APPENDIX B –

WETLANDS AND WATERS DELINEATION

REPORTS

Wetlands and Waters Delineation Report

Prepared for the

NASA WFF Wallops Pier

Wallops Island, Virginia

Prepared for

National Aeronautics and Space Administration
Wallops Flight Facility
32400 Fulton St.
Wallops Island, VA 23337

Prepared by

4840 Cox Road
Glen Allen, VA 23060

October 29, 2020

Table of Contents

APPENDICES

1.0 SITE DESCRIPTION

1.1 Introduction

The National Aeronautics and Space Administration (NASA) Wallops Flight Facility (WFF) has proposed infrastructure developments on the north end of Wallops Island (Study Area). These developments constitute a new Intermodal Facility at Wallops Island and could include: construction and operation of a Wallops Island Pier Area in proximity to the Mid-Atlantic Regional Spaceport (MARS) Unmanned Aerial Systems (UAS) airstrip; construction of a second hangar at the UAS airstrip; addition of potable and waste water lines to the hangars; addition of airstrip lighting; improvements to the airstrip access road including doubling of the existing culvert and construction of a 20-30 vehicle parking lot; and construction of a project support building at the entrance of the access road to the airstrip. According to the United States Maritime Administration (MARAD), this project has the potential to grow existing site capabilities at Wallops Island; enhance science, technology, engineering, and mathematics (STEM) research opportunities; and spur high-tech/high-paying jobs in a predominately rural area.

The Study Area is located on Wallops Island in Accomack County, Virginia, east of Atlantic Road (route 679), north of Causeway Road (route 803), and south of Chincoteague Island, and can be accessed from North Seawall Road. The approximate 14-acre Study Area location is depicted in **Appendix A, Figures 1 and 2**.

1.2 Topography and Geology

The United States (US) Geological Survey (USGS) Quadrangle map for Chincoteague West, VA (2019) depicts the Study Area with a mix of generally flat non-vegetated areas and vegetated submerged swamps. Upland elevations range from 5 feet above mean sea level (amsl) to 0 feet amsl (**Figure 1**). Aerial imagery (**Figure 2**) depicts similar environments as the USGS Quadrangle map, but also shows paved roads, maintained shoulders, and a runway.

The Study Area occurs in the Atlantic and Gulf Coastal Plain (USACE, 2010); more specifically, the United States Department of Agriculture (USDA) National Resources Conservation Services (NRCS) Major Land Resource Area (MLRA) Northern Tidewater Area (153D) subregion of Land Resource Region (LRR) T. The topography of the Atlantic and Gulf Coastal Plain region ranges from level to hilly terrain and is composed mainly of sedimentary rocks and alluvial sediments (USACE, 2010).

1.3 Soils

USDA NRCS Web Soil Survey (WSS) indicates the Study Area is predominately underlain by hydric soils. The following hydric soils can be found within the Study Area: Camocca fine sand along the runway, Chincoteague silt loam south and north of the runway, and Fisherman-Camocca complex by the hangar (USDA NRCS, 2020). The USDA NRCS WSS indicates that Fisherman-Assateague complex, a non-hydric soil, occurs north of the Study Area (USDA NRCS, 2020). Hydric soil percentages are shown in **Figure 3** and summarized in **Table 1**.

Table 1: USDA NRCS Web Soil Survey Map Units

CaA	Camocca fine sand, 0 to 2 percent slopes, frequently flooded	97	53.4
ChA	Chincoteague silt loan, 0 to 1 percent slopes, very frequently flooded	100	14.0
FmD	Fisherman-Assateague complex, 0 to 35 percent slopes, rarely flooded	5	16.9
FrB	Fisherman-Camocca complex, 0 to 6 percent slopes, frequently flooded	42	4.2
W	Water	0	11.5

* The hydric rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

1.4 NWI Wetlands

The United States Fish and Wildlife Service (USFWS) is the principal U.S. Federal agency tasked with providing information to the public on the status and trends of our Nation's wetlands. The National Wetland Inventory (NWI) is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of U.S. wetlands. The USFWS-NWI mapper was used to assess the possibility of wetlands occurring within the Study Area (USFWS, 2020). NWI mapping identified one estuarine intertidal emergent persistent regularly flooded wetland (E2EM1N) and one palustrine emergent persistent semi permanently flooded wetland (PEM1F) within the Study Area (**Figure 3**).

2.0 FIELD INVESTIGATION – METHODOLOGY

2.1 Wetlands Investigation and Delineation

On July 28 and August 31, 2020, a wetland and waters field investigation was conducted by AECOM Technical Services, Inc. (AECOM). The waters of the U.S. (WOUS) investigation was performed in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE, 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0, USACE, 2010). Any WOUS that were identified were flagged in the field with consecutively numbered Wetland Delineation flags and were located using a hand-held Global Positioning System (GPS) with sub-meter accuracy. The collected data is depicted in **Figure 4**. USACE Wetland Determination Data Forms are provided in **Appendix B**.

2.2 Surface Water Feature Investigation

Potentially regulated surface water features within the Study Area were delineated in accordance with the USACE Jurisdictional Determination Instructional Guidebook (USACE and EPA, 2007), and the guidelines in the USACE Regulatory Guidance Letter No. 05-05, Ordinary High Water Mark Identification Regulatory Guidance Letter (USACE, 2005).

3.0 FIELD INVESTIGATION – RESULTS

3.1 General Site Conditions

The Study Area consists of predominantly developed areas including roads, a runway, and structures associated with the runway. Site conditions were consistent with aerial imagery (**Figure 2**). Wetland delineation boundaries were generally consistent remnant flagging found east of the access road. It is presumed that the flagging remains are from the 2009 report by Timmons entitled *Wetland Delineation Package Uninhabited aerial Systems Airfield at Wallops Flight Facility (161.1 acres)* NAO-2011-0424, Timmons Group "UAS Airfield at WFF" April 3, 2009.

3.2 Wetland Investigation and Delineation Results

AECOM environmental scientists identified two potentially regulated wetlands within the Study Area (wetland WA and WB) through field investigation. Wetland WA is an estuarine emergent wetland (EEM) located southeast of the intersection of North Seawall Road and the runway within the Study Area. Wetland WA comprises approximately 66,618 square feet (1.53 acres) within the Study Area but extends outside of the Study Area to the southeast. Wetland WB is located west of the intersection of North Seawall Road and the runway as well as north of the runway. Wetland WB is an EEM wetland that comprises approximately 155,119 square feet (3.56 acres) within the Study Area but extends outside of the Study Area to the south, west, and north. Both wetlands were vegetated. Wetlands located within the Study Area are described in **Table 2**.

Wetland locations are shown in **Figure 4**. Associated photos are included in **Appendix C**.

Table 2: Summary of Wetland Features in the Study Area

WA	Tidal	EEM	66,618	1.53
WB	Tidal	EEM	155,119	3.56
	Total		**221,737**	**5.09**

***** Cowardin classification based on information from USFWS-NWI mapper and AECOM's July and August 2020 wetland delineation

3.2.1 Wetland and Upland Vegetation

EEM wetlands within the Study Area were typified by species frequently found in tidal marshes such as common reed (*Phragmites australis*), Jesuit's-bark (*Iva frutescens*), salt-meadow cord grass (*Spartina patens*), and southern bayberry (*Morella cerifera*). Forested uplands within the Study Area were typified by eastern redcedar (*Juniperus virginiana*), black cherry (*Prunus serotina*), loblolly pine (*Pinus taeda*), slender goldentop (*Euthamia caroliniana*), and horsebrier (*Smilax rotundifolia*).

3.3 Surface Water Feature Investigation Results

During AECOM's field investigation no surface water features were field located within 50 feet of the runway within the Study Area. One surface water feature was aerially interpreted in the northwest corner of the Study Area due to not being accessible by foot because of tidal water levels (**Figure 4)**.

4.0 REFERENCES

Federal Emergency Management Agency. 2014. National Flood Hazard Layer. Retrieved from https://msc.fema.gov/portal/home [Accessed July 2020].

USACE. 1987. Corps of Engineers Wetland Delineation Manual. *Technical Report* Y-87-1, USACE Waterways Experiment Station. Vicksburg, MS.

USACE. 2005. Ordinary High Water Mark Identification Regulatory Guidance Letter. Retrieved from https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf [Accessed July 2020].

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (Version 2.0). Retrieved from https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/ [Accessed July 2020].

USACE and U.S. Environmental Protection Agency. 2007. U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. Retrieved from https://www.nap.usace.army.mil/Portals/39/docs/regulatory/jd/jd_guidebook_051207final.pdf [Accessed July 2020].

USDA NRCS. 2019. Web Soil Survey. Retrieved from websoilsurvey.sc.egov.usda.gov [Accessed July 2020].

USFWS. 2019. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Retrieved from https://www.fws.gov/wetlands/data/data-download.html [Accessed July 2020].

U.S. Geological Survey. 2019. National Geospatial Program. Retrieved from https://www.usgs.gov/core-science-systems/national-geospatial-program [Accessed July 2020].

Appendix A: Project Figures

AECOM

National Aeronautic Space Administration
Wallops Island Flight Facility
2020

Wallops Pier
Accomack County, VA

Last Date Edited: 9/10/2020
Project Number: 60632314

0 1,500 3,000
Feet

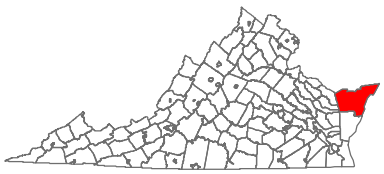
Legend

Study Area

N
W E
S

Note: This map is for reference only
NAD83 State Plane Virginia North;
Topographic Map Source: ESRI, 2019

Figure 1
Project Vicinity



Accomack County

AECOM

National Aeronautics and Space Administration
Wallops Flight Facility
2020
Wallops Pier
Accomack County, VA

Last Date Edited: 9/10/2020
Project Number: 60632314

0 500 1,000 Feet

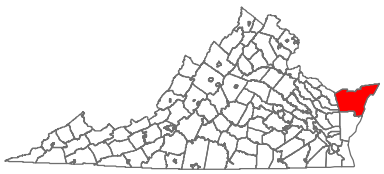
Legend

Study Area

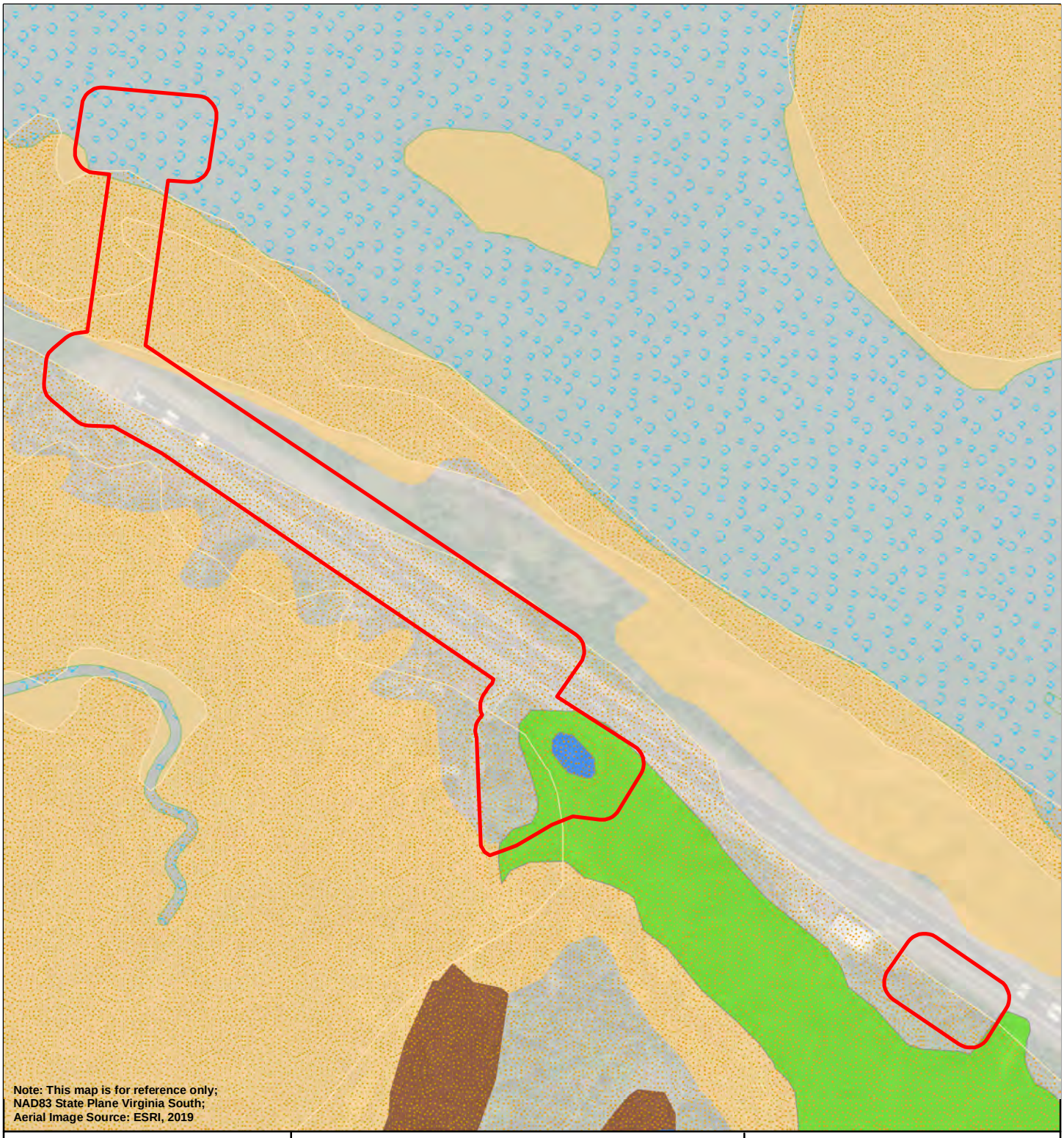
N
W E
S

Notes: This map is for reference only.
NAD83 State Plane Virginia North; Aerial Image Source: ESRI, 2019

Figure 2
Project Location



Accomack County



AECOM

National Aeronautics and Space Administration
Wallops Flight Facility
2020

Wallops Pier
Accomack County, VA

Last Date Edited: 9/10/2020
Project Number: 60617789

Legend

Study Area

0 250 500 Feet

Hydric Soil Rating (NRCS, 2020)

Hydric (66 to 100%)

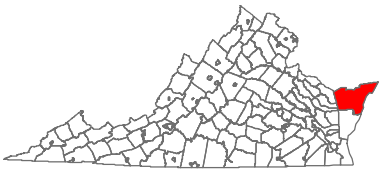
Waters of the US (NWI, 2020)

Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond

N
W E
S

Figure 3

Background Resources Map



Accomack County

AECOM

National Aeronautics and Space Agency
Wallops Flight Facility
2020

Wallops Pier
Accomack County, VA

Last Date Edited: 9/10/2020
Project Number: 60631607

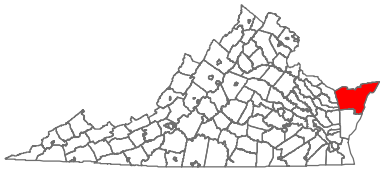
0 300 600 Feet

Legend

- Study Area
- Wetlands
- Surface Water
- Determination Points

N W E S

Figure 3
Wetland Delineation Map



Accomack County

Appendix B: USACE Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Wallops Pier City/County: Accomack Sampling Date: 7/28/2020

Applicant/Owner: NASA State: VA Sampling Point: UPL Hangar

Investigator(s): M. Batdorf and C. Lavagnino Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR or MLRA): MLRA 153D of LRR T Lat: 37.883684 Long: -75.434666 Datum: WGS84

Soil Map Unit Name: CaA - Camocca fine sand, 0 to 2 percent slopes, frequently flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Data point taken within upland southeast of the hangar and south of the runway. Hydrophytic vegetation passes dominance and prevalence tests due to facultative species.

Observed Classifications:

Cowardin: N/A

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present

AECOM has prepared this form using "data-entered" copies of the wetland determination data form in Appendix C in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0, November 2010. The resulting data sheet uses the 2016 National Wetland Plant List (v3.3) Regional List and the 2019 Web Soil Survey.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UPL Hangar

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina, Black Cherry	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Sapling Stratum (Plot size: 30 ft)			
1. Prunus serotina, Black Cherry	5	Yes	FACU
2. Pinus taeda, Loblolly Pine	5	Yes	FAC
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1. Pinus taeda, Loblolly Pine	20	Yes	FAC
2. Juniperus virginiana, Eastern Red-Cedar	10	Yes	FACU
3. Morella cerifera, Southern Bayberry	5	No	FAC
4. Rhus copallinum, Winged Sumac	2	No	UPL
5.			
6.			
	37 = Total Cover		
50% of total cover: 18.5	20% of total cover: 7.4		
Herb Stratum (Plot size: 30 ft)			
1. Chasmanthium laxum, Slender Wood-Oats	25	Yes	FACW
2. Euthamia caroliniana, Slender Goldentop	15	Yes	FAC
3. Toxicodendron radicans, Eastern Poison Ivy	10	No	FAC
4. Rubus argutus, Saw-Tooth Blackberry	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	60	Yes	FAC
2.			
3.			
4.			
5.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 25	x 2 = 50
FAC species 125	x 3 = 375
FACU species 20	x 4 = 80
UPL species 2	x 5 = 10
Column Totals: 172 (A)	515 (B)

Prevalence Index = B/A = 2.99

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

x 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

Remarks: (If observed, list morphological adaptations below).

Data point passes dominance and prevalence tests due to high number of facultative species.

SOIL

Sampling Point: UPL Hangar

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100%					Sandy loam	
1-8	7.5YR 4/2	100%					Loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** x

Remarks:

Did not auger below 8 inches to avoid utility lines in the vicinity.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Wallops Pier City/County: Accomack Sampling Date: 8/31/2020

Applicant/Owner: NASA State: VA Sampling Point: WA-WET

Investigator(s): M. Batdorf and K. Nayda-St.Clair Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): MLRA 153D of LRR T Lat: 37.885133 Long: -75.437916 Datum: WGS84

Soil Map Unit Name: CaA - Camocca fine sand, 0 to 2 percent slopes, frequently flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Data point taken within a wetland south of the runway and east of N Seawall Road.

Observed Classifications:

Cowardin: E2EM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes x No _____ Depth (inches): 1

Water Table Present? Yes x No _____ Depth (inches): 3.5

Saturation Present? (includes capillary fringe) Yes x No _____ Depth (inches): 0

Wetland Hydrology Present? Yes x No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water located adjacent to soil boring.

AECOM has prepared this form using "data-entered" copies of the wetland determination data form in Appendix C in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0, November 2010. The resulting data sheet uses the 2016 National Wetland Plant List (v3.3) Regional List and the 2019 Web Soil Survey.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: WA-WET

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1. Morella cerifera, Southern Bayberry	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Herb Stratum (Plot size: 30 ft)			
1. Phragmites australis, Common Reed	70	Yes	FACW
2. Chasmanthium laxum, Slender Wood-Oats	10	No	FACW
3. Setaria magna, Giant Bristle Grass	10	No	FACW
4. Smilax rotundifolia, Horsebrier	5	No	FAC
5. Toxicodendron radicans, Eastern Poison Ivy	5	No	FAC
6. Baccharis halimifolia, Groundseltree	5	No	FAC
7.			
8.			
9.			
10.			
11.			
	105 = Total Cover		
50% of total cover: 52.5	20% of total cover: 21		
Woody Vine Stratum (Plot size: 30 ft)			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		255 (B)

Prevalence Index = B/A = 2.22

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

x 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WA-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100%					Loam	
5-18	10YR 4/2	60%	10YR 3/1	40%			Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- x Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Wallops Pier City/County: Accomack Sampling Date: 8/31/2020

Applicant/Owner: NASA State: VA Sampling Point: WA-UPL

Investigator(s): M. Batdorf and K. Nayda-St.Clair Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): MLRA 153D of LRR T Lat: 37.885081 Long: -75.437979 Datum: WGS84

Soil Map Unit Name: ChA - Chincoteague silt loam, 0 to 1 percent slopes, very frequently flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Data point taken within upland adjacent to data point WA-WET. Hydrophytic vegetation passes dominance and prevalence tests due to facultative species.

Observed Classifications:

Cowardin: N/A

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): _____

Wetland Hydrology Present? Yes _____ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present

AECOM has prepared this form using "data-entered" copies of the wetland determination data form in Appendix C in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0, November 2010. The resulting data sheet uses the 2016 National Wetland Plant List (v3.3) Regional List and the 2019 Web Soil Survey.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: WA-UPL

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Pinus taeda, Loblolly Pine	75	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	5	Yes	FACU
2. Prunus serotina, Black Cherry	5	Yes	FACU
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Phragmites australis, Common Reed	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	75	Yes	FAC
2.			
3.			
4.			
5.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 10	x 2 = 20
FAC species 150	x 3 = 450
FACU species 10	x 4 = 40
UPL species 0	x 5 = 0
Column Totals: 170 (A)	510 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Data point passes dominance and prevalence tests due to high number of facultative species.

SOIL

Sampling Point: WA-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	100%					Sand	
3-16	10YR 3/4	100%					Sand	
16-18	10YR 4/4	100%					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Wallops Pier City/County: Accomack Sampling Date: 8/31/2020

Applicant/Owner: NASA State: VA Sampling Point: WB-WET

Investigator(s): M. Batdorf and K. Nayda-St.Clair Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): MLRA 153D of LRR T Lat: 37.885707 Long: -75.438387 Datum: WGS84

Soil Map Unit Name: CaA - Camocca fine sand, 0 to 2 percent slopes, frequently flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Data point taken with a high marsh downslope of the runway.

Observed Classifications:

Cowardin: E2EM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes x	No _____	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes x No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

AECOM has prepared this form using "data-entered" copies of the wetland determination data form in Appendix C in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0, November 2010. The resulting data sheet uses the 2016 National Wetland Plant List (v3.3) Regional List and the 2019 Web Soil Survey.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: WB-WET

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1. Iva frutescens, Jesuit's-Bark	40	Yes	FACW
2. Morella cerifera, Southern Bayberry	10	Yes	FAC
3.			
4.			
5.			
6.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Herb Stratum (Plot size: 30 ft)			
1. Spartina patens, Salt-Meadow Cord Grass	80	Yes	FACW
2. Bolboschoenus robustus, Saltmarsh Bulrush	10	No	OBL
3. Distichlis spicata, Coastal Salt Grass	10	No	OBL
4. Panicum virgatum, Wand Panic Grass	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	110 = Total Cover		
50% of total cover: 55	20% of total cover: 22		
Woody Vine Stratum (Plot size: 30 ft)			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	120	x 2 =	240
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	160 (A)		320 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

x 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WB-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100%					Sand	
4-11	10YR 4/2	85%	7.5YR 3/4	15%	C	M	Sand	
11-18	10YR 3/1	95%	10YR 3/6	5%	C	M	Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** _____

Remarks:

Appendix C: Representative Photographs

Project: Wallops Pier Project Number: 60617789	**PHOTOGRAPH LOG**
Client: National Aeronautics and Space Administration	

Photo ID: **A**	Date: 07/28/2020

Location: 37.883677, -75.434698
Description:
View of non-hydric soil, from a depth of 0 – 18 inches, present at data point UPL Hangar, southeast of the hangar and runway.

Photo ID: **B**	Date: 07/28/2020

Location: 37.883675, -75.43466
Description:
View, facing south, of typical vegetation present at data point UPL Hangar.

AECOM

Project: Wallops Pier Project Number: 60617789	**PHOTOGRAPH LOG**
Client: National Aeronautics and Space Administration	

Photo ID: **C**	Date: 08/31/2020
Location: 37.885117, -75.437914 Description: View of hydric soil, from a depth of 0 – 18 inches, at determination point WA-WET within wetland WA.	

Photo ID: **D**	Date: 08/31/2020
Location: 37.885169, -75.437902 Description: View, facing northeast, of typical vegetation present at determination point WA-WET within wetland WA.	

Project: Wallops Pier Project Number: 60617789	**PHOTOGRAPH LOG**
Client: National Aeronautics and Space Administration	

Photo ID: **E**	Date: 08/31/2020

Location: 37.885112, -75.43807
Description:
View of non-hydric soil, from a depth of 0 – 18 inches, present at determination point WA-UPL adjacent to wetland WA.

Photo ID: **F**	Date: 08/31/2020

Location: 37.885115, -75.438042
Description:
View, facing west, of typical vegetation present at determination point WA-UPL adjacent to wetland WA.

AECOM

Project: Wallops Pier Project Number: 60617789	**PHOTOGRAPH LOG**
Client: National Aeronautics and Space Administration	

Photo ID: **G**	Date: 08/31/2020

Location: 37.885724, -75.438394
Description:
View of hydric soil, from a depth of 0 – 18 inches, at determination point WB-WET within wetland WB.

Photo ID: **H**	Date: 08/31/2020

Location: 37.885715, -75.438381
Description:
View, facing southwest, of typical high marsh vegetation found at determination point WB-WET and within wetland WB.

AECOM

Wetland Delineation Report

UAS Airstrip Roadway

Wallops Flight Facility

Wallops Island, VA (Accomack County)

COASTAL VIRGINIA

ENVIRONMENTAL SERVICES

Prepared for:

GMB Architects & Engineers

206 West Main Street

Salisbury, MD 21801

Prepared by:

Rick Harris

VA PWD #: 3402000173

COVA Environmental

4409 Segovia Court

Virginia Beach, VA 23462

January 14, 2021

COVA ENVIRONMENTAL

Table of Contents

APPENDICES

1 Introduction and Executive Summary

Coastal Virginia Environmental Services, Inc. (COVA Environmental) has been contracted by GMB Architects & Engineers to complete a wetland delineation for a study area located near N Seawall Road within the northern portion of Wallops Island, VA. The study area is approximately 0.645 acres and consists of the culverted crossing (and its immediate vicinity) for the UAS Airstrip roadway access that is located approximately 650 feet south of the UAS Airstrip. The study area contains a portion of the UAS Airstrip roadway, a culverted stream crossing, and estuarine wetlands located to the west and east of the roadway access.

COVA Environmental personnel conducted the site investigation for the wetland delineation on January 13, 2021. Our initial findings from the wetland delineation identified approximately 0.519 cumulative acres of estuarine wetlands (E2EM1P) within the study area. Approximately 0.126 acres of uplands were observed and consisted of the roadway, the culverted stream crossing, and the sloped shoulder along the roadway. An estuarine stream was observed within the estuarine wetlands that intersected the roadway via the culverted crossing. Approximately 151 cumulative linear feet of estuarine stream channel (E1UBL) was observed within the study area. The identified wetland limits are considered preliminary until ultimately confirmed by the U.S. Army Corps of Engineers (USACE) through a jurisdictional determination. However, the limits of wetlands and Waters of the U.S. features depicted within Exhibit 2, Appendix 3 illustrate the flagged areas observed by COVA Environmental during the site investigation.

The wetland delineation was completed using the routine determination method found in the *1987 Corps of Engineers Wetlands Delineation Manual* and in accordance with procedures and criteria described in the *Atlantic and Gulf Coastal Plain Regional Supplement (Version 2, Nov. 2010)*. The methodology used for the wetland delineation is designed to determine whether portions of the study area meet all three technical parameters for wetland classification; these three technical parameters consist of wetland hydrology, hydrophytic vegetation, and hydric soil. Prior to completing the field investigation portion of the wetland delineation, COVA Environmental conducted extensive research of all available background resources to gain a better understanding of the study area and its vicinity. These background resources include the USGS topographic map, USFWS National Wetlands Inventory mapping, local Soil Survey provided by NRCS, LiDAR elevation data, and other available sources. The data obtained from the field investigation and background resources was analyzed thoroughly to complete the wetland delineation and determine the limits of wetlands within the study area. The data, analysis, and findings are described in detail below.

2 Background Research

2.1 USGS Topographical Map

The *USGS Chincoteague West Topographical Quadrangle* was used to produce the topographical map (Exhibit 1, Appendix 3) that illustrates many details of the study area and its vicinity. The study area is depicted at an elevation ranging between 0 to 5 feet above sea level. A roadway is depicted running through the center of the study area, intersecting the study area in a north-south orientation. This roadway continues offsite to the north and south. The roadway is illustrated as being surrounded by wetlands that connect to the larger wetland system located to the west. A stream is illustrated within the center of the study area, intersecting the in an east-west orientation. The roadway appears to cross this stream within the center of the study area. The stream is located within the wetlands and appears to slope down gradient in a western direction eventually drains into the Chincoteague Inlet. The Chincoteague Inlet connects directly to the Atlantic Ocean. These topographical maps are produced by COVA Environmental in part to gain a better understanding of the study area's landscape and its connection with the vicinity. Also, this topographical map was last updated in 1986 and was selected in part to provide additional historical context regarding the study area and its vicinity. Therefore, site conditions exhibited in this map may have changed.

2.2 LiDAR Map

Light Detection and Ranging (LiDAR) data is typically gathered by an airborne system that measures distances between ground features and the on-board sensor with pulsed laser lights. These measurements of the laser light return data are used to create 3D representations of ground features like houses and trees and can also accurately depict soil surface characteristics to display elevation, slope, and gradients across a given landscape. LiDAR maps can be particularly useful for wetland delineations by identifying low-laying areas, flat landscapes, streams, and many other aspects associated with wetland identification. The LiDAR data obtained for the LiDAR map (Exhibit 3, Appendix 3) has been enhanced to illustrate elevations through a color spectrum with the lower elevations in blue and the higher elevations in red. The LiDAR data exhibits similar conditions observed within the USGS topographical map. The study area overall contains a low-laying, flat landscape that is illustrated with blue colors. A linear drainage feature (dark blue color) appears to intersect the study area in an east-west orientation draining in a western direction. A linear feature containing higher elevations (green and light blues) is illustrated as intersecting the study area in a north-south orientation. This feature appears to cross the linear drainage.

2.3 National Wetlands Inventory Map

The National Wetlands Inventory (NWI) is produced by the U.S. Fish and Wildlife Service (USFWS) with digital map data and other resources to provide the public with an estimate of the nation's total wetland resources. The NWI mapped wetlands are displayed by wetland classification and illustrate the extent of each wetland class. It is important to note that the USFWS issues a limitation disclaimer on this data that states their mapped wetland resources are prepared from the analysis of high-altitude imagery and a margin of error is inherent in the use of imagery. Thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis. The NWI map produced by COVA Environmental (Exhibit 4, Appendix 3) identifies three wetland classes throughout the study area. PSS3/EM1C is a palustrine

wetland class that contains both a scrub-shrub landscape and a landscape dominated by emergent vegetation. The dominant vegetation within the scrub-shrub landscape is dominated by broad-leaved evergreen vegetation. The emergent vegetation is dominated by persistent herbaceous hydrophytes that normally remain standing at least until the beginning of the next growing season. The water regime for this wetland class is characterized as seasonally flooded, meaning surface water is present for extended periods especially early in the growing season, but absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface. E2EM1P6 is an estuarine wetland class that is located within the intertidal zone, meaning the substrate in these habitats is flooded and exposed by tides. The landscape is dominated by emergent vegetation that contain persistent herbaceous hydrophytes that normally remain standing at least until the beginning of the next growing season. The water regime is characterized as irregularly flooded, meaning tides flood the substrate less often than daily. The water chemistry for this wetland class is characterized as oligohaline, meaning the water contains salinity levels between 0.5 and 5 ppt. E2EM1N is an estuarine wetland class that is located within the intertidal zone, meaning the substrate in these habitats is flooded and exposed by tides. The landscape is dominated by emergent vegetation that contain persistent herbaceous hydrophytes that normally remain standing at least until the beginning of the next growing season. The water regime is characterized as regularly flooded, meaning tides alternately flood and expose the substrate at least once daily.

2.4 NRCS Soil Survey Map

Soil Surveys are produced by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The NRCS Soil Survey map (Exhibit 5, Appendix 3) created by COVA Environmental displays GIS soil survey data and information procured from the NRCS. This soil survey data is provided in part to assist landowners for silvicultural, agricultural, and other developmental activities. The soil survey map data for Accomack County, VA obtained from the NRCS lists two soil series within the study area. The Camocca fine sand (Soil Map Unit: CaA) is a 0 to 2 percent sloped soil that is composed of 95 percent Camocca/similar soils and 2 percent minor components. The typical Camocca soil profile is characterized as having fine sandy layers from the soil surface down to approximately 85 inches below the soil surface. This soil series is typically found within depressional landforms and is comprised of eolian sand. The natural drainage class of this soil series is rated as poorly drained that is frequently flooded. The Chincoteague silt loam (Soil Map Unit: ChA) is a 0 to 1 percent sloped soil that is composed of 90 percent Chincoteague/similar soils and 10 percent minor components. The typical Chincoteague soil profile is characterized as having a silt loam surface layer down to approximately 10 inches below the soil surface, a silty clay loam layer from 10 to 40 inches below the soil surface, and underlain by a silt loam layer from 40 to 65 inches below the soil surface. This soil series is typically found within salt marsh landforms and is comprised marine deposits. The natural drainage class of this soil series is rated as very poorly drained that is very frequently flooded. Both soil series are listed on the NRCS's list of hydric soils for Accomack County, VA meaning they possess the potential to be hydric.

3 Wetland Delineation Findings

3.1 Estuarine Wetlands

The wetland delineation field investigation resulted in identifying and flagging approximately 0.519 acres of estuarine wetlands (Cowardin Classification: E2EM1P) throughout the study area. These estuarine wetlands were observed along the eastern and western side of the roadway and began along the toe slope of the vegetated roadway shoulder. A tidal salt marsh landscape dominated the landscape within the estuarine wetlands and were drained by the stream observed in the center of the study area. The estuarine wetlands appeared to mostly be located within the high marsh zone with a narrow low marsh zone located near the stream.

The dominant vegetation within the estuarine wetlands consisted of marsh elder (*Iva frutescens*), saltmeadow cordgrass (*Spartina patens*), and smooth cordgrass (*Spartina alterniflora*). The hydrophytic vegetation parameter was met throughout all the estuarine wetlands observed within the study area by the dominance test. The soil profiles throughout the estuarine wetlands displayed low chroma colors and redoximorphic features (reduced iron) began near the soil surface. A presence of muck was observed within the upper 2 inches of the soil surface throughout the estuarine wetlands. A hydrogen sulfide odor was observed from the soil indicating the likely presence of persistent anaerobic conditions. The hydrogen sulfide, muck presence, 1cm muck, sandy mucky mineral, sandy redox, and depleted matrix hydric soil indicators were observed throughout the estuarine wetlands. The hydric soil parameter was met throughout the estuarine wetlands. The surface water, high water table, saturation, aquatic fauna, hydrogen sulfide odor, and oxidized rhizospheres along living roots primary wetland hydrology indicators and drainage patterns, geomorphic position, and FAC-Neutral test secondary wetland hydrology indicators were observed. The wetland hydrology parameter was met throughout the estuarine wetlands. The hydrology was consistent with that of a tidal salt marsh. Surface water was located within large pockets across the landscape that drained towards the estuarine stream.

3.2 Estuarine Stream and Culverted Crossing

An estuarine stream (Cowardin Classification: E1UBL) was observed in the center of the study area and accounted for approximately 151 cumulative linear feet of stream channel within the study area. This estuarine stream was surrounded by estuarine wetlands and sloped down gradient in a western direction towards the tributaries of Chincoteague Inlet. The stream was subtidal and exhibited water flowing in an eastern direction with the tide flooding in and water flowing in a western direction with the tide ebbing out. Aquatic fauna including fish, crabs, mollusks, etc. were observed throughout the stream. The stream contained an unconsolidated bottom and appeared to be continuously covered by tidal salt water. The roadway perpendicularly intersected the stream via of a culverted crossing.

The culverted crossing consisted of a 24-inch diameter corrugated HDPE pipe that hydrologically connected the stream on both sides of the roadway. The pipe from end to end was approximately 29 linear feet long. The crossing was structurally supported by a retaining wall that was backfilled with stone between the retaining wall and the roadway. The wetland line was determined to be located along the retaining wall that separated the estuarine wetlands from the upland roadway shoulder that contained the backfill materials.

3.3 Upland Roadway and Shoulder

The uplands observed during the wetland delineation consisted of a paved roadway and its vegetated shoulder located on both sides of the roadway. These uplands accounted for approximately 0.126 acres of the study area. The paved roadway was situated along a convex landscape with a sloped shoulder that was vegetated and appeared to be effectively drained due to its convex relief. Both the roadway and shoulder are positioned a few feet higher than the adjacent wetlands that began at the toe slope of the shoulder. The soil profile along the roadway shoulder exhibited what appeared to be sandy fill materials that covered the former soil surface. The soil and hydrological conditions observed along the roadway ultimately qualified this area as uplands.

The dominant vegetation within the uplands consisted of eastern Baccharis (*Baccharis halimifolia*), saltmeadow cordgrass (*Spartina patens*), and fescue (*Schedonorus arundinaceus*). The dominance test was met within the uplands and therefore meets the hydrophytic vegetation parameter. The vegetation near the roadway appeared to be routinely mowed and therefore the vegetation in the mowed areas was difficult to analyze. The soil profile displayed high chroma colored sandy layers within the upper 22 inches of the soil surface. Redoximorphic features (reduced iron) began at approximately 14 inches below the soil surface. A low chroma colored layer was observed beyond 22 inches below the soil surface. This darker colored layer appeared to be the former soil surface due to its similar characteristics to the soil profiles observed in the nearby wetlands that are outside of the roadway area. This former surface layer has most likely been buried by fill materials that were deposited for the shoulder of the paved roadway. No hydric soil indicators were observed, and the hydric soil parameter was not met. The FAC-Neutral test secondary wetland hydrology indicator was the only wetland hydrology indicator observed in the uplands due to the *Spartina patens* that encroached within the uplands. The wetland hydrology parameter was not met.

4 Conclusions

The wetland delineation determined that the study area possesses approximately 0.519 cumulative acres of estuarine wetlands (E2EM1P) within the study area. Approximately 0.126 acres of uplands were observed and consisted of the roadway, the culverted stream crossing, and the sloped shoulder along the roadway. An estuarine stream was observed within the estuarine wetlands that intersected the roadway via the culverted crossing. Approximately 151 cumulative linear feet of estuarine stream channel (E1UBL) was observed within the study area. The wetland limits are illustrated in Exhibit 2, Appendix 3. These wetland limits are considered preliminary until ultimately confirmed by the U.S. Army Corps of Engineers (USACE). Therefore, COVA Environmental recommends coordination with the USACE to confirm these wetland limits and issue their jurisdictional determination. The wetland limits are subject to modification upon USACE confirmation.

Jurisdictional wetlands are regulated under section 404 and 401 of the Clean Water Act. Filling, excavating, grading, and other activities in wetlands require permits from appropriate government agencies. Unauthorized activity in wetlands is subject to violation.

Appendix 1: Site Information

Wetland Delineation Site Information

UAS Airstrip Roadway Wetland Delineation
Tax Parcel 02800A000007500
(0.645-acre study area)
Wallops Island, VA

Latitude/ Longitude in Decimal Degrees using coordinate plane (NAD 1983)
37.883905° North / -75.438495° West (center of study area)

Has a previous delineation or JD been performed?
NAO-2011-0424, Timmons Group "UAS Airfield at WFF" April 3, 2009

Hydrologic Unit Code (HUC)
8-Digit HUC – 02040303 (Chincoteague)
10-Digit HUC – 0204030305 (Lower Chincoteague Bay)
12-Digit HUC – 020403030504 (Chincoteague Bay-Chincoteague Inlet)

USGS Topographic Sheet
USGS Chincoteague West, VA Topographical Quadrangle

Nearest Waterbody
The nearest named waterbody is Chincoteague Bay/Inlet located approximately 3,000 feet to the north.

Delineation Methods
- U.S. Army Corps of Engineers 1987 Wetland Delineation Manual in conjunction with Atlantic and Gulf Coastal Plain Regional Supplement (Version 2, Nov. 2010)
- Atlantic and Gulf Coastal Plain 2018 Regional Wetland Plant List (version 3.4)

On-Site Investigation Date
Wetland boundary delineation and site data collection conducted on January 13, 2021

Wetland Delineation Plan
The proposed wetland boundaries and Data Sampling Point locations are depicted on the plan entitled Exhibit 2: Site Map prepared by Rick Harris on January 14, 2021

Wetlands
The wetland delineation field investigation resulted in identifying and flagging approximately 0.519 acres of estuarine wetlands (Cowardin Classification: E2EM1P) throughout the study area. These estuarine wetlands were observed along the eastern and western side of the roadway and began along the toe slope of the vegetated roadway shoulder. A tidal salt marsh landscape dominated the landscape within the estuarine wetlands and were drained by the stream observed in the center of the study area. The estuarine wetlands appeared to mostly be located within the high marsh zone with a narrow low marsh zone located near the stream.

Stream Channels
An estuarine stream (Cowardin Classification: E1UBL) was observed in the center of the study area and accounted for approximately 151 cumulative linear feet of stream channel within the study area. This estuarine stream was surrounded by estuarine wetlands and sloped down gradient in a western direction towards the tributaries of Chincoteague Inlet. The stream was subtidal and exhibited water flowing in an eastern direction with the tide flooding in and water flowing in a western direction with the tide ebbing out. Aquatic fauna including fish, crabs, mollusks, etc. were observed throughout the stream. The stream contained an unconsolidated bottom and appeared to be continuously covered by tidal salt water. The roadway perpendicularly intersected the stream via of a culverted crossing.

Uplands
The uplands observed during the wetland delineation consisted of a paved roadway and its vegetated shoulder located on both sides of the roadway. These uplands accounted for approximately 0.126 acres of the study area. The paved roadway was situated along a convex landscape with a sloped shoulder that was vegetated and appeared to be effectively drained due to its convex relief. Both the roadway and shoulder are positioned a few feet higher than the adjacent wetlands that began at the toe slope of the shoulder. The soil profile along the roadway shoulder exhibited what appeared to be sandy fill materials that covered the former soil surface. The soil and hydrological conditions observed along the roadway ultimately qualified this area as uplands.

100-Year Floodplains
As depicted on the Federal Emergency Management Agency's (FEMA) on-line Flood Insurance Rate Map #51001C0265G, effective on 05/18/2015, the study area is located within Zone VE with a base flood elevation of 9 feet. Zone VE is characterized as a coastal area with a high risk for flooding and an additional hazard associated with storm waves.

National Wetlands Inventory
The NWI map produced by COVA Environmental (Exhibit 4, Appendix 3) identifies three wetland classes throughout the study area: PSS3/EM1C, E2EM1P6, and E2EM1N. Further information regarding these wetland classes are described within section 2.3 of the included report.

USDA NRCS Soil Survey
The soil survey map data for Accomack County, VA obtained from the NRCS lists two soil series within the study area: Camocca fine sand (Soil Map Unit: CaA) and Chincoteague silt loam (Soil Map Unit: ChA). Both soil series are listed on the NRCS's list of hydric soils for Accomack County, VA meaning they possess the potential to be hydric. Soil survey information for the study area is described in detail within section 2.4 of the included report and illustrated in Exhibit 5, Appendix 3. The full soil series information obtained form the USDA's NRCS for all identified soils within the study area are included with this site information summary.

Waters Table:

Wetland/Water	Latitude	Longitude	Cowardin Class	Area (Acres) / Length (feet)	Tidal / Non-Tidal
1	37.884012°N	-75.438634°W	E2EM1P	0.222 acres	Tidal
2	37.883944°N	-75.438317°W	E2EM1P	0.297 acres	Tidal
3	37.883934°N	-75.438643°W	E1UBL	73 liner feet	Tidal
4	37.883886°N	-75.438330°W	E1UBL	78 liner feet	Tidal

Waters Table Notes:

The #1 wetland feature consists of the estuarine wetlands identified and flagged west of the roadway.

The #2 wetland feature consists of the estuarine wetlands identified and flagged east of the roadway.

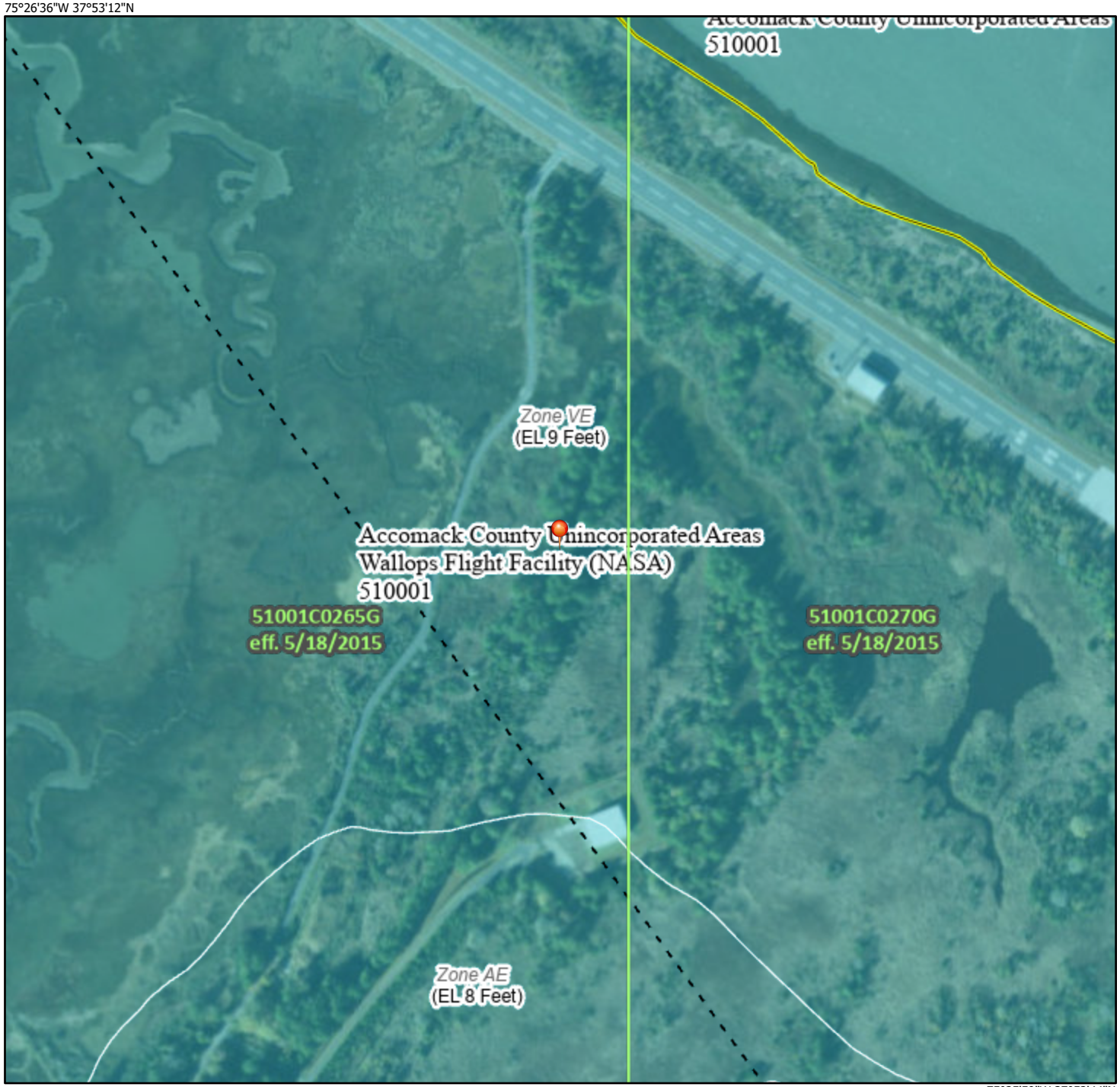
The #3 waters feature consists of the estuarine stream identified west of the roadway.

The #4 waters feature consists of the estuarine stream identified east of the roadway.

National Flood Hazard Layer FIRMette

FEMA

75°26'36"W 37°53'12"N



75°25'59"W 37°52'44"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/27/2023 at 11:00 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Accomack County, Virginia

CaA—Camocca fine sand, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 3yvy
Elevation: 0 to 10 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 200 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Camocca and similar soils: 95 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Camocca

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sand

Typical profile

H1 - 0 to 6 inches: fine sand
H2 - 6 to 85 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Chincoteague

Percent of map unit: 2 percent

Landform: Salt marshes
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Accomack County, Virginia
Survey Area Data: Version 16, Jun 3, 2020

Accomack County, Virginia

ChA—Chincoteague silt loam, 0 to 1 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2v9nb
Elevation: 0 to 80 feet
Mean annual precipitation: 40 to 59 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Chincoteague and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chincoteague

Setting

Landform: Salt marshes
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Typical profile

A - 0 to 10 inches: silt loam
Cg1 - 10 to 40 inches: silty clay loam
Cg2 - 40 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Maximum salinity: Strongly saline (90.0 to 230.0 mmhos/cm)
Sodium adsorption ratio, maximum: 70.0
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Magotha

Percent of map unit: 5 percent
Landform: Salt marshes
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Camocca

Percent of map unit: 3 percent
Landform: Depressions on interdunes
Landform position (three-dimensional): Dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Nimmo

Percent of map unit: 2 percent
Landform: Dunes
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Data Source Information

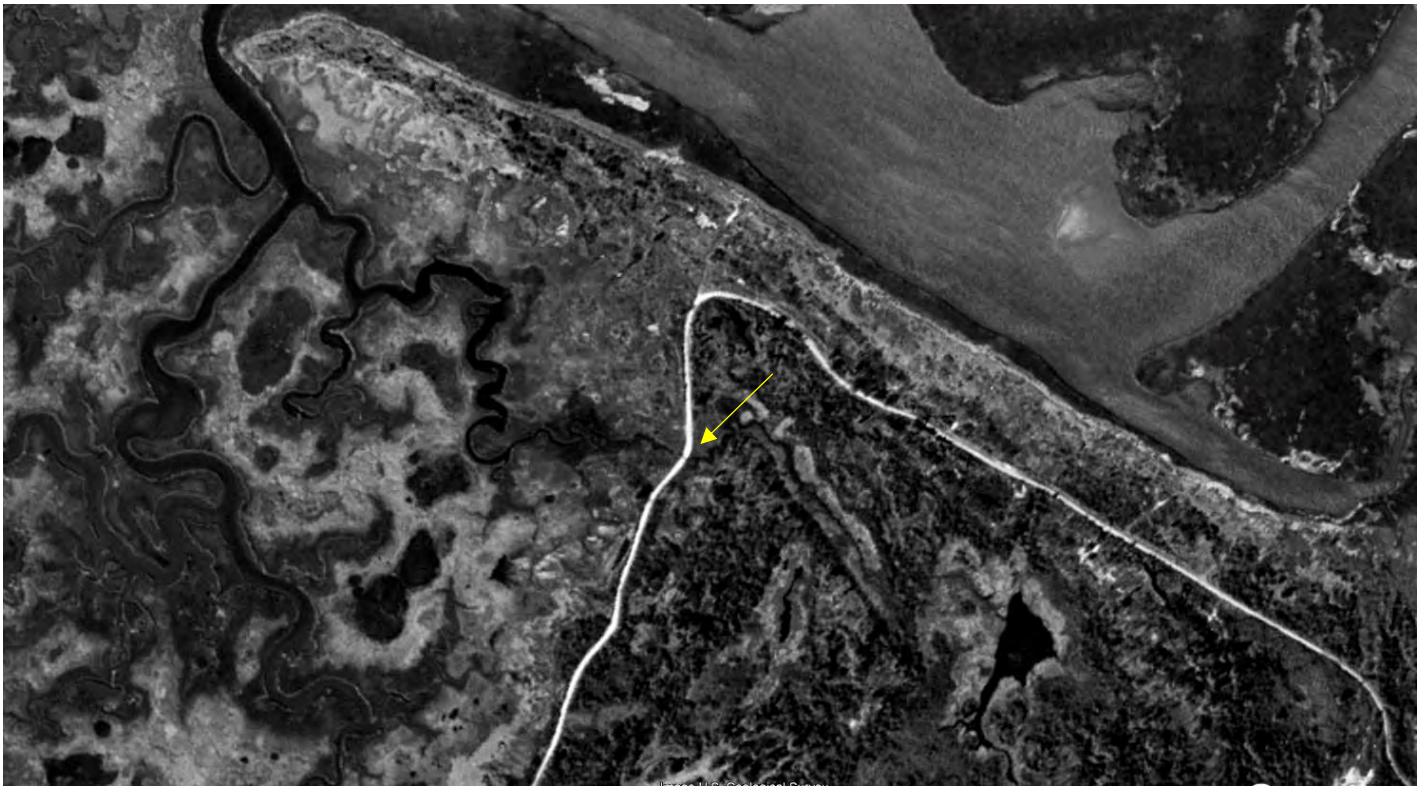
Soil Survey Area: Accomack County, Virginia
Survey Area Data: Version 16, Jun 3, 2020

2016

2013

UAS Airstrip Historical Aerial Photography
Source: Google Earth, United States Geological Survey

2007



1994

UAS Airstrip Historical Aerial Photography
Source: Google Earth, United States Geological Survey

1977

1973

UAS Airstrip Historical Aerial Photography
Source: Google Earth, United States Geological Survey

1963

1959

UAS Airstrip Historical Aerial Photography
Source: Google Earth, United States Geological Survey

Appendix 2: Photographs

Photograph 1: Representative view of the estuarine wetlands in the southeast portion of the study area

Photograph 2: Representative view of the estuarine wetlands in the western portion of the study area

Photograph 3: Representative view of the estuarine stream within the study area

Photograph 4: Typical view of wetland flag located along the roadway shoulder

Photograph 5: Representative view of the roadway within the study area

Photograph 6: Roadway culverted stream crossing

Photograph 7: Typical view of wetland line located directly above retaining wall

Photograph 8: Eastern side of culverted stream crossing

Photograph 9: Western side of culverted stream crossing

Photograph 10: Representative view of upland vegetated shoulder along roadway

Photograph 11: Soil profile of upland roadway shoulder exhibiting sandy fill materials

Appendix 3: Exhibit Maps

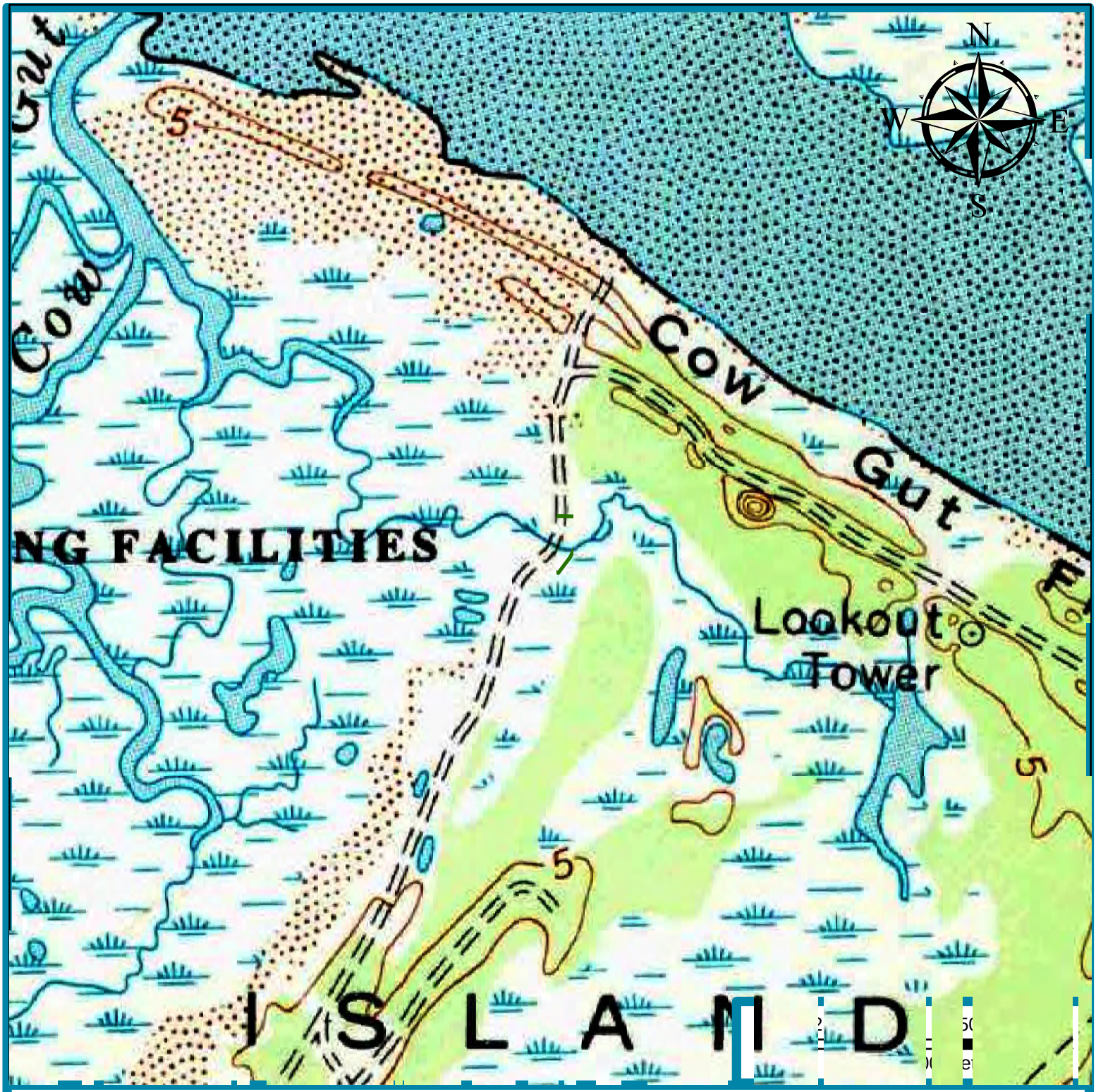


Exhibit 1: USGS Topographical Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: USGS Chincoteague West, VA 1986 Topographical Quadrangle

Legend

Study Area ~ 0.645 acres

COVA Project #: 2020-032
Date: 01/11/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

Exhibit 2: Site Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: VGIN 2017 Aerial Basemap; Delineation Data Collected via Trimble R1 GNSS Receiver

Legend

- Study Area ~ 0.645 acres
- E2EM1P Wetlands ~ 0.519 cumulative acres
- E1UBL Stream ~ 151 cumulative linear feet
- Culvert Pipe ~ 29 linear feet
- Data Point

COVA Project #: 2020-032
Date: 01/14/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

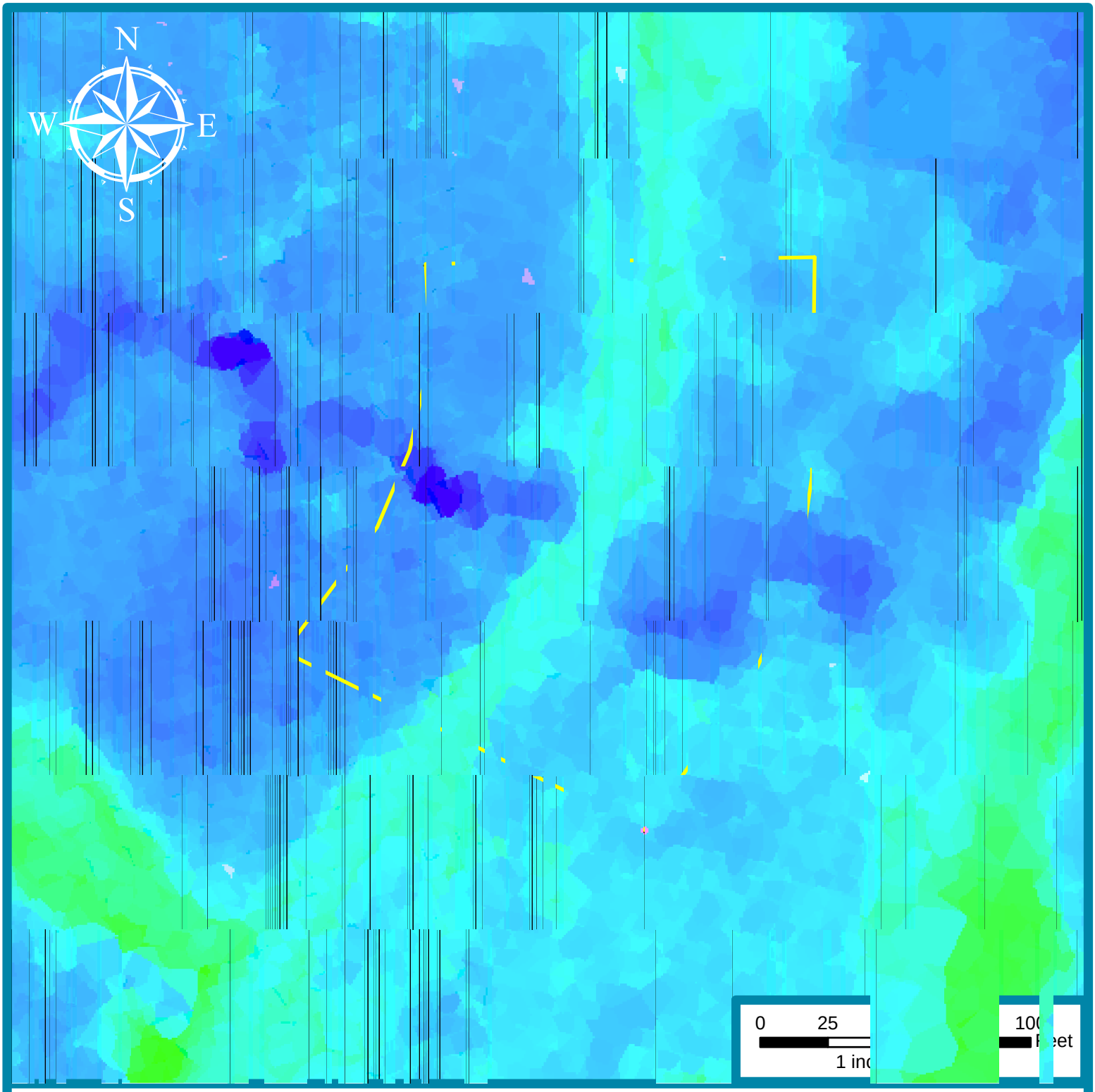


Exhibit 3: LiDAR Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: USGS LPC VA Eastern Shore 2010 LAS LiDAR Data

Legend

Study Area ~ 0.645 acres

Elevation

Lower — Higher

COVA Project #: 2020-032
Date: 01/11/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

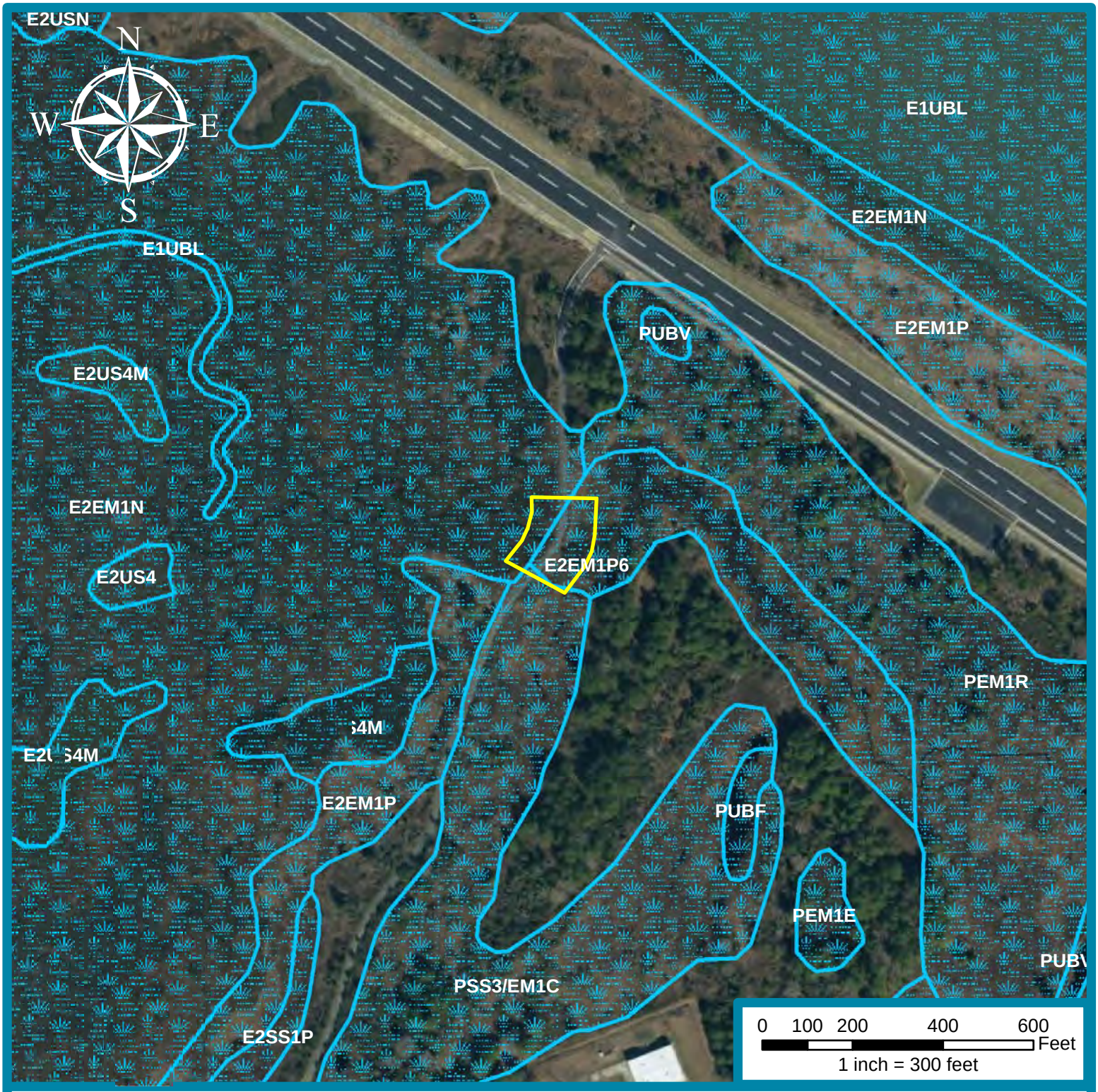


Exhibit 4: National Wetlands Inventory Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: VGIN 2017 Aerial Basemap; USFWS NWI shapefile for Virginia

Legend

Study Area ~ 0.645 acres

NWI Wetland Areas
(by wetland class)

COVA Project #: 2020-032
Date: 01/11/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

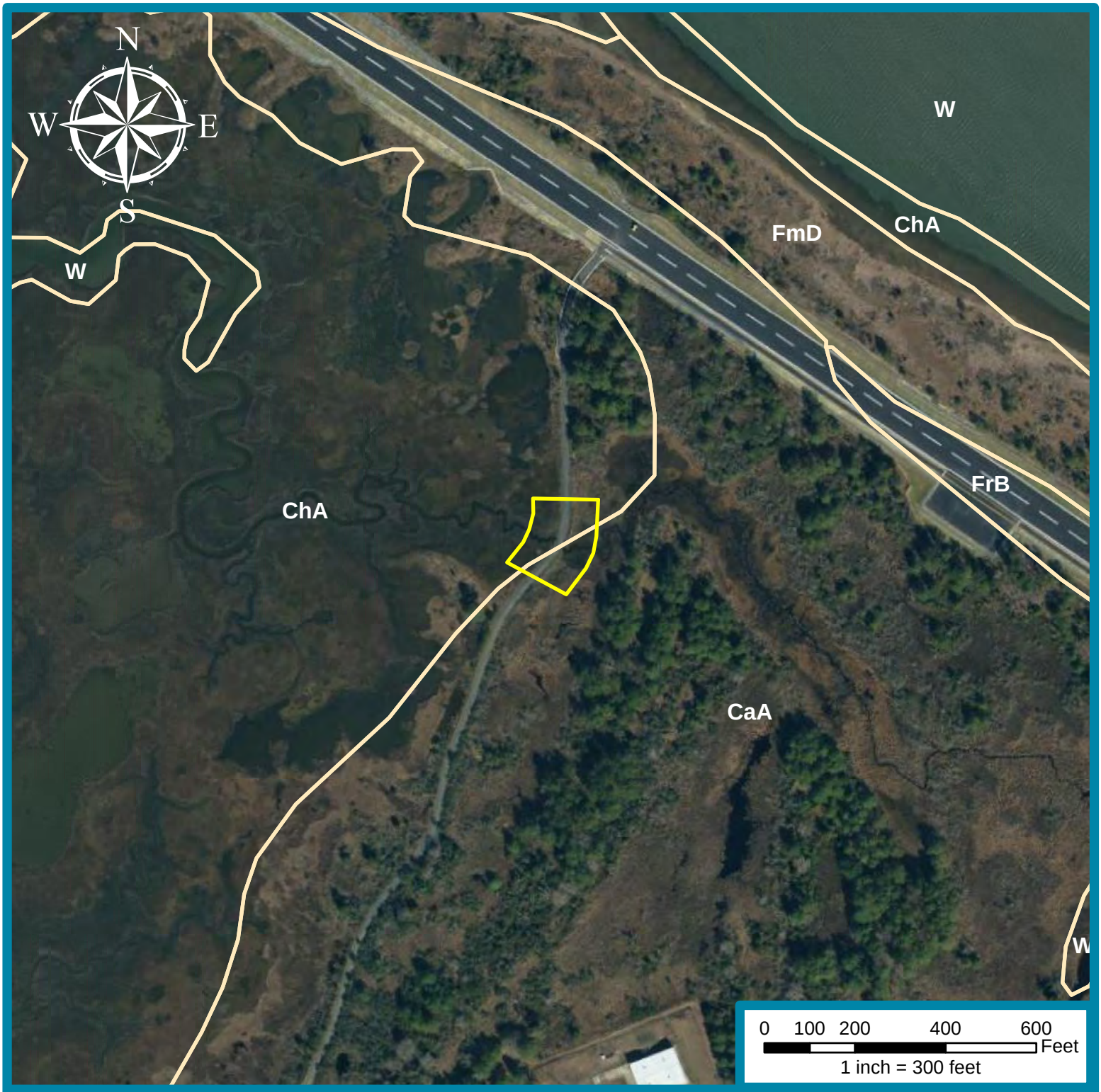


Exhibit 5: NRCS Soil Survey Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: VGIN 2017 Aerial Basemap; NRCS Soil Survey shapefile for Accomack County, VA

Legend

Study Area ~ 0.645 acres

Soil Map Unit Boundary

COVA Project #: 2020-032
Date: 01/11/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

Appendix 4: Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: UAS Airstrip Roadway City/County: Wallops Island, VA (Accomack County) Sampling Date: 01/13/2021

Applicant/Owner: GMB Architects & Engineers State: VA Sampling Point: DP1

Investigator(s): COVA Environmental (Rick Harris) Section, Township, Range:

Landform (hillslope, terrace, etc.): salt marsh Local relief (concave, convex, none): none - flat Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 37.883709° N Long: -75.438506° W Datum:

Soil Map Unit Name: CaA—Camocca fine sand, 0 to 2 percent slopes, frequently flooded NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

The hydrophytic vegetation, hydric soil, and wetland hydrology parameters were met. This area consisted of estuarine wetlands situated across a tidal salt marsh landscape.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☑ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✓	No ____	Depth (inches): 2"
Water Table Present?	Yes ✓	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The Surface Water (A1), High Water Table (A2), Saturation (A3), Aquatic Fauna (B13), Hydrogen Sulfide Odor (C1), and Oxidized Rhizospheres along Living Roots (C3) primary wetland hydrology indicators were observed. The Drainage Patterns (B10), Geomorphic Position, (D2) and FAC-Neutral Test (D5) secondary wetland hydrology indicators were observed. The wetland hydrology parameter was met. The hydrology in this area was consistent with that of the high marsh zone of a tidal salt marsh. Surface water was located within large pockets across the landscape that drained towards the estuarine stream located to the north.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP1

Tree Stratum (Plot size: 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 foot radius)			
1. Iva frutescens	25	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 30 foot radius)			
1. Spartina patens	80	YES	FACW
2. Phragmites australis	10	NO	FACW
3. Spartina alterniflora	5	NO	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

50% of total cover: 47.5 20% of total cover: 19

Woody Vine Stratum (Plot size: 30 foot radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks: (If observed, list morphological adaptations below).

The dominance test was met for this data point and therefore meets the hydrophytic vegetation parameter. This data point location was located within a salt marsh dominated by common saltmarsh species.

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 3/1	100					silt loam	muck presence
2 - 4	10YR 3/1	97	10YR 4/6	3			sandy loam	
4 - 24+	10YR 4/1	94	10YR 4/6	6			loamy fine sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☑ Muck Presence (A8) **(LRR U)**
- ☑ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

The soil profile displayed 10YR 3/1 colored surface layers down to approximately 4 inches below the soil surface with a presence of muck observed within the upper 2 inches. The soil transitioned to 10YR 4/1 beyond 4 inches. Redoximorphic features (reduced iron) began at approximately 2 inches below the soil surface. A hydrogen sulfide odor was observed from the soil indicating the likely presence of persistent anaerobic conditions. The Hydrogen Sulfide (A4), Muck Presence (A8), 1cm Muck (A9), and Depleted Matrix (F3) hydric soil indicators were observed and the hydric soil parameter was met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: UAS Airstrip Roadway City/County: Wallops Island, VA (Accomack County) Sampling Date: 01/13/2021

Applicant/Owner: GMB Architects & Engineers State: VA Sampling Point: DP2

Investigator(s): COVA Environmental (Rick Harris) Section, Township, Range:

Landform (hillslope, terrace, etc.): salt marsh Local relief (concave, convex, none): none - flat Slope (%): 0-1

Subregion (LRR or MLRA): LRR T Lat: 37.883916° N Long: -75.438630° W Datum:

Soil Map Unit Name: ChA—Chincoteague silt loam, 0 to 1 percent slopes, very frequently flooded NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No	**Is the Sampled Area within a Wetland?** Yes ✓ No
Hydric Soil Present?	Yes ✓ No	
Wetland Hydrology Present?	Yes ✓ No	

Remarks:

The hydrophytic vegetation, hydric soil, and wetland hydrology parameters were met. This area consisted of estuarine wetlands situated across a tidal salt marsh landscape. An estuarine stream was located adjacently to the north.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☑ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✓	No	Depth (inches): 4"
Water Table Present?	Yes ✓	No	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes ✓	No	Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The Surface Water (A1), High Water Table (A2), Saturation (A3), Aquatic Fauna (B13), Hydrogen Sulfide Odor (C1), and Oxidized Rhizospheres along Living Roots (C3) primary wetland hydrology indicators were observed. The Drainage Patterns (B10), Geomorphic Position, (D2) and FAC-Neutral Test (D5) secondary wetland hydrology indicators were observed. The wetland hydrology parameter was met. The hydrology in this area was consistent with that of a tidal salt marsh. Surface water was located within large pockets across the landscape that drained towards the estuarine stream located adjacency to the north.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP2

Tree Stratum (Plot size: 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30 foot radius)			
1. Iva frutescens	7	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	7 = Total Cover		
50% of total cover: 3.5	20% of total cover: 1.4		
Herb Stratum (Plot size: 30 foot radius)			
1. Spartina alterniflora	75	YES	OBL
2. Spartina patens	20	YES	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30 foot radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (If observed, list morphological adaptations below).

The dominance test was met for this data point and therefore meets the hydrophytic vegetation parameter. This data point location was located within a salt marsh dominated by common saltmarsh species.

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 2	10YR 3/1	100					loamy sand	muck presence
2 - 24+	10YR 4/1	95	10YR 5/6	5			sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☑ Muck Presence (A8) **(LRR U)**
- ☑ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☑ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

The soil profile displayed 10YR 3/1 colored surface layer down to approximately 2 inches below the soil surface with a presence of muck. The soil transitioned to 10YR 4/1 beyond 2 inches. Redoximorphic features (reduced iron) began at approximately 2 inches below the soil surface. A hydrogen sulfide odor was observed from the soil indicating the likely presence of persistent anaerobic conditions. The Hydrogen Sulfide (A4), Muck Presence (A8), 1cm Muck (A9), Sandy Mucky Mineral (S1), and Sandy Redox (S5) hydric soil indicators were observed and the hydric soil parameter was met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: UAS Airstrip Roadway City/County: Wallops Island, VA (Accomack County) Sampling Date: 01/13/2021

Applicant/Owner: GMB Architects & Engineers State: VA Sampling Point: DP3

Investigator(s): COVA Environmental (Rick Harris) Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): convex Slope (%): 8-10

Subregion (LRR or MLRA): LRR T Lat: 37.884115° N Long: -75.438395° W Datum:

Soil Map Unit Name: CaA—Camocca fine sand, 0 to 2 percent slopes, frequently flooded NWI classification: UPLANDS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No	**Is the Sampled Area within a Wetland?** Yes No ✓
Hydric Soil Present?	Yes	No ✓	
Wetland Hydrology Present?	Yes	No ✓	

Remarks:

The hydrophytic vegetation parameter was met. However, the hydric soil and wetland hydrology parameters were not met. This area consisted of a sloped shoulder along a paved roadway that qualified as uplands. The roadway and shoulder was a few feet higher than the adjacent wetlands and appeared to be effectively drained due to its convex relief.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No ✓	Depth (inches): N/A	
Water Table Present?	Yes ✓	No	Depth (inches): 20"	
Saturation Present? (includes capillary fringe)	Yes ✓	No	Depth (inches): 19"	**Wetland Hydrology Present?** Yes No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The FAC-Neutral Test (D5) secondary wetland hydrology indicator was the only indicator observed due to the Spartina patens that encroached within this area from the wetlands. The wetland hydrology parameter was not met. The landscape in this area consisted of a sloped shoulder along a paved roadway. The roadway and shoulder was a few feet higher than the adjacent wetlands and appeared to be effectively drained due to its convex relief.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP3

Tree Stratum (Plot size: 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30 foot radius)			
1. Baccharis halimifolia	25	YES	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 30 foot radius)			
1. Spartina patens	40	YES	FACW
2. Schedonorus arundinaceus	25	YES	FAC
3. Panicum virgatum	5	NO	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		

50% of total cover: 35 20% of total cover: 14

Woody Vine Stratum (Plot size: 30 foot radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks: (If observed, list morphological adaptations below).

The dominance test was met for this data point and therefore meets the hydrophytic vegetation parameter. This data point location was located along the sloped shoulder of a paved roadway. The vegetation near the roadway appeared to be routinely mowed and therefore the vegetation in the mowed areas was difficult to analyze.

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	2.5Y 6/4	100					sand	
8 - 14	2.5Y 6/3	100					sand	
14 - 22	2.5Y 6/3	98	2.5Y 5/6	2			sand	
22 - 26+	10YR 3/1	100					fine sandy loam	buried former surface layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

The soil profile displayed a 2.5Y 6/4 colored surface layer down to approximately 8 inches below the soil surface, underlain by 2.5Y 6/3 colored layers from 8 to 22 inches below the soil surface. Redoximorphic features (reduced iron) began at approximately 14 inches below the soil surface. A 10YR 3/1 colored layer was observed beyond 22 inches below the soil surface. This darker colored layer appeared to be the former soil surface due to its similar characteristics to the soil profiles observed in the nearby wetlands that are outside of the roadway area. This former surface layer has most likely been buried by fill materials that were deposited for the shoulder of the paved roadway. No hydric soil indicators were observed and the hydric soil parameter was not met.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

March 23, 2021

PRELIMINARY JURISDICTIONAL DETERMINATION

Eastern Virginia Regulatory Section
NAO-2020-1758 (Chincoteague Inlet)

NASA Wallops Flight Facility
Attn: Paul Bull
34200 Fulton Street
Wallops Island, VA 23338

Dear Mr. Bull:

This letter is in regard to your request for a preliminary jurisdictional determination for waters of the U.S. (including wetlands) associated with the project known as NASA WFF Wallops Pier adjacent to the Mid-Atlantic Regional Spaceport's (MARS) unmanned airstrip at Wallops Flight Facility in Wallops Island, Virginia.

The map entitled "Figure 3, Wetland Delineation Map", by AECOM dated 09/10/2020 (*copy enclosed)* provides the location(s) of waters and/or wetlands on the property listed above. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*, positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation. This letter is not confirming the Cowardin classifications of these aquatic resources.

The Norfolk District has relied on the information and data provided by the applicant or agent. If such information and data subsequently prove to be materially false or materially incomplete, this verification may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings.

Discharges of dredged or fill material, including those associated with mechanized landclearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in

question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination. This preliminary jurisdictional determination and associated wetland delineation map may be submitted with a permit application.

Enclosed is a copy of the “Preliminary Jurisdictional Determination Form”. Please review the document, sign, and return one copy to me either via email (brian.c.denson@usace.army.mil) or via standard mail to US Army Corps of Engineers, Regulatory Office, and ATTN: Mr. Brian Denson, 803 Front Street Norfolk, Virginia 23510 within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands can be relied upon for no more than five years from the date of this letter. New information may warrant revision.

If you have any questions, please contact me either via telephone at (757) 201-7792 or via email at the address above. Please include your NAO project number within the subject line.

Sincerely,

Brian Denson
Project Manager Eastern Virginia
Regulatory Section

Enclosure(s): Referenced Delineation Map, Preliminary JD Form

AECOM

National Aeronautics and Space Agency
Wallops Flight Facility
2020

Wallops Pier
Accomack County, VA

Last Date Edited: 9/10/2020
Project Number: 60631607

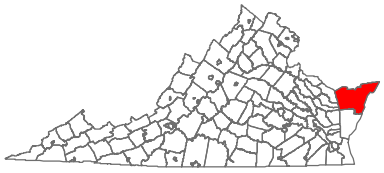
0 300 600 Feet

Legend

- Study Area
- Wetlands
- Surface Water
- Determination Points

N W E S

Figure 3
Wetland Delineation Map



Accomack County

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR PJD:** 23-MAR-2021

B. **NAME AND ADDRESS OF PERSON REQUESTING PJD:**

C. **DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO, NASA WALLOPS PORT FACILITY, NAO-2020-01758-BCD

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: VA County/parish/borough: Accomack County City:
Center coordinates of site (lat/long in degree decimal format):
Lat.: 37.887023º Long.: -75.439844º
Universal Transverse Mercator: 18
Name of nearest waterbody: Chincoteague Bay

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: March 23, 2021
☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Surface Water	37.889561	-75.441146	3 acres	Non-wetland waters	Section 10/404
WA	37.885179	-75.437651	1.53 acres	Wetland	Section 10/404
WB	37.886539	-75.439739	3.56 acres	Wetland	Section 10/404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the.JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there “may be” waters of the U.S. and/or that there “may be” navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

_X__ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: Figure 3 Wetland Delineation Map___.
__X_ Data sheets prepared/submitted by or on behalf of the PJD requestor.
__X_ Office concurs with data sheets/delineation report.
___ Office does not concur with data sheets/delineation report. Rationale:
_____.
___ Data sheets prepared by the Corps: _____.
___ Corps navigable waters' study: _____.
_X__ U.S. Geological Survey Hydrologic Atlas: _____.
___ USGS NHD data.
_X__ USGS 8 and 12 digit HUC maps.
_X__ U.S. Geological Survey map(s). Cite scale & quad name: _____Chincoteague West____.
__X_ Natural Resources Conservation Service Soil Survey. Citation: _____.
_X__ National wetlands inventory map(s). Cite name: _____.
___ State/local wetland inventory map(s): _____.
___ FEMA/FIRM maps: _____
___ 100-year Floodplain Elevation is: _____. (National Geodetic Vertical Datum of 1929)
_X__ Photographs: __X_ Aerial (Name & Date): ____Google Earth Various years___.
___ or __X_ Other (Name & Date): __photos provided by agent___.
___ Previous determination(s). File no. and date of response letter: _____.

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

___ Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of Regulatory staff member completing PJD

Paul Bull

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

March 16, 2021

PRELIMINARY JURISDICTIONAL DETERMINATION

Eastern Virginia Regulatory Section
NAO-2020-1758 (Cow Gut Flat)

NASA Wallops Flight Facility
Attn: Paul Bull
34200 Fulton Street
Wallops Island, VA 23338

Dear Mr. Bull:

This letter is in regard to your request for a preliminary jurisdictional determination for waters of the U.S. (including wetlands) for the road crossing portion of the NASA Wallops Pier project, located on a 0.645 acre study area near the UAS Airstrip in Wallops Island, Virginia (tax map parcel #02800A000007500).

The map entitled "Exhibit 2: Site Map, UAS Airstrip Wetland Delineation, Wallops Island, VA", by Rick Harris dated 01/14/2021 (*copy enclosed)* provides the location(s) of waters and/or wetlands on the property listed above. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*, positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of a mean high water mark. This letter is not confirming the Cowardin classifications of these aquatic resources.

The Norfolk District has relied on the information and data provided by the applicant or agent. If such information and data subsequently prove to be materially false or materially incomplete, this verification may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings.

Discharges of dredged or fill material, including those associated with mechanized landclearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination. This preliminary jurisdictional determination and associated wetland delineation map may be submitted with a permit application.

Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to me either via email (brian.c.denson@usace.army.mil) or via standard mail to US Army Corps of Engineers, Regulatory Office, and ATTN: Mr. Brian Denson, 803 Front Street Norfolk, Virginia 23510 within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands can be relied upon for no more than five years from the date of this letter. New information may warrant revision.

If you have any questions, please contact me either via telephone at (757) 201-7792 or via email at the address above. Please include your NAO project number within the subject line.

Sincerely,

Brian Denson
Project Manager Eastern Virginia
Regulatory Section

Enclosure(s): Referenced Delineation Map, Preliminary JD Form

Exhibit 2: Site Map, UAS Airstrip Wetland Delineation, Wallops Island, VA

Source: VGIN 2017 Aerial Basemap; Delineation Data Collected via Trimble R1 GNSS Receiver

Legend

- Study Area ~ 0.645 acres
- E2EM1P Wetlands ~ 0.519 cumulative acres
- E1UBL Stream ~ 151 cumulative linear feet
- Culvert Pipe ~ 29 linear feet
- Data Point

COVA Project #: 2020-032
Date: 01/14/2021
Created By: Rick Harris
VA PWD #: 3402000173

COASTAL VIRGINIA
ENVIRONMENTAL SERVICES

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. **REPORT COMPLETION DATE FOR PJD:** 16-MAR-2021

B. **NAME AND ADDRESS OF PERSON REQUESTING PJD:**
NASA Wallops Flight Facility
Attn: Paul Bull
34200 Fulton Street
Wallops Island, VA 23338

C. **DISTRICT OFFICE, FILE NAME, AND NUMBER:**
NAO, NASA WALLOPS PORT FACILITY, NAO-2020-01758-BCD

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: VA County/parish/borough: Accomack County City:
Center coordinates of site (lat/long in degree decimal format):
Lat.: 37.888799° Long.: -75.442899°
Universal Transverse Mercator: 18
Name of nearest waterbody: Chincoteague Bay

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: March 16, 2021
☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
E1UBL	37.883995	-75.438419	151 feet	Non-wetland waters	Section 10/404
E2EM1P	37.883962	-75.438454	0.519 acres	Wetland	Section 10/404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the.JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there “may be” waters of the U.S. and/or that there “may be” navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

_X__ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _ Exhibit 2: Site Map, UAS Airstrip Wetland Delineation, Wallops Island, VA.
_X__ Data sheets prepared/submitted by or on behalf of the PJD requestor.
_X__ Office concurs with data sheets/delineation report.
___ Office does not concur with data sheets/delineation report. Rationale:
_____.
___ Data sheets prepared by the Corps: _____.
___ Corps navigable waters' study: _____.
_X__ U.S. Geological Survey Hydrologic Atlas: _____.
X USGS NHD data.
_X__ USGS 8 and 12 digit HUC maps.
_X__ U.S. Geological Survey map(s). Cite scale & quad name: _____.
_X__ Natural Resources Conservation Service Soil Survey. Citation: _____.
_X__ National wetlands inventory map(s). Cite name: _____.
___ State/local wetland inventory map(s): _____.
___ FEMA/FIRM maps: _____
___ 100-year Floodplain Elevation is: _____. (National Geodetic Vertical Datum of 1929)

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

_X__ Photographs: _X__ Aerial (Name & Date): __Google Earth various years____.
___ or ___ Other (Name & Date): _____.
___ Previous determination(s). File no. and date of response letter: _____.
___ Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of Regulatory staff member completing PJD

Paul Bull

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

This page intentionally left blank.