Water Resources Delineation Report

80.8 Acres, Pinecrest Road
Orange, Ohio

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Executive Summary

The 80.8-acre site is located east of Orange Place, south of Chagrin Boulevard, west of Maplecrest Road, is bordered on the south by Harvard Road, and is bisected north to south by Pinecrest Road and Walnut Hills Avenue. This site is within the village of Orange, Cuyahoga County, Ohio. A water resources delineation was performed by Judith Mitchell on August 6 and August 15, 2913.

The study area contains residential development, commercial development, upland woods, shrub thickets, mowed grass, emergent wetlands, scrub/shrub wetlands, and forested wetlands. A map showing the location and size of the water resources identified on the property is shown in Appendix A. A map showing general plant communities found on the site is in Appendix B. Ten wetlands totaling 4.302 acres are found within the study area (Table 1). Three intermittent streams with a total length of 1,339 feet were found on the site. Three ephemeral streams with a combined length of 340 linear feet also flow through the site (Table 2). The wetlands rated between Category 1 and 2 using the Ohio Rapid Assessment Method (ORAM) form.

Table 1. Wetlands Delineated on the Site

Wetlands	Cover Type	Connectivity to Waters of the US[1]	Area (Acres)	ORAM Score	ORAM Category
A	Forested	Isolated	0.026	34	1 or 2
B	Emergent	Non-isolated	0.141	31	1 or 2
C	Emergent	Non-isolated	0.043	45.5	2
D	Emergent	Isolated	0.002	37	Modified 2
E	Emergent	Non-isolated	0.019	26	1
F	Emergent, scrub/shrub, forest	Non-isolated	1.988	41.5	Modified 2
G	Emergent, scrub/shrub, forest	Non-isolated	1.561	43	Modified 2
H	Emergent, forest	Non-isolated	0.388	48	2
I	Emergent	Isolated	0.009	24	1
J	Scrub/shrub	Isolated	0.125	23.5	1
Total			4.302		

[1] The final determination of a wetlands' connectivity to Waters of the US is made by the US Army Corps of Engineers.

Table 2. Drainageways Delineated on the Site

Stream	Type	Length (Linear Feet)	Average Bankfull Width (Feet)
1	intermittent	386	5
2	intermittent	235	4
3	ephemeral	40	2
4	ephemeral	61	1
5	intermittent	718	4
6	ephemeral	239	3
Total		1,679	

Introduction

Study Area Description and Location

The 80.8-acre site is located in Orange, Cuyahoga County, Ohio (Appendix C). The property is east of Orange Place, south of Chagrin Boulevard, west of Maplecrest Road, is bordered on the south by Harvard Road, and is bisected north to south by Pinecrest Road and Walnut Hills Avenue (Appendix D).

The study area is developed with single-family homes and a small area of commercial development. The property contains a motel, houses, driveways, upland woods, shrub thickets, mowed grass, emergent wetlands, scrub/shrub wetlands, and forested wetlands. Pinecrest Road and Walnut Hills Avenue bisect the property north to south.

All drainage on the site is to the east. Two small ephemeral streams, Streams 3 and 4, drain to the east into wetland areas. A third ephemeral stream, Stream 6, drains from Wetland H, draining east and emptying into a stormwater pipe on the west edge of Pinecrest Road. Two intermittent streams, Streams 1 and 5, originate at outlet pipes and drain east through the study area. A third intermittent stream originates off site, along the eastern property line, flowing north to join with Stream 1. Streams 1 and 5 join together off site, and continue to flow east into Willey Creek. Willey Creek flows south and east, eventually entering the Chagrin River to the east. The Chagrin River has a watershed area of 264 square miles and empties into Lake Erie at Eastlake.

Secondary Source Information

The property is shown on the Chagrin Falls Quadrangle of the United States Geological Survey (USGS) map (Appendix F). Elevations range from approximately 1,154 to 1,166 feet across the site.

The National Wetlands Inventory (NWI) map (Chagrin Falls Quadrangle) is in Appendix G. There are no NWI wetlands mapped on the site.

A map from the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey showing the soil types located on and adjacent to the site is found in Appendix H. Table 3 provides a list of soil types mapped for the site.

Table 3. Soil Types Mapped for the Site

Map Unit	Soil Description
DkF	Dekalb-loudonville complex, 25 to 70 percent slopes
LuC	Loudonville-urban land complex, rolling, 6 to 12 percent slopes
MgA	Mahoning silt loam, 0 to 2 percent slopes[1]
MgB	Mahoning silt loam, 2 to 6 percent slopes
MmB	Mahoning-urban land complex, undulating, 2 to 6 percent slopes[1]
Ub	Urban land

[1]Non-hydric soil with hydric inclusions

Methodology

The Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (U.S. Army Corps of Engineers, 2012) were used in delineating wetlands within the study area. A water resource determination was performed on January 16, 2013 by Rosty Caryk. The water resources were delineated and surveyed on August 6 and August 15, 2013. The water resources delineation fieldwork, boundary mapping, and data analysis were performed by Judith Mitchell. Ken Christensen prepared the vegetation, soils, and wetlands maps using AutoCAD® Map 2012 software. Shawn Bruzda prepared the maps included in Appendices C–H using ArcGIS® v.9.3. Kim Klosterman provided technical oversight and quality control.

Streams are identified as linear, flowing water features with a defined bed and bank. Streams are classified as ephemeral, intermittent, or perennial based upon flow regime. Ephemeral streams have flowing water only during, and for a short duration after, precipitation events. Intermittent streams have flowing water during certain times of the year, when groundwater and rainfall provide water for stream flow. During dry periods, intermittent streams may not have flowing water. Perennial streams have flowing water year-round, receiving water from groundwater and rainfall runoff.

Wetlands are identified based on three criteria: vegetation, soils, and hydrology. An area must meet all three criteria to be considered a jurisdictional wetland. Twelve sampling points were established in the field to determine wetlands boundaries. Data sheets reporting the results of soils, vegetation, and hydrology analyses were completed for each sample station and are located in Appendix K.

Soil samples were obtained to determine the extent of hydric soils on the site. A standard Munsell soil color chart was used to determine the hue, value, and chroma of each soil sample. Soil samples were taken to a depth to adequately make a hydric soil determination. Criteria established by the National Technical Committee for Hydric Soils (1991) were used to determine hydric soils.

Wetland hydrology was characterized during this water resources delineation. Inundation and/or soil saturation were noted for each sample point. Other hydrological indicators, including watermarks, drift lines, sediment deposits, wetlands drainage patterns, blackened leaves, morphological indicators, iron/manganese concretions, and oxidized root zones within the upper soil layers, were documented, if observed.

Quantitative vegetation data were collected at each sampling point. Dominance was estimated by percent areal cover. Four strata were considered for each sample point—trees, saplings/shrubs, herbs, and woody vines. Trees were defined as any woody plant having a diameter at breast height (DBH) greater than 3.0 inches. Saplings and shrubs were those woody plants with a DBH of less than 3.0 inches and greater than 3.2 feet in height. For each stratum, plant species within a plot were identified and percent areal cover was estimated for each species. Thirty-foot-radius plots were used for trees and vines; 15-foot-radius plots were used for saplings and shrubs; and 5-foot-radius plots were used for herbs.

Any species within a stratum comprising 20% or more of the total plot areal cover was considered to be dominant. Dominant species within all strata were then added to determine the percentage of wetlands vegetation for each sample point. The wetlands vegetation criterion was met if greater than 50% of the dominant vegetation was indicative of wetlands conditions.

Species identifications were based on Braun (1989) and Newcomb (1977). Lichvar (2013) was used to assign indicator statuses to each identified species. Plants with an indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) were considered to be indicative of wetlands conditions. Plants with an indicator status of facultative upland (FACU) or upland (UPL) were considered to be indicative of upland conditions. Plants that could only be identified to genus were sometimes assigned an indicator status based on the professional judgment of Davey Resource Group. These plants were classified as wetlands indicator species (WIS) or upland indicator species (UIS). See Appendix I for a more detailed explanation of wetlands vegetation indicator statuses.

Survey flags were placed at necessary points around each wetland to accurately depict the wetland upland boundary. The location of each flag was surveyed using a GeoXH™ Trimble® GeoExplorer® 6000 series Dual-frequency Global Navigation Satellite System or GNSS (GPS, GLONASS, SBAS [WAAS]) receiver and antenna with Everest™ multipath rejection technology and Floodlight technology with 220 channels, running professional TerraSync™ software capable of decimeter (10–75cm) accuracy after differential correction.

Trimble® GPS Pathfinder® Office software was used for postprocessing the GNSS field collected data incorporating Trimble® DeltaPhase™ differential correction technology using GPS data collected from an appropriate base station. The corrected GPS latitude-longitude positions were exported into a compatible coordinate system as an AutoCAD® drawing interchange file (DXF). The vegetation, soils, and wetlands maps included in this report were prepared using AutoCAD Map® 2012 software.

Wetlands that are hydrologically connected to other traditional navigable waters of the United States are considered non-isolated and fall under the federal jurisdiction of the US Army Corps of Engineers (USACE). All hydrologically isolated wetlands that lack connectivity to other surface waters are regulated by Ohio Environmental Protection Agency (EPA).

Ohio Rapid Assessment Method (ORAM) forms (Version 5.0) were completed for each wetland (Appendix L). The Field Form Quantitative Rating ORAM sheets are included for each wetland. The ORAM evaluates the ecological quality of wetlands using a scoring form containing multiple questions. Wetlands are classified into categories as shown in Table 4. As part of the ORAM process, a review of the Ohio Biodiversity database was initiated to determine if any rare, threatened, or endangered species are located within or near the project area. Results of the database search will be presented as they become available.

Table 4. ORAM Scoring Breakpoints for Wetland Regulatory Categories

ORAM Score	Wetland Category
0-29.9	1
30-34.9	1 or 2 gray zone
35-44.9	Modified 2
45-59.9	2
60-64.9	2 or 3
65-100	3

Results

Vegetation

A map showing the locations of vegetative communities present on the property is in Appendix B. Following is a discussion of these communities. Photographs showing water resources and the associated plant communities are included in Appendix J.

Upland Woods. Areas of upland woods are found on the back of home lots. Common species include *Acer rubrum* (red maple, FAC), *A. saccharum* (sugar maple, FACU), *Fagus grandifolia* (American beech, FACU), *Fraxinus americana* (white ash, FACU), *Lindera benzoin* (spicebush, FACW), *Quercus rubra* (red oak, FACU), *Rosa multiflora* (multiflora rose, FACU), *Rubus allegheniensis* (Allegheny blackberry, FACU), and *Toxicodendron radicans* (poison ivy, FAC).

Shrub Thickets. Small areas of dense shrubs are associated with forested areas. These areas contain *Fraxinus pennsylvanica* (green ash, FACW), *Lonicera japonica* (Japanese honeysuckle, FACU), *Rosa multiflora* (multiflora rose, FACU), *Rubus allegheniensis* (Allegheny blackberry, FACU), and *Ulmus americana* (American elm, FACW).

Mowed grass. The property around home sites is regularly mowed. Common species growing in these areas include *Aster* spp. (asters), *Dactylis glomerata* (orchard grass, FACU), *Festuca* spp. (fescues), *Phleum pratense* (timothy, FACU), *Plantago lanceolata* (English plantain, UPL), *Solidago canadensis* (Canada goldenrod, FACU), and *Taraxacum officinale* (common dandelion, FACU).

Emergent Wetlands. Wetlands B–E and I have emergent vegetation; Wetlands F and G have portions of emergent vegetation. Observed in these areas were *Carex* spp. (sedge species), *Juncus effusus* (soft rush, OBL), *Onoclea sensibilis* (sensitive fern, FACW), *Phragmites australis* (tall reed grass, FACW), and *Solidago* spp. (goldenrod species).

Scrub/Shrub Wetlands. Wetland J and small areas of Wetlands of F and G have scrub/shrub vegetation. Growing in these areas are *Alnus frangula* (glossy buckthorn, FAC), *Cornus amomum* (silky dogwood, FACW), *Glyceria striata* (fowl manna grass, OBL), and *Viburnum recognitum* (northern arrow-wood, FAC).

Forested Wetlands. Wetland A and areas of Wetlands F–H are forested. These areas have *Acer rubrum* (red maple, FAC), *Toxicodendron radicans* (poison ivy, FAC), and *Ulmus americana* (American elm, FACW) growing within them.

Soils

Although located within a residential development, the majority of the soils within the study area do not appear disturbed and generally match what is mapped on the soil survey. Although the wetlands are located in areas not mapped as hydric, these water resources are generally associated with streams or bottom of slopes. The soils within the wetlands meet the depleted matrix (F3) hydric soil indicator.

Hydrology

Wetland hydrology indicators observed in the wetlands include saturated soils, water-stained leaves, sediment deposits, and wetland drainage patterns.

Roof outlets, yard drains, and yard runoff provide hydrology to many of the wetlands on this site.

Wetland A is a small, concave depression and receives hydrology from surface runoff. No drainage out of this depression and no connection to other water resources were observed.

Wetland B receives hydrology from a small ephemeral stream, a groundwater seep, and surface runoff. This wetland drains east to Stream 2, a relatively permanent water (RPW).

The hydrology for Wetland C is primarily from surface runoff. This wetland drains east off site and drains into an unnamed tributary of Stream 1, a RPW.

Wetland D receives hydrology from a small yard drainage ditch. No drainage to or connectivity to other water resources was found.

Wetland E receives hydrology from a small ephemeral stream and surface runoff. This stream drains off site to an unnamed tributary of Stream 5, a RPW.

Yard runoff is the primary source of hydrology for Wetland F. This wetland drains east off site to an unnamed tributary of Stream 5.

The hydrology for a portion of Wetland G is provided by Stream 5. The hydrology for the remainder of the on-site portion of this wetland is primarily from sheetflow. Off site, the wetland receives stormwater input.

Wetland H receives hydrology from surface flow. This wetland empties into an ephemeral stream which empties into a storm pipe. This storm system drains into Stream 5.

Wetlands I and J are drainage swales along property boundaries, receiving hydrology from yard runoff. No connection to other water resources was observed.

Streams 1 and 5, both RPWs, join together just to the east of the study site, and continue to flow east into Willey Creek which empties into the Chagrin River. The Chagrin River is a traditional navigable water (TNW). Because of the connection to this TNW, Wetlands B, C, and E–H are considered non-isolated and are under the jurisdiction of the USACE.

Wetland A, I, and J are small depressional wetlands. Wetland D is fed by a small yard drainage ditch but does not drain elsewhere. No connection to other water resources was found for these four wetlands. Because of this lack of connectivity, these wetlands are isolated and are regulated by the Ohio EPA.

Conclusions

A map showing the location and size of the water resources identified on the property is shown in Appendix B. Ten wetlands totaling 4.302 acres are found within the study area. There are 1,339 linear feet of intermittent stream and 340 linear feet of ephemeral stream on the site.

Davey Resource Group is confident that all jurisdictional wetlands and drainageways were identified on this site. No unusual or problem areas were found. All water resource studies conducted by Davey Resource Group are objective and based strictly on professional judgment. Davey Resource Group and its employees have no vested interest in this property or the proposed project. Appendix M contains references used in the creation of this report, and Appendix N provides profiles of all Davey Resource Group personnel who contributed to this report.

All wetlands delineations must be verified by the US Army Corps of Engineers to be considered official. This wetlands delineation is reflective of environmental conditions at the time the fieldwork was performed. Wetlands are dynamic natural systems; therefore, boundaries may change slightly over time.

Definition of Wetlands Vegetation Indicator Status (from Lichvar, 2013)

Obligate Wetlands (OBL). Almost always is a hydrophyte, rarely in uplands.

Facultative Wetlands (FACW). Usually is a hydrophyte but occasionally found in uplands.

Facultative (FAC). Commonly occurs as either a hydrophyte or non-hydrophyte.

Facultative Upland (FACU). Occasionally is a hydrophyte but usually occurs in uplands.

Obligate Upland (UPL). Rarely is a hydrophyte, almost always in uplands.

Species for which little or no information was available to base an indicator status were assigned a no indicator (NI) status. An asterisk (*) after the indicator status indicates that the indicator status was based on limited ecological information.

The wetlands indicator categories should not be equated to degrees of wetness. Many obligate wetlands species occur in permanently or semi-permanently flooded wetlands, but a number of obligates also occur, and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands), to species in which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semi-permanently flooded wetlands.

Davey Resource Group has added two additional indicators for situations when plants can only be identified to genus. A Wetlands Indicator Species (WIS) is a plant that is most likely obligate wetlands, facultative wetlands, or facultative. An Upland Indicator Species (UIS) is a plant that is most likely indicative of upland or facultative upland conditions. These additional indicators are used when species identification is not possible. A variety of factors are part of the UIS and WIS assignments. Indicator statuses of all locally occurring members of the genus in question are considered, as are the health and size of the population and the indicator status of nearby plants.

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