.10 feet (36.04V);  
N 62°17'39" E a distance of 100.78 feet (36.28V);

N 78°13'48" E a distance of 101.19 feet (36.43V);  
N 75°07'47" E a distance of 100.50 feet (36.18V);  
N 67°07'43" E a distance of 100.08 feet (36.03V);  
N 73°25'24" E a distance of 100.24 feet (36.09V);  
N 64°50'43" E a distance of 100.32 feet (36.12V);

Thence N 72°51'10" E a distance of 22.45 feet (8.08V) to the north corner of this tract (N:13,823,308.40, E: 3,533,740.78) on an east line of the refuge and on the MHW line of the Gulf of Mexico as established in 2002;

Thence S 03°18'52" E along the east line of this tract, crossing said artificial fill, a distance of 35.31 feet (12.71V) to the **Place of Beginning**, containing 0.63 acres of land, more or less.

  
James M. Naismith, RPLS, LSLS  
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Naismith Marine Services, Inc.



THIS DOCUMENT IS RECORDED IN:

GALVESTON COUNTY - SURVEYOR'S RECORDS - BOOK I PAGE 259

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