



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
WATER DIVISION
GROUND WATER AND DRINKING WATER BRANCH (WG-15J)
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

January 22, 2009

Stephen Casebere
Bryan Municipal Utilities
841 East Edgerton St.
Bryan, OH 43506

Re: Sole Source Aquifer Petition
MICHINDOH Glacial Aquifer SSA

Dear Mr. Casebere:

Thank you for submitting a petition for designation of the Michindoh Sole Source Aquifer (SSA) area. By your action, you have requested United States Environmental Protection Agency (EPA) designation under the authority of Section 1424(e) of the Safe Drinking Water Act (SDWA).

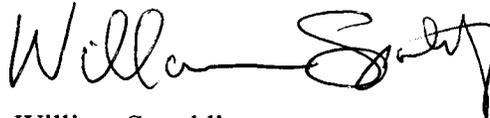
SDWA Section 1424(e) gives the EPA the authority to determine that an area has an aquifer which is the sole or principal drinking water source for a particular area and which, if contaminated, would create a significant hazard to public health. Section 1424(e) and related SSA designation petitioner guidance outlines a four-phased process for presenting information which is to be used as the basis for helping EPA make and publish its determination regarding the establishment of SSAs. The phases of this process are petition preparation, initial petition review and completeness determination, detailed review and technical verification, and designation determination. Once EPA makes its determination decision, SDWA Section 1424(e) requires EPA to publish a notice of that decision in the Federal Register. Prior to making this determination, EPA intends to publish a press release and provide the public with an opportunity to comment on this petition.

The Michindoh Aquifer SSA was submitted in October 2007 and submitted to EPA Region 5 for review. On February 25, 2008, EPA announced to you that we had completed the initial review of your petition for Sole Source Aquifer designation and informed you that your petition was sufficiently complete for EPA to proceed with a detailed technical review. This letter presents the findings of our detailed technical review, which is the third phase of the review petition process.

A summary of our observations, followed by comments on the Petition are enclosed with this letter. Our review concluded that additional justification and clarification is needed in order to answer questions on the technical content of the Petition and conclude the detailed review phase of this process. Following review of the enclosures, please provide responses to our comments in writing to me at the letterhead address. If you have and questions or need further clarification concerning this request, feel free to contact me a (312) 886-9262.

Your participation in this process and your interest in protecting the water resources in your area is appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "William Spaulding". The signature is written in a cursive style with a long horizontal stroke extending from the middle of the name.

William Spaulding
Sole Source Aquifer Coordinator

Enclosures

Project Summary

Groundwater Flow:

There are 2 natural drainage divides which intersect the area.

N to SW: One proceeds from the north down through the south side of Hillsdale, Michigan, just east of Reading, east of Fremont and south of Angola. There is eastward flow which appears to impact Devils Lake and Adrian. The final boundary includes Devils Lake, Michigan, which appears to be on the other side of the ground water divide.

N to SE: Just north of North Adams, south of Devils Lake, East of Manitou Beach, east of Clayton, and south of Jasper.

Surface Water Flow:

The St. Joseph River rises out a group of small lakes in southern Michigan, in Hillsdale County approximately 5 mi southwest of Hillsdale. The headwaters are within 5 mi of those of the St. Joseph River of Lake Michigan. It flows initially southeast, then turns to the southwest to flow across the northwestern corner of Ohio past Montpelier. It enters De Kalb County in northeastern Indiana, flowing southwest past Saint Joe and into the city of Fort Wayne, where it meets the St. Mary's River to form the Maumee. The Tiffin River rises in southeastern Michigan along the Hillsdale-Lenawee county line, approximately 12 mi east of Hillsdale. It flows east into Lenawee County, then generally SSW into northwestern Ohio across western Fulton County. At Stryker it turns to the south for its lower 15 mi, following a highly meandering course and joining the Maumee from the north 2 mi west of Defiance. Surface water drinking water systems include Archibold (Brush Creek/ Tiffin River, 1.93 MGD), Lyons (purchased SW from Wauseon), Wauseon (Big Ditch and Stucky Ditch/ Maumee River, 0.83 MGD), Delta (Bad Creek, 0.5 MGD), Napoleon (Maumee River, 1.15 MGD), Liberty Center (purchased from Napoleon), Defiance (Maumee River, 4.38 MGD), and Fort Wayne (St. Joseph River), IN. Defiance, Ohio and Ft. Wayne, IN are possible alternate sources and appear to have capacity to service additional neighboring systems, if needed (Ft. Wayne: Altona, Garrett – It is unclear why these are being serviced by Ft. Wayne instead of Auburn and St. Joe) (Defiance: Farmer, Ney, Hicksville, Sherwood – based on information presented it appears that Defiance has additional capacity to handle demand)

Geographic Factors:

West (to the eastside of Angola to the east side of Auburn) appears to be based on economics more than groundwater flow. It is not clear why the City of Angola would not be able to service Altona and Garrett instead of Ft. Wayne.

East (south from east of Weston to west of Defiance): Justification appears to be based on water use and divides between groundwater systems to the north and west and surface water systems to the east. Along the south border there are ground water systems to the north.

South (from Defiance to Auburn): The south border roughly follows the Defiance-Paulding County Line, OH and DeKalb – Allen, IN county line. The establishment of this boundary appears to exclude some communities in Paulding County, OH and Allen County, IN, which are in the groundwater flow path.

Geology:

Quaternary Geology structure consists of ground or end moraine or complex drift consisting of fine to coarse textured till for 2/3 of the SSA with the extreme SE portion of the SSA consisting of lacustrine deposits of silt and clay. More permeable sand and gravel deposits are mostly absent from the area, mainly impacting Osseo (south of Hillsdale) in the N and Montgomery and Clear Lake to the NW. Bryan area is silt and clay. Cross sections indicate that impermeable clay predominates the area with pockets of sand and gravel. Ground water recharge in the SSA ranges from 3 to 6 inches per year, compared to rates that are twice as much in the Michigan sand and gravel areas immediately to the north.

Vertical ground water recharge rates are low throughout the SSA, except for St. Joseph and Tiffin River segments where rates can be significantly higher. Recharge is very high along the N boundary of the SSA. It is here where the greatest potential for aquifer contamination exists. Based on this information, it appears that maintaining and protecting the Michigan portion of the Michindoh aquifer is critical to the integrity and overall quality of the rest of the aquifer. Information presented in the report appears to support the need for the Michigan portion of the aquifer to be included in the Federal Sole Source Aquifer Area designation.

A USGS report (Thomas, 2000) indicates that surficial glacial till is not likely to offer uniform protection to underlying aquifers due to potential pathways of near vertical fractures and sand and gravel stringers present in clay layers. Fractures in the clay layer may extend up to 50 feet. In addition there are thousands of private and abandoned wells in the SSA. Well logs are available for only about half of these wells. These findings lead the petitioner to conclude that aquifer is vulnerable to contamination threats.

Another USGS report (Coen) says that the unconsolidated sediments in the area which supply almost all of the usable water, are discontinuous, with several kinds of deposits which transmit and release water differently. The sand and gravel beds are either confined or semiconfined, although weathering in the clay and till increases their permeability in places, which allows water to move up or down to other more permeable sand and gravel layers. There is water bearing bedrock below Williams County, but very little of this water is currently being used. The most likely available aquifer below the shale bedrock is the Dundee Limestone of Devonian age, which is used as a water source in other parts of Ohio. This 40 foot thick bed is 200 to 900 feet below the land surface .

It appears that the unconsolidated material ranging from 50 to 130 feet below the surface is a somewhat connected aquifer which could be defined as the sole or principal source of water for the Bryan Ohio area. This report appears to support the Petitioner's claim that it is the "current" sole or principal source. The guidance requires that we determine whether it is needed to supply 50% or more of the drinking water for the aquifer service area. The shale above has low porosity and hydraulic conductivity, so it appears that it provides an adequate confining layer which

Michindoh Sole Source Aquifer Review Comments

Review Criteria

The EPA defines a sole or principal source aquifer as one which supplies at least 50 percent of the drinking water consumed in an area overlying the aquifer. EPA guidelines also stipulate that these areas can have no alternative drinking water source(s) which could physically, legally, and economically supply all those who depend upon the aquifer for drinking water.

Comments

EPA has reviewed the Michindoh SSA petition against the above guidelines and has identified certain areas of the Petition which need further clarification and justification. These areas are listed below.

1. What is the justification for including Devils Lake, Michigan in the Michindoh SSA?
2. Please provide clarification as to how the economic boundary in Figure 15 was determined and expand on the justification for excluding the cities of Angola, Auburn, Garrett, and Waterloo from the Michindoh SSA area.
3. More justification is needed to determine why only a portion of the Michindoh aquifer is under SSA consideration. Please provide more information as to the western extent of the Michindoh aquifer into Indiana and provide information on the groundwater flow connection, if any, with the rest of the study area.
4. Please provide more justification for excluding Allen County, IN and Paulding County, OH groundwater systems from the Michindoh SSA.
5. In its assessment of alternate water sources, the only studied option is one where water is obtained from wells or intakes outside the SSA and then piped to other systems. Geologic studies in the report seem to indicate that there might be other formations which might be able to produce water when needed, without having to look outside the SSA. The USGS report "Ground Water Resources of Williams County, Ohio (Coen) refers to a deeper aquifer which could be tapped to provide an alternate water source. We are unclear as to the quantity of water or the expense which providing water from this aquifer would require. Please elaborate on the potential for using the Dundee Limestone as an alternate water source.
6. The petition appears to indicate that a significant threat to Ohio water systems could be created by contamination events occurring in the northern areas of the designated SSA, some of which could be located in Michigan and, to a lesser extent, Indiana. Given the unique interstate nature of the SSA designation, the report needs to include a section on cooperative efforts among the involved States, agreements and or understandings between the Ohio communities and those in Michigan and Indiana, their counties and their local environmental agencies included in the area, with recognition of the area's unique characteristics and value. More information is needed to document support for the Petition in Indiana and Michigan.
7. Please include a record documenting any consultation with the Ohio, Michigan, and Indiana State governmental agencies in matters regarding this Petition.

would protect the water source should the near surface aquifer become unuseable. Would the Dundee Limestone be able to provide enough water to meet the current and future groundwater needs of the area? The report does not appear to completely address this question.

Economic Analysis:

The SSA study used an economic feasibility study to determine the western boundary of the aquifer. The economic analysis consisted of a study which assessed the feasibility of piping water in from new or existing surface water intakes or groundwater wells and comparing it to EPAs affordability hardship criteria. Figure 15 shows an “economic boundary” on as a Michindoh boundary, but there is no supporting reference to it in the report text.

Collaboration:

The Petitioner received letters of support from a Federal Congressman, State Senator, State Representative, Mayor of Bryan, Ohio, and officials from the Villages of Edgerton, Montpelier, Stryker, and West Unity, Ohio. A letter from the Michigan Department of Environmental Quality expressed “no objection to this designation for Ohio.” Another from an Indiana congressman expressed support for the petition. Collaboration with the Indiana and Ohio environmental agencies or public interest groups is not clearly documented. The Michigan DEQ letter implies a lack of support for this Petition in Michigan.



841 East Edgerton St.
Bryan, Ohio 43506

BRYAN MUNICIPAL UTILITIES

June 3, 2009

William Spaulding
U.S. Environmental Protection Agency
Groundwater and Drinking Water Branch
77 West Jackson Boulevard
Chicago, IL 60604-3590

**RE: Sole Source Aquifer Petition
MICHINDOH Glacial Aquifer**

Dear Mr. Spaulding,

Bryan Municipal Utilities is pleased to provide to the U.S. EPA written responses to your comments on our petition for designation of the MICHINDOH Sole Source Aquifer area under the authority of Section 1424(e) of the Safe Drinking Water Act.

Our consultant, Todd Feenstra of Tritium, Inc., has prepared these responses in order to provide additional justification and clarification of the petition. We apologize for the delay and hope the enclosed document answers your questions on the technical content of the petition and results in conclusion of the detailed review phase of the process. If further information or clarification is needed, please do not hesitate to contact us and we will do our best to supply it promptly. Please contact us at (419) 633-6100, scasebere@cityofbryan.net or our consultant, Todd Feenstra, Tritium, Inc. at (574) 675-4900, Todd@tritiuminc.net.

Bryan Municipal Utilities is dedicated to the protection of the groundwater resource used to meet the city's drinking water demands. Designation of the MICHINDOH Glacial Aquifer as a Sole Source Aquifer by the U.S. EPA would provide additional protection and management of our vulnerable aquifer system.

We look forward to hearing from you soon.

Sincerely,

Stephen Casebere
Director of Utilities

June 2, 2009

Mr. Stephen Casebere
Bryan Municipal Utilities
841 East Edgerton Street
Bryan, Ohio 43506-1413

RE: Response to U.S. EPA January 22, 2009 Letter

Dear Mr. Casebere,

In response to the January 22, 2009 letter written by Mr. William Spaulding of the U.S. EPA, regarding the Sole Source Aquifer Petition that was filed on behalf of the City of Bryan, Ohio in September of 2007, we will address the seven comments Mr. Spaulding enumerates at the end of his letter.

Comment 1. What is the justification for including Devils Lake, Michigan in the Michindoh SSA?

Step 12 of Section 3.2.4 in the EPA Sole Source Aquifer Designation Petitioner Guidance document (Document 440/6-87-003) states: "If a stream or a river contributes to the aquifer recharge, the streamflow source area should be included in the petition." Examination of Figure 14 of the petition document indicates that Devil's Lake (Lenawee County, MI) is located within the Bean Creek sub-basin of the Tiffin River watershed. This is also supported by the GIS databases maintained as part of the Michigan Groundwater Mapping Project mandated by the Public Act 148 of 2003.

Comment 2. Please provide clarification as to how the economic boundary in Figure 15 was determined and expand on the justification for excluding the cities of Angola, Auburn, Garrett, and Waterloo from the Michindoh SSA area.

The petition guidance states that the aquifer system must be the only viable source for a drinking water supply. The U.S. EPA "defines a sole or principal source aquifer as one which supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas can have no alternative drinking water source(s) which could physically, legally, and economically supply all those who depend upon the aquifer for drinking water."

The economics of implementing an alternative water resource are limited by a feasibility threshold established in the petition guidance documentation. The established threshold is detailed in Section 5.4 on pages 43 and 44 of the petition document.

The economic feasibility is evaluated in part based on whether the annual costs to use an alternative water supply source would create an economic burden for the local residents or municipal water customers. As proposed in the petition guidance document, a quantitative analysis of the annual system cost for a typical user was calculated. By definition, if this cost exceeds 0.4 to 0.6 percent of the mean annual household income, use of the alternative source would create a financial hardship for the end users and be considered economically unfeasible.

The available funding associated with each municipality was determined by combining the 2000 U.S. Census data statistics for the household mean annual income and the municipal population. The total



available funding for each project was compared to the estimated project costs to determine if a transfer to an alternative water supply resource would create a financial hardship for the residents and municipal water customers.

Detailed feasibility studies were compiled for the municipalities in the study area and summarized in Section 5 of the petition on pages 33 to 49. The feasibility studies were based on engineering estimates completed by a sub-contracted civil engineering firm, the 2000 U.S. census data for population and mean annual income, and a thorough examination of all the potential alternative water resources/supplies for the area.

The analyses indicated that the sole source aquifer designation is limited by an economic boundary along the western portions of the study area in Indiana, south of the groundwater divide in Steuben County and north of the physical extent boundary in southern DeKalb County. That is, economically-feasible alternative drinking water resources are present in Steuben County and DeKalb County. Thus, by definition the sole source aquifer designation is not met.

Evaluation of an alternative source must be based on the presence of an adequate supply of either groundwater or surface water *and* the economic cost of withdrawing, treating, and transporting the water derived from this alternative source. Three specific alternative sources were considered for each community within the Steuben and DeKalb counties: groundwater, surface water, and purchased water. An initial economic analysis was performed for each community by the civil engineering firm and the most economically feasible alternative source was then evaluated in great detail. The City of Angola was not included in the analysis as the current water supply for this municipality is already drawn partially from alternative water resources, both surface water and adjacent groundwater basins. Thus, additional development from the alternative sources is reasonable and the alternative resources are readily available. The results of the initial evaluation of the remaining Indiana communities were presented in Table 11 on page 42.

Table 11. Municipal Water Demands and Alternative Sources

MUNICIPALITY	WATER DEMAND (MGD)	ALTERNATIVE SOURCE
Ashley-Hudson, IN	0.378	purchased
Auburn-Garrett-Waterloo, IN	3.514	purchased
Butler, IN	0.256	purchased
Hamilton, IN	na	purchased
Saint Joe, IN	0.041	purchased

The three potential alternative resources were first identified and described in detail in Sections 5.1, 5.2, and 5.3 on pages 35 and 36 of the petition document. First, surface water intakes combined with up-ground reservoirs could be used to furnish raw water for the communities within the Steuben and DeKalb counties south of the groundwater divide. The nearest rivers are the St. Joseph River near Newville, Indiana and the Maumee River near Antwerp, Ohio. The discharge volume of the St. Joseph River is not sufficient to support the combined water demands of Auburn, Butler, Garrett, and Waterloo without significant up-ground reservoirs. The engineering cost estimates indicate that



construction of the required reservoirs is economically unfeasible given the 2000 U.S. census data for population and mean annual income within these communities (Appendix D and Tables 11, 12, 13, and 14). A surface water intake in the Maumee River would similarly be economically unfeasible given the costs of a surface water treatment plant and the required route of the water main.

Second, alternative groundwater resources are available north of the regional groundwater divide present near Angola, Indiana. The areas north of the divide are hydraulically separate from the petition area as described in the petition document (Section 3.6.2 and Figure 12). Replacement wellfields could potentially be developed north of Angola and the finished water then be transported via pipeline to supply drinking water to the southern communities in Steuben and DeKalb counties.

Third, the City of Fort Wayne, Indiana currently operates a surface water intake and water treatment facility on Maumee River. The infrastructure cost to expand the plant facilities and extend additional water main north to supply drinking water to the communities of Auburn, Garrett, and Waterloo was estimated and compared to the cost of developing alternative groundwater resources north of Angola, Indiana.

The most cost-efficient solutions to providing alternative water supply sources for the communities in Steuben and DeKalb counties are to develop new groundwater wellfields for the communities of Ashley, Hudson, and Pleasant Lake and purchase drinking water from Fort Wayne, Indiana for the communities of Auburn, Garrett, and Waterloo. Both of these solutions are economically feasible for the communities listed above based on the estimated implementation costs and analysis of the population and mean annual income statistics from the 2000 U.S. census. The costs to develop the alternative source is summarized in Table 12 (page 43), the available funding in summarized in Table 13 (page 45), and the economic feasibility results are summarized in Table 14 (page 48).

Table 12. Estimated Alternative Source Transfer Costs

Municipality	State	Population	Alternative Source Type	Estimated Project Cost (2007 dollars)
Angola	IN	7,344	groundwater	\$1,000,000
Butler	IN	2,725	purchased	\$4,644,000
Hamilton	IN	1,944	purchased	\$4,434,000
Ashley	IN	1,010	purchased	\$3,252,000
Hudson	IN	596	purchased	\$3,252,000
Saint Joe	IN	452	purchased	\$4,476,000
Auburn	IN	12,074	purchased	<i>combined</i>
Garrett	IN	5,349	purchased	<i>combined</i>
Waterloo	IN	2,200	purchased	<i>combined</i>
Auburn/Garrett/Waterloo*	IN	452	purchased	\$11,358,000

*analysis combined the communities of Auburn, Garrett, and Waterloo



Table 13. Available Funding by Municipality

City	State	Population	Households (Pop/2.5)	Household Mean Annual Income*	0.6% of MAI	Available Funding
Auburn	IN	12,074	4830	\$51,276	\$308	\$1,485,853
Angola	IN	7,344	2938	\$41,879	\$251	\$738,135
Garrett	IN	5,349	2140	\$50,059	\$300	\$642,755
Butler	IN	2,725	1090	\$44,666	\$268	\$292,119
Waterloo	IN	2,200	880	\$47,761	\$287	\$252,180
Hamilton	IN	1,944	778	\$50,062	\$300	\$233,571
Ashley	IN	1,010	404	\$43,039	\$258	\$104,327
Hudson	IN	596	238	\$50,747	\$304	\$72,589
Saint Joe	IN	452	181	\$43,668	\$262	\$47,371
Clear Lake	IN	242	97	\$59,056	\$354	\$34,300

Table 14. Economic Feasibility Analysis Results

City	State	Population	Alternative Source Type	Estimated Project Cost (2007 dollars)	Available Funding (2007 dollars)	Available Percent of Project Cost	Debt Repayment Years
Angola	IN	7,344	GW	\$1,000,000	\$738,135	74%	1
Butler	IN	2,725	PW	\$4,644,000	\$292,119	6%	16
Hamilton	IN	1,944	PW	\$4,434,000	\$233,571	5%	19
Ashley	IN	1,010	PW	\$3,252,000	\$104,327	3%	31
Hudson	IN	596	PW	\$3,252,000	\$72,589	2%	45
Saint Joe	IN	452	PW	\$4,476,000	\$47,371	1%	94
<i>Auburn</i>	<i>IN</i>	<i>12,074</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$1,485,853</i>	<i>13%</i>	<i>8</i>
<i>Garrett</i>	<i>IN</i>	<i>5,349</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$642,755</i>	<i>6%</i>	<i>18</i>
<i>Waterloo</i>	<i>IN</i>	<i>2,200</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$252,180</i>	<i>2%</i>	<i>45</i>
Combined*	IN	452	PW	\$11,358,000	\$2,380,788	21%	5

*analysis combined the communities of Auburn, Garrett, and Waterloo

The MICHINDOH aquifer system is one of several feasible water supply sources for the communities of Ashley, Auburn, Garrett, Hudson, Pleasant Lake, and Waterloo. The Indiana communities of Hamilton and Butler, however, do not have the financial resources to implement even the most cost-efficient alternative source of purchasing water from Angola or Waterloo. Therefore, there is an economic boundary present between Hamilton, Butler, and the remaining Indiana communities in Steuben and DeKalb counties.



Comment 3. More justification is needed to determine why only a portion of the Michindoh aquifer is under SSA consideration. Please provide more information as to the western extent of the Michindoh aquifer into Indiana and provide information on the groundwater flow connection, if any, with the rest of the study area.

Delineation of the sole source aquifer area was based on the identification and interconnection of four types of boundaries: physical extent limits, regional groundwater divides, an economic boundary, and surface water basins. These boundaries are described individually in the petition document on pages 23 and 24 in Section 3.6.

Three Indiana counties in particular are of importance along the western margin of the proposed sole source aquifer area: Allen County, Steuben County, and DeKalb County. Only portions of Steuben County and DeKalb County are included in the petition area on the basis of physical extent, groundwater divide, and economic boundaries.

Allen County has been excluded from the proposed sole source aquifer area on the basis of the physical extent of the aquifer system. Geologic cross-sections constructed across the southern portions of the study area (Figures 8, 9, and 10) exhibit the lack of sand and gravel deposits and the dominance of clay in the unconsolidated sediments above the bedrock. A description of the physical limits is presented in Section 3.6.1 on page 23.

The MICHINDOH aquifer system physical limits were delineated on the basis of well logs, geologic cross sections, and municipal water supply source changes. The aquifer system extends past the northern, western, and eastern study area limits. However, a physical extent boundary was identified in the southern portions of the study area. This boundary is present in Indiana near Spencerville, and extends along the county line between Defiance and Paulding Counties in Ohio (Figure 15). The boundary trends to the northeast across the eastern portions of Defiance County and extends between Morenci (Michigan) and Oakshade (Ohio).

The MICHINDOH glacial aquifer system does physically extend beneath both Steuben County and DeKalb County. However, as stated in Section 3.6.2 and shown in Figures 12 and 15, there is a groundwater boundary (divide) that traverses the northern half of Steuben County. The divide hydraulically separates the northern portions of this county from the rest of the proposed sole source aquifer area. Groundwater does not flow across the divide and thus the areas north of the divide do not impact the proposed sole source aquifer area.

The two groundwater divides displayed in Figures 12 and 15 were derived from the groundwater contour map generated for the area. The groundwater contouring was performed using Surfer (Golden Software, 2004) and kriging techniques performed on nearly 3,000 measured water levels within the study area. The northern divide begins near Stroh, Indiana, and extends to the northeast beneath Angola, Indiana, and Hillsdale, Michigan. Groundwater north of the divide flows to the northwest and groundwater to the south flows to the southeast.

The second divide is located in the northeastern portion of the study area and begins near North Adams, Michigan. The divide extends southeast and passes near Clayton, Weston, and Jasper, Michigan. Groundwater north of this divide flows to the east and is associated with the River Raisin in Michigan. Groundwater south of the divide flows to the south under the influence of the Maumee River.

DeKalb County lies south of the groundwater divide in Steuben County and the physical extent boundary only marginally extends north into DeKalb County. However, flow lines drawn on the groundwater contour map indicate another hydraulic separation that is present within DeKalb County. The groundwater flows south-southwest from the groundwater divide west of the City of



Angola in Steuben County, west of the communities of Hudson and Ashley, and just east of the Village of Coruna in DeKalb County. The groundwater then flows southeast from Village of Coruna beneath the City of Auburn and intersects the physical extent boundary just west of the Village of Spencerville. The flow line is evident in the attached copy of Figure 15 (revised).

In effect, this flow line hydraulically separates the area west of the flow line from the areas east of the flow line. The flow line itself could be considered a boundary for the petition area, but a more compelling argument is the economic boundary to the east.

Comment 4. Please provide more justification for excluding Allen County, IN and Paulding County, OH groundwater systems from the Michindoh SSA.

The petition for a sole source aquifer designation is for the glacial aquifer system. Geologic cross-sections constructed across the southern portions of the study area (Figures 8, 9, and 10) exhibit the lack of sand and gravel deposits and the dominance of clay in the unconsolidated sediments above the bedrock. A description of the physical limits of the glacial aquifer system is presented in Section 3.6.1 on page 23.

The MICHINDOH aquifer system physical limits were delineated on the basis of well logs, geologic cross sections, and municipal water supply source changes. The aquifer system extends past the northern, western, and eastern study area limits. However, a physical extent boundary was identified in the southern portions of the study area. This boundary is present in Indiana near Spencerville, and extends along the county line between Defiance and Paulding Counties in Ohio (Figure 15). The boundary trends to the northeast across the eastern portions of Defiance County and extends between Morenci (Michigan) and Oakshade (Ohio).

Therefore, both Allen County and Paulding County were eliminated from the petition area as the glacial aquifer system is not present in either county. Additional information regarding the extent and hydrogeologic description of the glacial aquifer system is presented in Magnus and Frum (2005), Eberts and George (2000), ODNR (1986), and source water assessment reports for the communities of Defiance, Hicksville, Ney, and Sherwood in Defiance County (ODNR).

Comment 5. In its assessment of alternate water sources, the only studied option is one where water is obtained from wells or intakes outside the SSA and then piped to other systems. Geologic studies in the report seem to indicate that there might be other formations which might be able to produce water when needed, without having to look outside the SSA. The USGS report "Ground Water Resources of Williams County, Ohio (Coen) refers to a deeper aquifer which could be tapped to provide an alternate water source. We are unclear as to the quantity of water or the expense which providing water from this aquifer would require. Please elaborate on the potential for using the Dundee Limestone as an alternate water source

The Dundee Limestone is described in the petition document on pages 30, 31, and 33.

Page 30-31: The third alternative, additional wellfields in the Dundee Limestone, is limited by the depth to the potential aquifer, the water quality, and lack of knowledge regarding this aquifer. The formation averages approximately 40 feet thick across the study area and is located at depths of more than 400 feet below grade. The groundwater quality within this potential aquifer is poor, exhibiting high hardness, sulfur, salinity, and iron content. Additionally, very little is known about the production capacity of this aquifer due to a lack of exploratory drilling and pumping tests conducted within the aquifer. The drilling



and well construction expenses and the necessary water treatment alternatives have previously eliminated this resource as an alternative.

Page 33: The alternative sources can only be reasonably compared to the MICHINDOH aquifer system if the quantity and quality of the source water is treated to meet the EPA drinking water standards. Lesser quantities of source water would necessitate additional intake structure(s). Poorer quality of source water would necessitate additional treatment infrastructure and expense. This assumption is particularly important when considering surface water resources and the Dundee Limestone that both exhibit limited quantities and poorer water qualities compared to the MICHINDOH aquifer system.

There are four primary concerns with utilizing this potential aquifer. First, well depth is a concern as the uppermost boundary of the aquifer is between 400 feet and 600 feet below grade. Second, the aquifer thickness is typically less than 40 feet across the study area. Third, the water quality is very poor, exhibiting very high levels of sulfur, iron, salt, and hardness. Finally, the production rates from this aquifer are typically less than 25 gpm. The pollution potential report for Defiance County describes the groundwater obtained from the uppermost carbonate sequences.

The Antrim Shale (or Ohio Shale) in southeastern Williams County is a poor source of ground water. Yields are typically less than 5 gpm (King, 1977, Coen, 1989, and Haiker, 1996). Typically, the uppermost 10 to 15 feet of the shale is weathered and broken and provides the most water. Wells drilled deeper into the shale provide increased well storage, but typically little additional water. Higher yields may be obtained from deep underlying limestones; however, the water quality in these units is quite objectionable. Water underlying the shale tends to be very high in sulfur, hydrogen sulfide, and iron.

An additional carbonate sequence is present beneath the Dundee Limestone. This sequence is composed of the Detroit River Group, the Salina Dolomite, the Tymochtee Dolomite, and the Greenfield Dolomite. The groundwater production rates from the uppermost 200 feet of the sequence ranges from 5 gpm to 100 gpm across Williams and Defiance counties, but is most often less than 25 gpm. The water quality from this sequence is also very poor, exhibiting very high levels of sulfur, iron, salt, and hardness.



Table 10. Bedrock stratigraphy of Defiance County.

System	Group/Formation (Symbol)	Lithologic Description
Devonian	Antrim Shale (Da)	Thick, brown to black, fissile to platy shale. Carbonaceous, contains pyrite, hydrogen sulfide, and pockets of methane gas. Poor aquifer with meager yields and poor water quality.
	Traverse Group Dundee Limestone Detroit River Group (Dtddr)	Interbedded brown limestones and dolomites. Contains sandy, shale-rich, cherty, evaporate, and fossiliferous zones. Unit underlies entire county except for northern 1/3. Moderate aquifer, yields average 5 to 25 gpm. Water quality may be poor where overlain by the Antrim Shale.
Silurian	Undifferentiated Salina Dolomite (Sus)	Gray to brown, thin-bedded, argillaceous dolomite. Thin evaporite zones common. This unit is typically greater than 100 feet in thickness, and average yields range from 5 to 25 gallons per minute. Underlies the Dtddr where it exists as the uppermost bedrock unit.
	Tymochtee and Greenfield Dolomites (Stg)	Thin- to massive-bedded, olive-gray to yellowish-brown. The Tymochtee contains shale partings. The Greenfield has a laminated dolomite lithology. Underlies the Sus, and thickness usually exceeds 100 feet. Yields range from 25 to 100 gpm.
	Lockport Dolomite (Sl)	White to medium gray, medium- to massive-bedded dolomite. Commonly contains cavernous solution zones. Thickness >100 feet. Yields can exceed 100 gpm, especially in cavernous or solution zones. Found in the subsurface where overlain by Stg.

In summary, the excessive depth, the limited production capacities, and the poor groundwater quality effectively eliminate the deep bedrock aquifers as viable alternative water sources for municipal drinking water supplies in the petition area.

Comments 6. The petition appears to indicate that a significant threat to Ohio water systems could be created by contamination events occurring in the northern areas of the designated SSA, some of which could be located in Michigan and, to a lesser extent, Indiana. Given the unique interstate nature of the SSA designation, the report needs to include a section on cooperative efforts among the involved States, agreements and or understandings between the Ohio communities and those in Michigan and Indiana, their counties and their local environmental agencies included in the area, with recognition of the area's unique characteristics and value. More information is needed to document support for the Petition in Indiana and Michigan.

Each potentially affected community with an existing public drinking water system that lies within the petition area was contacted. In addition, the appropriate Senate and House offices at the state and federal levels were also contacted. Each entity was provided with a cover letter from the City of Bryan, copies of previous letters of support, a map of the proposed petition area, an abstract of the petition, and a copy of the conclusions section of the document. Additional calls and emails were directed to a number of the offices to present additional information and discussion.



The contact list and the associated responses to our request for support are provided in Attachment 1, a table of the contacted entities/persons. The letters of support and local resolutions obtained were included in Appendix F of the petition document. A number of the Michigan and Indiana officials that were contacted requested additional information, but they have not rendered a final decision.

In a letter response to the request for support of the Sole Source Aquifer designation, a support letter was received from Mr. Steven Chester, Director of the Michigan Department of Environmental Quality. The letter states:

“We support the concept of enhanced protection of our drinking water sources and support the City of Bryan’s efforts in this endeavor.”

Since the issuance of the MDEQ letter, the legislation within the State of Michigan has changed with respect to large-capacity withdrawals. The scrutiny permits and approval of groundwater withdrawal has become much more stringent and based on a complicated set of groundwater and surface water models. The new regulatory approach can be easily combined with the results of the petition study to demonstrate for regulators in both Michigan and Ohio the interstate nature of the shared groundwater resource. The petition document and data will provide greater insight into the interactions between surface water and groundwater, especially within the watersheds located along the states’ borders.

Garnering additional support for the petition from the state and federal politicians and the local communities was increasingly difficult as the initial U.S. EPA review period proved to be an extended period with little reported progress. In a recent personal conversation with Mr. Spaulding, he indicated that his office intended to present its findings to all the state and federal offices that represented the proposed petition area. He also indicated that a public meeting would be held to review the petition and the implications of a sole source aquifer designation. The approach of conducting a public meeting is likely to have the greatest impact in the decisions to support the petition as the U.S. EPA’s representatives, rather than a private consultant, will present a review of the petition and explain the implications of the sole source designation.

Comment 7. Please include a record documenting any consultation with the Ohio, Michigan, and Indiana state governmental agencies in matters regarding this Petition.

We have met with state-level representatives from four state regulatory agencies. The research, data, analysis, and conclusions of the petition work were presented at each meeting. We gave PowerPoint presentations, provided additional copies of the petition document for review, and held question and answer periods. Furthermore, we followed up each meeting with copies of an abstract of the petition document and supporting figures.

In Indiana, we met the Indiana Department of Environmental Management field inspectors for northeast Indiana at the North office in South Bend on June 28, 2007. Those in attendance included Dan Plath, Lucio Ternieden, and William Morgan. In Michigan, we met at the offices of the Michigan Department of Environmental Quality in Lansing on July 17, 2007. Those in attendance included Elgar Brown, Brant Fisher, and Wayne Kukuk.



We held two meetings with the Ohio regulators. We met with Ohio Environmental Protection Agency personnel at their Northwest district office in Bowling Green on June 26, 2007. In attendance at that meeting were Timothy Fishbaugh, Richard Kroeger, Ken Brock, and Debbie Ko. We met with the Ohio Department of Natural Resources at their offices in Dayton on July 12, 2007. In attendance at that meeting were Jim Raab, Mike Hallfrisch, Mike Angle, Kathy Sprows, Bill Haiker, Dennis Crist, Paul Spahr, and Lenn Black.

We were selected to give a presentation at the September 2008 Michigan Section - American Water Works Association meeting. We presented the findings and conclusions of the regional study to a peer group of regulators, engineers, professional geologists, and municipal employees from across the state.

We believe the above information satisfies the request for additional information by Mr. Spaulding of the U.S. EPA regarding the sole source aquifer petition. If you any additional questions, comments, or concerns please feel free to contact me at our offices (574.266.5300) or by email at todd@tritiuminc.net.

Sincerely,
TRITIUM, INC.

Todd Feenstra
President, LPG





Attachment 1

Table. Officials contacted for Letters of Support.

STATE	ENTITY	NAME	TITLE	RESPONSE
Michigan	Hudson	Frank Goodrow	City Manager	under review
	Morenci	Russ Sutherland	Mayor	under review
	Addison	Walt Dental	Mayor	no response
	Waldron	Harold Douglas	Village President	no response
	Camden	Ed Carr	Mayor	no response
	State Representative	Bruce Caswell		no
	State Senator	Cameron Brown		under review
	US Senator	Debbie Stabenow		under review
	US Senator	Carl Levin		under review
	Governor	Jennifer Granholm		under review
Indiana	Butler	Floyd Coburn	Mayor	no response
	Hamilton	Milton Otero	Town Manager	no response
	Saint Joe	Mary Simcox	Clerk	no response
	State Senator	Dennis Kruse		yes
	State Representative	Richard Dodge		under review
	State Representative	Phyllis Pond		under review
	US Senator	Evan Bayh		no decision
	US Senator	Richard Lugar		no decision
	US Representative	Mark Souder		under review
	Governor	Mitch Daniels		under review



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

June 12, 2009

Stephen Casebere
Bryan Municipal Utilities
841 East Edgerton St.
Bryan, OH 43506

Re: Sole Source Aquifer Petition
MICHINDOH Glacial Aquifer SSA

Dear Mr. Casebere:

Thank you for your recent response to comments, dated June 2, 2009. We have reviewed your responses and found them to be satisfactory toward answering the questions posed in our letter, dated January 22, 2009.

Further review of the economic analysis has uncovered a need for more clarification as to reasons for excluding the Ashley-Hudson, Indiana vicinity. It appears from our review of the overall proposed aquifer boundaries that the economic hardship imposed by having to supply water to these communities would warrant including them in the Michindoh Sole Source Aquifer area.

Please excuse us for not including this request for additional information in our previous letter. Your prompt reply to this request is appreciated. If you have any questions, feel free to contact me at (312) 886-9262.

Sincerely,

A handwritten signature in black ink that reads "William Spaulding".

William Spaulding
Sole Source Aquifer Coordinator

cc: Tom Poy



841 East Edgerton St.
Bryan, Ohio 43506

BRYAN MUNICIPAL UTILITIES

July 10, 2009

William Spaulding
U.S. Environmental Protection Agency
Groundwater and Drinking Water Branch
77 West Jackson Boulevard
Chicago, IL 60604-3590

**RE: Sole Source Aquifer Petition
MICHINDOH Glacial Aquifer**

Dear Mr. Spaulding,

Thank you for your prompt review of our June 3, 2009, written responses to your comments on our petition for Sole Source Aquifer designation of the MICHINDOH Glacial Aquifer. We received your additional comment regarding the status of Ashley-Hudson, Indiana. Our consultant, Todd Feenstra of Tritium, Inc., has prepared justification and clarification to place Ashley-Hudson within the sole source aquifer area. We hope the enclosed documents answer your question.

If further information or clarification is needed, please do not hesitate to contact us and we will do our best to supply it promptly. Please contact us at (419) 633-6100, scasebere@cityofbryan.net or our consultant, Todd Feenstra, Tritium, Inc. at (574) 675-4900, Todd@tritiuminc.net.

We look forward to hearing from you soon.

Sincerely,

Stephen Casebere
Director of Utilities

July 8, 2009

Mr. Stephen Casebere
Bryan Municipal Utilities
841 East Edgerton Street
Bryan, Ohio 43506-1413

RE: Response to U.S. EPA June 12, 2009 Letter

Dear Mr. Casebere,

In response to the June 12, 2009 letter written by Mr. William Spaulding of the U.S. EPA, regarding the Sole Source Aquifer Petition that was filed on behalf of the City of Bryan, Ohio we will address the exclusion of the Ashley-Hudson, Indiana vicinity from the MICHINDOH Glacial Aquifer sole source aquifer area. The question raised in the letter is why the Ashley-Hudson area is excluded from the petition area although the economic analysis indicates that implementing an alternative source would create an economic hardship for this area.

After discussions with your staff and Mr. Spaulding, it was agreed to include the communities of Hudson, Indiana and Ashley, Indiana within the proposed sole source aquifer area based on the economics of the region. As presented in the petition document on page 46, the threshold for creating a financial hardship was based on 0.6 percent of the annual mean income and the required debt service to complete the project.

“The economic feasibility analysis was conducted using conservative numbers for both the available funding and the anticipated project costs. First, the maximum percentage (0.6 percent) was applied to the mean annual household income to determine the expected municipal contribution. Second, the annual municipal costs are based on only the debt service portion of the water bill. Furthermore, the debt service represents a feasibility level engineering design with a very basic level of component sizing.”

“The required debt service to complete the proposed projects is expressed as a percentage derived by dividing the maximum funding contribution by the minimized project cost. The number of years required to pay off the debt service was estimated with the assumptions of no inflation, no population change, and zero-interest loans. A payment term of greater than 10 years to eradicate the debt was considered to be unreasonable and provide a hardship for the municipality.”

Based on the above, the two communities could implement an alternative water source only if the maximum cost of \$1,769,160 over a ten-year period is not exceeded. The most feasible proposed alternative source proposed for these two communities is purchased water. The total estimated cost of water construction would exceed \$3,252,000 as presented in Appendix D and Tables 12, 13, and 14. Therefore, implementing an alternative source is not feasible for these communities.

Accordingly, we have revised the proposed boundaries of the sole source aquifer petition area as delineated on the revised Figures 15, 16, and 19 (see attached). We revised paragraph 2 on page 52 of the petition document to reflect the changes (see attached). In addition, we have revised the formatting of Table 12 (page 43) and Table 14 (page 48) to better reflect the proposed combined alternative public water supply systems for the communities of Ashley-Hudson and Auburn-Garrett-Waterloo (see attached).



Mr. Stephen Casebere

July 8, 2009

Page 2

We believe the above information satisfies the request for additional information by Mr. Spaulding of the U.S. EPA regarding the sole source aquifer petition. If you any additional questions, comments, or concerns please feel free to contact me at our offices (574.266.5300) or by email at todd@tritiuminc.net.

Sincerely,
TRITIUM, INC.

Todd Feenstra
President, LPG



Table 12. Estimated Alternative Source Transfer Costs

Municipality	State	Population	Alternative Source Type	Estimated Project Cost (2007 dollars)
Angola	IN	7,344	groundwater	\$1,000,000
Butler	IN	2,725	purchased	\$4,644,000
Hamilton	IN	1,944	purchased	\$4,434,000
Saint Joe	IN	452	purchased	\$4,476,000
<i>Ashley</i>	<i>IN</i>	<i>1,010</i>	<i>purchased</i>	<i>combined</i>
<i>Hudson</i>	<i>IN</i>	<i>596</i>	<i>purchased</i>	<i>combined</i>
Ashley-Hudson*	IN	1,606	purchased	\$3,252,000
<i>Auburn</i>	<i>IN</i>	<i>12,074</i>	<i>purchased</i>	<i>combined</i>
<i>Garrett</i>	<i>IN</i>	<i>5,349</i>	<i>purchased</i>	<i>combined</i>
<i>Waterloo</i>	<i>IN</i>	<i>2,200</i>	<i>purchased</i>	<i>combined</i>
Auburn-Garrett-Waterloo*	IN	19,623	purchased	\$11,358,000
Hudson	MI	2,415	groundwater	\$5,420,000
Morenci	MI	2,352	groundwater	\$11,072,000
Manitou Beach	MI	2,080	groundwater	\$2,804,000
Addison	MI	611	groundwater	\$1,916,000
Waldron	MI	577	purchased	\$5,796,000
Camden	MI	542	groundwater	\$3,120,000
Bryan	OH	8,360	surface water	\$35,734,000
Montpelier	OH	4,135	surface water	\$30,536,000
Hicksville	OH	3,533	purchased	\$9,996,000
Edgerton	OH	2,015	surface water	\$12,848,240
West Unity	OH	1,803	purchased	\$4,956,000
Stryker	OH	1,391	surface water	\$14,319,120
Fayette	OH	1,326	surface water	\$11,622,000
Pioneer	OH	1,248	purchased	\$4,200,000
Edon	OH	863	purchased	\$4,284,000
Sherwood	OH	801	purchased	\$9,030,000
Ney	OH	364	purchased	\$5,136,000
Alvordton	OH	298	purchased	\$3,228,000
Blakeslee	OH	126	purchased	\$2,112,000

**italicized communities and data represent a combined public water supply system*

5.4 AVAILABLE FUNDING

The economic feasibility is evaluated in part based on whether the annual costs to use an alternative water supply source would create an economic burden for the local residents or municipal water customers. As proposed in the petition guidance document, a quantitative analysis of the annual system cost for a typical user was calculated. By definition, if this cost exceeds 0.4 to 0.6 percent of the mean annual household income, use of the alternative source would create a financial hardship for the end users and be considered economically unfeasible.

Table 14. Economic Feasibility Analysis Results

City	State	Population	Alternative Source Type	Estimated Project Cost (2007 dollars)	Available Funding (2007 dollars)	Available Percent of Project Cost	Debt Repayment Years
Angola	IN	7,344	GW	\$1,000,000	\$738,135	74%	1
Butler	IN	2,725	PW	\$4,644,000	\$292,119	6%	16
Hamilton	IN	1,944	PW	\$4,434,000	\$233,571	5%	19
Saint Joe	IN	452	PW	\$4,476,000	\$47,371	1%	94
<i>Ashley</i>	<i>IN</i>	<i>1,010</i>	<i>PW</i>	<i>\$3,252,000</i>	<i>\$104,327</i>	<i>3%</i>	<i>31</i>
<i>Hudson</i>	<i>IN</i>	<i>596</i>	<i>PW</i>	<i>\$3,252,000</i>	<i>\$72,589</i>	<i>2%</i>	<i>45</i>
Combined	IN	1,606	PW	\$3,252,000	\$176,916	5%	19
<i>Auburn</i>	<i>IN</i>	<i>12,074</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$1,485,853</i>	<i>13%</i>	<i>8</i>
<i>Garrett</i>	<i>IN</i>	<i>5,349</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$642,755</i>	<i>6%</i>	<i>18</i>
<i>Waterloo</i>	<i>IN</i>	<i>2,200</i>	<i>PW</i>	<i>\$11,358,000</i>	<i>\$252,180</i>	<i>2%</i>	<i>45</i>
Combined	IN	19,623	PW	\$11,358,000	\$2,380,788	21%	5
Hudson	MI	2,415	GW	\$5,420,000	\$285,797	5%	19
Morenci	MI	2,352	GW	\$11,072,000	\$271,086	2%	41
Manitou Beach	MI	2,080	GW	\$2,804,000	\$227,093	8%	12
Addison	MI	611	GW	\$1,916,000	\$62,916	3%	30
Waldron	MI	577	PW	\$5,796,000	\$50,508	1%	115
Camden	MI	542	GW	\$3,120,000	\$53,077	2%	59
Bryan	OH	8,360	SW	\$35,734,000	\$889,644	2%	40
Monpelier	OH	4,135	SW	\$30,536,000	\$376,964	1%	81
Hicksville	OH	3,533	PW	\$9,996,000	\$401,196	4%	25
Edgerton	OH	2,015	SW	\$12,848,240	\$224,705	2%	57
West Unity	OH	1,803	PW	\$4,956,000	\$182,903	4%	27
Stryker	OH	1,391	SW	\$14,319,120	\$159,907	1%	90
Fayette	OH	1,326	SW	\$11,622,000	\$122,551	1%	95
Pioneer	OH	1,248	PW	\$4,200,000	\$133,437	3%	31
Edon	OH	863	PW	\$4,284,000	\$108,036	3%	40
Sherwood	OH	801	PW	\$9,030,000	\$90,212	1%	100
Ney	OH	364	PW	\$5,136,000	\$38,464	1%	134
Alvordton	OH	298	PW	\$3,228,000	\$31,088	1%	104
Blakeslee	OH	126	PW	\$2,112,000	\$15,864	1%	133

GW=groundwater; PW=purchase water; SW=surface water

*italicized communities and data represent a combined public water supply system

5.5.2 Rural Distribution System

A rough analysis of a potential rural water distribution system for the homeowners and businesses serviced by private wells was also performed based on the 2000 U.S. Census statistics. The proposed SSA area encompasses nearly 1,600 square miles across three states and eight counties. The average population density across this area is 59 persons per square mile. This is equivalent to 24 households per square mile (population divided by 2.5). Thus, there are approximately 38,400 rural households within the proposed SSA area.

water based municipal drinking water supplies. The physical extent boundary trends west to east from near Auburn, Indiana, along the Defiance-Paulding county line almost to the City of Defiance, Ohio. The trend then changes to a northeasterly direction, and the boundary passes between Stryker and Archbold, Ohio, and extends to Weston, Michigan.

The third boundary type is an economic boundary where the MICHINDOH aquifer system ceases to be the sole source for drinking water supplies. An economic feasibility analysis for the communities of Auburn, Angola, Garrett, and Waterloo, Indiana, indicates that these communities have the potential to meet their water demands with either additional wellfields in adjacent groundwater basins and/or purchased drinking water from adjacent water suppliers.

The fourth boundary type is the river basin divides. These divides were utilized in areas where the surficial drainage posed a potential contamination threat to the MICHINDOH aquifer system via potentially rapid surface transport of contaminants into high recharge areas above the MICHINDOH aquifer system. Such areas are located near the municipalities of Addison, Devils Lake, Hillsdale, Manitou Beach, Osseo and Reading, Michigan; and Auburn and Waterloo, Indiana.

The residents, businesses, and municipal drinking water supplies within the proposed sole source aquifer area rely exclusively on the MICHINDOH Glacial Aquifer to meet their drinking water demands. Additional users include smaller public water supply systems and irrigation supplies for agricultural use. No surface water intakes or purchased drinking water transmission lines are currently in place within the proposed sole source aquifer area. This is due to the ubiquitous presence of the MICHINDOH Glacial Aquifer, the geographic separation of the communities from each other and the surface water resources, and the expense to construct surface water treatment facilities and extensive drinking water transmission lines.

The economic feasibility of transferring to an alternative resource was based on the 2000 U.S. Census data for population and mean household income, civil engineering project design and estimated project costs, and the estimated water demands of the municipalities within the proposed SSA area. The underlying assumption of the feasibility analysis approach taken in this petition is that if the population centers where the greatest financial potential exists cannot feasibly afford to transfer to an alternative supply, the private users of the MICHINDOH aquifer system would not be able to afford a drinking water source transfer either.

The economic feasibility analysis is conservative. First, a civil engineer proposed the economical project designs and project costs for transferring each of the municipalities to an alternative drinking water resource. The project designs and costs were simplified and represent basic construction elements. In all likelihood, the total project requirements and costs would be considerably more than the estimates presented in this petition. Second, the available funding from the area residents is assumed to be the maximum of 0.6 percent of the reported income, as defined by the EPA guidance document. Third, the construction loans were assumed to be granted at zero percent interest.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

July 15, 2009

Stephen Casebere
Bryan Municipal Utilities
841 East Edgerton St.
Bryan, OH 43506

**Re: Sole Source Aquifer Petition
MICHINDOH Glacial Aquifer SSA**

Dear Mr. Casebere:

Thank you for your recent response to comments, dated July 8, 2009. We have reviewed your response and found it to be satisfactory toward answering the question posed in our letter, dated June 12, 2009.

We have included the latest revisions to the official Michindoh Sole Source Aquifer (SSA) Petition record. This action concludes the detailed Agency review phase of the petition process, and will soon go to the Regional Administrator for approval or denial. The Regional Administrator's action will be announced via a public notice to interested parties within the States of Indiana, Michigan and Ohio and nationally in the Federal Register, for 30 days. Following the conclusion of this time period, we will determine the need for a public hearing, or if there is insufficient need, announce the Regional Administrator's final decision in a letter.

In order to complete the petition process and announce the Regional Administrator's decision, we need the names and addresses of local, regional, and State contacts within the affected area, as well as those outside the area who might have an interest in this decision. Your assistance would be greatly appreciated. These contacts will be included with a mailing list of USEPA Region 5 contacts.

Thank you in advance for your response to this request. If you have any questions or would like further clarification concerning this request, feel free to call me at (312)886-9262.

Sincerely,

A handwritten signature in black ink, appearing to read "William Spaulding".

William Spaulding
Region 5 Sole Source Aquifer Coordinator

cc: Tom Poy