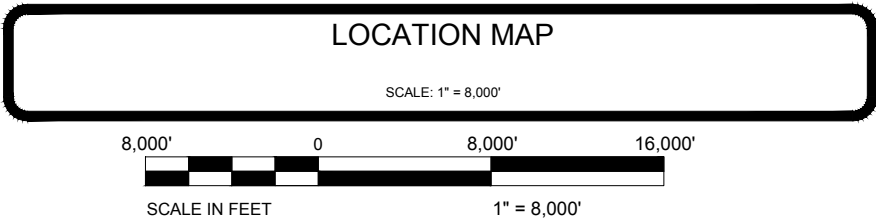
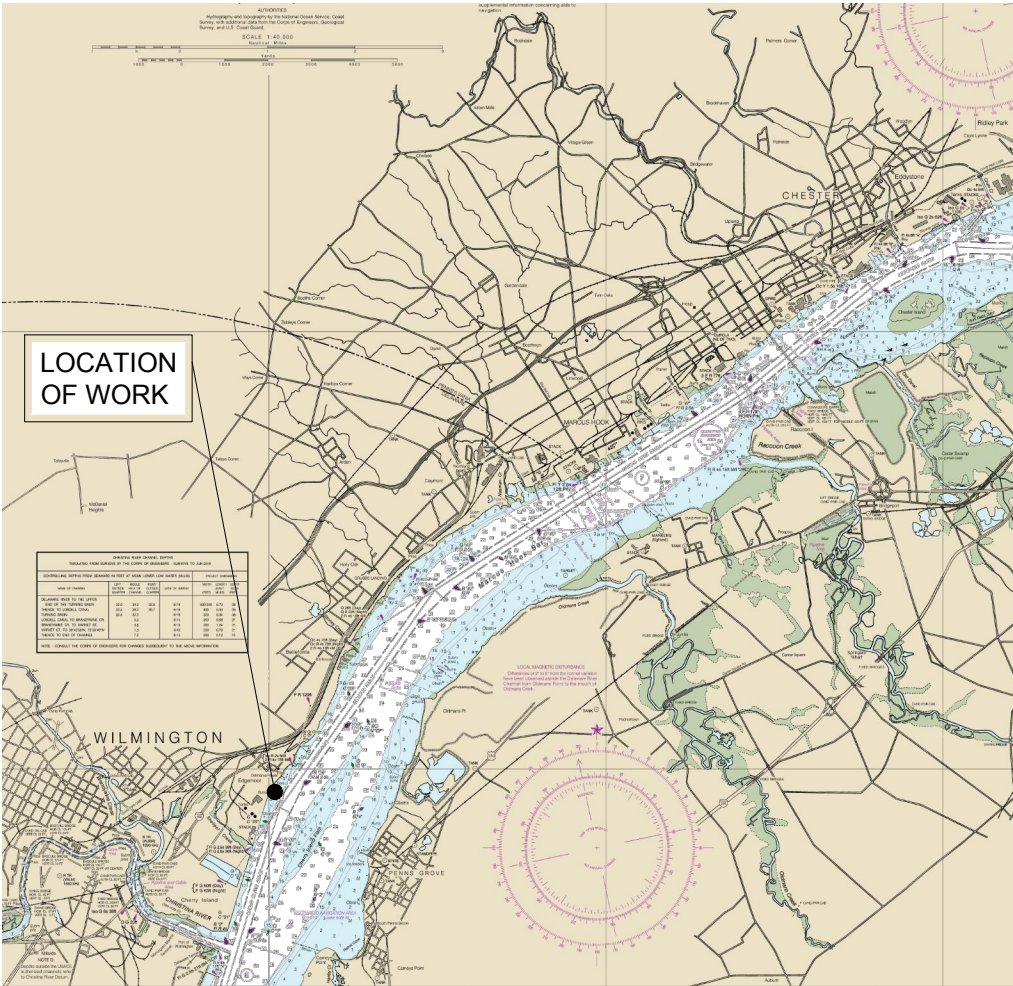


PORT OF WILMINGTON EDGEMOOR EXPANSION
PERMIT PLANS



BRANDYWINE HUNDRED, NEW CASTLE COUNTY, DELAWARE



PURPOSE:

THE PURPOSE OF THESE PLANS IS TO PROVIDE PLANS AND DETAILS FOR THE PERMITTING OF A NEW HARBOR AND DOCK STRUCTURE AT THE PORT OF WILMINGTON EDGEMOOR FACILITY IN NEW CASTLE COUNTY, DELAWARE. THESE DRAWINGS ARE FOR PERMITTING PURPOSES ONLY ARE NOT FOR BIDDING.

SITE DATA:

1.

TAX PARCEL NO.:

06-153.00-006
2.

SITE ADDRESS:

4600 HAY ROAD
WILMINGTON, DE 19809
3.

OWNER:

DIAMOND STATE PORT CORPORATION
1 HAUSEL ROAD
WILMINGTON, DE 19801
4.

SOURCE OF TITLE:

IN20170227-0010347
5.

ZONING:

HI - HEAVY INDUSTRIAL
6.

PARCEL SITE ACREAGE:

113.29 ± AC
7.

DATUM:

HORIZONTAL: NAD 83 DE STATE PLANE GRID
VERTICAL: NAVD 1988
8.

SURVEY:

THE TOPOGRAPHIC SURVEY DEPICTED ON THIS PLAN WAS TAKEN FROM AN AERIAL SURVEY PREPARED BY COOPER AERIAL SURVEYS CO. DATED DECEMBER 23, 2018.

BATHYMETRIC SOUNDING PERFORMED BY GAHAGAN & BRYANT ASSOCIATES IN JULY, 2018 WITH SINGLE BEAM AND MULTIBEAM SURVEY IN GENERAL ACCORDANCE WITH EM 1110-Z-1003.

THE GROUND CONTROL POINTS UTILIZED BY COOPER AERIAL SURVEYS CO. FOR THE AERIAL SURVEY WERE SET IN THE FIELD BY VANDEMARK & LYNCH, INC. DATED DECEMBER 12-14, 2018.

INDEX OF SHEETS:

- SHEET 1

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- SHEET 2

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- SHEET 3

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- SHEET 4

EXISTING TOPOGRAPHY
- SHEET 5

CONCEPTUAL SITE PLAN
- SHEET 6

BERTH GRADING PLAN
- SHEET 7

SECTIONS
- SHEET 8

SECTIONS
- SHEET 9

WHARF STRUCTURAL DETAILS
- SHEET 10

WHARF STRUCTURAL DETAILS
- SHEET 11

SEDIMENT FAN DETAILS
- SHEET 12

ANALYTICAL SAMPLE LOCATION SKETCH
- SHEET 13

GEOTECHNICAL BORINGS LOCATION SKETCH
- SHEET 14

ESSENTIAL FISH HABITAT
- SHEET 15

BATHYMETRIC SURVEY
- SHEET 16

MAGNETOMETER CONTOUR MAPPING
- SHEET 17

SITE SCAN SONAR

QUANTITY NOTES:

1.

AREA OF DREDGE:

86.9 ACRES
2.

AREA OF DREDGE TO 48":

64.5 ACRES
3.

AREA OF SUBAQUEOUS FILL:

5.5 ACRES
4.

VOLUME OF DREDGE:

3,325,000 CUBIC YARDS
5.

VOLUME OF SUBAQUEOUS FILL:

20,107 CUBIC YARDS
6.

VOLUME OF FLOODPLAIN FILL:

145,893 CUBIC YARDS
7.

AREA OF WETLAND IMPACT:

0.0 ACRES
8.

AREA OF SHALLOW WATER IMPACT:

35.3 ACRES
9.

APPROXIMATE NUMBER OF PILES:

4,500 (PLUMB AND BATTER)
10.

VOLUME OF PILE FILL:

2,160 CUBIC YARDS
11.

"SHADED" FOOTPRINT AREA COVERED BY WHARF / FENDERS:

32,900 SQUARE YARDS



5400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8465
OFFICES IN DELAWARE, MARYLAND
PENNSYLVANIA AND NEW JERSEY
E-MAIL: DUFFIELD@DUFFNET.COM

DESIGNED BY: MRB

DRAWN BY: AR

CHECKED BY: BJD

FILE: PRMT-Index-11139LH.dwg

PERMIT PLAN
COVER SHEET

PORT OF WILMINGTON EDGEMOOR EXPANSION

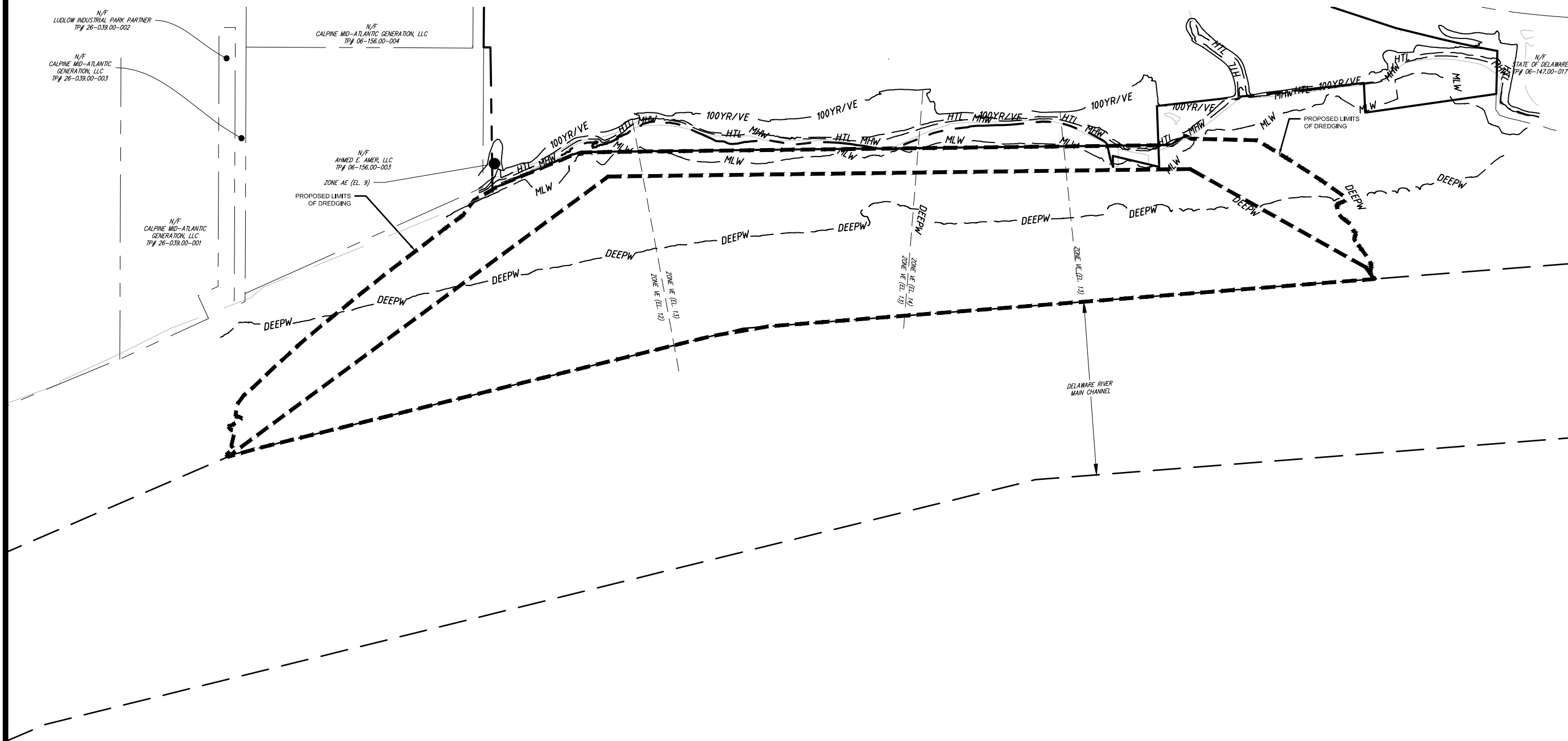
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 8,000'

PROJECT NO.
11139.LH

SHEET:
1 OF 17



LEGEND	
	PROPERTY LINE
	ADJOINER LINE
	100 YEAR FLOODPLAIN
	100 YEAR FLOODPLAIN (BASE FLOOD ELEVATIONS, BFE DETERMINED)
	100 YEAR FLOODPLAIN (COASTAL FLOOD ZONE WITH VELOCITY HAZARD, BFE DETERMINED)
	FLOODPLAIN DIVIDE
	HIGH TIDE LINE
	MEAN HIGH WATER LINE
	MEAN LOW WATER LINE
	DEEP WATER LINE
	CHANNEL LIMITS

DUFFIELD ASSOCIATES
Soil, Water & the Environment

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PERMIT PLAN

JURISDICTIONAL BOUNDARY PLAN

PORT OF WILMINGTON EDGEMOOR EXPANSION

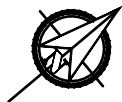
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE: OCTOBER 2019

SCALE: 1" = 500'

PROJECT NO. 11139.LH

SHEET: 2 OF 17



N/F
LUDLOW INDUSTRIAL PARK PARTNER
TP# 26-039.00-002

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-003

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-001

N/F
CALPINE MID-ATLANTIC GENERATION, LLC
TP# 06-156.00-004

N/F
AHMED E. AMER, LLC
TP# 06-156.00-003

N/F
STATE OF DELAWARE
TP# 06-147.00-017

SUBMERGED OUTFALL
(TO REMAIN)

SUBMERGED PILE STRUCTURE
(TO REMAIN)

EXISTING SEAWALL
(TO BE REMOVED)

ABANDONED EXISTING PIERS AND WATER
INTAKE STRUCTURE (TO BE REMOVED)

DELAWARE RIVER
MAIN CHANNEL

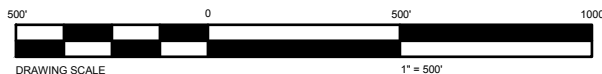
RANGE LIGHT
(TO BE RELOCATED)

SUBMERGED PILES (TO BE REMOVED)

EXISTING WOOD AND
CONCRETE PIER
(TO BE REMOVED)

LEGEND

————— PROPERTY LINE
- - - - - ADJOINER LINE
===== EXISTING RAILROAD
- - - - - EXISTING CONTOUR



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PERMIT PLAN
EXISTING CONDITIONS PLAN
PORT OF WILMINGTON EDGE MOOR EXPANSION

BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:

OCTOBER 2019

SCALE:

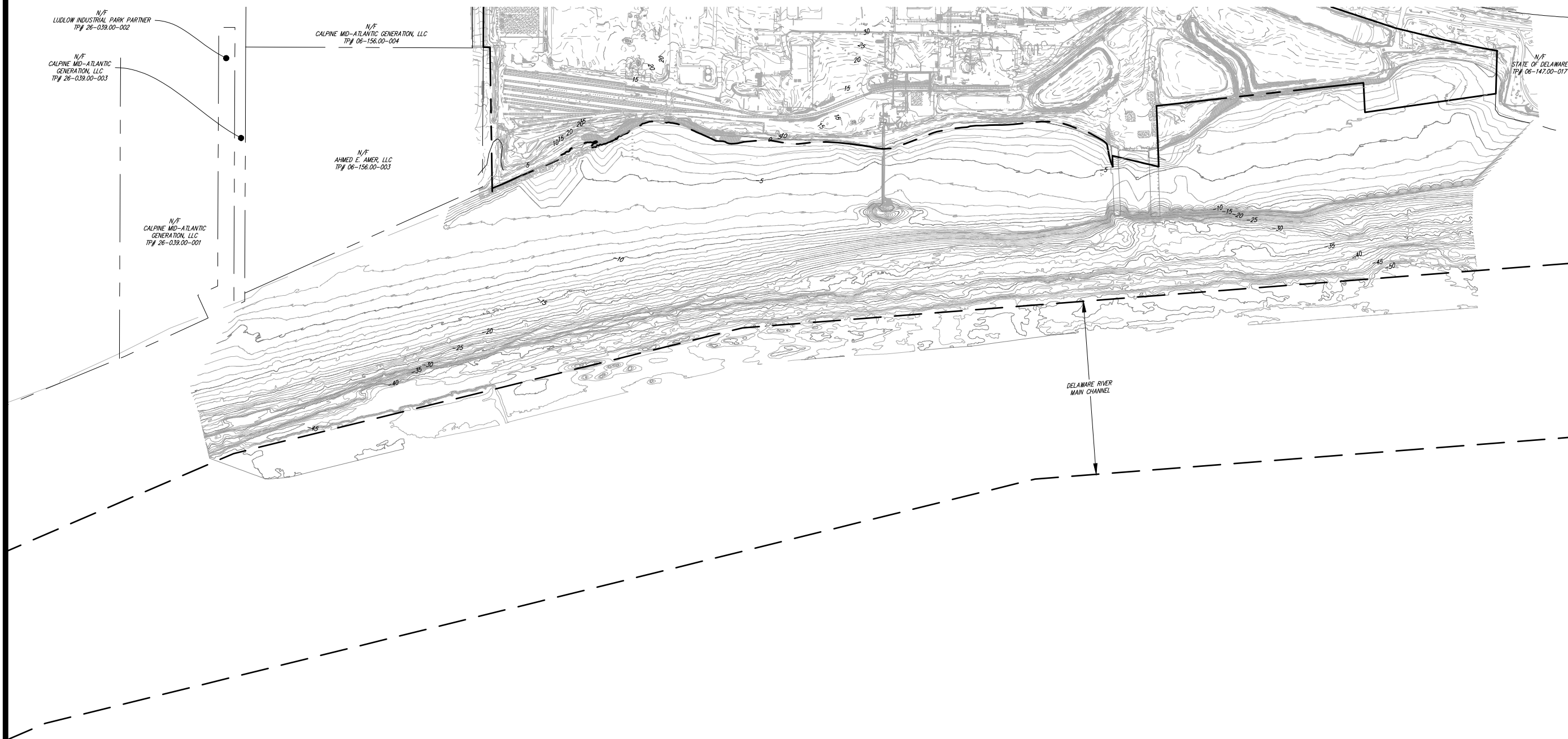
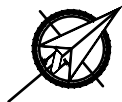
1" = 500'

PROJECT NO.

11139.LH

SHEET:

3 OF 17



LEGEND	
	PROPERTY LINE
	ADJOINER LINE
	EXISTING RAILROAD
	EXISTING CONTOUR



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PERMIT PLAN
EXISTING TOPOGRAPHY

PORT OF WILMINGTON EDGE MOOR EXPANSION

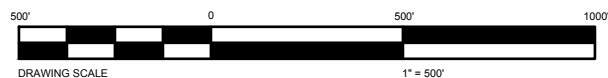
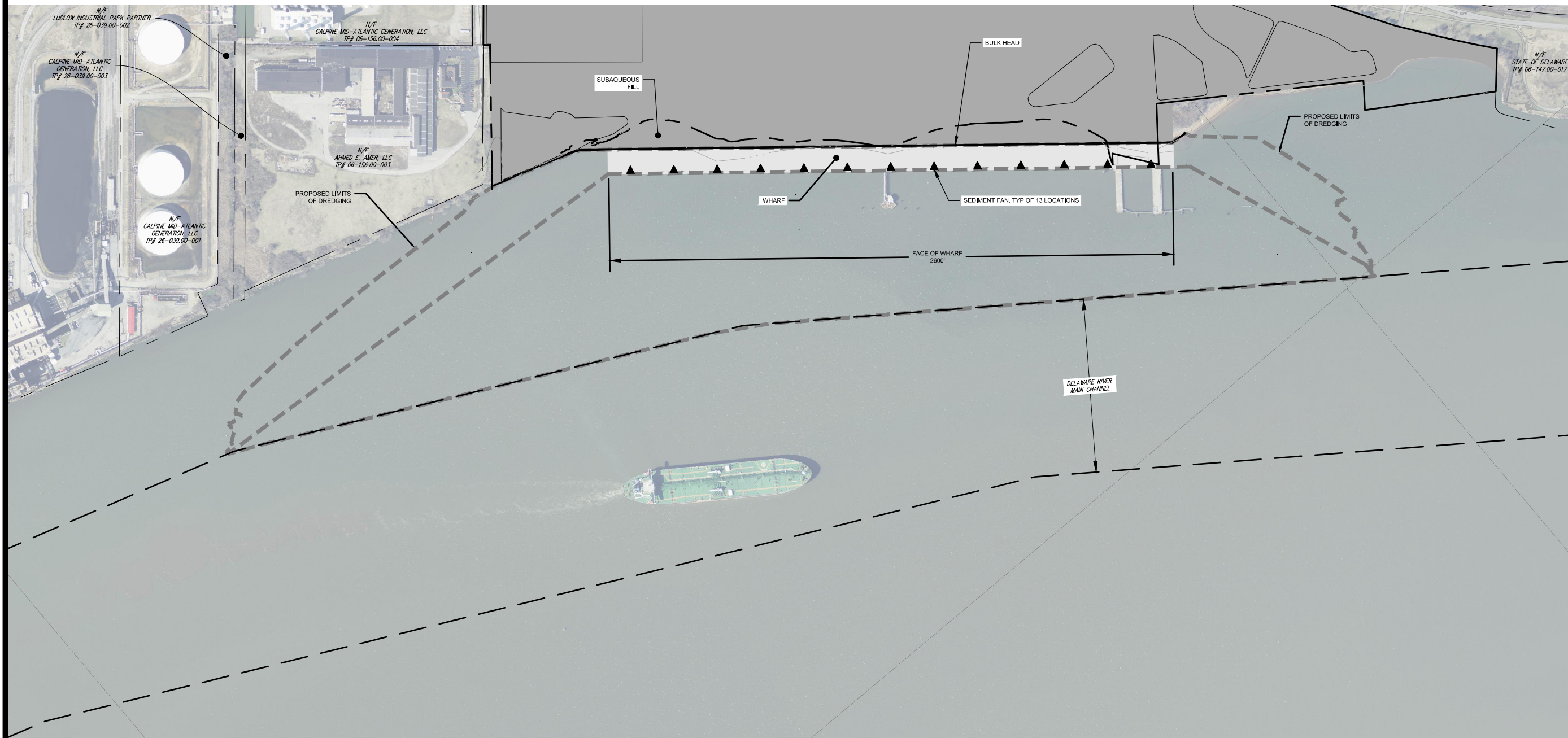
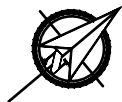
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 500'

PROJECT NO.
11139.LH

SHEET:
4 OF 17



LEGEND	
	PROPERTY LINE
	ADJOINER LINE
	CHANNEL LIMITS
	LIMITS OF DREDGING
	PROPOSED ASPHALT
	PROPOSED WHARF

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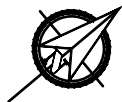
**PERMIT PLAN
CONCEPTUAL SITE PLAN
PORT OF WILMINGTON EDGEMOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE**

DATE:
OCTOBER 2019

SCALE:
1" = 500'

PROJECT NO.
11139.LH

SHEET:
5 OF 17



N/F
LUDLOW INDUSTRIAL PARK PARTNER
TP# 26-039.00-002

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-003

N/F
CALPINE MID-ATLANTIC GENERATION, LLC
TP# 06-156.00-004

N/F
AHMED E. AMER, LLC
TP# 06-156.00-003

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-001

PROPOSED LIMITS
OF DREDGING

6:1 SLOPE

3:1 SLOPE

BULK HEAD

FILLED SUBAQUEOUS LAND

SEA WALL

DELAWARE RIVER
MAIN CHANNEL

N/F
STATE OF DELAWARE
TP# 06-147.00-017

PROPOSED LIMITS
OF DREDGING

6:1 SLOPE



LEGEND	
	PROPERTY LINE
	ADJOINER LINE
	CHANNEL LIMITS
	EXISTING CONTOUR
	LIMITS OF DREDGING
	PROPOSED ASPHALT
	PROPOSED CONTOUR

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PERMIT PLAN
BERTH GRADING PLAN

PORT OF WILMINGTON EDGE MOOR EXPANSION

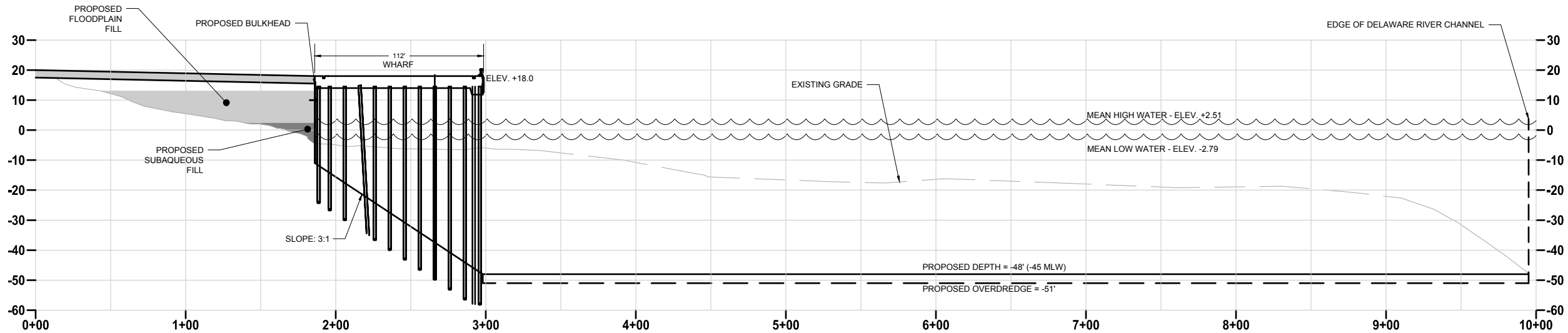
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 500'

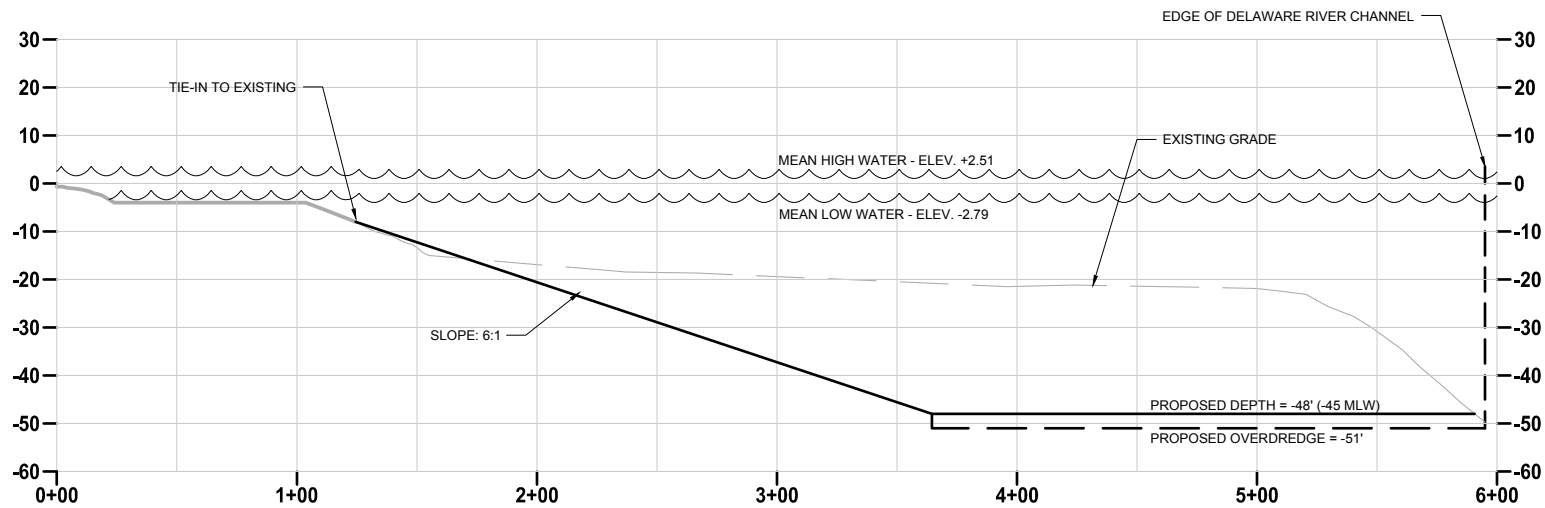
PROJECT NO.
11139.LH

SHEET:
6 OF 17



SECTION WHARF

SCALE: HORIZONTAL: 1" = 80'
VERTICAL: 1" = 40'



SECTION AT TIE-IN TO EXISTING SUBAQUEOUS SLOPE

SCALE: HORIZONTAL: 1" = 80'
VERTICAL: 1" = 40'



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DESIGNED BY: MRB

DRAWN BY: AR

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FILE: PRMT-Sections-11139LH

**PERMIT PLAN
SECTIONS**

PORT OF WILMINGTON EDGE MOOR EXPANSION

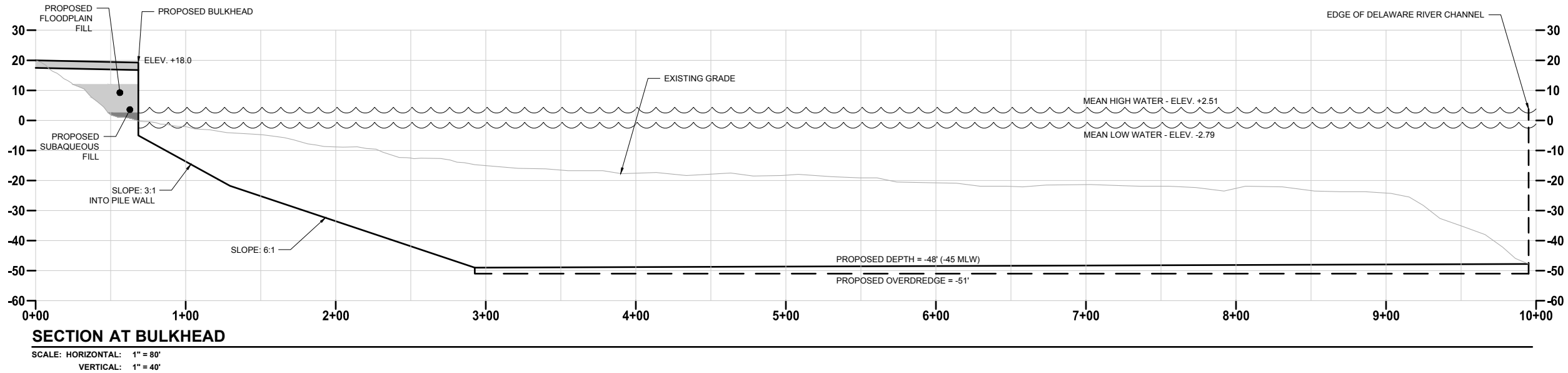
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE: OCTOBER 2019

SCALE: AS SHOWN

PROJECT NO. 11139.LH

SHEET: 7 OF 17





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ASSOCIATES

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PENNSYLVANIA AND NEW JERSEY

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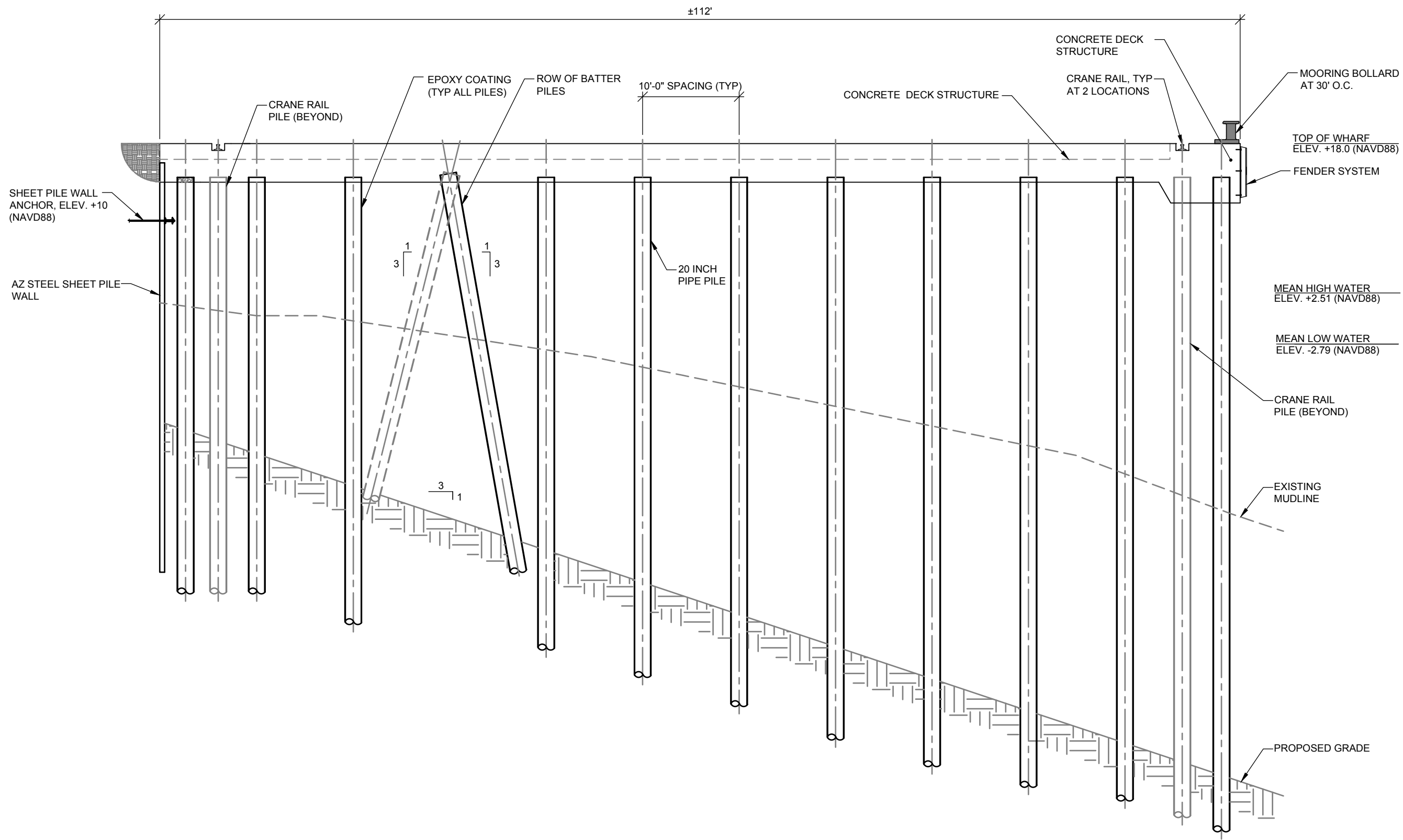
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DRAWN BY:	AR
CHECKED BY:	BJD
FILE:	PRMT-Sections-11139LH

PERMIT PLAN
SECTIONS

PORT OF WILMINGTON EDGE MOOR EXPANSION

BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:	OCTOBER 2019
SCALE:	AS SHOWN
PROJECT NO.	11139.LH
SHEET:	8 OF 17



WHARF CONSTRUCTION SECTION - SECTION VIEW
SCALE: NOT TO SCALE

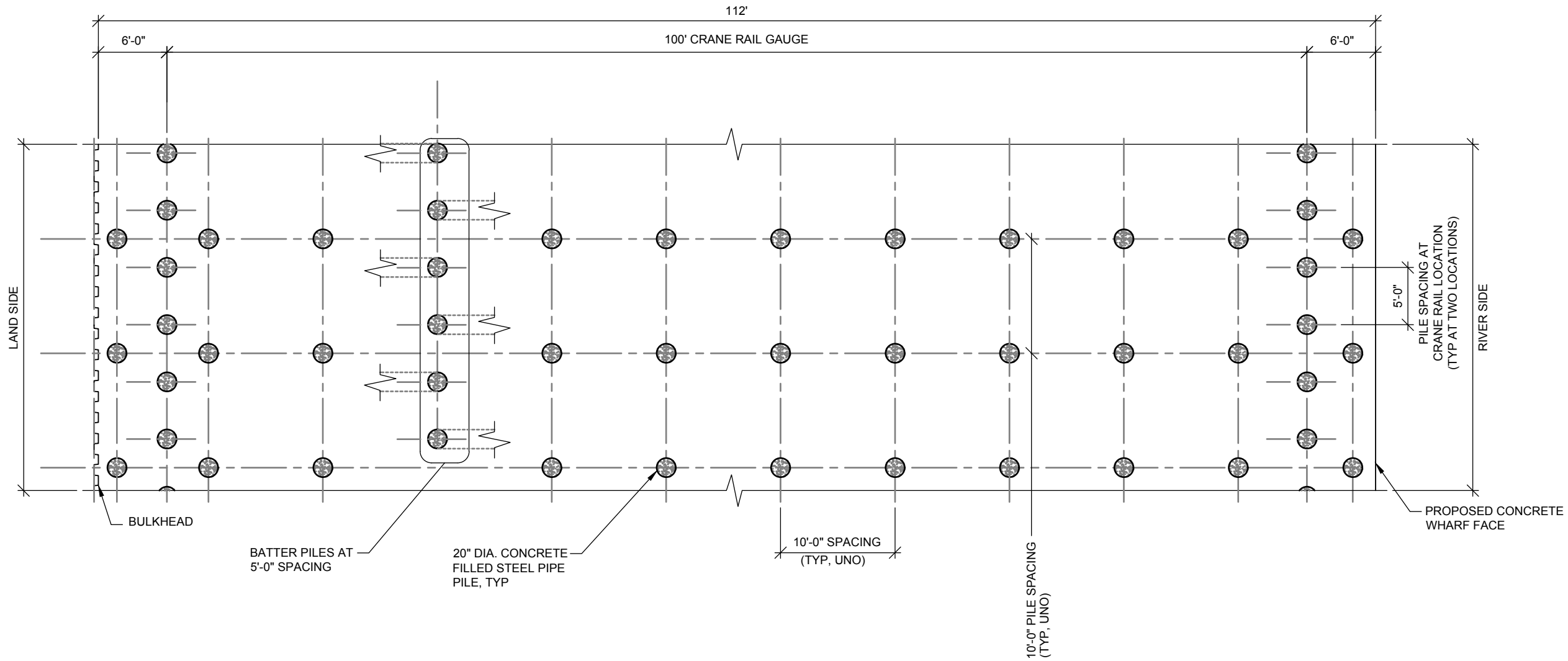


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DESIGNED BY:	MRB
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CHECKED BY:	BJD
FILE:	PRMT-Struct-11139.LH.dwg

PERMIT PLAN
WHARF STRUCTURAL DETAILS
PORT OF WILMINGTON EDGE MOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:	OCTOBER 2019
SCALE:	NTS
PROJECT NO.	11139.LH
SHEET:	9 OF 17



WHARF CONSTRUCTION SECTION - PLAN VIEW
SCALE: NOT TO SCALE

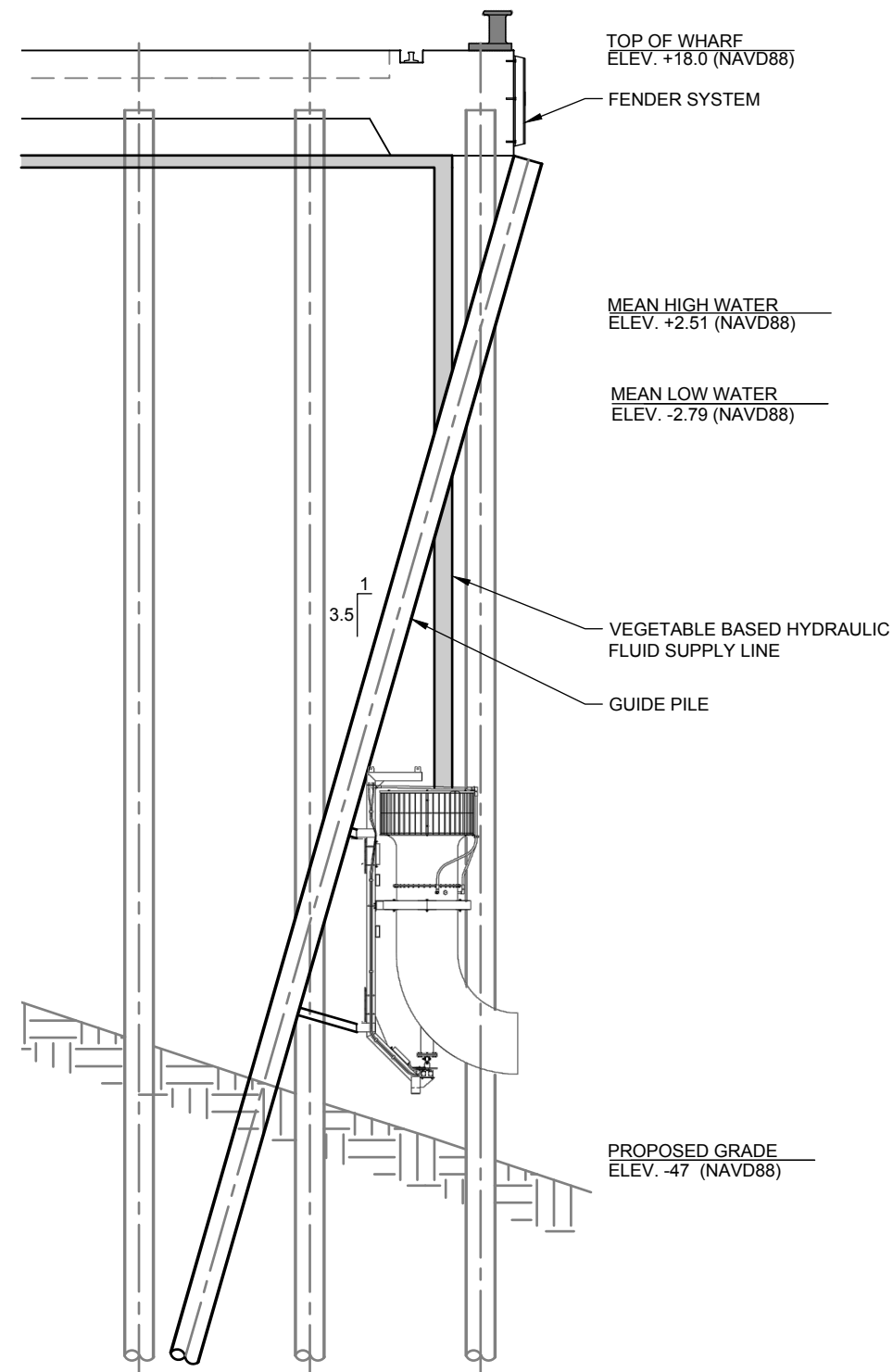
DESIGNED BY:	MRB
DRAWN BY:	SFH
CHECKED BY:	BJD
FILE:	PRMT-Struct-11139LH.dwg

PERMIT PLAN
WHARF STRUCTURAL DETAILS

PORT OF WILMINGTON EDGE MOOR EXPANSION

BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

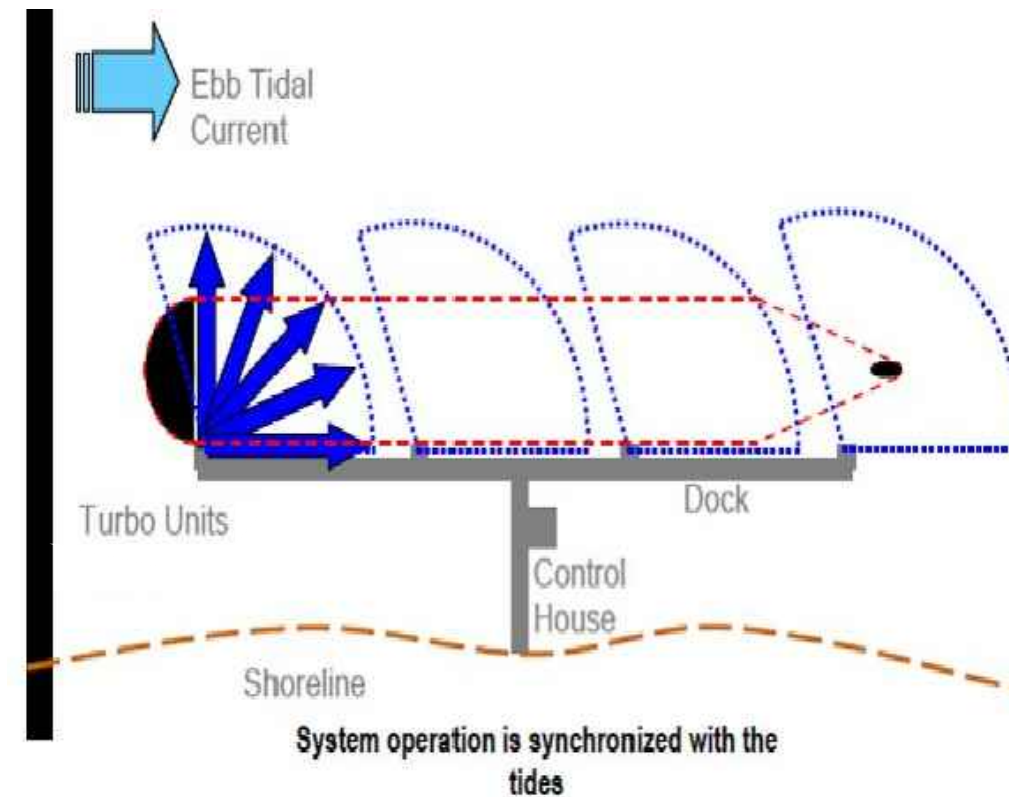
DATE:	OCTOBER 2019
SCALE:	NTS
PROJECT NO.	11139.LH
SHEET:	10 OF 17



SEDCON SHOALING FAN CONFIGURATION - SECTION VIEW
SCALE: NOT TO SCALE



SEDCON SHOALING FAN - CONCEPTUAL IMAGE
SCALE: NOT TO SCALE

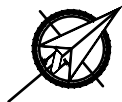


SEDCON SHOALING FAN - CONCEPTUAL IMAGE
SCALE: NOT TO SCALE

DESIGNED BY:	MRB
DRAWN BY:	SFH
CHECKED BY:	BJD
FILE:	PRMT-Struct-11139LH.dwg

**PERMIT PLAN
SEDIMENT FAN DETAILS**
PORT OF WILMINGTON EDGE MOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:	OCTOBER 2019
SCALE:	NTS
PROJECT NO.	11139.LH
SHEET:	11 OF 17



N/F
LUDLOW INDUSTRIAL PARK PARTNER
TP# 26-039.00-002

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-003

N/F
CALPINE MID-ATLANTIC GENERATION, LLC
TP# 06-156.00-004

N/F
AHMED E. AMER, LLC
TP# 06-156.00-003

N/F
STATE OF DELAWARE
TP# 06-147.00-017

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-001

PROPOSED LIMITS
OF DREDGING

PROPOSED LIMITS
OF DREDGING

DELAWARE RIVER
MAIN CHANNEL

LEGEND



2016 BORING PROGRAM



2019 VIBRACORE PROGRAM



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FAX: 302.239.8465
OFFICES IN DELAWARE, MARYLAND,
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E-MAIL: DUFFIELD@DUFFNET.COM

DESIGNED BY: MRB

DRAWN BY: KJT

CHECKED BY: BJD

FILE: PRMT-VIBRA-11139.LH.dwg

PERMIT PLAN
ANALYTICAL SAMPLE LOCATION SKETCH
PORT OF WILMINGTON EDGE MOOR EXPANSION

BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:

OCTOBER 2019

SCALE:

1" = 500'

PROJECT NO.

11139.LH

SHEET:

12 OF 17



N/F
LUDLOW INDUSTRIAL PARK PARTNER
TP# 26-039.00-002

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-003

N/F
CALPINE MID-ATLANTIC GENERATION, LLC
TP# 06-156.00-004

N/F
AHMED E. AMER, LLC
TP# 06-156.00-003

N/F
STATE OF DELAWARE
TP# 06-147.00-017

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-001

PROPOSED LIMITS
OF DREDGING

TB-6

TB-7
TB-7A

TB-1

TB-2

TB-3

TB-4

TB-8

TB-5

TB-9

TB-10

PROPOSED LIMITS
OF DREDGING

DELAWARE RIVER
MAIN CHANNEL

LEGEND

2016 TEST BORING PROGRAM

2018 TEST BORING PROGRAM





**DUFFIELD
ASSOCIATES**
Soil, Water & the Environment

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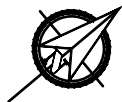
DESIGNED BY:	MRB
DRAWN BY:	KJT
CHECKED BY:	BJD
FILE:	PRMT-GEO-11139LH.dwg

PERMIT PLAN
GEOTECHNICAL BORING LOCATION SKETCH

PORT OF WILMINGTON EDGE MOOR EXPANSION

BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:	OCTOBER 2019
SCALE:	1" = 500'
PROJECT NO.	11139.LH
SHEET:	13 OF 17



N/F
LUDLOW INDUSTRIAL PARK PARTNER
TP# 26-039.00-002

N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-003

N/F
CALPINE MID-ATLANTIC GENERATION, LLC
TP# 06-156.00-004

N/F
AHMED E. AMER, LLC
TP# 06-156.00-003

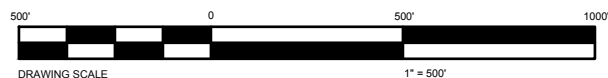
N/F
CALPINE MID-ATLANTIC
GENERATION, LLC
TP# 26-039.00-001

N/F
STATE OF DELAWARE
TP# 06-147.00-017

PROPOSED LIMITS
OF DREDGING

PROPOSED LIMITS
OF DREDGING

DELAWARE RIVER
MAIN CHANNEL



LEGEND



PROPOSED BENTHIC SAMPLE LOCATIONS

PROPOSED BEACH SEINE LOCATIONS

PROPOSED TRAWL HAUL LOCATIONS



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DESIGNED BY: MRB

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CHECKED BY: BJD

FILE: PRMT-FISH-11139LH.dwg

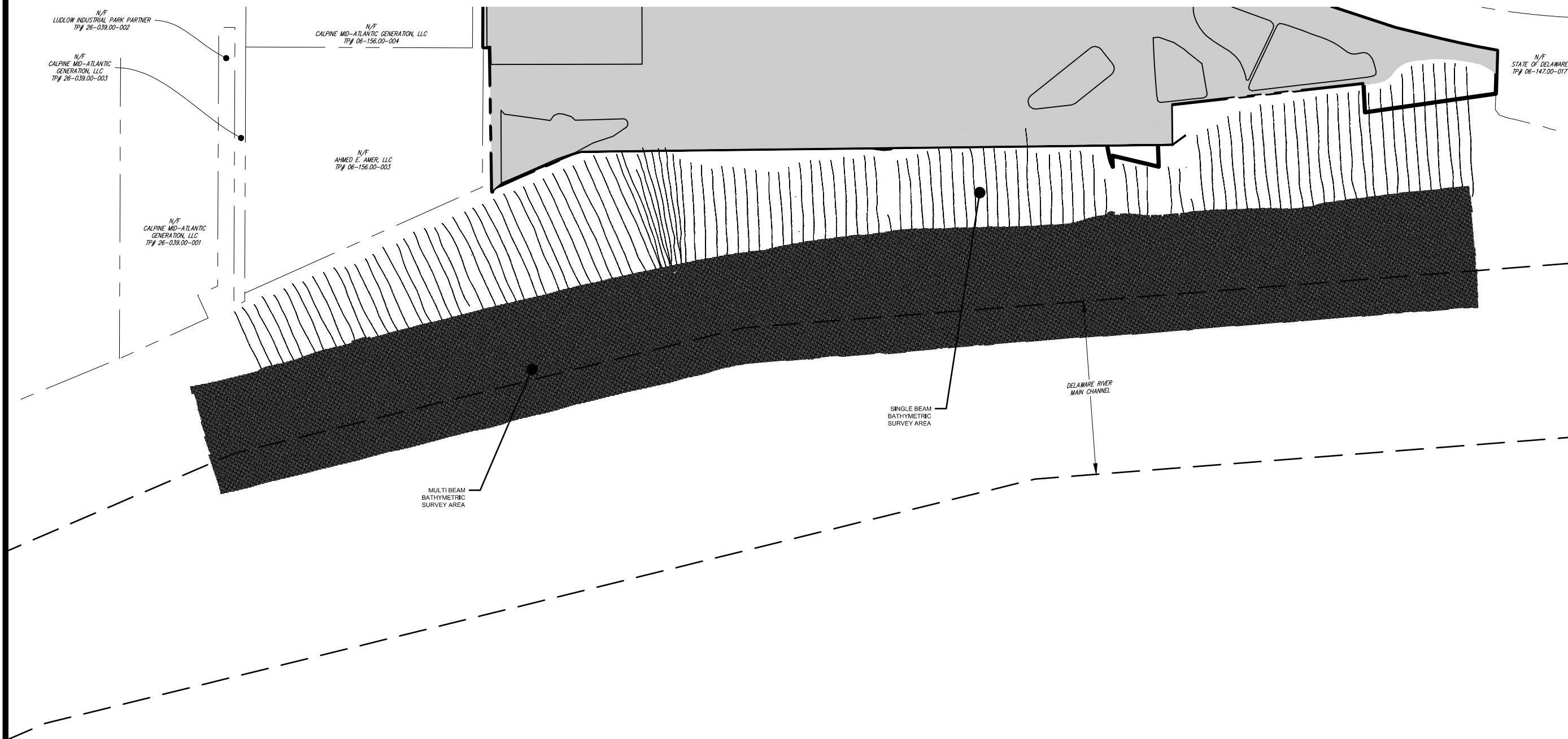
PERMIT PLAN
ESSENTIAL FISH HABITAT SURVEY
PORT OF WILMINGTON EDGE MOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 500'

PROJECT NO.
11139.LH

SHEET:
14 OF 17



NOTE:
BATHYMETRIC SOUNDING PERFORMED BY GAHAGAN & BRYANT ASSOCIATES IN JULY, 2018 WITH
SINGLE BEAM AND MULTIBEAM SURVEY IN GENERAL ACCORDANCE WITH EM 1110-Z-1003.

DUFFIELD ASSOCIATES
Soil, Water & the Environment

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E-MAIL: DUFFIELD@DUFFNET.COM

DESIGNED BY:	MRB
DRAWN BY:	KJT
CHECKED BY:	BJD
FILE:	PRMT-Bath-11139LH.dwg

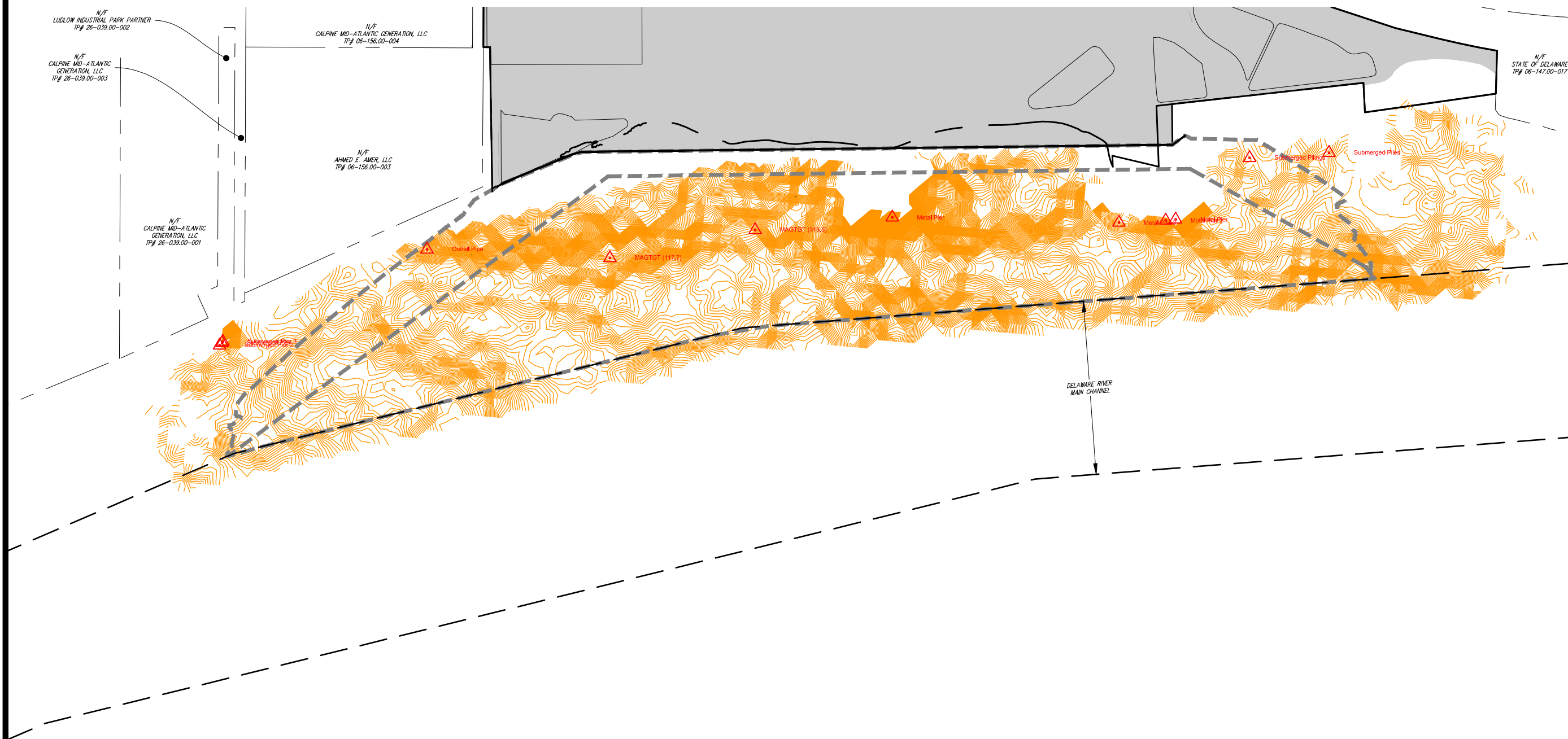
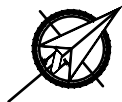
PERMIT PLAN
BATHYMETRIC SURVEY
PORT OF WILMINGTON EDGE MOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 500'

PROJECT NO.
11139.LH

SHEET:
15 OF 17



NOTE
MAGNETOMETER READINGS OF THE PROJECT SETUP PERFORMED BY
GAHAGAN & BRYANT ASSOCIATES IN JULY 2018. INTERPRETATION OF
DATA PROVIDED IN R.C. GOODWIN CULTURAL RESOURCES REPORT.



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E-MAIL: DUFFIELD@DUFFNET.COM

DESIGNED BY:	MRB
DRAWN BY:	MH
CHECKED BY:	BJD
FILE:	PRMT-MAG-11139LH.dwg

PERMIT PLAN
MAGNETOMETER CONTOUR MAPPING

PORT OF WILMINGTON EDGE MOOR EXPANSION

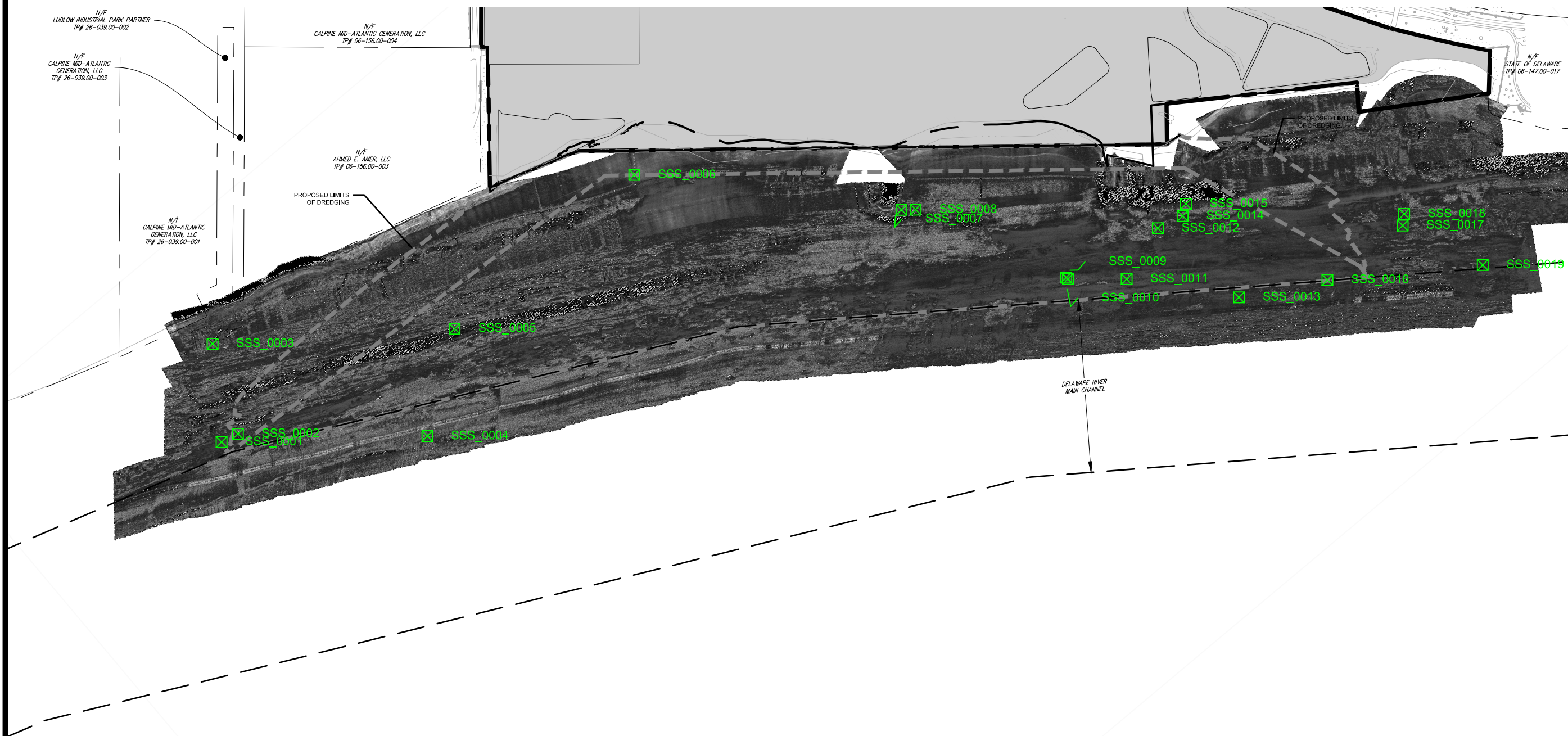
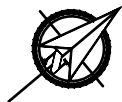
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
OCTOBER 2019

SCALE:
1" = 500'

PROJECT NO.
11139.LH

SHEET:
16 OF 17



NOTE
SIDE SCAN SONAR SOUNDING PERFORMED BY GAHAGAN & BRYANT
ASSOCIATES IN JULY, 2018. INTERPRETATION OF DATA PROVIDED IN
R.C. GOODWIN CULTURAL AND NATURAL RESOURCES REPORT.

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DESIGNED BY:	MRB
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CHECKED BY:	BJD
FILE:	PRMT-SSS-11139LH.dwg

PERMIT PLAN
SIDE SCAN SONAR
PORT OF WILMINGTON EDGE MOOR EXPANSION
BRANDYWINE HUNDRED ~ NEW CASTLE COUNTY ~ DELAWARE

DATE:
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SHEET:
17 OF 17