Site Reconnaissance

South Rockport Road and South Rogers Street
Bloomington, Indiana 47401

Prepared for:
Mr. Jeff Cockerill – Attorney
Monroe County Board of Commissioners
100 West Kirkwood Avenue
Bloomington, Indiana 47404

Prepared by:

VET Environmental Engineering, LLC
2335 West Fountain Drive
Bloomington, Indiana 47404

Date:
October 2, 2023

Project Number:
22-48

Site Reconnaissance

South Rockport Road and South Rogers Street
Bloomington, Indiana 47401

VET ENVIRONMENTAL ENGINEERING, LLC PROJECT NO. 23-258

LIST OF EXHIBITS

LIST OF TABLES IN NARRATIVE

LIST OF ATTACHMENTS

1.0 EXECUTIVE SUMMARY

VET Environmental Engineering, LLC (VET) was obtained by Mr. Jeff Cockerill, representative of the Monroe County Board of Commissioners (Monroe County) to conduct a site reconnaissance of approximately 87.84 acres of land (Parcel Numbers 53-08-08-200-001.000-009 and 53-08-08-100-127.000-009) located north of South Rockport Road and west of South Rogers Street in Bloomington, Indiana (Site). The purpose of the project is to identify potential environmental impacts and other obstacles to development of the Site. The Site is the proposed location of a new municipal development project for Monroe County. VET conducted both a desktop and field reconnaissance to identify potential obstacles to development.

2.0 SITE INFORMATION

The Site is located on three parcels of land located in Bloomington, Monroe County, Indiana. Parcel information is detailed in **Table A**. Parcels #1 and #2 are municipally owned vacant land, and Parcel #3 is vacant land zoned for industrial use and owned by AFR Partners, LLC. The Site is largely forested, with the exception of approximately 100-foot wide utility easements located throughout the Site. One utility easement is located adjacent to the entirety of the southern Site boundary. Two utility easements originate on the northern Site boundary and trend southward toward an east-west trending utility easement.

TABLE A. PARCEL INFORMATION		
Parcel Number	**Legal Description**	**Acreage**
Parcel #1: 53-08-08-200-001.000-009	015-17120-01 PT N1/2 8-8-1W 79.877+7.46A Plats 217&523	87.34
Parcel #2: 53-08-08-200-001.000-009		
Parcel #3: 53-08-08-100-127.000-009	015-17110-01 PT N1/2 8-8-1W 5.20A; PLAT 204	5.20

3.0 DESKTOP RECONNAISSANCE

VET obtained and analyzed environmental and geographic data from IndianaMap. IndianaMap is a large collective public database for geographic information system (GIS) map data. The scope of the desktop reconnaissance is to identify items that may limit or restrict development or other proposed land uses on the Site by evaluating readily ascertainable records.

3.1 Soils

The United States Agricultural Department (USDA) Web Soil Survey (WSS) indicates that the Site is largely underlain by Crider Silt Loam (**Exhibit 3**). All soils present on the Site are included in **Table B**. No soils mapped on-Site are classified as hydric soils according to the 2016 National Resources Conservation Service (NRCS) Hydric Soils List for Monroe County, Indiana.

TABLE B. SOIL SURVEY SUMMARY		
Map Symbol	**Soil Type Name**	**Percent of Site (%)**
CrC	Crider Silt Loam, 6-12% Slopes	55.5
Ud	Udorthents-Pits Complex	16.4
CrB	Crider Silt Loam, 2-6% Slopes	13.8
CrD	Crider Silt Loam, 12-18% Slopes	6.8
CaD	Caneyville Silt Loam 12-18% Slopes	4.1
CtB	Crider-Urban Land Complex, 2-6% Slopes	1.6
CtC	Crider-Urban Land Complex, 6-12% Slopes	1.2
Ua	Udorthents, Loamy	0.4
HaD	Hagerstown Silt Loam, 12-18% Slopes	0.3

3.2 Waterways and Waterbodies

The desktop reconnaissance identified two intermittent streams on-Site according to the United States Geological Survey`s (USGS) National Hydrography Dataset (NHD). One NHD-mapped stream is located on the southwestern corner of the Site and appears to flow toward the northwest toward a perennial stream. The second NHD-mapped stream is located in the approximate south central portion of the Site and appears to flow toward the south toward a perennial stream. All mapped waterbodies are displayed on **Exhibit 2**.

3.3 Floodplains

Floodplain data was obtained from the Federal Emergency Management Association (FEMA) Flood Rate Insurance Maps (FIRM). This data represents areas in Indiana that are located in a floodway or flood hazard zone. No floodways were identified on-Site.

3.4 Wetlands

One wetland was identified on-Site by the National Wetlands Inventory (NWI). The mapped wetland is located in the central portion of the southern boundary of the Site.

3.5 Karst Features

Karst features were identified on-Site along the northeastern portion of Parcel #1 and on Parcel #3 (IndianaMap, 2023). Additionally, mapped contours are indicative of potential karst features on the northwestern portion of Parcel #1. The Site is in the Mitchell Plateau physiographic region of Indiana (IndianaMap, 2022). The presence of karst topography features (sinkholes, swallow holes, sinking streams, etc.) is documented within the Mitchell Plateau physiographic region (Gray, 2000, p.8). The Site is reportedly in an area where drainage is mostly through solution channels (Hartke and Gray, 1989, p.4). Bedrock is mapped as Mississippian Age, Blue River Group containing mostly micritic, skeletal, and oolitic limestone (IndianaMap, 2022). Bedrock is shallow in this area and expected to be less than 50 feet below ground surface (Fenelon and Bobay, 1994, p.142).

3.6 Endangered and Threatened Species

VET utilized the Information for Planning and Consultation (IPaC) web service developed by the USFWS to screen the Site for endangered species, critical habitats, and migratory birds. According to IPaC,

the endangered Indiana Bat (*Myotis sodalist*), the endangered Northern Long-eared Bat (*Myotis septentrionalis*), the proposed endangered Tricolored Bat (*Perimyotis subflavus*), and the proposed endangered Salamander Mussel (*Simpsonaias ambigua*), are identified as potentially affected by the project area. The Site overlaps with the critical habitat for the Indiana Bat according to the USFWS`s Environmental Conservation Online System (ECOS).

The Monarch Butterfly (*Danaus plexippus*) was identified as potentially affected by the project area. The Monarch Butterfly was identified as a candidate for listing as a threatened or endangered species. There are generally no requirements under Section 7 Endangered Species Act (ESA) for candidate species, according to the USFWS.

IPaC identified 13 migratory Birds of Conservation Concern (BCC). The common name, scientific name, and category of concern for each species identified are detailed in **Table C**. Ten birds were identified as "BCC Rangewide". This status indicates that these species are a BCC throughout the entirety of their range in the United States. IPaC identified two "BCC – BCR" birds. This status indicates that these species are of concern only in particular Bird Conservation Ranges (BCRs) in the United States. One species, the Bald Eagle, was listed as "Non-BCC Vulnerable". This status indicates that the species is not specifically listed as a BCC, but is a species of concern due to requirements set forth by The Bald and Golden Eagle Protection Act (Eagle Act). The Eagle Act prohibits the take, possession, sale, or purchase of any dead or alive Bald Eagle (USFWS, 1940).

Due to the presence of several BCC species, VET recommends following the Nationwide Standard for Conservation Measures (**Attachment 3**), provided by the IPaC, to ensure minimal damage to potential habitats or breeding areas.

TABLE C. MIGRATORY BIRDS OF CONCERN

Common Name	Scientific Name	Category of Concern
Bald Eagle	*Haliaeetus leucocephalus*	Non-BCC Vulnerable
Black-billed Cuckoo	*Coccyzus erythropthalmus*	BCC Rangewide
Cerulean Warbler	*Dendroica cerulea*	BCC Rangewide
Chimney Swift	*Chaetura pelagica*	BCC Rangewide
Eastern Whippoorwill	*Antrostomus vociferus*	BCC Rangewide
Field Sparrow	*Spizella pusilla*	BCC – BCR
Kentucky Warbler	*Oporornis formosus*	BCC Rangewide
Lesser Yellowlegs	*Tringa flavipes*	BCC Rangewide
Prairie Warbler	*Dendroica discolor*	BCC Rangewide
Prothonotary Warbler	*Protonotaria citrea*	BCC Rangewide
Red-headed Woodpecker	*Melanerpes erythrocephalus*	BCC Rangewide
Rusty Blackbird	*Euphagus carolinus*	BCC – BCR
Wood Thrush	*Hylocichla mustelina*	BCC Rangewide

VET requested information on endangered and threatened species, high quality natural communities, and natural areas from the Indiana Department of Natural Resources (IDNR) Indiana Natural Heritage Data Center (INHDC) on September 15, 2023. VET received IDNR`s response on September 21, 2023. The Heritage Data Review indicates that five threatened or endangered species are documented within a half-mile of the Site (**Table D**).

TABLE D. INDIANA HERITAGE DATA – ENDANGERED AND THREATENED SPECIES			
Common Name	**Scientific Name**	**State**	**Federal**
Sharp-skinned Hawk	*Accipiter striatus*	SSC	N/A
American Burying Beetle	*Nicrophorus americanus*	SX	E
Agapetus Caddisfly	*Agapetus gelbae*	ST	N/A
Northern Casemaker Caddisfly	*Goera stylata*	SE	N/A
Western Ribbon Snake	*Thamnophis proximus Proximus*	SSC	N/A
Legend			
SE = State Endangered	SR = State Rare	E = Federal Endangered	
ST = State Threatened	SSC = State Species of Special Concern	N/A = Not listed	
SX = State Extirpated			

The Heritage Data Review specified that these findings do not preclude the requirement for formal consultation through the United States Fish and Wildlife Service (USFWS) under Section 7 of the ESA. A copy of the Heritage Data Review is included as **Attachment 2**. Due to the species potentially affected by the proposed project, a formal Section 7 ESA consultation may be required. VET recommends following the Nationwide Standard for Conservation Measures and minimizing disturbance to forested areas on-Site to ensure minimal damage to potential habitats or breeding grounds due to the species potentially affected by the proposed project.

3.7 Wells

The IDNR Water Well Survey identified no wells on-Site. The City of Bloomington Utilities Department (CBU) provides drinking water for the Site and surrounding area. CBU obtains drinking water from Lake Monroe, a surface water reservoir located southeast of Bloomington, Indiana. Groundwater is not utilized for drinking water in this area of Bloomington. One well is reportedly located within a 0.25-mile radius of the Site (**Exhibit 1**).

3.8 Historical Aerial Photographs

VET examined historical aerial photographs. Select historical aerial photographs are included as **Attachment 4**.

TABLE E. AERIAL PHOTOGRAPH SUMMARY		
Year	Quality	Description
1949	Fair	A 1949 Aerial Photograph displaying the area to the west of the Site is unavailable. The eastern and southeastern portions of the Site appear undeveloped due to prevalence of heavy vegetation. The central region and far eastern extending arm of the Site appear to be developed for agricultural purposes, evident by uniform lack of heavy vegetation. An apparent quarry, consisting of two rectangular-shaped mining pits, is evident on the western portion of the central region of the Site. Suspected light roadways/trails lead from the apparent quarry and exit along the northern portion of the eastern boundary of the Site. An apparent small-scale quarry is evident along the central portion of the southern boundary of the Site. Suspected light roadways/trails surround the apparent quarry, some of which trend northeast-southwest and exit the Site along the eastern boundary. The two apparent quarries on the Site, consisting of three pits total, appear to no longer be in use due to the apparent

		presence of water filling the pits. The suspected light roadways/trails leading from both apparent quarries on the Site terminate at an apparent developed industrial quarry processing facility to the north of the eastern extending arm of the Site. Additional northwest-southeast trending light roadways/trails, evident by two parallel lines of stressed vegetation suggesting the use of a motor vehicle, are evident along the central region of the Site. The northern adjacent parcels appear to be developed for agricultural purposes or are vacant, evident by prevalence of heavy vegetation. North of the northern adjacent properties from the Site, an apparent east-west trending roadway (West Allen Street) is evident. The eastern boundary of the eastern extending arm of the Site borders an apparent local roadway (South Rogers Street). A north-south trending railway is apparent to the east of the Site and South Rogers Street. Residential development is apparent to the northeast, east, and southeast of the Site. A water body is apparent to the south of the western portion of the Site. A single-family residential development is apparent to the west of the western extending arm of the Site along a local roadway (Sudburg Lane).
1961	Fair	A 1961 Aerial Photograph displaying the area to the east of the Site is unavailable. Light roadways/trails continue to traverse between the northern apparent quarry on the Site and the apparent industrial facility to the north of the eastern arm of the Site. The southern-most pit of the northern quarry on the Site appears to be partially drained of water and surrounded by stressed vegetation, suggesting renewed use of the pit for mining activities. A distinct oval-shaped area of dense vegetation is located in the approximate center of the Site, consistent with the local high elevation observed on historic and current topographic maps. The local high area is likely quarry overburden from previous mining activities. The apparent quarry processing facility to the northeast of the Site displays evidence of development and expansion due to the high prevalence of access roadways and land-clearing activities surrounding the facility. The central region of the Site displays an increased percentage of land utilized for agricultural activities. The western extending arm and the area north of the northern quarry on the Site remains undeveloped vacant land. An apparent telephone pole easement runs along the southern portion of the Site, parallel to the Site boundary. Development of an apparent substation bordering the western side of South Rogers Street is evident north of the eastern extending arm of the Site. Development of an industrial facility (Catalent Site) is evident to the northeast of the Site, north of the apparent quarry processing industrial facility. A northwest-southeast trending local roadway extends off of the industrial facility apparent to the northeast of the Site. Development of industrial and commercial activities is evident to the northeast of the Site, forming a buffer along both sides of the apparent railway. Residential development is apparent to the north (along West Allen Street), northeast, and southeast. An apparent quarry, evident by the uniformly shaped excavation pit filled with water, suggesting mining inactivity, is evident to the southwest of the Site.
1967	Good	The central region of the Site displays an increased percentage of land utilized for agricultural activities. The southern-most pit of the northern quarry on the Site appears to have been drained almost entirely of water and surrounded by increased vegetation, suggesting heavy use of the pit for mining activities. Catalent Site, has expanded to the north and west from the apparent railway. The apparent local roadway connected to Catalent Site, noted in the 1961 Aerial Photograph, extends further to the northwest, terminating in a roughly rectangular area of stressed vegetation. Debris of unknown origin appears to follow the perimeter of the roughly rectangular area of stressed vegetation. The apparent quarry processing facility displays evidence of expansion and further development across South Rogers Street. Residential development is apparent to the north (along West Allen

		Street), northeast, and southeast. The residential development along Sudburg Lane, to the west of the Site, displays evidence of expansion and development.
1972	Good	Both mining pits of the northern quarry on the Site appear to be filled with water, suggesting inactivity. The light roadways/trails and the area surrounding the quarry processing facility display signs of vegetative recovery. The area to the west of the Catalent Site building exhibits conditions consistent with landfilling and other possible waste disposal. The local roadway connecting the suspected landfill area and Catalent Site is further developed. Residential development is apparent to the northwest and south of the Site.
1975	Good	The quarry pits on the northeastern portion and the southern boundary of the Site are filled with water, suggesting inactivity. An apparent northwest-southeast trending drainage feature or footpath runs from outside of the southeastern Site boundary to the oval-shaped, elevated wooded area surrounded by agricultural land. The drainage feature or path flows onto the southern adjacent property, and borders the southern boundary of the residential development to the southeast and the quarry processing facility to the northeast. The suspected landfill area connected to Catalent Site displays evidence of vegetative recovery, particularly on the western portion of the suspected landfill. The remainder of the adjoining properties appear relatively unchanged.
1999	Excellent	A small structure is constructed on the northwestern portion of the Site. The land surface on which the structure is located appears to be elevated in comparison to the surrounding topography. The northern adjacent property is developed with a large commercial building and associated parking lot to the west. The structure constructed on the Site is located at the terminus of a path or crushed limestone road from the northern adjacent parking lot. The purpose of the structure on the Site is indiscernible in the photograph. Vegetation on the Site is less dense than in the 1975 photograph, with apparent paths cleared. A path is cleared on the oval-shaped, elevated wooded area in the center of the Site. The quarry pits on the Site are not discernible in this photograph, indicating they were filled to grade. The northeastern adjacent property exhibits additional evidence of disturbance compared to the 1975 photograph. Additional residential roads and a municipal park are constructed to the south of the Site.
2003	Good	Vegetation in the cleared areas outside of the apparent utility easements on the Site is recovered. The area immediately southwest of the oval-shaped, elevated, wooded area in the center of the Site discernible in previous photographs does not exhibit vegetative recovery. The lack of vegetative recovery may be due to clearing associated with the utility easements on the Site. The structure on the northwestern corner of the Site is still apparent. The remainder of the Site and adjoining properties appear relatively unchanged.
2005	Excellent	The Site exhibits evidence of cleared paths consistent with clearing in previous photographs. Clearings include the utility easements and apparent paths transecting the Site from adjoining properties to the north, south, and east. The structure on the northwestern corner of the Site is still present. A road (South Strong Drive) intersects the northern Site boundary from the north. Although the Site appears to be undeveloped, the clearings and footpaths indicate the consistent presence of maintenance crews or foot traffic on the Site from adjoining properties. An apparent residential development is constructed to the northwest of the Site.
2006	Excellent	The Site exhibits vegetative recovery compared to the 2005 photograph, though this may be due to natural seasonal variation in vegetative cover. An apparent parking area surfaced with crushed limestone is apparent between the northern Site Boundary and the Catalent Site building. The Site and adjoining properties appear relatively unchanged.

2008	Excellent	A more distinct path is evident originating from the eastern Site boundary, transecting the central portion, and terminating at the structure at the northwestern corner of the Site. Brown patches, consistent with possible filling activities, are located on the eastern extending arm of the Site and on the southern adjoining property west of West Cherokee Drive. The remainder of the Site and adjoining properties appear relatively unchanged.
2015	Excellent	The structure on the northwestern Site corner is no longer present. The remainder of the Site and adjoining properties appear relatively unchanged.
2016	Excellent	The Site and adjoining properties appear relatively unchanged.
2019	Excellent	The Site and adjoining properties appear relatively unchanged.
2022	Excellent	The Site and adjoining properties appear relatively unchanged.

Aerial photographs indicate the presence of stream, and wetland features that may constitute jurisdictional waters. Evidence of extensive modification, including grading and filling associated with the historic quarry operation, the utility easement, and activities on the northern adjacent properties, is visible on historical aerial photographs.

4.0 FIELD RECONNAISSANCE

VET representatives Ms. Sara Hamidovic, MS, PE, CHMM, CPESC and Ms. Rene Lloyd, MS, MPA conducted a field reconnaissance on September 15 and September 20, 2023. The purpose of the field investigation was to verify the accuracy of the information reviewed during the desktop reconnaissance and to identify features of concern that were not identified by the desktop reconnaissance. No formal wetlands or waters delineations were conducted. Select photos taken during the field reconnaissance are included as **Attachment 1**.

VET conducted Site Reconnaissance at the Site covering the approximate western two-thirds on September 15, 2023. The Site is located on the west side of South Rogers Street, with an access point directly south of the electrical substation owned by PSI on South Rogers Street. Access to the southern boundary of the Site is also provided via West Bernard Drive. South Strong Drive, a road associated with the northern adjacent Catalent Site, intersects and gives way to a crushed limestone surfaced parking lot on the northern boundary of the Site. There are no structures located on the Site. Significant Site observations are displayed on **Exhibit 4**.

VET observed utility easements at the Site associated with the northeastern adjacent electrical substation owned by PSI. VET observed evidence of herbicide spraying throughout the dense herbaceous stratum along the utility easements. The herbicide spraying is likely attributable to maintenance of the utility easements. The remainder of the Site not included in the utility easements is relatively densely vegetated with mature trees and understory. Several cleared areas that were likely historic roads or access paths were identified in the wooded areas. The historic road feature on the northeastern portion of the Site may be associated with historic quarrying operations or the historic railroad spur on the northeastern corner of the Site branching from the historic railroad line east of South Rogers Street.

Along the utility easements, VET observed evidence of heavily trodden footpaths entering the forested areas of the Site. Evidence of encampments was observed throughout the wooded areas of the Site, including trash disposal areas, cleared areas likely used for camping, and tents and other temporary structures apparently currently in use. Based on these observations, it is likely that people are currently occupying the Site. Trash disposal areas predominantly contained food and drink containers, clothing, and

bedding materials. Evidence of small amounts of potentially hazardous substances such as household batteries and camp-style propane cylinders were observed in the trash disposal areas.

VET verified the topographic high located in the central portion of the Site, that was identified during desktop reconnaissance examination of current and historic topographic contours. The local high is likely comprised of quarry overburden from the historic quarrying operation. The quarry overburden likely contains clay, fractured limestone, and topsoil cleared from the surface to create quarry pits. VET observed evidence of quarrying operations, including limestone blocks of varying sizes on the northeastern portion of the Site, just southwest of South Strong Drive. The historic quarry pit observed in aerial photographs that is located on the southern Site boundary is relatively co-located with the NHD-mapped wetland feature. VET observed evidence of limestone block and potential overburden on the southern adjacent property that may have been excavated from the quarry pit on the southern Site boundary.

4.1 Soils

No soils mapped on-Site are classified as hydric soils according to the 2016 NRCS Hydric Soils List for Monroe County, Indiana. According to on-Site observations, there is evidence of extensive grading and cut and fill activities on the Site. The grading is likely attributable to historic quarry operations and utility easement development on the Site. Soil and limestone overburden deposition from the historic quarry operations is the likely source of fill material observed on the north-central portion of Parcel #1. The extensive modification of the Site, to include grading and filling, likely altered the soil composition and drainage characteristics of Site soils.

4.2 Waterways and Waterbodies

The desktop reconnaissance identified two intermittent streams on-Site (**Exhibit 4**). VET observed several surface drainage features, likely ephemeral streams, within the forested areas of the Site that were not identified by the NHD. The United States Army Corps of Engineers (USACE) defines an ephemeral stream as "*having flowing water only during, and for a short duration after, precipitation events in a typical year.*"

The identified streams are likely classified as ephemeral at the higher elevation areas. VET did not observe water in the mapped or observed stream features. However, some of the stream features observed exhibited characteristics of jurisdictional streams, such as evidence of bed and bank. As the drainage features travel down slope the features may exhibit flow absent precipitation due to groundwater and karst influences. The stream features observed may be associated with the potential karst features observed at the Site. VET recommends conducting a formal jurisdictional waters delineation to determine the regulatory status of all water features on-Site.

4.3 Wetlands

One mapped wetland was identified during the desktop reconnaissance in the approximate central portion of the southern Site boundary. The NWI-mapped wetland feature was field verified during Site Reconnaissance. VET observed hydrophytic vegetation and wetland hydrology in several areas that could constitute regulated wetlands, indicated on **Exhibit 4**. A dominance of hydrophytic vegetation is indicative of presence of soil saturation at or near the surface during the growing season and is one of the three indicators of wetlands. Wetland hydrology refers to the timing and extent of flooding or soil saturation and is another of the three indicators of wetlands. Wetland hydrology characteristics observed at the Site

included concave topographic depressions and incidental surface soil cracks. Based on VET's experience, the additional wetland features are likely fringe wetland features bordering stream features, and emergent wetlands in areas impacted by apparent historic grading and cut and fill activities.

Isolated pockets dominated by hydrophytic vegetation are likely indicative of areas where topsoil was harvested changing the drainage qualities of the soils allowing water to pool for extended periods of time during the growing season. Isolated incidences of surface soil cracks are likely associated with access along the utility easements by heavy equipment decreasing the drainage qualities of the soil and resulting in prolonged inundation of the access paths.

Wetlands are regulated by IDEM and the USACE as they provide filtration, flood storage, and habitat. Construction in wetlands is typically subject to permitting requirements and/or compensatory mitigation. In VET's experience, wetland area published by NWI is typically less extensive than wetlands identified by formal field delineation methodology. VET recommends conducting a formal wetland delineation of the Site during the growing season to determine the presence or absence of regulated wetlands.

4.4 Karst Features

IndianaMap identified six karst features on-Site. Two features are located on Parcel #3, and four features are located on the northeastern portion of Parcel #1 **(Exhibit 4)**. VET observed karst features at the Site that were not identified by IndianaMap. Karst sinkholes were observed on the northwestern and northeastern wooded portions of the Site **(Exhibit 4)**. The sinkholes observed on the northwestern portion of the Site may be associated with a compound sinkhole. Sinkholes mapped and observed on the northeastern portion of the Site are coincident with former quarry operations and appear to be filled with limestone blocks.

Monroe County Ordinance, Chapter 829: Karst and Sinkhole Development Standards contains detailed requirements regarding sinkhole evaluations and sinkhole conservation areas (SCAs). VET recommends performing a formal sinkhole evaluation in accordance with Monroe County Ordinance 829-4(A). A copy of the ordinance is included as **Attachment 5**. Additionally, VET recommends having an environmental professional on-call for consultation during grading and construction in the event that additional karst features are identified.

4.5 Wells

No wells were identified on-Site during the desktop reconnaissance or the field reconnaissance. If a well is identified during development activities, it should be protected as the well may serve as a conduit to the subsurface water bearing zone. Subsequent to discovery, the well should be adequately restored or properly abandoned.

5.0 CONCLUSIONS

VET performed a desktop reconnaissance coupled with a field reconnaissance to identify obstacles that may impede development of the Site. VET identified potentially regulated wetlands and potentially jurisdictional streams on-Site. VET recommends conducting a formal wetland delineation and jurisdictional waterways determination prior to development of the Site as permitting and compensatory mitigation may be required through USACE and/or IDEM. VET recommends following the Nationwide

Standard for Conservation Measures to ensure minimal damage to potential habitats or breeding grounds due to the species potentially affected by the proposed project. VET recommends conducting a formal sinkhole evaluation and establishing SCAs as necessary to protect karst features.

If you have any questions or concerns regarding this report, please do not hesitate to contact VET at (812) 822-0400.

Respectfully submitted,

Sara R. Hamidovic, MS, PE, CHMM, CPESC
Principal Engineer, President/CEO

6.0 REFERENCES

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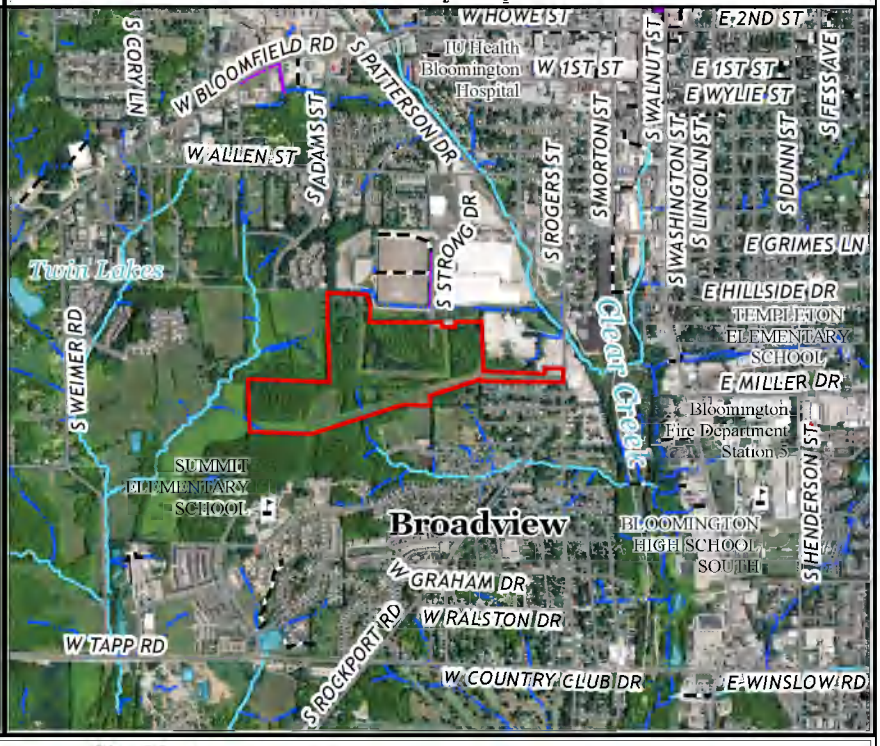
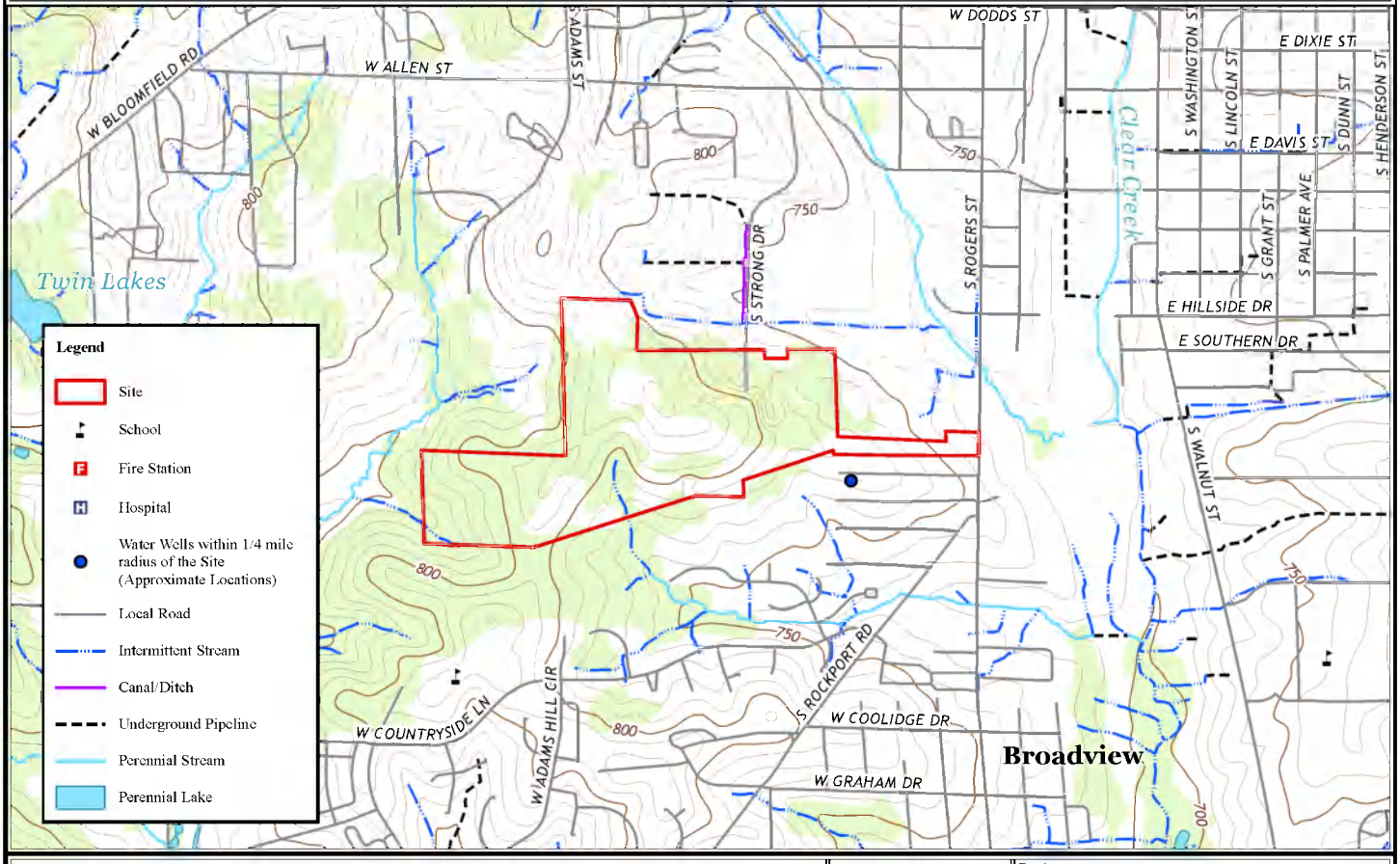
EXHIBITS

State Map

Vicinity Map



Site Map



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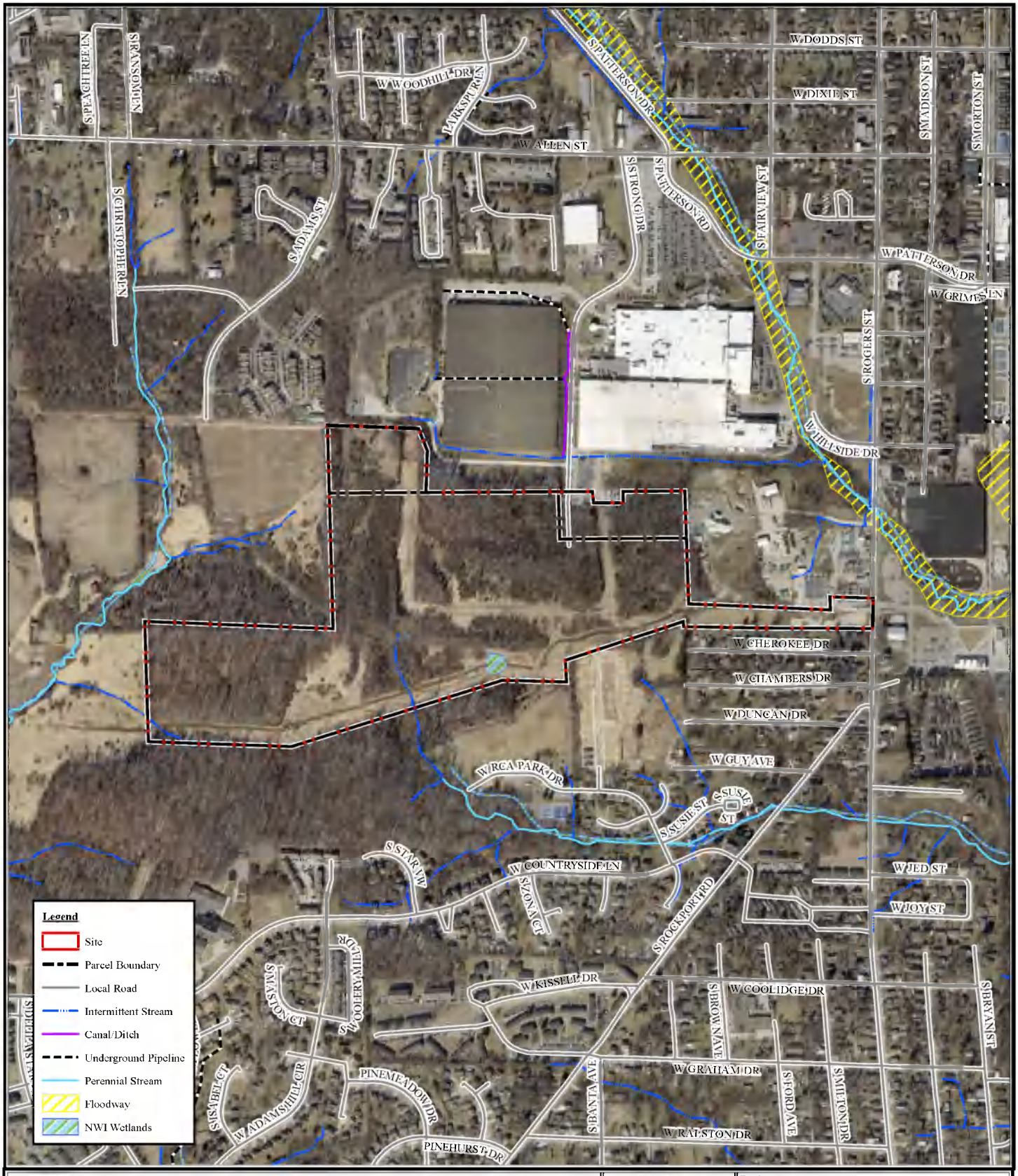
N

1 " = 1,500 '

0 360 720 1,080 Feet

Project:	Rockport - Monroe County Commissioners Site Reconnaissance
VET Project No.:	23-258
NPDES Permit No.:	N/A
Date:	9/15/2023
Exhibit:	1
Drawn By:	EMT
Notes:	Water wells shown: 1 in 1/4 mile radius of Subject Property

Title:	Area Map
Location:	North of South Rockport Road & West of South Rogers Street Bloomington, Indiana 47403 Monroe County
Data Sources:	Indiana Census TIGER 2000 and IGS Counties, 2014 NAIP Imagery, 2019 USGS TNM Topo Indiana Bloomington 7.5'



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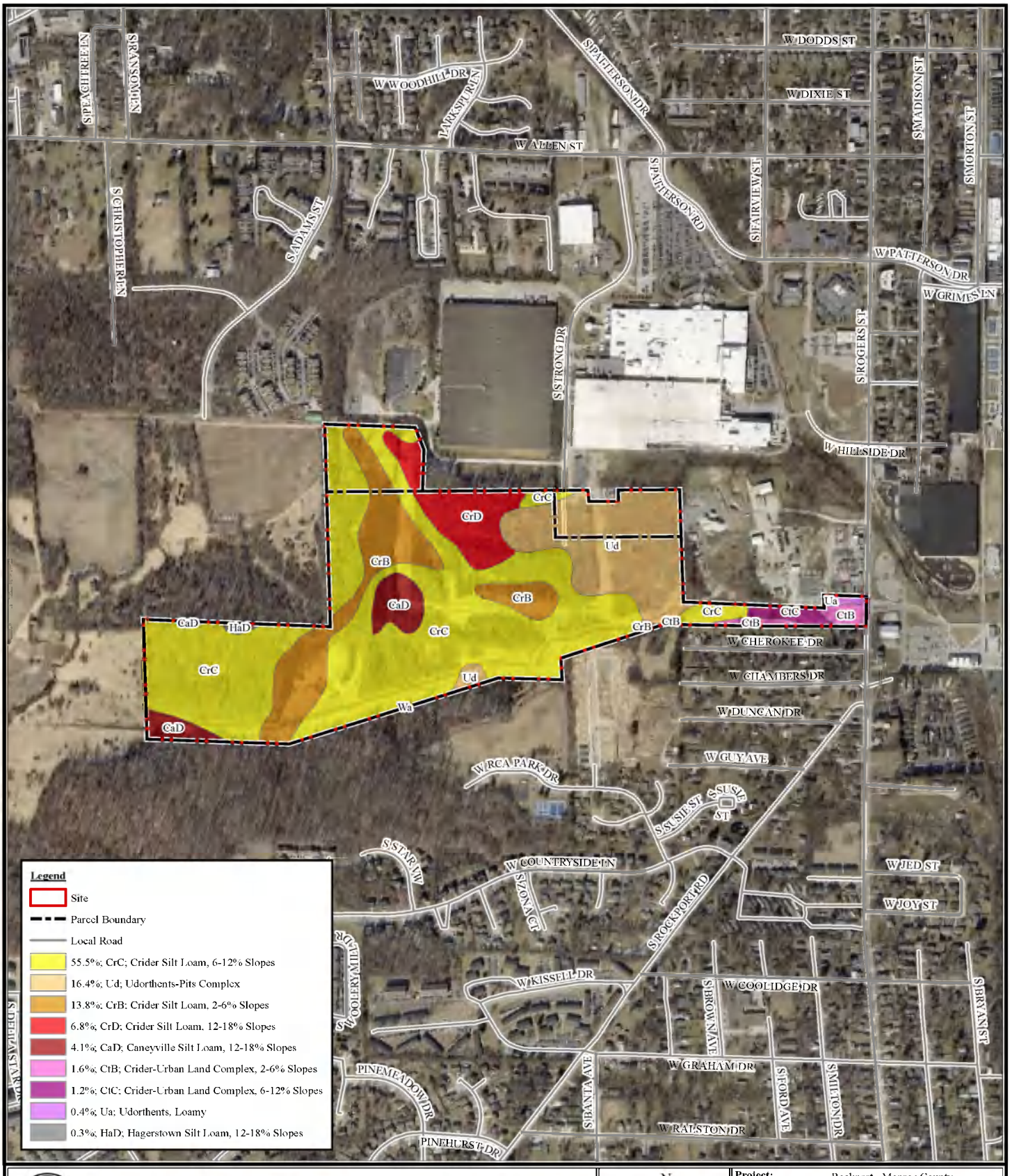
N

1 " = 833 '

0 190 380 570 Feet

Project:	Rockport - Monroe County Commissioners Site Reconnaissance
VET Project No.:	23-258
NPDES Permit No.:	N/A
Date:	9/15/2023
Exhibit:	2
Drawn By:	EMT
Notes:	Intermittent Stream & NWI Wetland Reported On Site

Title:	Parcel Map
Location:	North of South Rockport Road & West of South Rogers Street Bloomington, Indiana 47403 Monroe County
Data Sources:	2022 Elevate Imagery, 2019 USGS TNM Topo Indiana Bloomington 7.5'



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N

1 " = 833 '

0 200 400 600 Feet

Project:	Rockport - Monroe County Commissioners Site Reconnaissance
VET Project No.:	23-258
NPDES Permit No.:	N/A
Date:	9/15/2023
Exhibit:	3
Drawn By:	EMT
Notes:	Hydric Soils Not Reported On Site

Title:	Soils Map
Location:	North of South Rockport Road & West of South Rogers Street Bloomington, Indiana 47403 Monroe County
Data Sources:	2022 Elevate Imagery, 2016 USDA WSS Soils, 2019 USGS TNM Topo Indiana Bloomington 7.5'

VET Environmental Engineering, LLC

2335 W. Fountain Drive
Bloomington, IN 47404
Phone: (812) 822-0400
www.vet-env.com

Title: Subject Property & Adjoining Properties Map	**Location:** North of South Rockport Road & West of South Rogers Street Bloomington, Indiana 47403 Monroe County
Data Sources: 2022 Elevate Imagery, 2019 USGS TNM Topo Indiana Bloomington 7.5'	

Project:	Rockport - Monroe County Commissioners Site Reconnaissance
VET Project No.:	23-258
NPDES Permit No.:	N/A
Date:	9/21/2023
Exhibit:	4
Drawn By:	EMT
Notes:	N/A

ATTACHMENT 1

Site Reconnaissance Photographs
South Rockport Road and South Rogers Street, Bloomington, Indiana

Photo 1: Utility easement and intermittent stream crossing; View to the west

Photo 2: Footpath leading from penetrated fence on southern boundary; View to the south

Photo 3: Limestone outcropping in clearing on south central portion of Site; View to the northeast

Photo 4: Trash pile in western wooded area; View to the southeast

Site Reconnaissance Photographs
South Rockport Road and South Rogers Street, Bloomington, Indiana

Photo 5: Location of mapped wetland feature on southern Site boundary; View to the southeast

Photo 6: Suspected jurisdictional stream in western wooded area; View to the west

Photo 7: Limestone blocks in location of former quarry on northern Site boundary; View to the east

Photo 8: Limestone blocks in sinkhole area on northeastern portion of Site; View to the north

ATTACHMENT 2

Division of Nature Preserves
402 W. Washington St., Rm W267
Indianapolis, IN 46204-2739

September 21, 2023

Elizabeth Grubb
VET Environmental Engineering, LLC
2335 West Fountain Drive
Bloomington, IN 47404

Dear Elizabeth Grubb:

I am responding to your request for information on the threatened or endangered (T&E) species, high quality natural communities, and natural areas for the Rockport Site Reconnaissance located within Monroe County, Indiana. The Indiana Natural Heritage Data Center has been checked and included you will find a datasheet with information on the T&E species documented within 0.5 mile of the project area.

Adjacent to the project site is the RCA Community Park which is a property that is owned and managed by the City of Bloomington Parks & Recreation Department. For more information concerning this property and any further coordination, contact Bloomington Parks & Recreation (812)349-3700.

The T&E insect occurrences are historical and do not occur precisely at the project site. Therefore, if project activities are limited to only within the proposed project area, no impacts are expected on these occurrences.

If you need a review of the impacts to the animal species mentioned or a general environmental review, you can submit the project information (description, location map, and copy of this letter) to the DNR Division of Fish and Wildlife Environmental Coordinator, at environmentalreview@dnr.in.gov (preferred), or send to the street address below.

Department of Natural Resources
Environmental Review
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, IN 46204

The information I am providing does not preclude the requirement for further consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act of 1973. If you have concerns about potential Endangered Species Act issues you should contact the Service at their Bloomington, Indiana office.

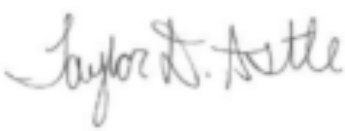
U.S. Fish and Wildlife Service
620 South Walker Street
Bloomington, Indiana 47403-2121
(812)334-4261

Please note that the Indiana Natural Heritage Data Center relies on the observations of many individuals for our data. In most cases, the information is not the result of comprehensive field surveys conducted at particular sites. Therefore, our statement that there are no documented significant natural features at a site should not be interpreted to mean that the site does not support special plants or animals.

Due to the dynamic nature and sensitivity of the data, this information should not be used for any project other than that for which it was originally intended. It may be necessary for you to request updated material from us in order to base your planning decisions on the most current information.

Thank you for contacting the Indiana Natural Heritage Data Center. You may reach me at (317)233-2558 if you have any questions or need additional information.

Sincerely,



Taylor Davis Astle
Indiana Natural Heritage Data Center

Enclosure: datasheet

September 21, 2023

INDIANA HERITAGE DATA WITHIN 0.5 MILE OF:

Rockport Site Reconnaissance, Monroe County

Sci. Name	Com. Name	State	Fed.	Date	Site
Bird					
Accipiter striatus	Sharp-shinned Hawk	SSC		1989	S SIDE OF BLOOMINGTON
Insect Coleoptera					
Nicrophorus americanus	American Burying Beetle	SX	E	1906	BLOOMINGTON
Insect Tricoptera					
Agapetus gelbae	An Agapetus Caddisfly	ST		1946	TWIN LAKES SPRING
Goera stylata	A Northern Casemaker Caddisfly	SE		1947	TWIN LAKES SPRING
Reptile					
Thamnophis proximus proximus	western ribbon snake	SSC		0	BLOOMINGTON

Fed: E = Federal endangered; T = Federal threatened; C = Federal candidate species

State: SE = State endangered; ST= State threatened; SR = State rare; SSC = State species of special concern; SG = State significant; no rank - not ranked but tracked to monitor status

ATTACHMENT 3

NATIONWIDE STANDARD CONSERVATION MEASURES

Listed below are effective measures that should be employed at all project development sites nationwide with the goal of reducing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures may be updated through time. We recommend checking the Conservation Measures website regularly for the most up-to-date list.

1. General Measures

a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the Service webpage on Regulations and Policies for more information on regulations that protect migratory birds.

b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit.
   i. See the Service Nest Destruction Policy

c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit. Please visit the Service permits page for more information on permits and permit applications.

d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the EPA Non-Hazardous Waste website.

e. Report any incidental take of a migratory bird, to the local Service Office of Law Enforcement.

f. Consult and follow applicable Service industry guidance.

2. Habitat Protection

a. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).

b. Consult all local, State, and Federal regulations for the development of an appropriate buffer distance between development site and any wetland or waterway. For more information on wetland protection regulations see the Clean Water Act sections 401 and 404.

c. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).

d. Implement standard soil erosion and dust control measures. For example:
   i. Establish vegetation cover to stabilize soil
   ii. Use erosion blankets to prevent soil loss
   iii. Water bare soil to prevent wind erosion and dust issues

3. Stressor Management

Stressor: Vegetation Removal

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Conservation Measure 1: Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local bird species; or, contact local Service Migratory Bird Program Office for breeding bird information.

Conservation Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

1) Generally, the surveys should be conducted no more than five days prior to scheduled activity.
2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.
3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged or the nest fails or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional Service office.
4) When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly, or in part, until the fence is satisfactorily repaired.
5) When establishing a buffer zone, a qualified biologist will be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.
6) If establishing a buffer zone is not feasible, contact the Service for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. Active nests may only be removed if you receive a permit from your local Migratory Bird Permit Office. A permit may authorize active nest removal by a qualified biologist with bird handling experience or by a permitted bird rehabilitator.

Conservation Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

Stressor: Invasive Species Introduction
Conservation Goal: Prevent the introduction of invasive plants.

Conservation Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.

Conservation Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Conservation Measure 3: Consider creating vehicle wash stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Conservation Measure 4: Remove invasive/exotic species that pose an attractive nuisance to migratory birds.

Stressor: Artificial Lighting
Conservation Goal: Prevent increase in lighting of native habitats during the bird breeding season.

Conservation Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.

Conservation Measure 2: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low intensity energy saving lighting (e.g. low pressure sodium lamps) will be used.

Conservation Measure 3: Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.

Conservation Measure 5: Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps should *not* be used.

Stressor: Human Disturbance
Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.

Conservation Measure 1: Restrict unauthorized access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

Stressor: Collision

Conservation Goal: Minimize collision risk with project infrastructure and vehicles.

Conservation Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility through appropriate marking and design features (e.g., lighting, wire marking, etc.).

Conservation Measure 2: On bridge crossing areas with adjacent riparian, beach, estuary, or other bird habitat, use fencing or metal bridge poles (Sebastian Poles) that extend to the height of the tallest vehicles that will use the structure.

Conservation Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging road kill on the roadway.

Conservation Measure 4: Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.

Conservation Measure 5: Avoid planting "desirable" fruited or preferred nesting vegetation in medians or Rights of Way.

Conservation Measure 6: Eliminate use of steady burning lights on tall structures (e.g., >200 ft).

Stressor: Entrapment

Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nesting in project areas that may endanger them.

Conservation Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch
2. Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.
3. Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.

Conservation Measure 2: Use the appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally , between April and August, depending on the geographic location), potential nesting

surfaces should be monitored at least once every three days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.

2. If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.

Stressor: Noise

Conservation Goal: Prevent the increase in noise above ambient levels during the nesting bird breeding season.

Conservation Measure 1: Minimize an increase in noise above ambient levels during project construction by installing temporary structural barriers such as sand bags

Conservation Measure 2: Avoid permanent additions to ambient noise levels from the proposed project by using baffle boxes or sound walls.

Stressor: Chemical Contamination

Conservation Goal: Prevent the introduction of chemicals contaminants into the environment.

Conservation Measure 1: Avoid chemical contamination of the project area by implementing a Hazardous Materials Plan. For more information on hazardous waste and how to properly manage hazardous waste, see the EPA Hazardous Waste website.

Conservation Measure 2: Avoid soil contamination by using drip pans underneath equipment and containment zones at construction sites and when refueling vehicles or equipment.

Conservation Measure 3: Avoid contaminating natural aquatic and wetland systems with runoff by limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas.

Conservation Measure 4: Any use of pesticides or rodenticides shall comply with the applicable Federal and State laws.

1. Choose non-chemical alternatives when appropriate
2. Pesticides shall be used only in accordance with their registered uses and in accordance with the manufacturer's instructions to limit access to non-target species.

3. For general measures to reducing wildlife exposure to pesticides, see EPA's Pesticides: Environmental Effects website.

Stressor: Fire

Conservation Goal: Minimize fire potential from project-related activities.

Conservation Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use spark arrestors on power equipment, avoid driving vehicles off road).

Conservation Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with a palate of low-growing, sparse, fire resistant native species that meet with the approval of the County Fire Department and local FWS Office.

ATTACHMENT 4

1949 Aerial Photograph

Image: Indiana Spatial Data Portal

1961 Aerial Photograph

Image: Indiana Spatial Data Portal

1967 Aerial Photograph

Image: Indiana Spatial Data Portal

1972 Aerial Photograph

Image: Indiana Spatial Data Portal

1975 Aerial Photograph

Image: Indiana Spatial Data Portal

1999 Aerial Photograph

Image: United States Geological Survey, Google Earth

2003 Aerial Photograph

Image: Google Earth

2005 Aerial Photograph

Image: IndianaMap Framework Data, Google Earth

2006 Aerial Photograph

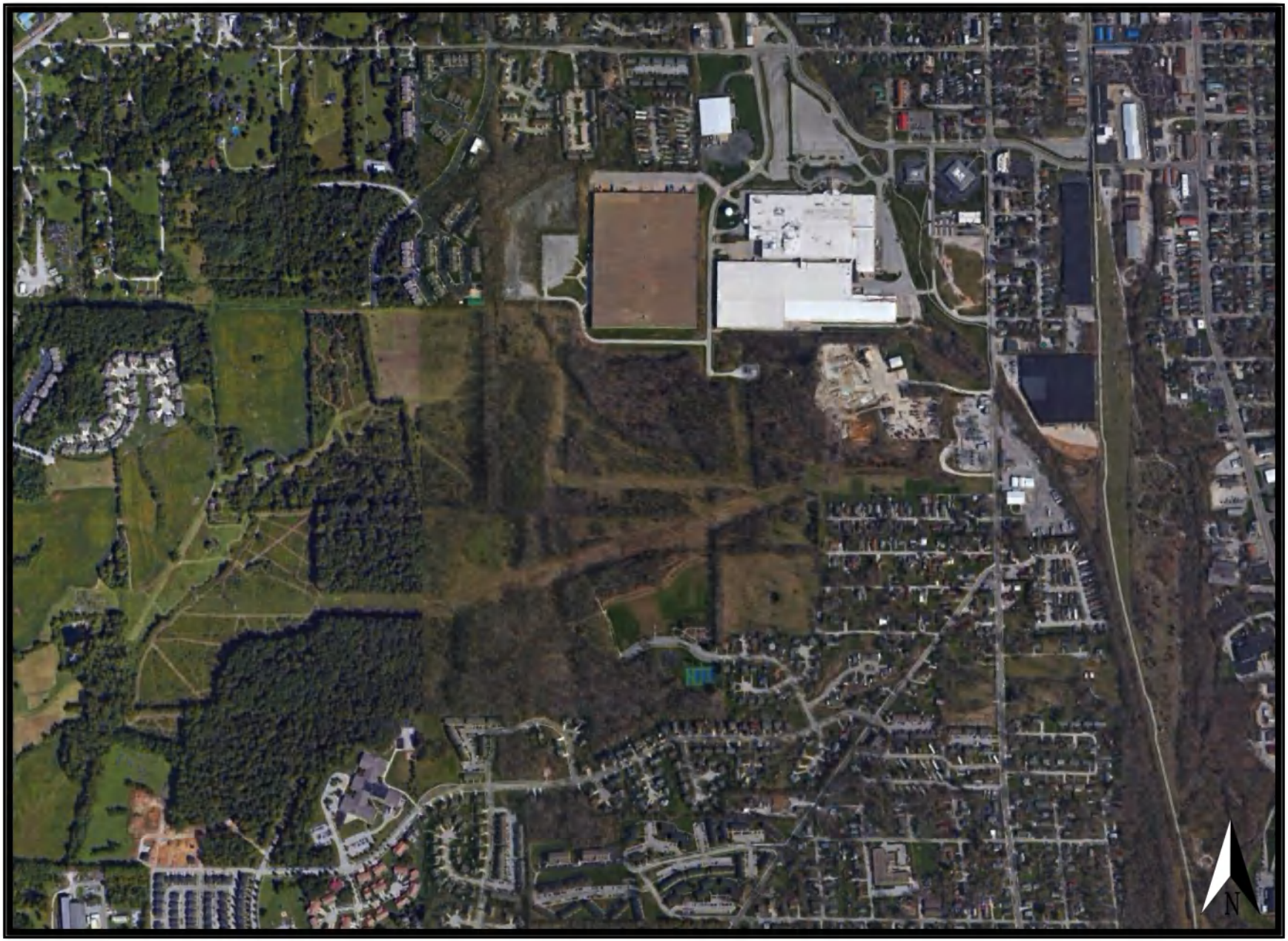
Image: United States Department of Agriculture, Google Earth

2008 Aerial Photograph

Image: United States Department of Agriculture, Google Earth

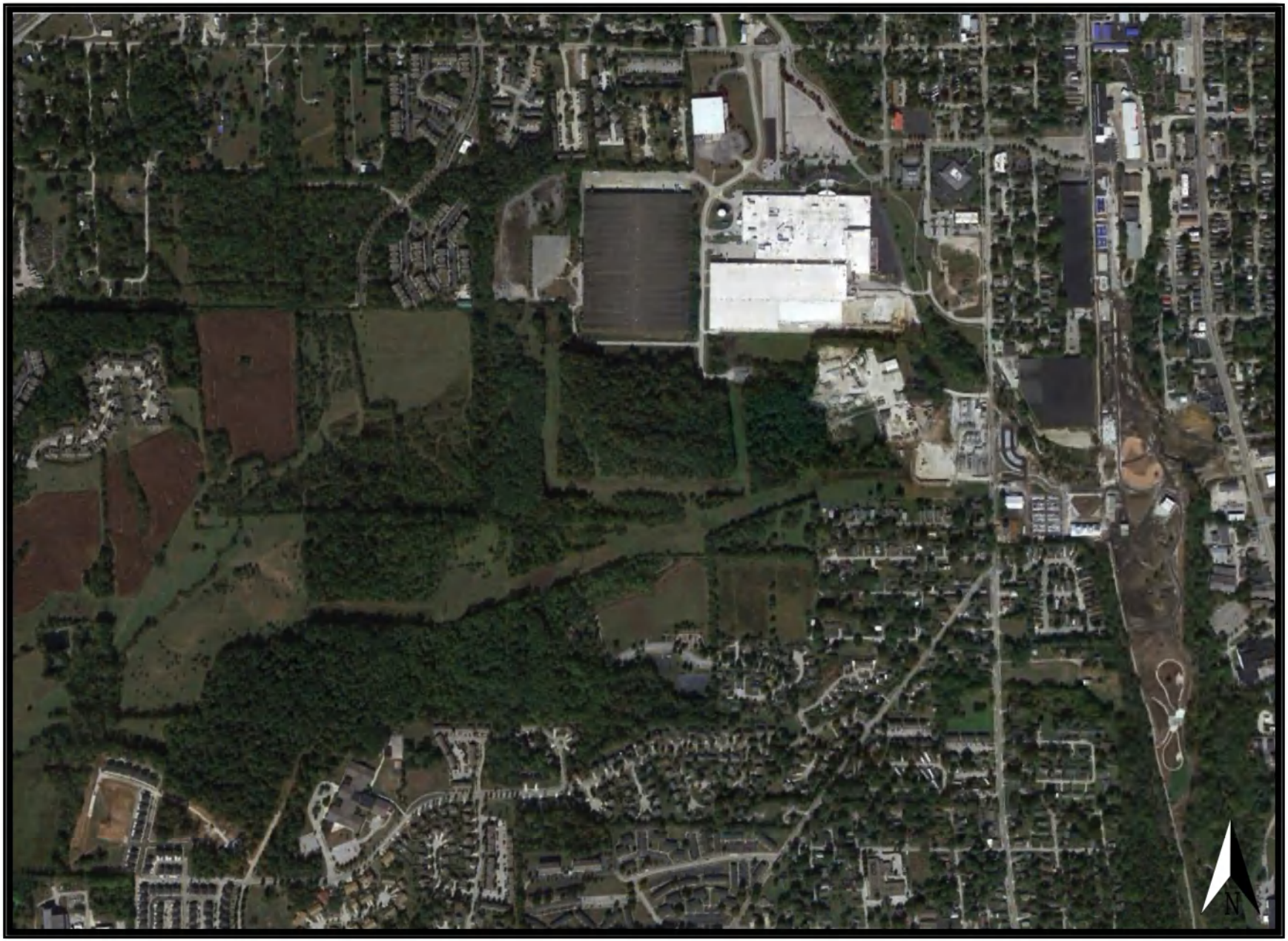
2015 Aerial Photograph

Image: United States Department of Agriculture



2016 Aerial Photograph

Image: Maxar Technologies, Google Earth



2019 Aerial Photograph

Image: Google Earth

2022 Aerial Photograph

Image: Google Earth

ATTACHMENT 5

CHAPTER 829

ZONING ORDINANCE: KARST AND SINKHOLE DEVELOPMENT STANDARDS

829-1. Purpose and Intent

The purpose of this chapter is to establish review procedures, use limitations, design standards and performance standards applicable to site developments that encompass or affect sinkholes or other karst features. The intent of this chapter is to protect the public health, safety and welfare by requiring the development and use of environmentally constrained areas to proceed in a manner that promotes safe and appropriate storm water management and ground water quality.

829-2. Policy

Unless expressly stated otherwise or contrary to context, the provisions of this chapter shall be interpreted and applied in accordance with the following policies:

(A) Development in areas that encompass or affect sinkholes or other karst features (i.e., in "sinkhole areas") is prohibited unless expressly permitted by this chapter or until it is demonstrated that the development would have no significant detrimental impact on storm water management or ground water quality.

(B) Potential impacts on storm water management and ground water quality must be identified, assessed and addressed through written studies at the earliest stages of the development approval process (e.g., during the preliminary plat, development plan or site plan approval stages).

(C) The extent and sophistication of any required study should directly reflect the nature and complexity of the proposed development and of the development site (e.g., the more complex the karst features, the more extensive and sophisticated the study).

(D) All applicable Federal, State and Local permits shall be obtained prior to construction.

829-3. Development Requirements

(A) This chapter shall apply to all public, private and institutional land disturbing activities, with the following exception:

(1) Logging, mineral extraction, and agricultural uses.

(a) Accessory structures and roadways used for mineral extraction uses shall comply with the Ordinance if there is an anticipated impact on any adjacent property;

(b) Accessory structures and roadways used for logging and agricultural uses shall comply with the Ordinance; and,

(c) The above notwithstanding, the filling or plugging of a sinkhole with any material (e.g. earthen, manmade, animal or vegetable) in a way that adversely affects stormwater management or groundwater quality is prohibited.

(B) Any report, study, plan, calculation or proposal required by this chapter shall be provided by the petitioner at the petitioner's cost.

(C) Sinkhole conservancy areas (SCA) shall be established to the following minimum standards in all sinkhole areas subject to the sinkhole evaluation requirement of Section 829-4:

(1) For sinkholes less than or equal to one quarter (0.25) acre in area, the SCA shall, at a minimum, encompass the entire sinkhole and all of the area within twenty-five (25) feet of the sinkhole rim.

(2) For all sinkholes greater than one quarter (0.25) acre in size, the SCA shall, at a minimum, encompass all of the area within fifty (50) feet of the post-development sinkhole flooding area as determined in 829-6 or all of the area within twenty-five (25) feet of the sinkhole rim, whichever is less.

(3) For compound sinkholes, the SCA shall be established in accordance with parts (1) and (2) above for each component sinkhole and for the compound sinkhole. For example, if the compound sinkhole is greater than one quarter (0.25) acre in area, the SCA shall comply with part (2). The SCA for sinkholes that are less than one quarter (0.25) acre in area and that are within the compound sinkhole must comply with part (1). It is possible that areas within the rim of a compound sinkhole will not be subject to a SCA.

If a SCA is required to be established on a parcel that was not, or will not be created by recorded plat, a legal description of the SCA shall be included on the recorded deed of the parcel.

(D) Setbacks and Use Restrictions. The following setbacks and use restrictions are established.

(1) No new construction of any of the following shall be permitted within the SCA:

(a) Commercial or industrial structures;

(b) Private drives, streets, and highways unless the County Highway Engineer and Drainage Engineer conclude that traffic safety

considerations outweigh stormwater and water quality considerations;

(c) Storage yards or parking lots for materials, vehicles and equipment;

(d) Residential structures and accessory structures;

(e) Public, semi-public and office facilities;

(f) Swimming pools and other amusement and recreational services unless expressly permitted; and/or

(g) Stormwater detention features that have not been approved by the drainage board.

(2) Construction of the following shall not be permitted within twenty-five (25) feet of the sinkhole rim regardless of size of sinkhole:

(a) structures for storage of hazardous material(s); and/or

(b) any structure associated with a use allowed in Light Industrial (LI) or Heavy Industrial (HI) zones.

(3) Residential, commercial, and industrial structures and public, semi-public and office facilities shall not be constructed within the sinkhole rim unless the lowest floor elevation is a minimum of five (5) feet above the sinkhole flooding elevation, or one (1) foot above the lowest elevation on the sinkhole rim, whichever is less, and provided that a statement of a registered professional engineer or geologist is submitted to the Administrator (see definitions Chapter 801) indicating that foundation conditions are suitable for such structures.

(4) Individual Wastewater Systems

(a) Septic tanks shall not be located within the SCA.

(b) Septic Disposal Fields or wastewater stabilization ponds (lagoons) shall not be located within twenty-five (25) feet of the SCA.

(5) Pesticides and fertilizers may be used in sinkhole areas only in accordance with the rules and regulations of the State of Indiana Pesticide Review Board and with industry standards.

(6) Operation of heavy construction equipment is prohibited in the SCA unless:

(a) it is demonstrated to the Administrator that the operation of such equipment is necessary to prevent clear and imminent danger to persons and property;

(b) the operation of such equipment is necessary to implement a drainage and/or erosion control plan approved by the Drainage Board; and/or

(c) if the operation of such equipment is required for the removal of material from a previously filled sinkhole.

(7) Underground utility lines, equipment and facilities shall be installed in a manner that does not disturb a sinkhole eye or disrupt the natural pattern of storm runoff into the sinkhole. Sanitary sewer lines installed within a SCA shall be water grade pipe.

(8) Recreational facilities such as unpaved hiking, jogging, and bicycling trails, playgrounds, and exercise courses, are permitted within the SCA.

(9) Golf courses and grass playing fields are permitted within the SCA subject to approval of a Management Plan for use of pesticides and fertilizers by the Administrator.

(10) Clearing and pruning of trees as well as understory, and limited grubbing of roots is permitted within the SCA provided that equivalent or improved protective living vegetative ground cover is maintained.

(11) Landscaping and minor gardening is permitted in the SCA provided erosion and sediment discharge is limited through use of minimum tillage and mulches. Normal yard and landscaping maintenance is permitted.

(12) Construction of light incidental landscaping and recreational structures (such as gazebos, playground equipment, etc.), is permitted in the SCA but not within the sinkhole eye. Such structures may not be placed within a SCA on excavated foundations or concrete pads but may be placed on small concrete post-hole foundations.

The above notwithstanding, no land disturbing activity may occur within a SCA if that development, construction or use is determined by the Administrator to violate the intent of this chapter.

(E) Newly formed or pre-existing sinkholes that become active in a way that causes an immediate threat to nearby structures, roadways, persons, and/or property may be stabilized and filled provided existing drainage patterns are not changed. This subsection authorizes conditional, emergency action to remediate a hazardous condition. However, within thirty (30) days of the action, the person responsible for taking the action shall submit a report to the Administrator detailing the actions used to stabilize and/or fill the sinkhole. The report shall be reviewed by

the County Drainage Engineer and County Surveyor to determine whether existing drainage patterns were changed by the action. If the Engineer and Surveyor find that existing drainage patterns were changed, the person responsible for the action shall promptly take all measures necessary to restore the drainage patterns and to otherwise comply with this Chapter.

(F) Stormwater Detention in Sinkholes. The Administrator, upon the Drainage Board's recommendation, may waive detention requirements to allow increased runoff into sinkholes and may authorize excavation within a sinkhole flooding area in order to provide additional water detention storage, upon finding that:

(1) the flooding concerns expressed through Section 829-6 will be satisfactorily addressed;

(2) there are no other areas on the site suitable for detention; and

(3) there will be no significant impact on the karst system or upon water quality.

In cases where concentrated runoff is directed to sinkholes, temporary and permanent erosion control measures, as detailed in a plan approved by the Administrator shall be implemented to prevent channel erosion.

(G) Modification of Sinkholes to Increase Outflow Rates. Increasing outflow rates of sinkholes by excavating the sinkhole eye or installing disposal wells for diverting surface runoff to the groundwater system is prohibited, unless:

(1) it is demonstrated to the satisfaction of the Administrator and/or the Drainage Engineer that such an action is necessary to safeguard persons or property from clear and imminent danger; or

(2) such an action is required to implement a drainage and/or erosion control plan that was approved by the Administrator.

(H) Altered Sinkholes. Filling or altering of sinkholes without an improvement location permit constitutes a zoning violation. In the event, corrective measures must be taken. No corrective or remedial measures shall be undertaken until a remediation plan has been approved by all relevant County entities or representatives and the Administrator has issued an improvement location permit for the plan. No building permits will be issued, or zoning or subdivision approvals granted until the remedial measures specified in the improvement location permit have been completed and approved.

(I) Airport Evaluation. With respect to all land owned, used and/or held by the Monroe County Board of Aviation Commissioners (BAC) for airport purposes, a Section 829-4 sinkhole evaluation (Airport Evaluation) may be made for the entire property (Airport Property). If made for the entire Airport Property, the Airport Evaluation shall be submitted to the Administrator, the Monroe County Drainage Board and the Monroe County Plan Commission for their review.

Upon a finding of compliance with this chapter and with other relevant County Code chapters, the foregoing entities shall approve the Airport Evaluation.

(1) All future development, construction and land disturbing activities (Development Activities) at the Airport Property shall be:

(a) Consistent with the approved Airport Evaluation;

(b) Remedial actions suggested by the Airport Evaluation and required as a part of the Airport Evaluation approval may be implemented at one time or may be implemented in phases in conjunction with future Development Activities; and,

(c) For each proposed Development Activity, BAC shall seek site plan approval and, in connection with that process, shall submit for review and approval that portion of the Airport Evaluation relevant to the proposed Development Activities.

(2) The original Airport Evaluation shall remain in full force and effect for a period of five (5) years from the date it is approved by the County Planning Commission. During that period of time, Development Activities at the Airport Property are subject to the approved terms and provisions of the Airport Evaluation and to the zoning and drainage regulations in effect on the date the Airport Evaluation was approved.

(3) The Airport Evaluation shall be re-evaluated after a five (5) year period.

(a) The BAC may apply for additional five (5) year extensions without limitation;

(b) Each request for a re-evaluation of the Airport Evaluation shall be reviewed by the Administrator and may be approved administratively, subject to compliance with current law; and,

(c) If the Administrator finds that further extension of the Airport Evaluation is not possible under the Federal, State or County Code regulations in effect at the time of review, the BAC shall be promptly notified and shall be given a period or one (1) year beyond the expiration of the current five (5) year period to bring the Airport Evaluation into compliance with the relevant regulations.

(4) The Airport Evaluation shall be consistent with the Federal and State authorities with respect to Airport Property development requirements.

(a) Federal and State standards and requirements will supersede local standards in the event of a conflict or discrepancy; and

(b) In the event that Federal and/or State standards change during the period Airport Evaluation approval, activities may continue in accordance with such changes until the end of the period for which the Airport Evaluation was approved.

829-4. Sinkhole Evaluation and Plan Requirements

A Sinkhole Evaluation shall be performed for each site subject to this chapter (i.e., sites upon which sinkholes are fully or partially located and/or which drain to sinkholes). A Sinkhole Evaluation shall include the information set forth in subsections A through F of this section.

The following types of developments or sites may be excepted from full compliance with the Sinkhole Evaluation requirements upon the petitioner's request and a finding by the Administrator that significant drainage or water quality impacts will not result from the development or the use of the site:

(1) administrative and minor subdivisions;
(2) lots created greater than 10 acres for agricultural and residential uses; and
(3) existing lots of record for which single-family residential use is proposed.

The above notwithstanding, neither the Administrator nor the Drainage Board may except a development or a site from subsection 829-4 (E). The burden of proof for establishing that there will be no significant impacts shall rest with the petitioner.

(A) A plat or site plan for the proposed subdivision or development, setting forth the following information for each of the enumerated items:

(1) Sinkholes

(a) Location and limits of the area of the sinkhole depression as determined by field surveys or other reliable sources as may be approved by the Administrator. Location of sinkholes based solely upon USGS 7 ½ Minute Series Quadrangle Maps will not be considered sufficient unless field verified by a registered Indiana Surveyor, Engineer, or geologist.

(b) Location and elevation of the sinkhole eye or low point.

(c) Topographic contours at maximum intervals of two (2) feet, and spot elevations sufficient to determine the low point on the sinkhole rim and the profile of the potential overflow areas.

(d) Minimum floor elevations of any existing structures located within the sinkhole rim.

(e) Elevation of any public or private roadway or drive located within or adjacent to the sinkhole.

(2) Flooding limits as determined in Section 829-6.

(3) Water considerations specified in Section 829-7, including, without limitation:

(a) The approximate location of public or private water supply sources such as springs or wells within 500 feet of the site.

(b) Boundaries of any known recharge areas to wells or springs.

(4) Other geologic features: location of caves, springs, faults and fracture trends, geologic mapping units.

(5) Proposed discharge points: the location, type and size of all points at which concentrated discharges of stormwater into the sinkhole are proposed. The drainage area to each point of concentrated discharge shall be delineated on the plan and the size of the drainage area noted.

(6) Existing watercourses which drain into the sinkhole.

(7) All other information required to demonstrate or assess compliance with this chapter, as specified by the Administrator.

(8) The location of the foregoing items with respect to the location of the proposed or existing roads, detention ponds, significant landscaping features, property lines, underground utilities, and other structures.

(B) A drainage area map showing the sinkhole watershed area, and where the site is located in a sinkhole cluster area. This map shall be extended to include, in the watershed area, any sinkholes located downstream of the site which may receive overflow drainage from the site.

(C) Proposed SCA in accordance with Chapter 829-3 (C).

(D) An analysis of the orientation and flow of the sinkhole drainage system, as detailed on the subsection (B) map. The use of dye trace injection testing to produce an accurate mapping of the system may be required by the Administrator when the system drains towards an area that has known flooding problems and for which the flow pattern has not been established through previous dye testing, and when significant increases or decreases in the runoff to sinkholes is expected to result from the proposed development. Significant increases generally occur if the residential density is greater than one lot per two acres (or a commercial development with equivalent impervious surfaces).

(E) The approximate location of karst features must be shown on the final plat based on the best available mapping and/or noted on the deeds if no plat is recorded for the subdivision.

(F) All other information deemed necessary by the Administrator.

829-5. Permit Requirement

No person or persons shall engage in the grading of land or modification of a sinkhole within the SCA or the area that would be covered by a SCA as described in 829-3 (C) without first securing an improvement location permit from the Administrator .

(A) The owner of the property or person having an interest therein shall submit an application for a permit to the Administrator along with the sinkhole evaluation required by 829-4. The Administrator shall submit all applications to the County Drainage Engineer for review and comment and may, upon the Drainage Engineer's recommendation, submit an application to the Drainage Board for review and comment.

(B) Upon review of the information presented by the applicant, the site, and other information as may be available, the Administrator may issue a permit for work to be performed in the SCA.

(1) All work shall be performed in accordance with the requirements of the Zoning Ordinance and any conditions of permit approval; and,
(2) The Administrator may designate certain areas where grading or construction equipment is not permitted or is otherwise limited.

(C) Karst-Related Non-Buildable Areas. In addition to establishing a plan for grading and use of construction equipment, the Administrator may, based upon the topography, geology, soils, history of the sinkhole (such as past filling) and the developer's engineer's storm water analysis and plan, establish sinkhole-related non-buildable areas:

(1) No buildings, parking areas, grading or other structures shall be permitted within the sinkhole-related non-buildable area unless otherwise authorized by the Administrator; and

(2) No private drives, streets, and highways shall be permitted within the sinkhole-related non-buildable area unless the County Highway Engineer and Drainage Engineer conclude that traffic safety considerations outweigh stormwater and water quality considerations.

829-6. Flooding Considerations

(A) Sinkhole Flooding Area. Except in cases in which the annual exceedance probability (AEP) of 1% (100 year storm) has been determined in a published

flood insurance study, the sinkhole flooding area shall be determined for each sinkhole for both pre-development and post-development conditions, assuming no subsurface outflow from the sinkhole.

Where the estimated volume of runoff exceeds the volume of the sinkhole depression, the depth, spread and path of overflow shall be estimated using methods established by the Drainage Board and shown on the plan.

The overflow volume shall be included in determining the maximum estimated flooding elevations in the next downstream sinkhole. This analysis shall continue downstream until the lowest sinkhole of the sinkhole cluster is reached or overflow reaches a surface watercourse.

The volume of runoff considered shall be that which results from a rainstorm with a 1% AEP and a duration of forty-eight (48) hours. The runoff volume shall be determined by the method set forth in the Natural Resource Conservation Service's TR-55 Manual.

No further flooding analysis will be required provided that:

(1) The post-development flooding area of any sinkhole which receives drainage from the site is located entirely on the site.

(2) A drainage easement covering the post-development flooding area is provided for any off-site sinkhole or portion of a sinkhole which receives increased peak rates of runoff from the site. If the receiving sinkhole is not contiguous to the site, an easement must also be provided for the waterway which connects the site to the sinkhole.

(3) The minimum floor elevation of any existing structure is at least two (2) feet higher than the estimated flooding elevation from the 1% AEP 48-hour storm.

(4) The increase in volume of runoff from the site does not cause the flooding depth on any existing public road to exceed the maximum depth as determined by the Drainage Board.

(B) Detailed Flooding Analysis. In cases where the conditions set forth in (A) above cannot be met, a detailed flooding analysis will be required if any increase in runoff volume is proposed or expected. As part of the detailed flooding analysis, a runoff model must be made and a reservoir routing analysis performed for the sinkhole watershed using hydrograph techniques as established by the Drainage Board.

(C) The following alternative methods may be proposed and approved, singly or in combination, to keep flooding levels at pre-development levels:

(1) Diversion of Excess Runoff to Surface Watercourses. Where feasible, increased post-development runoff may be diverted to a surface watercourse, provided that

(a) Any increase in peak runoff rate in the receiving watercourse does not create or worsen existing flooding problems downstream; and

(b) The diverted storm water remains in the same surface watershed.

Storm sewers, open channels and other appurtenances provided for diversions shall be designed in accordance with applicable sections of these Design Criteria.

The effect of diverted water on downstream watercourses and developments, and requirements for additional detention facilities prior to release of runoff to the surface watercourse shall be determined as established by the Drainage Board.

(2) Storage of Excess Runoff within the Sinkhole Watershed. If consistent with the intent of this chapter, detention facilities may be constructed within the sinkhole watershed or the area of the sinkhole outside of the sinkhole flooding area as determined for post-development conditions.

(D) The flooding considerations set forth in this section are designed and are intended to ensure that:

(1) Inflow rates to the sinkhole are maintained at or below pre-development values; and

(2) Sediment and erosion control and water quality considerations set forth in this chapter can be satisfied.

829-7. Water Quality Considerations

Because sinkholes provide direct recharge routes to groundwater, water quality in wells, caves, and springs may be affected by discharge of runoff from developed sinkhole areas. Consequently, and as more fully specified in subsections A through D below, the Sinkhole Evaluation must address potential impacts of proposed development on receiving groundwaters and must propose water quality management measures to mitigate such impacts.

(A) Receiving Groundwater Use. The Sinkhole Evaluation Report shall identify whether the site lies within a critical area or a sensitive area based upon the following classifications.

(1) Critical Areas. The following areas are classified as critically sensitive to contamination from runoff and thus, are critical areas for purposes of this chapter:

(a) Areas within 100 feet of private water supply wells.

(b) Areas within 300 feet of public water supply wells.

(c) Areas within 500 feet of springs used for public or private water supply.

(d) Areas within 1000 feet of caves providing habitat to rare or endangered species.

The distances listed above may be extended by the Administrator where the recharge areas for a well, spring, or cave have been determined by studies by a qualified engineer or geologist. The length of the extension may be no greater than necessary to achieve the policies of this chapter.

(2) Sensitive Areas. Sinkhole areas that are not within critical areas are classified as sensitive for groundwater contamination for purposes of this chapter.

(B) Groundwater Contamination Hazard. The relative potential for groundwater contamination shall be classified as low, moderate, or high depending upon the nature of the proposed land use, development density and amount of directly connected impervious area. The Sinkhole Evaluation shall identify whether the proposed development poses a low, moderate, or high hazard to groundwater uses, as defined below:

(1) Low Hazard. The following land uses are classified as posing a relatively low hazard to groundwater contamination:

(a) Residential developments on sewer, provided directly connected impervious areas discharging to the sinkhole are less than or equal to one (1) acre in total area;

(b) Parks and recreation areas;

(c) Low density commercial and office developments, provided directly connected impervious areas discharging to the sinkhole are less than or equal to one (1) acre in total area; and

(d) Discharge from graded areas less than or equal to one (1) acre.

(2) Moderate Hazard. The following land uses are classified as posing a relatively moderate hazard to groundwater contamination:

(a) Concentrated discharge from streets, parking lots, roofs, and other directly connected impervious areas having an area greater than one (1) acre and less than or equal to five (5) acres;

(b) Multifamily residential developments and higher intensity office developments, provided the directly connected impervious areas discharging to the sinkhole are less than or equal to five (5) acres; and

(c) Discharge from graded areas greater than one (1) acre and less than or equal to five (5) acres.

(3) High Hazard. The following land uses are classified as posing a high hazard to groundwater contamination:

(a) Collector and arterial streets and highways;

(b) Railroads;

(c) Concentrated discharge from streets, parking lots, roofs, and other directly connected impervious areas having an area greater than five (5) acres;

(d) Commercial, industrial, and manufacturing areas;

(e) Individual wastewater treatment systems;

(f) Commercial feed lots or poultry operations; and

(g) Discharge from graded areas greater than five (5) acres.

(C) Water Quality Management Measures. The majority of sinkholes drain a limited watershed area. For sinkholes where the surrounding drainage area is small enough that the area draining to the sinkhole flows predominantly as sheet flow, potential impacts on water quality can be addressed in many cases by erecting and maintaining reliable silt control barriers around the sinkhole during construction and providing a vegetative buffer area around the sinkhole to filter out potential contaminants.

When the volume of runoff into the sinkhole increases to the point where flow becomes concentrated surface flow, the degree of effort required to capture and filter out contaminants increases significantly.

Concentrated surface flow occurs naturally when the sinkhole watershed area reaches a sufficient size for watercourses leading into the sinkhole to form. Concentrated surface flow results as urbanization occurs due to construction of roads, storm sewers, and drainage channels. Subsurface flows can become concentrated through utility trenches.

(D) Mitigation of Stormwater Runoff. The following water quality management measures may be used to mitigate the impact of storm water runoff quality. Temporary sediment controls are required for all sites. The other measures listed

may be used singly or in combination as needed based upon the potential groundwater contamination hazard of the proposed development.

(1) Sediment and Erosion Control

(a) Nonconcentrated (sheet) flow: existing ground cover shall not be removed within twenty-five (25) feet of the sinkhole flooding area and a temporary silt barrier shall be erected and maintained around the outer perimeter of the buffer area during the construction period. Vegetative cover must be of sufficient quality and density to provide desired filtration. If existing vegetative cover is sparse, it must be improved to sufficient quality and density to provide the desired filtration.

(b) Concentrated surface and subsurface flow: a sediment basin will be required at each point where concentrated flows are discharged into the sinkhole. Sediment basins shall be designed according to criteria set forth in the *Indiana Handbook for Erosion Control in Developing Areas*. A permanent sediment basin may be required by the Drainage Board in some cases. This requirement shall be based on the watershed area, the disturbance that the proposed project will create, and the availability of suitable sites for a sediment basin.

(2) Minimizing Directly Connected Impervious Area.

(a) The groundwater contamination hazard category for impervious areas may be reduced by reducing the amount of directly connected impervious area. This is the area of roofs, drives, streets, parking lots, etc., which are connected via paved gutters, channels, or storm sewers.

(b) Directly connected impervious areas can be reduced by providing sized grass swales, vegetative filter strips or other Best Management Practices to separate paved areas.

(3) Diversion of Runoff.

(a) Concentrated discharges to sinkholes can be reduced to manageable levels or avoided by diverting runoff from impervious areas away from sinkholes where possible.

(b) Diversions shall be done in a manner that does not increase flooding hazards on downstream properties and, generally, shall not be directed out of the surface watershed in which the sinkhole is located.

(4) Filtration Areas. For areas having a low groundwater contamination hazard and where flow into the sinkhole occurs as sheet flow, water quality requirements can be satisfied by maintaining a permanent

vegetative buffer area with a minimum width of twenty-five (25) feet around the sinkhole flooding area.

(5) Grassed Swales and Channels.

(a) For areas having a low groundwater contamination hazard, concentrated flows from directly connected impervious areas of less than one (1) acre may be discharged into the sinkhole through grassed swales and channels.

(b) Swales and channels shall be designed for non-erosive velocities and appropriate temporary erosion control measures such as sodding or erosion control blankets shall be provided.

(6) Storage and Infiltration. Storage and infiltration basins shall be designed to capture the first one-half (0.5) of an inch of runoff from the tributary drainage area and release the runoff over a minimum period of twenty-four (24) hours. Standard outlet structures for sedimentation and infiltration are shown in the *Indiana Handbook for Erosion Control in Developing Areas*. Storage and infiltration will be required in the following cases:

(a) All areas having a high groundwater contamination hazard.

(b) Areas having a moderate groundwater contamination hazard and where concentrated inflow occurs.

(7) Hazardous and Toxic Materials. Facilities which involve storage or handling of hazardous or toxic materials shall comply with the State of Indiana Department of Environmental Management.

[end of chapter]