APPENDIX J

Wetland Delineations

J.1 | SIGNATURE EAST

J.2 | SIGNATURE SOUTH

APPENDIX J.1

Signature East

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SECTION 3

WETLAND DELINEATION REPORT



TETERBORO AIRPORT – SIGNATURE EAST WETLAND DELINEATION REPORT

BLOCK 203, LOTS 1 AND 1.02 (PORTION)
BOROUGH OF TETERBORO, BERGEN COUNTY, NJ

FEBRUARY 2024

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1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The objective of this effort was to delineate and describe waters of the United States, including wetlands, located within a portion of the property designated as Block 203, Lots 1 and 1.02 located at 200 Fred Wehran Drive, Borough of Teterboro, Bergen County, New Jersey (**Figures 1** and **Figure 2**). Areas identified and delineated are potentially regulated pursuant to Section 404 of the Clean Water Act (CWA). Section 404 of the CWA defines wetlands as:

> *"Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

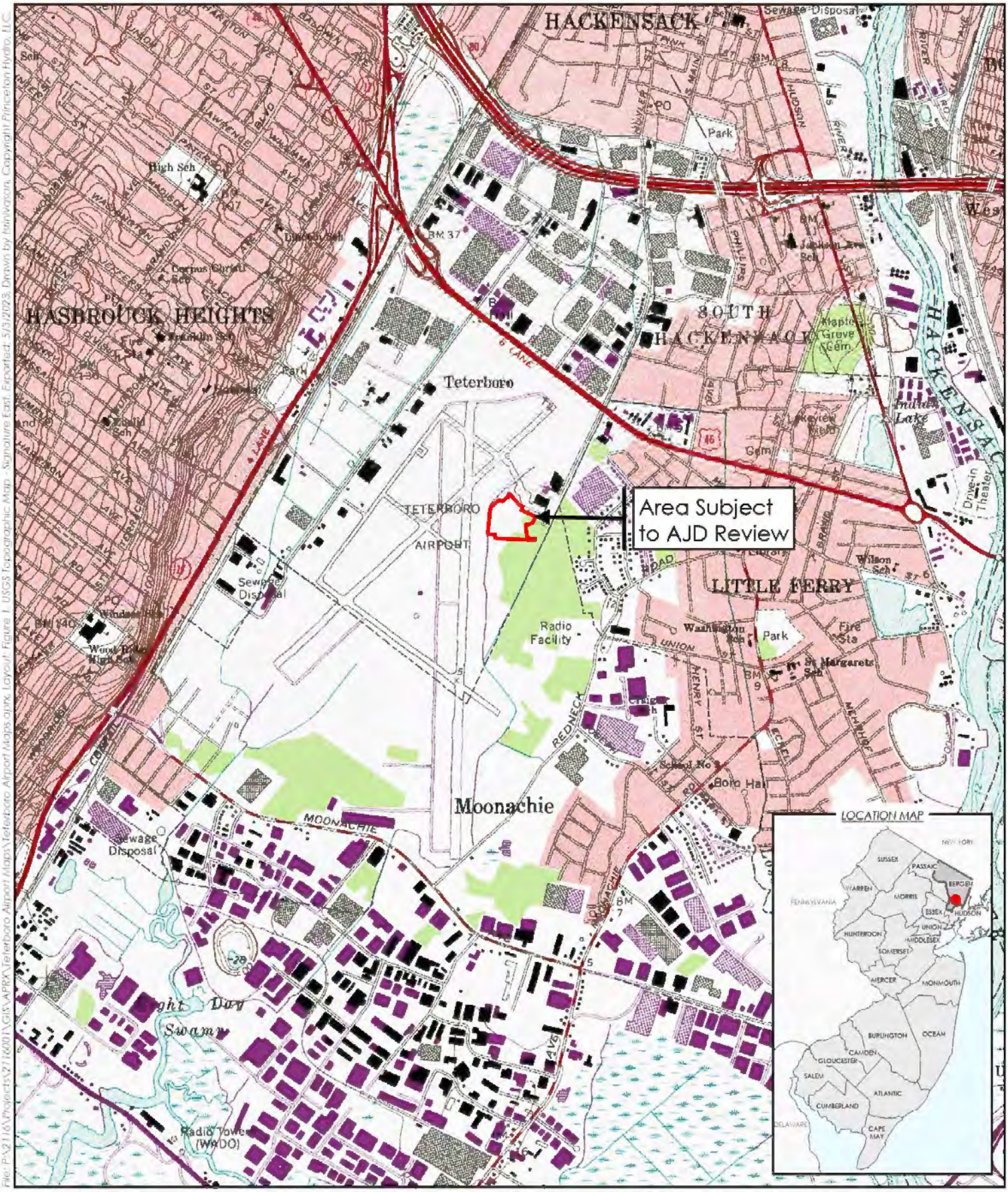
The delineation of waters of the United States, including wetlands, was performed by Princeton Hydro, LLC (Princeton Hydro) on February 6, 2023 in accordance with the methods and procedures set forth in the *1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (1987 Manual)* (Environmental Laboratory 1987) and the U.S. Army Corps of Engineers (USACE) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (NCNE Regional Supplement)* (Environmental Laboratory 2012). Princeton Hydro conducted a desktop review of historical aerial imagery, soil, wetland, and topographic information prior to the field investigation to assist in describing and delineating areas potentially under Federal and/or State jurisdiction.

1.2 SITE DESCRIPTION

The area subject to the delineation effort consists of 7.987-acres within a portion of Block 203, Lots 1 and 1.02 in the Borough of Teterboro, Bergen County, New Jersey (Site) (**Figure 1** and **Figure 2**). The Site is bound to the north by the existing Signature Flight hangars and tarmac, to the east by the Aviation Hall of Fame, to the south by freshwater wetlands, and to the west by maintained lawns and taxiways of the airport.

The land associated with the Teterboro Airport was acquired in 1917 by William Teter. The first flight took off from the present-day airport in 1919, and airport operations have continued to the present day. The Site, located on the eastern side of the airport, has remained largely unchanged since the opening of the airport. The Site is currently vegetated and provides a buffer between the airport runways and tarmac and Fred Wehran Drive located off the property. The Site is owned by the Port Authority of New York and New Jersey (PANYNJ) and will be leased by First Aviation Services. The Signature East Expansion Project (Project) is proposed within a 5.251-acre portion of the Site. The Project area is generally defined by the anticipated limit of disturbance for the future expansion of the existing aircraft hangar facilities.

The Site possessed ten (10) distinct vegetative communities (**Figure 3**): grey birch/red maple successional forested wetland, grey birch/red maple successional upland, common reed dominated



NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. USGS topographic map obtained from the New Jersey Geographic Information Network, Weehawken, NJ quadrangle.

0 1,000 2,000 Feet

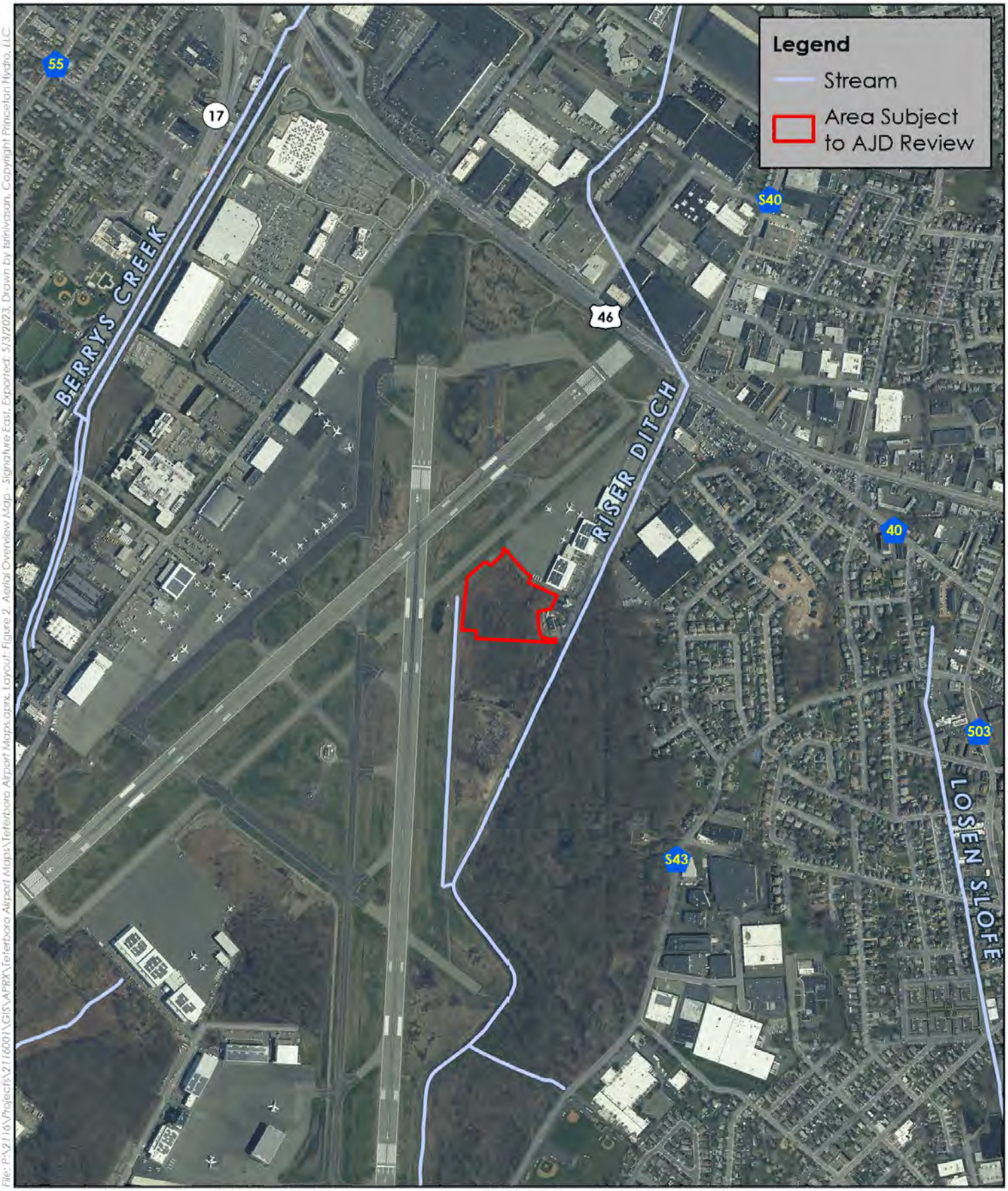
Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 1.
USGS TOPOGRAPHIC MAP
SIGNATURE EAST

SIGNATURE FLIGHT SUPPORT - TETERBORO AIRPORT
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File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 1_USGS Topographic Map - Signature East, Exported: 5/3/2023, Drawn by: hlevinson, Copyright Princeton Hydro, LLC



File: P:\2116\Project\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 2. Aerial Overview Map - Signature East, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC

NOTES:
1. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
2. Area Subject to AJD Review provided by Signature Flight Support.
3. 2020 orthoimagery and roads obtained from the New Jersey Geographic Information Network.

0 500 1,000 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 2.
AERIAL OVERVIEW MAP
SIGNATURE EAST

SIGNATURE FLIGHT SUPPORT - TETERBORO AIRPORT
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File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 3. Existing Ecological Communities - Signature East, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC



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NOTES:
1. Wetland flag locations, wetland limits, ditch limits, and existing ecological community boundaries are approximate.
2. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
3. Area Subject to AJD Review provided by Signature Flight Support.
4. Property boundaries (Bergen County 2021 Parcels) and 2020 orthoimagery obtained from the NJ Geographic Information Network (NJGIN).

0 50 100 Feet

Spatial Reference: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

FIGURE 3. EXISTING ECOLOGICAL COMMUNITIES SIGNATURE EAST

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BERGEN COUNTY, NEW JERSEY

wetland, Japanese knotweed wetland, Japanese knotweed upland, scrub/shrub wetland, scrub/shrub upland, maintained lawn wetland, maintained lawn upland, and an upland berm. The grey birch/red maple successional forested communities were located within the eastern and southern portion of the Site; the common reed dominated wetland and maintained lawn communities were located within the western portion of the Site; the scrub/shrub communities were located in the southern and central portions of the Site; and the berm upland community was located along the northern boundary of the Site.

The Site is located within the Hackensack River (below and including Hirshfeld Brook) Watershed (Hydrologic Unit Code [HUC]-11: 02030103180). Two ditches are located in and within the vicinity of the Site. The first ditch, called "East Riser Ditch", is located within the eastern portion of the Site, and the second ditch, called "West Riser Ditch", is located to the west of the Site. The wetlands on-Site are adjacent to these ditches. Both ditches are tributaries to Berry's Creek, which is a tidal tributary of the Hackensack River, a navigable waterbody pursuant to Section 404 of the CWA.

1.3 PRIOR APPROVED JURISIDICTIONAL DETERMINATION

Wetlands and waterbodies on-Site were originally delineated by Langan Engineering and Environmental Services, Inc. (Langan) in 2016. On September 29, 2017, the USACE-NYD issued an Approved Jurisdictional Determination (AJD) for the Site, which confirmed that Langan's wetland delineation accurately reflected the extent of waters of the United States present (Permit Application No. NAN-2015-01327-WCA). The jurisdictional waters of the United States identified on-Site consisted of four principal jurisdictional areas. These jurisdictional areas were on-Site wetlands, identified as Wetland SB-2 (4.5 acres), Wetland O (0.001 acres), Wetland OA (0.001 acres), and Wetland OB (0.008 acres), totaling approximately 4.51 acres. These wetlands consisted of non-tidal forested, scrub/shrub, and emergent wetlands that were identified as adjacent to East Riser Ditch. The East Riser Ditch is a tributary of Berry's Creek, which is a tidal tributary of the Hackensack River, which is a navigable water body. Being a part of a tributary system, these wetlands were considered to be waters of the United States, and under the jurisdiction of the USACE. A copy of the prior AJD for the Site is provided in **Section 5**. The prior AJD expired on September 29, 2022.

1.4 SUMMARY OF PROPOSED JURISDICTIONAL DETERMINATION

Based on the findings presented herein, it was determined that waters of the United States existed on-Site as it applies to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA. There were no non-jurisdictional waters observed on-Site.

On February 6, 2023, Princeton Hydro conducted field investigations at the Site. During this field investigation, Princeton Hydro determined that changes to the limits of jurisdictional waters of the United States were necessary based on the vegetation, hydrology, and soils present at the Site. Princeton Hydro made the following changes to the limits of delineated waters on-Site:

- **Change #1:** The prior AJD's wetland flags #26 through #28 were moved downslope to the bottom of the berm (redelineated as wetland flags WA-8 through WA-10). The previous location of these flags was near the top of the berm where there was no wetland hydrology, hydrophytic vegetation, or hydric soils present.

- **Change #2:** The prior AJD's wetland flags #24 and #25 were redelineated with a new WY-Line. The WY-Line (wetland flags WY-1 through WY-4) represents the new limit of this portion of the wetland. This change to the wetland line was made to reflect the extent of hydric soils, which were not present within the former line limits.

- **Change #3:** Princeton Hydro delineated the WZ-Line to the north of the Site. This line represents the limits of the West Riser Ditch within the vicinity of the Site, which was not delineated in the prior AJD.

With the exception of these changes, the remaining extent of the waters of the United States on-Site remain unchanged from those previously approved by the USACE in 2017.

Table 1 below summarizes waters of the United States delineated and their proposed jurisdiction as it applies to the authority of the USACE under Section 404 of the CWA. Overall, the Site contained a total of 5.346 acres of jurisdictional wetlands and 0.014 acres of jurisdictional waterbodies (see **Section 4**).

The jurisdiction of waters of the United States is subject to review and approval by the USACE. As such, the findings within this report are preliminary and should not be considered final until the USACE has issued an AJD.

Table 1. Summary of Proposed CWA Section 404 Jurisdiction

IDENTIFIED FEATURE[1]	RESOURCE TYPE[2]	VEGETATIVE COMMUNITIES	PROPOSED JURIDICTION[3]	JURIDICTIONAL DETERMINATION RATIONALE[4]	SIZE OF EXISTING RESOURCE[5]
Wetlands					
WA / WY / WZ	PFO1E / PSS1E PEM1E / PEM5E	• Maintained Lawn • Common reed wetland • Scrub/shrub wetland • Grey birch/red maple successional forest wetland • Japanese knotweed wetland	Jurisdictional	Wetland Adjacent to a RPW (Berry's Creek UNT)	5.336
O	PSS1E	• Grey birch/red maple successional forest wetland	Jurisdictional	Wetland Adjacent to a RPW (Berry's Creek UNT)	0.001
OA	PSS1E	• Grey birch/red maple successional forest wetland	Jurisdictional	Wetland Adjacent to a RPW (Berry's Creek UNT)	0.001
OB	PSS1E	• Grey birch/red maple successional forest wetland	Jurisdictional	Wetland Adjacent to a RPW (Berry's Creek UNT)	0.008
Waterbodies					
IDENTIFIED FEATURE[1]	WATER TYPE	WATERS OF THE U.S. CLASSIFICATION	PROPOSED JURIDICTION[3]	LENGTH (FEET)	SIZE OF EXISTING RESOURCE[5]
East Riser Ditch	Ditch	RPW (Barry's Creek UNT)	Jurisdictional	237	0.014

Notes:
[1] Reference the Wetland Delineation Plan provided externally as Section 4.
[2] Cowardin Classifications, Cowardin et al. 1979.
PFO1E = Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded/Saturated
PSS1E = Palustrine Scrub/Shrub Broad-Leaved Deciduous Seasonally Flooded/Saturated
PEM1E = Palustrine Emergent Persistent Seasonally Flooded/Saturated

IDENTIFIED FEATURE[1]	RESOURCE TYPE[2]	VEGETATIVE COMMUNITIES	PROPOSED JURIDICTION[3]	JURIDICTIONAL DETERMINATION RATIONALE[4]	SIZE OF EXISTING RESOURCE[5]

PEM5E = Palustrine Emergent *Phragmites australis* Seasonally Flooded/Saturated
[3] The jurisdiction of waters of the United States is subject to review and approval by the USACE. As such, the findings within this report are preliminary and should not be considered fina until the USACE has issued an Approved Jurisdictional Determination.
[4] Source: EPA 2008 and 80 FR 3004
[5] Area in acres

2.0 FIELD INVESTIGATIONS

2.1 *WETLAND DELINEATION METHODOLOGY*

The delineation of waters of the United States, including wetlands, was performed in accordance with the methods and procedures set forth in the *1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (1987 Manual)* (Environmental Laboratory 1987) with supplemental information provided by the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast (Version 2.0) (NCNE Regional Supplement)* (Environmental Laboratory 2012). The methods and procedures set forth in *the 1987 Manual* were applied for both the collection and review of existing available background information on vegetation, soils, and hydrology and the on-Site delineation.

Based on the "three parameter" approach, an area is defined as a wetland if it exhibits, under normal circumstances, all of the following characteristics:

1. The land supports a dominance of hydrophytic vegetation.
2. The substrate is hydric soil.
3. The soil/substrate is at least periodically saturated or inundated during a portion of the growing season.

The delineation effort involved the establishment of representative sampling points along wetland lines and at representative locations within each plant assemblage on-Site. At each sampling point, data regarding the vegetation, soil and hydrology of the area was collected. The data collected provided the information required to determine whether the area met the definition of a wetland.

2.1.1 VEGETATION

A hydrophyte is any plant that has the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels. The United States Fish and Wildlife Service (USFWS) prepared a list of wetland plant species for the Northeast United States (Region 1) (USFWS 1988 & 1996). On June 1, 2012, the 2012 National Wetland Plant List replaced the 1988 USFWS' National list of plant species that occur in wetlands (USFWS Biological Report 88 (24)). This list was developed by the USACE, the USFWS, the United States Environmental Protection Agency (USEPA), and the NRCS. The 2012 list included changes in the names of species, the recognition of new species, changes in wetland regions, and changes in the wetland indicator statuses of species. The most recently updated 2020 National Wetland Plant List was utilized

to classify the plant species identified on-Site. The wetland indicator classification assigned to each species listed is provided in **Table 2**.

Table 2. Plant Affinity for Wetland Conditions

INDICATOR CLASSIFICATION	PERCENT OCCURRENCE IN WETLANDS
Obligate (OBL)	>99
Facultative Wetland (FACW)	67-99
Facultative (FAC)	34-66
Facultative Upland (FACU)	1-33
Non-wetland (UPL)	<1

Species for which insufficient information is available for classification are listed in the USFWS list with a designation of NI (No Indicator) for regional status. This wetland indicator classification was used for plant species found at the Site. A designation of NL (Not Listed) was used if a species was not present within the list.

To accurately describe the vegetation at each sampling point, data on each horizontal strata or layer were collected. Vegetative strata for which dominants were determined included (1) tree (≥ 5.0 inches diameter at breast height (DBH) and 20 feet or taller); (2) sapling (0.4 to <5.0 inches DBH and <20 feet tall); (3) shrub (usually 3 to 20 feet tall including multi-stemmed, bushy shrubs); (4) woody vine; and (5) herb (herbaceous plants including graminoids, forbs, ferns, fern allies, herbaceous vines, and tree seedlings).

The dominant species was determined by making visual estimates of the herb, shrub, sapling, woody vine, and tree strata and assigned one of the following cover classes, with the midpoints of each cover class in parentheses: T < 1% (none); 1 = 1-5% (3.0); 2 = 6-15% (10.5); 3 = 16-25% (20.5); 4 = 26-50% (38.0); 5 = 51-75% (63.0); 6 = 76-95% (85.5); 7 = 96- 100% (98.0). The midpoints of each species were averaged at each sample point and ranked. The dominance threshold number was calculated and used to determine dominant species. Those species comprising 50 percent of the total cover were considered to be the dominants, plus any additional species representing 20 percent or more of the total cover class midpoint values for each stratum. A USFWS wetland indicator was assigned to each species recorded. The affinity of the dominant species to wetlands was used in the determination of the wetland status at each sample point.

At each wetland determination data point, vegetation was initially evaluated using the Rapid Test for Hydrophytic Vegetation. If all dominant species across all strata were OBL or FACW based on a visual assessment, vegetation was determined to be hydraphytic. If the area sampled was not daminated salely by OBL and FACW species, the standard Dominance Test was used. Using the Daminance Test, if greater than 50 percent af the dominant plant species were OBL, FACW or FAC then hydrophytic vegetation was determined ta be present.

2.1.2 SOILS

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory 1987). Typically, these soils are predominately gray and mottled immediately below the "A" horizon and have thick,

dark colored surface layers. At each sampling point, a detailed soil description was obtained from an auger boring. A Munsell soil color book was used to determine soil color. Each boring was taken to a depth of at least 18 inches or until refusal was met.

2.1.3 HYDROLOGY

The identification of positive indicators of wetland hydrology includes direct observation of inundation, soil saturation, or secondary characteristics, such as stained leaf litter or buttressed tree trunks, indicating that the area is subject to inundation or saturation for a prolonged duration. For an area to be designated as a wetland, the area must have the presence of water for a week or more during the growing season (Environmental Laboratory 1987). Areas with wetland hydrology characteristics are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively.

At each sampling point, positive indicators of wetland hydrology were noted when encountered. These indicators include, but are not limited to, drainage patterns, drift lines, sediment deposition, watermarks, saturated soils, or inundation. Features that could influence the hydrology of the area, such as ditches or drainage systems, were also noted.

2.2 WATERBODIES

This study also evaluated the presence of waters of the United States, other than wetlands, potentially subject to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA. Waterbodies within the northcentral northeast region include, but are not limited to, tidal flats and shorelines along the Atlantic coast and estuaries; unvegetated temporary pools; ponds; lakes; mud flats; and perennial, intermittent, and ephemeral stream channels (*NCNE Regional Supplement*). The delineation of waterbodies on-Site was based on the high tide line and indicators of ordinary highwater marks (OHWM) (33 CFR 328.3c).

3.0 RESULTS AND DISCUSSION

3.1 VEGETATION

3.1.1 DESKTOP REVIEW OF VEGETATION

Prior to conducting Site investigations, Princeton Hydro conducted a desktop review of mapped freshwater wetlands utilizing the previous AJD issued for the Site, along with both NJDEP's GeoWeb (NJDEP 2023) and the USFWS's National Wetland Inventory (NWI) (USFWS 2023). As described in Section 1.3 above, the previous AJD reported that there were four wetland areas located on-Site, which consisted of non-tidal forested, scrub shrub, and emergent wetlands. Additionally, both NJDEP GeoWeb (**Figure 4**) and the NWI (**Figure 5**) indicated the presence of freshwater wetlands being located on-Site. NJDEP GeoWeb indicated the presence of three vegetative wetland communities on-Site: Managed Wetland in Maintained Lawn Greenspace, Deciduous Scrub/Shrub Wetlands, and Herbaceous Wetlands. NWI Wetland Map indicated the presence of two vegetative wetland communities on-Site: Freshwater Emergent Wetland and Freshwater Forested/Shrub Scrub Wetland.



File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 4. NJDEP Wetlands Map - Signature East, Exported: 5/3/2023, Drawn by Srinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
2. Area Subject to AJD Review provided by Signature Flight Support.
3. NJDEP Wetlands (2015 land use/land cover) obtained from NJDEP GIS website: www.state.nj.us/dep/gis/
4. 2020 orthoimagery and roads obtained from the New Jersey Geographic Information Network.

0 100 200 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 4.
NJDEP WETLANDS MAP
SIGNATURE EAST

SIGNATURE FLIGHT SUPPORT - TETERBORO AIRPORT
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File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 5. NWI Wetlands Map - Signature East, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. National Wetlands Inventory (NWI) wetlands obtained from The US Fish & Wildlife Service.
3. 2020 orthoimagery and roads obtained from the New Jersey Geographic Information Network.

0 100 200 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 5.
NWI WETLANDS MAP
SIGNATURE EAST

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3.1.1 RESULTS OF FIELD INVESTIGATIONS OF VEGETATION

Princeton Hydro observed ten (10) distinct plant communities on-Site: grey birch/red maple successional forested wetland, grey birch/red maple successional upland, common reed dominated wetland, Japanese knotweed wetland, Japanese knotweed upland, scrub/shrub wetland, scrub/shrub upland, maintained lawn wetland, maintained lawn upland, and an upland berm (**Figure 3**). A list of all plant species identified on-Site during the wetland delineation is provided in **Appendix I**. Plant species identified at each sampling point are provided in the Wetland Delineation Data Forms included in **Appendix II**.

The grey birch/red maple successional forested wetland vegetative community was located downslope of the grey birch/red maple successional forested upland. This community comprised the majority of the central and southern portions of the Site as well as the wetlands delineated by the WA-WY-WZ-Line, the O-Line, the OA-Line, and the OB-Line. The tree stratum was dominated by 4 to 8 inch diameter red maple (*Acer rubrum*, FAC) and grey birch (*Betula populifolia*, FAC). The tops of the red maples in the area between the tower and the runway were removed in order to maintain visibility to the airport runways and taxiways from the control tower, which is located just to the east of this community (see **Appendix III, Photo 7**). Because of its proximity to the airport control tower, this forested community is unable to fully mature as control tower visibility will always need to be maintained. The sapling/shrub stratum was dominated by red maple saplings and highbush blueberry (*Vaccinium corymbosum*, FACW). The herbaceous stratum was dominated by common reed (*Phragmites australis*, FACW) and New York ironweed (*Vernonia noveboracensis*, FACW), and the woody vine stratum was dominated by Asiatic tearthumb *Persicaria perfoliata*, FAC).

The grey birch/red maple successional forested upland vegetative community is represented on the Wetland Delineation Data Forms by Bor-5 (**Appendix II**). This vegetative community was observed primarily in the northern portion of the Site upslope of the grey birch/red maple successional forested wetland. The tree stratum was dominated by red maple and grey birch. A few black cherry (Prunus serotina, FACU) were also observed within this community. The sapling/shrub stratum was dominated by red maple saplings. The herbaceous stratum was dominated by common reed (*Phragmites australis*, FACW) and New York ironweed (*Vernonia noveboracensis*, FACW). The woody vine stratum was dominated by Allegheny blackberry (*Rubus allegheniensis*, FACU). This upland community possessed hydrophytic vegetation in places as it passed the Dominance Test for hydrophytic vegetation. However, it did not possess either wetland hydrology or hydric soils, so it was considered upland and not delineated as a wetland.

The common reed dominated wetland is represented by Bor-1 on the Wetland Delineation Data Forms (**Appendix II**). This community was located in the western portion of the Site. This community lacked a tree stratum; however, the sapling/shrub stratum was dominated by highbush blueberry and common elderberry (*Sambucus canadensis*, FACW). The herbaceous stratum was dominated by common reed (*Phragmites australis*, FACW). No woody wine vegetation was present.

The Japanese knotweed upland vegetative community, located in the northern portion of the Site, did not possess a tree stratum or a sapling/shrub stratum. The herbaceous stratum was dominated by

Japanese knotweed (*Reynoutria japonica*, FACU). The woody vine stratum was dominated by fox grape (*Vitis labrusca*, FAC) and Asiatic tearthumb (*Persicaria perfoliata*, FAC).

A small portion of the Japanese knotweed vegetative community was determined to be wetland. This area possessed a similar vegetative structure to the Japanese knotweed upland; however red maple was also represented and comprised less than 50% canopy cover within the tree and sapling/shrub stratum.

The scrub/shrub wetland vegetative community is represented by Bor-2 and Bor-3 on the Wetland Delineation Data Forms (**Appendix II**). This community was located in a band in the central portion of the Site adjacent to the grey birch/red maple successional forest. This vegetative community lacked a tree stratum, and was dominated by highbush blueberry, black cherry silky dogwood (*Cornus sericea*, FACW), and red maple within the sapling/shrub stratum. The herbaceous stratum was dominated by giant goldenrod (*Solidago gigantea*, FACW), Japanese stiltgrass (*Microstegium vimineum*, FAC), and purpleleaf willowherb (*Epilobium coloratum*, OBL). The woody vine stratum was dominated by fox grape and Asiatic tearthumb.

A small portion of the scrub/shrub vegetative community extended into uplands in the northern portion of the Site. This community possessed a similar vegetative community as the scrub/shrub wetlands but did not possess silky dogwood within the sapling/shrub stratum and purpleleaf willowherb within the herbaceous stratum.

The maintained lawn upland vegetative community was located along the western boundary of the Site and bordered the airport runways. This community was dominated by a monoculture of mowed cool season grass species (*Poa* spp.) within the herbaceous stratum. No vegetation was present within the tree, sapling/shrub, or woody vine stratums.

Just downslope of the maintained lawn upland community was a maintained lawn wetland vegetative community. This community was also dominated by a monoculture of mowed grass species, but also possessed common reed, switchgrass (*Panicum virgatum*, FAC), and common rush (*Juncus effusus*, OBL). No vegetation was present within the tree, sapling/shrub, or woody vine stratums in this community.

The berm upland vegetative community, located along the northern border of the Site, was dominated by tree-of-heaven (*Ailanthus altissima*, FACU) and staghorn sumac (*Rhus typhina*, NL) in the tree and sapling/shrub stratums. In the herbaceous stratum, this community was dominated by Japanese stiltgrass. No vegetation was present within the woody vine stratum. Within this vegetative community, Wetland Flags WA-8 through WA-10 were placed along the bottom of the man-made berm, which reflects a change in the jurisdictional limits from the previous AJD. This revision to the wetland line was based, in part, upon the existing vegetation on the berm, of which there was no hydrophytic vegetation present (see **Appendix III, Photos 5 and 6**).

The vegetative communities described in this proposed jurisdictional determination differ from those described in the prior AJD for the Site. This was done to outline the vegetative communities of the Site more accurately and in greater detail, but also to show that low quality habitat comprises a majority of the vegetative communities on-Site. For instance, the common reed dominated wetland, the Japanese knotweed upland and wetlands, and the berm are dominated mostly by invasive species.

The maintained lawn communities are routinely mowed owing to their proximity to the runways and tarmac of the airport. Additionally, the grey birch/red maple successional forest consisted of a relatively young forest that is unable to mature owing to its proximity to the airport control tower, leading many maturing trees to be topped or felled to maintain a clear view of the runway (see **Appendix III, Photo 11**).

3.2 *SOILS*

3.2.1 DESKTOP REVIEW OF SOILS

The NRCS' Web Soil Survey is the official source for soil survey information for Bergen County, New Jersey. The NRCS' Web Soil Survey was utilized to conduct a desktop review of soils on-Site prior to conducting the wetland delineation (USDA NRCS 2023). The NRCS' Web Soil Survey indicated the presence of two soil-mapping units on-Site (**Figure 6**). A summary of these soils is provided in **Table 3** below. An official NRCS soil description is provided in the sections below. Additionally, a soil resource report for the Site is provided in **Appendix IV**.

Table 3. NRCS Mapped Soils

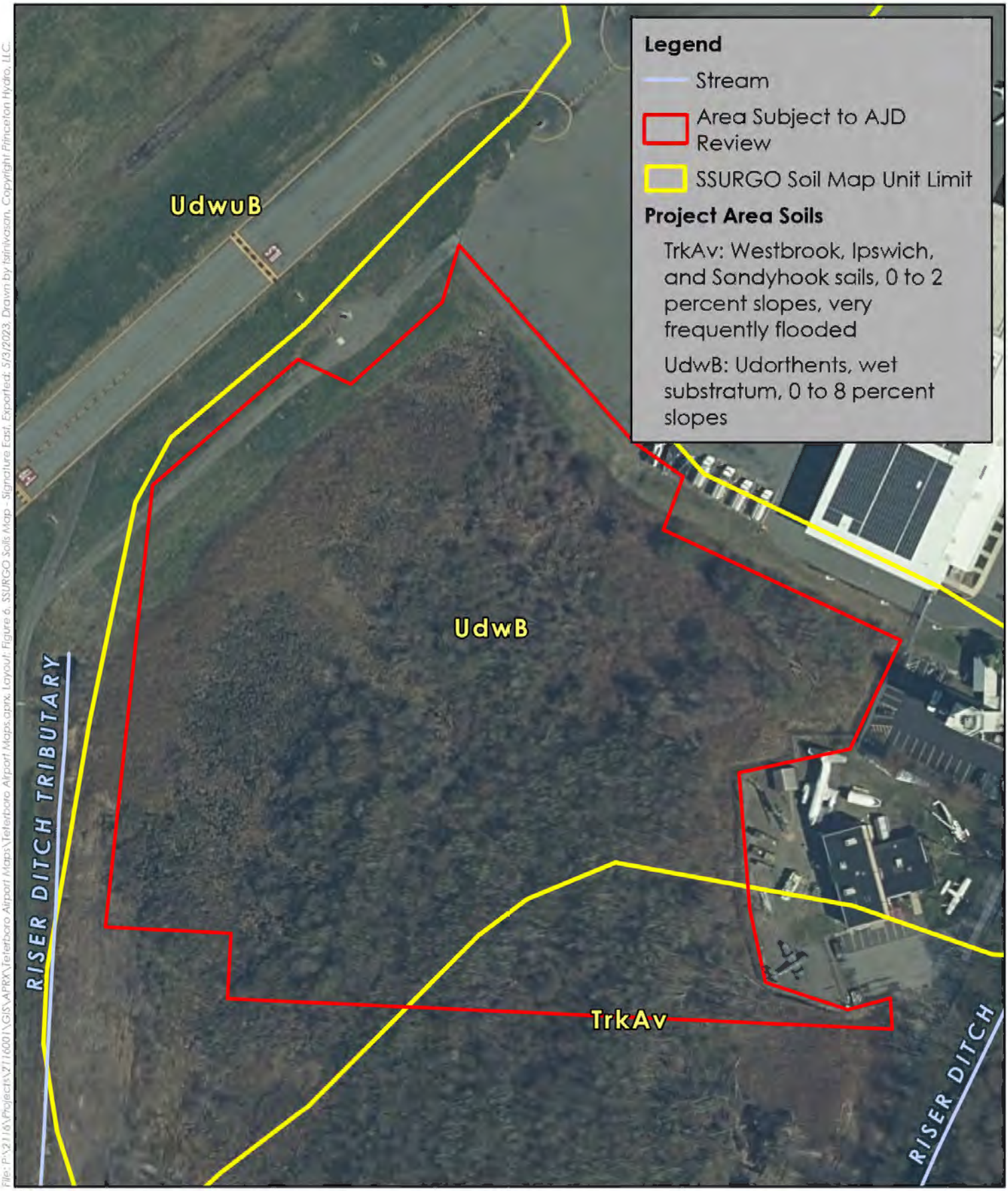
MAP UNIT SYMBOL	MAP UNIT NAME
TrkAv	Westbrook, Ipswich, and Sandyhook soils, 0 to 2 percent slopes, very frequently flooded
UdwB	Udorthents, wet substratum, 0 to 8 percent slopes

WESTBROOK SERIES

The Westbrook Series consists of very deep, very poorly drained soils formed in organic deposits over loamy mineral material. This soil series is typically found in flat coastal areas and along tidal marshes and rivers that are subject to inundation by salt water twice daily. Slopes in this series generally range from 0 to 2 percent. In a representative soil profile, the surface layer, from 0 to 40 inches, is a very dark gray (10YR 3/1) mucky peat with 45 percent organic matter, followed from 48 to 64 inches by a very dark gray (5Y 3/1) silt loam with 12 percent organic matter. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.

IPSWICH SERIES

The Ipswich Series consists of very deep, very poorly drained soils formed in thick herbaceous organic deposits. This series is typically found level tidal marshes and coastal areas that are subject to inundation by salt water twice daily. Slopes in this series generally range from 0 to 2 percent. In a representative soil profile, the first soil horizon, from 0 to 18 inches, is a dark grayish brown (2.5Y 4/2) mucky peat (hemic material), about 80 percent fiber and a dense mat of roots, stems, and leaves. This layer is followed from 18 to 42 inches by a very dark grayish brown (2.5Y 3/2) mucky peat (hemic material) with about 70 percent fiber, underlain from 42 to 62 inches by a very dark gray (2.5Y 3/1) muck (sapric material) with about 50 percent mineral material of silt and very fine sand. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.



File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 6. SSURGO Soils Map - Signature East, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
2. Area Subject to AJD Review provided by Signature Flight Support.
3. SSURGO Soils obtained from NRCS, USDA, Soil Survey Geographic (SSURGO) Database for Bergen County, New Jersey.
4. 2020 orthoimagery obtained from the New Jersey Geographic Information Network.

0 60 120 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 6.
SSURGO SOILS MAP
SIGNATURE EAST

SIGNATURE FLIGHT SUPPORT - TETERBORO AIRPORT
TETERBORO AND MOONACHIE BOROUGHS
BERGEN COUNTY, NEW JERSEY

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SANDYHOOK SERIES

The Sandyhook Series consists of very deep, very poorly drained soils formed in thick sandy marine deposits along the Atlantic coast. Soils in this series are typically found on flats and other level areas in back-barrier beaches and tidal marshes that are subject to daily tide flooding. Slopes in this series generally range from 0 to 8 percent. In a representative soil profile, the surface layer, from 0 to 4 inches, is a dark brown (7.5YR 3/2) mucky peat, followed from 4 to 8 inches by dark grayish brown (10YR 4/2) sand with many very fine to medium roots throughout. This was followed in the upper portion of the subsoil from 8 to 11 inches by a black (7.5YR 2.5/1) mucky sand with many very fine to medium roots throughout. This was underlain from 11 to 26 inches by a very dark grayish brown (10YR 3/2) coarse sand, and from 26 to 40 inches by a very dark gray (10YR 3/1) coarse sand with few very fine and fine roots throughout. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.

UDORTHENTS, WET SUBSTRAUM

This soil mapping unit consists of very deep, well-drained soils that are mapped by NRCS as being highly disturbed or altered by cutting or filling. The fill in these soils typically consists of rubble, refuse, and mixed soil materials. These soils generally occur in areas that were previously tidal marshes, river flood plains, bays, and swamps. Slopes in this series generally range from 0 to 8 percent. A typical soil profile of this soil mapping unit consists of 0 to 36 inches of sand, followed from 36 to 60 inches of muck. The depth to the water table is typically 18 to 42 inches but this varies throughout the year, and these soils are predominantly non-hydric.

3.2.2 RESULTS OF FIELD INVESTIGATIONS OF SOILS

Soils that exhibited indicators of anoerobic and/or hydric soil conditions were observed within the wetlands delineated by the WA-WY-WZ-Line, the O-Line, the OA-Line, and the OB-Line. The depth, matrix color, redoximorphic features, and texture of a subset of soil samples taken are provided in the Wetland Delineation Data Forms provided in **Appendix II**.

Soils within the common reed dominated and maintained lawn wetlands met the criteria for hydric soil indicator A12: Thick Dark Surface (*NCNE Regional Supplement*) (**Appendix II, Bor-1**). A typical soil profile observed within this area consisted of a 0 to 1-inch surface layer comprised of a black (10YR 2/1) sandy clay mixed with 50-percent organic matter. This was followed by a 9-inch layer of a black (10YR 2/1) sandy clay. From 10 to 17-inches, soils were characterized by a mixed matrix of 90-percent black (10YR 2/1) and 10-percent brown (10YR 5/3) sandy clay. From 17 to 20-inches, soils were characterized by a mixed matrix of 65-percent black (10YR 2/1), 30-percent brown (10YR 5/3), and 5-percent dark yellowish brown (10YR 4/4) sandy clay. Rock fill refusal was met beyond 20-inches.

Soils within the grey birch/red maple successional forested wetland met the criteria for hydric soil indicator F3: Depleted Matrix (*NCNE Regional Supplement*) (**Appendix II, Bor-2**). A typical soil profile observed within wetland consisted of a 0 to 4-inch surface layer of very dark brown (10YR 2/2) loam mixed with 25-percent organic matter. From 4 to 7-inches, soils were characterized by olive brown (2.5Y 4/3) sand. This layer was underlain from 7 to 20-inches by dark grayish brown (2.5Y 4/2) sand with 15-percent dark yellowish brown (10YR 4/6) redoximorphic concentrations occurring in the matrix. From

20 to 24-inches, soils were characterized by a dark grayish brown (2.5Y 4/2) sand with 50-percent dark yellowish brown (10YR 4/6) redoximorphic concentrations occurring in the matrix.

Soils within the shrub/scrub wetland met the criteria for hydric soil indicator F3: Depleted Matrix (*NCNE Regional Supplement*) (**Appendix II, Bor-3**). A typical soil profile observed within wetland consisted of a 0 to 1-inch later of 50-percent black (10YR 2/1) loam mixed with 50-percent organic matter as a clayey sand, followed by a 4-inch clayey sand mixed matrix of 70-percent very dark gray (10YR 3/1) with 30-percent dark grayish brown (10YR 4/2). This was followed from 5 to 10-inches by a mixed matrix consisting of 70-percent very dark gray (10YR 3/1) clayey sand with 20-percent dark grayish brown (10YR 4/2) and 10-percent dark brown (7.5YR 3/4) prominent redox concentrations, underlain from 10 to 14-inches by a very dark gray (10YR 3/1) clayey sand with 30-percent dark yellowish brown (10YR 3/4) distinct redox concentrations in the matrix. Below this, from 14 to 24-inches, was a yellowish brown (10YR 5/4) sand.

Indicators of anaerobic soil conditions were absent in soil borings taken within the upland ecological communities on-Site (**Appendix II, Bor-4 and Bor-5**). Bor-4 was taken upslope of new wetland flag WY-2, but downslope of the former wetland flag #25 from the previous AJD, which represents a change in the limits of jurisdictional wetlands on-Site. The WY-Line was redelineated based upon similar soil borings and soil profiles observed in Bor-4, along with the associated lack of wetland hydrology and hydrophytic vegetation observed within this area. The soil profile of this boring consisted of a 2-inch surface layer of a black (10YR 2/1) sandy loam, followed from 2 to 6-inches by a dark brown (10YR 3/3) sandy loam. This was underlain from 6 to 12-inches by a dark yellowish brown (10YR 4/4) sandy silt, followed from 12 to 24-inches and beyond by a sandy mixed matrix consisting of 60-percent yellowish brown (10YR 5/4) with 40-percent dark yellowish brown (10YR 4/4). The soil profile in the area delineated upslope of the new WY-Line did not possess redoximorphic features or any other indicators of anaerobic conditions and did not satisfy the definition of a hydric soil. Therefore the WY-Line was redelineated further downslope than the original AJD limits to match the extent of hydric soils in this area.

A typical soil profile within the scrub/shrub upland portions of the Site was characterized by a 1-inch surface layer consisting of a very dark brown (10YR 2/2) sandy loam with 5-percent organic matter, followed from 1 to 8-inches by a dark yellowish brown (10YR 4/4) sandy loam, then followed from 8 to 14-inches by a black (10YR 2/1) sandy loam with 20-percent dark brown (10YR 3/3). This was underlain by a 6-inch layer of black (10YR 2/1) sandy loam, followed from 20 to 24-inches by a light olive brown (2.5Y 5/4) sand. Soils within the upland areas of the Site did not possess redoximorphic features or any other indicators of anaerobic conditions and did not satisfy the definition of a hydric soil (**Appendix II, Bor-5**).

The upland berm in the northern portion of the Site consisted of a man-made raised barrier that formed a border between the Signature East complex tarmac and the vegetative communities described herein. The soils of the berm consisted of degraded soils and fill.

3.3 HYDROLOGY

3.3.1 DESKTOP REVIEW OF HYDROLOGY

Prior to conducting Site investigations, Princeton Hydro conducted a desktop review of mapped waterbodies on-Site utilizing the previous AJD for the Site, along with NJDEP's GeoWeb (NJDEP 2023) and the USFWS's NWI (USFWS 2023). The previous AJD indicated the presence of one ditch located along the eastern border of the Site. Both the NJDEP GeoWeb (**Figure 4**) and the NWI Wetlands Map (**Figure 5**) indicated the presence of freshwater wetlands being located on-Site. There were no waterbodies mapped on-Site according NWI, but NJDEP GeoWeb indicated the presence of a canal/ditch (Riser Ditch tributary) being located along the western edge of the Site.

3.3.2 RESULTS OF FIELD INVESTIGATIONS OF HYDROLOGY

Primary and secondary wetland hydrology indicators were observed within the wetlands delineated by the WA-WY-WZ-Line. Saturation (A3), a primary wetland hydrology indicator, was observed within the common reed dominated and maintained lawn wetland vegetative communities. Additionally, two secondary indicators of wetland hydrology were observed within the same wetland vegetative communities: Geomorphic Position (D2) and FAC-Neutral Test (D5) (**Appendix II, Bor-1**).

Within the grey birch/red maple successional forested wetland vegetative communities, one primary wetland hydrology indicator was observed: High Water Table (A2). Within the same wetland vegetative community, one secondary indicator of wetland hydrology was observed: FAC-Neutral Test (D5) (**Appendix II, Bor-2**).

Within the scrub/shrub wetland and Japanese knotweed wetland vegetative communities, two primary wetland hydrology indicators were observed: High Water Table (A2) and Saturation (A3). There were no secondary indicators of wetland hydrology observed within this wetland vegetative community (**Appendix II, Bor-3**).

Primary and secondary indicators of wetland hydrology were absent within the upland maintained lawn, shrub/scrub, Japanese knotweed, grey birch/red maple successional forest, and berm vegetative communities found within the Site (**Appendix II, Bor-5**). Notably, primary and secondary indicators of wetland hydrology were absent in the redelineated area upslope of the WY-Line and downslope of the prior AJD flag #25 (**Appendix II, Bor-4**).

Within the wetlands delineated by the O, OA, and OB-Lines, Surface Water (A1) and Saturation (A3) were observed within the grey birch/red maple successional forested wetland vegetative communities.

3.4 WATERBODIES

The Site is located within the Hackensack River (below and including Hirshfeld Brook) Watershed (HUC-11: 02030103180). This watershed is approximately 220 square kilometers, or 85 square miles, in size. This region receives approximately 47-inches of precipitation on average per year (US Climate Data 2023).

During the desktop review, the USFWS' NWI mapping also indicated the presence of the Riser Ditch Tributary along the western edge of the Site. This ditch was delineated during Princeton Hydro's field investigations of the Site by a portion of the WZ-Line (West Riser Ditch).

Additionally, the previous AJD for the Site indicated the presence of the East Riser Ditch within the eastern portion of the Site along the Site boundary with the Aviation Museum Hall of Fame. The limits of the East Riser Ditch were verified to be consistent with the previous AJD during Princeton Hydro's field investigation of the Site. The West and East Riser Ditch on and adjacent to the Site are tributaries to Berry's Creek, which is a tidal tributary of the Hackensack River, a navigable water body.

4.0 CONCLUSIONS

4.1 DELINEATION SUMMARY

The delineation of waters of the United States, including wetlands, was performed in accordance with the Routine Determination methods and procedures set forth in the *1987 Manual* (Environmental Laboratory 1987) and the *NCNE Regional Supplement* (Environmental Laboratory 2012). Wetlands on-Site were originally delineated by Langan in 2016. On September 29, 2017, the USACE-NYD issued an AJD for the Site, which confirmed that Langan's wetland delineation accurately reflected the extent of waters of the United States present (Permit Application No. NAN-2015-01327-WCA).

Four primary areas of jurisdictional wetlands were determined to be present under the prior AJD: Wetland SB-2 (4.5 acres), Wetland O (0.001 acres), Wetland OA (0.001 acres), and Wetland OB (0.008 acres), totaling approximately 4.51 acres. These wetlands were adjacent to East Riser Ditch, which was determined to be a tidal tributary of Berry's Creek. Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable water body pursuant to Section 404 of the CWA. Being a part of a tributary system, the wetlands on-Site were considered to be waters of the United States, and under the jurisdiction of the USACE. The prior AJD expired on September 29, 2022. A copy of the prior AJD for the Site is provided in **Section 5**.

On February 6, 2023, Princeton Hydro conducted field investigations at the Site. During this field investigation, Princeton Hydro determined that changes to the limits of jurisdictional waters of the United States were necessary based on the vegetation, hydrology, and soils present at the Site. Princeton Hydro made the following changes to the limits of delineated waters on-Site:

- **Change #1:** The prior AJD's wetland flags #26 through #28 were moved downslope to the bottom of the berm (redelineated as wetland flags WA-8 through WA-10). The previous location of these flags was near the top of the berm where there was no wetland hydrology, hydrophytic vegetation, or hydric soils present.

- **Change #2:** The prior AJD's wetland flags #24 and #25 were redelineated with a new WY-Line. The WY-Line (wetland flags WY-1 through WY-4) represents the new limit of this portion of the wetland. This change to the wetland line was made to reflect the extent of hydric soils, which were not present within the former line limits.

- **Change #3:** Princeton Hydro delineated the WZ-Line to the north of the Site. This line represents the limits of the West Riser Ditch within the vicinity of the Site, which was not delineated in the prior AJD.

With the exception of these changes, the remaining extent of the waters of the United States on-Site remain unchanged from those previously approved by the USACE in 2017.

During Princeton Hydro's field investigations, it was determined that Wetland WA-WY-WZ possessed the following vegetative communities: maintained lawn wetland, common reed dominated wetland, scrub/shrub wetland, grey birch/red maple successional forested wetland, and Japanese knotweed wetland. Wetlands O, OA, and OB were comprised of grey birch/red maple successional forested wetland vegetative communities.

Upgradient of the wetland communities were the following upland vegetative communities: maintained lawn upland, grey birch/red maple successional forested upland, Japanese knotweed upland, maintained lawn upland, scrub/shrub upland, and an upland berm. Although hydrophytic vegetation was observed in some portions of these areas (see **Appendix II, Bor-5**), neither hydric soils nor wetland hydrology indicators were observed. As these areas did not meet all three criteria of a wetland, they were determined to be uplands.

The vegetative communities described in this AJD differ from those described in the prior AJD. This was done to outline the vegetative communities of the Site more accurately and in greater detail, and also to highlight that low quality habitat comprises a majority of the vegetative communities on-Site. For instance, the common reed dominated wetland, the Japanese knotweed upland and wetlands, and the berm are dominated mostly by invasive species. The maintained lawn communities are routinely mowed owing to their proximity to the runways and tarmac of the airport. Additionally, the grey birch/red maple successional forest was a relatively young forest that will never be able to fully mature owing to its proximity to the airport control tower, leading many maturing trees to be topped or felled to maintain a clear view of the runway (see **Appendix III, Photo 11**).

The prior AJD determined that one waterbody consisting of East Riser Ditch was located within the eastern portion of the Site. Princeton Hydro verified that the limits of East Riser Ditch have not changed since the prior AJD was issued. Princeton Hydro also delineated a second ditch, West Riser Ditch, located to the west of the Site. The wetlands subject to this AJD request abut East Riser Ditch on-Site and West Riser Ditch off-Site. Both East Riser Ditch and West Riser Ditch are tidal tributaries of Berry's Creek, and Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody.

A list of all plants identified on-Site are provided in **Appendix I**. Data collected at each sampling point pertaining to vegetation, soils and hydrology are presented in **Appendix II**. Representative photographs of the Site and a photo location map illustrating the location and direction of each photo taken are provided in **Appendix III**. A SSURGO Soil Report and official descriptions of soils are provided in **Appendix IV**. Resumes of personnel involved in the delineation and preparation of this wetland delineation report are provided in **Appendix V**.

4.2 PROPOSED JURISDICTIONAL DETERMINATION

Based on the findings presented herein, it was determined that the wetland delineated by the WA-WY-WZ-Lines, the wetlands delineated by the O, OA, and OB-Lines, and East Riser Ditch meet the definition of waters of the United States as it applies to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA (USACE and EPA 2023). The Wetland Delineation Plan provided as **Section 4** of the AJD request depicts the extent of jurisdictional wetlands and waterbodies located on-Site. **Table 1** above summarizes the extent of wetlands and waterbodies delineated and their proposed jurisdiction. Overall, the Site contained 5.346 acres of jurisdictional wetlands and 0.014 acres (237 linear feet) of jurisdictional waterbodies.

The location of waters of the United States on-Site is subject to review and approval by the USACE – New York District. Therefore, this determination should not be considered final until the USACE has issued an AJD with regard to the represented extent of jurisdictional areas on-Site.

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