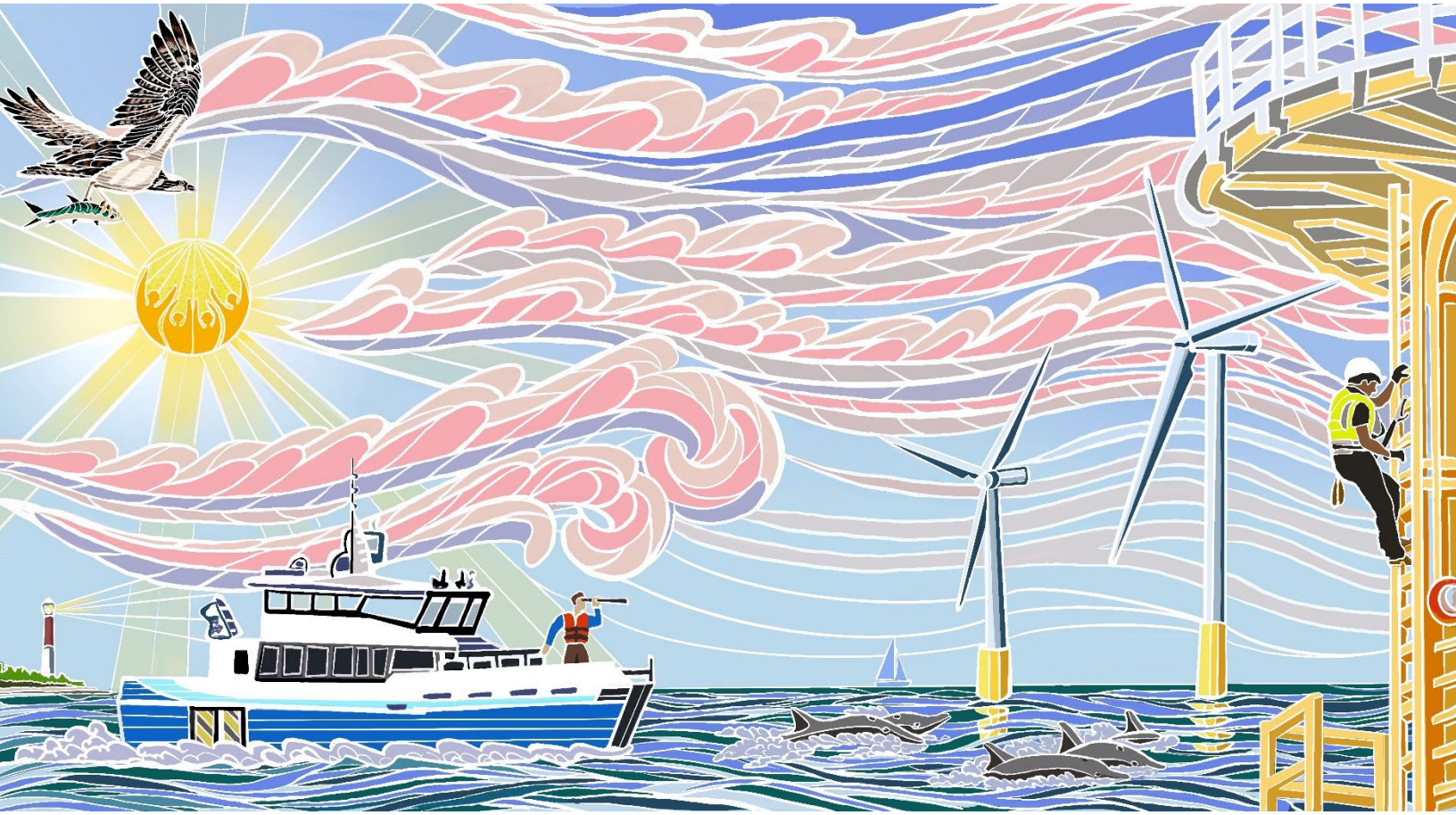

Appendix II-J1

Essential Fish Habitat (EFH) Technical Report

March 2024

Note: Atlantic Shores has updated the Project Design Envelope to include the following landfall sites: Monmouth Landfall Site, Asbury Landfall Site, Kingsley Landfall Site, Lemon Creek Landfall Site, Wolfe's Pond Landfall Site, and Fort Hamilton Landfall Site. The information included in this report demonstrates the completeness of Atlantic Shores' multi-year development efforts and should be considered representative for the Project. For additional information regarding the layout of the Project, please refer to COP Volume I Project Information, Sections 1.0 Introduction and 4.7 Landfall Sites, as well as Figure 1.1-2 Project Overview.

Essential Fish Habitat Technical Report

Atlantic Shores Offshore Wind North

Prepared for:

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7th Floor
Brooklyn, NY 11205
www.atlanticshoreswind.com

Prepared by:

Environmental Design & Research,
Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000
Syracuse, New York 13202
P: 315.471.0688
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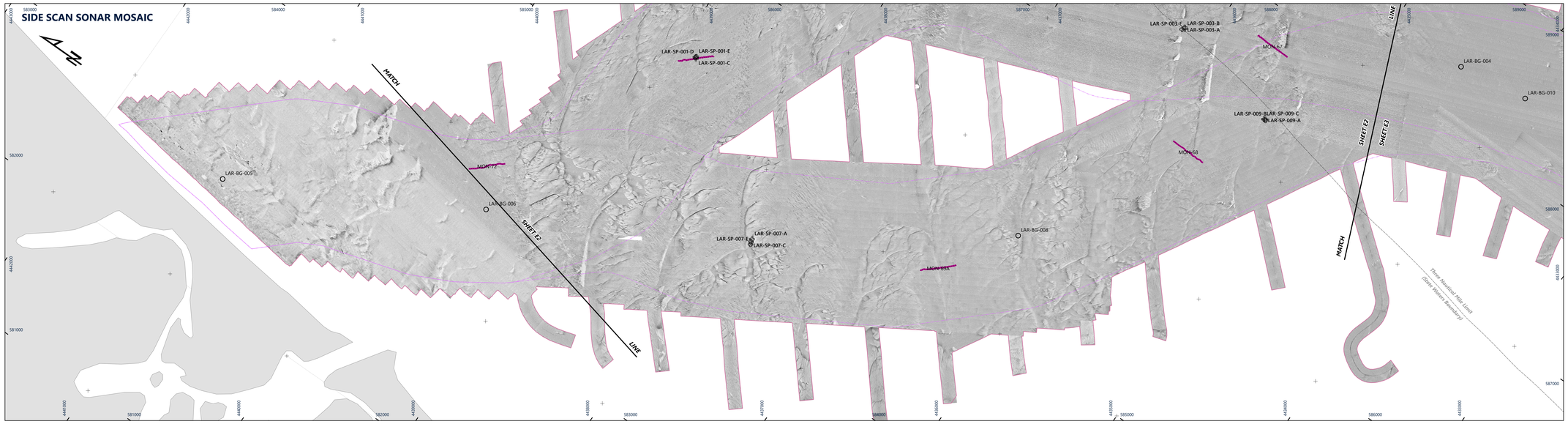
www.edrdpc.com

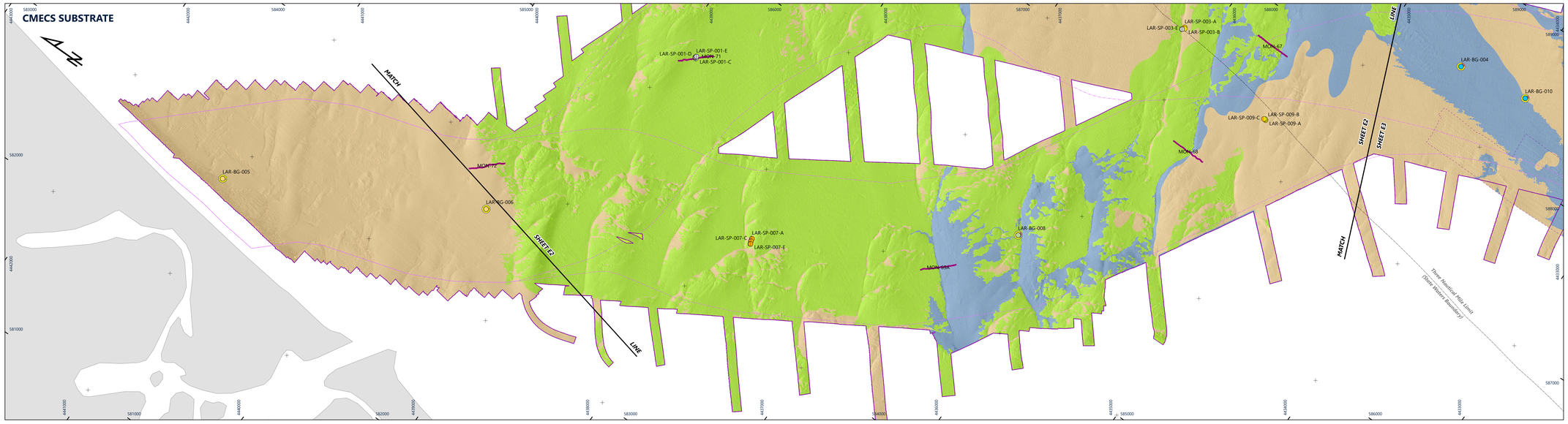
March 2024

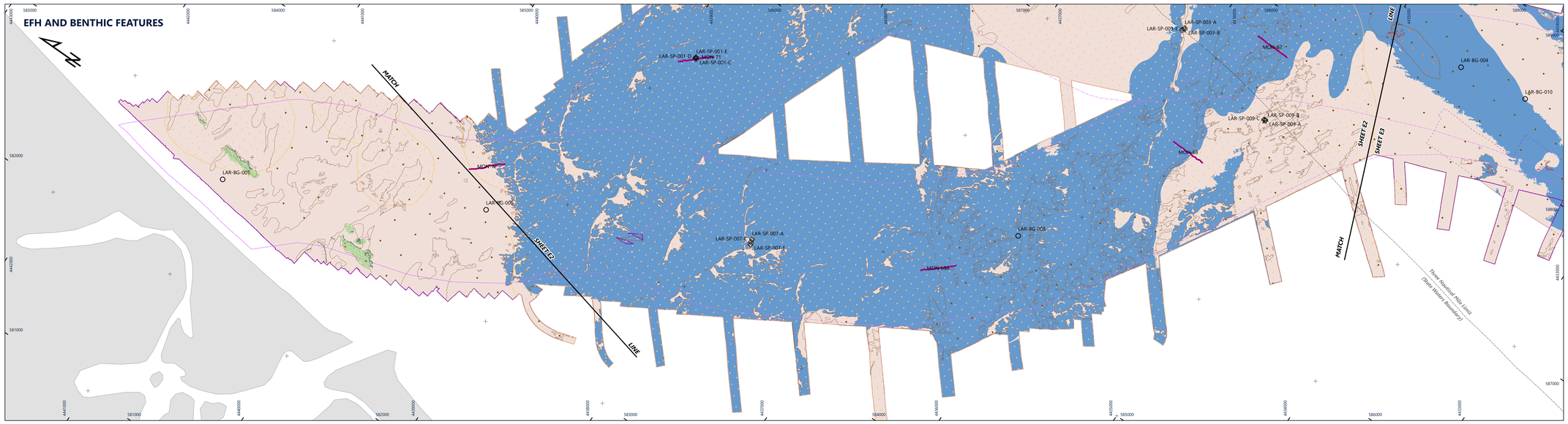
Attachment 3

Benthic Habitat Maps – 1:10,000 Scale

Monmouth Export Cable Corridor – North







ATLANTIC SHORES offshore wind

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MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW JERSEY

NORTH MONMOUTH EXPORT CABLE CORRIDOR BENTHIC HABITAT CHART

2021 | Appendix E: Benthic Technical Memo | Chart No. E1

FUGRO USA MARINE, INC.
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Houston, Texas 77081
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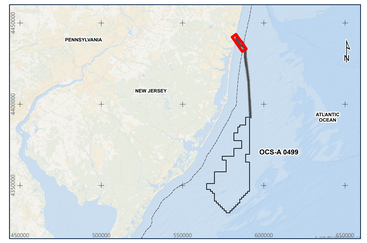

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CMECS SUBSTRATE

SPI-PV SAMPLE LOCATIONS (Fugro, 2020)

CMECS Substrate Group and Substrate Subgroup

- Gravel Mixes,Sandy Gravel
- Gravels,Pebble/Granule
- Gravelly,Pebble/Granule
- Gravelly,Gravelly Sand
- Sand,Gravelly Sand
- Sand,Very Coarse/Coarse Sand
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GRAB SAMPLE LOCATIONS (Terrasond, 2019 and Fugro, 2020)

Wentworth Grain Size Composition
Center symbol displays CMECS substrate classification

- Gravel (%)
- Sand (%)
- Mud (%)

Hybrid CMECS Substrate / Simplified-Folk Sediment Classification (Fugro, 2020)

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- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand

CMECS SUBSTRATES

Substrate interpretation overlain by shaded relief sun illumination model (azimuth 315 degrees, z factor 1, and 70% transparency).

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- Towed Video Transect (RPS, 2021)

SIDE SCAN SONAR MOSAIC

High
Relative Reflectivity
Low

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic feature layers indicate multiple benthic features are present

BENTHIC FEATURES

- Scarp
- Interbedded Surficial Sediments
- Localized Relief Features (LRFs)
- Sand Ridge Crests
- Sand Waves
- Mega Ripples
- Ripples

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogenous Complex
- Soft

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram

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Vessel(s):
R/V *Fugro Enterprise*, M/V *Fugro Brasilia*, DSV *Splash*, R/V *Shearwater*

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(*Fugro Enterprise*) Fugro StarPack Navigation Satellite System; (*Fugro Brasilia*) Kongsberg Seapath 380 Navigation Satellite System

Multibeam System:
Kongsberg EM2040 MBES for all Vessels

Side Scan Sonar
EdgeTech 4205 SSS (300/600) kHz frequencies) for all Vessels

USBL System
Kongsberg HiPAP 502 USBL system for all Vessels

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Salish Grab Standard SG-20 sampler 0.10 m2

Towed Video (2021)
(R/V *Shearwater*) Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,00m E
False Northing	0m N
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch E page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	11/25/2021	DRAFT - For Review	MB	DD	DD
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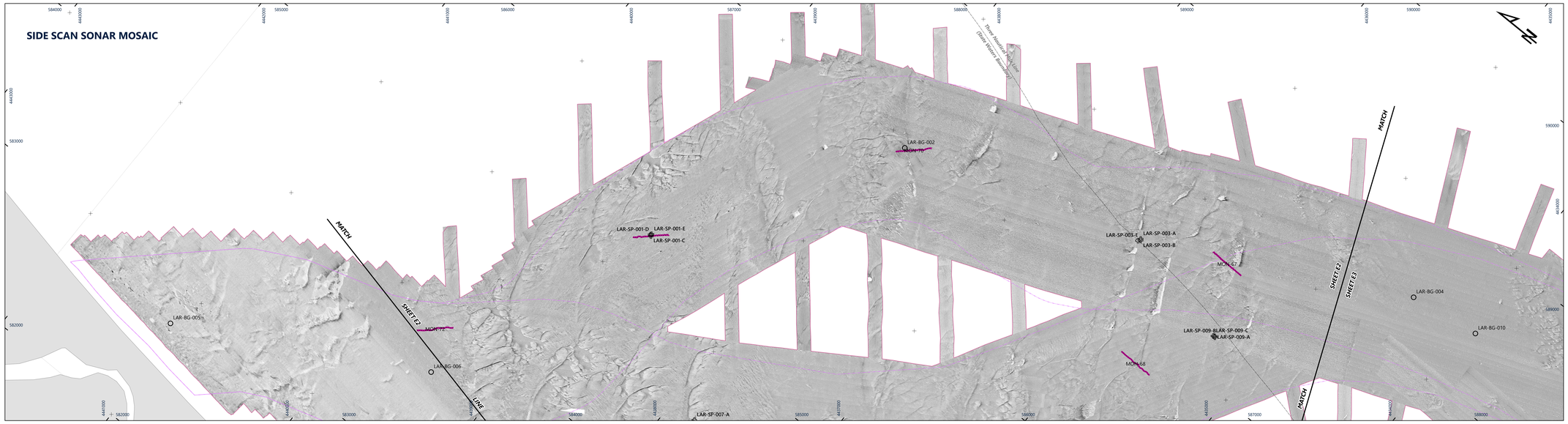

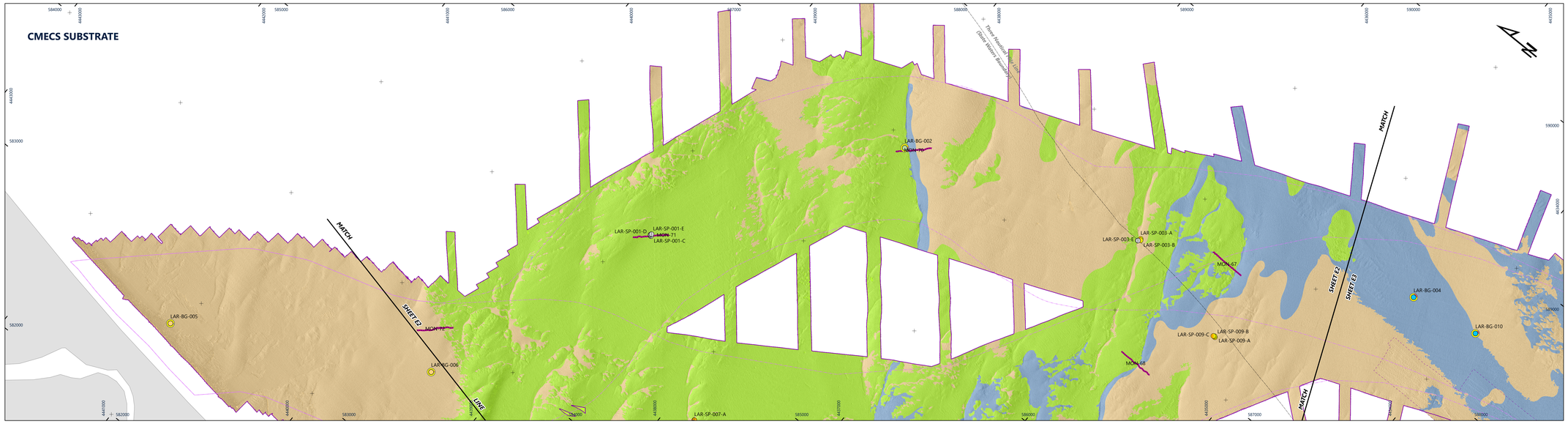

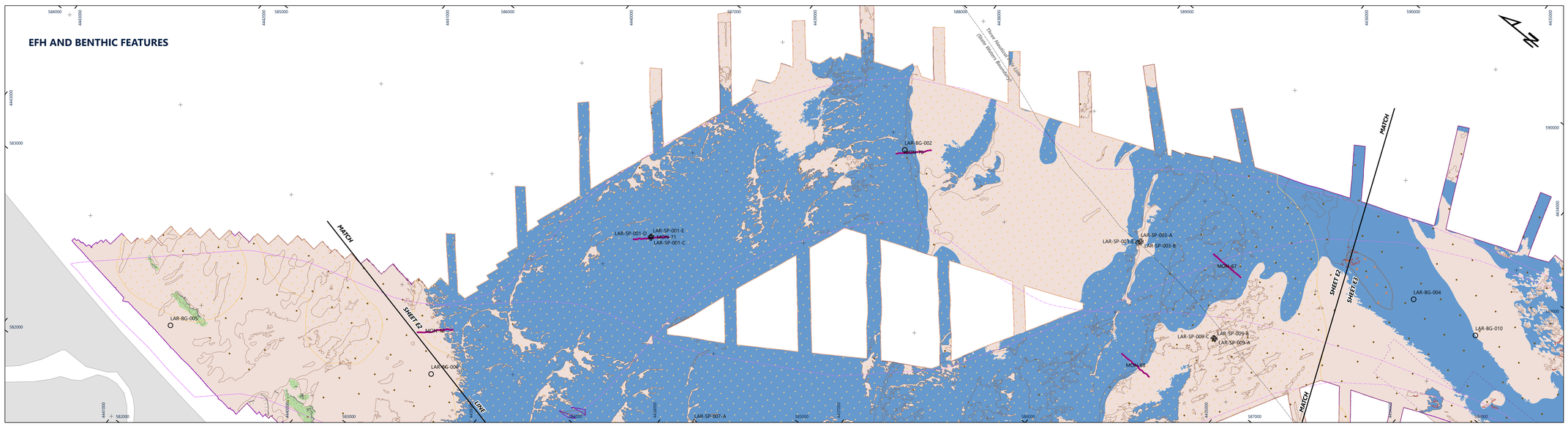

ATLANTIC SHORES offshore wind

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MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW JERSEY

NORTH MONMOUTH EXPORT CABLE BENTHIC HABITAT CHART

2021 | Appendix E: Benthic Technical Memo | Chart No. E2

FUGRO USA MARINE, INC.
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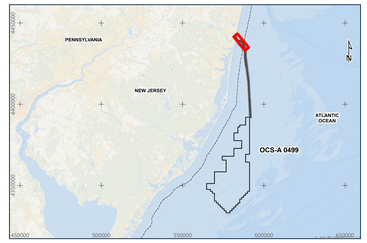

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CMECS SUBSTRATE

SPI-PV SAMPLE LOCATIONS (Fugro, 2020)

CMECS Substrate Group and Substrate Subgroup

- Gravel Mixes,Sandy Gravel
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- Gravelly,Pebble/Granule
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SIDE SCAN SONAR MOSAIC

High — Relative Reflectivity — Low

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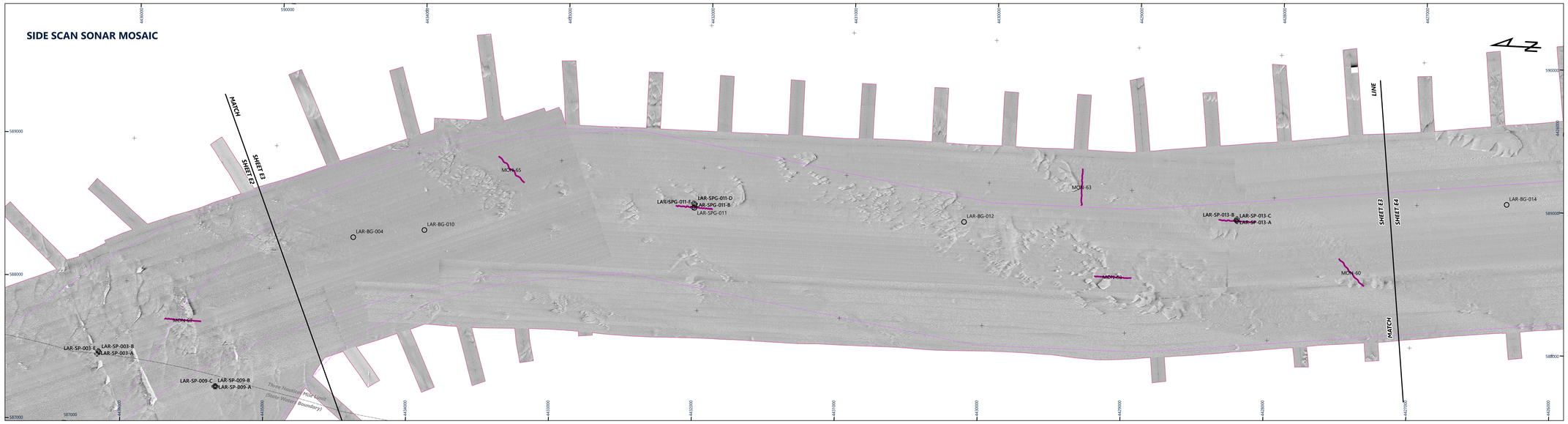
02.20030011	20030011_Shell_Monmouth_ECC_E2_Benthic_Alignment_Sheet	E2

SIDE SCAN SONAR MOSAIC



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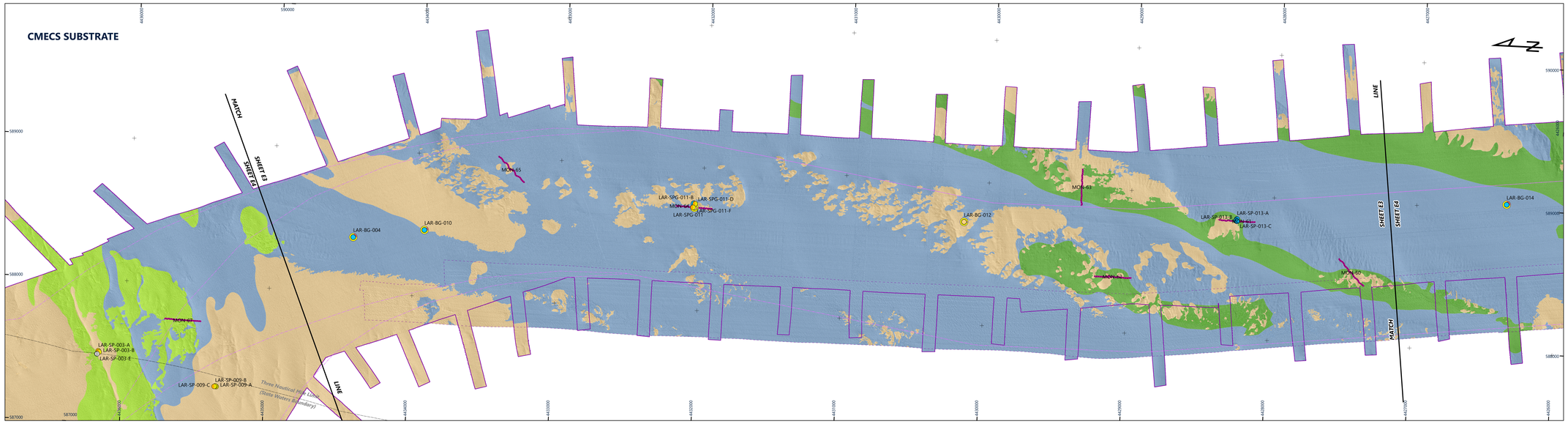
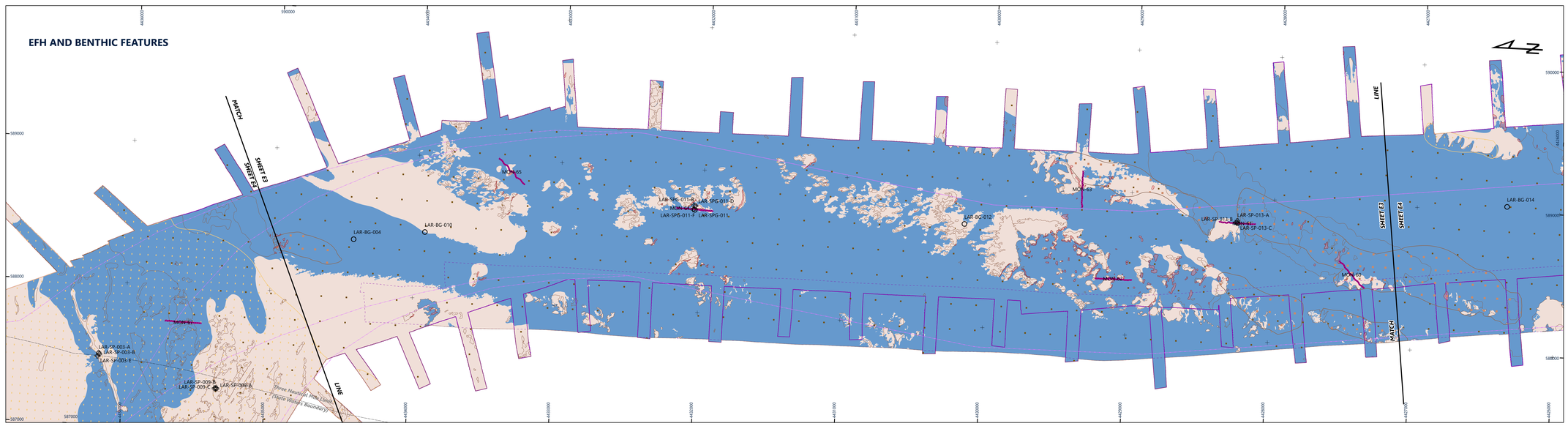


EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

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NORTH MONMOUTH EXPORT CABLE CORRIDOR BENTHIC HABITAT CHART

2021 Appendix E: Benthic Technical Memo Chart No. E3

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
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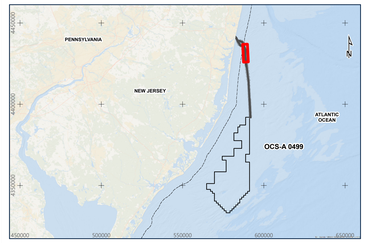

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Project No:	Chart Name:	Chart No:
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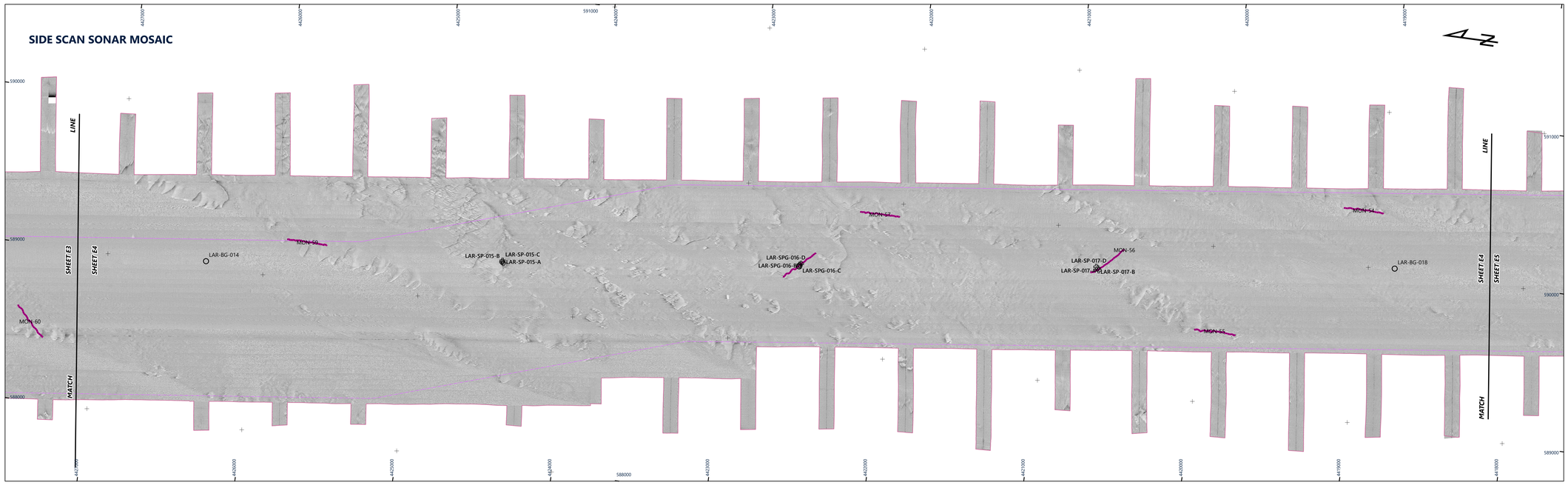
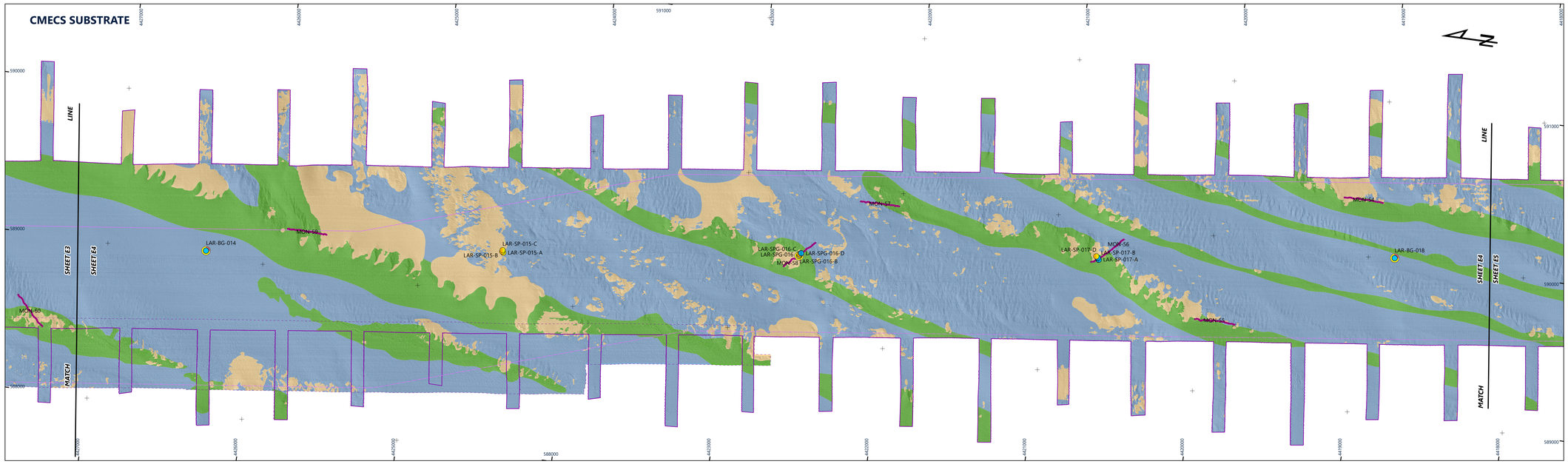
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATE



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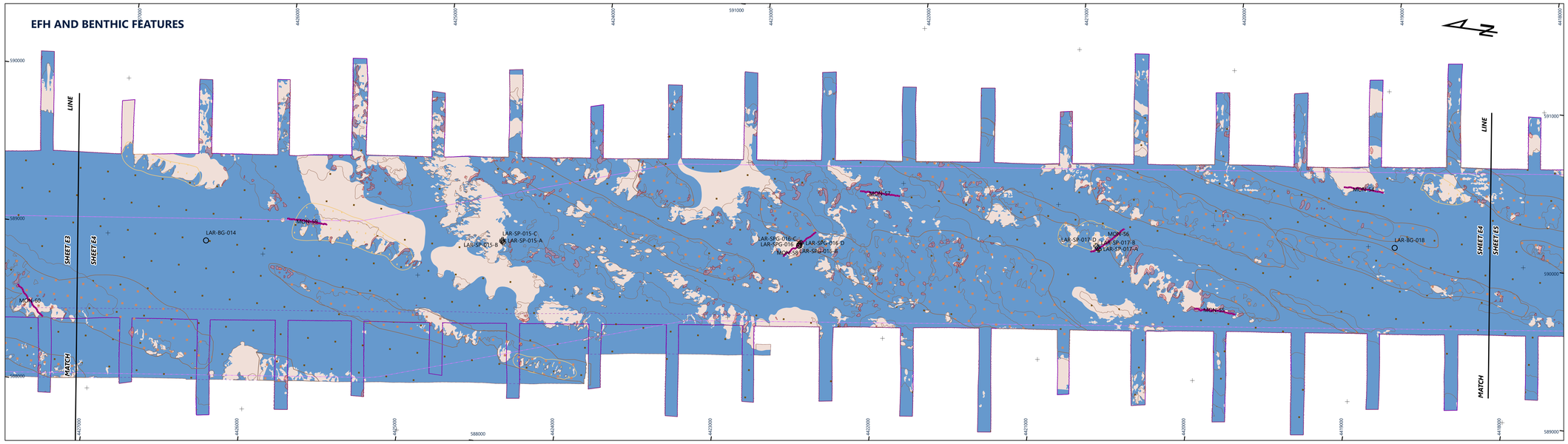

ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW JERSEY

NORTH MONMOUTH EXPORT CABLE CORRIDOR BENTHIC HABITAT CHART

2021 Appendix E: Benthic Technical Memo Chart No. E4

FUGRO USA MARINE, INC.
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Houston, Texas 77081
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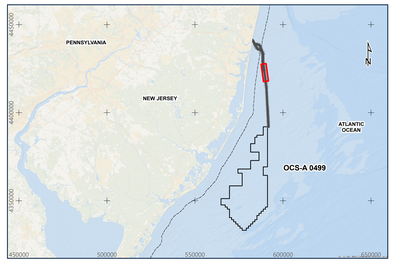

LEGEND

SURVEY EXTENTS

- Monmouth Export Cable Corridor Extent
- North Monmouth Export Cable Corridor MBES Data Extent (2020)
- North Monmouth Export Cable Corridor MBES Data Extent (2021)

CMECS SUBSTRATE

SPI-PV SAMPLE LOCATIONS (Fugro, 2020)

CMECS Substrate Group and Substrate Subgroup

- Gravel Mixes,Sandy Gravel
- Gravels,Pebble/Granule
- Gravelly,Pebble/Granule
- Gravelly,Gravelly Sand
- Sand,Gravelly Sand
- Sand,Very Coarse/Coarse Sand
- Sand,Medium Sand
- Sand,Fine/Very Fine Sand

GRAB SAMPLE LOCATIONS (Terrasond, 2019 and Fugro, 2020)

Wentworth Grain Size Composition
Center symbol displays CMECS substrate classification

- Gravel (%)
- Sand (%)
- Mud (%)

Hybrid CMECS Substrate / Simplified-Folk Sediment Classification (Fugro, 2020)

- Gravel
- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand

CMECS SUBSTRATES

Substrate interpretation overlain by shaded relief sun illumination model (azimuth 315 degrees, z factor 1, and 70% transparency).

- Gravel
- Gravelly
- Gravelly Sand
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BENTHIC SAMPLING LOCATIONS

Benthic samples were taken from several surveys conducted in 2019 thru 2021 by various contractors.

- Benthic Grab (Terrasond, 2019)
- Benthic GrabCam (Fugro, 2020)
- SPI-PV Image (Fugro, 2020)
- Towed Video Transect (RPS, 2021)

SIDE SCAN SONAR MOSAIC

High
Relative Reflectivity
Low

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic feature layers indicate multiple benthic features are present

BENTHIC FEATURES

- Scarp
- Interbedded Surficial Sediments
- Localized Relief Features (LRFs)
- Sand Ridge Crests
- Sand Waves
- Mega Ripples
- Ripples

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogenous Complex
- Soft

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram

NOTES

1) Survey data were acquired in geographic coordinates relative to the World Geodetic System 1984 (WGS84) datum. Data were then converted to North American Datum 1983 (NAD83) and projected to the Universal Transverse Mercator Zone 18 North (UTM Zone 18N) projection.
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Multibeam System:
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Side Scan Sonar
EdgeTech 4205 SSS (300/600) kHz frequencies) for all Vessels

USBL System
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Sediment Grab (2019):
Saltah Grab Standard SG-20 sampler 0.10 m2

Towed Video (2021)
(R/V *Shearwater*) Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,00m E
False Northing	0m N
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch E page size

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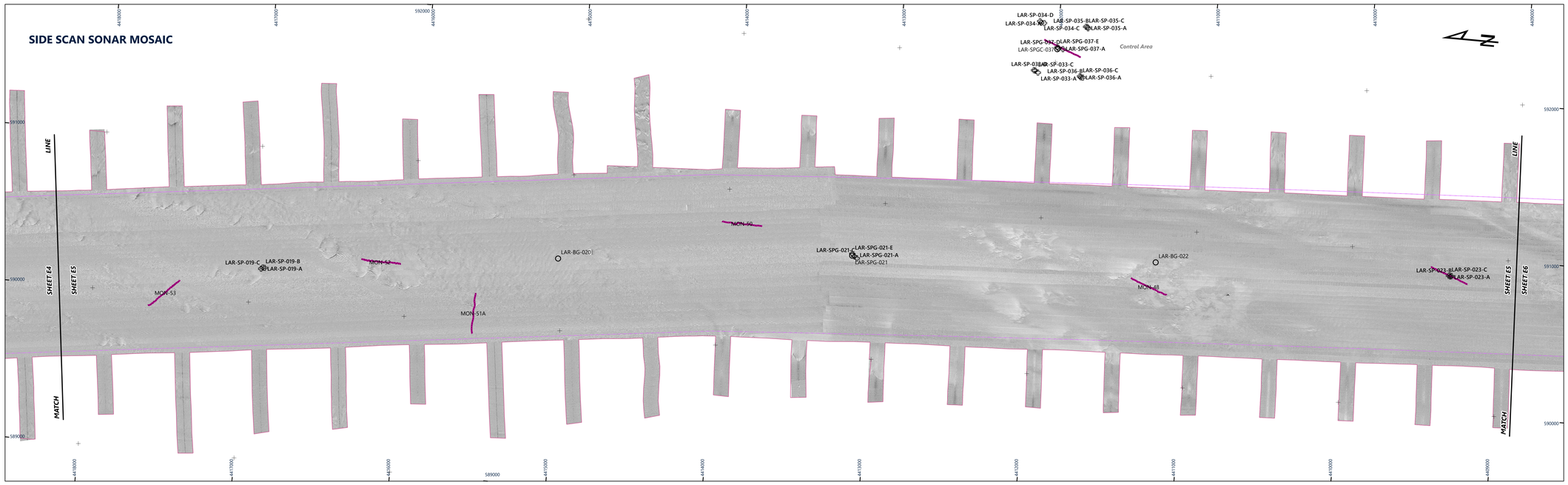
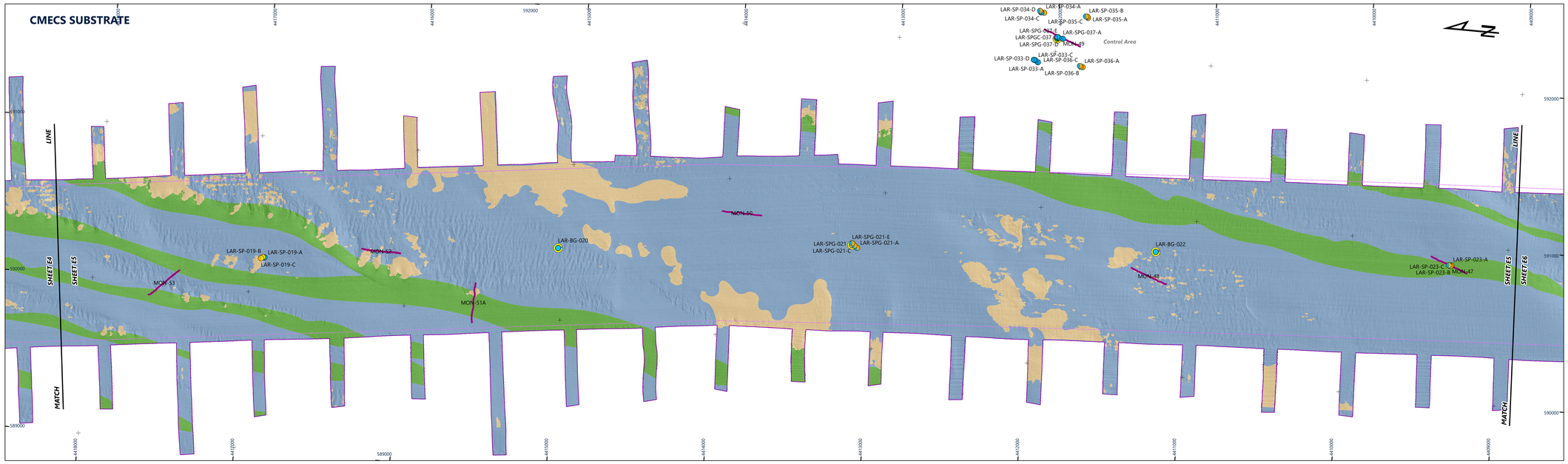
Project No:	Chart Name:	Chart No:
02.20030011	20030011_Shell_Monmouth_ECC_E4_Benthic_Alignment_Sheet	E4

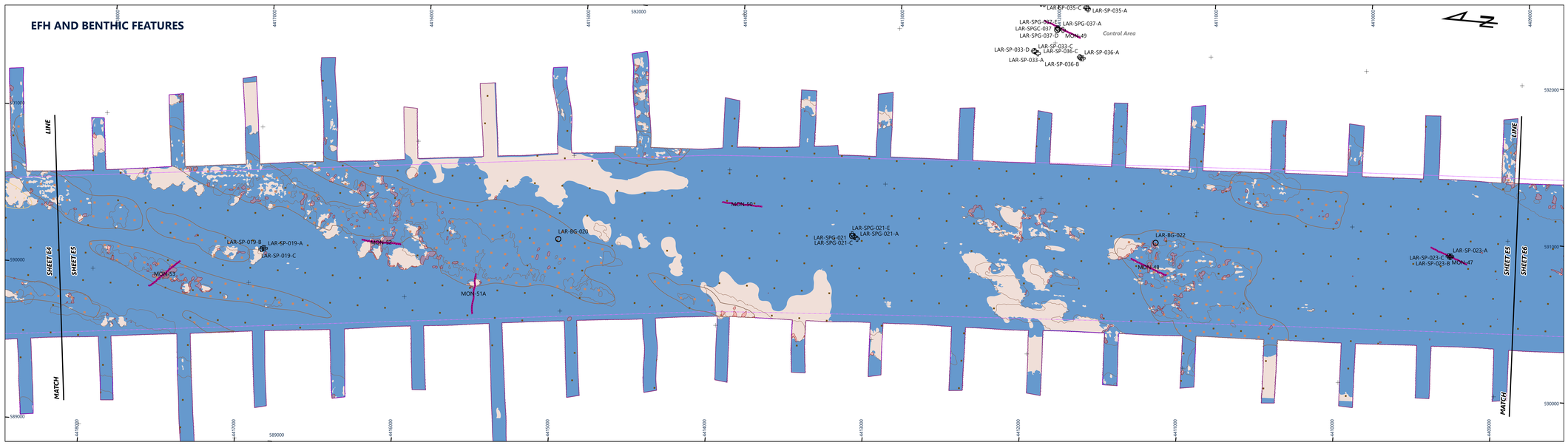
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATE



EFH AND BENTHIC FEATURES



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NORTH MONMOUTH EXPORT CABLE CORRIDOR BENTHIC HABITAT CHARTS

2021 | Appendix E: Benthic Technical Memo | Chart No. E5

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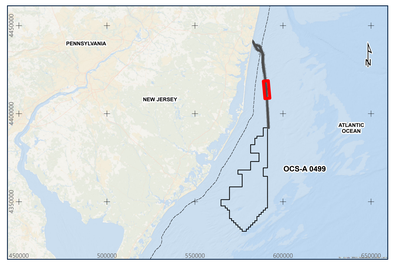

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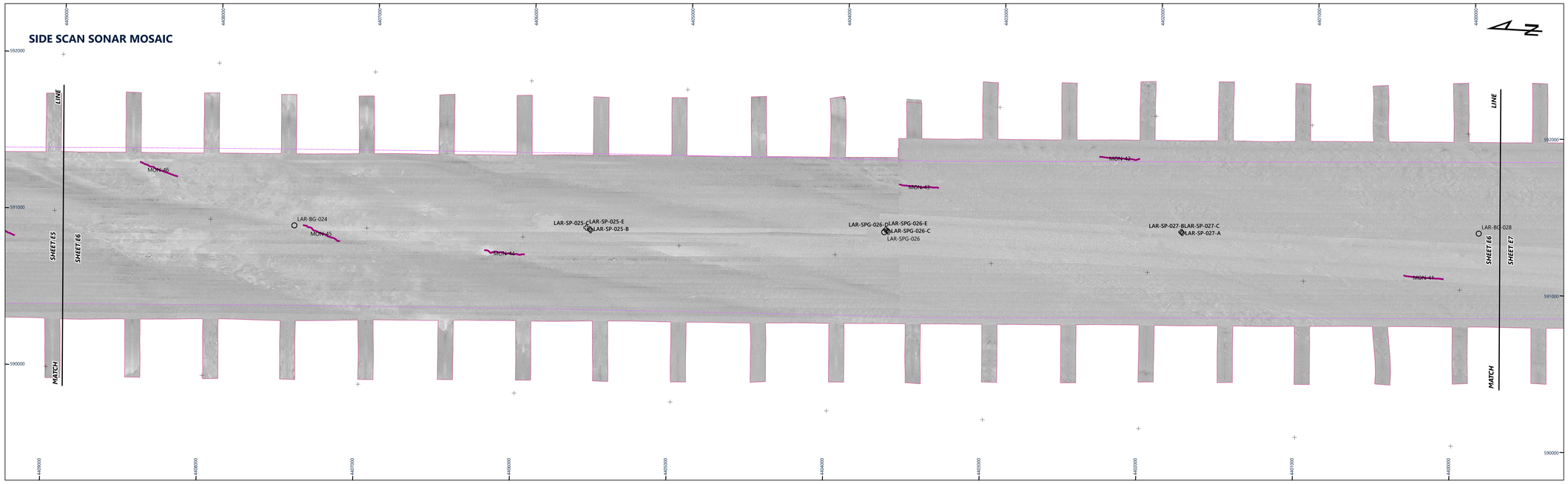
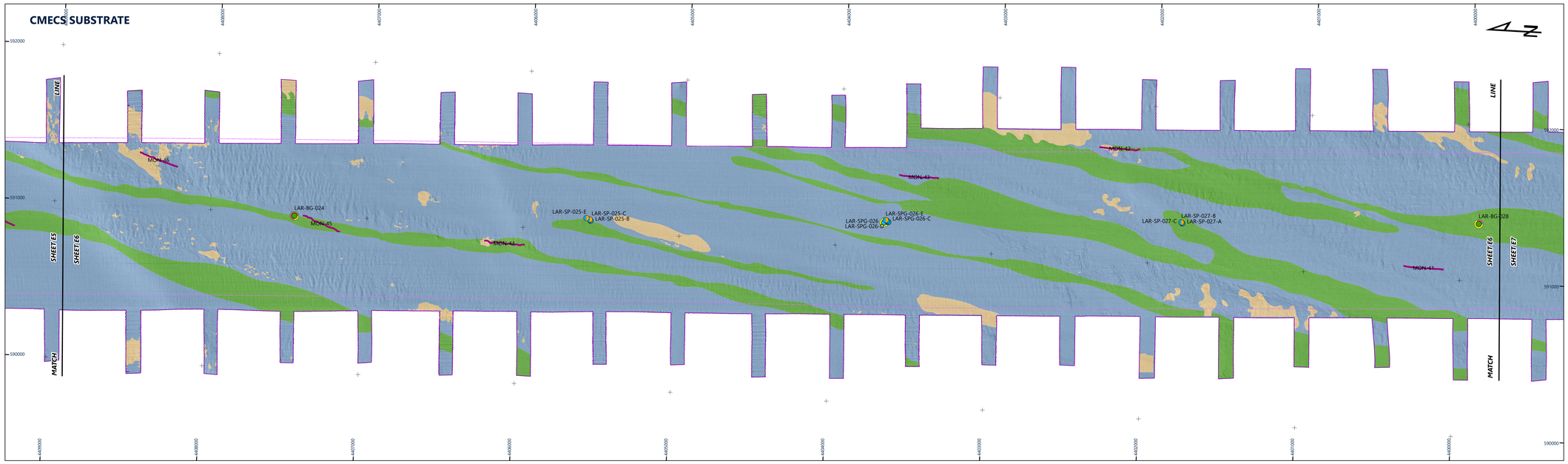
02.20030011	20030011_Shell_Monmouth_ECC_E5_Benthic_Alignment_Sheet	E5

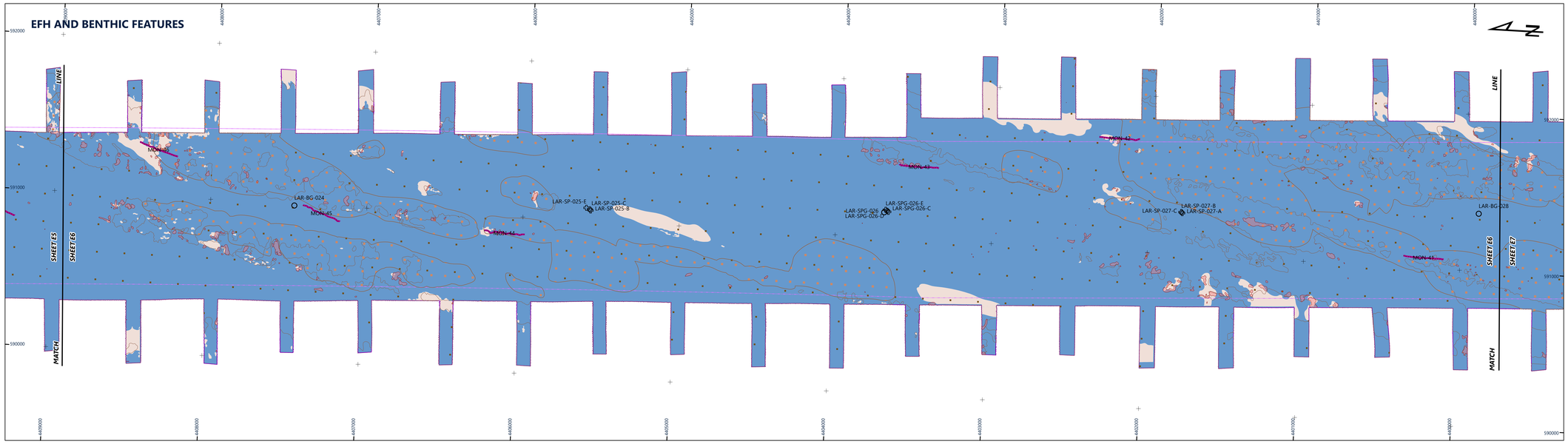
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATE



EFH AND BENTHIC FEATURES



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NORTH MONMOUTH EXPORT CABLE CORRIDOR BENTHIC HABITAT CHART

2021 Appendix E: Benthic Technical Memo Chart No. E6

FUGRO USA MARINE, INC.
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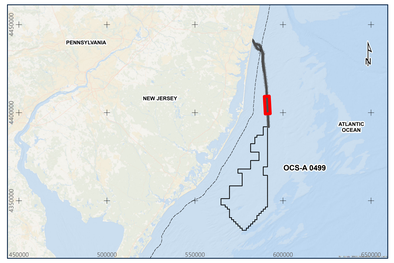

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CMECS SUBSTRATE

SPI-PV SAMPLE LOCATIONS (Fugro, 2020)

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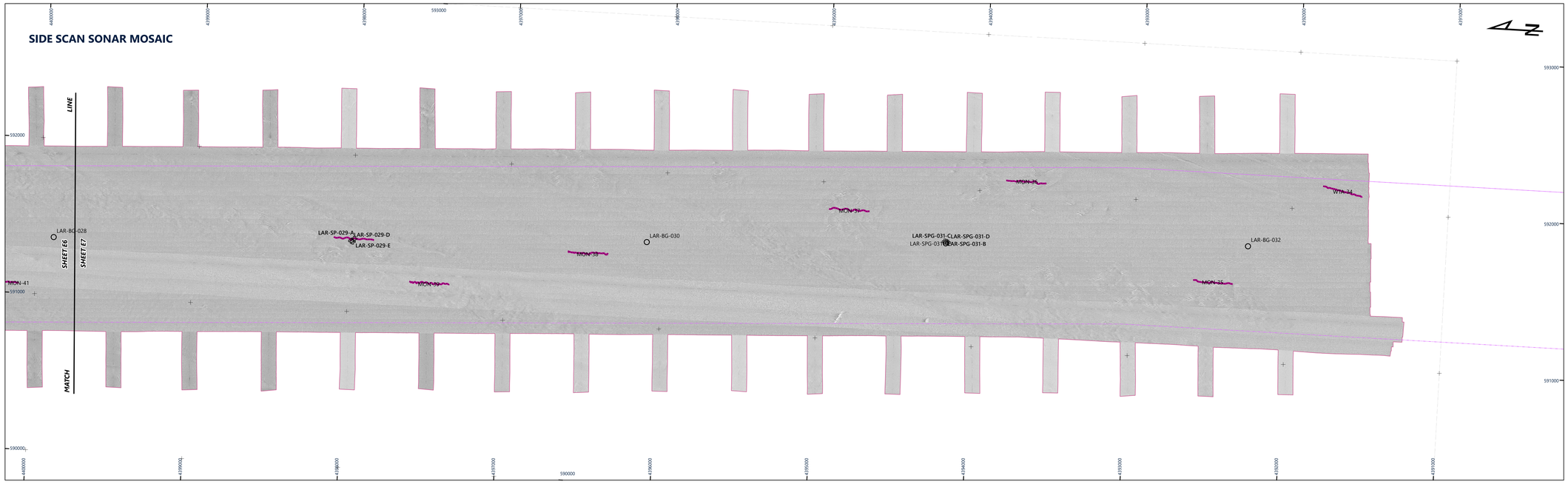

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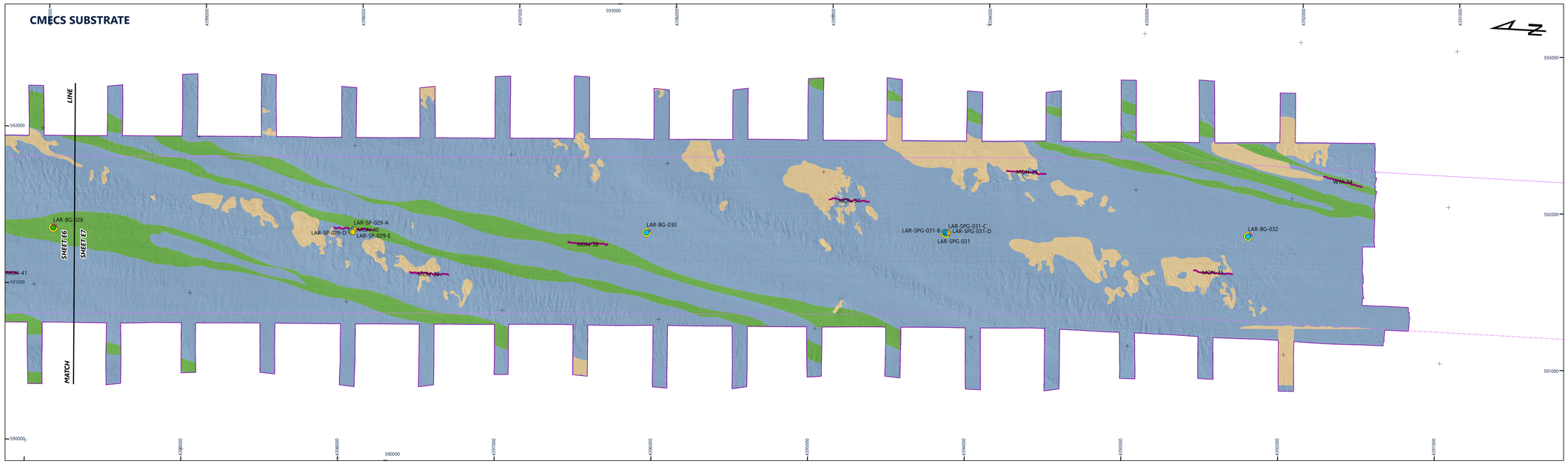

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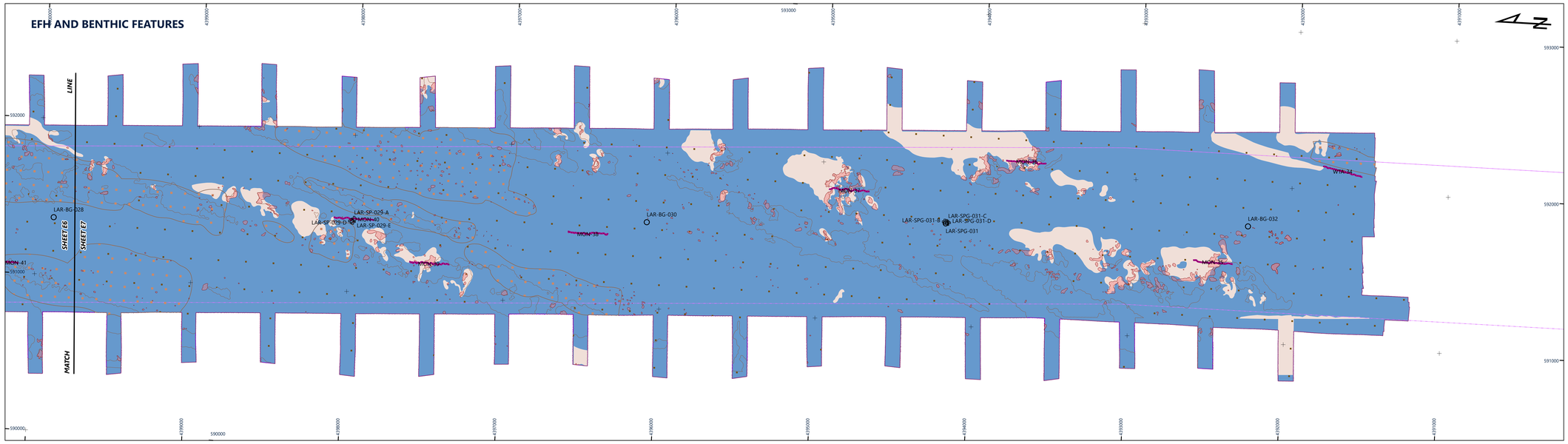

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2021 Appendix E: Benthic Technical Memo Chart No. E7

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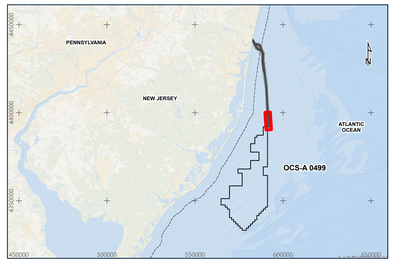

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- Interbedded Surficial Sediments
- Localized Relief Features (LRFs)
- Sand Ridge Crests
- Sand Waves
- Mega Ripples
- Ripples

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogenous Complex
- Soft

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram

NOTES

1) Survey data were acquired in geographic coordinates relative to the World Geodetic System 1984 (WGS84) datum. Data were then converted to North American Datum 1983 (NAD83) and projected to the Universal Transverse Mercator Zone 18 North (UTM Zone 18N) projection.

2) Fugro collected (non-continuously) geophysical and geotechnical data in the North Monmouth ECC from June 1, 2020 to June 19, 2021.

3) Reported lease block information is based on Fugro's GIS database.

4) Maritime Boundaries are provided by NOAA Nautical Charts (2019). Federal/State Boundaries are provided by BOEM Digital Offshore Cadastre (DOC), Atlantic83, Submerged Lands Act (SLA) Boundary.

5) Interpretation is based on collected seafloor geophysical data (SSS, MBES bathymetry and backscatter) and ground truth sampling results. CMECS substrate, EFH, and benthic features interpretation clipped to MBES bathymetry (2021) data extent.

6) EFH habitat delineations and characterization of benthic features charted here are in reference to NMFS' letter to BOEM dated March 29, 2021 regarding "Updated Recommendations for Mapping Fish Habitat".

7) Mobile sediment areas are mapped within the Cable Burial Risk Assessment (CBRA). Refer to Fugro MSIR, Vol. 4, 2021m.

8) No large grained complex habitats were delineated within the survey area.

9) Neither vegetated habitats nor submerged aquatic vegetation (SAV) has been charted in the survey area.

10) Biotic classification (NMFS Modified CMECS) of grab samples (Terrasond, 2019 and Fugro, 2020), GrabCam video (Fugro, 2020), and towed video transects (RPS, 2021) are reported in the COP Volume II - Affected Environment. SPI-PV biotic classification is reported in Fugro MSIR (2021, Vol. 1), Appendix G.

EQUIPMENT

Vessel(s):
R/V *Fugro Enterprise*, M/V *Fugro Brasilis*, DSV *Splash*, R/V *Shearwater*

Navigation System GPS Primary:
(*Fugro Enterprise*) Fugro StarPack Navigation Satellite System; (*Fugro Brasilis*) Kongsberg Seapath 380 Navigation Satellite System

Multibeam System:
Kongsberg EM2040 MBES for all Vessels

Side Scan Sonar
EdgeTech 4205 SSS (300/600) kHz frequencies) for all Vessels

USBL System
Kongsberg HPAP 502 USBL system for all Vessels

SPI-PV (2020)
Ocean Imaging System (OIS) 3731-D REMOTS digital sediment profiling camera with DSC 24000 plan view camera

GrabCam (2020)
Ted Young-Modified Van Veen Grab dual 0.04 m2 bucket sampler equipped with Fugro's real-time GrabCam HD video system

Sediment Grab (2019)
Salish Grab Standard SG-20 sampler 0.10 m2

Towed Video (2021)
(R/V *Shearwater*) Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,00m E
False Northing	0m N
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch E page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	11/25/2021	DRAFT - For Review	MB	DD	DD
02	12/08/2021	Rev00	MB	DD	DD

Project No:	Chart Name:	Chart No:
02.20030011	20030011_Shell_Monmouth_ECC_E7_Benthic_Alignment_Sheet	E7