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18-0488-EL-BGN

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TO THE OHIO POWER SITING BOARD

JULY 25, 2019

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FROM: PATRICIA J PASKO, 6594 S TOWNSHIP RD 17, TIFFIN, OHIO, SENECA COUNTY, EDEN TOWNSHIP

**REGARDING: 18-0488-EL-BGN: Seneca Wind Farm**

BEING A LIFELONG RESIDENT (OVER 65 YEARS) AND CONTROLLING OVER 1200 ACRES IN THE FOOTPRINT OF THE ABOVE MENTIONED PROJECT AND HAVING ATTENDED THE JULY 23, 2019 PUBLIC HEARING AT THE MARION CENTER, TIFFIN UNIVERSITY, TIFFIN OHIO I FEEL COMPELLED TO AT LEAST WRITE AND STATE MY OBJECTIONS TO THE APPROVAL OF THE APPLICATION TO CONSTRUCT AND OPERATE THE PROPOSED 77 WIND TURBINES IN OUR AREA.

IN 2005 I WAS APPROACHED AND ATTENDED MULTIPLE MEETINGS GIVEN BY JOHN DEERE WIND AND ACTUALLY RECEIVED, REVIEWED, AND DETERMINED NOT TO SIGN THE LEASE OFFERED. AT THAT TIME THE RHETORIC INCLUDED THAT SINCE IT WAS PRESENTED AND WOULD BE MAINTAINED BY A "FRIEND OF THE FARMER AND RURAL COMMUNITIES" I.E. JOHN DEERE, IT WOULD BE ADVANTAGEOUS FOR ALL INVOLVED TO ENTER INTO SAID LEASE. FORTUNATELY FOR MANY REASONS, THE THREE MOST PREVAILING BEING THE ASSIGN ABILITY OF THE LEASE, REQUIREMENTS TO MAINTAIN LIABILITY INSURANCE IF A WIND TURBINE WAS CONSTRUCTED, AND CONCERNS AS TO THE REMOVAL AND RECONDITIONING OF THE LAND WHEN AN INDIVIDUAL TURBINE WAS DISCONTINUED OR WAS IN NEED OF REPAIR. NOW MY EYES HAVE BEEN OPENED TO MANY MORE ALTRUISTIC CONCERNS:

HEALTH – THE UNKNOWN WITH ONGOING RESEARCH SHOWING DETRIMENTAL INDIRECT SIDE EFFECTS CAUSED BY THE ENVIRONMENTAL CHANGES (NOISE, FLICKER, ETC) AND DIRECT BY THE INTERFERENCE OF EMERGENCY MEDI-VAC HELICOPTERS' ABILITY TO LAND. FURTHER THE INDIRECT SIDE EFFECTS ARE UNKNOWN – AS THEY WERE WITH ASBESTOS, LEAD, HERNIA MESH, AND TALCUM POWDER – WHO KNEW. S-POWER IS NOT A MAJOR COMPANY, THERE WOULD BE NO MONIES FROM SETTLEMENTS IF ANY OF THE STUDIES PROVE THESE TURBINES ARE THE CAUSE OF DEATH OR DISABILITY.

DEVALUATION OF REAL ESTATE – FOR OBVIOUS REASONS – NOT MY FARMLAND - BUT OF RESIDENCES IN THE FOOTPRINT. IF THE TESTIMONY WAS TRUE AND CORRECT THERE WILL NOT BE ANY UNAFFECTED SKYLINE. WE ALREADY ARE AT LEAST 1-1/2 HOURS AWAY FROM AIRPORTS SUPPORTING COMMERCIAL AIRLINES, CULTURAL EVENTS, ZOOS, METROPOLITAN MUSEUMS, FINE DINING, ADEQUATE SHOPPING, AND THE LIKE. WE LIVE HERE BECAUSE OF THE QUIET, SCENERY, WILDLIFE, ETC AND TRADED THAT FOR MANY AMENITIES. WE HAVE ALWAYS BEEN PROTECTED BY THE ZONING CODE OR AT LEAST A ZONING CODE THAT ATTEMPTS TO LESSEN THE DISTURBANCES CREATED BY **TRUE** AGRICULTURAL ENTERPRISES. IF YOU WANTED TO ERECT LIVESTOCK FACILITIES THERE ARE MANY ADDITIONAL EXPENSES THAT MUST BE INCURRED TO MEET THESE REQUIREMENTS **WHICH ARE FOR THE PROTECTION OF THE NEIGHBORING PROPERTY OWNERS BENEFIT**. THESE REQUIREMENTS IF NOT ADHERED TO WOULD SHUT YOU DOWN. AROMAS ARE NOW CONTAINED, SPECIAL PERMITS FOR LARGE LIVESTOCK ENTERPRISES MUST BE OBTAINED. YOU HAVE TO OWN OR CONTROL A SPECIFIC NUMBER OF ACRES TO KNIFE IN AMONIA RELATED RESIDUE – THESE THINGS ARE FOR THE BENEFIT OF RESIDENTS IN THE SURROUNDING AREA. AND ALTHOUGH ENERGY IS IMPORTANT, I REFUSE TO BELIEVE IT IS MORE IMPORTANT THAN FOOD TO THE PUBLIC. ACTUAL AGRICULTURAL FACILITIES ARE REGULATED TO LIMIT THE INTERFERENCE TO NEIGHBORING RESIDENTS WHY ARE WIND FARMS ALLOWED TO CHANGE OUR QUALITY OF LIFE?

INTEGRITY OF LAND BEING USED – WE HAVE RECENTLY HAD A MAJOR PIPELINE PROJECT GO THROUGH OUR AREA. THE NORMAL PROBLEMS OCCURRED AND SOME NOT SO NORMAL. THE MOST SURPRISING TO ME WAS THE SINK HOLES THAT OCCURRED AND THAT WAS JUST FROM BORING AND TRENCHING. I DID REMEMBER (HAZY RECOLLECTION) THAT A PORTION OF STATE ROUTE 19 OUTSIDE OF BLOOMVILLE COLLAPSED ONCE AND OF COURSE WE HAVE SENECA CAVERNS AND LONG KNEW OF THE SUPPOSED UNDERGROUND RIVER, SPRINGS, ETC – AM NOT A GEOLOGIST BUT WHEN THE SINK HOLES MANIFESTED THEMSELVES IN AGRICULTURAL FIELDS IN OUR AREA I GOT TO LOOKING AND FOUND THE KARST MAP (COPY ATTACHED) I'M SURE YOU HAVE BEEN MADE AWARE OF THIS ISSUE, AND NO DOUBT ENGINEERS HAVE WRITTEN PROBABILITIES AS TO THESE OUTCOMES AS DID THE PIPELINE. I'VE LIVED THROUGH ENGINEER'S DESIGNS AND PROBABILITIES BEFORE, OK SO THE NEW BRIDGE ON 224 DOESN'T SOLVE THE WATER OVER THE ROAD PROBLEM EVEN THOUGH IT WAS TO BE ENGINEERED FOR THAT SOLE PURPOSE, SO WHAT IF BUILDING THE SEAWALL AT EAST HARBOR STATE PARK TO SOLVE THE SHIFTING SHORELINE MADE IT SO THEY LOST HALF THE BEACH BECAUSE SHORELINES AND WATER DEPTH CHANGE, ETC

PROVING ALL THE ENGINEERING PROBABILITIES IN THE WORLD DON'T ELIMINATE RISK. YOU ONLY APPROVE THIS KIND OF RISK IF THERE IS NO ALTERNATIVE.

EAGLE AND BAT POPULATION – IT HAS JUST BEEN SINCE 2015 THAT WE HAVE HAD EAGLES SITED ON OUR PROPERTY. BAT POPULATION – WITH THE ADVENT OF PESTICIDE REGULATION INSECT POPULATION AND THE DISEASES THEY CARRY HAVE BEEN ON THE RISE, EVEN IF THE BATS ARE NOT ALL KILLED BY THE BLADES THE POPULATION WILL DECREASE AND MOST PROBABLY RELOCATE TO A MORE FAVORABLE TERRITORY.

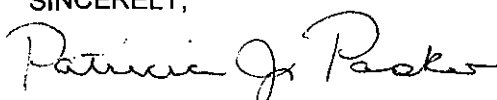
ALTERNATIVE ENERGY SOURCES – SOLAR - THERE HAVE BEEN POSITIVE INROADS IN DESIGNING PANELS THAT COULD AND WILL GENERATE VIABLE ALTERNATIVE ENERGY (I RECEIVE PERIODIC OFFERS TO LEASE OUR PROPERTIES TO SOLAR COMPANIES). A PROJECT OF THAT NATURE WOULD UTILIZE THE TRANSMISSION LINES AND SUBSTATIONS RECENTLY ERECTED, PROVIDE POSITIVE REVENUE FOR THE LOCAL GOVERNMENTS, SCHOOLS, THE STATE OF OHIO, ETC AT A MUCH LESS COST TO OUR INFRASTRUCTURE WITH LESS INCONVENIENCE TO OUR RESIDENTS. YES, WHEN GOING BY THEM THEY ARE AN EYESORE BUT NOT TO EVERYONE WITHIN A FIVE MILE RADIUS. THEY DON'T INTERFERE WITH MIGRATING BIRDS OR HELICOPTERS, DO NOT GIVE OFF NOISE WE CAN'T HEAR THAT IS HARMFUL, DON'T FLICKER OR THROW OFF DEBRIS OR HAVE BLADE SHEAR. COMPONENTS WOULD COME ON LIGHTER SHORTER TRUCKS TO BE ERECTED ONSITE. WHEN IN NEED OF REPAIR IT IS AT GROUND LEVEL SO MORE EASILY FIXED - THEY WOULD GET REPAIR ON A MORE TIMELY BASIS AS LESS EQUIPMENT WOULD BE NEEDED AND WHEN THEY ARE ABANDONED MORE ABLE TO BE DISMANTLED, EVEN TO THE POINT THAT IF THE COMPANY GOES BANKRUPT AND THE BOND DOESN'T COVER THE LAND RECLAMATION, IT COULD BE DONE BY LOCAL ELBOW GREASE AS THEY WOULD NOT BE **600+ FEET TALL OR CONTAIN CONCRETE FOUNDATIONS EXTENDING DOWN GREAT LENGTHS**. FURTHER, AS IMPROVEMENTS ARE MADE TO THE ENGINEERING, PANELS COULD BE MORE EASILY UPDATED. YES, I HAVE BEEN INFORMED THAT THE PRODUCTION OF ELECTRIC VIA THIS METHOD IS MORE COSTLY PER KW THAN WIND (THAT HAS REALLY YET TO BE PROVEN BECAUSE THE LONGEVITY OF THESE INDUSTRIAL TURBINES IS NOT KNOWN OR WHAT COSTS WOULD BE NECESSARY TO DO MAINTENANCE OR IMPROVEMENTS AS TECHNOLOGY CHANGES) BUT EVEN IF IT IS, THE COST WOULD BE BOURNE BY THE USERS EQUALLY. THE SOLAR PROJECTS WOULD NOT BE COURTING LANDOWNERS IN THIS AREA IF IT WERE NOT FEASIBLE TO CREATE ADEQUATE ELECTRICITY TO BE PROFITABLE. IN FACT, IT IS POSSIBLE IF THIS WIND TURBINE PROJECT IS TURNED DOWN THE EXISTING LEASES COULD BE TERMINATED ALLOWING FOR THE LANDOWNERS TO ENTER INTO THE MUCH MORE LUCRATIVE SOLAR LEASES. AND NO, I HAVE NO INTENTION OF ENTERING INTO ONE OF THEM NOR HAVE I A CONFLICT OF INTEREST. I DO HOWEVER KNOW SEVERAL OF THE PRO-WIND SPEAKERS ON JULY 23<sup>RD</sup> AND THEY WOULD/COULD BENEFIT BY THIS.

IN SUMMARY,

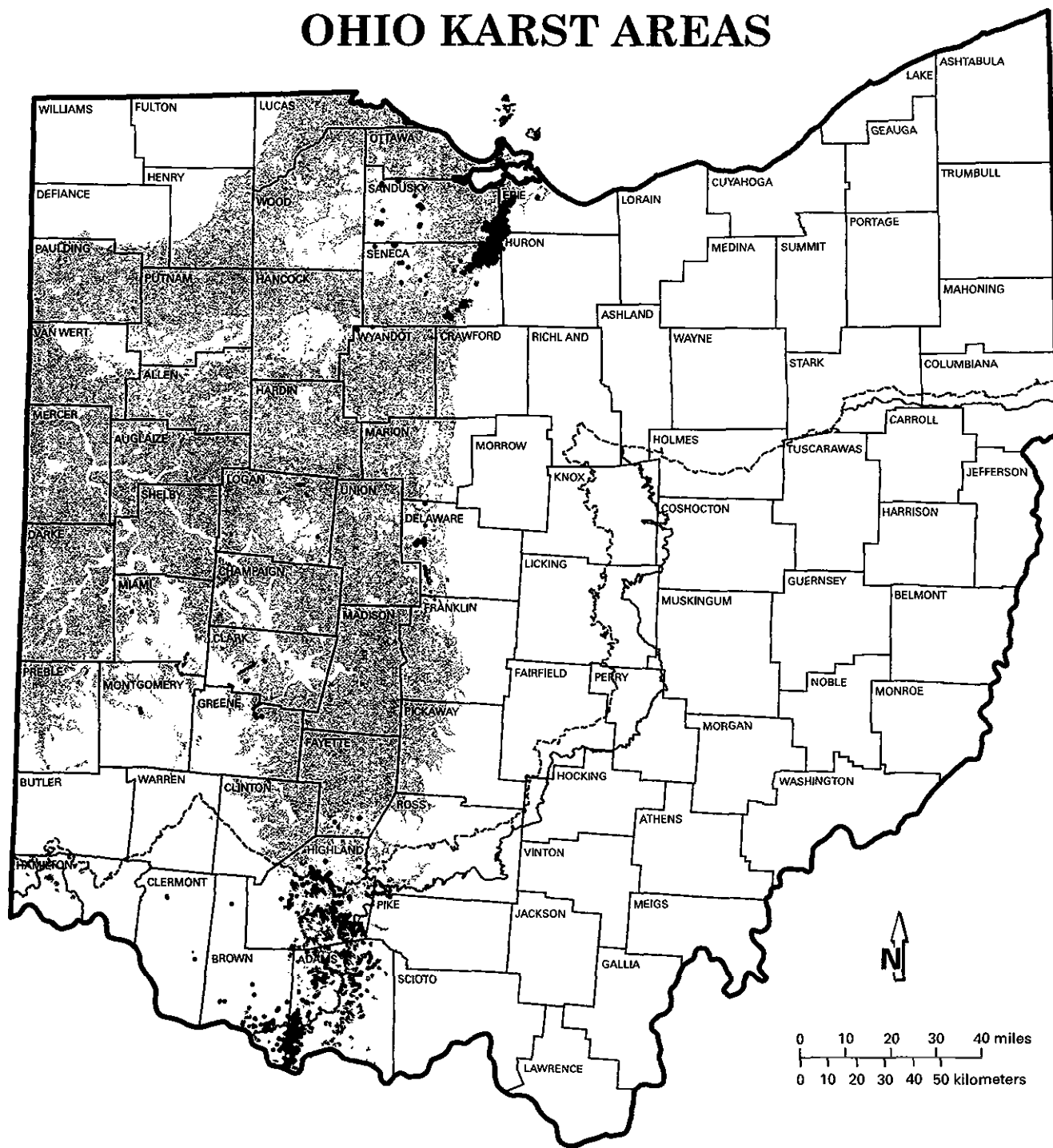
1. THIS PROJECT IS USING UNPROVEN TURBINES THAT ARE TOO TALL, EXCESSIVE IN NUMBER, ERECTED IN A MORE LARGELY POPULATED AREA BY A COMPANY THAT HAS NOT SHOWN IT CAN HANDLE A PROJECT OF THIS MAGNITUDE, IN ADDITION HAVING SET BACKS NOT WITHIN THE MACHINERY MANUFACTURER'S GUIDELINES MIGHT LIMIT S-POWER'S ABILITY TO ATTACH THE MANUFACTURER TO ANY LAWSUIT WHEN SOMEONE GETS HURT FROM DEBRIS THROW OR BLADE SHEAR. THEREFORE I SEE THIS AS LIMITING OUR CHANCES FOR LEGAL RECOURSE.
2. THERE ARE ALTERNATIVES TO PRODUCE ENERGY FROM GREEN SOURCES THAT WOULD NOT SO NEGATIVELY AFFECT RESIDENTS AND PROVIDE LIKE FUNDING FOR THE SCHOOLS AND LOCAL GOVERNMENTS AS WELL AS EMPLOY UNION LABOR IN FACT, I THINK A CASE COULD BE MADE THAT SOLAR WOULD EVEN LEND ITSELF TO MORE LOCAL LABOR AS IT IS ON GROUND LEVEL.

IF THERE WERE NOT A VIABLE ALTERNATIVE, AT LESSER RISK TO RESIDENTS, WITH EQUAL BENEFITS TO THE PUBLIC, IT COULD BE A HARDER DECISION TO MAKE. AS THERE IS AN ALTERNATIVE, IT IS HARD TO IMAGINE THIS PROJECT COULD BE APPROVED CONSIDERING THE NATURE OF THE PROBABLE ENVIRONMENTAL IMPACT IS SIGNIFICANTLY HIGHER THAN THAT OF SOLAR, THE TURBINES REPRESENT MORE THAN A MINIMUM ADVERSE ENVIRONMENT IMPACT WHEN COMPARED TO SOLAR, THE STATE OF AVAILABLE AND IMPROVING SOLAR TECHNOLOGY AND THE NATURE AND ECONOMICS OF SOLAR, SPECIFICALLY AN ALTERNATE FACILITY (SOLAR) WOULD SERVE THE PUBLIC INTEREST, CONVENIENCE, AND NECESSITY, THE WIND TURBINES DO NOT INCORPORATE MAXIMUM FEASIBLE WATER CONSERVATION PRACTICES WHEN CONSIDERING SOLAR ALTERNATIVES. FOR ALL THESE REASONS I IMPLORE YOU TO REJECT THIS APPLICATION.









SINCERELY,



# OHIO KARST AREAS



## EXPLANATION

- |   |   |   |  |
|---|---|---|--|
|  | Silurian- and Devonian-age carbonate bedrock overlain by less than 20 feet of glacial drift and/or alluvium   |  | Probable karst areas                     |
|  | Silurian- and Devonian-age carbonate bedrock overlain by more than 20 feet of glacial drift and/or alluvium   |  | Area not known to contain karst features |
|  | Interbedded Ordovician-age limestone and shale overlain by less than 20 feet of glacial drift and/or alluvium |  | Wisconsinan Glacial Margin               |
|  | Interbedded Ordovician-age limestone and shale overlain by more than 20 feet of glacial drift and/or alluvium |  | Illinoian Glacial Margin                 |

# OHIO KARST AREAS

Karst is a landform that develops on or in limestone, dolomite, or gypsum by dissolution and that is characterized by the presence of characteristic features such as sinkholes, underground (or internal) drainage through solution-enlarged fractures (joints), and caves. While karst landforms and features are commonly striking in appearance and host to some of Ohio's rarest fauna, they also can be a significant geologic hazard. Sudden collapse of an underground cavern or opening of a sinkhole can cause surface subsidence that can severely damage or destroy any overlying structure such as a building, bridge, or highway. Improperly backfilled sinkholes are prone to both gradual and sudden subsidence, and similarly threaten overlying structures. Sewage, animal wastes, and agricultural, industrial, and ice-control chemicals entering sinkholes as surface drainage are conducted directly and quickly into the ground-water system, thereby posing a severe threat to potable water supplies. Because of such risks, many of the nation's state geological surveys, and the U.S. Geological Survey, are actively mapping and characterizing the nation's karst regions.

The five most significant Ohio karst regions are described below.

## BELLEVUE-CASTALIA KARST PLAIN

The Bellevue-Castalia Karst Plain occupies portions of northeastern Seneca County, northwestern Huron County, southeastern Sandusky County, and western Erie County. Adjacent karst terrain in portions of Ottawa County, including the Marblehead Peninsula, Catawba Island, and the Bass Islands, is related in geologic origin to the Bellevue-Castalia Karst Plain. The area is underlain by up to 175 feet of Devonian carbonates (Delaware Limestone, Columbus Limestone, Lucas Dolomite, and Amherstburg Dolomite) overlying Silurian dolomite, anhydrite, and gypsum of the Bass Islands Dolomite and Salina Group.

The Bellevue-Castalia Karst Plain is believed to contain more sinkholes than any of Ohio's other karst regions. Huge, irregularly shaped, closed depressions up to 270 acres in size and commonly enclosing smaller, circular-closed depressions 5 to 80 feet in diameter pockmark the land between the village of Flat Rock in northeastern Seneca County and Castalia in western Erie County. Surface drainage on the plain is very limited, and many of the streams which are present disappear into sinkholes called swallow holes.

Karst in the Bellevue-Castalia and Lake Erie islands region is due to collapse of overlying carbonate rocks into voids created by the dissolution and removal of underlying gypsum beds. According to Verber and Stansbery (1953, Ohio Journal of Science), ground water is introduced into Salina Group anhydrite ( $\text{CaSO}_4$ ) through pores and fractures in the overlying carbonates. The anhydrite chemically reacts with the water to form gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), undergoing a 33 to 62 percent increase in volume in the process. This swelling lifts overlying strata, thereby opening fractures and creating massive passageways for conduction of greater volumes of ground water through the Silurian Bass Islands Dolomite and into underlying Salina Group strata. Gypsum, being readily soluble in water, is dissolved, creating huge voids. Overlying carbonates then collapse or break down, leaving surface depressions similar to those resulting from roof failure of an underground mine.

## DISSECTED NIAGARA ESCARPMENT

The dissected Niagara Escarpment of southwestern Ohio includes the largest single area of karst terrain in the state and the greatest number of surveyed caves. It also is estimated to include the second-largest number of sinkholes in the state. The area is underlain by Silurian rocks of the Peebles Dolomite, Lilley Formation, Bisher Formation, Estill Shale, and Noland Formation in Adams, Highland, and Clinton Counties and the Cedarville Dolomite, Springfield Dolomite, Euphemia Dolomite, Massie Shale, Laurel Dolomite, Osgood Shale, and Dayton Formation in Greene, Clark, Miami, Montgomery, and Preble Counties. The Peebles-Lilley-Bisher sequence and the Cedarville-Springfield-Euphemia sequence constitute the Lockport Group.

Most karst features along the Niagara Escarpment in southwestern Ohio are developed in Lockport Group strata. More than 100 sinkholes and caves developed in the Lockport have been documented in the field, and more than 1,000 probable sinkholes in the Lockport have been identified on aerial photographs, soils maps, and topographic maps. As with most karst terrain, sinkholes developed on the Niagara Escarpment commonly show linear orientations aligned with prevailing joint trends in the area. The greatest concentration of sinkholes on the escarpment is south of the Wisconsin glacial border in southern Highland and Adams Counties, where highly dissected ridges capped by Silurian carbonate rocks rise 150 to 200 feet above surrounding drainage. Illinoian till in these areas is thin to absent, and soils are completely leached with respect to calcium and calcium-magnesium carbonate. Such geologic settings are ideal for active karst processes, as downward-percolating, naturally acidic rain water is not buffered until it has dissolved some of the underlying carbonate bedrock. Other significant karst features of the Niagara Escarpment include small caves in escarpment re-entrants created by the valleys of the Great Miami and Stillwater Rivers in Miami County.

## BELLEFONTAINE OUTLIER

The Bellefontaine Outlier in Logan and northern Champaign Counties is an erosionally resistant "island" of Devonian carbonates capped by Ohio Shale and surrounded by a "sea" of Silurian strata. Though completely glaciated, the outlier was such an impediment to Ice Age glaciers that it repeatedly separated advancing ice sheets into two glacial lobes—the Miami Lobe on the west and the Scioto Lobe on the east. Most Ohioans recognize the outlier as the location of Campbell Hill—the highest point in the state at an elevation of 1,549 feet above mean sea level.

Although it is not known for having an especially well-developed karst terrain, the outlier is the location of Ohio's largest known cave, Ohio Caverns. The greatest sinkhole concentrations are present in McArthur and Rushcreek Townships of Logan County, where the density of sinkholes in some areas approaches 30 per square mile. Sinkholes here typically occur in upland areas of Devonian Lucas Dolomite or Columbus Limestone that are 30 to 50 feet or more above surrounding drainage and are covered by less than 20 feet of glacial drift and/or Ohio Shale.

## SCIOTO AND OLENTANGY RIVER GORGES

The uplands adjacent to the gorges of the Scioto and Olentangy Rivers in northern Franklin and southern Delaware Counties include areas of well-developed, active karst terrain. These uplands also are among the most rapidly developing areas of the state, which means karst should be a consideration in site assessments for commercial and residential construction projects.

The Scioto River in this area has been incised to a depth of 50 to 100 feet into underlying bedrock, creating a shallow gorge. The floor, walls, and adjacent uplands of the gorge consist of Devonian Delaware and Columbus Limestones mantled by up to 20 feet of Wisconsin till. Sinkhole concentrations up to 1 sinkhole per acre are not uncommon in Concord, Scioto, and Radnor Townships of Delaware County. The sinkholes range in diameter from about 10 to 100 feet and commonly are aligned linearly along major joint systems.

The Olentangy River is approximately 5 miles east of the Scioto River in southern Delaware County and occupies a gorge that is narrower and up to 50 feet deeper than the Scioto River gorge. The floor and the lower half of the walls along the Olentangy gorge are composed of Delaware and Columbus Limestones, the upper half of the walls is composed of Devonian Ohio and Olentangy Shales mantled by a thin veneer of glacial drift. Karst terrain has developed along portions of the gorge in a manner similar to karst terrain along the Scioto River.

## ORDOVICIAN UPLANDS

The Ordovician uplands of southwestern Ohio are the location of surprisingly well-developed karst terrain despite the large component of shale in local bedrock. Numerous sinkholes are present in Ordovician rocks of Adams, Brown, Clermont, and Hamilton Counties.

The carbonate-rich members of the Grant Lake Formation (Bellevue and Mount Auburn), Grant Lake Limestone (Bellevue and Straight Creek), and the upper portion of the Arnheim formation are the Ordovician units most prone to karstification; however, the shale-rich (70 percent shale, 30 percent limestone) Waynesville Formation also has been subjected to a surprising amount of karst development in southeastern Brown and southwestern Adams Counties, just north of the Ohio River.

## ACKNOWLEDGMENT

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