

APPENDIX L

WATER RESOURCES

L.1 INTRODUCTION

Federal Aviation Administration (FAA) Order 1050.1F provides policies and procedures for complying with the National Environmental Policy Act (NEPA). This appendix documents the analyses determining the impacts to water resources resulting from the Proposed Action due to ground-disturbance or potential pollutant discharges.

L.2 RESOURCES

Water resources are surface waters and groundwater that are important in providing drinking water and supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. The water resources in the project area are described in **Section 5.13.3** of this Environmental Assessment (EA). Impacts to the following water resource categories resulting from the Proposed Action are presented in **Section L.4** below:

- Wetlands,
- Floodplains, and
- Surface Water.

L.3 SCENARIOS TO BE EVALUATED

Impact assessments were conducted for these three water resource categories for the Existing, Interim, and Build Out Conditions for both the No Action and Proposed Action Alternatives. The water resources impact analyses focused on changes in drainage and land cover. These conditions are summarized below specifically as they relate to water resources.

L.3.1 Existing Condition

The Existing Condition includes existing infrastructure and landscaping, as well as projects independent of the Proposed Action that are approved to be completed prior to the Proposed Action. The Existing Condition provides a baseline and includes a variety of airside and landside improvements. Of note is the Taxiway A and B project, the scope of which included filling and expanding two of the three detention basins on the airfield. This project is further explained in **Section L.4.3**.

L.3.2 Interim Condition

L.3.2.1 Interim No Action

The Interim No Action includes the baseline condition without the Proposed Action. For the purposes of this EA, it is assumed that all projects included in the baseline have gone or will go through required environmental reviews and design to identify any impacts separately from this EA. It is also assumed that appropriate mitigation and permitting for these projects will have occurred to offset impacts before or concurrent with project implementation.

L.3.2.2 Interim Proposed Action

This phase of the proposed project includes projects that will be completed in the Interim Condition of the Proposed Action. The majority of the interim projects near the terminal occur on portions of the airport that have already been disturbed and include the satellite concourses, consolidated tunnel, Terminal 5 curbside and roadway improvements, and other airside improvements located in the City of Chicago. Several interim projects include new development in DuPage County on the west side of the airport—referred to as the West Side Development Area.

L.3.3 Build Out Condition

L.3.3.1 Build Out No Action

This phase of the No Action Alternative represents all baseline independent utility projects projected for implementation by the time Build Out is complete. This alternative assumes the airport would continue to operate and maintain its drainage and surface water infrastructure system in accordance with its permits and adhere to regulatory requirements associated with the Interim and Build Out Conditions, all of which have been or will be processed through separate NEPA review and documentation.

L.3.3.2 Build Out Proposed Action

The Proposed Action includes 35 projects summarized in the EA, **Chapter 3, Table 3-6**. They are organized into five groups. The proposed resultant footprint area includes the facility and pavement/roadways footprints in each project group. The project would be implemented between 2025 and 2032. Most of the footprint of the Proposed Action is within the airport's airside stormwater system except for the Hotel and Detention Basin Relocation at the Multimodal Facility (MMF) and the Centralized Distribution and Receiving Facility.

L.4 IMPACT ANALYSIS

L.4.1 Wetlands

A comprehensive review of wetlands, and a Waters of the U.S. delineation, were conducted in summer 2019 as part of the EA. Field methods and documentation conformed to Routine Onsite Method of the 1987 U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual, as enhanced by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, Version 2.0.¹

¹ U.S. Army Corps of Engineers, Routine Onsite Method of the 1987 U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual, as enhanced by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, Version 2.0, 2010.

Approximately 7,200 acres within the O'Hare property were examined. **Attachment L-1** of this appendix includes the wetland delineation report. Documentation required to receive an Approved Jurisdictional Determination (AJD) from the USACE was submitted in fall 2019. Based on that documentation and an October 4, 2019 field review, the USACE provided an AJD in December 2019. An AJD is a process the USACE uses to make a definitive, official determination as to whether aquatic resources in the review area are or are not jurisdictional (33 CFR 331.2). The only USACE process for determining that an aquatic resource is *not* jurisdictional is an AJD. For AJDs, aquatic resources must first either meet the definition of a wetland based on the 1987 *Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* or contain an ordinary high water mark (OHWM) as defined by USACE methodology. None of the delineated waters impacted were determined to be jurisdictional wetlands or Waters of the U.S. The AJD is included in Appendix M of the Wetland Delineation Report contained in **Attachment L-1** of this appendix.

Exhibits 5.13-2 and **5.13-3** in **Section 5.13** of the EA show the jurisdictional wetlands and Waters of the U.S. delineated in the vicinity of the Proposed Action. **Table L-1** summarizes anticipated impacts to the delineated wetlands/Waters of the U.S./ditches and provides brief descriptions of them. Estimated impacts are based on a 50-foot buffer around the dimensions in the conceptual project drawings.

TABLE L-1
DELINEATED WETLANDS/WATERS OF THE U.S./DITCHES IMPACTED BY
PROPOSED ACTION

Waters Category	Wetlands ID	Interim/Build Out Proposed Action Project Impact	Area (sq. ft.)	Area (acres)*
Wetland (Non-Jurisdictional)	SE19-146	Interim	8,426.18	0.19
Wetland (Non-Jurisdictional)	SW19-101	Interim	331.07	0.01
Wetland (Non-Jurisdictional)	SW19-71	Interim	2,778.25	0.06
Wetland (Non-Jurisdictional)	SW19-74	Interim	4,907.62	0.11
Wetland (Non-Jurisdictional)	SW19-70	Interim	7,316.91	0.17
Wetland (Non-Jurisdictional)	NE19-13	Interim	17,400.63	0.40
Wetland (Non-Jurisdictional)	NE19-14	Interim	6,306.76	0.14
Wetland (Non-Jurisdictional)	SE19-134	Interim	589.82	0.01
Wetland (Non-Jurisdictional)	SE19-135	Interim	3,117.41	0.07
Interim Wetland Impact			51,174.66	1.17
Waters of the U.S. (Non-Jurisdictional)	Ditch 12	Build Out	6,082.41	0.14
Waters of the U.S. (Non-Jurisdictional)	Ditch 09	Build Out	1,553.57	0.04
Waters of the U.S. (Non-Jurisdictional)	Ditch 09	Build Out	1,783.56	0.04
Wetland (Non-Jurisdictional)	SW19-102	Build Out	126.08	0.00
Wetland (Non-Jurisdictional)	NW19-91	Build Out	2,173.93	0.05
Wetland (Non-Jurisdictional)	NW19-90	Build Out	330.98	0.01
Wetland (Non-Jurisdictional)	SW19-93	Build Out	1,362.30	0.03
Build Out Wetland Impact			13,412.82	0.31

Waters Category	Wetlands ID	Interim/Build Out Proposed Action Project Impact	Area (sq. ft.)	Area (acres)*
Total Wetland Impact			64,587.48	1.48

*Differences in totals result from 'area' being rounded to the nearest one-hundredth of an acre.

For the Interim Condition, 1.17 acres of wetland impact were identified. An additional 0.31 acres would be impacted with the Build Out, making a total wetland impact of 1.48 acres for the Build Out Proposed Action.

Non-jurisdictional wetlands are protected under Executive Order (EO) 11990, which requires a "no net loss" of wetlands. However, the impacted wetlands are characterized as small, isolated areas with relatively low water quality and limited runoff storage function due to their small sizes and do not provide functions that rise to a level requiring mitigation; therefore, no mitigation is proposed.

Federal non-jurisdictional wetlands may also fall under state regulation. As stated in the O'Hare Modernization Program (OMP) Environmental Impact Statement (EIS): "If any financial assistance will be administered or provided by a state agency, compliance with the Illinois Department of Natural Resources (IDNR) Interagency Wetland Policy Act of 1989 is required." No financial assistance is being administered or provided by a state agency, so the project is not required to comply with IDNR's Interagency Wetland Policy Act of 1989. DuPage County also regulates wetlands under its Countywide Stormwater and Floodplain Ordinance. None of the wetlands impacted by the project in DuPage County, however, are Waters of DuPage, a classification defined in the ordinance. Therefore, no further action, including mitigation, is required for any impact to non-jurisdictional wetlands and Waters of the U.S.

L.4.2 Floodplains

EO 11988, Floodplain Management, directs federal agencies to:

1. Assert leadership in reducing flood losses and losses to environmental values served by floodplains,
2. Avoid actions located in or adversely affecting floodplains unless there is no practicable alternative,
3. Take action to mitigate losses if avoidance is not practicable, and
4. Establish a process for flood hazard evaluation based upon the 100-year base flood standard of the National Flood Insurance Program (NFIP).

This EO also directs federal agencies to issue implementing procedures; provides a consultation mechanism for developing the implementing procedures; and provides oversight mechanisms. According to the EO, federal agencies must, at minimum, comply with NFIP regulations. The Federal Emergency Management Agency (FEMA) oversees floodplain management and has developed flood hazard maps. FEMA coordinates with the IDNR, Office of Water Resources (IDNR-OWR) on the designation of floodplain boundaries in the state, and IDNR-OWR participates in an administrative process to concur with FEMA map revisions. IDNR-OWR has jurisdiction over construction in areas where the watershed size exceeds one square mile. According to the Christopher B. Burke Engineering, Ltd. (CBBEL) Future Airport Layout Plan Landside Projects Drainage Systems Engineering Report:

The Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR) regulates watercourses with a tributary area greater than one square mile, which applies to all watercourses on the airport (Willow and Higgins Creeks, Bensenville Ditch and Crystal Creek). Permits are required from IDNR-OWR for any physical modification within one of these floodways. This is not anticipated based upon the development areas shown on the Future ALP. However, the City does hold several IDNR-OWR permits for previously constructed relocations and enclosures of these watercourses. The design of these previous projects followed IDNR/OWR regulations, and to comply with the permit criteria, any development shown on the Future ALP must not increase the flow rate of Willow Creek for all storm events up to and including the 100-year recurrence interval. Also, the storage volume within floodways may not decrease from existing to proposed conditions.²

Three CBBEL drainage systems engineering reports for future O'Hare projects provide the analysis demonstrating that the Proposed Action meets these permit criteria as detailed in the next section.

Floodplain activity at O'Hare also falls under the jurisdictions of various local municipalities, including Cook and DuPage Counties, the City of Chicago, and the Village of Bensenville. These municipalities regulate floodplains with specific floodplain ordinances and/or indirectly through their stormwater storage and release requirements within airport property. Floodplain regulations include the 100-year (one percent) floodplain and floodway.

Current national Flood Insurance Rate Maps (FIRMs) were accessed for this document. Of note is the discrepancy between the Bensenville Ditch FIRM floodplain/floodway limit in the southwest portion of the airport and what currently exists on the ground. **Figure L-1** shows the current FIRM for this area, which does not reflect the realignment of Bensenville Ditch east of York Road to the south and its partial enclosure, completed in 2012 and covered under a separate NEPA document.³ The revised floodplain resulting from these ditch modifications is shown in Figure 3-2 of the CBBEL report, shown here as **Figure L-2**.⁴ Mapping information from LOMR 21-05-1469P, Bensenville Ditch Relocation, was incorporated into **Exhibit 5.13-5** in **Section 5.13**.

It is concluded that there are no impacts to regulated 100-year floodplains for the Proposed Action for either the Interim or Build Out Conditions.

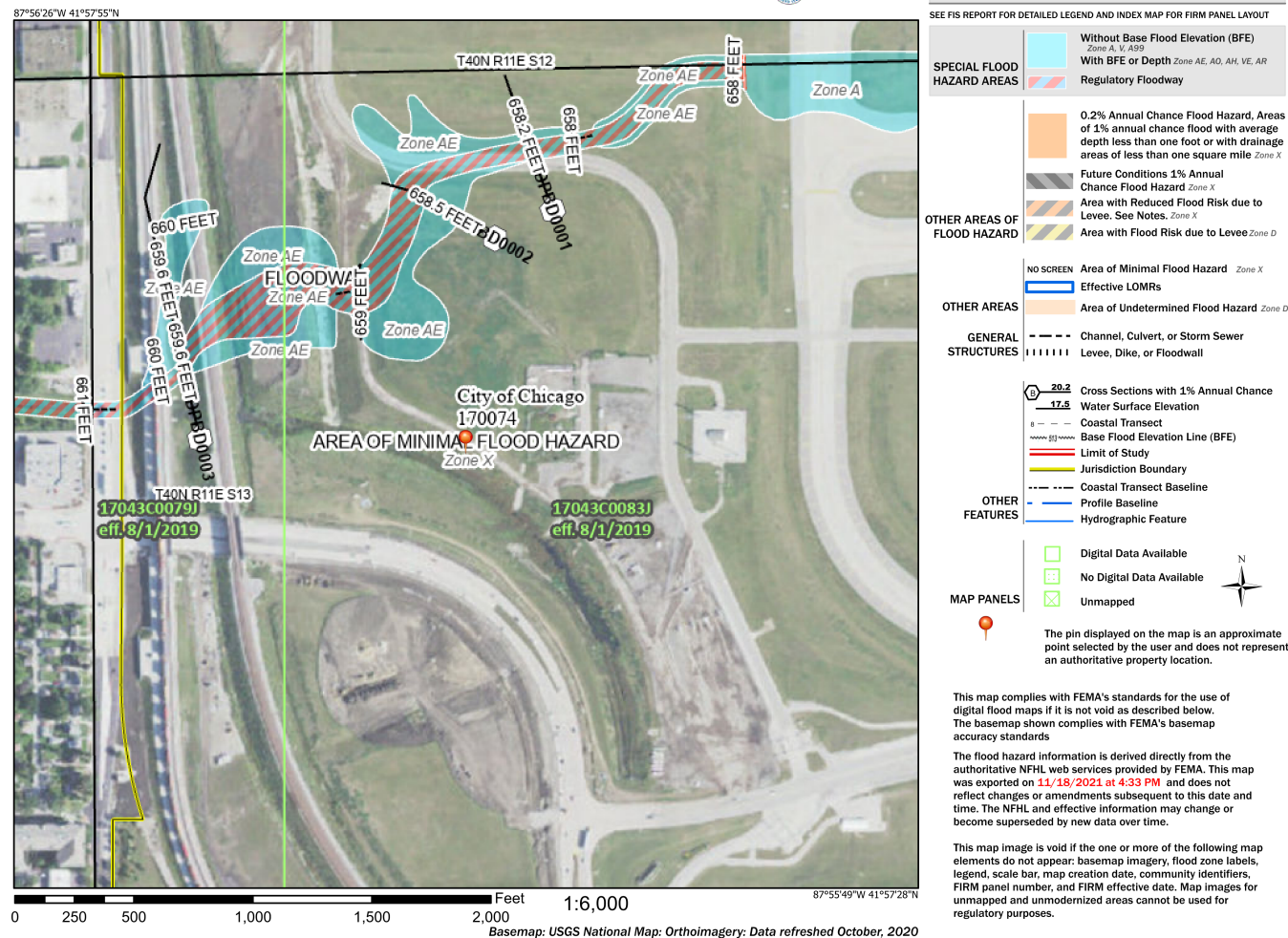
² Christopher B. Burke Engineering, Ltd., Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report, October 15, 2019.

³ O'Hare Modernization Final Environmental Impact Statement, July 2005.

⁴ Figure 3-2 from the CBBEL October 2019 report shows the revised Bensenville Ditch floodplain area.

FIGURE L-1
CURRENT NATIONAL FLOOD INSURANCE RATE MAP IN THE AREA OF THE BENSENVILLE DITCH IN THE
SOUTHWEST PORTION OF THE AIRPORT

National Flood Hazard Layer FIRMette



Note: Mapping has not been updated since relocation of the Bensenville Ditch.

Source: FEMA Flood Map Service Center | Welcome!

FIGURE L-2
BENSENVILLE DITCH FLOODPLAIN AREAS



Source: Christopher B. Burke Engineering, Ltd., Chicago O'Hare International Airport: Future Airport Layout Plan – Landside Projects, Drainage Systems Engineering Report (draft), October 15, 2019

L.4.3 Surface Water

Surface water quality is associated with on- and off-site sources, including deicing activities and runoff, and particularly from impervious surfaces including airfield pavements and roads, maintenance activities, and other operations.

L.4.3.1 Water Quality Regulations

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into Waters of the U.S. Pertinent sections of the CWA related to Waters of the U.S. are Section 303(d), Section 404, Section 401, and Section 402, which establishes the National Pollutant Discharge Elimination System (NPDES) program.

The NPDES program requires permits for the discharge of treated municipal effluent, treated industrial effluent, and stormwater. In Illinois, the USEPA has delegated the authority to issue NPDES permits to the Illinois Environmental Protection Agency (IEPA). O'Hare has been regulated under the NPDES permit program since 1975, and its NPDES permit was most recently renewed in 2020 (Permit No. IL0002283). As a condition of the NPDES Permit, O'Hare is required to maintain and update its Stormwater Pollution Prevention Plan (SWPPP) and amend its Spill Prevention, Control, and Countermeasure Plan (SPCCP) as necessary. These plans contain methods and management practices to prevent contaminated runoff from entering surface and ground water.

An NPDES permit for construction activity is also required for activities disturbing one acre or more. Permittees are required to control runoff from construction sites and develop a Construction SWPPP that includes Best Management Practices (BMPs) for erosion prevention and sediment control. DuPage County's stormwater ordinance also requires stormwater detention for projects disturbing greater than 25,000 square feet; these projects require a County permit and the implementation of BMPs.

L.4.3.2 Stormwater Regulations

Development typically alters land cover and drainage systems. Increases in impervious area and drainage infrastructure can increase the amount of runoff and alter surface water flows (in both volume and rate). Municipalities, counties, and local water management districts have adopted ordinances and regulations to address the impact of development on stormwater systems. These regulations apply to both airside and landside development at O'Hare, though stormwater management requirements differ depending on the location of the development. Applicable regulations, compiled from three CBBEL Drainage Systems Engineering Reports that evaluated O'Hare's future Airport Layout Plan (ALP) (airside and landside) and the Taxiway A-B/South Airfield Detention consolidation, are included below to provide context for how stormwater impacts were evaluated for this EA.

- Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) – The MWRDGC is the stormwater management authority of Cook County. Both the CBBEL's Future Airport Layout Plan and Taxiway A-B/South Airfield Detention Consolidation Drainage Systems Engineering Reports include the following regarding the MWRDGC's regulatory role at O'Hare.

The MWRDGC's requirements do not typically apply within the City of Chicago, therefore they have not factored into the [South Detention Basin] volume sizing. However, stormwater discharged from the [South Detention Basin] is ultimately treated by MWRDGC facilities. Due to the pump station connection and other factors such as the airport's location

within the MWRDGC's service area, a permit was required for the [South Detention Basin] pump station's discharge connection.⁵

- Cook County/Village of Schiller Park – According to the CBBEL October 15, 2019, report, the Village of Schiller Park follows the stormwater requirements of the MWRDGC Watershed Management Ordinance (WMO), the stormwater management authority of Cook County. MWRDGC and the City of Chicago both cite a maximum allowable release rate (0.2 cubic feet per second [cfs]/acre compared to 1 cfs/acre), which requires detention storage, and an additional requirement for volume control storage (1" times the impervious area).⁶
- City of Chicago – The City's stormwater ordinance requires rate control storage but allows a release rate of 1 cfs/acre. In addition to rate control, the City's ordinance requires volume control storage that is intended to be housed separately and infiltrated into the ground.⁷
- DuPage County – According to the CBBEL October 15, 2019, report:

Stormwater management requirements in DuPage County are described in the DuPage County Countywide Stormwater and Floodplain Ordinance (effective May 2019). Stormwater detention is required for all developments with greater than 25,000 square feet of impervious area. Stormwater detention is sized to limit the allowable discharge rate from a site to a maximum of 0.1 cfs per developed acre for a 100-year storm event. DuPage County also requires Best Management Practices (BMPs) to address water quality.⁸

The airport's drainage system must meet federal, state, and local requirements. In addition to the requirements identified above, applicable federal requirements include the FAA's five-year design storm guidance for airfield facilities and ponding limitations due to potential for increase in wildlife attractants caused by standing water.

L.4.3.3 Airport Surface Water

For purposes of discussion below, the airport is composed of airside and landside facilities. Airside facilities generally include all runways, taxiways, ramps, and other areas accessible to aircraft. The terms "airfield" and "airside" are used synonymously in the discussion below.

Landside facilities, which provide transition between ground and air transportation modes, are needed to move passengers and automobiles and to store aircraft. These facilities typically include the terminal complex, access system, and any other areas within the airport's property boundaries that are not considered airside facilities and to which the public has access.

L.4.3.3.1 Airfield Drainage

O'Hare's airside drainage is managed by a complex system of storm sewers, detention basins, flood control reservoirs, and pump stations. Although parts of this system have existed for many years, much of it has been constructed since 2003 as part of the OMP. Airside drainage is defined in the CBBEL March 2021

⁵ Christopher B. Burke Engineering, Ltd., "Final Taxiway A-B/South Airfield Detention Consolidation Drainage Systems Engineering Report," March 10, 2021; Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan Drainage Systems Engineering Report," August 30, 2019.

⁶ Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report," October 15, 2019.

⁷ Christopher B. Burke Engineering, Ltd., "Final Taxiway A-B/South Airfield Detention Consolidation Drainage Systems Engineering Report," March 10, 2021; Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan Drainage Systems Engineering Report," August 30, 2019; Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report," October 15, 2019.

⁸ Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report," October 15, 2019.

report as “being subject to aircraft deicing chemical and drained into the airport’s collection and treatment systems.”⁹

The airfield drainage system consists of 11 major storm sewer systems that collect and convey flow into three detention basins on the airfield (see **Attachment L-2**). The overall system includes the “North Airfield” and “South Airfield.” North Airfield storm sewer systems A, B, C, D, and E flow into the North Detention Basin, which temporarily stores runoff until it can either be discharged to Willow-Higgins Creek or offsite treatment facilities. The North Detention Basin and Willow Creek Flood Control Reservoir (WHFCR) are hydraulically connected to allow for a variety of operational scenarios to meet ORD’s permit conditions. South Airfield storm sewer systems A, B, CD, E, F, and GH flow is stored in two interconnected detention basins: A and B flow into the Central Detention Basin and CD, E, F, and GH flow into the South Detention Basin. The Central Detention Basin and South Detention Basin are hydraulically connected, by gravity and pumped systems, to the primary route to ultimately discharge from the South Detention Basin via a force main connected to the MWRDGC drop shaft that discharges into its Tunnel and Reservoir Plan in accordance with permitted discharge requirements.

CBBEL completed three drainage system engineering reports for the City of Chicago Department of Aviation (CDA). As noted in CBBEL’s Future Airport Layout Plan Drainage Systems Engineering Report, “Many of the drainage systems that will be required for the Future ALP are currently in place and functioning.”¹⁰ However, construction and relocation of Taxiways A and B will directly impact the Central Detention Basin and South Airfield system. Therefore, CBBEL conducted a drainage study for the CDA to analyze and demonstrate that the proposed changes associated with the Taxiway A-B project. The Taxiway A-B project includes filling in the Central Detention Basin, expanding the South Detention Basin to offset the storage volume lost, and constructing stormwater infrastructure (including a stormwater tunnel) to convey airfield runoff that currently drains to the Central Detention Basin and rerouting it to the expanded South Detention Basin. This project, referred to as the South Airfield Detention Consolidation (SADC) Project, will provide existing capacity and allow O’Hare to continue to meet its design criteria and was evaluated in a separate NEPA document.

The CBBEL study concluded that the storage capacity of the expanded South Detention Basin will exceed the capacity of the existing Central Detention Basin and South Detention Basin and associated stormwater infrastructure and, therefore, will allow O’Hare to continue to meet airport design criteria for the Existing Condition and future ALP conditions. The CBBEL August 2019 report summarizes the existing airside drainage system, provides the regulatory criteria for how it was designed, and establishes a baseline condition that includes the SADC project and other projects anticipated to be constructed. Comprehensive modeling and analysis of the Existing Condition were conducted to evaluate the stormwater requirements for future ALP projects and determine whether additional modifications to the airfield drainage system will be needed. The report’s Executive Summary concludes that:

- Prior expansion of the North Detention Basin (circa 2013) provides sufficient storage volume to accommodate the Future ALP. No modifications to the North Detention Basin are required.
- Major modifications to the south airfield will occur with the SADC project, which will fill the Central Detention Basin and expand the South Detention Basin. These projects are anticipated for near-term construction and are therefore considered part of the baseline condition.

⁹ Christopher B. Burke Engineering, Ltd., “Final Taxiway A-B/South Airfield Detention Consolidation Drainage Systems Engineering Report,” March 10, 2021

¹⁰ Christopher B. Burke Engineering, Ltd., “Draft Chicago O’Hare international Airport Future Airport Layout Plan Drainage Systems Engineering Report,” August 30, 2019

- Following construction of SADC, the south airfield will have sufficient storage volume to implement the future ALP. No modifications to the South Detention Basin are required.¹¹

Additionally, the future ALP shows a “Future Detention Basin” adjacent to the North Detention Basin, south of Runway 9L/27R and west of the ARFF Training Facility. As noted in the report:

Based on the analysis completed for the impervious areas depicted in the Future ALP, this future detention basin is not currently needed. This basin was not factored into any analysis included in this report and the results show that the storage provided by the current [North Detention Basin] is sufficient to meet the detention needs of the Future ALP without modification. However, the future detention basin area has been retained as part of the Future ALP in the event of unanticipated regulatory changes or airfield developments not currently anticipated.¹²

L.4.3.3.2 Landside Drainage

The CBBEL draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report states that landside developments are “not subject to deicing chemicals and therefore are discharged directly to surface watercourses.”¹³ The report individually evaluates the following landside projects.

United Air Lines and American Air Lines Ground Equipment Maintenance Buildings

Both buildings have been constructed. Stormwater management—consisting of volume control—for the development was permitted by the City of Chicago and the project is considered part of the Existing Condition for the EA.

Fuel Farm Storage Tank Expansion

This is a future landside project in the existing fuel farm area, which is mostly impervious. Two tanks are included in the expansion. The CBBEL report presents a conceptual stormwater plan to provide volume control storage by redesigning an existing ditch, adjacent to the fuel farm, to function as a volume control feature to provide required storage. The existing flow in the ditch will be intercepted and routed via a storm sewer around the volume control feature. This baseline project falls under City of Chicago regulatory authority and is not included in this EA.

Multi-Modal Facility

This development is in the northeastern corner of the airport, southeast of Mannheim Road and Zemke Boulevard. The current on-site parking structure, constructed in 2018, went through the City of Chicago's permitting process. Future development on this site, including a hotel and a mixed-use development, will impact one of the existing detention basins. The report identified a stormwater plan concept that would satisfy the storage volume control requirements by reconfiguring the basins. This project is considered in the Interim Proposed Action.

West Side Development Area

As noted in the CBBEL report, the West Side Development Area refers to a collection of projects on the west side of the airport that will create western employee access to the airport. The projects include the Heating and Refrigeration Facility, the West Screening Facility, the West Ground Transportation Facility

¹¹ Christopher B. Burke Engineering, Ltd., “Draft Chicago O'Hare International Airport Future Airport Layout Plan Drainage Systems Engineering Report,” August 30, 2019

¹² Christopher B. Burke Engineering, Ltd., “Draft Chicago O'Hare International Airport Future Airport Layout Plan Drainage Systems Engineering Report,” August 30, 2019

¹³ Christopher B. Burke Engineering, Ltd., “Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report,” October 15, 2019

and Parking Garage, and West Landside Access, which includes the roadway network that will provide access to the airport to and from York Road, I-390, and I-490.¹⁴

This project resides within DuPage County and is regulated by the County's Countywide Stormwater and Flood Control Ordinance. An analysis was completed to develop a conceptual stormwater plan that demonstrates how DuPage County stormwater regulations for volume/storage and release rates can be met. The concept includes providing storage in three stormwater basins as shown on the Future ALP. The basins are designed to drain completely and consider the 100-year adjacent Willow Creek flood elevations, as it is assumed there is no discharge from detention basins below that elevation. These projects are TAP projects included in the Interim Condition Year with Project.

Centralized Distribution and Receiving Facility

This development is located on an undeveloped area of the airport south of Runway 10C/28C and north of the Bensenville Ditch. When developed, this 3.5-acre site will consist of a 60,000-square-foot structure with a 190,000-square-foot parking lot. The project must comply with DuPage County's Countywide Stormwater and Flood Control Ordinance. The project includes a 3.5-acre detention pond west of the facility, with a controlled release to the Bensenville Ditch south of the development. This project is included in the Build Out Proposed Action.

Airport Maintenance Complex Expansion

This project is in the southeastern portion of the airport. It includes two buildings and associated pavement. The site redevelopment includes a stormwater plan that meets City of Chicago storage and rate control requirements using an underground detention facility.

L.4.4 Summary

The Interim Proposed Action would impact approximately 1.17 acres of wetlands. The Build Out Proposed Action would impact an additional 0.31 acres of wetlands, for a total of 1.48 acres of wetland impact to non-jurisdictional federal, state, and local (DuPage County) wetlands. There are no 100-year floodplain impacts with the Interim or Build Out Proposed Action. For purposes of surface water impact evaluation, it is assumed that the CBBEL Airside Future ALP analysis includes all future airside projects shown on the 2019 ALP, whether baseline, independent utility, or the Proposed Action. It also assumes that all projects that drain to the existing airside stormwater system are included in that ALP drainage analysis. As the CBBEL airside evaluation demonstrates, adequate storage exists for the future airside projects, and no impacts to surface water for airside projects are identified for any of the conditions.

For landside projects, if projects are designed in accordance with the stormwater management conceptual plans provided in the CBBEL reports, and appropriate permits are received, then no impact to the drainage systems should result.

¹⁴ Christopher B. Burke Engineering, Ltd., "Draft Chicago O'Hare International Airport Future Airport Layout Plan – Landside Projects Drainage Systems Engineering Report," October 15, 2019

ATTACHMENT L-1

WETLAND DELINEATION REPORT



WETLANDS AND WATERS OF THE UNITED STATES
CHICAGO O'HARE INTERNATIONAL AIRPORT

PROJECT NUMBER 4367600-191392.01

April 15, 2021



EXECUTIVE SUMMARY

The Federal Aviation Administration (FAA) is preparing an Environmental Assessment (EA) to evaluate the City of Chicago Department of Aviation's (CDA) proposed Terminal Area Plan (Phase I or the 10-Year Plan), Capital Improvement Projects, and hotel developments. In support of the EA, Mead & Hunt, Inc (Mead & Hunt) was contracted to perform a wetland delineation within Airport property.

Approximately 7,200 acres contained within the Chicago O'Hare International Airport property boundary were examined for wetlands and water resources, located in the following sections within Cook and DuPage counties:

- Sections 4 through 9, 16, 17, and 18, Township 40 North, Range 12 East,
- Sections 30 through 32 in Township 41 North, Range 12 East,
- Sections 25, 35, and 36, Township 41 North, Range 11 East, and
- Sections 1, 11, 12, and 13, Township 40 North, Range 11 East

The project area is primarily an active airfield covered by runway, taxiway, apron, roadway pavement, and associated vegetation. Areas around the periphery of the active airfield contain major roadways on all sides of the project area of interest (AOI). Streams flowing through the property have been highly modified and on-airfield vegetation is regularly mown.

During field work all areas within the project AOI were examined with the exception of certain areas under active construction, stockpile areas, and previously permitted project areas. A total of 146 wetlands were delineated and six previously identified wetlands were re-examined and documented. Twenty-four streams and 51 ditches or erosional features were delineated and documented within the project AOI.

An Agency site review on October 4, 2019 included representatives from the FAA, CDA, Mead & Hunt, and the Chicago District of the U.S. Army Corps of Engineers. Representative wetland types were reviewed in the field during the site visit. An Approved Jurisdictional Determination was issued December 20, 2019.

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1. Introduction

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 7,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Project Location Map in Appendix A). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport.

The Federal Aviation Administration (FAA) is preparing an Environmental Assessment (EA) to evaluate the City of Chicago Department of Aviation's (CDA) proposed Terminal Area Plan (Phase I or the 10-Year Plan), Capital Improvement Projects, and hotel developments. In support of the EA, Mead & Hunt, Inc (Mead & Hunt) was contracted to perform a wetland delineation within Airport property. Field work was conducted on the following dates:

- July 15 – 19, 2019
- July 29 – August 2, 2019
- August 12 – 16, 2019
- August 19 – 23, 2019
- August 26 – 30, 2019
- September 9 – 13, 2019
- September 16 – 20, 2019
- September 23 – 27, 2019
- October 3, 2019

An Agency site visit on October 4, 2019 included representatives from the FAA, CDA, Mead & Hunt, and the Chicago District of the U.S. Army Corps of Engineers. Representative wetland types were reviewed in the field during the site visit. An Approved Jurisdictional Determination was issued December 20, 2019.

The Area of Interest (AOI) comprises 7,227 acres located in the following Public Land Survey sections:

Cook County

Sections 4 through 9, 16, 17, and 18, Township 40 North, Range 12 East,
Sections 30 through 32 in Township 41 North, Range 12 East,
Sections 25, 35, and 36, Township 41 North, Range 11 East

DuPage County

Section 1, 11, 12, and 13, Township 40 North, Range 11 East

The AOI is located on portions of three USGS quadrangle sheets: River Forest, Elmhurst, and Arlington Heights, Illinois.

A total of 146 wetlands, 22,644 linear feet of streams, and 47,582 linear feet of ditches were identified within the AOI. Six previously identified wetlands were re-delineated.

This report summarizes the results of the wetland delineation. Delineator qualifications are provided in Appendix N. Mead & Hunt staff who performed the wetland delineation are:

- Brauna Hartzell, BS Biological Science, Florida State University, 1982; MS Environmental Monitoring, University of Wisconsin-Madison, 1994; 18 years wetland delineation practice.
- Kim Shannon, BS Biology, Oklahoma State University, 1994; MS Applied and Natural Science (Botany), Oklahoma State University, 1997; 11 years wetland delineation practice.
- Conor Makepeace, BS Environmental Science / Politics and Law, Bryant University, 2015; MEM Environmental Management, Duke University, 2017; three years wetland delineation practice.

2. Methods

The field methods used conform to the *Routine Onsite Method of the 1987 U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual*, as enhanced by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, Version 2.0* (U.S. Army Corps of Engineers, 2010). Soil characteristics were examined by digging pits with a 16-inch tile spade and hydrologic indicators were visually assessed. Soil pits were left open for a minimum of 15 minutes to adequately assess the water table. Munsell Soil Color charts were used to determine the hue, value, and chroma for the matrix and any redoximorphic features in each soil layer.

Vegetation was documented on Midwest Regional data forms. Percent cover for each species in each stratum was estimated. The herbaceous stratum was sampled within a 5-foot radius plot; a 15-foot radius plot for the shrub/sapling stratum; and a 30-foot radius plot for the tree and woody vine stratum. The 2016 National Wetland Plant List (Lichvar, R.W., et al, 2016) was used to determine the wetland indicator status for each species and the 50/20 rule was applied to determine dominance.

Wetland boundary points indicated by wire pin flags were placed approximately 25-50 feet apart. In areas under active vegetation management, the wire pin flags were removed after survey so that mowing operations would not be impacted. Sampling points documented on Midwest data forms and wetland boundary flags were surveyed with a Trimble Geo7X capable of sub-foot accuracy and mapped using Geographic Information System (GIS) software.

All wetlands were documented using one of two methods. Representative ecosystem types and large wetlands were documented with paired data points on Midwest regional supplement data forms, sampling both wetland and upland conditions across the boundary. Documentation of wetland criteria using a modified data sheet was completed at other wetlands including depressional wetlands where clear topographic breaks defined the wetland boundary. Smaller examples of ecologically similar wetlands previously documented by data points were also documented in this way.

The supplemental data sheet includes documentation of all three wetland criteria including hydrophytic vegetation, hydric soils, and wetland hydrology. Plant species observed in the wetland were listed with dominant species noted. These species are the basis for a Floristic Quality Assessment (FQA) of the wetland. Significant disturbance of vegetation, soils, and/or hydrology, Cowardin wetland type, and additional notes were also captured on the supplemental form. Photographs of all features were taken.

To assess floristic quality within each wetland, vegetation data was entered into the Chicago Region Floristic Quality Assessment (FQA) Calculator (Herman et al., 2017). Calculations of the Mean Coefficient of Conservatism (mean C for all species) and for Floristic Quality Assessment Index (FQAI for all species) are metrics that indicate the vegetative quality of an area.

To rapidly assess soils in an area, an Eijkelkamp Edelman soil auger for combination soils with a 3-inch diameter by 6-inch-long barrel was employed to periodically test soils on both the upland and wetland sides of the boundary line. Vegetation and hydrology were visually assessed along the boundary in combination with topographic breaks. The lack of any one or more of the wetland criteria - wetland hydrology, hydric soils indicators, or hydrophytic vegetation - determined the boundary.

Waterways and streams were characterized by observation of indicators of the Ordinary High Water Mark (OHWM) including shelving, presence of litter and debris, wracking, scour, deposition, bed and banks, and change in plant community, among others. Additional stream characteristics including width and depth of water, bank height, stream bottom attributes, and streamside vegetative cover were documented on Stream Characterization forms for each stream or waterway.

3. Site Conditions

A. Site Description

(1) Soils Mapping

Nearly 92% of Airport property is covered by soils mapped as Urban land or Orthents. Soil units mapped as Urban land are areas in which 85% or more are covered by pavement, buildings, and other impervious surfaces. Orthents generally consist of disturbed soil varying from well drained to moderately well drained and are marked by a thin surface layer of either loam or silty clay.

Only 4.8% of the AOI is covered by soils mapped as hydric or predominantly hydric (shown in bold in Table 1). Soils mapping is provided in Appendix B.

Table 1. Summary of Soils in Area of Interest

MAP UNIT SYMBOL	MAP UNIT NAME	HYDRIC RATING (Percent)	AREA IN AOI (Acres)	PERCENT OF AOI
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97	0.1	0.0%
522F	Orthents, clayey, refuse substratum, steep	0	0.0	0.0%
533	Urban land	0	2,169.0	30.0%
534B	Urban land-Orthents, clayey, complex, gently sloping	5	0.1	0.0%
802B	Orthents, loamy, undulating	2	0.0	0.0%
805A	Orthents, clayey, nearly level	6	3,070.5	42.5%
805B	Orthents, clayey, undulating	6	118.0	1.6%
830	Landfills	0	0.3	0.0%
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	100	0.0	0.0%
W	Water	0	12.0	0.2%
Subtotals for Soil Survey Area (Cook County)			5,598.6	77.5%
146A	Elliott silt loam, 0 to 2 percent slopes	4	33.1	0.5%
223B	Varna silt loam, 2 to 4 percent slopes	4	31.3	0.4%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97	303.5	4.2%
298A	Beecher silt loam, 0 to 2 percent slopes	4	57.0	0.8%
330A	Peotone silty clay loam, 0 to 2 percent slopes	100	15.9	0.2%
530B	Ozaukee silt loam, 2 to 4 percent slopes	4	2.0	0.0%
531B	Markham silt loam, 2 to 4 percent slopes	6	31.7	0.4%

MAP UNIT SYMBOL	MAP UNIT NAME	HYDRIC RATING (Percent)	AREA IN AOI (Acres)	PERCENT OF AOI
802B	Orthents, loamy, undulating	2	20.1	0.3%
802D	Orthents, loamy, rolling	0	85.7	1.2%
805B	Orthents, clayey, undulating	6	950.1	13.1%
830	Landfills	0	2.1	0.0%
854B	Markham-Ashkum- Beecher complex, 1 to 6 percent slopes	30	66.2	0.9%
903A	Muskego and Houghton mucks, 0 to 2 percent slopes	100	16.2	0.2%
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	100	13.0	0.2%
Subtotals for Soil Survey Area (DuPage County)			1,628.0	22.5%
Totals for Area of Interest			7,226.6	100.0%

(2) Aquatic Resources

National Wetlands Inventory (NWI) mapping is provided in Appendix C. Based on source information provided on the NWI Mapper (<https://www.fws.gov/wetlands/Data/Mapper.html>, accessed May 7, 2019 and March 15, 2021), mapped wetlands shown in this figure are current as of 1981.

The Federal Emergency Management Agency (FEMA) Floodplain mapping is provided in Appendix C. Areas of regulatory floodway occur along Higgins and Willow Creeks along the northern and southeastern extents of Airport property.

(3) Previous Delineations

Harza Engineering (Harza, 2000) conducted a wetland delineation at the Airport in 2000 in which approximately 128 acres of wetlands were delineated in 122 sites (Harza, 2000: 6). Approximately 20 acres of jurisdictional Waters of the US were also found on Airport property. This delineation was an update of an Airport-wide field delineation performed in 1995.

Overall, Harza (2000) assessed the delineated wetlands at that time as many small sites possessing "relatively low water quality, stormwater and flood storage, and wildlife habitat" (Harza, 2000: 11). Intensive land use and earth-moving activities resulted in disturbance to soils throughout the Airport leading to the predominance of weedy invasives such as reed canary grass (*Phalaris arundinacea*) and cattail (*Typha* spp.). The small size and isolated locations of many wetlands provided little water quality benefits except in localized situations; the shallow depressional nature of many of the wetlands and isolation provided minimal flood storage benefit.

(4) Antecedent Climatic Conditions

Field work was conducted over eight weeks starting in mid-July and ending at the end of September. An assessment of antecedent climatic conditions was made using precipitation data for

the three months prior to start of field work in July. This analysis indicated that climatic conditions were wetter than normal range for both the July field visits. Table 2 provides Climatic normal and site precipitation data. See Appendix D for assessment of antecedent precipitation for July.

Table 2. Climatic Normals and Precipitation Data for ORD¹

MONTH	30% CHANCE PRECIP LESS THAN	AVERAGE PRECIPITATION (in.)	30% CHANCE PRECIP MORE THAN	SITE PRECIPITATION (in.)
APRIL	2.45	3.52	4.19	6.02
MAY	2.36	3.55	4.25	8.25
JUNE	2.42	3.63	4.35	3.05
JULY	2.61	3.58	4.21	3.94
AUGUST	2.89	4.83	5.86	3.63
SEPTEMBER	1.57	3.38	4.12	7.61
TOTAL	14.30	22.49	26.98	32.50

¹ Based on 1971-2010 Climate Normals at Station CHICAGO OHARE INTL AP, IL

The summer months of June, July, and August saw rainfall within normal range while the month of September was more than four inches above normal.

(5) Atypical Conditions

The Airport has a long history within Cook and DuPage counties, opening for commercial service in 1955. The Airport has seen periodic expansion as demand for passenger travel increased culminating in the 2001 O'Hare Modernization Program (OMP) to reconfigure the airfield. Construction for this project is on-going.

Within airport property, construction activities over the Airport's history have affected many areas on the landscape which have experienced some or all of the following disturbances:

- Grading, filling, mixing, transportation, and compaction of native soils.
- Introduction of cool-season turf grasses.
- Changes to topography and drainage.
- Substitution of pipe drainage for natural sheet flow in some areas.
- Replacement of natural creek banks with concrete or gabion side walls.
- Construction of large detention ponds.
- Armoring of some creeks with significant placement of rip rap.
- Stockpiling of a significant volume of construction spoils placed throughout the Airport.
- Regular mowing of most airport property, which encourages the growth of grass species over forbs.

(6) Excluded Areas

Some areas of Airport property were excluded from field survey:

- Active Construction Areas (provided by CDA and presented in Appendix E)
- Impervious surfaces including active runway, taxiway, and apron areas; paved parking areas, access roads, and buildings
- Active Stockpile Areas
- Areas previously examined and permitted as part of IDOT's Elgin-O'Hare Western Access project, the Canine Facility Relocation Site on Touhy Ave, and the Taxiway A-B Relocation Construction area

These areas were defined and agreed upon prior to field work.

4. Results

A. Wetlands and Water of the US

(1) Wetlands

A total of 146 wetlands were identified during field work. The majority (95.2%) are shallow depressional emergent wetlands (PEM) with five forested (PFO) wetlands (3.4%) and two scrub/shrub (PSS) wetlands (1.3%). Wetlands on the airfield are generally characterized as small, isolated areas with relatively low water quality and limited runoff storage function due to their small size. The average size of wetlands is 0.19 acres. Few are located close to streams and therefore provide little floodwater storage benefit.

Wetland plant communities were often dominated by invasive and/or introduced species including cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), seaside goldenrod (*Solidago sempervirens*), buckthorn (*Rhamnus cathartica*), and reed canary grass (*Phalaris arundinacea*). A list of plant species observed within the AOI during field work is presented in Appendix F.

High Quality Aquatic Resources (HQAR) are defined by the Chicago District as fens, sedge meadows, bogs and other high-quality wetlands as well as wetlands with a Floristic Quality Index of >20 or a Mean C-value of >3.5. These resources are "considered regionally critical due to their uniqueness, scarcity, and/or value" under USACE Regional Permit Program guidance (<https://www.lrc.usace.army.mil/Portals/36/docs/regulatory/pdf/RPP/2017RPP.pdf>, accessed March 24, 2021). None of the delineated wetlands met HQAR criteria.

(2) Previously Identified Wetlands

Several wetlands and Waters identified in Harza (2000) had not been impacted by the 2001 O'Hare Modernization Program. These wetlands are generally located around the periphery of the airfield and are generally not part of on-airfield construction activities relating to the OMP. They have not been examined since the original field work in 2000. Each of the previously identified wetlands were assessed and documented during this field work.

Table 3 summarizes the delineated wetlands within the AOI.

Table 3. Wetland Site Summary Table

WETLAND ID	COWARDIN TYPE	AREA WITHIN AOI	FQI (all species) ¹	MEAN C (all species) ¹	HQAR ²	USACE STATUS ³
NW19-01	PEM	0.01	1.50	0.75	NO	JURISDICTIONAL
NW19-02	PEM	0.18	5.31	2.17	NO	NON-JURISDICTIONAL
NW19-03	PEM	0.01	2.85	0.90	NO	NON-JURISDICTIONAL
NW19-04	PEM	0.62	4.16	1.57	NO	JURISDICTIONAL
NW19-05	PEM	0.14	0.00	0.00	NO	JURISDICTIONAL
NW19-06	PEM	0.14	4.49	1.83	NO	JURISDICTIONAL
NW19-07	PEM	0.13	3.40	1.29	NO	NON-JURISDICTIONAL
NW19-08	PEM	0.02	1.73	1.00	NO	NON-JURISDICTIONAL
NW19-09	PEM	0.01	1.34	0.60	NO	NON-JURISDICTIONAL
NW19-10	PEM	0.36	3.67	1.50	NO	NON-JURISDICTIONAL
NW19-11	PEM	0.52	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-12	PEM	0.35	5.72	2.33	NO	JURISDICTIONAL
NE19-13	PEM	0.40	2.67	0.89	NO	NON-JURISDICTIONAL
NE19-14	PEM	0.14	3.48	1.10	NO	NON-JURISDICTIONAL
NE19-15	PEM	0.12	4.74	1.50	NO	NON-JURISDICTIONAL
NE19-16	PEM	0.04	1.50	0.75	NO	NON-JURISDICTIONAL
NE19-17	PEM	0.04	2.83	1.00	NO	NON-JURISDICTIONAL
NW19-18	PEM	0.06	5.72	2.33	NO	JURISDICTIONAL
NE19-19	PEM	0.04	3.62	1.09	NO	NON-JURISDICTIONAL
NE19-20	PEM	1.39	1.58	0.50	NO	JURISDICTIONAL
NE19-21	PEM	0.07	3.00	1.50	NO	NON-JURISDICTIONAL
NE19-22	PEM	0.10	8.84	3.13	NO	NON-JURISDICTIONAL
NE19-23	PEM	0.38	2.65	1.00	NO	NON-JURISDICTIONAL
SE19-24	PEM	0.27	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-25	PEM	0.04	2.50	1.25	NO	NON-JURISDICTIONAL
SE19-26	PEM	0.03	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-27	PEM	0.01	2.68	1.20	NO	NON-JURISDICTIONAL
SW19-28	PEM	0.01	5.72	2.33	NO	NON-JURISDICTIONAL
SW19-29	PEM	0.03	3.78	1.43	NO	NON-JURISDICTIONAL
SW19-30	PEM	0.01	4.92	2.20	NO	NON-JURISDICTIONAL
SW19-31	PEM	0.06	3.78	1.43	NO	NON-JURISDICTIONAL
SW19-32	PEM	0.01	1.15	0.67	NO	NON-JURISDICTIONAL
SW19-33	PEM	0.02	3.67	1.50	NO	NON-JURISDICTIONAL
SW19-34	PEM	0.00	3.46	2.00	NO	NON-JURISDICTIONAL
SW19-35	PEM	0.01	1.50	0.75	NO	NON-JURISDICTIONAL
SW19-36	PEM	0.02	6.50	3.25	NO	NON-JURISDICTIONAL
SW19-37	PEM	0.02	3.00	1.50	NO	JURISDICTIONAL
SW19-38	PEM	0.01	4.08	1.67	NO	NON-JURISDICTIONAL
SW19-39	PEM	0.29	3.00	1.50	NO	NON-JURISDICTIONAL

WETLAND ID	COWARDIN TYPE	AREA WITHIN AOI	FQI (all species) ¹	MEAN C (all species) ¹	HQAR ²	USACE STATUS ³
SE19-41	PEM	0.02	2.85	0.90	NO	NON-JURISDICTIONAL
SW19-42	PEM	0.03	7.16	3.20	NO	NON-JURISDICTIONAL
SE19-43	PEM	0.03	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-44	PEM	0.02	0.00	0.00	NO	JURISDICTIONAL
SE19-46	PEM	1.32	4.16	1.57	NO	JURISDICTIONAL
SE19-47	PEM	0.09	0.00	0.00	NO	JURISDICTIONAL
SE19-48	PEM	0.74	3.16	1.00	NO	JURISDICTIONAL
SE19-49	PEM	0.43	2.12	0.75	NO	JURISDICTIONAL
SE19-50	PEM	0.08	3.54	1.25	NO	JURISDICTIONAL
SE19-51	PEM	0.10	2.00	1.00	NO	JURISDICTIONAL
SE19-52	PEM	0.05	3.33	1.11	NO	JURISDICTIONAL
SE19-53	PEM	0.57	6.67	2.22	NO	NON-JURISDICTIONAL
SE19-54	PEM	0.01	2.86	1.17	NO	NON-JURISDICTIONAL
SE19-55	PEM	4.05	0.76	0.29	NO	JURISDICTIONAL
SW19-56	PEM	0.04	1.34	0.60	NO	NON-JURISDICTIONAL
SW19-57	PEM	0.40	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-58	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-59	PEM	0.03	1.13	0.43	NO	NON-JURISDICTIONAL
SE19-60	PEM	0.04	0.00	0.00	NO	JURISDICTIONAL
NE19-61	PEM	0.40	0.00	0.00	NO	JURISDICTIONAL
NE19-62	PEM	0.03	3.02	1.14	NO	JURISDICTIONAL
SE19-63	PEM	0.01	1.79	0.80	NO	NON-JURISDICTIONAL
SE19-64	PEM	0.01	1.34	0.60	NO	NON-JURISDICTIONAL
SE19-65	PEM	0.11	3.50	1.75	NO	JURISDICTIONAL
SE19-66	PEM	0.12	1.34	0.60	NO	JURISDICTIONAL
SE19-67	PEM	0.18	1.41	0.50	NO	NON-JURISDICTIONAL
SE19-68	PEM	0.08	5.67	1.89	NO	NON-JURISDICTIONAL
NE19-69	PEM	0.08	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-70	PEM	0.25	7.27	2.30	NO	NON-JURISDICTIONAL
SW19-71	PEM	0.17	3.89	1.38	NO	NON-JURISDICTIONAL
SW19-72	PEM	0.02	2.00	1.00	NO	NON-JURISDICTIONAL
SW19-73	PEM	0.06	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-74	PEM	0.11	7.54	2.27	NO	NON-JURISDICTIONAL
NW19-75	PEM	0.12	5.38	1.70	NO	NON-JURISDICTIONAL
NW19-76	PEM	0.10	6.80	2.57	NO	NON-JURISDICTIONAL
NW19-77	PEM	0.15	2.86	1.17	NO	JURISDICTIONAL
NW19-78	PEM	0.13	2.86	1.17	NO	JURISDICTIONAL
NW19-79	PEM	0.02	2.68	1.20	NO	NON-JURISDICTIONAL
NE19-80	PEM	0.03	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-81	PEM	0.03	6.53	2.67	NO	NON-JURISDICTIONAL

WETLAND ID	COWARDIN TYPE	AREA WITHIN AOI	FQI (all species) ¹	MEAN C (all species) ¹	HQAR ²	USACE STATUS ³
NW19-82	PEM	0.08	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-83	PEM	0.06	4.92	2.20	NO	NON-JURISDICTIONAL
NW19-84	PEM	0.12	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-85	PEM	0.02	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-86	PEM	0.02	0.00	0.00	NO	NON-JURISDICTIONAL
NE19-87	PEM	0.10	0.00	0.00	NO	JURISDICTIONAL
NE19-88	PEM	0.12	1.22	0.50	NO	JURISDICTIONAL
NE19-89	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-90	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-91	PEM	0.05	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-92	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-93	PEM	0.03	5.67	2.14	NO	NON-JURISDICTIONAL
SW19-94	PEM	0.07	1.00	0.50	NO	JURISDICTIONAL
SE19-95	PEM	0.02	0.00	0.00	NO	JURISDICTIONAL
NW19-96	PEM	0.11	1.89	0.71	NO	JURISDICTIONAL
SE19-97	PEM	0.28	0.00	0.00	NO	JURISDICTIONAL
SE19-98	PEM	0.06	4.11	1.30	NO	NON-JURISDICTIONAL
SE19-99	PEM	0.01	1.50	0.75	NO	NON-JURISDICTIONAL
SE19-100	PEM	0.01	1.22	0.50	NO	NON-JURISDICTIONAL
SW19-101	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
SW19-102	PEM	0.00	0.00	0.00	NO	NON-JURISDICTIONAL
NW19-103	PEM	0.07	0.00	0.00	NO	NON-JURISDICTIONAL
NE19-104 ⁴	PEM	2.60	6.68	1.79	NO	JURISDICTIONAL
NE19-104A	PEM	0.04	---	---	NO	JURISDICTIONAL
NE19-104B	PEM	0.05	---	---	NO	JURISDICTIONAL
NE19-105	PEM	0.16	2.41	0.73	NO	JURISDICTIONAL
NE19-106	PEM	0.15	5.77	1.67	NO	JURISDICTIONAL
NE19-107	PEM	0.01	0.00	0.00	NO	NON-JURISDICTIONAL
NE19-108	PEM	0.03	0.00	0.00	NO	NON-JURISDICTIONAL
NE19-109	PEM	1.21	4.24	1.50	NO	JURISDICTIONAL
NE19-110	PSS	0.28	6.64	1.92	NO	JURISDICTIONAL
NE19-111	PSS	0.01	7.42	2.63	NO	JURISDICTIONAL
NE19-112	PEM	0.05	3.58	1.60	NO	JURISDICTIONAL
NE19-113	PFO	0.18	2.83	1.00	NO	JURISDICTIONAL
SE19-114	PEM	0.24	1.13	0.43	NO	JURISDICTIONAL
SE19-115	PEM	0.01	2.86	1.17	NO	JURISDICTIONAL
NE19-116	PFO	0.02	0.00	0.00	NO	JURISDICTIONAL
NE19-117	PEM	0.02	4.08	1.67	NO	JURISDICTIONAL
NE19-118	PFO	0.12	5.29	2.00	NO	JURISDICTIONAL
SE19-119	PEM	0.03	0.00	0.00	NO	NON-JURISDICTIONAL

WETLAND ID	COWARDIN TYPE	AREA WITHIN AOI	FQI (all species) ¹	MEAN C (all species) ¹	HQAR ²	USACE STATUS ³
SE19-120	PEM	0.35	0.00	0.00	NO	JURISDICTIONAL
SE19-121	PEM	0.17	2.27	0.86	NO	JURISDICTIONAL
SE19-122	PEM	0.27	1.50	0.75	NO	JURISDICTIONAL
SE19-123	PFO	0.44	2.77	0.77	NO	NON-JURISDICTIONAL
SE19-124	PFO	0.56	1.13	0.43	NO	JURISDICTIONAL
SE19-125	PEM	0.07	0.00	0.00	NO	JURISDICTIONAL
NE19-126	PEM	0.09	1.51	0.57	NO	NON-JURISDICTIONAL
SE19-127	PEM	0.07	1.22	0.50	NO	JURISDICTIONAL
NE19-128	PEM	0.01	1.34	0.60	NO	NON-JURISDICTIONAL
SE19-129	PEM	0.01	1.63	0.67	NO	NON-JURISDICTIONAL
SE19-130	PEM	0.06	3.67	1.22	NO	NON-JURISDICTIONAL
SE19-131	PEM	0.37	0.71	0.25	NO	NON-JURISDICTIONAL
SE19-132	PEM	0.32	1.22	0.50	NO	NON-JURISDICTIONAL
SE19-133	PEM	0.02	1.50	0.75	NO	NON-JURISDICTIONAL
SE19-134	PEM	0.01	1.50	0.75	NO	NON-JURISDICTIONAL
SE19-135	PEM	0.07	1.22	0.50	NO	NON-JURISDICTIONAL
SE19-136	PEM	0.01	1.22	0.50	NO	JURISDICTIONAL
SE19-137	PEM	0.33	2.31	0.67	NO	JURISDICTIONAL
SE19-138	PEM	0.18	0.35	0.13	NO	JURISDICTIONAL
SE19-139	PEM	0.15	4.04	1.17	NO	NON-JURISDICTIONAL
SE19-140	PEM	0.02	2.47	0.88	NO	NON-JURISDICTIONAL
SE19-141	PEM	0.00	4.04	1.17	NO	NON-JURISDICTIONAL
SW19-142	PEM	0.19	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-143	PEM	0.10	0.00	0.00	NO	NON-JURISDICTIONAL
SE19-144	PEM	0.20	1.79	0.80	NO	NON-JURISDICTIONAL
SE19-145	PEM	0.12	3.02	1.14	NO	NON-JURISDICTIONAL
SE19-146	PEM	0.19	2.24	1.00	NO	NON-JURISDICTIONAL
Remaining Wetlands						
SW120	PEM	9.20	1.00	3.46	NO	JURISDICTIONAL
NE65	PSS	0.17	3.16	1.00	NO	JURISDICTIONAL
NW39/NW01	PEM	0.78	5.25	1.31	NO	JURISDICTIONAL
SE64	PEM	1.00	1.33	0.44	NO	JURISDICTIONAL
SE62	PEM	0.72	2.00	1.00	NO	JURISDICTIONAL
NE41	PEM	0.51	9.00	3.00	NO	JURISDICTIONAL
¹ See Appendix L for Floristic Quality Assessment calculations.						
² High Quality Aquatic Resources (HQAR) are defined by the Chicago District as fens, sedge meadows, bogs, among other high-quality wetlands as well as wetlands with a Floristic Quality Index of >20 or a Mean C-value of >3.5.						
³ See Approved Jurisdictional Determination (dated December 20, 2019) in Appendix M.						
⁴ The FQI and Mean C-values were combined for Wetlands 104, 104A, and 104B and reported under Wetland 104.						

Delineated wetlands and Waters of the US mapping is provided in Appendix G. Midwest Region data sheets and Wetland Supplemental forms are presented in Appendices H and I, respectively. Field photographs appear in Appendix K and Floristic Quality Assessment sheets along with a summary table are provided in Appendix L.

(3) Waters of the US

Streams within the airfield have been highly altered over the history of the Airport. Four major streams flow through parts of the Airport. Higgins Creek at the northern periphery of the AOI flows southward and empties to Willow Creek. Willow Creek flows from the west, skirts the north side of the Airport before flowing eastward to the Des Plaines River. A portion of Crystal Creek is carried through the southeastern side of the Airport. Finally, Silver Creek flows from the southwestern corner of the Airport through the Bensenville Ditch and flows southward off Airport property.

Some sections of streams have seen channel relocations, replacement of open channel flow with underground conveyance, replacement of natural banks with concrete or gabion side walls along open channel sections, or the installation of heavy armoring consisting of large rip-rap. Willow Creek illustrates the variation in bank types over its course through the Airport. Sections with concrete walls include Sections 1, 2, and 8, gabion side walls are along Sections 4 and 5, natural banks with some rip-rap occur along Sections 6 and 7, and natural banks occur along Sections 3 and 9. Sections of Willow Creek are carried underground near the Runway 27R end, the Runway 9L end, and between Section 3 and 4 as shown on maps in Appendix G. Through many of these open channel sections, installation of bird wires acts to deter waterfowl and other avian use.

Stream characterization forms are presented in Appendix J. Contained on these forms is information on the following: approximate width and depth of water flow, bank height and weight, flow regime, stream bottom characteristics, water appearance and odor, presence of woody debris, channel shape, description of stream side cover, and indicators of the Ordinary High Water Mark.

Table 4 summarizes the Water of the US delineated within the AOI.

Table 4. Waters of the US Summary Table

WATERS ID	COWARDIN TYPE	LINEAR FT WITHIN AOI	LOCAL WATERWAY	USACE STATUS
Bensenville Ditch - Section 1	R2	1454	Bensenville Ditch / Silver Creek	JURISDICTIONAL
Bensenville Ditch - Section 2	R2	2209	Bensenville Ditch / Silver Creek	JURISDICTIONAL
Bensenville Ditch - Section 3	R2	83	Bensenville Ditch / Silver Creek	JURISDICTIONAL
Crystal Creek - Section 1	R2	319	Crystal Creek	JURISDICTIONAL
Crystal Creek - Section 2	R2	719	Crystal Creek	JURISDICTIONAL
Crystal Creek - Section 3	R2	709	Crystal Creek	JURISDICTIONAL
Crystal Creek - Section 4	R2	730	Crystal Creek	JURISDICTIONAL

WATERS ID	COWARDIN TYPE	LINEAR FT WITHIN AOI	LOCAL WATERWAY	USACE STATUS
Higgins Creek - Section 2	R3	71	Higgins Creek	JURISDICTIONAL
Higgins Creek - Section 3	R3	132	Higgins Creek	JURISDICTIONAL
Middle Sister	R3	29	Willow Creek	JURISDICTIONAL
North Sister	R3	23	Willow Creek	JURISDICTIONAL
South Sister	R3	19	Willow Creek	JURISDICTIONAL
Willow Creek - Section 1	R2	1501	Willow Creek	JURISDICTIONAL
Willow Creek - Section 2	R2	551	Willow Creek	JURISDICTIONAL
Willow Creek - Section 3	R2	668	Willow Creek	JURISDICTIONAL
Willow Creek - Section 4	R2	274	Willow Creek	JURISDICTIONAL
Willow Creek - Section 5	R2	1561	Willow Creek	JURISDICTIONAL
Willow Creek - Section 6	R2	3919	Willow Creek	JURISDICTIONAL
Willow Creek - Section 7	R2	1365	Willow Creek	JURISDICTIONAL
Willow Creek - Section 8	R2	1618	Willow Creek	JURISDICTIONAL
Willow Creek - Section 9	R2	1555	Willow Creek	JURISDICTIONAL
Tributary 1: Willow Creek	R3	1355	Willow Creek	JURISDICTIONAL
Tributary 2: Willow Creek	R3	1163	Willow Creek	JURISDICTIONAL
Tributary 3: Willow Creek	R3	617	Willow Creek	JURISDICTIONAL

(4) Ditches

Delineated ditches within the AOI consist of constructed features designed to convey stormwater from impervious surfaces. These occur mostly along roadsides and occasionally on the airfield. Ditches are characterized as shallow linear depressional features that satisfy all three wetland criteria.

Table 5. Summary of Ditches within the AOI

WATERS ID	COWARDIN TYPE	LINEAR FT WITHIN AOI	LOCAL WATERWAY	USACE STATUS
Ditch 01	R4	547	Willow Creek	NON-JURISDICTIONAL
Ditch 02	R4	1026	Willow Creek	NON-JURISDICTIONAL
Ditch 03	R4	220	Willow Creek	JURISDICTIONAL
Ditch 04	R4	354	Willow Creek	NON-JURISDICTIONAL
Ditch 05	R4	79	Willow Creek	NON-JURISDICTIONAL
Ditch 06	R4	149	Willow Creek	NON-JURISDICTIONAL
Ditch 07	R4	483	N/A	NON-JURISDICTIONAL
Ditch 08	R4	1889	Willow Creek	JURISDICTIONAL
Ditch 09	R4	957	Willow Creek	NON-JURISDICTIONAL
Ditch 10	R4	722	Willow Creek	JURISDICTIONAL
Ditch 11	R4	1102	Willow Creek	NON-JURISDICTIONAL
Ditch 12	R4	528	N/A	NON-JURISDICTIONAL
Ditch 13 - Section 1	R4	1437	Willow Creek	NON-JURISDICTIONAL

WATERS ID	COWARDIN TYPE	LINEAR FT WITHIN AOI	LOCAL WATERWAY	USACE STATUS
Ditch 13 - Section 2	R4	437	Willow Creek	JURISDICTIONAL
Ditch 14	R4	1966	Willow Creek	NON-JURISDICTIONAL
Ditch 15	R4	516	Willow Creek	NON-JURISDICTIONAL
Ditch 16	R4	187	Willow Creek	NON-JURISDICTIONAL
Ditch 17	R4	642	Willow Creek	NON-JURISDICTIONAL
Ditch 18	R4	262	Willow Creek	NON-JURISDICTIONAL
Ditch 19	R4	105	Willow Creek	NON-JURISDICTIONAL
Ditch 20	R4	692	Willow Creek	NON-JURISDICTIONAL
Ditch 21	R4	3647	N/A	NON-JURISDICTIONAL
Ditch 22	R4	321	N/A	NON-JURISDICTIONAL
Ditch 23	R4	1130	N/A	NON-JURISDICTIONAL
Ditch 24	R4	1044	N/A	NON-JURISDICTIONAL
Ditch 25	R4	1462	N/A	NON-JURISDICTIONAL
Ditch 27	R4	1232	Crystal Creek	NON-JURISDICTIONAL
Ditch 28	R4	431	N/A	NON-JURISDICTIONAL
Ditch 29	R4	299	N/A	NON-JURISDICTIONAL
Ditch 30	R4	310	Bensenville Ditch / Silver Creek	JURISDICTIONAL
Ditch 31	R4	5833	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 32	R4	2177	N/A	NON-JURISDICTIONAL
Ditch 33	R4	1082	N/A	NON-JURISDICTIONAL
Ditch 34	R4	822	Crystal Creek	NON-JURISDICTIONAL
Ditch 35	R4	527	Crystal Creek	NON-JURISDICTIONAL
Ditch 36	R4	246	Crystal Creek	NON-JURISDICTIONAL
Ditch 37	R4	580	N/A	NON-JURISDICTIONAL
Ditch 38	R4	449	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 39	R4	575	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 40	R4	3043	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 41	R4	3847	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 42 (PO Drainage)	R4	330	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 43	R4	1213	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 44	R4	1139	Bensenville Ditch / Silver Creek	NON-JURISDICTIONAL
Ditch 45	R4	470	N/A	NON-JURISDICTIONAL
Ditch 46	R4	217	N/A	NON-JURISDICTIONAL
Ditch 47	R4	246	N/A	NON-JURISDICTIONAL
Ditch 48	R4	327	N/A	NON-JURISDICTIONAL
Erosional Feature 1	R4	129	Willow Creek	NON-JURISDICTIONAL

WATERS ID	COWARDIN TYPE	LINEAR FT WITHIN AOI	LOCAL WATERWAY	USACE STATUS
Erosional Feature 2	R4	81	Willow Creek	NON-JURISDICTIONAL
Erosional Feature 3	R4	73	Willow Creek	NON-JURISDICTIONAL

(5) Observed Wildlife

General observations of wildlife encountered over the course of field work are listed below in Table 6. These are characterized as common species that are typically seen in urban environments such as butterflies, bees, bumblebees, dragonflies, crickets, frogs, and ducks. Table 6 lists species with the common name and scientific name where species identifications could be made.

On the active airfield, vegetation is regularly maintained by mowing and provides little habitat for most species. In less frequently maintained areas around the periphery of the active airfield and along open channel streams, a limited array of common species was observed.

Table 6. General Wildlife Observations

COMMON NAME	SCIENTIFIC NAME
Birds	
Great Blue Heron	<i>Ardea herodias</i>
Green Heron	<i>Butorides virescens</i>
Barn swallow	<i>Hirundo rustica</i>
Redwing blackbird	<i>Agelaius phoeniceus</i>
Robin	<i>Turdus migratorius</i>
Mourning Dove	<i>Zenaida macroura</i>
Mallard	<i>Anas platyrhynchos</i>
Insects	
Grasshopper	<i>Melanoplus differentialis</i>
Mammals	
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Muskrat	<i>Ondatra zibethicus</i>
Vole	<i>Microtus spp.</i>
Raccoon	<i>Procyon lotor</i>

5. Summary

Approximately 7,200 acres contained within the Chicago O'Hare International Airport property boundary were examined for wetlands and water resources, located in the following sections within Cook and DuPage counties:

- Sections 4 through 9, 16, 17, and 18, Township 40 North, Range 12 East,
- Sections 30 through 32 in Township 41 North, Range 12 East,
- Sections 25, 35, and 36, Township 41 North, Range 11 East, and
- Sections 1, 11, 12, and 13, Township 40 North, Range 11 East

The project area is primarily an active airfield covered by runway, taxiway, apron, and roadway pavement. Areas around the periphery of the active airfield contain major roadways on all sides of the project AOI. Streams flowing through the property have been highly modified and on-airfield vegetation is regularly mown.

During field work all areas within the project AOI were examined with the exception of those detailed in Section 3 (6): active construction areas, stockpile areas, and previously permitted project areas. A total of 146 wetlands were delineated and six previously identified wetlands were re-examined and documented. Twenty-four streams and 51 ditches or erosional features were delineated and documented within the project AOI.

An Agency site review on October 4, 2019 included representatives from the FAA, CDA, Mead & Hunt, and the Chicago District of the U.S. Army Corps of Engineers. Representative wetland types were reviewed in the field during the site visit. An Approved Jurisdictional Determination was issued December 20, 2019.

6. Conclusion

A jurisdictional determination for these wetlands and Waters was issued by the U.S. Corps of Engineers on December 20, 2019. A Section 404 wetland fill permit from the USACE will be needed for any construction activities (filling, dredging, or mechanical land clearing) within jurisdictional wetland boundaries. A Section 401 water quality certification may also be required by the Illinois Environmental Protection Agency (IEPA) and other approvals or permits may be required from other state, federal, or local authorities including the DuPage County under Stormwater and Floodplain Ordinance regulations related to Special Management Areas. Final authority over the project rests with the above federal, state, and local agencies.

The wetland boundaries established by this work are valid only for the subject project and any use or interpretation of its findings for areas outside the project area of interest is not supported. The user of this wetland boundary report is advised that changing environmental conditions may affect the future validity of the wetland boundaries so established.

7. Certifications and Limitations

The undersigned does hereby certify and state that she is an employee of Mead & Hunt, Inc., that she has been designated as being in responsible charge of the delineation of wetlands described herein; and that this delineation was performed in accordance with the USACE 1987 *Wetland Delineation Manual* as enhanced by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, Version 2.0* (U.S. Army Corps of Engineers, 2010).

This wetland delineation report documents vegetation, soils, and hydrology conditions on the above-referenced parcel according to these standard accepted practices, and the wetland boundary so established is valid only for the designated area. No uses or interpretations of wetland conditions or boundaries outside of the work area are supported by this work.

The mapped wetland boundaries are valid under the environmental conditions existing at the time of delineation. The user of this information is hereby notified that changing environmental conditions may affect the future validity of the wetland boundary.

MEAD & HUNT, Inc.



Brauna Hartzell
Wetland Ecologist & GIS Analyst

Date: April 2021

8. References

The following data sources were examined prior to fieldwork:

AgACIS, WETS Climate Tables for 1971-2010, Climate Data and Summary Reports. Station: Chicago O'Hare International Airport. Data accessed at <http://agacis.rcc-acis.org/>.

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Harza Environmental Services, Inc., 2000. Delineation of Wetland and Floodplain Areas, Chicago O'Hare International Airport. Report prepared for the City of Chicago, Department of Aviation. Report prepared by Harza Engineering, February 2000.

Herman, B., Sliwinski, R. and S. Whitaker, 2017. Chicago Region FQA (Floristic Quality Assessment) Calculator. U.S. Army Corps of Engineers, Chicago, IL. Accessed at <https://www.lrc.usace.army.mil/Missions/Regulatory/fqa.aspx>, March 25, 2019.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin, 2016. Midwest 2016 Regional Wetland Plant List (version 3.3) from The National Wetland Plant List: 2016 wetland ratings.

National Wetlands Inventory Mapping from the U.S. Fish and Wildlife Service at <https://www.fws.gov/wetlands/data/mapper.html>.

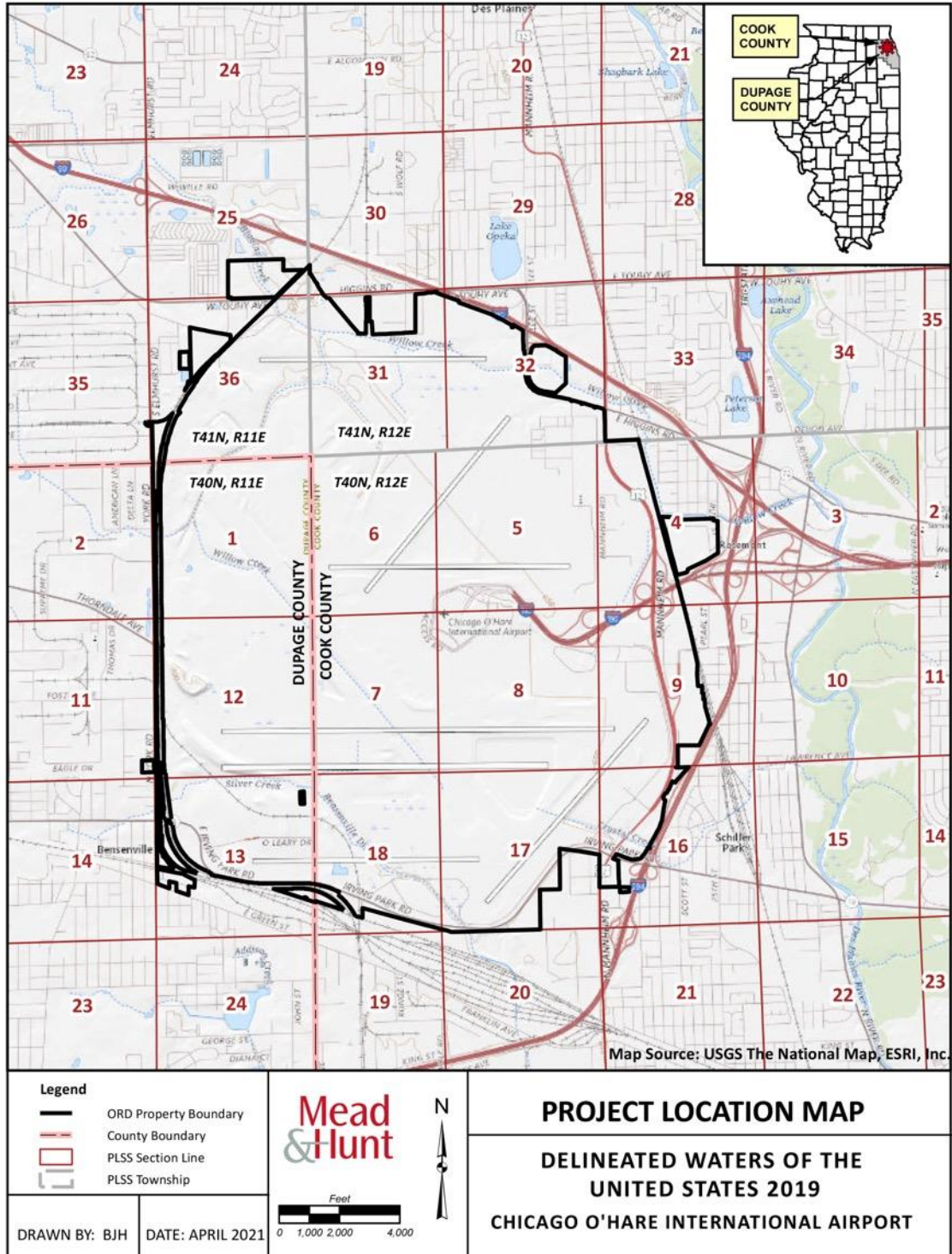
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Soils Survey of Cook and DuPage counties, IL. U.S. Department of Agriculture (USDA), Natural Resources Conservation Service, Web Soil Survey available online at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

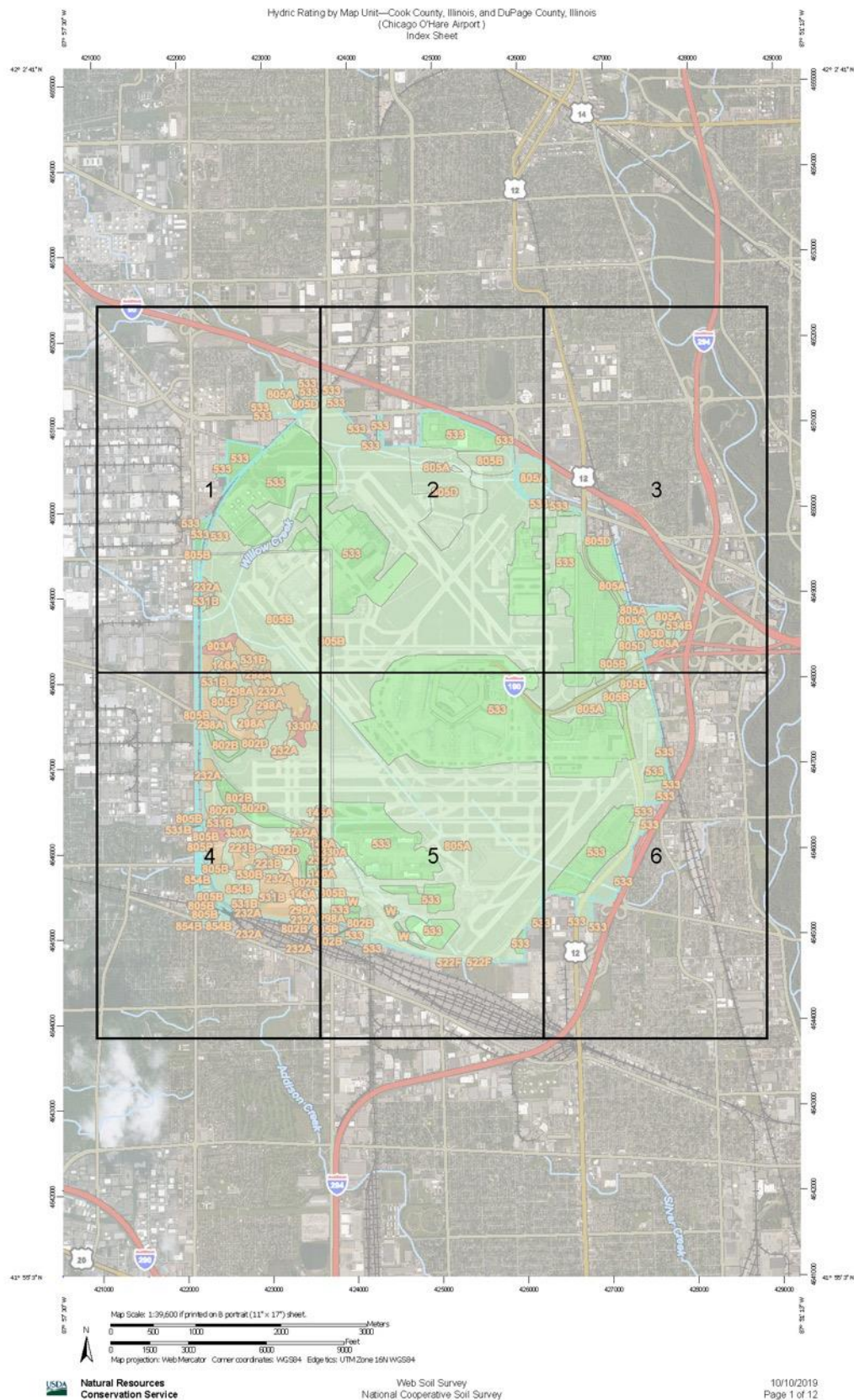
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U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS), 2018. Field Indicators of Hydric Soils in the United States, Version 8.2, ed. L.M. Vasilas and J.F. Berkowitz. USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils.

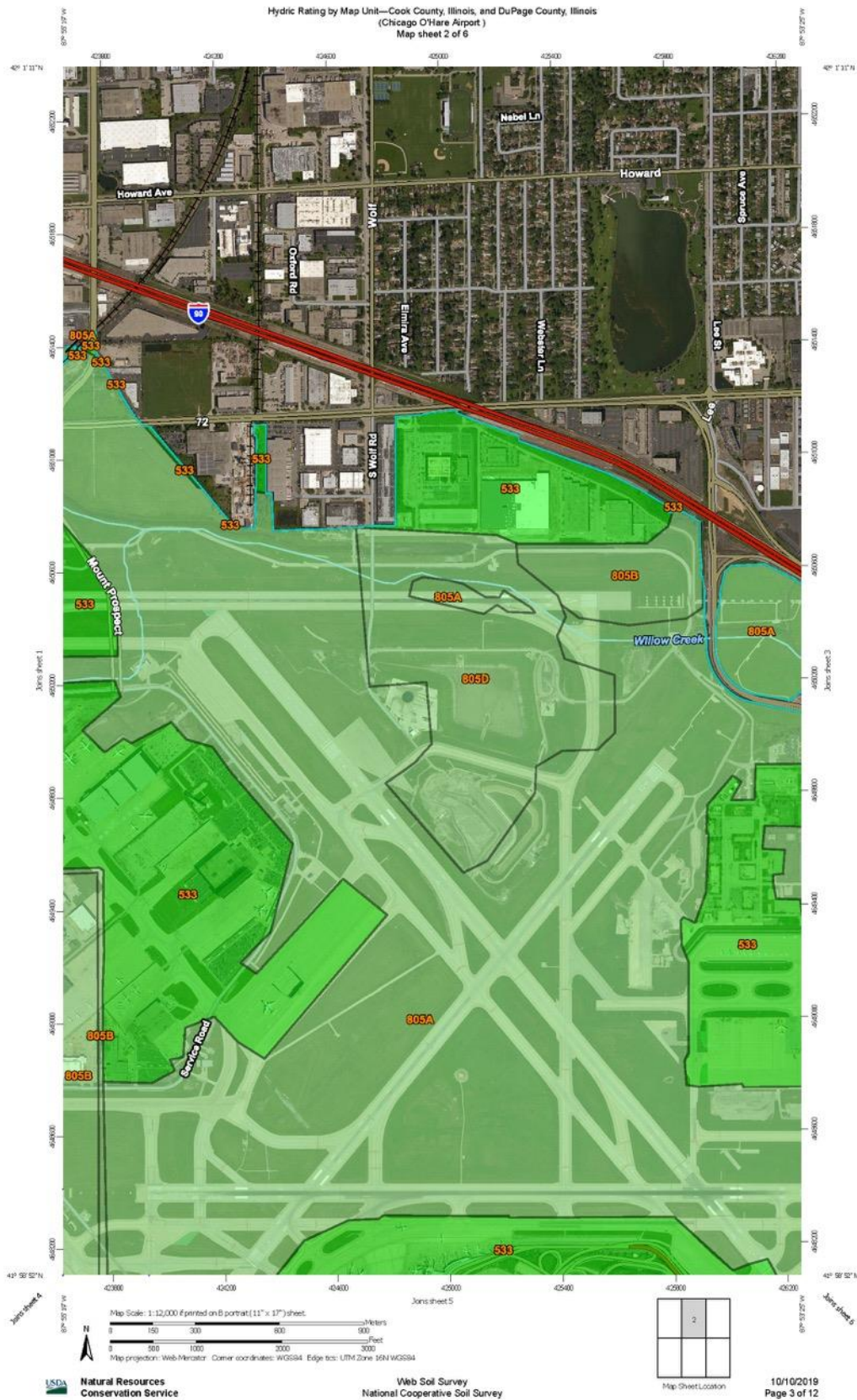
Appendix A. Project Location Map

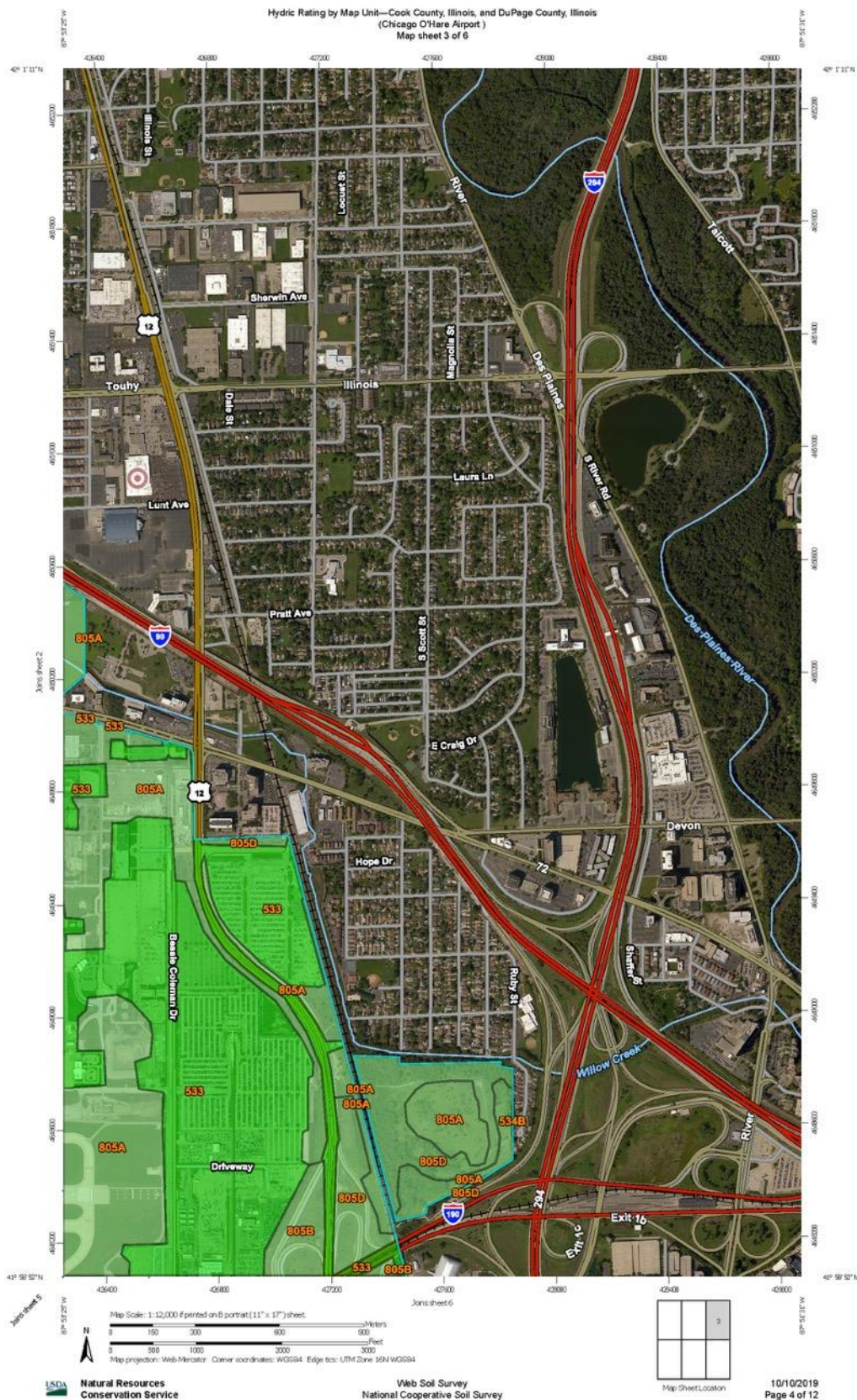


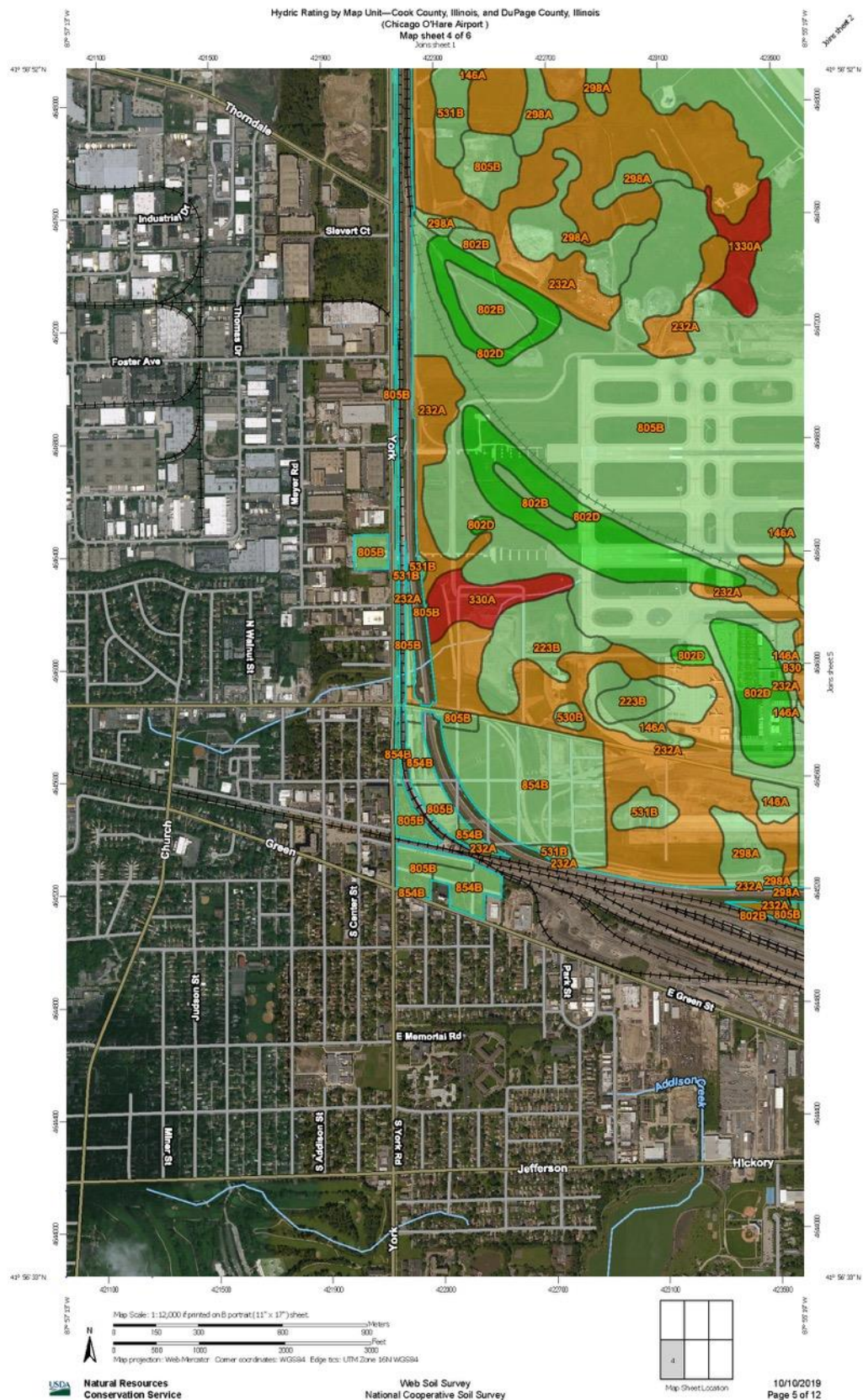
Appendix B. NRCS Soils Maps

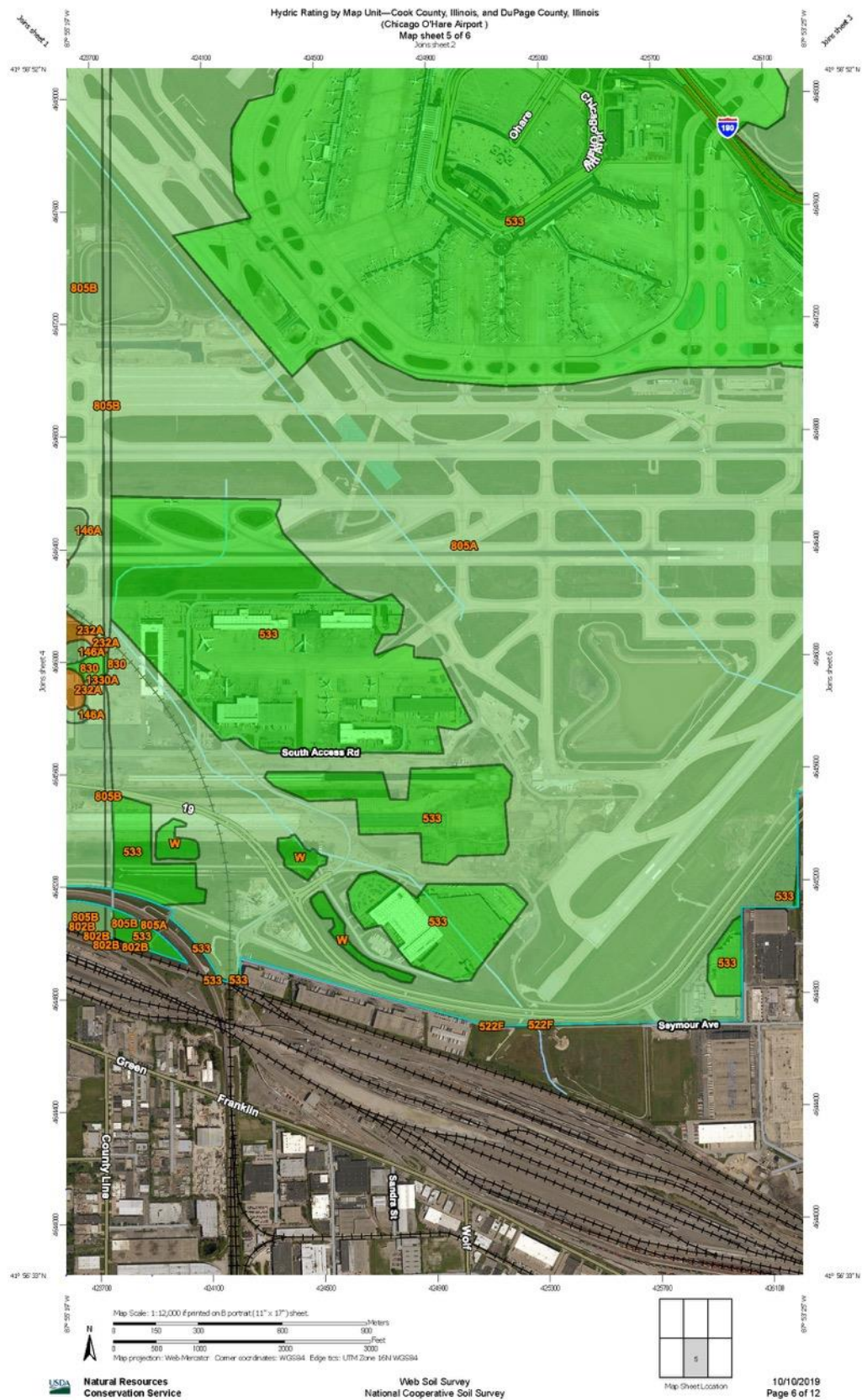






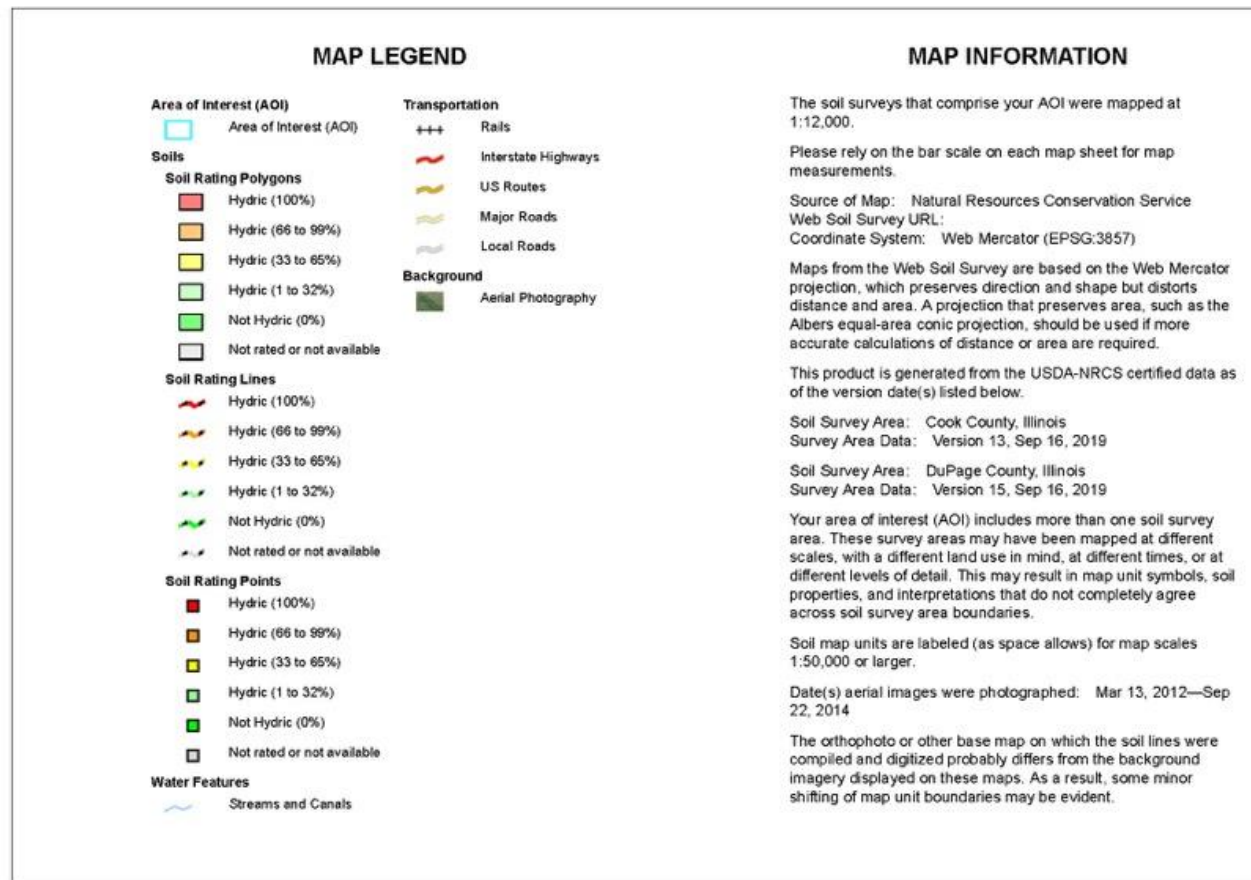








Hydric Rating by Map Unit—Cook County, Illinois, and DuPage County, Illinois
(Chicago O'Hare Airport)



Hydric Rating by Map Unit—Cook County, Illinois, and DuPage County, Illinois

Chicago O'Hare Airport

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97	0.1	0.0%
522F	Orthents, clayey, refuse substratum, steep	0	0.0	0.0%
533	Urban land	0	2,169.0	30.0%
534B	Urban land-Orthents, clayey, complex, gently sloping	5	0.1	0.0%
802B	Orthents, loamy, undulating	2	0.0	0.0%
805A	Orthents, clayey, nearly level	6	3,070.5	42.5%
805B	Orthents, clayey, undulating	6	118.0	1.6%
805D	Orthents, clayey, rolling	1	228.6	3.2%
830	Landfills	0	0.3	0.0%
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	100	0.0	0.0%
W	Water	0	12.0	0.2%
Subtotals for Soil Survey Area			5,598.6	77.5%
Totals for Area of Interest			7,226.6	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
146A	Elliott silt loam, 0 to 2 percent slopes	4	33.1	0.5%
223B	Varna silt loam, 2 to 4 percent slopes	4	31.3	0.4%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97	303.5	4.2%
298A	Beecher silt loam, 0 to 2 percent slopes	4	57.0	0.8%
330A	Peotone silty clay loam, 0 to 2 percent slopes	100	15.9	0.2%
530B	Ozaukee silt loam, 2 to 4 percent slopes	4	2.0	0.0%
531B	Markham silt loam, 2 to 4 percent slopes	6	31.7	0.4%
802B	Orthents, loamy, undulating	2	20.1	0.3%
802D	Orthents, loamy, rolling	0	85.7	1.2%

Hydric Rating by Map Unit—Cook County, Illinois, and DuPage County, Illinois

Chicago O'Hare Airport

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
805B	Orthents, clayey, undulating	6	950.1	13.1%
830	Landfills	0	2.1	0.0%
854B	Markham-Ashkum-Beecher complex, 1 to 6 percent slopes	30	66.2	0.9%
903A	Muskego and Houghton mucks, 0 to 2 percent slopes	100	16.2	0.2%
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	100	13.0	0.2%
Subtotals for Soil Survey Area			1,628.0	22.5%
Totals for Area of Interest			7,226.6	100.0%

Description

This 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. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hydric Rating by Map Unit—Cook County, Illinois, and DuPage County, Illinois

Chicago O'Hare Airport

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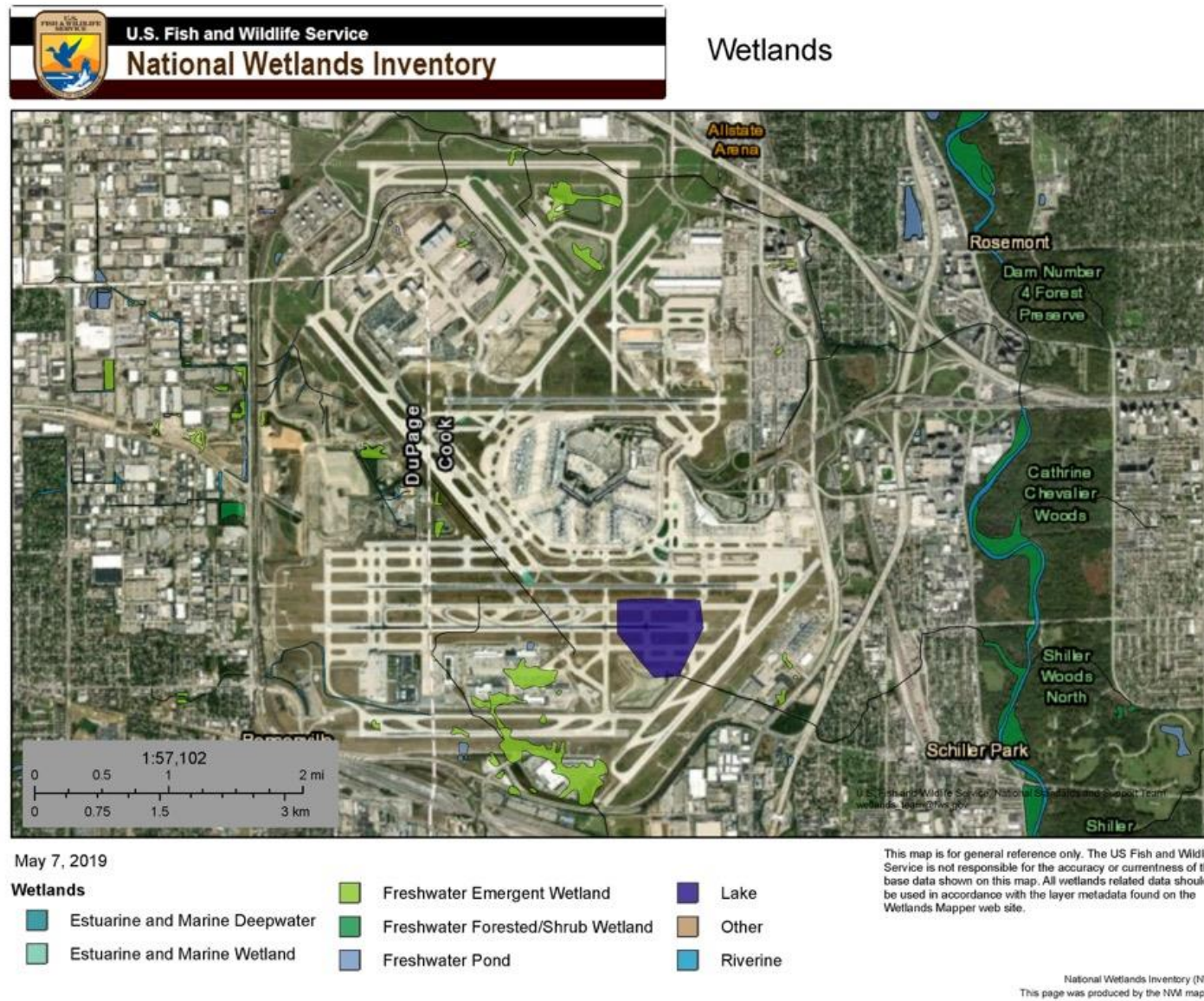
Rating Options

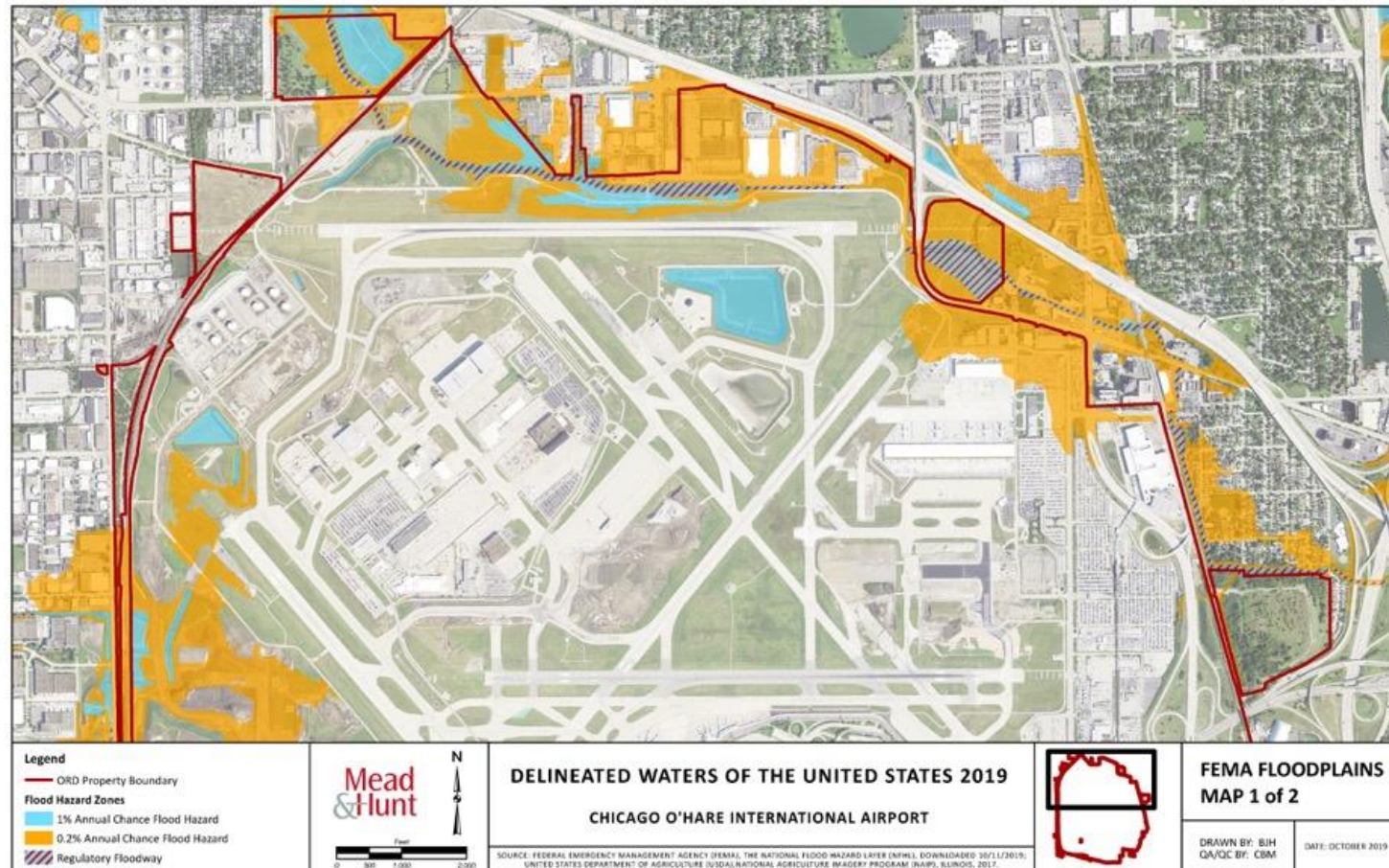
Aggregation Method: Percent Present

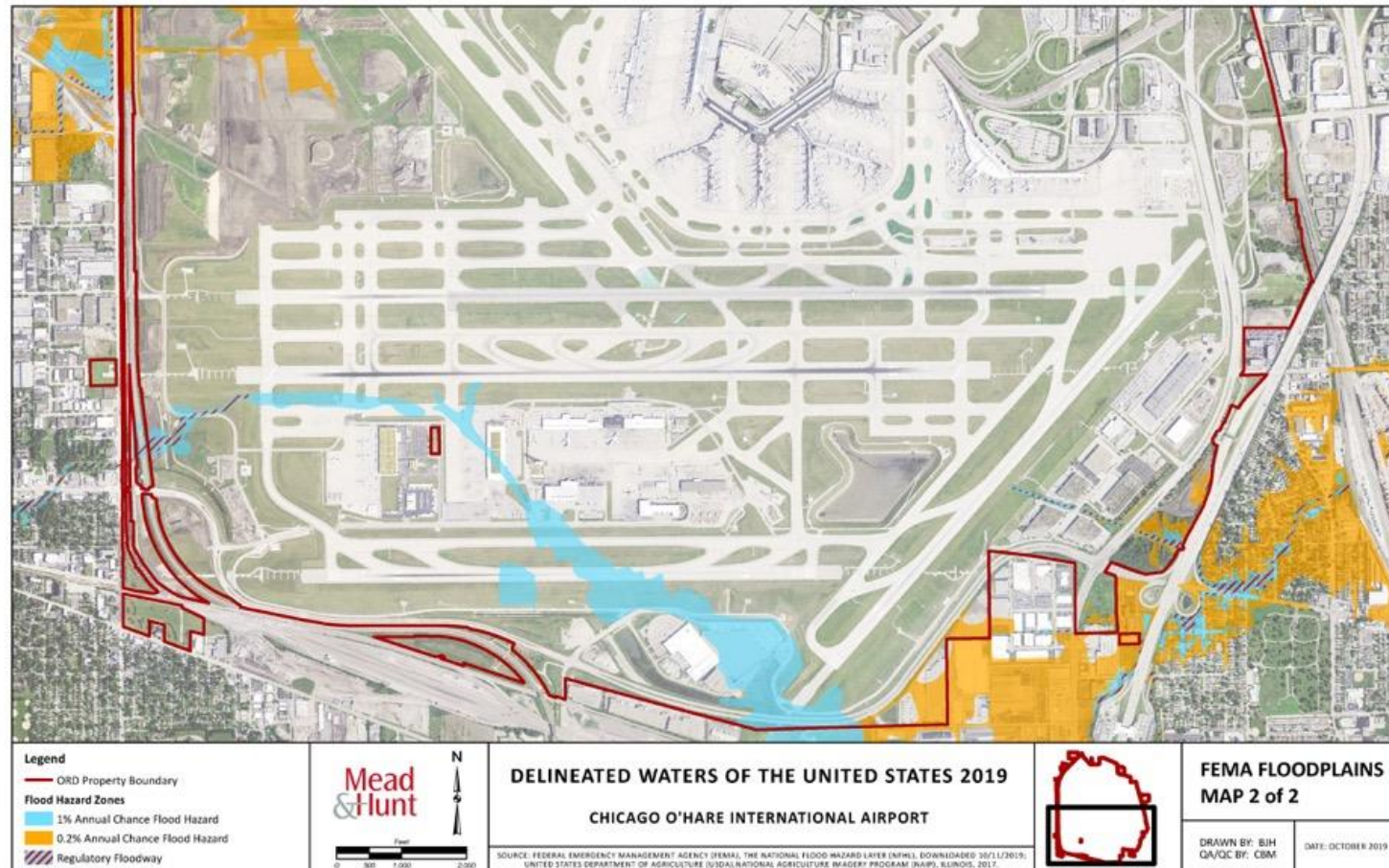
Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix C. National Wetland Inventory and FEMA Floodplain Mapping







Appendix D. WETS Analysis and Climatic Data

WETS Analysis Worksheet

Project Name: **Chicago O'Hare International Airport**
 Period Of Interest: April - June
 Station: **CHICAGO OHARE INTL AP, IL**
 County: Cook/DuPage
 Normals Period: 1971 - 2010

Long-term rainfall records

	Month	30% chance <	Normal	30% chance >
1st month prior:	June	2.42	3.63	4.35
2nd month prior:	May	2.36	3.55	4.25
3rd month prior:	April	2.45	3.52	4.19
Sum =			10.7	

Sum =

Site Determination

Site Rainfall (in)	Condition (Dry/Normal*/Wet)	Condition** Value	Month Weight	Product
6.02	Wet	3	3	9
8.25	Wet	3	2	6
3.05	Normal	1	1	1
Sum =			Sum***=	16

* Normal precipitation with 30% to 70% probability of occurrence

Determination: X Wet
 Dry
 Normal

** Condition value:

Dry = 1

Normal = 2

Wet = 3

***If sum is:

6 to 9 then period has been drier than normal

10 to 14 then period has been normal

15 to 18 then period has been wetter than normal

Precipitation data source:

<http://agacis.rcc-acis.org/>

Reference:

Donald E. Woodward, ed. 1997. *Hydrology Tools for Wetland Determination*, Chapter 19. Engineering Field Handbook. U.S. Department of Agriculture, Natural Resources Conservation Service, Fort Worth, TX.

WETS Table

WETS Station: CHICAGO OHARE INTL AP, IL													
Requested years: 1971 - 2010													
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall					
Jan	30.2	15.3	22.8	1.72	1.02	2.09	5	11.2					
Feb	34.6	19.4	27.0	1.69	1.02	2.04	4	8.1					
Mar	46.3	29.0	37.7	2.63	1.82	3.13	6	5.3					
Apr	58.9	38.6	48.7	3.52	2.45	4.19	7	1.4					
May	70.0	48.2	59.1	3.55	2.36	4.25	7	0.0					
Jun	79.7	58.0	68.8	3.63	2.42	4.35	6	0.0					
Jul	84.1	63.8	73.9	3.58	2.61	4.21	6	0.0					
Aug	82.0	62.9	72.4	4.83	2.89	5.86	7	0.0					
Sep	74.9	54.4	64.6	3.38	1.57	4.12	6	0.0					
Oct	62.5	42.7	52.6	2.80	1.79	3.38	5	0.2					
Nov	48.2	32.3	40.3	2.85	1.77	3.45	6	1.7					
Dec	34.8	20.6	27.7	2.44	1.54	2.95	5	8.9					
Annual:					33.17	39.58							
Average	58.9	40.4	49.6	-	-	-	-	-					
Total	-	-	-	36.62			70	36.8					
GROWING SEASON DATES													
Years with missing data:	24 deg = 0	28 deg = 0	32 deg = 0										
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0										
Data years used:	24 deg = 40	28 deg = 40	32 deg = 40										
Probability	24 F or higher	28 F or higher	32 F or higher										
50 percent *	3/31 to 11/11: 225 days	4/11 to 10/29: 201 days	4/24 to 10/13: 172 days										
70 percent *	3/26 to 11/16: 235 days	4/7 to 11/3: 210 days	4/19 to 10/18: 182 days										
* Percent chance of the growing season occurring between the Beginning and Ending dates.													
STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1958											1.85	0.72	2.57
1959	1.91	1.66	3.39	2.44	3.44	1.68	5.18	2.03	1.91	4.04	2.57	1.99	32.24
1960	3.07	2.70	1.17	3.02	2.46	4.06	4.27	3.46	1.39	1.33	0.81	0.46	28.20
1961	0.27	0.88	4.01	2.47	2.03	4.20	3.69	1.34	11.44	3.34	1.76	1.35	36.78
1962	2.39	1.18	1.33	1.14	3.38	2.13	5.27	1.62	1.50	0.89	0.71	0.23	21.77
1963	0.84	0.36	2.26	4.88	1.92	2.30	4.09	2.73	2.88	0.28	2.00	0.73	25.27
1964	0.72	0.52	3.45	5.22	2.26	2.86	4.23	1.95	3.95	0.16	2.90	1.51	29.73
1965	4.11	1.18	3.06	3.48	2.36	3.44	3.66	6.40	5.03	1.57	1.47	3.32	39.08
1966	1.09	1.75	2.64	6.28	4.77	2.95	2.19	1.00	0.	2.	4.	1.	32.

NOVEMBER 2022

									59	12	71	11	36
2001	1.12	2.57	1.30	2.82	3.34	2.61	2.96	12.25	6.05	8.54	1.22	0.99	45.77
2002	1.20	0.96	2.73	3.00	4.39	4.61	2.68	8.06	1.72	1.60	1.04	1.93	33.92
2003	0.36	0.19	1.82	4.33	5.29	1.46	4.50	4.19	1.72	1.88	4.46	1.82	32.02
2004	0.91	0.71	2.68	0.74	7.22	2.82	2.66	5.30	0.26	2.85	4.28	1.15	31.58
2005	4.00	2.19	1.48	1.53	1.99	0.76	1.95	2.47	2.66	1.39	2.31	1.36	24.09
2006	2.78	1.80	2.70	3.60	3.65	4.05	3.70	2.95	5.85	4.04	3.65	3.18	41.95
2007	1.72	1.61	3.66	3.49	1.80	2.29	3.86	9.70	1.23	1.69	1.26	3.49	35.80
2008	1.93	3.53	2.63	2.72	4.10	4.18	4.76	3.73	13.63	2.07	1.81	5.77	50.86
2009	1.16	3.39	5.20	5.19	3.63	7.18	1.53	4.26	1.03	6.04	1.23	2.73	42.57
2010	1.13	1.64	1.55	3.01	4.90	6.17	8.84	1.80	2.78	0.93	2.51	2.35	37.61
2011	0.92	3.52	2.62	4.90	7.27	3.39	11.15	4.54	3.45	1.98	3.44	2.65	49.83
2012	1.86	1.64	2.68	1.65	4.38	0.90	3.66	2.07	1.76	3.15	0.95	2.21	26.91
2013	3.63	2.96	2.00	8.68	4.96	6.23	2.22	1.69	2.57	3.12	2.09	1.94	42.09
2014	2.82	2.48	1.71	2.84	4.98	7.81	2.14	7.30	2.71	2.48	1.41	0.79	39.47
2015	1.41	1.45	1.10	2.87	4.66	7.12	2.85	2.16	4.64	2.23	4.49	4.87	39.85
2016	0.84	1.23	3.34	2.80	5.43	2.85	6.23	4.26	1.76	3.77	1.69	1.77	35.97
2017	2.87	1.52	4.01	6.43	3.28	3.44	7.68	2.51	0.32	8.70	1.75	0.59	43.10
2018	1.54	4.64	1.74	2.72	8.21	7.63	1.14	6.61	3.65	4.79	3.24	3.32	49.23
2019	1.96	2.81	2.09	6.02	8.25	3.05	3.94	3.63	7.61	6.76	1.87	1.55	49.54
2020	2.80	0.77	3.48	3.81	9.51	4.40	2.55	0.80	3.18	3.65	1.72	2.55	39.22
2021	1.95	1.25	M0.00										3.20
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2016-07-22													

Monthly Total Precipitation for CHICAGO OHARE INTL AP, IL

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	1.96	2.81	2.09	6.02	8.25	3.05	3.94	3.63	7.61	6.76	1.87	1.55	49.54
Mean	1.96	2.81	2.09	6.02	8.25	3.05	3.94	3.63	7.61	6.76	1.87	1.55	49.54

Appendix E. Excluded Areas



JULY 2019

[DRAFT]

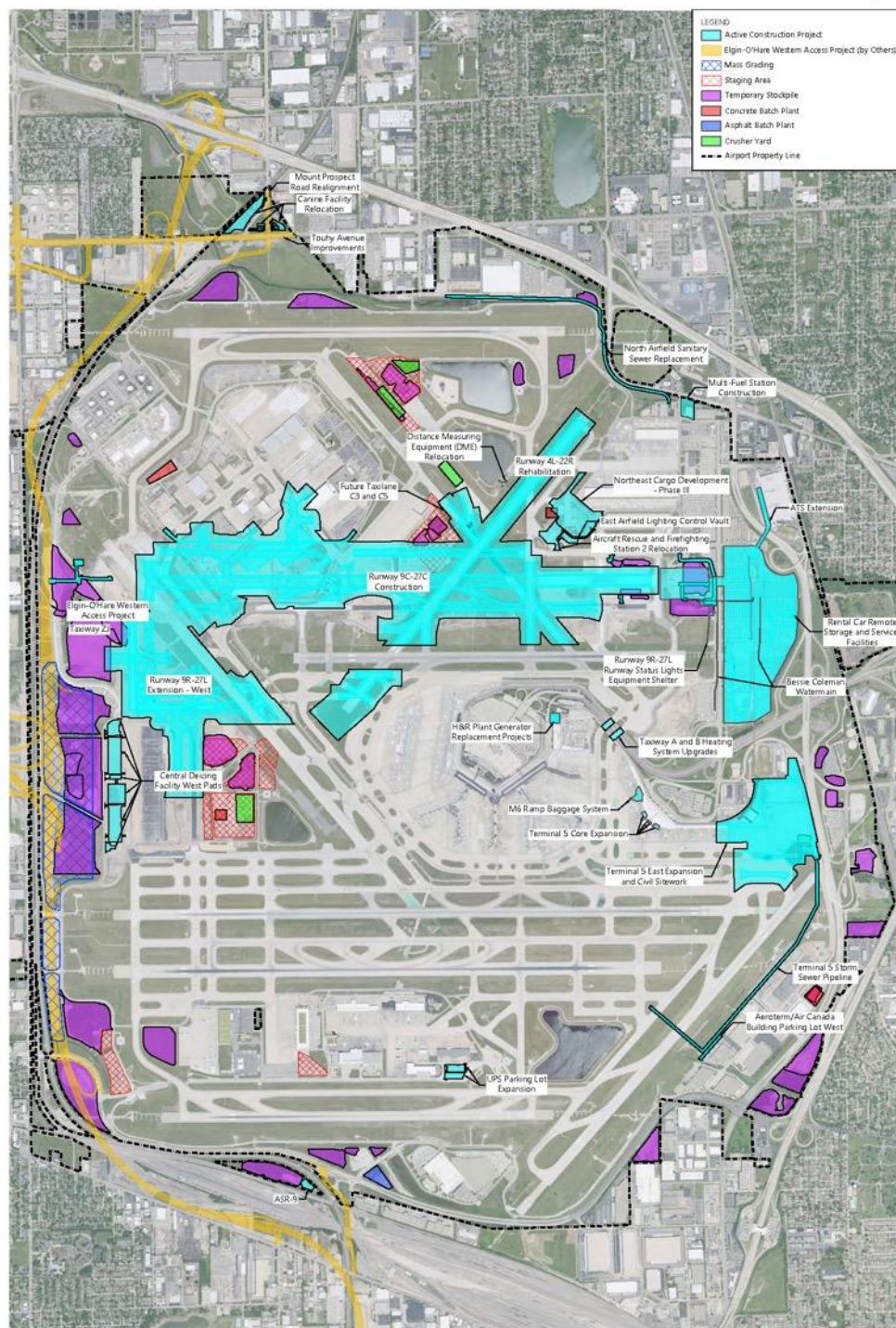


EXHIBIT 1



Drawing: P:\Project-Chicago\Chicago ORD VME Environmental\Terminal Area Plan (TAP)\Revised\CAI\2015 Active Construction Areas Map.dwg Layout: T1.dwg Plotted: Jul 10, 2015, 01:36PM

Chicago, IL
O'Hare International Airport

Wetlands Review
Anticipated 2019 Construction Activity Areas

Appendix F. List of Plants observed within the AOI

ORD Flora Reference List

	A	B	C	D	E	G
1	Code	Scientific Name (bold=common)	Common Name	Wetland Indicator	Habit	Invasive / Introduced
2	ABTH	<i>Abutilon theophrasti</i>	velvetleaf	FACU	forb	introduced
3	ACNE2	<i>Acer negundo</i>	ash-leaf maple	FAC	tree	
4	ACMI2	<i>Achillea millefolium</i>	common yarrow	FACU	forb	
5	AIAL	<i>Ailanthus altissima</i>	tree of heaven	FACU	tree	I/I
6	ALSU	<i>Alisma subcordatum</i>	American water plantain	OBL	forb	
7	ALSE2	<i>Alnus serrulata</i>	brookside alder	OBL	shrub	
8	AMAR2	<i>Ambrosia artemisiifolia</i>	annual ragweed	FACU	forb	
9	APCA	<i>Apocynum cannabinum</i>	Indian hemp	FAC	forb	
10	AROL	<i>Aristida oligantha</i>	prairie threeawn	UPL	graminoid	
11	ASIN	<i>Asclepias incarnata</i>	swamp milkweed	OBL	forb	
12	ASSY	<i>Asclepias syriaca</i>	common milkweed	UPL	forb	
13	ASVE	<i>Asclepias verticillata</i>	whorled milkweed	FACU	forb	
14	ASOF	<i>Asparagus officinalis</i>	asparagus	FACU	forb	
15	ATPA4	<i>Atriplex patula</i>	halberd-leaf orache	FACW	forb	
16	BIBI7	<i>Bidens bipinnata</i>	Spanish-needles	FAC	forb	
17	BOCU	<i>Bouteloua curtipendula</i>	sideoats grama	N/A	graminoid	
18	BODA2	<i>Bouteloua dactyloides</i>	buffalo grass	FACU	graminoid	
19	BROMU	<i>Bromus sp.</i>	brome grass		graminoid	
20	CAGR3	<i>Carex granularis</i>	limestone-meadow sedge	FACW	graminoid	
21	CAST5	<i>Carex stipata</i>	stalk-grain sedge	OBL	graminoid	
22	CAVU2	<i>Carex vulpinoidea</i>	common fox sedge	FACW	graminoid	
23	CEOC	<i>Celtis occidentalis</i>	common hackberry	FAC	tree	
24	CESTM	<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	spotted knapweed	N/A	forb	
25	CEPU3	<i>Centaurea pulchellum</i>	branched centaury	FACU	forb	
26	CHAL7	<i>Chenopodium album</i>	lamb's-quarters	FACU	forb	introduced
27	CIIN	<i>Cichorium intybus</i>	chicory	FACU	forb	introduced
28	CIAR4	<i>Cirsium arvense</i>	Canadian thistle	FACU	forb	
29	CIVU	<i>Cirsium vulgare</i>	bull thistle	FACU	forb	
30	COAR4	<i>Convolvulus arvensis</i>	field bindweed	N/A	vine	I/I
31	COCA5	<i>Conyza canadensis</i>	Canada horsweed	N/A	forb	
32	COLA5	<i>Coreopsis lanceolata</i>	lance-leaf tickseed	FACU	forb	
33	COSE16	<i>Cornus alba</i>	red osier	FACW	shrub	
34	CUSCU	<i>Cuscuta sp.</i>	dodder		forb	
35	CYES	<i>Cyperus esculentus</i>	chufa	FACW	graminoid	
36	DACA6	<i>Daucus carota</i>	queen Anne's-lace	UPL	forb	I/I
37	DEIL	<i>Desmanthus illinoensis</i>	prairie bundle-flower	FACU	forb	
38	DIOL	<i>Dichanthelium oligosanthos</i>	Heller's rosette grass	FACU	graminoid	
39	DICI	<i>Digitaria ciliaris</i>	southern crab grass	FACU	graminoid	
40	DICO6	<i>Digitaria cognata</i>	fall witch grass	N/A	graminoid	
41	LEFU21	<i>Diplachne fusca</i>	Bearded Sprangletop	OBL	graminoid	
42	DIFU2	<i>Dipsacus fullonum</i>	Fuller's teasel	FACU	forb	I/I
43	DILA4	<i>Dipsacus laciniatus</i>	cut-leaf teasel	UPL	forb	I/I
44	ECPU	<i>Echinacea purpurea</i>	purple coneflower	N/A	forb	
45	ECCR	<i>Echinochloa crus-galli</i>	large barnyard grass	FACW	graminoid	
46	ELAN	<i>Elaeagnus angustifolia</i>	Russian-olive	FACU	tree	I/I
47	ELOB2	<i>Eleocharis obtusa</i>	blunt spike-rush	OBL	graminoid	
48	ELPA3	<i>Eleocharis palustris</i>	common spike-rush	OBL	graminoid	
49	ELTE	<i>Eleocharis tenuis</i>	slender spike-rush	FACW	graminoid	
50	ELVI3	<i>Elymus virginicus</i>	Virginia wild rye	FACW	graminoid	
51	EPCO	<i>Epilobium coloratum</i>	purple-leaf willow herb	OBL	forb	
52	ERPH	<i>Erigeron philadelphicus</i>	Philadelphia fleabane	FACW	forb	

ORD Flora Reference List

	A	B	C	D	E	G
1	Code	Scientific Name (bold=common)	Common Name	Wetland Indicator	Habit	Invasive / Introduced
53	EUAL3	<i>Eupatorium altissimum</i>	tall thoroughwort	FACU	forb	
54	EUSE2	<i>Eupatorium serotinum</i>	late-flowering thoroughwort	FAC	forb	
55	EUGR5	<i>Euthamia graminifolia</i>	flat-top goldentop	FACW	forb	
56	FRV1	<i>Fragaria virginiana</i>	Virginia strawberry	FACU	forb	
57	FRAM2	<i>Fraxinus americana</i>	white ash	FACU	tree	
58	FRPE	<i>Fraxinus pennsylvanica</i>	green ash	FACW	tree	
59	GECA7	<i>Geum canadense</i>	white avens	FAC	forb	
60	GLHE2	<i>Glechoma hederaceae</i>	groundivy	FACU	ground cover	
61	GLTR	<i>Gleditsia triacanthos</i>	honey-locust	FACU	tree	
62	GLST	<i>Glyceria striata</i>	fowl manna grass	OBL	graminoid	
63	HEAN3	<i>Helianthus annuus</i>	common sunflower	FACU	forb	
64	HEMA2	<i>Helianthus maximiliani</i>	Maximilian's sunflower	UPL	forb	
65	HIGR3	<i>Hieracium gronovii</i>	queendevil	UPL	forb	
66	HOJU	<i>Hordeum jubatum</i>	fox-tail barley	FAC	graminoid	
67	IVAN	<i>Iva annua</i>	annual marsh-elder	FAC	forb	
68	JUNI	<i>Juglans nigra</i>	black walnut	FACU	tree	
69	JUCA3	<i>Juncus canadensis</i>	Canadian rush	OBL	graminoid	
70	JUDU2	<i>Juncus dudleyi</i>	Dudley's rush	FACW	graminoid	
71	JUNO2	<i>Juncus nodosus</i>	knotted rush	OBL	graminoid	
72	JUTE	<i>Juncus tenuis</i>	lesser poverty rush	FAC	graminoid	
73	JUTO	<i>Juncus torreyi</i>	Torrey's rush	FACW	graminoid	
74	JUVI	<i>Juniperus virginiana</i>	eastern red-cedar	FACU	tree	
75	LACA	<i>Lactuca canadensis</i>	Canadian blue lettuce	FACU	forb	
76	LEMI3	<i>Lemna minor</i>	common duckweed	OBL	forb	
77	LEVI3	<i>Lepidium virginicum</i>	poorman's-pepperwort	FACU	forb	
78	LEVU	<i>Leucanthemum vulgare</i>	ox-eye daisy	UPL	forb	I/I
79	LOPE	<i>Lolium perenne</i>	perennial rye grass	FACU	graminoid	introduced
80	LOCO6	<i>Lotus corniculatus</i>	garden bird's-foot trefoil	FACU	forb	
81	LYAM	<i>Lycopus americanus</i>	cut-leaf water horehound	OBL	forb	
82	LYSA2	<i>Lythrum salicaria</i>	purple loosestrife	OBL	forb	I/I
83	MELU	<i>Medicago lupulina</i>	black medick	FACU	forb	introduced
84	MEOF	<i>Melilotus officinalis</i>	yellow sweet-clover	FACU	forb	I/I
85	MOAL	<i>Morus alba</i>	white mulberry	FAC	tree	I/I
86	MORU2	<i>Morus rubra</i>	red mulberry	FACU	tree	
87	NECA2	<i>Nepeta cataria</i>	catnip	FACU	forb	introduced
88	PAQUH	<i>Parthenocissus quinquefolia</i>	Virginia-creeper	FACU	vine	
89	PASA2	<i>Pastinaca sativa</i>	wild parsnip	N/A	forb	I/I
90	POLA4	<i>Persicaria lapathifolia</i>	dockleaf smartweed	FACW	forb	
91	POPE3	<i>Persicaria maculosa</i>	Spotted Lady's-Thumb	FACW	forb	introduced
92	POPE2	<i>Persicaria pennsylvanica</i>	Pennsylvania smartweed	FACW	forb	
93	PHAR3	<i>Phalaris arundinacea</i>	reed canary grass	FACW	graminoid	I/I
94	PHAU7	<i>Phragmites australis</i>	common reed	FACW	graminoid	I/I
95	PHAN5	<i>Physalis angulata</i>	cutleaf groundcherry	FAC	forb	
96	PLLA	<i>Plantago lanceolata</i>	English plantain	FACU	forb	introduced
97	PLMA2	<i>Plantago major</i>	common plantain	FAC	forb	introduced
98	POPA2	<i>Poa palustris</i>	fowl blue grass	FACW	graminoid	
99	POPR	<i>Poa pratensis</i>	Kentucky blue grass	FACW	graminoid	
100	PODE3	<i>Populus deltoides</i>	eastern cottonwood	FAC	tree	
101	POTAM	<i>Potamogeton</i> sp.	pondweed		aquatic	introduced
102	PRVU	<i>Prunella vulgaris</i>	common selfheal	FAC	forb	
103	RAPI	<i>Ratibida pinnata</i>	pinnate prairie coneflower	N/A	forb	

ORD Flora Reference List

	A	B	C	D	E	G
1	Code	Scientific Name (bold=common)	Common Name	Wetland Indicator	Habit	Invasive / Introduced
104	RHCA3	<i>Rhamnus cathartica</i>	European buckthorn	FAC	shrub/tree	I/I
105	RHGL	<i>Rhus glabra</i>	smooth sumac	N/A	shrub	
106	RHTY	<i>Rhus typhina</i>	staghorn sumac	N/A	shrub	
107	ROPS	<i>Robinia pseudoacacia</i>	black locust	FACU	tree	
108	ROSA5	<i>Rosa</i> sp.	rose		shrub	
109	RUH12	<i>Rudbeckia hirta</i>	black-eyed Susan	FACU	forb	
110	RUCR	<i>Rumex crispus</i>	curly dock	FAC	forb	introduced
111	SACU	<i>Sagittaria cuneata</i>	arum-leaf arrowhead	OBL	forb	
112	SAIN3	<i>Salix interior</i>	sandbar willow	FACW	shrub	
113	SANI	<i>Salix nigra</i>	black willow	OBL	tree	
114	SANIC4	<i>Sambucus nigra</i>	black elder	FAC	shrub	introduced
115	SCAR7	<i>Schedonorus arundinaceus</i>	tall false rye grass	FACU	graminoid	introduced
116	SCPR4	<i>Schedonorus pratensis</i>	meadow false rye grass	FACU	graminoid	introduced
117	SCSC	<i>Schizachyrium scoparium</i>	little bluestem	FACU	graminoid	
118	BOFL3	<i>Schoenoplectus fluviatilis</i>	river club-rush	OBL	graminoid	
119	SCPU10	<i>Schoenoplectus pungens</i>	three-square	OBL	graminoid	
120	SCTA2	<i>Schoenoplectus tabernaemontani</i>	soft-stem club-rush	OBL	graminoid	
121	SCCY	<i>Scirpus cyperinus</i>	cottongrass bulrush	OBL	graminoid	
122	SCPE4	<i>Scirpus pendulus</i>	rufous bulrush	OBL	graminoid	
123		<i>Securigera varia</i>	crown vetch	UPL	forb	I/I
124	SERU	<i>Selaginella rupestris</i>	northern selaginella	N/A	ground cover	
125	SEPUP2	<i>Setaria pumila</i>	yellow bristle grass	FAC	graminoid	introduced
126	SILAA3	<i>Silene latifolia</i> ssp. <i>alba</i>	bladder campion	N/A	forb	introduced
127	SIOF	<i>Sisymbrium officinale</i>	hedgemustard	UPL	forb	introduced
128	SOCA3	<i>Solanum carolinense</i>	Carolina horsenettle	FACU	forb	
129	SODU	<i>Solanum dulcamara</i>	climbing nightshade	FAC	forb	introduced
130	SOAL6	<i>Solidago altissima</i>	late goldenrod	FACU	forb	
131	SOCA6	<i>Solidago canadensis</i>	Canadian goldenrod	FACU	forb	
132	SOG1	<i>Solidago gigantea</i>	Late goldenrod	FACW	forb	
133	SONE	<i>Solidago nemoralis</i>	gray goldenrod	N/A	forb	
134	OLRIG	<i>Solidago rigida</i>	hard-leaf flat-top goldenrod	FACU	forb	
135	SOSE	<i>Solidago sempervirens</i>	seaside goldenrod	FACW	forb	I/I
136	SPVA	<i>Sporobolus vaginiflorus</i>	poverty dropseed	N/A	graminoid	
137	SUCA2	<i>Suaeda calceoliformis</i>	Paiuteweed	FACW	forb	
138	SYER	<i>Symphiotrichum ericoides</i>	white heath American-aster	FACU	forb	
139	TAOFC	<i>Taraxacum officinale</i>	common dandelion	FACU	forb	introduced
140	TECA3	<i>Teucrium canadense</i>	American germander	FACW	forb	
141	TORA2	<i>Toxicodendron radicans</i>	eastern poison ivy	FAC	vine	
142	TRPR2	<i>Trifolium pratense</i>	red clover	FACU	forb	introduced
143	TRRE3	<i>Trifolium repens</i>	white clover	FACU	forb	I/I
144	TYAN	<i>Typha angustifolia</i>	narrow-leaf cattail	OBL	forb	
145	TYLA	<i>Typha latifolia</i>	broadleaf cattail	OBL	forb	
146	ULAM	<i>Ulmus americana</i>	American elm	FACW	tree	
147	ULPU	<i>Ulmus pumila</i>	Siberian elm	UPL	tree	introduced
148	VEHA2	<i>Verbena hastata</i>	swamp verbena	FACW	forb	
149	VEST	<i>Verbena stricta</i>	hoary verbena	N/A	forb	
150	VIRI	<i>Vitis riparia</i>	river-bank grape	FACW	vine	

Appendix G. Delineated Waters of the US Maps

