

AK Steel Corporation
MIDDLETOWN WORKS
1801 CRAWFORD STREET
MIDDLETOWN, OHIO 45044-4572

July 6, 2016

Ms. Tiffani Kavalec
Chief, Division of Surface Water
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, OH 43216-1049

OHIO EPA - DSW

2016 JUL -8 PM 1:19

Dear Ms. Kavalec:

Re: Request to Modify the Agricultural Water Supply Use Designation
for a Segment of the Main Stem of Dicks Creek (Butler County)

Attached are two copies of a request by AK Steel Corporation (AK Steel) for Ohio EPA to modify the Agricultural Water Supply use designation for a four mile segment of the main stem of Dicks Creek in Butler County.



In summary, the proposed modification for this limited segment of Dicks Creek would maintain Agricultural Water Supply irrigation uses, remove livestock watering uses and would provide for hardness-based fluoride water quality criteria derived by Ohio EPA. The new fluoride water quality criteria would be protective of aquatic life and allow for possible future irrigation uses of Dicks Creek, should they occur. We believe this request meets Ohio and federal regulatory requirements for modifying use designations.

We understand that it will likely take some time to process this request that will include Ohio EPA and U.S. EPA review and a public notice and comment period. The NPDES permit for the AK Steel Middletown Works is up for renewal and this proposed modification of the Agricultural Water Supply use designation would have a bearing on the renewal NPDES permit. The current permit contains preliminary effluent limits (PELs) for fluoride for certain AK Steel outfalls that discharge to Dicks Creek. If the renewal NPDES permit is issued in the near term, we request the renewal permit maintain the status quo with respect to the fluoride PELs. This would provide an opportunity for Ohio EPA to consider this request and take appropriate actions. In any event, we hope that this proposed modification can be completed within six months, or by the end of 2016.

We appreciate the cooperation by the Standards and Technical Support Section provided thus far. If you or your staff require additional information, please contact me at 513-425-2480, or by e-mail at pat.gallo@aksteel.com.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Pat Gallo'.

Pat Gallo

Sr. Environmental Affairs Manager
AK Steel Corporation

Enclosures

cc: Daniel Dudley, Ohio EPA
Division of Surface Water

Gary Amendola
Amendola Engineering, Inc.



**Request to Modify Agricultural Water Supply
Use Designation
Main Stem Dicks Creek (RM 4.15 to RM 0.00)**

**AK Steel Corporation
Middletown Works
NPDES Permit No. 1ID00001*LD**

June 30, 2016

Prepared for:



**AK Steel Corporation
Middletown, OH**

Prepared by:



**Amendola Engineering, Inc.
Lakewood, OH**

Request to Modify Agricultural Water Supply Use Designation Main Stem Dicks Creek (RM 4.15 to RM 0.00)

**AK Steel Corporation – Middletown Works
Middletown, OH
NPDES permit No. 1ID00001*LD**

1.0 Introduction

AK Steel Corporation (AK Steel) is requesting a modification of the Agricultural Water Supply (AWS) use designation for a reach of the main stem Dicks Creek, a tributary of the Great Miami River. The reach that would be affected is from the AK Steel Middletown Works Outfall 015 (RM 4.15) downstream to the confluence of Dicks Creek and the Great Miami River. Figure 1 is a drainage area map of Dicks Creek that shows the location of the AK Steel Middletown Works, Outfall 015 and the reach of Dicks Creek that would be affected. Figure 2 is a stick diagram of contributing sources of flow to Dicks Creek.

The Clean Water Act at Section 101(a) establishes national water use goals of protection and propagation of fish, shellfish and wildlife and recreation in and on the water. The Ohio AWS use designation that would be affected by this proposed modification is not associated with either national goal. This proposal would result in a modification of the Agricultural Water Supply use and not remove the use. However, any modification of the Ohio AWS use must assure protection of aquatic life.

The Ohio AWS use designation includes livestock watering and irrigation. AK Steel's request is to remove the livestock watering use while maintaining the irrigation use. The proposed modification would change the current Ohio 2,000 ug/L (2 mg/L) fluoride agricultural use criterion to hardness-based fluoride criteria that would be suitable for irrigation uses and protective of aquatic life. AK Steel has found no evidence of livestock watering uses of Dicks Creek since at least 1975, and no current irrigation uses of Dicks Creek water in the affected reach.

Dicks Creek

Dicks Creek is a relatively small tributary of the Great Miami River located in Butler County in and near the City of Middletown. The drainage area of Dicks Creek is 48.8 square miles. It is a low flow stream with flow in the main stem dominated by AK Steel discharges to the main stem and the North Branch of Dicks Creek. During dry weather conditions, the aggregate average AK Steel discharge to Dicks Creek is typically in the range of 7 mgd (4.5 cfs). Ohio EPA reports the following stream flows for Dicks Creek upstream of AK Steel outfalls that discharge to Dicks Creek and Shaker Creek (see Figure 2).¹

¹ FACT SHEET Regarding an NPDES Permit to Discharge to Waters of the State of Ohio for AK Steel Corporation. Ohio EPA Permit No. 1ID00001*KD. Public Notice No. 07-10-026. Public Notice Date: October 16, 2007.

Table 1.1
Dicks Creek Water Flows
7Q10, 1Q10, Harmonic Mean Flow

Location	7Q10 (cfs)	1Q10 (cfs)	Harmonic Mean Flow (cfs)
Dicks Creek above North Branch	0	0	0.50
North Branch above AK Steel	0	0	0.43
Shaker Creek	0.15	0.15	2.35

Designated uses for Dicks Creek are set out in the Ohio water quality standards as follows:

Table 1.2
Dicks Creek Designated Water Uses
OAC 3745-1-21, Table 21-1

Dicks Creek Segment	Aquatic Life Habitat		Water Supply		Recreation
	Warm Water Habitat	Modified Warm Water Habitat	Agricultural Water Supply	Industrial Water Supply	Primary Contact Recreation
Cincinnati-Dayton Road (RM 5.4) to Yankee Road (RM 2.5)		X	X	X	X
All other segments	X		X	X	X
Monroe Ditch (Dicks Creek RM 2.65) headwaters to Middletown corporate boundary (RM 0.8)	X		X	X	X
North Branch – headwaters to Briel Road (RM 1.0)	X		X	X	X
Shaker Creek	X		X	X	X
Miller Creek	X		X	X	X

AK Steel Corporation – Middletown Works

The AK Steel Middletown Works is a fully integrated steel mill located in Middletown, Ohio. The facility produces flat rolled steels primarily for the automotive and appliance markets. Process operations include a by-product coke plant, a blast furnace, basic oxygen furnaces, a ladle metallurgy station, continuous casters, a hot strip mill and several steel finishing operations. Water for process and cooling applications is obtained from the Great Miami River. AK Steel has one outfall that discharges treated process and cooling water to the Great Miami River and four process water/cooling water outfalls and other storm water outfalls that discharge to Dicks Creek.

AK Steel NPDES permit 1ID00001*LD contains preliminary effluent limits (PELs) of 2.68 mg/L for fluoride at Outfalls 003, 009 and 015 that discharge to Dicks Creek (NPDES Permit No. 1ID00001*LD, Part II, Sect. I, p.25). The PELs are based on an Ohio EPA preliminary water quality assessment designed to achieve the Agricultural Water Supply (AWS) use designation fluoride criterion of 2,000 ug/L (2.0 mg/L) in Dicks Creek. AK Steel discharges from Outfalls 003 (treated basic oxygen furnace process wastewater, storm water) and Outfall 009 (storm water from landfill settling ponds) have consistently been below the PELs of 2.68 mg/L. Discharges from Outfall 015 have consistently been above the PEL of 2.68 mg/L. Outfall 015 discharges treated process wastewaters from the continuous casters, the 84" hot strip mill (internal Outfall 005) and storm water.

Fluoride is introduced into continuous casting process wastewaters from use of calcium fluoride as a mold powder. Fluoride becomes soluble in the continuous caster process wastewater and cannot be removed in the existing combined AK Steel process wastewater treatment and high rate recycle systems for the continuous casters and the hot strip mill. These treatment systems exceed U.S. EPA's model best available technology treatment systems considered when 40 CFR Part 420 was published.² There are currently no suitable materials that can be used as a substitute for calcium fluoride in the continuous caster applications.

AK Steel has evaluated a number of alternatives for achieving the fluoride PEL of 2.68 mg/L for Outfall 015. None of the alternatives were found to be cost reasonable. They would involve simply transferring the fluoride loading to the Great Miami River, either directly through an existing AK Steel outfall, or indirectly through to the City of Middletown POTW.³ The estimated investment cost for a direct discharge to the Great Miami River is in excess of \$3,000,000. Indirect discharges to City of Middletown sewerage systems are estimated to cost from approximately \$1,000,000 to \$3,300,000 with annual operating and maintenance costs from \$420,000 to \$790,000, depending on the technology considered.

Given these circumstances, AK Steel contacted Ohio EPA about the possibility of evaluating a modification of the AWS use designation for Dicks Creek for the reach of Dicks Creek downstream of AK Steel Outfall 015. This would involve maintaining the existing irrigation use and removing the livestock watering use, and it would accommodate existing AK Steel discharges to Dicks Creek. This report presents AK Steel's request for the proposed change in the AWS use designation for Dicks Creek.

² 40 CFR Part 420 sets out the categorical effluent limitations guidelines for the iron and steel industry. The regulation does not contain technology based effluent limitations guidelines or standards for fluoride.

³ ***Preliminary Technical Assessment and Preliminary Cost Estimates For Fluoride Treatment, Outfalls 005 and 015, AK Steel Corporation, Middletown Works, NPDES Permit No. 1ID00001*LD.*** Amendola Engineering, Inc., Lakewood, Ohio. April 2015.

2.0 Current and Possible Modified Agricultural Use Designation Criteria for Fluoride in Dicks Creek

Current Ohio Agricultural Water Supply Use Designation Criterion for Fluoride

Dicks Creek is designated for Agricultural Water Supply (AWS) and the aquatic life and recreational uses noted above. Ohio's AWS criterion for fluoride is 2,000 ug/L (2.0 mg/L) as an outside the mixing zone average (OMZA) criterion (OAC 3745-1-07, Table 7.12). The designated agricultural uses are livestock watering and irrigation.

Ohio EPA's current AWS water quality criterion for fluoride is based on U.S. EPA's recommended water quality criteria set out in the Blue Book (1972).⁴ The Blue Book recommends a 2 mg/L criterion for livestock watering. Blue Book recommendations for fluoride for irrigation uses are set out below:

"Because of the capacity of neutral and alkaline soils to inactivate fluoride, a relatively high maximum concentration for continuous use on these soils is recommended. Recommended maximum concentrations are 1.0 mg/L for continuous use on all soils and 15 mg/L for use for a 20-year period on neutral and alkaline fine textured soils."

As described below, for the reach of Dicks Creek that would be affected by this proposal, AK Steel could not find any evidence that water from Dicks Creek has been used for livestock watering since at least 1975, and has not found any current uses of Dicks Creek water for irrigation.

Possible Agricultural Water Supply Use Designation Criteria for Fluoride

Based on considerations of possible impacts of fluoride on aquatic life, it appears the Blue Book fluoride criterion of 15 mg/L for irrigation may not be fully protective. Consequently, Ohio EPA completed a preliminary assessment of possible fluoride criteria for irrigation uses following Tier II water quality standard procedures and developed fluoride criteria that would be protective of aquatic life.⁵ This takes into account receiving stream hardness, where increasing receiving stream hardness diminishes aquatic life impacts of fluoride. The preliminary fluoride criteria developed by Ohio EPA are set out in Table 2.1 below.

⁴ **Water Quality Criteria 1972.** A Report of the Committee on Water Quality. Environmental Studies Board. National Academy of Sciences, National Academy of Engineering. Washington, D.C. 1972. (p. 343).

⁵ E-mail from Chris Skalaski, Ohio Environmental Protection Agency, Columbus, OH to Gary Amendola, Amendola Engineering, Inc., Lakewood, OH. May 31, 2016. w/attachment (Ohio Fluoride Criteria Calculation.xlsx)

Table 2.1
Ohio EPA Preliminary Tier II Fluoride Criteria for Protection of Aquatic Life
OAC 3745-1-36: Methodologies for Developing Aquatic Life Criteria and Values

Total Hardness (mg/L)	Chronic Criteria (mg/L)	Acute Criteria (mg/L)
50	3.53	7.02
100	5.04	10.03
150	6.21	12.36
200	7.20	14.32
250	8.07	16.06
300	8.87	17.63
350	9.60	19.08
400	10.28	20.44
450	10.92	21.31
500	11.53	22.92

Acute standards for variable hardness: $e^{(V(\text{LN}(\text{hardness})) + \text{LN}(\text{acute standard at 50 hardness}) - (V(\text{LNZ})))}$

Chronic standards for variable hardness: $e^{(V(\text{LN}(\text{hardness})) + \text{LN}(\text{chronic standard at 50 hardness}) - (V(\text{LNZ})))}$

AK Steel has conducted measurements of total hardness in Dicks Creek as shown in Table 2.2 below. Considering the Ohio Tier II values above, the median total hardness value of 380 mg/L would result in a chronic criterion of approximately 10 mg/L and an acute criterion of approximately 20 mg/L.

Table 2.2
Dicks Creek Total Hardness
AK Steel Corporation – Middletown Works

Sample Date	Approximate Sample Location	Total Hardness (mg/L)
02/05/16	Main Stem Dicks Creek 500 yards downstream of North Branch and 650 yards upstream of Shaker Creek	472
02/10/16	Main Stem Dicks Creek 500 yards downstream of North Branch and 650 yards upstream of Shaker Creek	567
02/16/16	Main Stem Dicks Creek 100 yards upstream of Outfall 015	397
02/16/16	Main Stem Dicks Creek 200 yards downstream of Outfall 015	386
02/22/16	Main Stem Dicks Creek 100 yards upstream of Outfall 015	313
02/22/16	Main Stem Dicks Creek 200 yards downstream of Outfall 015	323
03/01/16	Main Stem Dicks Creek 100 yards upstream of Outfall 015	374
03/01/16	Main Stem Dicks Creek 200 yards downstream of Outfall 015	372
	Median	380

3.0 Assessment of Prior and Current Agricultural Water Supply Uses of Dicks Creek

Livestock Watering

40 CFR §131.10 is the federal water quality standard regulation that establishes requirements for each state to specify (designate) appropriate water uses to be achieved and protected. The regulation at §131.10(a) provides that state classifications of waters must take into consideration the use and value of waters for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. The regulation at §131.10(g) provides that a state may remove a designated use which is not an existing use as defined at §131.3(e). Existing uses are defined at §131.3(e) as uses actually attained in the water body on or after November 28, 1975, whether or not they were included in the water quality standards.

This is a request to modify the Agricultural Water Supply use designation for a segment of Dicks Creek, not to remove the AWS use designation. Furthermore, the AWS use designation is not a national goal use. Thus, AK Steel believes the provisions of §131.10(g) are not applicable because the AWS use would not be removed. Nonetheless, AK Steel conducted a review to determine whether there have been any actual livestock watering uses of the main stem of Dicks Creek in the segment from Outfall 015 downstream to the confluence of Dicks Creek and the Great Miami River, a distance of approximately 4.15 river miles.

Ohio Department of Natural Resources records show there have been no documented direct uses of Dicks Creek water downstream of Outfall 015 for either livestock watering or irrigation since at least November 28, 1975 (see Figure 3). That is the threshold date in the federal water quality regulations at 40 CFR §131.3(e) for determining whether there have been any “actual uses” of a water body.

Butler County’s classification of land uses includes the following land use codes that have to the potential for livestock watering uses:

Table 3.1
Butler County Land Use Codes
Potentially Associated with Livestock Watering

Land Use Code	Designation
102	Livestock Farms except Dairy or Poultry
103	Dairy Farms
104	Poultry Farms
112	Livestock Farms other than Dairy or Poultry
113	Dairy Farms
114	Poultry Farms

AK Steel's reviewed Butler County property records and found that none of the 767 properties located within ¼ mile of Dicks Creek downstream of AK Steel Outfall 015 is classified for livestock watering.⁶ Attachment A presents the results of AK Steel's search of Butler County property records.

In summary, AK Steel's research shows there is no information to indicate there have been livestock watering uses of the main stem of Dicks Creek downstream of Outfall 015 since November 1975.

Irrigation

Butler County land use classifications that have the potential to include irrigation uses are reported in Table 3.2.

Table 3.2
Butler County Land Use Codes
Potentially Associated with Irrigation

Land Use Code (LUC)	Designation
100	Agricultural Vacant Land
101	Cash Grain or General Farm
105	Fruit and Nut Farms
108	Nurseries
109	Greenhouses, Vegetables and Floralcult
110	Agricultural Vacant Land
111	Cash Grain or General Farm
115	Fruit and Nut Farms
116	Vegetable Farms
120	Timber or Forest Lands
121	Timber
122	Taxes as CAUV with Commercial Timber Growth
190, 199	Other Agricultural Use

Four parcels were identified with agricultural land use codes: two as LUC 110 – agricultural vacant land, one as LUC 111 – cash grain or general farm and one as LUC 190 – other agricultural use. AK Steel's inquiries of property owners indicate no current irrigation uses of Dicks Creek water downstream of Outfall 015.

⁶ One-quarter mile was selected as the distance for the AK Steel Butler County property search to assess possible agricultural water supply uses of Dicks Creek water. This distance is considered a reasonable distance to pump water for possible livestock watering uses. Furthermore, the search of Ohio Department of Natural Resources records show there have been no water intake structures on the main stem of Dicks Creek downstream of AK Steel Outfall 015, and there have been no groundwater wells located near the Creek.

One of the above parcels includes a greenhouse operation located near the downstream end of Dicks Creek. Personal communication with the greenhouse owner indicated that Dicks Creek water is not used for irrigation at the greenhouse.

4.0 Assessment of Soil Alkalinity and Texture in Dicks Creek Basin Surface Soils

AK Steel obtained soil alkalinity and soil texture data for Butler County from AASHTO (American Association of State and Highway Officials). Those data include results for soils in the Dicks Creek drainage basin. Dicks Creek basin soils are in the neutral to slightly alkaline range. Neutral and alkaline soils deactivate fluoride or restrict its uptake by plants. The pH range for 42 Butler County/Dicks Creek basin soil samples (1 to 1 soil/water mixture) is pH 6.1 to 7.9 su with a median of 6.8 su, which fits within the neutral to alkaline range cited above for the recommended EPA Blue Book 15 mg/L fluoride irrigation criterion. Most of the soils were characterized as silt loams or silt clay loams which are fine textured. The AASHTO soil pH data and soil texture information are presented in Attachment B.

In addition, Ohio EPA advised that supplemental soil pH and soil texture data for an 11-acre parcel located adjacent to Dicks Creek would be helpful in this regard. This is one of the four parcels identified by AK Steel as having an agricultural land use code from Butler County for cash grain or general farm. AK Steel conducted a supplemental soil sampling program of that parcel and nearby parcels owned by AK Steel following a sampling plan approved by Ohio EPA.⁷ The sampling program involved collection of 20 soil samples from 10 locations in the 11-acre parcel, one each at the surface (0 to 8 inches) and one each at depth (8 to 18 inches). The sample locations were identified by a grid across the parcel. Four locations (8 discrete samples) were similarly sampled at the AK Steel parcels. Soil samples were analyzed for pH and soil texture by the ASTM methods identified in Attachment C. The AK Steel sampling program results presented in Attachment C show soil pH and texture data similar to the AASHTO Butler County soil data reviewed above. With limited exceptions, soil pH for both parcels was found to be in the neutral to alkaline range. The soils are fine grained comprising mostly silt and clay, relatively little sand and nearly no gravel.

5.0 Summary

AK Steel is proposing a modification of the Ohio Agricultural Water Supply (AWS) use designation for a four mile reach of the main stem of Dicks Creek from AK Steel Middletown Works Outfall 015 downstream to the mouth of Dicks Creek at the Great Miami River. The proposed modification would remove the current livestock watering use and maintain the current irrigation use. The current Ohio 2,000 ug/L (2.0 mg/L) AWS fluoride criterion would be replaced with hardness-based fluoride criteria developed by Ohio EPA that would be fully protective of aquatic life. This proposed modification would

⁷ *Draft Sampling and Analysis Plan, Soil Characterization in Selected Parcel in the Dicks Creek Basin*, Amendola Engineering, Inc., March 24, 2016.

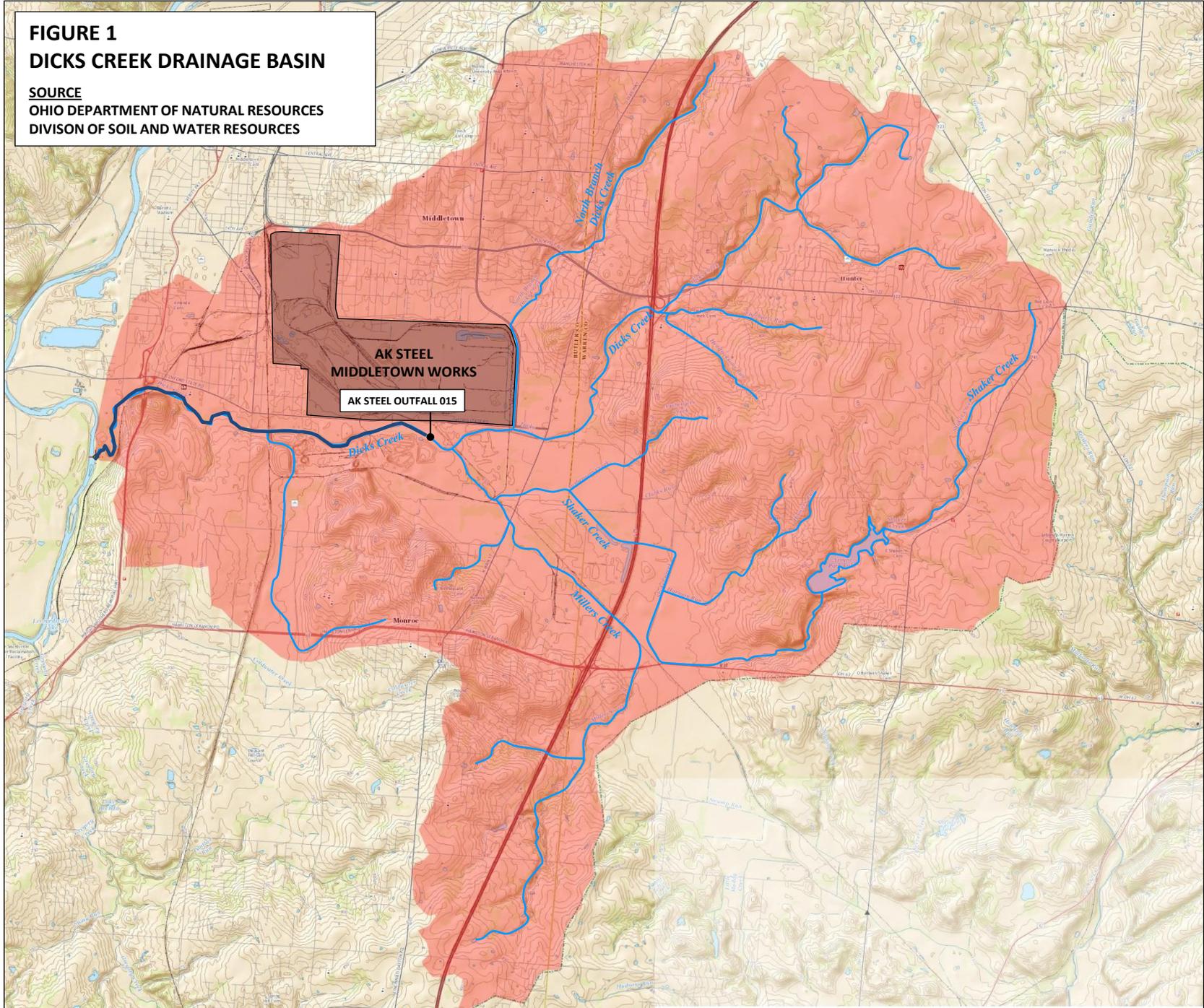
not involve any changes to Clean Water Act national goal water uses of protection and propagation of fish, shellfish and wildlife and recreation in and on the water.

AK Steel has found, that for the reach of Dicks Creek for which the proposed modification is requested, there is no information that indicates there were any actual livestock water uses of Dicks Creek water since 1975, and no indication there are any current irrigation uses of Dicks Creek water. In any event, the fluoride water criteria developed by Ohio EPA to protect aquatic life uses would also be protective of possible future agricultural irrigation uses.

40 CFR §131.10(a) provides that state classifications of waters must take into consideration the use and value of waters for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Because there are no actual agricultural water supply uses of Dicks Creek water for the reach for which the proposed modification is requested, there is essentially no current value associated with such uses. On the other hand, there is substantial value to the industrial use by AK Steel. Furthermore, the investment and operating costs for AK Steel to achieve the current Agricultural Water Supply fluoride criterion of 2,000 ug/L (2.0 mg/L) would be substantial and result in essentially no environmental, commercial or human health benefit. Thus, AK Steel requests the Agricultural Water Supply use designation for the main stem of Dicks Creek from Outfall 015 to the mouth of Dicks Creek be changed to irrigation use only; and, that the fluoride water quality criteria developed by Ohio EPA be considered in the next renewal NPDES permit for the Middletown Works.

FIGURE 1
DICKS CREEK DRAINAGE BASIN

SOURCE
OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF SOIL AND WATER RESOURCES



**FIGURE 2
DICKS CREEK TRIBUTARIES
AND AK STEEL OUTFALLS**

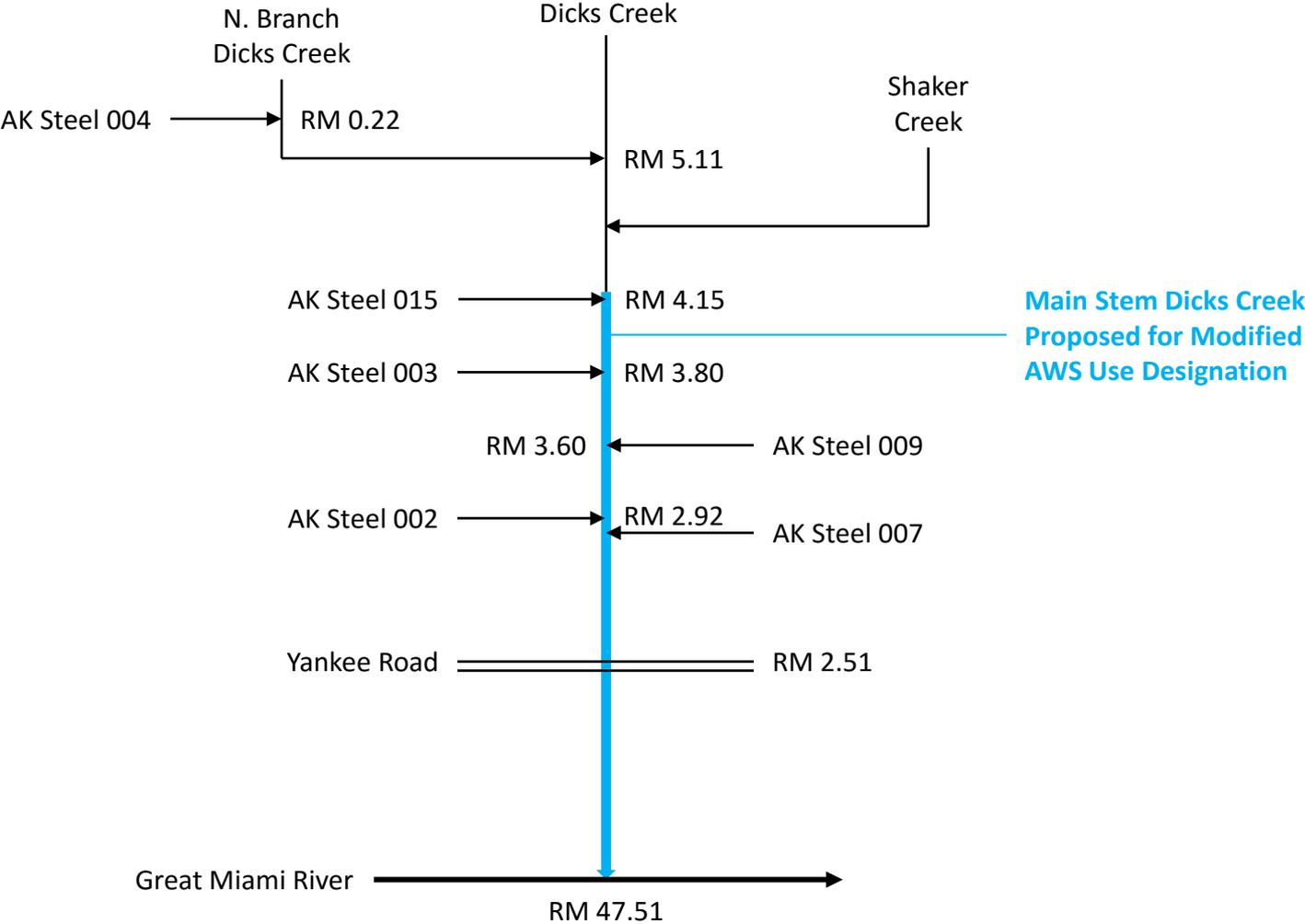
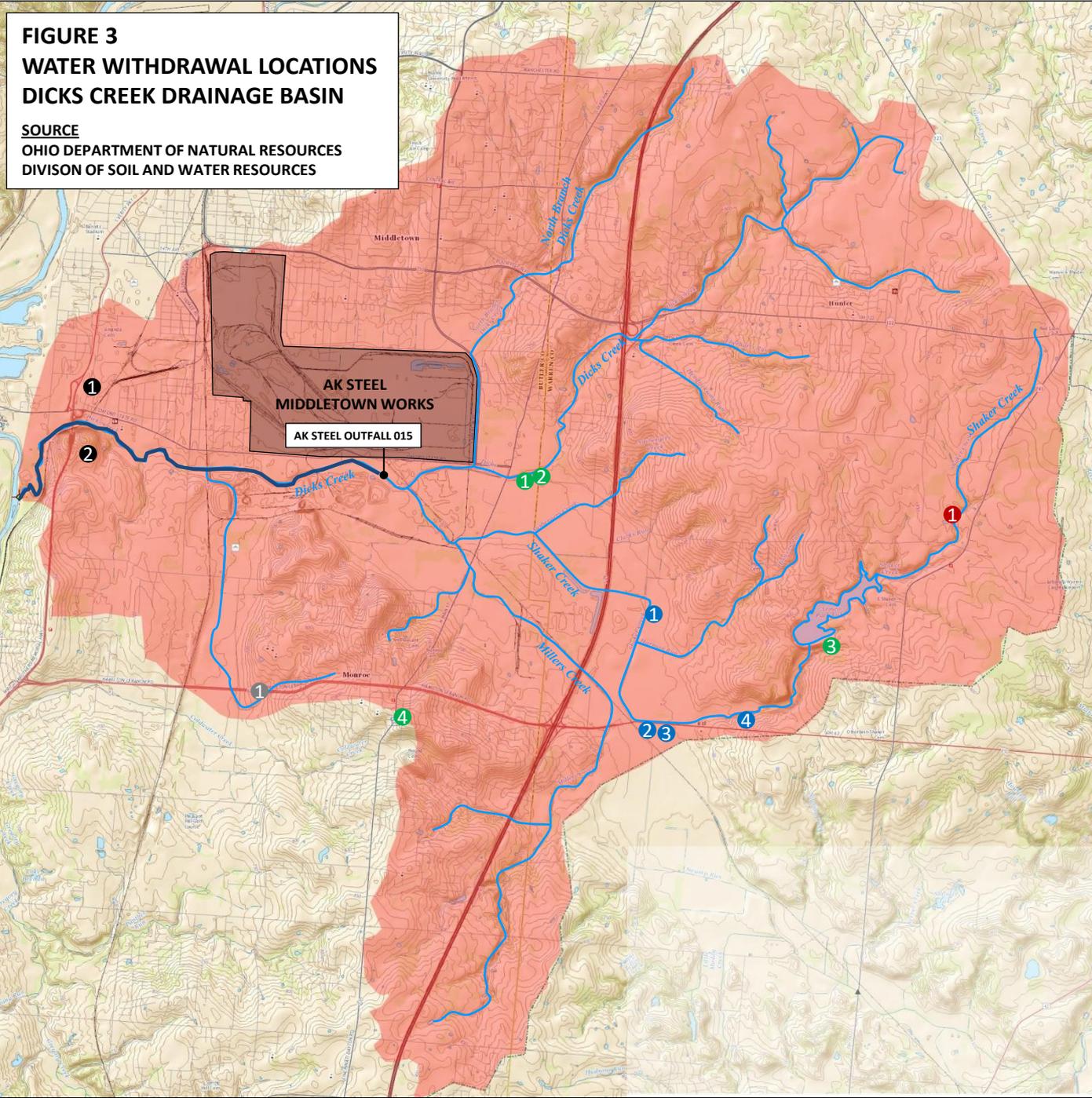


FIGURE 3
WATER WITHDRAWAL LOCATIONS
DICKS CREEK DRAINAGE BASIN

SOURCE
 OHIO DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF SOIL AND WATER RESOURCES



GROUNDWATER WELLS – INDUSTRIAL

- 1** FACILITY: CRYSTAL TISSUE CO.
 NO. WELLS: 6 (0 ACTIVE)
 CAPACITY/DEPTH: 8 MGD/120 FT
- 2** FACILITY: HARDING JONES MILL
 NO. WELLS: 2 (0 ACTIVE)
 CAPACITY/DEPTH: 4 MGD/85 FT

GROUNDWATER WELLS - AGRICULTURE

- 1** FACILITY: BERN'S GARDEN CENTER
 NO. WELLS: 1 (1 ACTIVE)
 CAPACITY/DEPTH: 0.1 MGD/74 FT
- 2** FACILITY: BEAUTY LAWN SOD
 NO. WELLS: 1 (0 ACTIVE)
 CAPACITY/DEPTH: 1.5 MGD/100 FT
- 3** FACILITY: SHAKERLAND FARMS
 NO. WELLS: 1 (0 ACTIVE)
 CAPACITY/DEPTH: 1.5 MGD/77 FT
- 4** FACILITY: BERN'S GREENHOUSE
 NO. WELLS: 1 (0 ACTIVE)
 CAPACITY/DEPTH: 2 MGD/93 FT

GROUNDWATER WELLS – PUBLIC WATER SYS.

- 1** FACILITY: WARREN COUNTY PWS
 NO. WELLS: 2 (0 ACTIVE)
 CAPACITY/DEPTH: 3 MGD/100 FT
- 2** FACILITY: MONROE CITY PWS
 NO. WELLS: 4 (0 ACTIVE)
 CAPACITY/DEPTH: 2.5 MGD/36 FT
- 3** FACILITY: LEBANON CORR. FAC.
 NO. WELLS: 7 (7 ACTIVE)
 CAPACITY/DEPTH: 4.5 MGD/130-150 FT
- 4** FACILITY: OTTERBEIN LEBANON RT
 NO. WELLS: 2 (2 ACTIVE)
 CAPACITY/DEPTH: 0.4 MGD/135 FT

GROUNDWATER WELLS – GOLF COURSES

- 1** FACILITY: SHAKER RUN GC
 NO. WELLS: UNKNOWN (ACTIVE)
 CAPACITY/DEPTH: UNKNOWN

SURFACE WATER INTAKE – INDUSTRIAL

- 1** FACILITY: ATEX-GREAT MIAMI NO.
 INTAKES: 1 (0 ACTIVE)
 CAPACITY/DEPTH: UNKNOWN

ATTACHMENT A

AK Steel – Middletown, Ohio

Land use codes for properties downstream of AK Steel Outfall 015 on Dick's Creek were analyzed using geographic information system (GIS) software to determine if any properties in the area within 0.25 miles of Dick's Creek were currently being used to water live stock. Our analysis shows that of the 767 properties that are within that location parameter, 498 are classified as residential (LUC 500 – 599) and were not considered for further analysis. Another 45 properties are owned by AK Steel or entities affiliated with AK Steel. 3 properties to the west of the Great Miami River and 7 properties upstream of AK Steel Outfall 015 on Dick's Creek that are not owned by AK Steel were also excluded. The remaining 214 properties were analyzed to determine their land use, of those 214 parcels, only 4 have agricultural land use codes¹:

PIN - Q6542116000078: LUC 110 Agricultural Vacant Land

PIN - Q6542116000079: LUC 199 Other Agricultural Use

PIN - Q6542061000017: LUC 111 Cash Grain or General Farm

PIN - C1800018000017 : LUC 110 Agricultural Vacant Land

Butler County has the following Land Use Codes pertaining to agricultural use (some classifications have been duplicated by Butler County):

100 – Agricultural Vacant Land

101 – Cash Grain or General Farm

102 – Livestock Farms except Dairy or Poultry

103 – Dairy Farms

104 – Poultry Farms

105 – Fruit and Nut Farms

108 – Nurseries

109 – Greenhouses, Vegetables, and Floracult

110 – Agricultural Vacant Land

111 – Cash Grain or General Farm

112 – Livestock Farm other than Dairy or Poultry

113 – Dairy Farms

114 – Poultry Farms

115 – Fruit and Nut Farms

116 – Vegetable Farms

120 – Timber or Forest Lands

121 – Timber

122 – Taxes as CAUV with Commercial Timber Growth

190, 199 – Other Agricultural Use

¹ In addition to the 4 properties with Agricultural Land Use Codes, there is a fifth property with an agricultural land use, PIN - Q6542084000047: LUC 100 – Agricultural Vacant Land, which is owned by AK Steel however we excluded that property in our analysis because it is owned by AK Steel.

Attachments

Land Use Map, Dick's Creek Area

Butler County Land Use Codes

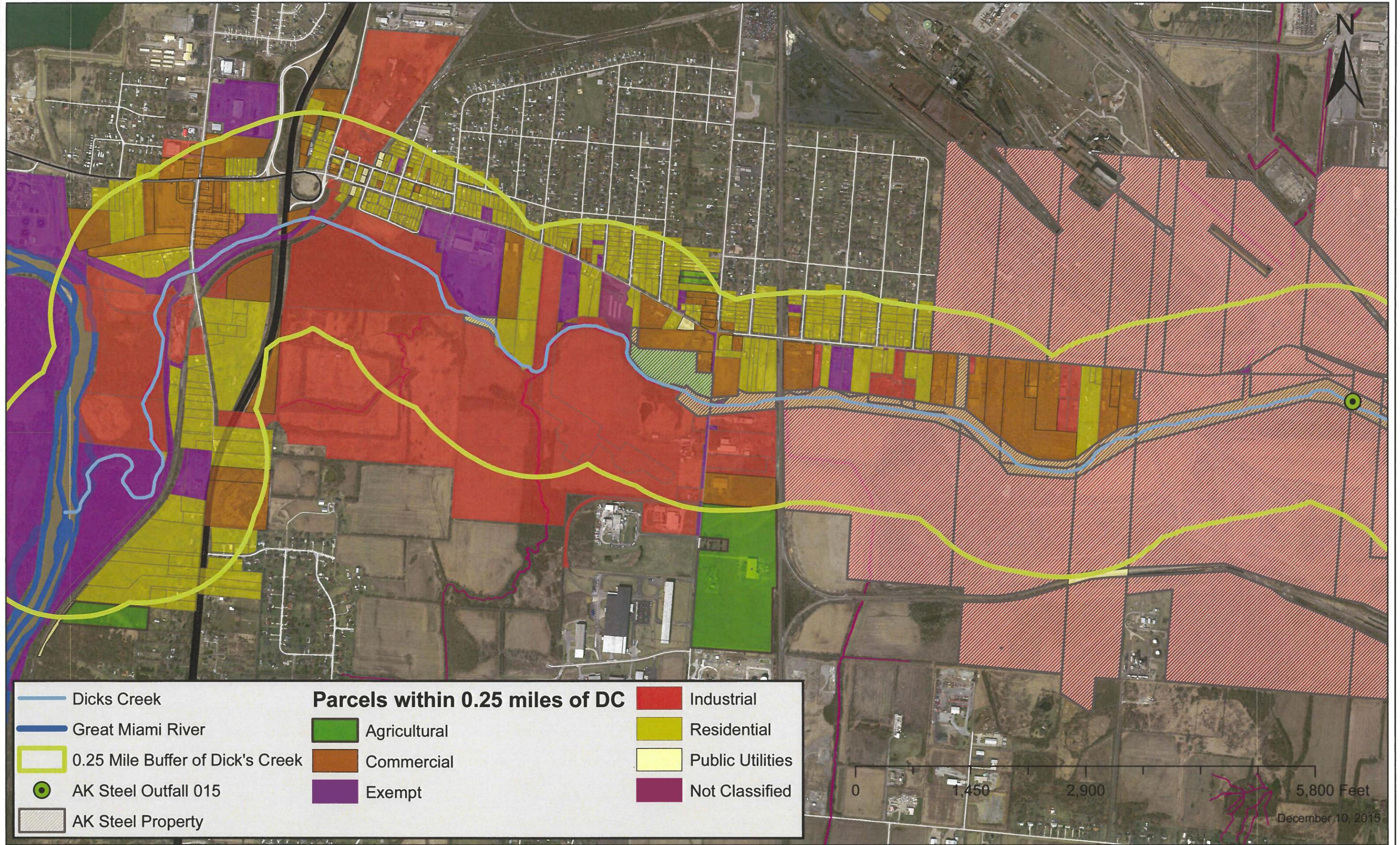
Parcel Database of all Properties within 0.25 miles of Dick's Creek

Butler County, Ohio – pH Map of Dick's Creek Area

Butler County, Ohio – Soil Map of Dick's Creek Area

Butler County, Ohio – AASHTO Group Classifications of Dick's Creek Area

Land Use for Parcels within 0.25 miles of Dick's Creek



Land Use Code (LUC)	
Three digit code denoting the present use of each property	
Code	Description
<u>Agricultural 100-199</u>	
100	AGRICULTURAL VACANT LAND
101	CASH GRAIN OR GENERAL FARM
102	LIVESTOCK FARMS EXCEPT DAIRY&POULTRY
103	DAIRY FARMS
104	POULTRY FARMS
105	FRUIT AND NUT FARMS
108	NURSERIES
109	GREENHOUSES, VEGETABLES & FLORACULT.
110	AGRICULTURAL VACANT LAND
111	CASH GRAIN OR GENERAL FARM
112	LIVESTOCK FARM OTHER THAN DRY&POLRY
113	DAIRY FARMS
114	POULTRY FARMS
115	FRUIT AND NUT FARMS
116	VEGETABLE TABLES
120	TIMBER OR FOREST LANDS
121	TIMBER
122	TAXED AS CAUV W/COM TIMB GROWTH
190	OTHER AGRICULTURAL USE
199	OTHER AGRICULTURAL USE
<u>Mineral Land & Rights 201-260</u>	
210	COAL LANDS, SURFACE AND RIGHTS
220	COAL RIGHTS, WORKING INTEREST
230	COAL RIGHTS, SEPARATE ROYALTY INT.
240	OIL AND GAS RIGHTS, WORKING INTEREST
245	OIL AND GAS RIGHTS, WORKING INTEREST
250	OIL AND GAS RIGHTS, SEPARATE ROYALTY INT
255	OIL AND GAS RIGHTS, SEPARATE ROYALTY
260	OTHER MINERALS
<u>Industrial 300-399</u>	
300	INDUSTRIAL, VACANT LAND
310	FOOD&DRINK PROCESS PLANTS AND STORAE
320	FOUNDERIES&HEAVY MANUFACT PLANTS
330	MANUFACTURING & ASSEMBLY MEDIUM
340	MANUFACTURING & ASSEMBLY LIGHT
350	INDUSTRIAL WAREHOUSES LIGHT
360	INDUSTRIAL TRUCK TERMINALS
370	SMALL SHOPS (MACHINE, TOOL & DIE ETC)
380	MINES AND QUARRIES
390	GRAIN ELEVATORS
399	OTHER INDUSTRIAL STRUCTURES
<u>Commercial 400-499</u>	

400	COMMERCIAL VACANT LAND
401	APARTMENTS 4-19 RENTAL UNITS
402	APARTMENTS 20-39 RENTAL UNITS
403	APARTMENTS 40 OR MORE RENTAL UNITS
403	APTS - 40 OR MORE RENTAL UNITS
410	MOTELS AND TOURIST CABINS
411	MOTELS
412	NURSING HOMES & PRIVATE HOSPITALS
415	TRAILER OR MOBILE HOME PARK
416	COMMERCIAL CAMPGROUNDS
419	OTHER COMMERCIAL HOUSING
420	SMALL (UNDER 10,000SF) DETACH RETAI
421	SUPERMARKETS
422	DISCOUNT STORES & JR. DEPT STORES
424	FULL LINE DEPARTMENT STORES
425	NEIGHBORHOOD SHOPPING CENTER
426	COMMUNITY SHOPPING CENTER
427	REGIONAL SHOPPING CENTER
429	OTHER RETAIL STRUCTURES
430	RESTURANT, CAFETERIA, AND/OR BAR
435	DRIVE-IN REST/FOOD SERVICE FACILITY
439	OTHER FOOD SERVICE STRUCTURE
440	DRY CLEANING PLANTS & LAUNDRIES
441	FUNERAL HOMES
442	MEDICAL CLINICS AND OFFICES
444	FULL SERVICE BANKS
445	SAVINGS AND LOAN
447	OFFICE BUILDING 1-2 STORIES
448	OFFICE BULD 3 OR MORE STORIES WALKUP
449	OFFICE BULD 3 OR MORE STORIES ELEVAT
450	CONDOMINIUM OFFICE UNITS
452	AUTOMOTIVE SERVICE STATION
453	CAR WASHES
454	AUTO CAR SALES AND SERVICES
455	COMMERCIAL GARAGES
456	PARKING GARAGE STRUCTURE & LOTS
460	THEATERS
461	DRIVE-IN THEATERS
462	GOLF DRIV RANGE & MINI GOLF COURSES
463	GOLF COURSES
464	BOWLING ALLEYS
465	LODGE HALLS AND AMUSEMENT PARKS
480	COMMERCIAL WAREHOUSES
481	MINI WAREHOUSE
482	COMMERCIAL TRUCK TERMINALS
490	MARINE SERVICE FACILITIES
499	OTHER COMMERCIAL STRUCTURES

Residential 500-599	
500	RESIDENTIAL, VACANT LAND, LOT
501	RESIDENTIAL, 0-9.999 AC
502	RESIDENTIAL, 10-19.999 AC
503	RESIDENTIAL, 20-29.999 AC
504	RESIDENTIAL, 30-39.999 AC
505	RESIDENTIAL, 40+ ACRES
510	SINGLE FAMILY DWELLING, PLATTED LOT
511	SINGLE FAMILY, 0-9.999 AC
512	SINGLE FAMILY, 10-19.999 AC
513	SINGLE FAMILY, 20-29.999 AC
514	SINGLE FAMILY, 30-39.999 AC
515	SINGLE FAMILY, 40+ AC
520	TWO FAMILY DWELLING, PLATTED LOT
521	TWO FAMILY, 0-9.999 AC
522	TWO FAMILY, 10-19.999 AC
530	THREE FAMILY DWELLING, PLATTED LOT
531	THREE FAMILY, 0-9.999 AC
550	CONDOMINIUM
560	HTRL/MOBILE HOME ON REAL ESTATE
599	OTHER RESIDENTIAL
Exempt 600-690	
600	EXEMPT PROPERTY OWNED BY USA
610	EXEMPT PROPERTY OWNED BY STATE OF OH
620	EXEMPT PROPERTY OWNED BY COUNTIES
630	EXEMPT PROPERTY OWNED BY TOWNSHIP
640	EXEMPT PROPERTY OWNED BY MUNICIPALS
645	EXEMPT PROP OWN/ACQUIRE BY MET AUTH
650	EXEMPT PROPERTY OWNED BY BD OF EDUC.
660	EXEMPT PROPERTY OWNED PARK DIST.PUB
670	EXEMPT PROP OWNED COL-ACAD-PRI SCHOO
680	CHARIT EXEMT HOSP HOMS AGED ETC,PRIV
685	CHURCHES ETC PUBLIC WORSHIP PRIVE
690	GRAVEYARDS MONUMENTS, CEMETERIES
Special Tax Abatement 700-740	
700	COMM URBAN REDEVL CORP TAX ABATEMENT
710	COMM REINVEST AREA TAX ABATEMENT
720	MUNICIPAL IMPROVE TAX ABATEMENT
730	MUNICIPAL URBAN REDEVELOP TAX ABATET
740	OTHER TAX ABATEMENT
741	TIF - SPECIAL ASSESSMENT
Public Utilities 800-880	
800	AGRI LAND&IMPRO OWN PUBLIC UTI RAIL
820	INDU LAND&IMPRO OWN PUBLIC UTI RAIL
830	COMM LD&IMPRO OWN BY PUB UTI TH RAIL
840	RAILROAD REAL PROP USED IN OPERATION
850	RAILROAD REAL PROP NOT USED OPERATOS

860	RAIL PER PROP USED OPER RAIL PER PRO
880	PUB UTIL PER PROP OTHER THAN RRS

Non-Residential Parcels Located within 0.25 Miles of Dick's Creek in Butler County, Ohio

PIN	Land Use Code	Class	Owner
Q6542116000078	110	Agricultural	BERNS ALBERT L & CHERIE ANN
C1800018000017	110	Agricultural	HUTTON SUZI
Q6542061000017	111	Agricultural	SHEPHERD MIDDLETOWN CO
Q6542116000079	199	Agricultural	BERNS ALBERT L & CHERIE ANN
C1710018000117	300	Industrial	B & G AUTOSALES LLC
Q6542061000006	300	Industrial	BRYANT CORWIN L
Q6542100000003	300	Industrial	BRYANT CORWIN L
Q6542061000005	300	Industrial	BRYANT CORWIN L
Q6542084000048	300	Industrial	CITY OF MIDDLETOWN
C1710018000120	300	Industrial	CRYSTAL TISSUE CO
C1730076000185	300	Industrial	CRYSTAL TISSUE CO
C1710017000061	300	Industrial	CRYSTAL TISSUE CO
C1710015000012	300	Industrial	CRYSTAL TISSUE CO
C1710018000045	300	Industrial	CRYSTAL TISSUE CO
C1730076000187	300	Industrial	CRYSTAL TISSUE CO
C1710017000087	300	Industrial	CRYSTAL TISSUE CO
Q6542085000022	300	Industrial	CSX TRANSPORTATION INC
Q6542061000013	300	Industrial	KING ARNOLD & RUTH
C1730076000186	300	Industrial	LAWSON EMMIT
Q6542084000066	300	Industrial	MIDDLETOWN COGENERATION COMPANY LLC
Q6542084000002	300	Industrial	MIDDLETOWN COKE COMPANY LLC
Q6542084000003	300	Industrial	MIDDLETOWN COKE COMPANY LLC
Q6542061000025	300	Industrial	MIDDLETOWN COKE COMPANY LLC
Q6542084000004	300	Industrial	MIDDLETOWN COKE COMPANY LLC
C1710017000084	300	Industrial	MONROE FIRST CHURCH OF GOD
C1710018000064	300	Industrial	SIMPSON PAPER CO
C1710018000048	300	Industrial	SIMPSON PAPER CO
C1710017000060	300	Industrial	SIMPSON PAPER CO
C1710017000001	300	Industrial	SIMPSON PAPER CO
C1710018000052	300	Industrial	SIMPSON PAPER CO
Q6542061000023	300	Industrial	YANKEE PROPERTIES LLC
Q6542084000065	320	Industrial	MIDDLETOWN COKE CO LLC
Q6542111000002	330	Industrial	CB SOUTH VERITY PROPERTIES LLC
Q6542111000001	330	Industrial	CB SOUTH VERITY PROPERTIES LLC
C1710018000034	340	Industrial	DJP ENTERPRISES LLC
Q6542101000012	340	Industrial	HARRIS NEAL
Q6542061000015	340	Industrial	YANKEE PROPERTIES LLC
C1710017000085	350	Industrial	B & G AUTOSALES LLC
Q6542084000011	350	Industrial	QUAKER CHEMICAL CORPORATION
Q6542084000001	370	Industrial	CLARK RICHARD ALLEN
Q6542100000009	370	Industrial	ENGLE FELIX & IRENE
Q6542061000014	370	Industrial	YANKEE PROPERTIES LLC
Q6542099000006	399	Industrial	B & D OHIO HOLDINGS LTD
Q6542099000017	399	Industrial	B & D OHIO HOLDINGS LTD
Q6542099000005	399	Industrial	B & D OHIO HOLDINGS LTD
Q6542099000004	399	Industrial	B & D OHIO HOLDINGS LTD
Q6542061000007	399	Industrial	BRYANT CORWIN L
Q6542084000059	399	Industrial	DUKE ENERGY OHIO INC
Q6542102000118	400	Commercial	CITY OF MIDDLETOWN
Q6542116000099	400	Commercial	CITY OF MIDDLETOWN
Q6542101000021	400	Commercial	CITY OF MIDDLETOWN
C1710015000011	400	Commercial	CRYSTAL TISSUE
C1720077000009	400	Commercial	JOHNSON PHYLLIS ANITA TR OF THE PHYLLIS ANITA JOHNSON TRUST
C1720077000010	400	Commercial	JOHNSON PHYLLIS ANITA TR OF THE PHYLLIS ANITA JOHNSON TRUST
C1720077000002	400	Commercial	JOHNSON ROGER & ANITA
C1720077000008	400	Commercial	JOHNSON ROGER G
C1720085000017	400	Commercial	MOORE WILLIAM Y
Q6542116000086	400	Commercial	ONKAR INVESTMENTS LLC

Non-Residential Parcels Located within 0.25 Miles of Dick's Creek in Butler County, Ohio

PIN	Land Use Code	Class	Owner
C1710018000047	400	Commercial	PALMER RAYMOND S
Q6542119000046	400	Commercial	PENTECOSTAL CHURCH OF GOD
Q6542084000029	400	Commercial	PENTECOSTAL CHURCH OF GOD OHIO DISTRICT
Q6542113000010	400	Commercial	PORTER ADVERTISING LLC
Q6542116000009	400	Commercial	VRITI N NEEL PROPERTY LLC
Q6542100000011	400	Commercial	ZENDEJAS RODOLFO
C1730076000053	401	Commercial	HALE DONALD D & PATRICIA
C1730076000058	401	Commercial	JMJB INVESTMENTS LLC
Q6542113000008	412	Commercial	BOYMEL FAMILY LLC
Q6542113000009	412	Commercial	BOYMEL FAMILY LLC
C1720086000032	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000036	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000026	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000019	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000025	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000035	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000024	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000027	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1710018000046	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1720086000034	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
C1710018000098	415	Commercial	CREEKWOOD MOBILE HOME PARK LLC
Q6542116000085	419	Commercial	COON MAX E & VICTORIA A
Q6542116000083	419	Commercial	COON MAX E & VICTORIA A
C1730076000098	419	Commercial	KAJA HOLDINGS LLC
C1720085000001	420	Commercial	JACKSON SUSAN L
C1710018000050	421	Commercial	KROGER LIMITED PARTNERSHIP I
C1710018000111	421	Commercial	KROGER LTD PRT I
C1710018000125	422	Commercial	FINKELMAN & IRELAN MIDDLETOWN PROP LLC
C1710018000112	422	Commercial	FINKELMAN & IRELAN MIDDLETOWN PROP LLC
C1720086000022	429	Commercial	3324 SOUTH MAIN STREET LLC
Q6542102000094	429	Commercial	BAKER ARTHUR C
C1710018000097	429	Commercial	EMRO MARKETING CO
Q6542100000007	429	Commercial	JOHNSON TIMOTHY J TR ETAL
C1730076000113	429	Commercial	ROBERTS RAYMOND E & PATRICIA L
Q6542084000035	429	Commercial	VRITI N NEEL PROPERTY LLC
Q6542102000044	430	Commercial	BANKS LARRY R
Q6542116000096	430	Commercial	HOMAN HOLLIE L
Q6542119000010	430	Commercial	MILLER LOIS ELAINE
Q6542119000009	430	Commercial	MILLER LOIS ELAINE
C1730076000088	430	Commercial	ROBERTS AARON
C1710018000110	435	Commercial	BASSINI MICHAEL
C1710018000044	435	Commercial	GOLDEN ARCH LTD PRT
C1710018000113	435	Commercial	GSC PROPERTIES LLC
C1710018000119	435	Commercial	GSC PROPERTIES LLC
C1710018000043	435	Commercial	MHBL INC
Q6542116000091	439	Commercial	ONKAR INVESTMENTS LLC
C1710018000118	439	Commercial	SPEEDWAY SUPERAMERICA LLC
C1720086000021	452	Commercial	KUSHMEET INC
C1720086000020	452	Commercial	KUSHMEET INC
C1720086000033	453	Commercial	ALUM CLIFF IDUSTRIES LLC
Q6542084000037	454	Commercial	BROWN JAMES A & LUCINDA K
C1730076000091	455	Commercial	AGEE JAMES T & SHEILA J
C1730076000191	455	Commercial	AGEE JAMES T & SHEILA J
C1730076000092	455	Commercial	AGEE JAMES T & SHEILA J
C1720086000018	455	Commercial	ALUM CLIFF IDUSTRIES LLC
C1720086000017	455	Commercial	ALUM CLIFF IDUSTRIES LLC
Q6542119000027	455	Commercial	CSB PROPERTIES OF OHIO LLC
Q6542119000026	455	Commercial	CSB PROPERTIES OF OHIO LLC

Non-Residential Parcels Located within 0.25 Miles of Dick's Creek in Butler County, Ohio

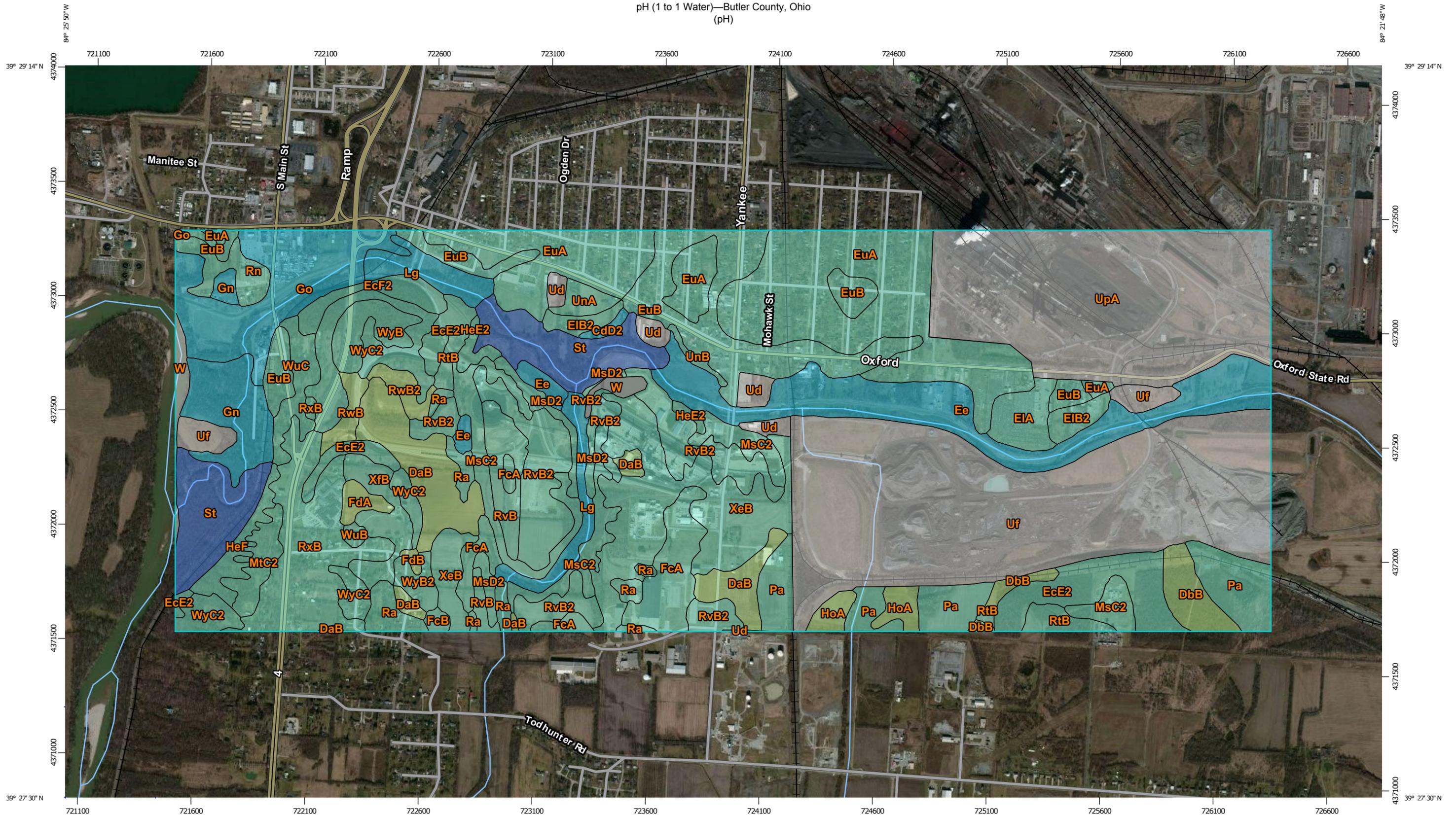
PIN	Land Use Code	Class	Owner
Q6542099000002	455	Commercial	DEMPSTER INDUSTRIAL SERVICES LLC
Q6542101000011	455	Commercial	FRASIK MARY
Q6542116000006	455	Commercial	MCCRAY GREGORY S
Q6542116000097	455	Commercial	RICE TERRY
Q6542100000006	455	Commercial	RZ AUTO PARTS LLC
Q6542099000010	480	Commercial	BAKER DOUGLAS A
Q6542099000012	480	Commercial	BAKER DOUGLAS A
Q6542101000003	480	Commercial	BROWN JOSEPH E II
Q6542099000018	480	Commercial	DEMPSTER INDUSTRIAL SERVICES LLC
Q6542099000011	480	Commercial	MULLIN JEFFREY B & JENNIFER L
Q6542085000027	480	Commercial	P S PROPERTIES INC
C1720077000011	480	Commercial	PERGRAM DOUG
C1720077000026	480	Commercial	PERGRAM DOUG
Q6542061000016	480	Commercial	QUAKER CHEMICAL CORPORTATION
Q6542099000013	480	Commercial	SCHWANS HOME SERVICE INC
C1720077000018	481	Commercial	JOHNSON ROGER TR OF THE ROGER GLEN JOHNSON TRUST
C1720077000005	481	Commercial	JOHNSON ROGER TR OF THE ROGER GLEN JOHNSON TRUST
C1720077000004	481	Commercial	JOHNSON ROGER TR OF THE ROGER GLEN JOHNSON TRUST
Q6542100000010	482	Commercial	HENDERSON OIL CO INC
Q6542099000001	499	Commercial	ATA PROPERTIES INC
Q6542099000016	499	Commercial	DEMPSTER INDUSTRIAL SERVICES LLC
Q6542101000005	499	Commercial	GARLAND II LLC
C1730076000125	499	Commercial	JOHNSON DONALD M
C1720086000023	499	Commercial	PETERS EDWARD JR TR
Q6542099000003	499	Commercial	SPONSEL ROBERT V & CANTRELL BEVERLY J
C1710018000091	610	Exempt	MIAMI CONSERVANCY DIST
C1710017000057	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000080	610	Exempt	MIAMI CONSERVANCY DIST
C1720085000018	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000077	610	Exempt	MIAMI CONSERVANCY DIST
C1720086000031	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000085	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000078	610	Exempt	MIAMI CONSERVANCY DIST
C1710017000056	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000081	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000084	610	Exempt	MIAMI CONSERVANCY DIST
C1720086000030	610	Exempt	MIAMI CONSERVANCY DIST
C1800018000001	610	Exempt	MIAMI CONSERVANCY DIST
C1720086000028	610	Exempt	MIAMI CONSERVANCY DIST
C1710017000055	610	Exempt	MIAMI CONSERVANCY DIST
C1720086000029	610	Exempt	MIAMI CONSERVANCY DIST
C1710018000079	610	Exempt	MIAMI CONSERVANCY DIST
Q6542119000021	610	Exempt	STATE OF OHIO FORFEITED LAND SALE
Q6542102000092	610	Exempt	STATE OF OHIO FORFEITED LAND SALE
Q6542101000020	620	Exempt	BUTLER COUNTY
C1710018000067	620	Exempt	COUNTY OF BUTLER
Q6542084000054	640	Exempt	CITY OF MIDDLETOWN
C1710018000053	640	Exempt	CITY OF MIDDLETOWN
Q6542084000051	640	Exempt	CITY OF MIDDLETOWN
Q6542084000053	640	Exempt	CITY OF MIDDLETOWN
Q6542061000024	640	Exempt	CITY OF MIDDLETOWN
Q6542085000025	640	Exempt	CITY OF MIDDLETOWN
Q6542084000052	640	Exempt	CITY OF MIDDLETOWN
C1710015000046	640	Exempt	CITY OF MIDDLETOWN
Q6542085000023	640	Exempt	CITY OF MIDDLETOWN
Q6542084000056	640	Exempt	CITY OF MIDDLETOWN
Q6542084000050	640	Exempt	CITY OF MIDDLETOWN
Q6542084000055	640	Exempt	CITY OF MIDDLETOWN OH

Non-Residential Parcels Located within 0.25 Miles of Dick's Creek in Butler County, Ohio

PIN	Land Use Code	Class	Owner
Q6542085000024	650	Exempt	BOARD OF EDUCATION
Q6542085000026	650	Exempt	BOARD OF EDUCATION
C1800018000035	660	Exempt	BUTLER COUNTY PARK DISTRICT
Q6542060000015	680	Exempt	DICK CRK LITTLE MUDDY CRK SUB DIST
Q6542101000015	680	Exempt	FRATERNAL ORDER OF EAGLES LODGE #3458
Q6542101000014	680	Exempt	FRATERNAL ORDER OF EAGLES LODGE #3458
C1710018000042	680	Exempt	MIDDLETOWN LOYAL ORDER OF MOOSE #501
Q6542098000008	685	Exempt	AMANDA METHODIST CHURCH
Q6542098000009	685	Exempt	AMANDA METHODIST CHURCH
Q6542119000029	685	Exempt	CALVARY PENTECOSTAL LIGHTHOUSE CHURCH
C1730076000059	685	Exempt	CEDARS OF LEBANON OF THE OLD REGULAR BAPT CH
Q6542116000092	685	Exempt	MIDDLETOWN GOSPEL ASSEMBLY
Q6542116000082	685	Exempt	MIDDLETOWN GOSPEL ASSEMBLY
Q6542116000093	685	Exempt	MIDDLETOWN GOSPEL ASSEMBLY
Q6542116000087	685	Exempt	MIDDLETOWN GOSPEL ASSEMBLY
Q6542116000084	685	Exempt	MIDDLETOWN GOSPEL ASSEMBLY
C1730076000061	685	Exempt	OLD REGULAR BAPTIST CHURCH OF JESUS CHRIST
C1730076000060	685	Exempt	OLD REGULAR BAPTIST CHURCH OF JESUS CHRIST
Q6542084000030	685	Exempt	PENTECOSTAL CHURCH OF GOD OHIO DISTRICT
Q6542085000030	685	Exempt	PENTECOSTAL CHURCH OF GOD OHIO DISTRICT
Q6542113000007	685	Exempt	TRUTH TABERNACLE
C1800018000003	685	Exempt	TRUTH TABERNACLE APOSTOLIC CHURCH INC
Q6542116000008	830	Public Utility	CINCINNATI GAS & ELECTRIC CO
C1730076000105	840	Public Utility	B & O RAILROAD
C1730076000104	840	Public Utility	B & O RAILROAD
C1730076000182	840	Public Utility	B&O R R
C1730076000181	840	Public Utility	B&O R R
C1800018000028	840	Public Utility	BALTIMORE & OHIO RR CO
C1800018000029	840	Public Utility	BALTIMORE & OHIO RR CO
C1730076000068	840	Public Utility	CIN & DAYTON BR B&O RR T & C
C1800018000002	840	Public Utility	CIN & DAYTON BR B&O RR T & C
C1730076000070	840	Public Utility	CIN & DAYTON BR B&O RR T & C
Q6542061000021	840	Public Utility	CONSOLIDATED RAIL CORP C/O NORFOLK SOUTHERN RAILWAY
Q6542100000017			CITY OF MIDDLETOWN OHIO
Q6542061000027			CITY OF MIDDLETOWN OHIO
Q6542061000026			CITY OF MIDDLETOWN OHIO
Q6542100000016			CITY OF MIDDLETOWN OHIO
Q6542100000015			CITY OF MIDDLETOWN OHIO
Q6542119000052			OM ENTERPRISES LLC
Q6542119000053			Z HOME LLC

ATTACHMENT B

pH (1 to 1 Water)—Butler County, Ohio
(pH)



Map Scale: 1:15,600 if printed on B landscape (17" x 11") sheet.
0 200 400 800 1200 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

pH (1 to 1 Water)—Butler County, Ohio
(pH)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  Ultra acid (pH < 3.5)
-  Extremely acid (pH 3.5 - 4.4)
-  Very strongly acid (pH 4.5 - 5.0)
-  Strongly acid (pH 5.1 - 5.5)
-  Moderately acid (pH 5.6 - 6.0)
-  Slightly acid (pH 6.1 - 6.5)
-  Neutral (pH 6.6 - 7.3)
-  Slightly alkaline (pH 7.4 - 7.8)
-  Moderately alkaline (pH 7.9 - 8.4)
-  Strongly alkaline (pH 8.5 - 9.0)
-  Very strongly alkaline (pH > 9.0)
-  Not rated or not available

Soil Rating Lines

-  Ultra acid (pH < 3.5)
-  Extremely acid (pH 3.5 - 4.4)
-  Very strongly acid (pH 4.5 - 5.0)
-  Strongly acid (pH 5.1 - 5.5)
-  Moderately acid (pH 5.6 - 6.0)
-  Slightly acid (pH 6.1 - 6.5)
-  Neutral (pH 6.6 - 7.3)
-  Slightly alkaline (pH 7.4 - 7.8)
-  Moderately alkaline (pH 7.9 - 8.4)
-  Strongly alkaline (pH 8.5 - 9.0)
-  Very strongly alkaline (pH > 9.0)
-  Not rated or not available

Soil Rating Points

-  Ultra acid (pH < 3.5)
-  Extremely acid (pH 3.5 - 4.4)

-  Very strongly acid (pH 4.5 - 5.0)
-  Strongly acid (pH 5.1 - 5.5)
-  Moderately acid (pH 5.6 - 6.0)
-  Slightly acid (pH 6.1 - 6.5)
-  Neutral (pH 6.6 - 7.3)
-  Slightly alkaline (pH 7.4 - 7.8)
-  Moderately alkaline (pH 7.9 - 8.4)
-  Strongly alkaline (pH 8.5 - 9.0)
-  Very strongly alkaline (pH > 9.0)
-  Not rated or not available

Background

 Aerial Photography

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Butler County, Ohio
Survey Area Data: Version 14, Sep 26, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 6, 2012—Feb 20, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

pH (1 to 1 Water)

pH (1 to 1 Water)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CdD2	Casco and Rodman gravelly loams, 6 to 18 percent slopes, moderately eroded	7.5	2.4	0.1%
DaB	Dana silt loam, 2 to 6 percent slopes	6.4	61.6	2.9%
DbB	Dana silt loam, bedrock substratum, 2 to 8 percent slopes	6.5	22.1	1.1%
EcE2	Eden silty clay loam, 15 to 25 percent slopes, moderately eroded	6.8	53.5	2.5%
EcF2	Eden silty clay loam, 25 to 50 percent slopes, moderately eroded	6.8	13.7	0.7%
Ee	Eel silt loam	7.4	111.6	5.3%
EIA	Eldean loam, 0 to 2 percent slopes	7.1	16.6	0.8%
EIB2	Eldean loam, 2 to 6 percent slopes, moderately eroded	7.1	14.1	0.7%
EuA	Eldean-Urban land complex, nearly level	7.1	199.7	9.5%
EuB	Eldean-Urban land complex, gently sloping	7.1	98.3	4.7%
FcA	Fincastle silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	6.9	42.0	2.0%
FcB	Fincastle silt loam, 2 to 6 percent slopes	6.6	2.3	0.1%
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	6.1	6.0	0.3%
FdB	Fincastle silt loam, bedrock substratum, 2 to 6 percent slopes	6.3	1.4	0.1%
Gn	Genesee loam	7.5	37.6	1.8%
Go	Genesee-Urban land complex	7.5	72.8	3.5%
HeE2	Hennepin-Miamian silt loams, 18 to 25 percent slopes, moderately eroded	7.2	6.4	0.3%

pH (1 to 1 Water)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HeF	Hennepin-Miamian silt loams, 25 to 50 percent slopes	7.2	12.5	0.6%
HoA	Henshaw silt loam, 0 to 2 percent slopes	6.4	13.0	0.6%
Lg	Lanier fine sandy loam	7.8	33.6	1.6%
MsC2	Miamian-Russell silt loams, 6 to 12 percent slopes, moderately eroded	7.3	58.6	2.8%
MsD2	Miamian-Russell silt loams, 12 to 18 percent slopes, moderately eroded	7.3	15.1	0.7%
MtC2	Miamian-Russell silt loams, bedrock substratum, 6 to 12 percent slopes, moderately eroded	7.2	13.8	0.7%
Pa	Patton silty clay loam	7.3	57.8	2.8%
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	7.1	23.0	1.1%
Rn	Ross loam	7.0	14.0	0.7%
RtB	Russell silt loam, 2 to 6 percent slopes	6.7	13.7	0.7%
RvB	Russell-Miamian silt loams, 2 to 6 percent slopes	6.7	21.8	1.0%
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	6.8	92.5	4.4%
RwB	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes	6.4	7.5	0.4%
RwB2	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes, moderately eroded	6.4	7.4	0.4%
RxB	Russell-Urban land complex, gently sloping	6.7	68.9	3.3%
St	Stonelick fine sandy loam	7.9	79.1	3.8%
Ud	Udorthents		15.2	0.7%
Uf	Udorthents and Dumps		334.6	15.9%
UnA	Uniontown silt loam, 0 to 2 percent slopes	6.7	7.0	0.3%

pH (1 to 1 Water)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
UnB	Uniontown silt loam, 2 to 6 percent slopes	6.7	2.8	0.1%
UpA	Urban land-Eldean complex, nearly level		220.6	10.5%
W	Water		10.5	0.5%
WuB	Wynn-Urban land complex, gently sloping	6.8	2.1	0.1%
WuC	Wynn-Urban land complex, sloping	6.8	15.0	0.7%
WyB	Wynn silt loam, 2 to 6 percent slopes	6.8	16.8	0.8%
WyB2	Wynn silt loam, 2 to 6 percent slopes, moderately eroded	6.8	7.7	0.4%
WyC2	Wynn silt loam, 6 to 12 percent slopes, moderately eroded	6.8	51.0	2.4%
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	7.1	100.6	4.8%
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	6.6	20.1	1.0%
Totals for Area of Interest			2,098.2	100.0%

Description

Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion. In general, soils that are either highly alkaline or highly acid are likely to be very corrosive to steel. The most common soil laboratory measurement of pH is the 1:1 water method. A crushed soil sample is mixed with an equal amount of water, and a measurement is made of the suspension.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Top Depth: 0

Bottom Depth: 1000

Units of Measure: Centimeters

Soil Map—Butler County, Ohio
(Dicks Creek)



Map Scale: 1:17,800 if printed on B landscape (17" x 11") sheet.
0 250 500 1000 1500 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Butler County, Ohio

Survey Area Data: Version 14, Sep 26, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 6, 2012—Feb 20, 2012

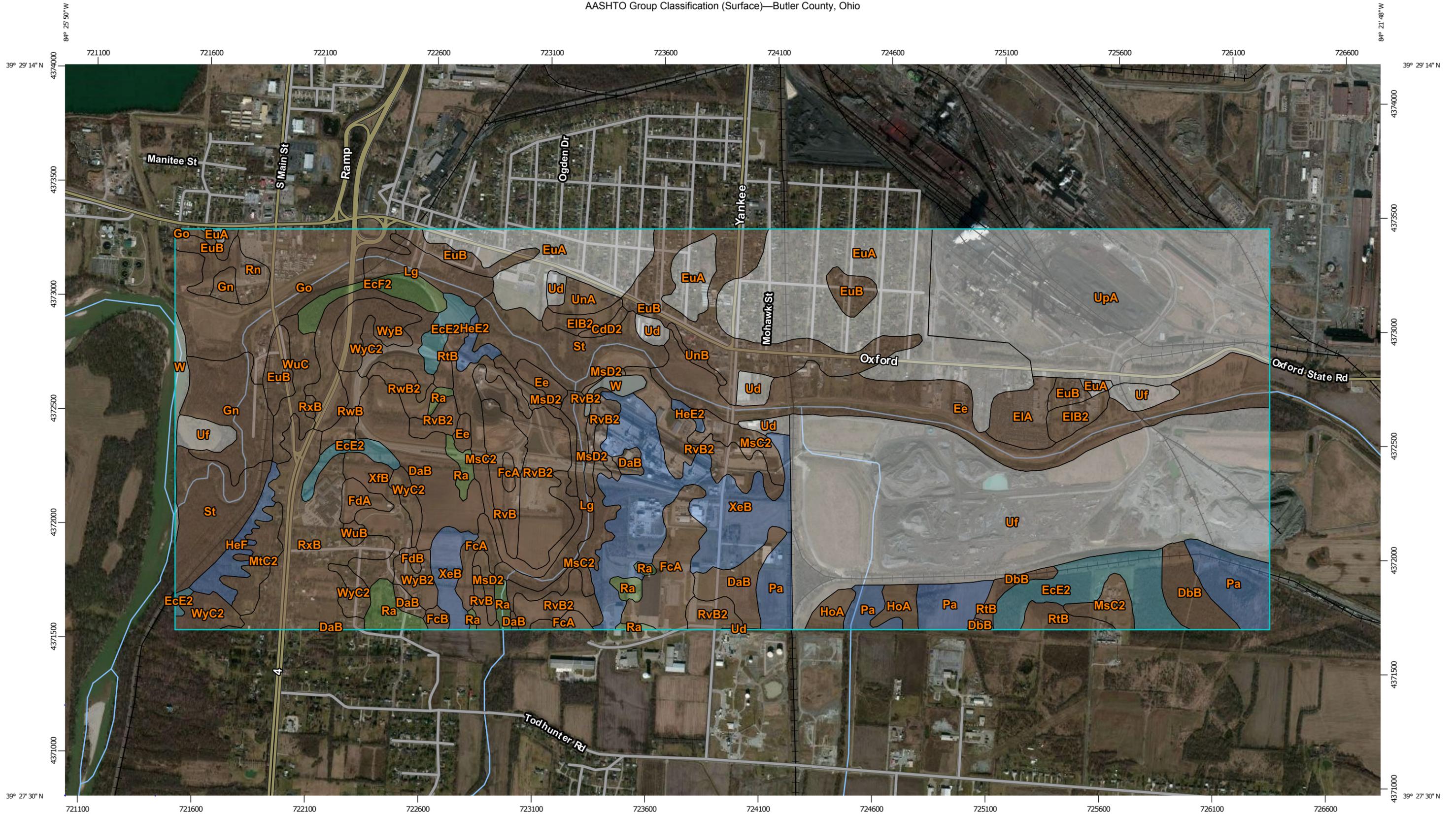
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Butler County, Ohio (OH017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CdD2	Casco and Rodman gravelly loams, 6 to 18 percent slopes, moderately eroded	2.4	0.1%
DaB	Dana silt loam, 2 to 6 percent slopes	56.6	2.3%
DbB	Dana silt loam, bedrock substratum, 2 to 8 percent slopes	13.9	0.6%
EcE2	Eden silty clay loam, 15 to 25 percent slopes, moderately eroded	43.8	1.8%
EcF2	Eden silty clay loam, 25 to 50 percent slopes, moderately eroded	13.7	0.6%
Ee	Eel silt loam	138.9	5.7%
EIA	Eldean loam, 0 to 2 percent slopes	16.6	0.7%
EIB2	Eldean loam, 2 to 6 percent slopes, moderately eroded	18.5	0.8%
EuA	Eldean-Urban land complex, nearly level	276.2	11.3%
EuB	Eldean-Urban land complex, gently sloping	129.0	5.3%
FcA	Fincastle silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	30.6	1.3%
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	6.0	0.2%
FdB	Fincastle silt loam, bedrock substratum, 2 to 6 percent slopes	1.4	0.1%
Gn	Genesee loam	37.6	1.5%
Go	Genesee-Urban land complex	115.1	4.7%
HeE2	Hennepin-Miamian silt loams, 18 to 25 percent slopes, moderately eroded	6.4	0.3%
HeF	Hennepin-Miamian silt loams, 25 to 50 percent slopes	12.4	0.5%
HoA	Henshaw silt loam, 0 to 2 percent slopes	18.0	0.7%
Lg	Lanier fine sandy loam	33.6	1.4%
MsC2	Miamian-Russell silt loams, 6 to 12 percent slopes, moderately eroded	52.3	2.1%

Butler County, Ohio (OH017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsD2	Miamian-Russell silt loams, 12 to 18 percent slopes, moderately eroded	14.2	0.6%
MtC2	Miamian-Russell silt loams, bedrock substratum, 6 to 12 percent slopes, moderately eroded	12.7	0.5%
OcA	Ockley silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	16.4	0.7%
Pa	Patton silty clay loam	69.8	2.9%
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	13.5	0.6%
Rh	Riverwash	4.5	0.2%
Rn	Ross loam	14.1	0.6%
RtB	Russell silt loam, 2 to 6 percent slopes	4.9	0.2%
RvB	Russell-Miamian silt loams, 2 to 6 percent slopes	19.9	0.8%
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	78.7	3.2%
RwB	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes	7.5	0.3%
RwB2	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes, moderately eroded	7.4	0.3%
RxB	Russell-Urban land complex, gently sloping	55.6	2.3%
St	Stonelick fine sandy loam	112.2	4.6%
Ud	Udorthents	17.0	0.7%
Uf	Udorthents and Dumps	352.1	14.4%
UnA	Uniontown silt loam, 0 to 2 percent slopes	7.0	0.3%
UnB	Uniontown silt loam, 2 to 6 percent slopes	2.8	0.1%
UpA	Urban land-Eldean complex, nearly level	301.8	12.3%
UsA	Urban land-Patton complex, nearly level	73.4	3.0%
W	Water	38.8	1.6%
WuB	Wynn-Urban land complex, gently sloping	2.1	0.1%
WuC	Wynn-Urban land complex, sloping	15.0	0.6%

Butler County, Ohio (OH017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WyB	Wynn silt loam, 2 to 6 percent slopes	16.8	0.7%
WyB2	Wynn silt loam, 2 to 6 percent slopes, moderately eroded	7.3	0.3%
WyC2	Wynn silt loam, 6 to 12 percent slopes, moderately eroded	41.8	1.7%
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	95.1	3.9%
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	20.1	0.8%
Totals for Area of Interest		2,445.4	100.0%



Map Scale: 1:15,600 if printed on B landscape (17" x 11") sheet.
0 200 400 800 1200 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  A-1
-  A-1-a
-  A-1-b
-  A-2
-  A-2-4
-  A-2-5
-  A-2-6
-  A-2-7
-  A-3
-  A-4
-  A-5
-  A-6
-  A-7
-  A-7-5
-  A-7-6
-  A-8
-  Not rated or not available

Soil Rating Lines

-  A-1
-  A-1-a
-  A-1-b
-  A-2

-  A-2-4
-  A-2-5
-  A-2-6
-  A-2-7
-  A-3
-  A-4
-  A-5
-  A-6
-  A-7
-  A-7-5
-  A-7-6
-  A-8
-  Not rated or not available

Soil Rating Points

-  A-1
-  A-1-a
-  A-1-b
-  A-2
-  A-2-4
-  A-2-5
-  A-2-6
-  A-2-7
-  A-3
-  A-4
-  A-5
-  A-6

-  A-7
-  A-7-5
-  A-7-6
-  A-8
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Butler County, Ohio
 Survey Area Data: Version 14, Sep 26, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 6, 2012—Feb 20, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

AASHTO Group Classification (Surface)

AASHTO Group Classification (Surface)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CdD2	Casco and Rodman gravelly loams, 6 to 18 percent slopes, moderately eroded	A-4	2.4	0.1%
DaB	Dana silt loam, 2 to 6 percent slopes	A-4	61.6	2.9%
DbB	Dana silt loam, bedrock substratum, 2 to 8 percent slopes	A-4	22.1	1.1%
EcE2	Eden silty clay loam, 15 to 25 percent slopes, moderately eroded	A-7	53.5	2.5%
EcF2	Eden silty clay loam, 25 to 50 percent slopes, moderately eroded	A-7-6	13.7	0.7%
Ee	Eel silt loam	A-4	111.6	5.3%
EIA	Eldean loam, 0 to 2 percent slopes	A-4	16.6	0.8%
EIB2	Eldean loam, 2 to 6 percent slopes, moderately eroded	A-4	14.1	0.7%
EuA	Eldean-Urban land complex, nearly level		199.7	9.5%
EuB	Eldean-Urban land complex, gently sloping	A-4	98.3	4.7%
FcA	Fincastle silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	A-4	42.0	2.0%
FcB	Fincastle silt loam, 2 to 6 percent slopes	A-4	2.3	0.1%
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	A-4	6.0	0.3%
FdB	Fincastle silt loam, bedrock substratum, 2 to 6 percent slopes	A-4	1.4	0.1%
Gn	Genesee loam	A-4	37.6	1.8%
Go	Genesee-Urban land complex	A-4	72.8	3.5%
HeE2	Hennepin-Miamian silt loams, 18 to 25 percent slopes, moderately eroded	A-6	6.4	0.3%

AASHTO Group Classification (Surface)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HeF	Hennepin-Miamian silt loams, 25 to 50 percent slopes	A-6	12.5	0.6%
HoA	Henshaw silt loam, 0 to 2 percent slopes	A-4	13.0	0.6%
Lg	Lanier fine sandy loam	A-4	33.6	1.6%
MsC2	Miamian-Russell silt loams, 6 to 12 percent slopes, moderately eroded	A-4	58.6	2.8%
MsD2	Miamian-Russell silt loams, 12 to 18 percent slopes, moderately eroded	A-4	15.1	0.7%
MtC2	Miamian-Russell silt loams, bedrock substratum, 6 to 12 percent slopes, moderately eroded	A-4	13.8	0.7%
Pa	Patton silty clay loam	A-6	57.8	2.8%
Ra	Ragsdale silty clay loam, 0 to 2 percent slopes	A-7-6	23.0	1.1%
Rn	Ross loam	A-4	14.0	0.7%
RtB	Russell silt loam, 2 to 6 percent slopes	A-4	13.7	0.7%
RvB	Russell-Miamian silt loams, 2 to 6 percent slopes	A-4	21.8	1.0%
RvB2	Russell-Miamian silt loams, 2 to 6 percent slopes, moderately eroded	A-4	92.5	4.4%
RwB	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes	A-4	7.5	0.4%
RwB2	Russell-Miamian silt loams, bedrock substratum, 2 to 6 percent slopes, moderately eroded	A-4	7.4	0.4%
RxB	Russell-Urban land complex, gently sloping	A-4	68.9	3.3%
St	Stonelick fine sandy loam	A-4	79.1	3.8%
Ud	Udorthents		15.2	0.7%
Uf	Udorthents and Dumps		334.6	15.9%
UnA	Uniontown silt loam, 0 to 2 percent slopes	A-4	7.0	0.3%

AASHTO Group Classification (Surface)— Summary by Map Unit — Butler County, Ohio (OH017)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
UnB	Uniontown silt loam, 2 to 6 percent slopes	A-4	2.8	0.1%
UpA	Urban land-Eldean complex, nearly level		220.6	10.5%
W	Water		10.5	0.5%
WuB	Wynn-Urban land complex, gently sloping	A-4	2.1	0.1%
WuC	Wynn-Urban land complex, sloping	A-4	15.0	0.7%
WyB	Wynn silt loam, 2 to 6 percent slopes	A-4	16.8	0.8%
WyB2	Wynn silt loam, 2 to 6 percent slopes, moderately eroded	A-4	7.7	0.4%
WyC2	Wynn silt loam, 6 to 12 percent slopes, moderately eroded	A-4	51.0	2.4%
XeB	Xenia silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	A-6	100.6	4.8%
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	A-4	20.1	1.0%
Totals for Area of Interest			2,098.2	100.0%

Description

AASHTO group classification is a system that classifies soils specifically for geotechnical engineering purposes that are related to highway and airfield construction. It is based on particle-size distribution and Atterberg limits, such as liquid limit and plasticity index. This classification system is covered in AASHTO Standard No. M 145-82. The classification is based on that portion of the soil that is smaller than 3 inches in diameter.

The AASHTO classification system has two general classifications: (i) granular materials having 35 percent or less, by weight, particles smaller than 0.074 mm in diameter and (ii) silt-clay materials having more than 35 percent, by weight, particles smaller than 0.074 mm in diameter. These two divisions are further subdivided into seven main group classifications, plus eight subgroups, for a total of fifteen for mineral soils. Another class for organic soils is used.

For each soil horizon in the database one or more AASHTO Group Classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

ATTACHMENT C

**AK Steel Corporation – Middletown Works
Dicks Creek Agricultural Water Supply Use Designation**

**Soil Characterization for Parcel Xeb3
CTL Project No. 16050053COL**

Test Methods: ASTM D2487-11 (Standard Practice for Classification of Soils for Engineering Purposes)
ASTM D4792-13 (Standard Test Method for pH of Soils)

Sample ID		Classification	Soil pH	Composition				Grain Size Distribution				
Location	Depth			% Gravel	% Sand	% Silt	% Clay	D100	D60	D50	D30	D10
S-01	0" – 8"	Lean Clay (CL)	6.46	0	11	65	24	9.525	0.023	0.018	0.008	
S-01	8" – 18"	Lean Clay (CL)	6.23	0	8	57	35	2	0.021	0.014		
S-02	0" – 8"	Lean Clay with Sand (CL)	6.81	1	21	56	22	9.525	0.036	0.025	0.01	
S-02	8" – 18"	Lean Clay (CL)	6.25	0	7	60	33	4.75	0.018	0.013	0.004	
S-03	0" – 8"	Lean Clay with Sand (CL)	7.21	0	20	44	36	4.75	0.022	0.013	0.003	
S-03	8" – 18"	Fat Clay with Sand (CH)	7.30	0	21	37	42	4.75	0.021	0.01		
S-04	0" – 8"	Lean Clay with Sand (CL)	7.50	1	21	54	24	9.525	0.035	0.023	0.009	
S-04	8" – 18"	Sandy Lean Clay (CL)	7.54	1	31	39	29	9.525	0.046	0.026	0.005	
S-05	0" – 8"	Lean Clay (CL)	6.20	0	5	66	29	4.75	0.02	0.014	0.005	
S-05	8" – 18"	Lean Clay (CL)	4.84	0	2	64	34	2	0.021	0.013		
S-06	0" – 8"	Lean Clay with Sand (CL)	6.65	0	19	57	24	4.75	0.037	0.026	0.009	
S-06	8" – 18"	Silty Clay with Sand (CL-ML)	6.61	0	17	66	17	4.75	0.035	0.025	0.012	
S-07	0" – 8"	Lean Clay (CL)	7.36	1	11	62	26	9.525	0.031	0.02	0.007	
S-07	8" – 18"	Sandy Lean Clay (CL)	7.60	3	28	41	28	19	0.042	0.024	0.006	
S-08	0" – 8"	Lean Clay with Sand (CL)	7.42	0	22	52	26	9.525	0.03	0.021	0.007	
S-08	8" – 18"	Lean Clay with Sand (CL)	7.30	1	19	44	36	9.525	0.02	0.011		
S-09	0" – 8"	Lean Clay with Sand (CL)	7.49	0	15	64	21	4.75	0.033	0.023	0.009	
S-09	8" – 18"	Lean Clay with Sand (CL)	7.49	1	20	41	38	9.525	0.023	0.012		
S-10	0" – 8"	Lean Clay (CL)	7.45	0	14	57	29	9.525	0.024	0.016	0.005	
S-10	8" – 18"	Lean Clay (CL)	7.10	0	9	56	35	4.75	0.02	0.012		

ATTACHMENT C

**AK Steel Corporation – Middletown Works
Dicks Creek Agricultural Water Supply Use Designation**

**Soil Characterization for AK Steel Parcels
CTL Project No. 16050053COL**

Test Methods: ASTM D2487-11 (Standard Practice for Classification of Soils for Engineering Purposes)
ASTM D4792-13 (Standard Test Method for pH of Soils)

Sample ID		Classification	Soil pH	Composition				Grain Size Distribution				
Location	Depth			% Gravel	% Sand	% Silt	% Clay	D100	D60	D50	D30	D10
AK-01	0" – 8"	Sandy Silty Clay (CL-ML)	7.03	0	43	38	19	9.525	0.088	0.046	0.011	
AK-01	8" – 18"	Clayey Sand (SC)	5.17	0	51	22	27	9.525	0.137	0.08	0.007	
AK-02	0" – 8"	Lean Clay with Sand (CL)	7.44	0	25	39	36	9.525	0.024	0.011	0.003	
AK-02	8" – 18"	Lean Clay with Sand (CL)	7.39	0	20	35	45	4.75	0.013	0.007		
AK-03	0" – 8"	Lean Clay with Sand (CL)	7.73	0	19	42	39	9.525	0.022	0.01		
AK-03	8" – 18"	Fat Clay (CH)	7.56	0	8	37	55	4.75	0.007	0.003		
AK-04	0" – 8"	Lean Clay with Sand (CL)	7.21	0	15	44	41	9.525	0.016	0.009		
AK-04	8" – 18"	Lean Clay with Sand (CL)	7.21	0	25	31	44	9.525	0.016	0.008		