Rib Mountain Sanitary District
WELLHEAD PROTECTION PLAN
WELLS #1, #2, #3 and #4

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Prepared for the Rib Mountain Sanitary District
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BACKGROUND

Rib Mountain Sanitary District has prepared this wellhead protection plan for the purpose of minimizing the risk of contamination to the municipal water supply. Wellhead protection is a preventative program designed to protect public water supplies by managing land use in the area surrounding the wells. For newly constructed wells, wellhead protection plans are required by the WI DNR. For existing wells constructed prior to 1992, such as Rib Mountain's wells, wellhead protection plans are voluntarily completed at the utilities discretion. This plan establishes wellhead protection areas around each municipal water supply well. These areas are designated for special protective measures intended to minimize the risk of the well becoming contaminated. The wellhead protection areas are established based on the area determined by a hydrologic study to contribute groundwater to the well. This plan is prepared in accordance with the Wisconsin Administrative Code, Chapter NR 811.12(6) for wellhead protection planning.

WATER SUPPLY

Rib Mountain Sanitary District has a long history with wellhead protection. They were one of the first utilities in the state to be protected by a wellhead protection ordinance. The ordinance was originally passed by the Town of Rib Mountain in 1985, and updated in 2013. The sanitary district is located in the Town of Rib Mountain in central Marathon County. The Sanitary district is considered a separate entity from the town and serves a population of around 5,000 people in the populated area of Rib Mountain. The system has an average demand of around 450,000 gallons per day (gpd) which spikes during the summer months due to irrigation and during December & January when the ski hill is making snow. Currently the ski hill is working towards an alternative water supply which would reduce the sanitary districts demand during those months. This plan includes the Sanitary District's four existing wells. Well construction details are as follows.

Table 1

Well #	WI Unique Well ID#	Pump Type	Year Constructed	Total Depth (ft)	Casing Depth (ft)	Open Interval (ft)	Well Diameter (in)	Design Capacity (gpm)
1	VX778	Vertical Turbine	1984	75	60	15	16	525
2	DG454	Vertical Turbine	1984	90	70	20	16	525
3	DG455	Vertical Turbine	1984	90	70	20	16	400
4	MZ701	Vertical Turbine	2000	78	63	15	20	250

The Sanitary District has one storage reservoir with a capacity of 483,000 gallons. Locations of the wells are shown in Figure 1. Well #1 was originally constructed in 1984 and reconstructed in 2014 with a 14" casing sleeve. Lithologic logs and construction details for the wells are included in Appendix B.

WELL LOCATIONS

All four wells are located roughly 300 feet apart between State Highway 51 to the west and the Wisconsin River to the east. The sanitary district owns a triangular piece of property between Lilac Ave. to the west, Lake Shore Drive to the east and Fern Lane to the north. The wells are surrounded by a mix of land use, a majority which is residential with some commercial to the north and a major transportation corridor to the west and south.

WATER QUALITY

Water pumped from the wells meets all state and federal drinking water standards. Hardness measured as calcium carbonate levels range from around 50-170 mg/L which is classified as moderately hard (Kammerer, 1981). Iron and Manganese levels are slightly elevated in Wells #1 and #2. Recent Iron levels in Wells #1 and #2 have been around 0.90 and 1.0 mg/L respectively. Recent Manganese levels in Wells #1 and #2 have been around 0.15 and 0.18 mg/L respectively. Iron and Manganese in groundwater typically comes from the weathering of Iron and Manganese rich minerals in the Aquifer. The EPA has set a secondary standard of 0.3 mg/L for Iron and 0.05 mg/L for Manganese. A secondary standard is not a health concern, but can cause aesthetic affects such as taste and odor issues. In 1985 the Vyrdox method of treating Iron & Manganese was deployed around Wells #1 and #2. This includes injection of highly oxygenated water around the pumping wells to create a highly oxidized zone in the aquifer. Iron and Manganese are precipitated and retained in the aquifer and water entering the pumping well will have a reduced level of Iron and Manganese. The recent rise in Iron and Manganese levels indicate that this treatment method is not effective at Rib Mountain and the sanitary district is considering installation of post pumping treatment.

The other water quality concern is raising Chloride levels in Well #4. Chloride levels have risen from 140 mg/L in the year 2000 to 310 in 2016. The EPA has set a secondary standard of 250 mg/L for Chloride. The source of Chloride is likely from de-icing salts applied to roads and parking lots near the well.

HYDROGEOLOGIC SETTING

Rib Mountaian is located in central Marathon County on the west bank of Lake Wausau, which is an impoundment on the Wisconsin River. The Sanitary District land sits on an area of relatively flat unconsolidated sand and gravel deposited by sediment filled glacial meltwater around 18,000 years ago. During Wisconsin's most recent glacial episode, glaciers advanced into eastern Marathon County. As the glaciers retreated, meltwater carried sand & gravel sediment down the Eau Claire River, depositing much of that sediment in the area where the Eau Claire River meets the Wisconsin River (Attig & Mulldoon, 1989). A map of the glacial geology is shown in Figure 2. The unconsolidated deposits along Lake Wausau & the Wisconsin River range in thickness from 40ft o 160ft. The thickness and ability of the unconsolidated aquifer to contain and transmit water make it the most important municipal water supply in the area and is known as the "Wausau Aquifer" by geologists. The aquifer is considered

unconfined, which means there is no low hydraulic conductivity layer to help attenuate, retard, or immobilize pollutants trying to move downward into the aquifer; providing protection for the aquifer. To the west are hill slope and an upland area that consists of relatively impermeable pre-Cambrian age crystalline bedrock that does not yield adequate water for municipal water supplies (Kendy & Bradbury, 1988). All of Rib Mountain's wells pump from the unconsolidated sand & gravel Wausau Aquifer that lies along Lake Wausau.

AQUIFER CHARACTERISTICS

The source of all groundwater is precipitation which infiltrates and recharges the aquifer. The rate at which groundwater flows in the aquifer is determined by the hydraulic parameters of the aquifer. Important hydraulic parameters are described below and given in Table 2:

- Aquifer Thickness – Vertical thickness of water bearing porous medium.
- Effective Porosity – The ratio of void volume to the total volume of material (estimate)
- Hydraulic Gradient – The change in water table elevation (hydraulic head), divided by the change in distance in a given direction (calculation shown in Figure 3)
- Storage Coefficient – The volume of water that an aquifer releases from storage, per unit surface area of the aquifer, per unit change in head. Estimated for unconfined aquifers (Driscoll 1986, pp. 737).
- Transmissivity – The rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient. It is estimated using pump test data, and the "T-Guess" computer solution (Bradbury and Rothschild, 1985).
- Hydraulic Conductivity – The ease with which flow takes place through a porous medium. It is calculated by dividing the transmissivity by the aquifer thickness.

Table 2

Aquifer Hydrologic Parameters	Well #1	Well #2	Well #3	Well #4
Saturated Aquifer Thickness (ft)	75	58	62.7	47.5
Effective Porosity	0.2	0.2	0.2	0.2
Hydraulic Gradient	0.01	0.01	0.01	0.01
Storage Coefficient	0.001	0.001	0.001	0.001
Transmissivity (ft2/sec)	0.15	0.13	0.18	0.047
Hydraulic Conductivity (ft/day)	320.79	193.66	248.04	85.49

The Aquifer hydraulic parameters are estimated using a pump test, which is conducted at the time of well construction, and can be found on the well construction report. A pump test provides an estimate of how much water an aquifer can yield and how good the well performs, also known as the wells specific capacity. This is done by measuring drawdown, which is the difference between the static (pre-pumping) water levels and water levels after pumping the well at a given rate for a given period of time. The pumping test results are as follows:

Table 3

Pump Test	Well #1	Well #2	Well #3	Well #4
Pumping Rate (gpm)	450	500	650	300
Duration (hours)	72	72	72	12
Static Water Level (ft)	34.6	32	27.3	30.5
Pumping Water Level (ft)	51	49.2	44.3	60
Drawdown (ft)	16.4	17.2	17	29.5
Specific Capacity (gpm/ft)	27.4	29.1	38.2	10.2

GROUNDWATER FLOW DIRECTION

In a groundwater flow system, groundwater moves continuously from areas of recharge to areas of groundwater discharge. The direction of groundwater flow may be inferred from the regional topography and the slope of the water table. The water table is the upper limit of the aquifer and is measured in "head" or elevation above sea level. The water table is estimated by looking at water levels in wells that have a screened interval within the aquifer. Wells provide a point of measurement of the water table2 elevation. The best available water table map for the area was published by the Wisconsin Geological and Natural History Survey (Kendy & Bradbury, 1988). A local section of the water table map is shown in Figure 4. The water table is shown as contour lines of equal head with a 10 ft contour interval. Groundwater flows approximately at right angles to the contour lines of equal head in the direction of decreasing head. Blue arrows were added to the map to show the general direction of groundwater flow. Near Rib Mountain, groundwater originates as precipitation that falls around the wells and in topographically higher areas to the west. Precipitation infiltrates downward until it reaches the water table where it starts to move in a horizontal direction to the east and the Wisconsin River.

ZONE OF INFLUENCE

The Theis Equation is used to calculate the Zone of Influence (ZOI), which is a circle around each well that represents a cone of depression in the water table defined by a drawdown of 1 foot that would develop after 30 days of continuous pumping at full capacity, with no recharge to the groundwater. It assumes that the aquifer is homogeneous (the aquifer is equally permeable in all places and in all directions), the well fully penetrates the aquifer and drawdown is small compared to the saturated thickness. It simulates theoretical worst-case condition. Since the formula uses continuous pumping at full capacity and does not consider recharge to the aquifer, the calculation is likely artificially large. When recharge is considered the ZOI becomes an elliptical shape extending farther upgradient and less downgradient.

Theis Equation:

$$W(\mu) = \frac{sT}{114.6*Q}$$

$$r^2 = \frac{Tt\mu}{1.87S}$$

Where:

$W(\mu)$ = Well Function
s = Drawdown (1 ft)
Q = Maximum Pumping Capacity
T = Transmissivity (gpd/ft)
S = Storativity
μ = From lookup table based on $W(\mu)$
t = 30 days continuous pumping
R = Radius of the cone of depression

Zone of Influence (ZOI) Calculations:

Well #1 $W(\mu)$= $\frac{1 \text{ X } 96{,}900}{114.6 \text{ X } 525}$ W(μ)= 1.6106

μ = 0.12

r = $\sqrt{\left(\frac{96{,}900 \text{ X } 30 \text{ X } 0.12}{1.87 \text{ X } 0.001}\right)}$ ZOI radius= 13,658 feet

Well #2 $W(\mu)$= $\frac{1 \text{ X } 83{,}980}{114.6 \text{ X } 525}$ W(μ)= 1.3958

μ = 0.16

r = $\sqrt{\left(\frac{83{,}980 \text{ X } 30 \text{ X } 0.16}{1.87 \text{ X } 0.001}\right)}$ ZOI radius= 14,682 feet

Well #3 $W(\mu)$= $\frac{1 \text{ X } 116{,}280}{114.6 \text{ X } 400}$ W(μ)= 2.5366

μ = 0.047

r = $\sqrt{\left(\frac{116{,}280 \text{ X } 30 \text{ X } 0.047}{1.87 \text{ X } 0.001}\right)}$ ZOI radius= 9,364 feet

Well #4 $W(\mu)$= $\frac{1 \text{ X } 30{,}362}{114.6 \text{ X } 250}$ W(μ)= 1.0598

μ = 0.25

r = $\sqrt{\left(\frac{30{,}362 \text{ X } 30 \text{ X } 0.25}{1.87 \text{ X } 0.001}\right)}$ ZOI radius= 11,035 feet

ZONE OF CONTRIBUTION (RECHARGE AREA)

In order to protect the groundwater reaching Rib Mountain's municipal wells, it is important to determine where that groundwater is coming from. The land area that contributes water to a well is known as the "Zone of Contribution" (ZOC) or recharge area. Several methods can be used to delineate a well's recharge area ranging from a simple calculated fixed radius to the use of complex computer models. There is no groundwater flow model currently developed for the area. The sanitary district previously delineated an approximate recharge area based on topography (Figure 3). To double check the previously delineated area and increase precision, WRWA developed a groundwater flow model using the analytical element modeling software

GFLOW. The model uses reverse particle tracking to estimate groundwater flow lines from the well backwards to the origination point. Near Rib Mountain the model shows groundwater flow originating west of the wells and flowing east towards the wells and the Wisconsin River. This agrees with the groundwater flow indicated on the mapped water table. Assumptions used in the model include an average hydraulic conductivity (K) of 130 ft/day, porosity of 0.3, average aquifer thickness of 55 ft, average annual recharge of 10 inches/year, and a pumping rate equal to half of each well's maximum capacity for a conservative ZOC estimate.

The ZOC is delineated as a "capture zones" equal to the 5-year Time of Travel (TOT). This means that water recharging the aquifer at the margins of the 5-year capture zone should take 5 years to reach the pumping well. The 5-year capture zone is particularly important because 5 years is generally determined to be an adequate amount of time needed for the geologic formation to degrade or dilute small quantities of most contaminants, or contamination could be cleaned up before reaching the pumping well. The 5-year TOT capture zones represents an area where protecting the groundwater is the most important. Typically, in addition to the 5-year capture zone, the ZOC is delineated further back in time to the origination point. For Rib Mountain, the 5-year ZOC extends nearly to the edge of the Wausau Aquifer. It is assumed that very little groundwater from beyond the extent of the Wausau Aquifer is contributing to the municipal wells. Therefore, it would be unnecessary and likely inaccurate (based on the geology) to delineate the capture zone beyond the extent of the Wausau Aquifer. The modeled ZOCs are mapped along with the approximate extent of the Wausau Aquifer in Figure 5.

POTENTIAL CONTAMINANT SOURCES

In order to design the most appropriate management strategy, it is necessary to know what possible sources of contaminants are present around each well. These are locations where human activity or land use has created the potential to release contaminates into the groundwater aquifer. Potential contaminant sources within ½ mile of each well were identified in the Source Water Assessment prepared by the Wisconsin Department of Natural Resources (WDNR, 2003) as well as a records review and field reconnaissance.

Contaminants released on the land surface are subject to a series of physical, chemical and biological processes that impede, destroy or bind up contaminants moving through the soil and unconsolidated surficial deposits toward the groundwater. Soil grain size & organic matter along with any layers of silt & clay work to reduce the susceptibility of the aquifer. Soils near Rib Mountain are primarily loamy sands and loams that have a very limited potential to attenuate pollutants. The primary risks to the aquifer are described and discussed below and potential contaminant sources within ½ mile of each well are mapped in Figures 6. Appendix A contains a comprehensive inventory with distances and direction from the nearest well.

Domestic Wastewater

Sewage from leaking sanitary sewers and septic systems can contain both domestic and industrial wastewater. While industrial wastewater can have many types of pollutants, the contaminants of most concern in domestic wastewater are pathogens and nitrate. Pathogens (primarily bacteria and viruses) are filtered somewhat as they move through the ground and are viable for a limited time. Pathogens are treated most effectively using continuous disinfection, making it an important protective measure. The area surrounding the wells is serviced by the sanitary district's sewer system. Wastewater mains that are less than the DNR's minimum required distance of 200 feet are constructed of water main class material to prevent sewer leaks.

Volatile Organic Compounds (VOCs)

VOCs can be released from a variety of sources, including petroleum storage & transport, auto repair shops, dry cleaners & industrial solvents. Some VOCs are heavy and readily move downward through the aquifer. Heavy VOCs consist primarily of chlorinated solvents used in dry cleaning, parts washing (general de-greasing) and brake cleaning operations. There are several potential VOC sources to the north. The commercial district to the north contains several potential VOC sources, however; the distance from the wells minimizes the risk from these sources. The closest permanent potential VOC source is auto repair activity at King's Campers just west of Well #4. Proper handling and storage of solvents, petroleum products and waste is an important protective measure against VOC contamination. The second potential VOC source of concern is potential spills along Highway 51 just west of all four municipal wells. The sanitary district should work with the Rib Mountain first responders on spill mitigation procedures along transportation routes near the municipal wells.

Private Wells

Water can move through a private well that is unused or in disrepair. These wells can be a direct conduit for contaminants to move quickly from the surface to the groundwater. Damaged or missing well caps provide a direct path for vermin, insect and other organisms to contaminate the aquifer. There are a number of private wells near the municipal wells, including the area up-gradient. The Sanitary District administers a permit program and maintains an inventory of private wells within their service area. If any private wells don't meet construction code or are unused, they should be properly abandoned.

Other Threats

Chloride can be released from road salt spread on roads & parking lots. Chloride rich runoff can enter the groundwater system through Stormwater infiltration basins or focused sub-surface drainage such as French drains. Road salt is used along Highway 51 which has led to slightly elevated chloride levels in all wells; however Well #4 is experiencing exceptionally high chloride levels. This is likely due to the French drain system used to manage stormwater at the King's Campers facility just west of Well #4. The sanitary district should work with King's Campers on reducing chloride use, finding alternative de-icing methods or using engineering controls to mover stormwater further off site.

WELLHEAD PROTECTION AREAS

A Wellhead Protection Area (WHPA) is defined by the federal Safe Drinking Water Act as the "surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water or well field". In practical terms, the WHPA is a legally-defined area including all or part of the Zone of Contribution and within which zoning practices or other land-use controls can be implemented to help protect groundwater from contamination (Bradbury et. al., 1999). The WHPA is established to clearly define the area most critical for protecting Rib Mountain's wells from contamination. It should be the primary focus of efforts to protect the Sanitary District water supply.

The WHPA is divided into two zones. Zone A is identified as the primary source of water for the municipal well aquifer and as the area most likely to transmit groundwater contaminants to the municipal wells. Zone A is more restrictive than Zone B. Zone B is identified as secondary source of water for the municipal well aquifer as an area where there is a lower probability of surface contaminants reaching the municipal well fields. Zone B is less restrictive (Rib Mountain Sanitary District, Ordinance 5). The DNR mandates that WHPAs are based on a 5-year groundwater travel time. Additionally, the WHPA is normalized to convenient natural and political boundaries. The sanitary district has previously established a wellhead protection area around all four wells. This area extends beyond the modeled 5-year ZOC which provides a conservative protection area. This plan maintains the WHPA previously established by the sanitary district. New maps of the WHPA are included in Figures 7 & 8 and the map of the wellhead protection area from the sanitary district's ordinance is included in Figure 9.

MANAGEMENT STRATEGY

The management strategy outlines the Sanitary District's plan to implement the wellhead protection plan. "Implementation" means taking specific actions to protect the Sanitary District water supply wells. This includes addressing specific issues and solutions identified in the wellhead protection plan or by the steering committee. The implementation plan lays out specific actions along with the responsible party and a timeline for completion

Blue-shaded blocks indicate activities already in place and ongoing

Activity	***Responsible Party***	***When Implemented***	***Comments***
SOURCE MANAGEMENT ACTIVITIES			
Private Well Abandonment Ordinance	Director of Utilities	Ongoing	The sanitary district will continue to enforce of the private well abandonment ordinance which requires permitting of private wells within the sanitary district boundary and abandonment of private wells that are unused or do not meet code.

Wellhead Protection Ordinance	Director of Utilities	Ongoing	The sanitary district will continue to work with the Town of Rib Mountain to enforce their wellhead protection ordinance: *Rib Mountain Sanitary District Municipal Well Recharge Area and Restrictions. Ordinance 5*.
Cross Connection Control	Director of Utilities	Ongoing	The sanitary district has an ongoing Cross Connection Control program to reduce the risk of contamination to the municipal water supply.
New Development/Re-Development	Director of Utilities/Town Director of Community Development	Within 6 Months of Plan Completion	The Director of Utilities will work with the Town Director of Community Development to formalize procedures for communication when new development is proposed.
EDUCATION AND OUTREACH ACTIVITIES			
Consumer Confidence Reports	Water & Wastewater Operator/Sanitary District Clerk	Annually	Consumer Confidence Reports are direct mailed to every customer annually to educate them and provide information on water quality.
Town Beat (Newsletter)	Director of Utilities/Town Director of Community Development	Within 6 Months of Plan Completion	The Director of Utilities will work with the Town Director of Community Development to write an article for the Town Beat about wellhead protection and the importance of protecting groundwater.
Tow Website	Sanitary District Clerk/Town Clerk	Ongoing	The sanitary district will work with the town to include a link to information on wellhead protection on the own website.
WHP Area Signs	Director of Utilities	Within 1 Year of Plan Completion	The Sanitary district will develop road signs for placement in the wellhead protection areas
WATER CONSERVATION ACTIVITIES			
Leak Detection	Director of Utilities	Ongoing	Water bills are screened for anomalies that indicate leaks. Leak detection surveys are conducted as needed.
Water Meter Exchange	Director of Utilities	Ongoing	Water meters are exchanged every 20 years in accordance with PSC requirements.

STEERING COMMITTEE A steering committee has been formed to oversee implementation of the elements of this plan. The committee consists of the following individuals:

- Mike Heyroth, Director of Utilities, Rib Mountain Sanitary District
- Michael Cyrtmus, Operator, Rib Mountain Sanitary District
- Joel Kiepke, Operator, Rib Mountain Sanitary District
- Ed Jensen, Board Member, Rib Mountain Sanitary District
- Steve Kunst, Director of Community Development, Town of Rib Mountain
- Andrew Aslesen, Source Water Specialist, Wisconsin Rural Water Association

Local governmental entities that have jurisdiction in the planning area are the Town of Rib Mountain and Marathon County. Cooperation will be sought with these entities in implementing this plan.

CONTINGENCY PLANNING

Contingency planning is done to minimize the disruption of water service in the event of emergencies. In the event that Rib Mountain's water supply becomes contaminated, the procedures laid out in the Emergency Response Plan, developed by Rib Mountain Sanitary District and stored at the utility office will be followed. The Emergency Response Plan provides a regularly updated comprehensive list of all necessary contacts for water system employees, emergency management agencies, contractors, and state agencies; as well as emergency procedures, including emergency alternate water sources and emergency disinfection procedures.

An abbreviated list of emergency contacts is included below. With any one or two of the sanitary district's four wells out of service, the remaining wells could temporarily meet the average daily demand of around 450,000 gallons. The Sanitary District has one reservoir with a 483,000 gallon capacity that could provide approximately one day of water. Additionally, emergency water use restrictions could be implemented to conserve water.

EMERGENCY CONTACT		PHONE NUMBERS
Local:	Director or Utilities, Rib Mountain SD – Mike Heyroth	715-581-5525
	Operator, Rib Mountain SD – Joel Kiepke	715-574-6177
	Fire/EMS – South Area Fire and Emergency Response	911 or 715-355-6763
	Police Department-Marathon County Sheriff	911 or 715-261-12001
	DNR Representative-Glen Falkowski	715-359-5284
County and Regional:		
	Marathon County Sheriff	911 or 715-261-1200
	Marathon County Emergency Management	715-261-1229
	Marathon County Public Health Department	715-261-1900
	DNR-Regional Spill Coordinator	715-684-2914 ext. 117
State:	DNR-State Spill Response	800-943-0003
	State Lab of Hygiene	608-263-3280

Figure 1 – Rib Mountain Sanitary District Municipal Well Locations

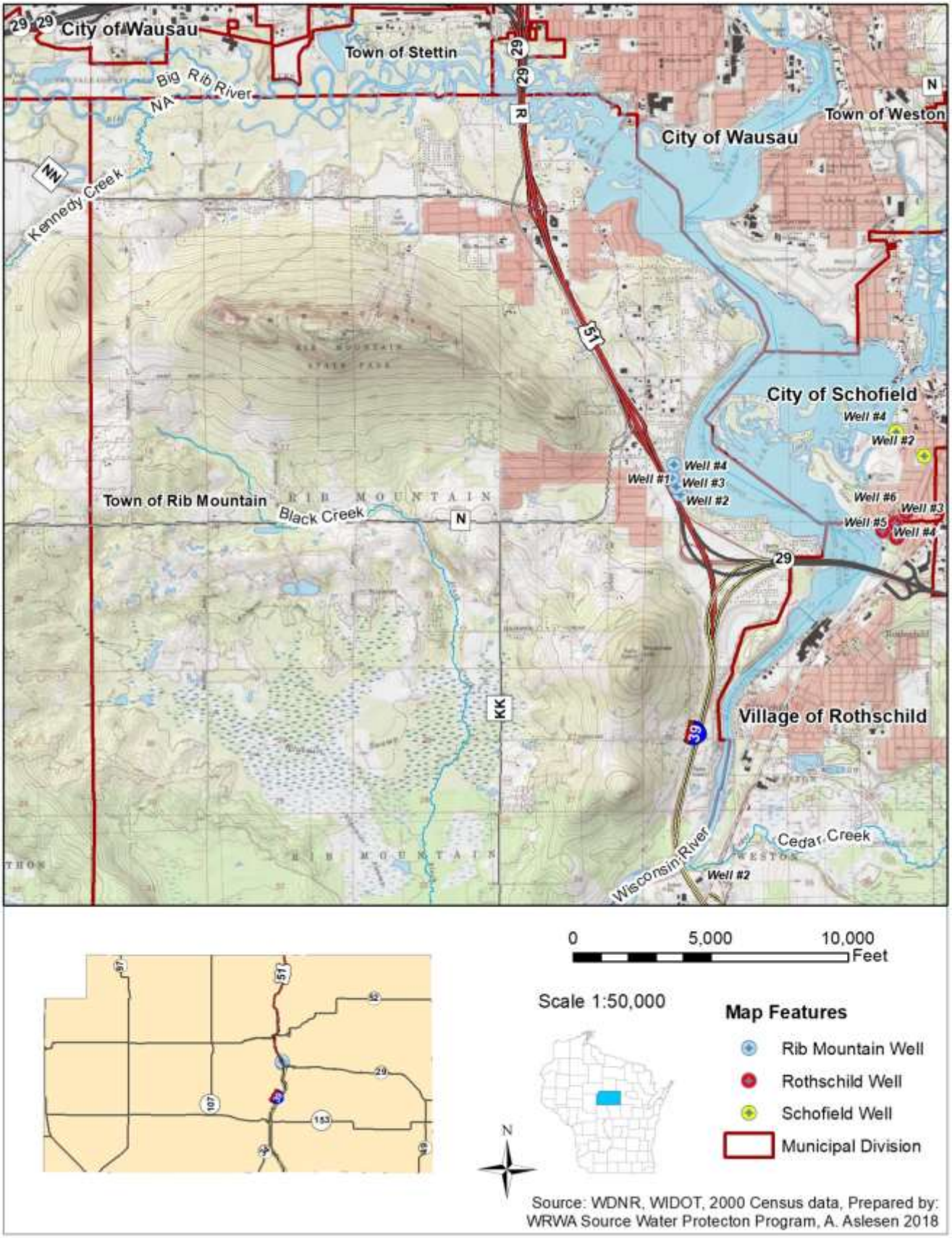

Figure 2 – Pleistocene Geology

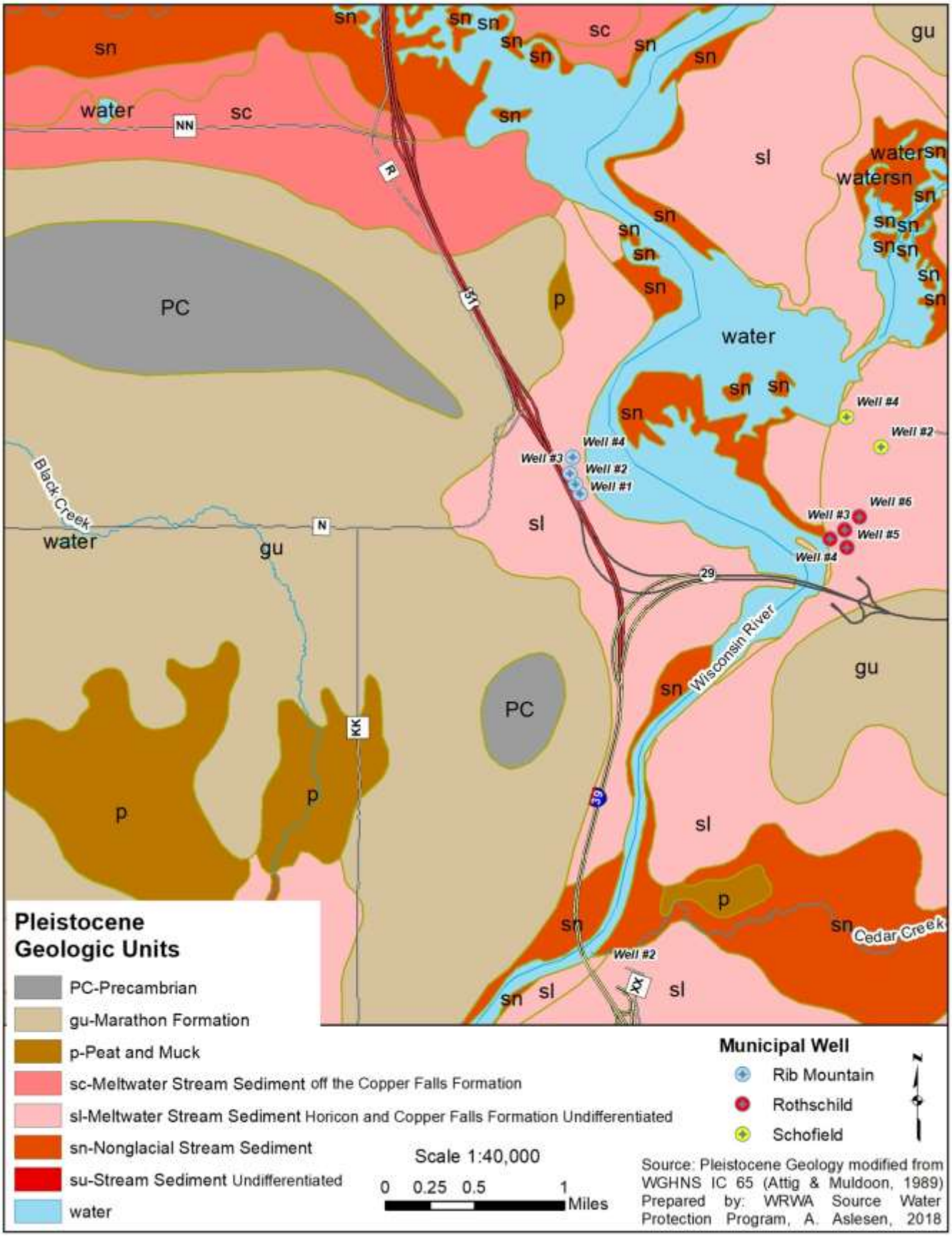

Figure 3 –General Extent of Subsurface Conditions (From Previous WHP Study)

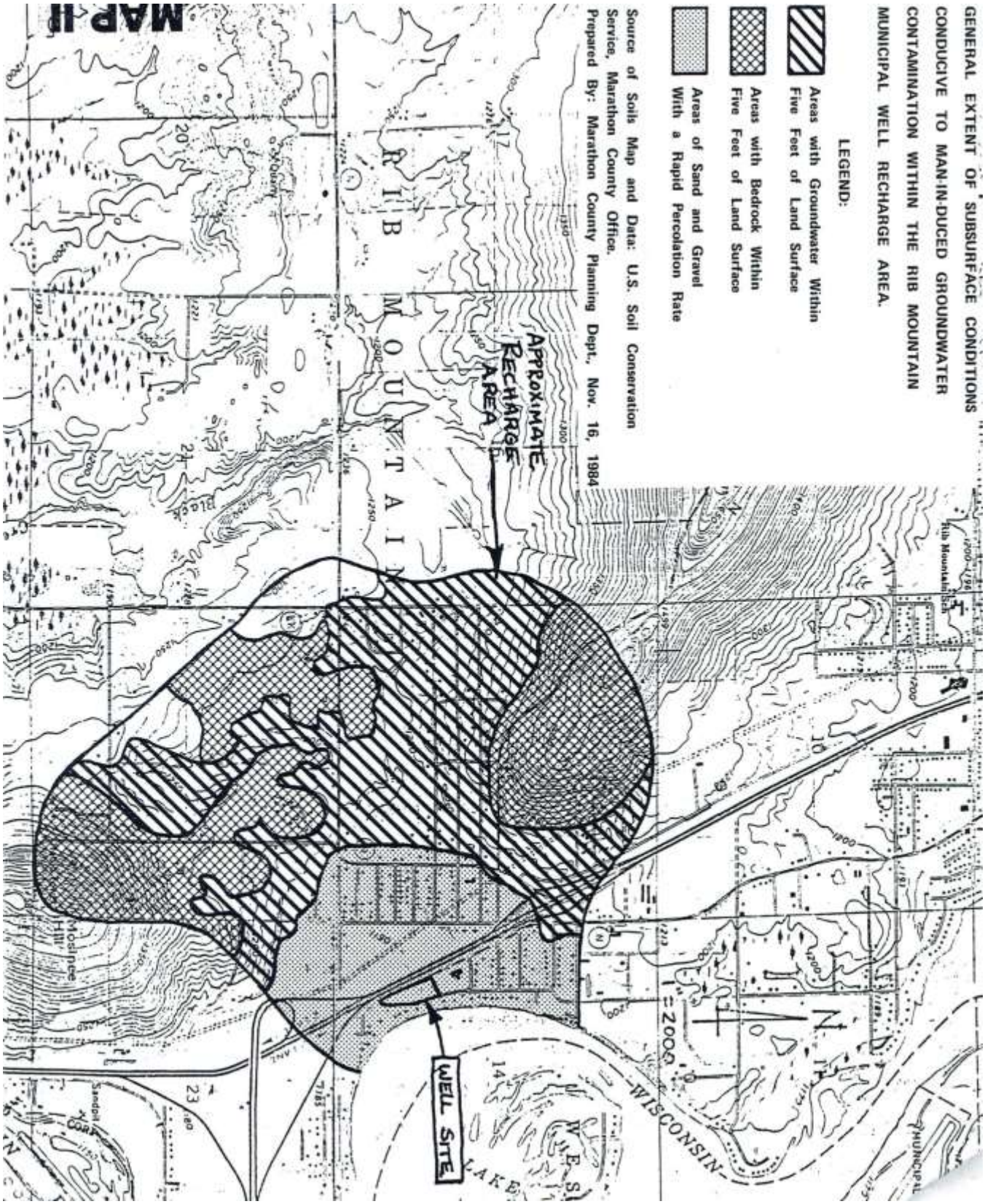

Figure 4 – Groundwater Flow

Figure 5 – Modeled Zone of Contribution

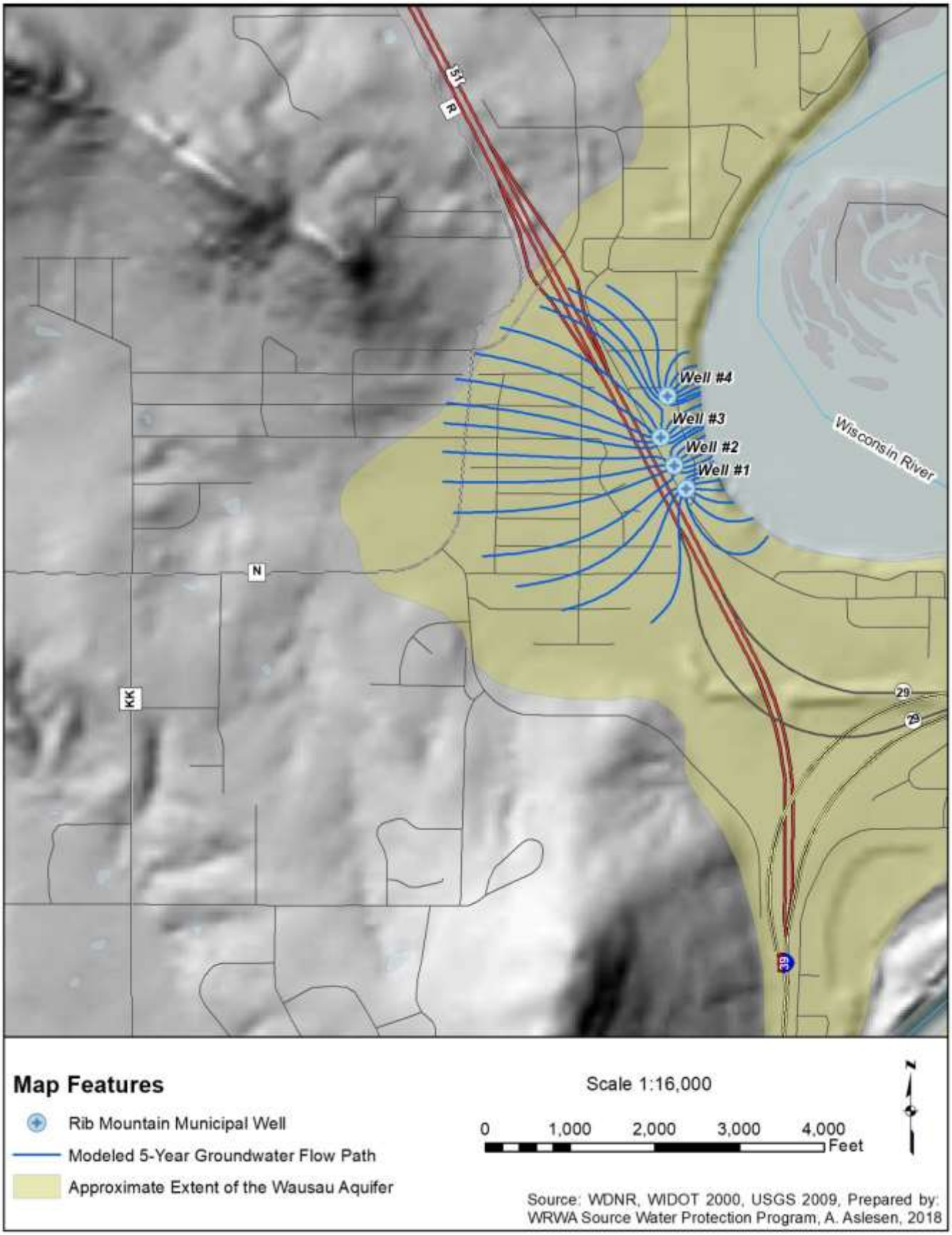

Figure 6 –Potential Contaminant Sources

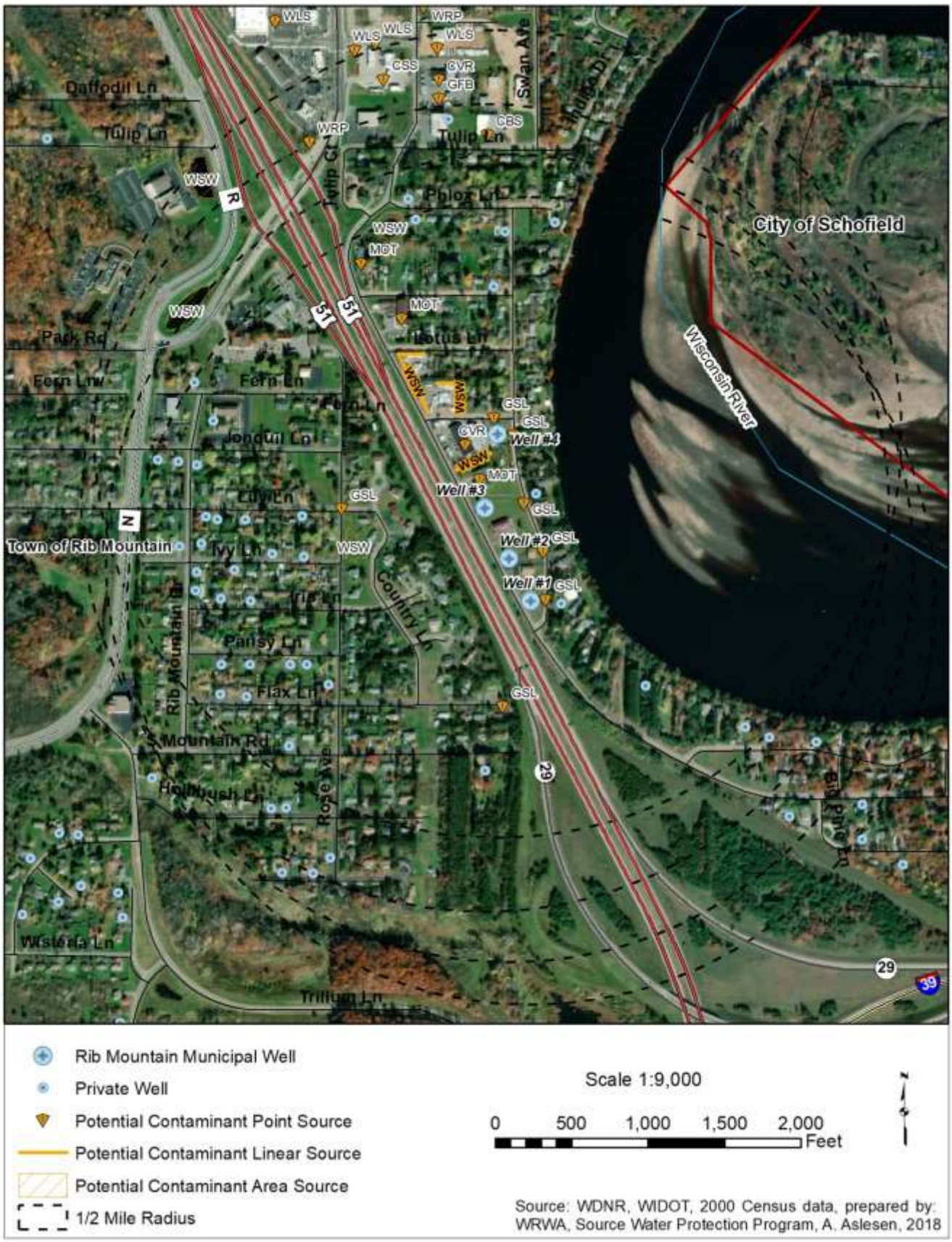

Figure 7 – Wellhead Protection Area

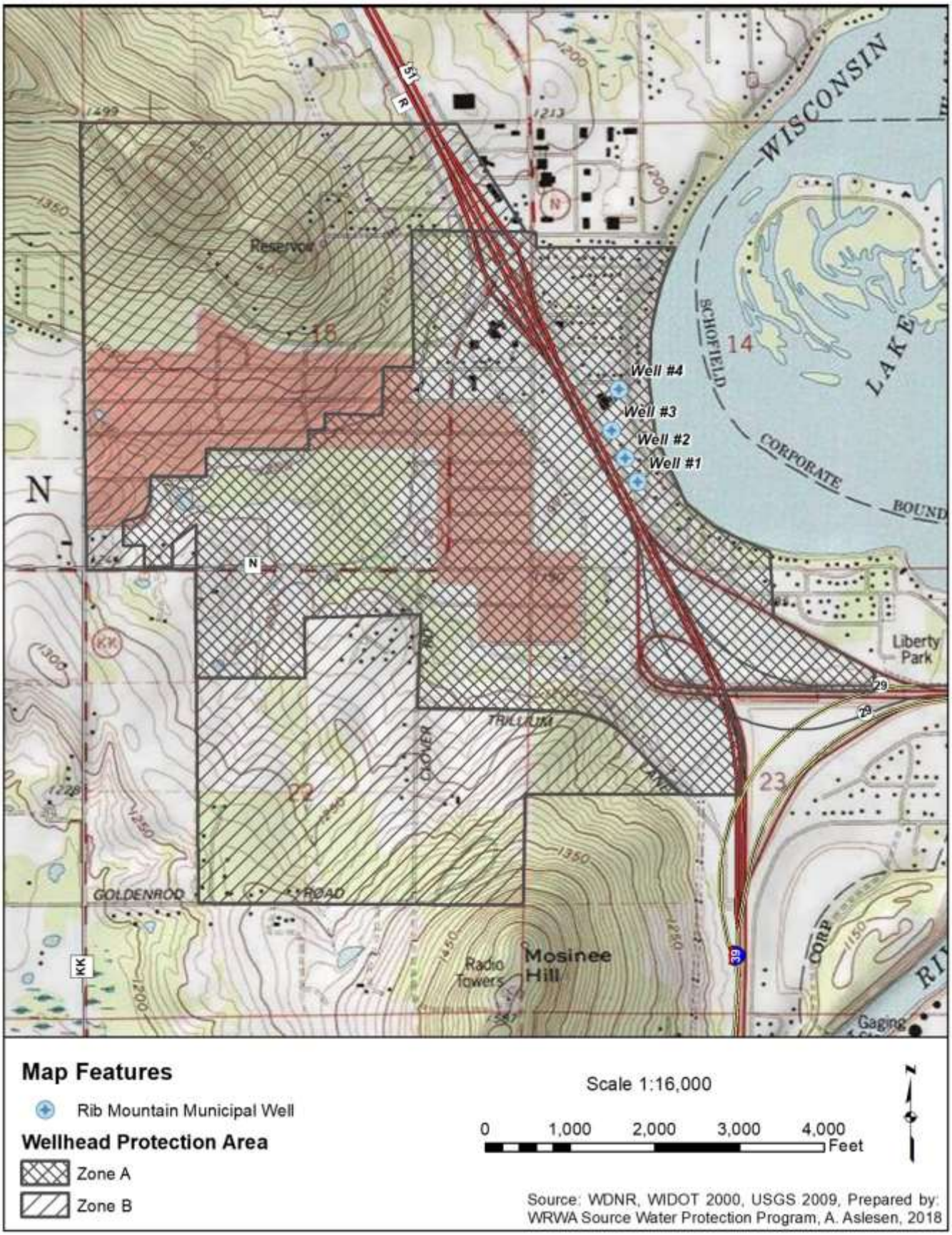

Figure 8 – Wellhead Protection Area

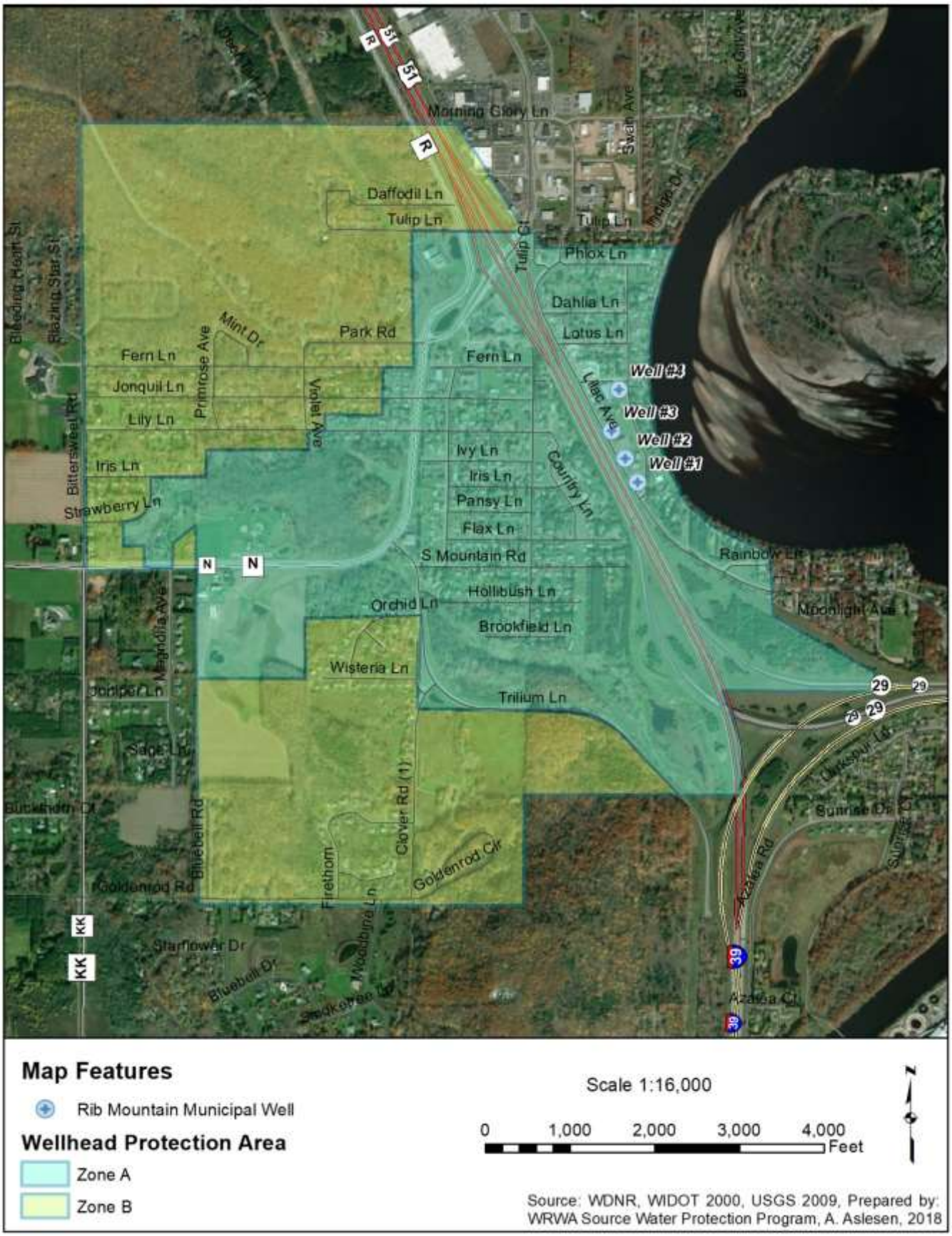

Figure 9 – Map of WHP Area from Sanitary District Ordinance 5 *(Figure 5.12 Maps of Recharge Areas)*

(5.12) Maps of Recharge Areas

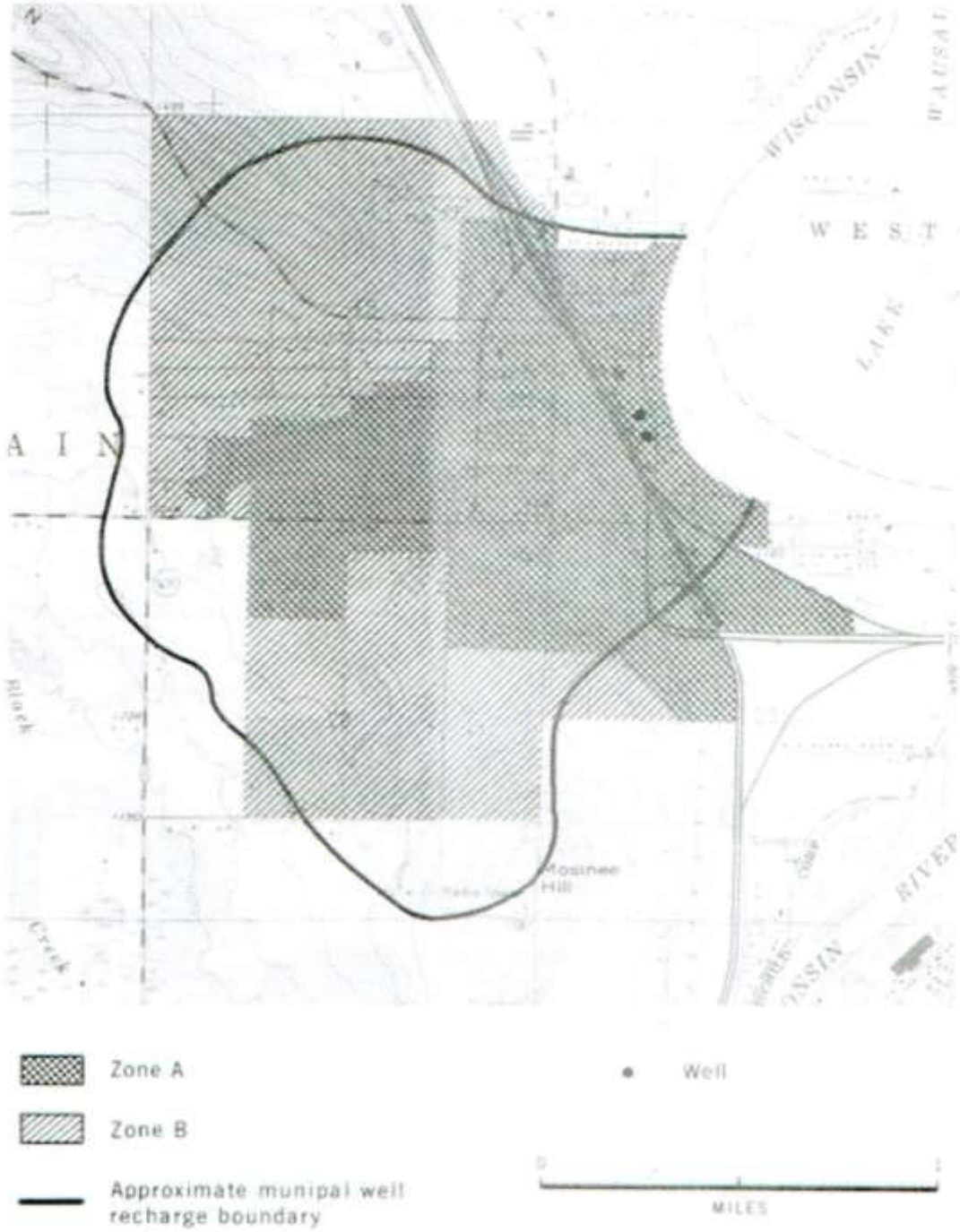

Figure V-1a. Municipal well recharge area with wellhead-protection zones.

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Appendix A – Potential Contaminant Source Inventory, Setbacks & List of Abbreviations

Potential Contaminant Sources Within ½ Mile of Wells #1

See Figure 6

	Code	Potential Contaminant Sources	Distance (ft)	Direction	Name/Owner
1	GSL	Sewer Line	110+	E,S,W,N	Rib Mountain Sanitary District
2	GWA	Water Well-Active	200+	E,S,W,N	Multiple
3	MOT	Other-Dog Kennel	860	N/NW	Red Woof Pet Resort
4	WSW	Stormwater Retention/Infiltration	1,000	N	Kings Campers
5	CVR	Motor Vehicle Repair Shop	1,120	N	Kings Campers
6	WSW	Stormwater Retention Pond	1,200	W	Town of Rib Mountain
7	MOT	Other-Restoration & Cleaning Business	2,000	N/NW	Service Masters
8	MOT	Other-Restoration & Cleaning Business	2,480	N/NW	Restor U
9	WSW	Stormwater Retention Pond	2,510	N	Town of Rib Mountain

Potential Contaminant Sources Within ½ Mile of Wells #2

See Figure 6

	Code	Potential Contaminant Sources	Distance (ft)	Direction	Name/Owner
1	GSL	Sewer Line	240+	E,S,W,N	Rib Mountain Sanitary District
2	GWA	Water Well-Active	450+	E,S,W,N	Multiple
3	MOT	Other-Dog Kennel	520	N/NW	Red Woof Pet Resort
4	WSW	Stormwater Retention/Infiltration	660	N	Kings Campers
5	CVR	Motor Vehicle Repair Shop	750	N	Kings Campers
6	WSW	Stormwater Retention Pond	950	W	Town of Rib Mountain
7	MOT	Other-Restoration & Cleaning Business	1,700	N/NW	Service Masters
8	WSW	Stormwater Retention Pond	2,170	N	Town of Rib Mountain
9	MOT	Other-Restoration & Cleaning Business	2,180	N/NW	Restor U
10	WSW	Stormwater Retention Pond	2,590	NW	Town of Rib Mountain

Potential Contaminant Sources Within ½ Mile of Wells #3

See Figure 6

	Code	Potential Contaminant Sources	Distance (ft)	Direction	Name/Owner
1	MOT	Other-Dog Kennel	170	N	Red Woof Pet Resort
2	GSL	Sewer Line	250+	E,S,W,N	Rib Mountain Sanitary District
3	GWA	Water Well-Active	330+	E,S,W,N	Multiple
4	WSW	Stormwater Retention/Infiltration	330	N	Kings Campers
5	CVR	Motor Vehicle Repair Shop	400	N	Kings Campers
6	WSW	Stormwater Retention Pond	830	W	Town of Rib Mountain
7	MOT	Other-Restoration & Cleaning Business	1,340	N/NW	Service Masters
8	MOT	Other-Restoration & Cleaning Business	1,800	N/NW	Restor U
9	WSW	Stormwater Retention Pond	1,850	N	Town of Rib Mountain
10	WSW	Stormwater Retention Pond	2,300	NW	Town of Rib Mountain
11	CBS	Auto Body Shop	2,430	N	Yach's Body & Custom, Inc.

Potential Contaminant Sources Within ½ Mile of Wells #4

See Figure 6

	Code	Potential Contaminant Sources	Distance (ft)	Direction	Name/Owner	
1	GSL	Sewer Line	90+	N,E,S,W	Rib Mountain Sanitary District	
2	WSW	Stormwater Retention/Infiltration	130	SW,NW	Kings Campers	
3	CVR	Motor Vehicle Repair Shop	140	W	Kings Campers	
4	MOT	Other-Dog Kennel	320	SW	Red Woof Pet Resort	
5	WSW	Stormwater Retention/Infiltration	330	N	Kings Campers	
6	GWA	Water Well-Active	500+	E,S,W,N	Multiple	
7	MOT	Other-Restoration & Cleaning Business	980	NW	Service Masters	
8	WSW	Stormwater Retention Pond	1,150	SW	Town of Rib Mountain	
9	WSW	Stormwater Retention Pond	1,400	NW	Town of Rib Mountain	
10	MOT	Other-Restoration & Cleaning Business	1,450	NW	Restor U	
11	CBS	Auto Body Shop	1,950	N	Yach's Body & Custom, Inc.	
12	WSW	Stormwater Retention Pond	2,100	NW	Town of Rib Mountain	
13	GFB	Fuel Storage Tank-Underground	2,240	N	Ryder Transportation Services	
14	CVR	Motor Vehicle Repair Shop	2,330	N	Ryder Transportation Services	
15	WSW	Stormwater Retention Pond	2,400	NW	Town of Rib Mountain	
16	CSS	Gas Service Station	2,430	NW	Kwik Trip	
	WRP	**ERRP Site**	**Dist (ft)**	**Direction**	**BRRTS ID #**	**Status**
17		Timme Const	2,270	NW	02-37-000378	Closed
	WLS	**Leaking underground storage tank**	**Dist (ft)**	**Direction**	**BRRTS ID #**	**Status**
18		Ryder Truck	2,560	N	03-37-000806	Closed

CONT CODE	CONTAMINANT SOURCE	DESCRIPTION	SPECIFIC CONTAMINANTS
AAH	Animal housing		Livestock sewage wastes, nitrates, phosphates, chloride, chemical sprays and dips for controlling insect, bacterial, viral , and fungal pests, coliform bacteria, viruses
AFA	Animal Feedlot		Livestock sewage wastes, nitrates, phosphates, chloride, chemical sprays and dips for controlling insect, bacterial, viral , and fungal pests, coliform bacteria, viruses
AFP	Agricultural farming	Active farming operations	Pesticides, fertilizers
AIA	Irrigation system	Agricultural irrigation	Pesticides, fertilizers
AMH	Agriculture milkhouse		Livestock sewage wastes, nitrates, phosphates, chloride, chemical sprays and dips for controlling insect, bacterial, viral , and fungal pests, coliform bacteria, viruses, acids
AMS	Manure storage	Lined and unlined manure storage facilities	Livestock sewage wastes, nitrates, phosphates, chloride, chemical sprays and dips for controlling insect, bacterial, viral , and fungal pests, coliform bacteria, viruses
BCT	Chemical storage	500 gallon or more	Specific to chemical product stored at site
BFS	Fertilizer storage/mixing	Feed mill, agricultural co-op	Nitrates
BFT	Petroleum storage	500 gallon or more	Specific to petroleum product stored at site
BGS	Grain storage site		Fungicides
BPS	Pesticide storage / mixing / load	Feed mill, agricultural co-op	Herbicides, insecticides, rodenticides, fungicides, avicides
BSS	Road salt storage	Bulk storage sites	Sodium chloride, calcium chloride, waste oil
CAI	Airport		Jet fuels, deicers, batteries, diesel fuel, chlorinated solvents, automobile wastes, heating oil, building wastes
CBS	Auto body shop		Paints, solvents
CBY	Boat yard		Diesel fuels, batteries, oils, septage from boat waste disposal areas, wood preservatives, paints, waxes, varnishes, automotive wastes
CCE	Cemetery		Leachate (formaldehyde), lawn and maintenance chemicals
CCW	Car wash	Car washes in unsewered areas	Soaps, detergents, waxes, miscellaneous chemicals
CDC	Dry cleaning		Solvents (tetrachloroethylene, petroleum solvents, freon), spotting chemicals (trichloroethane, ammonia, rust removers)
CLD	Laundromat	Laundromats in unsewered areas	Detergents, bleaches, fabric dyes
CMP	Plating facility	Jewelry and metal plating	Cyanide, heavy metals
CMW	Machine / metal working shop		Solvents, metals, organics, sludges, cutting oils, degreasers
CPH	Photo processing	Only include processing facilities, don't include photo drop off sites	Cyanides, biosludges, silver sludges
CPR	Printing		Solvents, inks, dyes, oils, organics, chemicals
CPS	Paint shop		Paint, paint thinner, solvents
CRT	Railroad track		Spills
CRY	Rail yard		Spills
CSP	Seed production plant		Fumigants
CSS	Gas service station		Gasoline, oils, solvents, miscellaneous wastes
CSY	Scrap/junkyard		Oil, gasoline, antifreeze, PCB contaminated soils, lead acids batteries
CVR	Motor vehicle repair shop		Waste oils, solvents, acids, paints, automotive wastes,
GFA	Fuel storage tank - above ground	Non-service station tanks	Gasoline, diesel fuel, other petroleum products
GFB	Fuel storage tank - underground	Non-service station tanks	Gasoline, diesel fuel, other petroleum products
GSA	Sewage absorption area	Drainfields, mounds, dry wells	"
GSL	Sewer line (municipal)	Municipal sewer lines	Septage, coliform bacteria, viruses, nitrates
GSN	Sewer line (non-municipal)	Non-municipal sewer lines	"
GST	Sewage tank	Holding tanks, septic tanks, sumps	Septage, coliform bacteria, viruses, nitrates, heavy metals, synthetic detergents, cooking and motor oil, bleach, pesticides, paints, paint thinner, photographic chemicals, septic tank cleaner chemicals, chlorides, sulfate, calcium, magnesium, potassium, phosphate
GWA	Water well (active production)		Potential conduit
GWI	Water well (unused or improperly abandoned)		Potential conduit
IAS	Asphalt plant		Petroleum derivatives
ICM	Chemical production	Industrial chemical production facilities	Chemicals
IEE	Electrical and electronic products		Cyanides, metal sludges, caustics, solvents, oils, acids, alkalis,

	manufacturing		paints, methylene chloride, tetrachloroethylene, trichloroethane, acetone, toluene, PCBs
IES	Electroplating / metal finishing facility		Acids, alkaline solutions, cyanide, metallic salts, solvents, cyanide, heavy metal contaminated wastewater
IFM	Furniture or wood manufacturing / refinishing / stripping		Paints, solvents (toluene, methylene chloride), degreasing sludges
IFW	Foundry / smelting plant		Cyanides, sulfides
IGS	Gravel and Sand pits		Spills, miscellaneous chemicals, bacteria
IMQ	Mining / Mine waste		Cyanide, sulfides, metals, acids drainage
IPC	Plastics manufacturer / molder		Solvents, oils, organics and inorganics, paint wastes, cyanides, acids, alkalis, sludges, esters, surfactants, glycols, phenols, formaldehyde, peroxides
IPM	Paper mill		Metals, acids, minerals, sulfides, chemicals, sludges, chlorine, hypochlorite, chlorine dioxide, hydrogen peroxide
IPP	Pipeline (petro./chem.)		Petroleum, chemicals
ISQ	Stone quarries		Spills, miscellaneous chemicals, potential conduit, bacteria
ITP	Textile / polyester manufacturer		Chemicals
IWT	Wood preserving facility		Treated wood residue, preservatives (pentachlorophenol, chromate, copper arsenate,), tanner gas, paint sludges, solvents, creosote, coating wastes
MFT	Fire training facility		Chemicals
MGC	Golf course		Fertilizers, herbicides, pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests., automotive wastes
MGP	Manufactured gas plant / gasification plant		Petroleum VOCs, Benzo(a)pyrene, PAHs, cyanide
MLA	Laboratory (college, medical, school, private, etc.)		Biological wastes, disinfectants, acids, formaldehyde, miscellaneous chemicals
MMI	Military installation		
MMP	Medical Installation (e.g. Hospital)		X-ray developers and fixers, infectious wastes, radiological wastes, biological wastes, disinfectants, asbestos, beryllium, acids, formaldehyde, miscellaneous chemicals
MOT	Other (specify) _____		
WDR	Class V injection well	Any well, drilled or dug hole, used to inject fluids into the subsoil	Chlorides, pathogens, petroleum products, pesticides
WHS	Hazardous waste generator (SARA Title III) / RCRA authority clean-ups	Any facility listed on the SARA Title III list thought to pose a threat to the well / RCRA clean-ups	Hazardous waste
WIN	Incinerator (municipal)		Metals, combustion by-products
WLA	Landfill	Solid and hazardous waste sites listed in the DNR "Registry of Waste Disposal Sites in Wisconsin"	Leachate
WLS	Leaking underground storage tank (LUST)	LUST Sites included in the DNR "Leaking Underground Storage Tank List"	Gasoline, diesel fuel, other petroleum products
WRF	Recycling facility		Petroleum products, chemicals
WRP	ERRP Site	Sites on the DNR "Emergency and Remedial Response" list	Spills
WSI	Wastewater Spray Irrigation		Coliform bacteria, nitrate, chloride, pathogens, viruses
WSS	Sludge spreading	Municipal wastewater sludge, paper mill sludge	Viruses, coliform bacteria, heavy metals, dioxins
WSW	Storm water retention pond		Metals, petroleum products
WTS	Solid waste transfer station		Miscellaneous chemicals
WUC	Superfund site	Sites listed in the DNR "Superfund Sites in Wisconsin"	Miscellaneous contaminants
WWL	Wastewater lagoon	Treatment and/or storage lagoons	Coliform bacteria, viruses
WWO	Wastewater discharge to surface water	Surface water outfall	Coliform bacteria, viruses
WWP	Wastewater treatment plant		
WWS	Wastewater discharge to groundwater	Absorption and seepage cells, spray irrigation, subsurface systems, etc.	Coliform bacteria, viruses

NR 811.12(5) Required Setback Distances From Community Water Supply Wells and Potential Sources of Contamination

Potential Contaminant Source	Minimum Setback Distance (ft)
Emergency Power System Operated by The Same Facility Operating Well And Has a Double Wall Above Ground Storage Tank With Continuous Electronic Interstitial Leak Monitoring	10
Storm Sewer Main or Sanitary Sewer Main Constructed of Water Main Class Material	50
Sanitary Sewer Main Not Constructed of Water Main Class Materials	200
Lift Station	
One or Two Family Residential Fuel Oil UST[1] or AST[2]	
POWTS Treatment Tank or Holding Tank	
Any farm UST[1] system or other UST[1] system with double wall and with electronic interstitial monitoring for the system, any farm AST[2] with double wall, or single wall tank with other secondary containment and under a canopy; other AST[2] system with double wall, or single wall tank with secondary containment and under a canopy and with electronic interstitial monitoring for a double wall tank or electronic leakage monitoring for a single wall tank secondary containment structure*	300[3]
Septic Tank (<12,000 gpd)	400
Cemetery	
Storm Water Retention or Detention Pond	
Farm UST[1] system or other UST[1] system with double wall and with electronic interstitial monitoring for the system, any farm AST[2] with double wall, or single wall tank with other secondary containment and under a canopy or other AST[2] system with double wall, or single wall tank with secondary containment and under a canopy; and with electronic interstitial monitoring for a double wall tank or electronic leakage monitoring for a single wall tank secondary containment structure*	600[6]
Land Application of Municipal, Commercial, or Industrial Waste	1,000
The Boundary of a Land Spreading Facility for Spreading of Petroleum-Sontaminated Sol Regulated Under ch. NR 718 While Facility is in Operation	
Industrial, Commercial, or Municipal Wastewater Treatment Plant Treatment Units, Lagoons, or Storage Structures	
Manure Stacks or Storage Structures	
Septic Tank (>12,000 gpd)	
Solid Waste Storage, Transportation, Transfer, Incineration, Air Curtain Destructor, Processing, Wood Burning, One Time Disposal or Small Demolition Facility	1,200
Sanitary Landfill	
Any Property With Residual Groundwater Contamination That Exceeds CH. NR140 Enforecement	
Coal Storage Area	
Salt or Deicing Material Storage Area	
Single Wall Farm UST or Single Wall Farm AST or Other Single Wall UST or AST That Has or Has Not Received Written Approval From The Department of Commerce or Its Designated Local Program Operator*	
Bulk Fuel Storage Facilities	
Bulk Pesticide or Fertilizer Handling or Storage Facilities	

Footnotes On Page 2

*These requirements apply to tanks containing gasoline, diesel, bio-diesel, ethanol, orther alternative fuel, fuel oil, petroleum product, motor fuel, burner fuel, lubricant, waste oil, or hazardous substance

[1] UST-Underground Storage Tank

[2] AST-Above Ground Storage Tank

[3] These installations shall meet the most restrictive installation requirements of s. Comm 10.260 and receive written approval from the department of commerce or its designated Local Program Operator under s. Comm 10.110

[4] For USTs s. Comm 10.260 states the 600ft setback distance may be reduced by 50% if all of the following features are provided and maintained in addition to the features in the tank–type column: tank system construction of corrosion–resistant material, such as fiber–reinforced plastic, or steel with a fiber–reinforced plastic wrap or jacket; non–discriminating sump sensors; testable secondary containment spill bucket; continuous electronic liquid–filled, pressure, or vacuum interstitial monitoring with automatic system shut–down; audible and visual high–level alarm at 90% full, and automatic shut–off at 95%; all fueling area protected by canopy; and downspouts for drainage of rainwater do not discharge into a fueling area.

[5] For ASTs s. Comm 10.260 states the 600ft setback distance may be reduced by 50% if all of the following features are provided and maintained in addition to the features in the tank–type column: either continuous non–discriminating electronic interstitial monitoring for double wall, or continuous non–discriminating electronic sensor for other secondary containment; audible and visual high–level alarm at 90% full, and either automatic shut–off at 95% or no latch–open device is used with any manual–shutoff nozzle; all dispensing by suction pump fuel transfer; all motor vehicle fueling limited to private or fleet use; all fueling area protected by canopy; and downspouts for drainage of rainwater do not discharge into a fueling area.

[6] These installations shall meet the standard double wall tank or single wall tank secondary containment installation requirements of s. Comm 10.260 and receive written approval from the department of commerce or its designated Local Program Operator under s. Comm 10.110

Appendix B – Lithologic Logs and Well Construction Details

Well #1 Original Well Construction Record

State of Wisconsin
Department of Natural Resources
Private Water Supply
Box 7921
Madison, Wisconsin 53707

NOTE:
White Copy - Division's Copy
Green Copy - Driller's Copy
Yellow Copy - Owner's Copy

WELL CONSTRUCTOR'S REPORT
Form 3300-15
Rev. 2-79

1. COUNTY: MARATHON
CHECK (✓) ONE: ☒ Town ☐ Village ☐ City
Name: RIB MOUNTAIN

2. LOCATION: ¼ Section or Gov't. Lot: SW 1/4 | Section: 14 | Township: 28N | Range: 7E
OR – Grid or Street No. | Street or Road Name: LAKE SHORE DRIVE
AND – If available subdivision name, lot & block No.

3. NAME ☒ OWNER ☐ AGENT AT TIME OF DRILLING CHECK (✓) ONE
RIB MOUNTAIN SANITARY DISTRICT
ADDRESS: 2000 N. MOUNTAIN ROAD
POST OFFICE: WAUSAU WI
ZIP CODE: 54401

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building	Sanitary Bldg. Drain C.I.	Sanitary Bldg. Drain Other	Sanitary Bldg. Sewer C.I.	Sanitary Bldg. Sewer Other	Floor Drain Connected To: C.I. Sewer	Floor Drain Connected To: Other Sewer	Storm Bldg. Drain C.I.	Storm Bldg. Drain Other	Storm Bldg. Sewer C.I.	Storm Bldg. Sewer Other

Street Sewer San.	Street Sewer Storm	Other Sewers C.I.	Other Sewers Other	Foundation Drain Connected to: Sewer	Foundation Drain Connected to: Clearwater Or.	Sewage Sump	Clearwater Sump	Sewage Absorption Unit	Manure Hopper or Retention or Pneumatic Tank
						C.I.	Other	Seepage Pit	
								Seepage Bed	
								Seepage Trench	

Privy	Pet Waste Pit	Pit: Nonconforming Existing	Subsurface Pumproom	Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit	Earthen Manure Basin
		Well	Nonconforming Existing								
		Pump									
		Tank									

Temporary Manure Stack or Platform	Watertight Liquid Manure Tank or Basin	Manure Pressure Pipe	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Manure Storage Basin	Concrete Floor Only	Concrete Floor and Partial Concrete Walls	Other (Describe)

5. Well is intended to supply water for: MUNICIPALITY WELL #1

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
38"	Surface	75'			

7. CASING, LINER, CURBING AND SCREEN

Dia. (in.)	Material, Weight, Specification Mfg. & Method of Assembly	From (ft.)	To (ft.)
16"	NEW STEEL WELDED ASTM A53 GR B	Surface	60'
26"	NEW STEEL WELDED ASTM A53 GR B	SURFACE	57'
16"	S.S. SCREEN SLOT .045	60'	75'

8. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
6 BAG CLASS A MIX	Surface	57'

9. FORMATIONS

Kind	From (ft.)	To (ft.)
SAND & GRAVEL	Surface	75'

10. TYPE OF DRILLING MACHINE USED
☐ Cable Tool ☐ Rotary-air w/drilling mud ☐ Rotary-w/drilling mud ☐ Rotary-hammer w/drilling mud & air ☐ Rotary-hammer & air ☒ Reverse Rotary ☐ Jetting with Air ☐ Water

11. MISCELLANEOUS DATA
Yield Test: 72 Hrs. at 450 GPM
Depth from surface to normal water level 34.65 Ft.
Depth of water level when pumping 51 Ft. Stabilized ☒ Yes ☐ No

Well construction completed on SEPT 18 19 84
Well is terminated 30 inches ☒ above ☐ below final grade
Well disinfected upon completion ☒ Yes ☐ No
Well sealed watertight upon completion ☒ Yes ☐ No

Water sample sent to MARATHON COUNTY HEALTH LAB laboratory on SEPT 18 19 84

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature: [illegible] # 208 Registered Well Driller

Business Name and Complete Mailing Address: MILLER WELL & PUMP CO. [illegible]

Well #1 2014 Rebuild Well Construction Record

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER **VX778**

State of WI - Private Water Systems-DG/2
Department of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A (R 9/05)

Property Owner: RIB MOUNTAIN SAN. DISTRICT	Telephone Number: (715) 359-6177
Mailing Address: 5703 LILAC AVENUE	
City: RIB MOUNTAIN	State: WI Zip Code: 54401-
County of Well Location: MARATHON	Co. Well permit No. W_____
Well Completion Date (mm-dd-yyyy): 12 - 23 - 2014	
Well Constructor (Business Name): Layne Christensen Co	License #: 582
Facility ID Number (Public Wells): 73706600	
Address: W229 N5005 DuPlainville Road	Well Plan Approval #: 2014 - 0707
City: Pewaukee State: WI Zip Code: 53072-	Date of Approval (mm/dd/yyyy): 12 / 12 / 2014
Hicap Permanent Well #:	Common Well #: 1
Specific Capacity: 23.4 gpm/ft	
3. Well serves _____ # of _____ (For example: home, barn, restaurant, church, school, industry, etc.)	High Capacity: Well? [X] Yes [ ] No; Property? [X] Yes [ ] No

1. Well Location
[X] Town [ ] City [ ] Village of RIB MOUNTAIN
Fire # (If avail.)
Street Address or Road Name and Number: LILAC AVENUE #1
Subdivision Name | Lot # | Block #
Gov't Lot # _____ or SE 1/4 of SE 1/4 of Section 14, T 28 N; R 7 [X] E [ ] W
Latitude Deg. _____ Min. _____
Longitude Deg. _____ Min. _____

2. Well Type [ ] New [ ] Replacement [X] Reconstruction (see item 12 below)
Lat/Long Method
of previous unique well # BG332 constructed in 1984
Reason for replaced or reconstructed well? COMPROMISED CASING
[ ] Drilled [ ] Driven Point [ ] Jetted [X] Other _____

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? [X] Yes [ ] No If no, explain on back side.
Well located within 1,200 feet of a quarry? [ ] Yes [ ] No If yes, distance in feet from quarry: _____
Well located in floodplain? [ ] Yes [X] No

Distance in feet from well to nearest: (include proposed)
- ____ 1. Landfill
- ____ 2. Building Overhang
- ____ 3. Septic [ ] Holding Tank [ ]
- ____ 4. Sewage Absorption Unit
- ____ 5. Nonconforming Pit
- ____ 6. Buried Home Heating Oil Tank
- ____ 7. Buried Petroleum Tank
- ____ 8. Shoreline [ ] Swimming Pool [ ]
- ____ 9. Downspout/Yard Hydrant
- ____ 10. Privy
- ____ 11. Foundation Drain to Clearwater
- ____ 12. Foundation Drain to Sewer
- ____ 13. Building Drain [ ] Cast Iron or Plastic [ ] Other
- ____ 14. Building Sewer [ ] Gravity [ ] Pressure [ ] Cast Iron or Plastic [ ] Other
- ____ 15. Collector Sewer: [ ] sanitary ___ units ___ in. diam. [ ] storm [ ] ≤ 6" [ ] > 6"
- ____ 16. Clearwater Sump
- ____ 17. Wastewater Sump
- ____ 18. Paved Animal Barn Pen
- ____ 19. Animal Yard or Shelter
- ____ 20. Silo
- ____ 21. Barn Gutter
- ____ 22. Manure Pipe [ ] Gravity [ ] Pressure [ ] Cast Iron or Plastic [ ] Other
- ____ 23. Other Manure Storage _____
- ____ 24. Ditch
- ____ 25. Other NR 812 Waste Source _____

5. Drillhole Dimensions and Construction Method

Dia.(in.)	From (ft.)	To (ft.)	Upper Enlarged Drillhole	Lower Open Bedrock
38	surface	75	[ ] 1. Rotary - Mud Circulation	[ ]
			[ ] 2. Rotary - Air	[ ]
			[ ] 3. Rotary - Air and Foam	[ ]
			[ ] 4. Drill-Through Casing Hammer	
			[X] 5. Reverse Rotary	
			[ ] 6. Cable-tool Bit ____ in. dia.	[ ]
			[ ] 7. Temp. Outer Casing _____ in. dia. Removed? _____ depth ft. [ ] Yes [ ] No - If no, explain on back side.	

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
16	NEW ASTM A53 GR B	surface	60
26	NEW ASTM A53 GR B		57
14	NEW ASTM A53 BR B, 0.375" WALL		60
Dia. (in.) 14	Screen type, material & slot size SS .045" WIRE WRAP	From 60	To 75

7. Grout or Other Sealing Material
Method _____ From To # Sacks

Geology Codes	8. Geology Type, Caving/Noncaving, Color, Hardness, etc.	From (ft.)	To (ft.)
T - G -	GRAVEL	0	55
T - S -	SAND	55	70
R - G -	GRAVEL	70	75

9. Static Water Level
_____ ft. above ground surface
35 ft. below ground surface

10. Pump Test
Pumping level _____ ft. below surface
Pumping at _____ GPM for _____ Hrs.

11. Well Is:
24 in. [X] Above Grade [ ] Below
Developed? [X] Yes [ ] No
Disinfected? [X] Yes [ ] No
Capped? [X] Yes [ ] No

12. Did you permanently abandon and fill all unused, noncomplying or unsafe wells on this property?

WISCONSIN UNIQUE WELL NUMBER
Source: SWAP PROJECT KEYED **DG454**

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Property Owner: RIB MOUNTAIN SANITARY DISTRICT
Telephone Number: 715 -359 -6177
Depth 90 FT

Mailing Address: 5703 LILAC AVE

City: RIB MOUNTAIN | State: WI | Zip Code: 54401

County of Well Location: 37 MARATHON | WC | Co Well Permit No: W | Well Completion Date: September 6, 1984

1. Well Location
T=Town C=City V=Village: T of RIB MOUNTAIN
Fire#:
Street Address or Road Name and Number: LILAC AVE #2
Subdivision Name | Lot# | Block #

Well Constructor: MILLER WELL & PUMP | License #: 208
Facility ID (Public): 737066000
Address:
Public Well Plan Approval#: 84-0692
City | State | Zip Code
Date Of Approval: 08/08/1984
Hicap Permanent Well #: 81959 | Common Well #: 002
Specific Capacity: 29.1 gpm/ft

Gov't Lot or SE 1/4 of SW 1/4 of
Section 14 T 28 N R 7 E

2. Well Type 1 (See item 12 below)
1=New 2=Replacement 3=Reconstruction
of previous unique well # _____ constructed in _____
Reason for replaced or reconstructed Well?

1 1=Drilled 2=Driven Point 3=Jetted 4=Other

3. Well Serves M # of homes and or (eg: barn, restaurant, church, school, industry, etc.)
M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole
High Capacity: Well? Property?

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties?
Well located in floodplain?
Distance in feet from well to nearest: (including proposed)

1. Landfill
2. Building Overhang
3. 1=Septic 2= Holding Tank
4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool
9. Downspout/ Yard Hydrant
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain 1=Cast Iron or Plastic 2=Other
14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other
15. Collector Sewer: ___ units ___ in . diam.
16. Clearwater Sump
17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other
23. Other manure Storage
24. Ditch
25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

Dia.(in.)	From (ft)	To (ft)
38.0	surface	90

Upper Enlarged Drillhole — Lower Open Bedrock
-- 1. Rotary - Mud Circulation
-- 2. Rotary - Air
-- 3. Rotary - Air and Foam
-- 4. Drill-Through Casing Hammer
X -- 5. Reverse Rotary
-- 6. Cable-tool Bit _ n. dia
-- 7. Temp. Outer Casing _ in. dia. _____ depth ft. Removed ?
Other

Geology Codes	8. Geology Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
T_I_	SOIL	0	5
T_G_	GRAVEL	5	35
T_S_	SAND	35	90

6. Casing Liner Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
16.0	NEW STEEL WELDED ASTM A 53 GR B	surface	70
26.0	NEW STEEL WELDED ASTM A 53 GR B	0	65

Dia.(in.)	Screen type, material & slot size	From	To
16.0	SS SLOT 0 04 SCREEN	70	90

9. Static Water Level
32.0 feet B ground surface
A=Above B=Below

10. Pump Test
Pumping level 49.2 ft. below surface
Pumping at 500.0 GP M 72.0 Hrs

11. Well is: in. Grade
A=Above B=Below
Developed?
Disinfected?
Capped?

7. Grout or Other Sealing Material

Method / Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
CLASS A MIX	surface	65.0	6 S
GRAVEL PACK	0.0	60.0	

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?
If no, explain

13. Initials of Well Constructor or Supervisory Driller | Date Signed

Initials of Drill Rig Operator (Mandatory unless same as above) | Date Signed

Additonal Comments? DG
Owner Sent Label? Y
Variance Issued?
More Geology?

Batch 560

WISCONSIN UNIQUE WELL NUMBER **Source:** SWAP PROJECT KEYED **DG455**

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Property Owner: RIB MOUNTAIN SANITARY DISTRICT
Telephone Number: 715 -359 -6177
Mailing Address: 5703 LILAC AVE
City: RIB MOUNTAIN
State: WI
Zip Code: 54401
County of Well Location: 37 MARATHON
WC
Co Well Permit No: W
Well Completion Date: October 2, 1984

Depth 90 FT

1. Well Location
T=Town C=City V=Village: T of RIB MOUNTAIN
Fire#:
Street Address or Road Name and Number: LILAC AVE #3
Subdivision Name:
Lot#:
Block #:

Well Constructor: MILLER WELL & PUMP
License #: 208
Facility ID (Public): 737066000
Address:
Public Well Plan Approval#: 84-0692
City:
State:
Zip Code:
Date Of Approval: 08/08/1984
Hicap Permanent Well #: 81960
Common Well #: 003
Specific Capacity: 38.2 gpm/ft

Gov't Lot: or SE 1/4 of SW 1/4 of
Section 14 T 28 N R 7 E

2. Well Type 1 (See item 12 below)
1=New 2=Replacement 3=Reconstruction
of previous unique well # _____ constructed in _____
Reason for replaced or reconstructed Well?

3. Well Serves: M
# of homes and or (eg: barn, restaurant, church, school, industry, etc.)
M=Munic O=DTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole
High Capacity: Well? Property?

1 1=Drilled 2=Driven Point 3=Jetted 4=Other

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties?
Well located in floodplain?
Distance in feet from well to nearest: (including proposed)

1. Landfill
2. Building Overhang
3. 1=Septic 2= Holding Tank
4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool
9. Downspout/ Yard Hydrant
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain 1=Cast Iron or Plastic 2=Other
14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other
15. Collector Sewer: ___ units ___ in . diam.
16. Clearwater Sump
17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other
23. Other manure Storage
24. Ditch
25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

Dia.(in.)	From (ft)	To (ft)
38.0	surface	90

Upper Enlarged Drillhole
-- 1. Rotary - Mud Circulation
-- 2. Rotary - Air
-- 3. Rotary - Air and Foam
-- 4. Drill-Through Casing Hammer
X -- 5. Reverse Rotary
-- 6. Cable-tool Bit _ n. dia
-- 7. Temp. Outer Casing _ in. dia. _____ depth ft. Removed ?
Other
Lower Open Bedrock

Geology Codes	8. Geology Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
_G_	GRAVEL	0	25
_S_	SAND	25	30
_G_	GRAVEL	30	35
_S_	SAND	35	40
_G_	GRAVEL	40	45
_S_	SAND	45	90

6. Casing Liner Screen Material, Weight, Specification Manufacturer & Method of Assembly

Dia. (in.)		From (ft.)	To (ft.)
16.0	NEW STEEL WELDED ASTM A 53 GR B	surface	70
26.0	NEW STEEL WELDED ASTMA 53 GR B	0	65

Dia.(in.)	Screen type, material & slot size	From	To
16.0	SS SLOT 0 045 SCREEN	70	90

9. Static Water Level
27.3 feet B ground surface
A=Above B=Below

10. Pump Test
Pumping level 44.3 ft. below surface
Pumping at 650.0 GP M 72.0 Hrs

11. Well Is:
Developed?
Disinfected?
Capped?
in. Grade
A=Above B=Below

7. Grout or Other Sealing Material

Method / Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
CLASS A MIX	surface	65.0	6 S
GRAVEL PACK	0.0	90.0	

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?
If no, explain

13. Initials of Well Constructor or Supervisory Driller Date Signed

Initials of Drill Rig Operator (Mandatory unless same as above) Date Signed

Additonal Comments? DG
Owner Sent Label? Y
Variance Issued?
More Geology?

Batch 560

WISCONSIN UNIQUE WELL NUMBER **MZ701**

Source: WELL CONSTRUCTION

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Property Owner: RIB MOUNTAIN SAN DISTR
Telephone Number: 715 -359 -6177

Mailing Address: 5703 LILAC AVE

City: WAUSAU | State: WI | Zip Code: 54401

County of Well Location: 37 MARATHON | WC | Co Well Permit No: W | Well Completion Date: May 2, 2000

Well Constructor: MUNICIPAL WELL & PUMP INC | License #: 13 | Facility ID (Public): 737066000

Address: 20950 ENTERPRISE AVE | Public Well Plan Approval#: 2000-0204

City: BROOKFIELD | State: WI | Zip Code: 53045 | Date Of Approval: 03/13/2000

Hrcap Permanent Well #: 2861 | Common Well #: 4 | Specific Capacity: 10.2 gpm/ft

1. Well Location — Depth 78 FT

T=Town C=City V=Village: T of RIB MOUNTAIN | Fire#:

Street Address or Road Name and Number: CORNER OF FERN & LAKESHORE DR

Subdivision Name | Lot# | Block #

Gov't Lot or SE 1/4 of SW 1/4 of

Section 14 T 28 N R 7 E

2. Well Type 1 (See item 12 below)

1=New 2=Replacement 3=Reconstruction

of previous unique well # _____ constructed in _____

Reason for replaced or reconstructed Well?

3. Well Serves: M — # of homes and or MUNICIPALITY (eg: barn, restaurant, church, school, industry, etc.)

M=Manic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole

High Capacity: Well? Y | Property? Y

1 1=Drilled 2=Driven Point 3=Jetted 4=Other

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? Y

Well located in floodplain? N

Distance in feet from well to nearest: (including proposed)

1. Landfill
2. Building Overhang
3. 1=Septic 2= Holding Tank
4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool
9. Downspout/ Yard Hydrant
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain 1=Cast Iron or Plastic 2=Other
14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other
15. Collector Sewer: ___ units ___ in . diam.
16. Clearwater Sump
17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other
23. Other manure Storage
24. Ditch
25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

Dia.(in.)	From (ft)	To (ft)
42.0	surface	28
36.0	28	78

Upper Enlarged Drillhole — Lower Open Bedrock

-- 1. Rotary - Mud Circulation
-- 2. Rotary - Air
-- 3. Rotary - Air and Foam
-- 4. Drill-Through Casing Hammer
-- 5. Reverse Rotary
X -- 6. Cable-tool Bit _35 n. dia
X -- 7. Temp. Outer Casing _42 in. dia. _____ depth ft. Removed ? X

Other

8. Geology

Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
_SC	SAND MIXED WITH CLAY	0	5
_NGS	SAND WITH FINE GRAVEL	5	10
_NY_	SAND & GRAVEL (FINE)	10	73
_MGS	SAND WITH MEDIUM GRAVEL	73	78

6. Casing Liner Screen Material, Weight, Specification Manufacturer & Method of Assembly

Dia. (in.)		From (ft.)	To (ft.)
26.0	.500 WALL ASTM A53B PE BEVELED WELD 136.2#FT	surface	60
20.0	.375 WALL ASTM A53B PE BEVELED WELD 78.6#/FT BAKRIE PIPE IND	0	63

Dia.(in.)	Screen type, material & slot size	From	To
20.0	304 SS PS, .038 IN SLOT COOK MFG	63	78

9. Static Water Level 30.5 feet B ground surface (A=Above B=Below)

10. Pump Test Pumping level 60.0 ft. below surface — Pumping at 300.0 GP M 12.0 Hrs

11. Well Is: 60 in. A Grade (A=Above B=Below)

Developed? Y
Disinfected? Y
Capped? Y

7. Grout or Other Sealing Material

Method PRESSURE TREMIE

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CMENT	surface	60.0	485 S
GRAVEL PACK	0.0	78.0	

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property? N

If no, explain: MONITORING WELLS (3)

13. Initials of Well Constructor or Supervisory Driller: TG — Date Signed: 6/8/00

Initials of Drill Rig Operator (Mandatory unless same as above): AKJ — Date Signed: 6/8/00

Additonal Comments? MZ
Owner Sent Label? Y
Variance Issued?
More Geology?

Batch 719